Baker, Talia (DES)

From:	thelma achamire <thelma.achamire@gmail.com>
Sent:	Monday, April 3, 2017 9:47 AM
To:	Baker, Talia (DES)
Subject:	Enloe Dam

Ms. Baker,
I am writing in opposition to the proposed re-electrification of Enloe Dam.
First, the plan is too expensive, and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

Second, more importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power up from the current 8%. It is also cheaper power.

Third, although the Okanogan PUD does not highly value the aesthetics of the County, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely, Thelma Achamire

Baker, Talia (DES)

From: S T Albin <mjalbin@gmail.com>
Sent: Saturday, April 8, 2017 11:06 AM
To: Baker, Talia (DES)
Subject: No Enloe Dam

Dear Project Review Committee,

I am heartily convinced that the PUD's plan to upgrade Enloe Dam and begin generating electricity with it is a horrible idea. The current PUD directors have already put the PUD deeply in debt by building a new building for their offices. This dam upgrade would add tremendously to the PUD's debt load and interest payments unnecessarily. At a time when dams are being deconstructed (torn down) around the country to improve fish habitat, to go the opposite direction w/ Enloe is foolish. AND the electricity the dam is proposed to produce will be more expensive than replacement electricity which could be bought from Douglas County.

I understand that Okanogan County, where I have lived for 37 years, is a backward-thinking area with many confused people running various government and utility agencies. Please protect us, the citizens, from this foolish action which seem likely to bankrupt the PUD and cost many people and investors sooo much money.

thank you,

L D Albin
114 Haley Creek Rd
Omak, WA 98841

--
--

sent from my ... spaceship

L D Albin / Singing T

"art is a more trustworthy expression of God than religion"
Rosanne Cash

"War will exist until that distant day when the conscientious objector enjoys the same reputation and prestige that the warrior does today."
John F. Kennedy

Baker, Talia (DES)

From: Char Alkire <char.alkire@gmail.com>
Sent: Thursday, April 13, 2017 9:28 AM
To: Baker, Talia (DES)
Subject: Enloe Dam

Dear Ms. Baker

I am a OPUD ratepayer and a native of Washington State. I initially looked into this issue with an open mind in my desire as a rate payer and citizen to better understand both sides.

With my research complete I now urge you to **stop the electrification of Enloe.** The key reasons for me that tipped my hand to this position were principally based on financial and environmental data.

1) A study show that OPUD ratepayers will pay 2-4 times as much for power from Enloe Dam as they would if the power were purchased from the open market.

2) This is an old outdated Damm!!! Construction of a new powerhouse will be expensive and will more than double the annual payments on principle and interest carried by OPUD

3) The cost of reenergizing Enloe Da is projected to be between $39.1 Million to $45.5 million according to OPUD.

3) Decommissioning and removing Enloe Dam will reconnect 200 miles of the Similkameen River and offers the best opportunity for restoring a rich salmon and steelhead fishery since the removal of the Elwha and Glines Canyon Dams on Washington's Olympic Peninsula.

Thank you for taking the time to read my email. I respect the work you do as part of the review committee and hope that you come to the same conclusion as I have. On so many levels, this does not make sense and thus you will vote to stop the electrification of Enloe.

Best,
Char Olson-Alkire

Baker, Talia (DES)

From:	Rita Anderson <ritaganderson@outlook.com>
Sent:	Wednesday, April 12, 2017 11:09 AM
To:	Baker, Talia (DES)
Subject:	Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely,

Rita G Anderson
Sent from my iPhone

Kim Andrew Buchman

606 Juniper Street

Oroville Washington

April 17, 2017 @ 2:00PM

Project Review Committee

Enloe Hydroelectric Project

To Whom it may concern,

I live on the Similkameen River. As I write this I look out my window at the levee going along the backyard. What a privilege it is to have this beautiful and almost wild river going past.

I lived most my life in Alaska and fished commercialy for the first ten years of my life. I then became a U.S. Merchant Marine for the next 40 years and am still going to sea. I have had the chance to visit over 40 countries in my lifetime and have lived in 8 of them. I am now 72 years old and still sailing. I have seen the world changing with more people and more development. There are not any other places in the world like the U.S.A. with its Parks and Wilderness. The oceans of the world are being fished out; as I sail I see great areas of just water deserts with no living beings. We do not know how fortunate we are to have some fish left in our coastal waters and some wildlife still in our country. There is nothing so sad as traveling through other countries and seeing only the crush of humanity.

It has been suggested to renew electrification of the Enloe Dam, but I am told that the Wells Dam already guartees the Electricity for Okanogan County (at 22%). If this project is just an expense for a few people can make a profit and that it will only be an extra burden on the people of Okanogan county; then it should be put on hold.

I was in Japan recently and hired a car and driver for a day for we could visit one of the historical sites. We went through the city the suburbs and country side and everywhere there were solar panels on houses, buildings and in rice fields. The Okanogan gets plenty of sunshine.

I drove up to Keremeos in British Columbia along the Similkameen River. If the dam was not there the salmon could run up river as there are plenty of beautiful spanning areas up river in Canada. In Alaska there have been made improvements on some of the rivers for the fish to comes up more easily.

What a wonderful thing it would be to bring the run back and improve it. It would bring people up to sports fish. It is shoulder to shoulder with people fishing along the Kenia River in Alaska and a big economic benefit.

I hope that a wise discession can be made that will benefit the county into the future.

Sincerely Yours

Kim Andrew Buchman

Baker, Talia (DES)

From:	Veeda Angell <vangell_dvm@hotmail.com>
Sent:	Monday, April 17, 2017 10:04 PM
To:	Baker, Talia (DES)
Subject:	I OPPOSE electrifying the Enloe dam

Dear Ms. Baker

I am writing to state my voice that I OPPOSE electrifying the Enloe Dam.

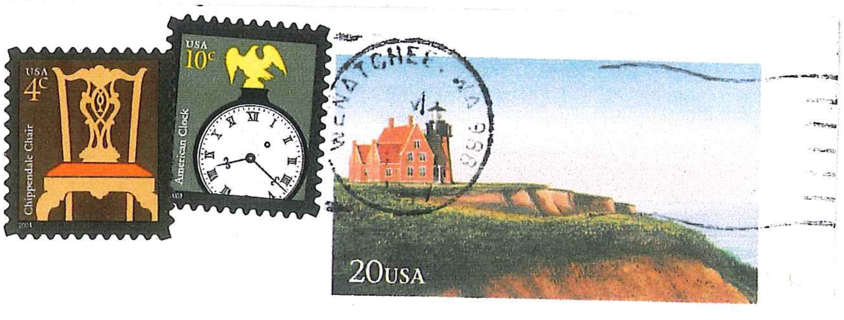
Thank you for your time and consideration.

Sincerely,
Veeda Angell

Dont Electrify Enloe

Dont Electrify Enloe

Do Not Let
The PUD To Rebuild
The Enloe Dam.

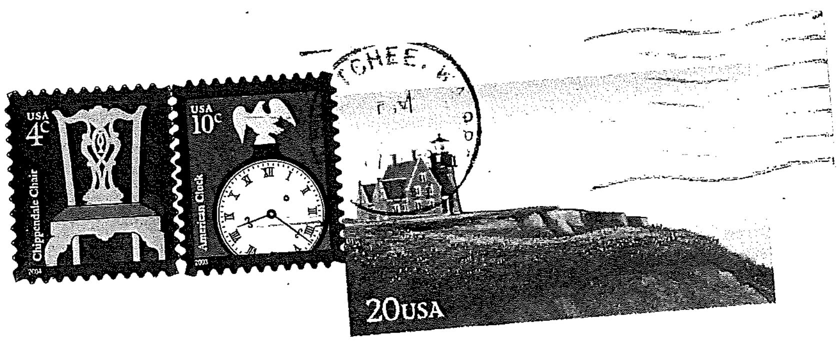


Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

Please do not power Enloe Dam - ~~Et~~ We have enough power through our agreements with Douglas County - Do not do this - OPUD rate payers can not afford that

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

NO! to Enloe Powering DAM



Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

Baker, Talia (DES)

From:	David and Debbie <bluberry@methownet.com>
Sent:	Wednesday, April 12, 2017 9:38 AM
To:	Baker, Talia (DES)
Subject:	Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed.
Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely,
David and Debbie Asia

Baker, Talia (DES)

From:	Gregg Bafundo <greggbafundo@gmail.com>
Sent:	Tuesday, April 4, 2017 4:55 PM
To:	Baker, Talia (DES)
Subject:	Enloe Dam

Mrs. Baker,

I'm writing you to persuade you to deny Okanogan County PUD any fast track or design build options on re-powering Enloe Dam. As a rate payer this project would vastly increase my rates while providing very little power. This entire project is simply a political move and has no real benefit to the people of Okanogan County. Considering we have a few of the largest dams in the United States already providing us with ample electricity at very reasonable rates there is absolutely no need for this small, expensive and silly project. Please don't support this.

Thank You,
Gregg Bafundo
Tonasket, WA

Baker, Talia (DES)

From: kris baker <krisbfacebookpage@gmail.com>
Sent: Monday, April 10, 2017 2:54 PM
To: Baker, Talia (DES)
Subject: Enloe Dam

As a resident of Okanogan County for over 40 years, I would like to be recognized as one of many who are opposed to the electrification of Enloe Dam. I've attended several PUD meetings regarding the Dam when the overwhelming majority of the audience and the speakers were against the electrification proposal, and yet the commissioners have disregarded all the comments and gone on with their private agenda. Enough is enough. Time to stop and listen to the residents. Please do not go on with this costly and unnecessary project. Thank you.

Kristin Baker
PO Box 234
Tonasket, WA. 98855
429 3598

Sent from my iPhone

Baker, Talia (DES)

From: Janet Bauer <jsrbauer@gmail.com>
Sent: Wednesday, April 12, 2017 8:39 AM
To: Baker, Talia (DES)
Subject: Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely,

Baker, Talia (DES)

From: Patrice Belzer <pbelzer@hotmail.com>
Sent: Monday, April 17, 2017 3:07 PM
To: Baker, Talia (DES)
Subject: NO to Electrifying Enloe Dam

Too much of our rate-payer's money has been spent on looking into trying to rebuild and revive the Enloe Dam. Such a venture is not ecologically--or economically--sound. Comparisons to other dams by Okanogan Commissioners are unfounded. The only people that will benefit are the builders (and those they have in their pocket.) Please do not think that the vocal minority in governement speak for the majority of rate payers.

Thank you,

Patrice Belzer
738 Mary Ann Creek Road
Oroville, WA 98844

Baker, Talia (DES)

From: cynthia benitez <wordgrdn@hotmail.com>
Sent: Thursday, April 6, 2017 5:41 AM
To: Baker, Talia (DES)
Subject: DON'T ELECTRIFY ENLOE DAM - from a rate payer & registered voter

WE in OKANOGAN COUNTY have the access to the power supply we need &

Enloe power is not needed. OPUD has a Memorandum of Understanding (MOU) with Douglas County PUD to purchase up to 22% of Wells Dam Power in addition to the 8% we now receive. The total amount of power available in 2018 from Douglas County PUD will be 170 megawatts (MW), more than double the current average daily-load of Okanogan County, 77 MW.

The cost of energizing Enloe Dam is projected to be $39.1 million to $45.5 million, according to OPUD.

Construction of a new powerhouse will require extensive borrowing that will more than double the annual payments on principle and interest carried by the Okanogan PUD (OPUD).

PLEASE HELP STOP THIS.- Don't ELECTRIFY ENLOE DAM.

Respectfully,

Cynthia Benitez

Local rate payer & registered voter

Baker, Talia (DES)

From: Lori B <loribialic@gmail.com>
Sent: Wednesday, April 12, 2017 5:56 PM
To: Baker, Talia (DES)
Subject: It is not in my interest or anyone else's interest to electrify Enloe Dam.

For the consumer of electricity in Okanogan County .... electrifying Enloe Dam is a stupid and foolish decision and waste of money. tt would be much wiser to spend less money on upgrading our infrastructure, poles/wires etc. to Wells Dam which can put out all the electricity our county needs with it's slow and steady increase in population. We live in the most economically depressed county in the state and most of us who live here cannot afford the rate hike this project will demand.
Sincerely, Lori Bialic 30 year resident of Okanogan County.

Baker, Talia (DES)

From:	cloudbird bonin <cloudbird3@gmail.com>
Sent:	Sunday, April 16, 2017 9:38 AM
To:	Baker, Talia (DES)
Subject:	Similkameen River

Dear Talia Baker-

Please consider my comments with regard to the Okanogan Public Utility District proposal to build Enloe Dam.

I have lived in Okanogan County for 33 years. During this time, I have witnessed many irresponsible actions carried out by OPUD, all of which have been made at ratepayers expense. Projects have been undertaken with little or no advance notice, such as the purchase of giant generators, I believe at a cost of $6 million, which were never put into service. We ratepayers, did however, notice a charge on our billing statements. While the basic Kwh rate has remained almost the same, there have been additional fees charged since that time ('cost of power adjustment')

While I realize that a utility district has electricity as its product, there should also be financial responsibility to its customers. The OPUD has acted with as little transparency as they can get away with, and the proposed Enloe Dam project follows suit.

The qualifications of the managers of the proposed dam come into question for a project of this scope and size. The information in the permitting process appears to intentionally mask the fact that neither OPUD project manager is qualified to manage a project of the size and scale that is proposed. And in the process of filing for permits and seeking a contractor to build and OWN this project- at ratepayers expense- they have already spent millions of dollars of our money- without asking our permission.

We don't need this dam and we are weary of the OPUD wasting our money!

--

Peace and be well,
Cloudbird Bonin
Carlton Complex Assistance Network
www.CCANrelief.org

Ruby Slippers Farms
Be Well Holistic Nutritional Therapy
PO Box 1322 Twisp WA 98856
(H) 509-997-2348

(C) 509-341-4576

"Food is fabricated soil fertility. It is food that will win the war and write the peace." ~Weston A. Price

Baker, Talia (DES)

From: Jeremy Brown <barcarole@me.com>
Sent: Saturday, April 15, 2017 9:10 PM
To: Baker, Talia (DES)
Subject: Enloe Dam

Please register my opposition to the powerhouse proposal.
Not needed, won't pencil out. Doesn't make sense.
We need to be letting our rivers function as rivers, their ecological service value is significant.
Thanks,
Jeremy Brown.
Bellingham.

Sent from my iPhone

Baker, Talia (DES)

From: Gary Bull <gary1bull@outlook.com>
Sent: Thursday, April 13, 2017 6:04 AM
To: Baker, Talia (DES)
Subject: Enloe Dam

I am opposed to the startup of Enloe dam based on the cost. This will be a hardship on the rate payers of Okanogan County. We are a poor county and an increased cost for electricity will not help those in financial distress. With the option of buying additional power from Wells Dam at a reasonable price I see The electrification of Enloe Dam as a waste of money.
Sincerely,
Gary Bull-a ratepayer of PUD#1 of Okanogan County

Sent from Mail for Windows 10

Baker, Talia (DES)

From:	Salley Bull <salonbalmes@outlook.com>
Sent:	Wednesday, April 12, 2017 2:43 PM
To:	DES mi PRC
Subject:	Public Comments: Enloe Dam Project

Okanogan PUD No. 1
Enloe Hydroelectric Dam Project
April 12, 2016
PUBLIC COMMENTS: CPARB's Project Review Committee (PRC):

I am protesting the proposed Enloe Dam Re-electrification Project being proposed by the Okanogan County PUD No. 1. As a landlord and resident of the Oroville area, I have first hand knowledge of the financial hardship this project will have on the poorer residents here.

This past winter was cold – very harsh, and was hard for many to pay the $300 to $600 in monthly electrical bills for, not 1 or 2 months, but for 3 full cold months. Continuing down the path chosen by PUD No. 1 of securing loans to proceed with this boondoggle, only increases the rates that each of us have to pay. Our power costs would raise – doubling or tripling would be impossible for the many who live here. And yet, when the dam is electrified, it will only be active for the spring runoff season, and shut down for the rest of the year....While we poor people, the residents, have to pay year round for the outrageous loans it will take.

The power output is too small to justify rebuilding it. We have a obligation to buy 22% of the Bonneville Power output, and utilize only 13%. The surplus that we can sell, is more than the power output possible at peak from Enloe.

Enloe Dam is just a few miles downstream from Canada. Our Canadian neighbors are against this plan as it will cause them to lose their flood control capabilities. A whole new treaty with Canada will have to be negotiated, and our PUD has put the cart before the horse: seeking to activate the Dam before negotiating with Canada. We won't make friends this way!

Well then, are we just plain stupid?

I protest this governmental push to develop the Enloe site – on financial reasons, now and in the future; the financial impact on our mostly below poverty county; the international relationship impact on our friendly Canadian neighbors, who will reap nothing from this project and lose flood control capabilities; and I protest that the small amount of year-round power output, which will not benefit Oroville, nor Okanogan County, but will create a huge financial burden on us rate payers who live here, and flies in the face of common sense as we have a surplus of power.

Salley J. Bull
5 Balmes Rd.
Oroville, WA 98844 509.560.3624

Sent from Mail for Windows 10

Baker, Talia (DES)

From: Salley Bull <salonbalmes@outlook.com>
Sent: Thursday, April 13, 2017 4:37 PM
To: DES mi PRC
Subject: Enloe Dam Project: Public comments

PUBLIC COMMENTS: ENLOE DAM PROJECT
April 13, 2017

As the review of the Project referenced above concerns the Design-Build vs. Design-Bid-Build methods of contracting the re-electrification of Enloe Dam, located on the Similakeen River, just outside of Oroville, Washington, and that there is substantial resistance from the Residents of Oroville and of the Okanogan County, as evidenced by the many e-mailed letters so far recorded, I want to point to RCW 39.10.270 (2) – "A public body must....demonstrate successful management of a design-build .... project within the previous 5 years" and Okanogan PUD No. does not possess any successful management of any project of this sort; and also in RCW 39.10.270 (5) that the Review Committee can "revoke any public body's certification upon finding, after a public hearing, that it's use of design-build.......NO LONGER SERVES THE PUBLIC INTEREST."

I insist that this project NO LONGER SERVES THE PUBLIC INTEREST and should now be ABANDONED.

S.J. Bull
5 Balmes Rd., Oroville, WA 98844

Sent from Mail for Windows 10

Baker, Talia (DES)

From: Jack Burchard <pbandjburchard@gmail.com>
Sent: Wednesday, April 12, 2017 1:07 PM
To: Baker, Talia (DES)
Subject: Don't Electrify Enloe Dam
Attachments: Don't Electrify Enloe 2.pages

Hi:
It is unclear whether my comment was received. Here is a edited copy as text and as attachment.
Thank you for including in the record.

Jack and Peg Burchard
pbandjburchard@gmail.com
509-429-8796

April 12. 2017

Ms. Talia Baker
Project Review Committee
Department of Enterprise Services

Dear Committee Members:

I am writing to express my opposition to the Okanogan PUD's plan to electrify Enloe Dam. I am a rate payer, registered voter and land owner in Okanogan WA.

It seems to me that the PUD is blundering ahead with this un-needed and ridiculously expensive project in disregard of its rate-payers and the facts.

The PUD's untenable position can be summarized in two points: 1) We have spent millions in permitting and legal costs. That money will be wasted if we "abandon" our project. 2) It would be really great to have our own dam.

These underling arguments don't reasonably support the plan: 1) This is called "throwing good money after bad." Enloe power is not needed and will cost rate-payers much more than what is already available from Wells Dam. The capital costs are outrageous.

Reason #2 promotes vague notions of the value of owning our own dam. We understand that the PUD just wants to have a dam. But the PUD offers no real answers to the clear fact that we don't need costly Enloe power.

At a time when we are becoming more aware of the environmental damage caused by hydroelectric dams, the Okanogan PUD is out of touch with reality. Please don't let them saddle us with this boondoggle of a project.

Thank you for considering the public interest in this matter .

Jack and Peg Burchard
137 Danker Cutoff Rd
Okanogan WA 98840
pbandjburchard@gmail.com
509-429-8796

Baker, Talia (DES)

From: Carla <cfrey1949@gmail.com>
Sent: Saturday, April 15, 2017 9:59 AM
To: Baker, Talia (DES)
Subject: Enloe Dam

Follow Up Flag: Follow up
Flag Status: Completed

Please stop wasting any more resources on rebuilding Enloe Dam. It is a far too expensive project with very little return and a waste of ratepayers money. The money would be far better spent on wind and/or solar and much more environmentally friendly.

Baker, Talia (DES)

From:	jaycarter@communitynet.org
Sent:	Thursday, April 13, 2017 4:19 PM
To:	Baker, Talia (DES)
Subject:	Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest. A project generating this type of financial burden on a relatively small ratepayer base warrants very careful consideration. Many of the ratepayers live at or near a subsistance level. The rate increases that will surely accompany this project represent an unacceptable burden. I encourage the PUD to view their decision making process from the perspective of an "average" ratepayer. There simply must be less expensive alternatives.

Thank you for handling comments on the Enloe Dam.

Sincerely,

Jay Carter

Any intelligent fool can make things larger and more complex...

it takes a touch of genius - and a lot of courage to move in the opposite direction. Albert Einstein

Baker, Talia (DES)

From:	Stan Carter <scarterc@ncidata.com>
Sent:	Thursday, April 13, 2017 10:05 AM
To:	Baker, Talia (DES)
Subject:	Enloe Dam

Ms. Baker

Please put me on record as being adamantly opposed to the electrification of Enloe Dam to the extent the Okanogan County PUD has proposed.

The PUD's proposed approach for the electrification of Enloe Dam may be technically sound. But that is not the entire issue. If the PRC fails to consider the financial feasibility of this project based on the impact it will have on the ratepayers it will have failed to fully evaluate the project.

The debt load is far too great for the projected return. I doubt if the decision makers would invest their own money in a similar venture.

Okanogan County PUD ratepayers are not an affluent group. PUD management goals should reflect concern for this fact. That appears not to be the case. Therefore the Enloe project as envisioned is not a good decision and should not have the approval of the PRC.

The PRC should ask the PUD why they have chosen such an extravagant route for electrification of Enloe Dam. Satisfying the requirements of the license can be done with a much simpler approach that would be more in line with the financial status of the majority of the ratepayers.

Stan Carter
36 Bass Alley
Okanogan, WA

509-422-4756

Baker, Talia (DES)

From:	Stan Carter <scarterc@ncidata.com>
Sent:	Sunday, April 16, 2017 8:14 PM
To:	Baker, Talia (DES)

Ms. Baker,

I have already submitted comments for the PRC regarding Enloe Dam. Please attach the following two documents to those comments.

Stan Carter

Dear Ms. Baker and Deakins:

Thank you for the opportunity to provide comment on Okanogan Public Utility District's ("OPUD") application to the Project Review Committee (PRC) to utilize the design-build process for their proposed project to re-energize Enloe Dam on the Similkameen River. We appreciate that the PRC is holding a special hearing to receive comment on this issue.

Our organizations write to express concern regarding OPUD's proposal, as members of our organizations and OPUD ratepayers are raising important questions about the economic viability of the Project. We also believe that it is important to ensure that the PRC is aware that there are significant legal and economic risks involved with this Project that render OPUD unqualified for the Design-Build process under the requirements outlined in RCW 39.10.280.

I. OPUD Does Not Have the Necessary and Appropriate Time to Complete the Project (RCW 39.10.280(2)(c)(iv))

RCW 39.10.280(2)(c)(iv) requires the PRC to determine that the entity seeking to use the Design-Build process has the necessary and appropriate time to properly manage the job and complete the project. OPUD fails to meet this requirement because it is likely to miss a legally set deadline for commencing construction.

The Federal Energy Regulatory Commission ("FERC") requires that OPUD commence construction on Enloe Dam no later than July 9, 2017.[1] This appears to be an impossible deadline for OPUD to meet. Before OPUD can commence construction, it is required to submit numerous plans to FERC for approval, and OPUD has already missed the deadline for submitting several of the required plans.[2]

In its December 13, 2017 Request for Qualifications, OPUD states that it anticipates applying for an amendment to the date to commence construction.[3] However, OPUD neglects to share with the PRC and prospective Design-Build contractors that it has exhausted its administrative options for extending this deadline (i.e. through FERC),[4] and that the only way it can do so is through an act of Congress.[5] To date, legislation has not been introduced to extend the PUD's construction deadline.

The legal requirements to commence construction before July 9, 2017 are part of the hydropower license that FERC issued OPUD on July 9, 2013.[6] Under the Federal Power Act, OPUD cannot proceed with its plans to re-energize Enloe Dam without this license.

II. OPUD Does Not Have the Necessary and Appropriate Funding (RCW 39.10.280(2)(c)(iv)), or the Necessary and Appropriate Construction Budget (RCW 39.10.280(2)(c)(vi)) to Properly Manage the Job and Complete the Project.

RCW 39.10.280(2)(c)(iv) requires the PRC to determine that the entity seeking to use the design-build process has the necessary and appropriate funding to properly manage the job and complete the project. RCW 39.10.280(2)(c)(vi) requires the PRC to determine that the entity seeking to use the design-build process has the necessary and appropriate construction budget. As we outline below, OPUD does not meet these requirements because its ability to generate revenue to pay for the project is highly questionable and its construction budget does not accurately portray the actual costs.

a. Uncertainty Relating to Revenue

OPUD states in its application to the PRC that it will fund the project in the long-term by securing municipal revenue bonds and utilizing revenue from power generation. OPUD neglected to inform the PRC that the amount of water that will be available to produce power at Enloe, and therefore generate revenue, will not be known until *after* the project is fully operational and the costs of construction have already been incurred.

Re-energizing Enloe Dam depends on whether OPUD successfully obtains necessary permits and certifications from the Washington State Department of Ecology ("Ecology"), including a hydropower water right and a Clean Water Act section 401 Water Quality Certification ("401 Certification"). While Ecology has issued these documents, the agency has not yet made a final determination regarding the amount of water that OPUD will be required to spill into the bypass reach to protect aesthetics and fish. As discussed below, this is because the Pollution Control Hearings Board ("Board") required Ecology to conduct an aesthetic flow study to ascertain the flow that OPUD must pass through the bypass reach (and thus not use to generate power) in order to protect aesthetic, fish and other instream values. Given the slim economic margins associated with this Project, it is highly likely that legally-compliant instream flows for the bypass reach will render the Project uneconomical.

Ecology's original 401 Certification required that OPUD maintain a 10 to 30 cubic feet per second (cfs) minimum instream flow year-round within Enloe's bypass reach and over Similkameen Falls, which are located immediately downstream of the dam. Ecology initially chose these flow levels because PUD staff informed the agency that any flows above 100 cfs would make the Project uneconomical. In 2013, conservation organizations appealed the 401 Certification because it failed to comply with state water quality standards. The Board issued an order agreeing with the conservation organizations, stating that there was no evidence to show that the 10/30 instream flow would protect aesthetic values.[7] Because that information was missing, the Board ordered Ecology to perform an aesthetic flow study within three years of the completion of construction on the project. Instream flow specialists at Confluence Research and Consulting performed an expert analysis on instream flows in the bypass reach in 2013 (see attached), and their report suggests that Ecology is likely to require aesthetic flows of up to 350-450 cfs,[8] which will significantly reduce Enloe's potential to generate electricity[9] and will render the project economically infeasible. The Washington Court of Appeals recently acknowledged the risks associated with the Project, noting that "the [aesthetic flow] study may indicate that there is no flow level that is protective of both the fishery resource and aesthetics, and Ecology may withdraw the water right permit."[10] In light of this uncertainty, any investment in re-energizing Enloe Dam carries a substantial risk.

b. Uncertainty Regarding Budget

In addition to the uncertainty regarding the ability of Enloe to generate electricity, and therefore bring in revenues, we have significant concerns about the increasing costs of construction for re-energizing Enloe Dam. In its 2008 Final License Application to FERC, OPUD estimated that the cost of constructing the Project would be $31 million.[11] In 2014, OPUD revised its construction cost estimate and reported that inflation would increase the cost to at least $39 million and as much as $45 million,[12] which is consistent with the $42.5 million figure OPUD provided to the PRC in its application. On top of these costs, OPUD invested $13.1 million from general revenues between 2010 and 2015 towards the project, which they refer to as "sunk costs."[13] Further, OPUD budgeted an additional $1.3 million from general funds towards the project in 2016.[14] In total, spending on Enloe could reach $59.4 million, which is nearly twice as much as OPUD initially calculated.

c. Description of the Project

In its application to the PRC, OPUD states that the Enloe Project involves "development of new fish rearing facilities." This would lead the reader to believe that the PUD is developing a fish hatchery or other type of facility with the project. The Federal Energy Regulatory Commission issued a license to OPUD on July 9, 2013,[15] and it does not contain any description of fish rearing facilities. Instead, the license requires that OPUD enhance a side channel downstream of the project in order to improve holding, spawning and rearing habitat for salmonids. This action is a required condition within the license as part of constructing the project in order to minimize the impact of the project on Upper Columbia River steelhead, which are federally listed under the Endangered Species Act.[16]

III. Conclusion

Re-energizing Enloe Dam is a risky venture, and if OPUD proceeds with this project, the burden of these risks will be placed upon its ratepayers. A recent analysis by Rocky Mountain Econometrics found that if Enloe is re-energized, OPUD ratepayers would pay two to four times the cost of power on the open market.[17] This is a questionable tradeoff given that the maximum amount of power that Enloe could produce is 9 MW, or the equivalent of three wind towers. This is a marginal contribution to the energy market when compared to the 700+ MW of power produced by other regional dams.

Given the significant public resources at stake, and the fact that OPUD does not meet the criteria of 39.10.280(2)(c), we urge the PRC to deny OPUD's application for utilizing the design-build process for re-energizing Enloe Dam.
Thank you for taking the time to consider our comments.

Sincerely,

Stan Carter
36 Bass Alley
Okanogan, WA

Dear Ms. Baker and Ms. Deakins:

The Project Review Committee ("PRC") should reject the Okanogan Public Utility District's ("OPUD") application for project approval to use the design-build alternative contracting procedure on the Enloe Hydroelectric Project (the "Project"). As the PRC is well aware, this is a highly controversial project in the Okanogan County community, and should be considered carefully. Ultimately, the PRC should find that the OPUD has not met the statutory requirements necessary for the PRC to approve this application.

<u>1. The OPUD is not qualified to manage this Project.</u>

RCW 39.10.280 is the relevant statute here, providing the process by which the PRC must adhere when reviewing a project for approval. First, the application submitted must include a description of the public body's qualifications. *Id.* at (1). The requirements that the public body have the requisite management experience is also incorporated into RCW 39.10.280(2)(c)(i), (ii), and (v), as well as (2)(d). In this case, the PRC should find that the OPUD is not properly qualified to oversee this project. At section 7.7 of the OPUD's application (pg 6), it gives a brief summary of the construction experience of the organization's project management team. The management team at OPUD includes Tim DeVries and Dan Boettger. Mr. DeVries is not listed as having **any** experience managing a hydroelectric project and is only listed as having managed projects costing around $3 million, a small fraction of the cost of this $42 million Project. Please require OPUD to identify Mr. DeVries's relevant experience, if any.

Dan Boettger, on the other hand is listed as having "led many large scale energy projects, including two FERC hydropower projects ..." Notably, the names of these two projects are not listed, though the names of these projects would be highly relevant here. When will that information be provided to the public? Columbiana asserts that these two FERC hydropower projects referenced in the application are actually the Enloe Dam at issue here and the failed Shankers Bend Dam. Columbiana believes that these are the two projects referenced because these appear to be the only two projects that have been conducted by the OPUD since Mr. Boettger began working at the OPUD in 1986, 30 years ago. *See* OPUD Application at pg 7 ("Dan Boettger joined the District in 1986"). Of course, the Enloe Dam Project has not yet been constructed and thus it cannot be said that Mr. Boettger successfully managed something that has not yet been completed. The Shankers Bend Dam was never constructed, after the OPUD voluntarily surrendered its preliminary permit to build the dam. *See* Attachment 1. Of course, having not been built, it cannot be said that Mr. Boettger has successfully managed the building of this hydroelectric project. At the very least, the PRC should inquire as to what two FERC projects Mr. Boettger has allegedly managed and provide that information to the public. Aside from these two questionable projects, Mr. Boettger is not listed as having any experience managing hydropower projects.

In all, Mr. DeVries and Mr. Boettger do not have the statutorily required experience necessary to manage this Project. While the OPUD has hired consultants with relevant experience (described at section 7.3 of the application) the public body itself lack such experience. As such, the PRC should reject the OPUD's application to utilize the design-build process.

Second, in addition to not having a qualified management team, the OPUD demonstrates in its application that the OPUD itself has not ever successfully managed a hydropower project. The OPUD has provided a chart at Attachment D to its application. Most importantly, none of the projects listed are hydropower projects. Second, the budgets of the projects listed were at most, one-third of the budget proposed for the Project here. The timelines for the projects listed are at most, 2 years and 4 months, with most of the projects listed having a timeline closer to one year. The proposed timeline for this Project is four years. And finally, the project called "PT 115v Transmission Line" was proposed as taking 8 months, to be completed in December 2016. According to Attachment D, that project is still ongoing and has been delayed for "environmental restrictions." This four month delay should be concerning to the PRC, as should the reason for the delay. Many local and regional environmental groups (including American Rivers, American Whitewater, Center for Environmental Law and Policy, North Cascades Conservation Council, Sierra Club, Wild Steelhead Coalition, Wild Washington Rivers, and Columbiana) are concerned about the Project at issue here, leaving the potential for a delay here due to "environmental restrictions." Given the result in the "PT 115v Transmission Line" project, and concerns with the instant Project, the undersigned request that the PRC conduct a transparent analysis as to whether "environmental restrictions" may cause a delay here, and the OPUD's ability to successfully manage such issues.

<u>2. The OPUD has not shown that the design-build process will provide a substantial fiscal benefit.</u>

The next statutory requirement for the PRC to approve a project application is that the PRC must determine that "[t]he alternative contracting procedure will provide a substantial fiscal benefit oveytr the use of the traditional method of awarding contracts in lump sum to the low responsive bidder is not practical for meeting desired quality standard or delivery schedules ..." RCW 39.10.280(2)(a). The only support in the OPUD's application that this project will provide a substantial fiscal benefit is found at section 6, pages 3-4. The application states that the design-build project delivery "will enable the District to make better risk-informed decisions in finalizing the engineering design and implementation plan for the project with early contractor input regarding project design configuration, equipment procurement, cost, schedule, and construction planning." Does the PRC contend that this is enough to meet the statutory requirement of showing that the design-build process will provide a *substantial fiscal benefit*? Will the PRC require the OPUD to provide further justification regarding the fiscal benefit of the use of the design-build process on this Project?

<u>3. The OPUD does not have the necessary and appropriate funding for this Project</u>

Next, RCW 39.10.280 requires that the public body have the necessary experience or qualified team to carry out the alternative contracting procedure. *Id.* at (2)(c). The requirements of condition (2)(c)(i), (ii), and (v) were discussed above. Condition (2)(iv) requires that the public body have "the necessary and appropriate funding and time to properly manage the job and complete the project." Similarly, condition (2)(vi) requires that the public body have the "necessary and appropriate construction budget." Regarding the funding for this project, the OPUD application states that it will fund the design and construction of this Project on short-term credit from commercial banks, and then once the Project is complete, the cost of the Project will be secured by "power generation revenue." *See* section 3.B. Is Columbiana correct in understanding that this Project, including its commercial bank financing, will ultimately be paid for by the ratepayers of Okanogan County?

Importantly, a study conducted by Rocky Mountain Econometrics, attached hereto as <u>Attachment 2</u>, found that this Project is not economically feasible. Ultimately, the study concludes that if the Project is built, it will lose at least $26 on every Megawatt-hour (MWh) that it generates. The PRC should review this study in its consideration of whether the OPUD has the "necessary and appropriate construction budget" for this Project and should conclude that it does not. In light of this study, does the PRC agree that the Project is economically infeasible?

<u>4. Approval of this Project is not in the public interest.</u>

Finally, RCW 39.10.200 defines the purpose of RCW Chapter 39.10, which outlines the requirements for the design-build process, stating in part that the purpose is "to prescribe appropriate requirements to ensure that such contracting procedures **serve the public interest**." (emphasis added). As such, in considering the OPUD's application, the PRC should keep the public interest in mind. It is clear from the resistance the OPUD has seen to this Project that the public feels that this Project is not in its best interest. The Rocky Mountain Econometrics study (Attachment 2) confirms the public sentiment that this Project is not in its best interest. This Project will lose money, and the ratepayers of the County will be left paying the bill. As the PRC is aware, it is obligated to consider all public comments it receives on this Project. RCW 39.10.280(3).

Columbiana urges the PRC to consider this letter as well as all the other comments received on this Project. The PRC should ultimately conclude that the OPUD failed to meet the obligations required for project approval, and that approving this application to allow the OPUD to utilize the design-build process is not in the public interest. At the very least the PRC should require the OPUD to submit a more thorough application, which the PRC could then reconsider at a later date.

Sincerely,
Stan Carter
36 Bass Alley
Okanogan, WA.

[1] *See* Public Utility District No. 1 of Okanogan County, WA. 144 FERC ¶ 62,018 (July 9, 2013) (*Order Issuing New License*). FERC Project No. P-12569. FERC eLibrary Accession No. 20130709-3025 and Federal Energy Regulatory Commission. *Order Granting Extension of Time Pursuant to Article 301.* (July 31, 2015) FERC Project No. P-12569. FERC eLibrary Accession No. 20150731-3032.

[2] Id. See also FERC eLibrary for docket No. P-12569.

[3] Cite to RFP

[4] Cite needed. In extension document?

[5] Citation needed.

[6] Public Utility District No. 1 of Okanogan County, WA. 144 FERC ¶ 62,018 (July 9, 2013) (*Order Issuing New License*). FERC Project No. P-12569. FERC eLibrary Accession No. 20130709-3025.

[7] *Ctr. for Envtl. Law & Policy, et al. v. Ecology, PUD No. 1 of Okanogan County*, PCHB No. 12-082 (Findings of Fact, Conclusions of Law & Final Order (As Amended Upon Reconsideration)) (Aug. 30, 2013).

[8] Shelby, Bo and Whittaker, Doug. Aesthetics and Recreation Issues at the Enloe Hydroelectric Project: Expert Witness Report prepared for Washington Pollution Control Hearings Board, PCHB No. 12-082. February 4, 2013. Page 21. (See attached.)

[9] Enloe is projected to generate 44,963 aMwh under the 10/30 cfs scenario, and 36,705 aMwh if instream flows are set at 300 cfs. See Jones, Anthony, Rocky Mountain Econometrics. 3rd Review of the Economics of Restoring Hydropower at Enloe Dam on the Similkameen River: Analysis of the Public Utility District No. 1 of Okanogan County's Final License Application for Federal Energy Regulatory Commission Project No. 12569. July 1, 2016. Pages 7-8. Available at www.columbiana.org, last visited July 25, 2016.

[10] *Id. Ctr. for Envtl. Law & Policy, et al. v. Dep't of Ecology, PUD No. 1 of Okanogan* County, No. 74841-6-I (WA Court of Appeals, Div. 1) (unpublished opinion) (July 11, 2016).

[11] Utility District No. 1 of Okanogan County, Application for Original License, Enloe Hydroelectric Project, FERC Project No. P-12569, August 22, 2008. Exhibit D at p. D-2. (FERC eLibrary Accession Number 20080822-5021.)

[12] Utility District No. 1 of Okanogan County, Power Point presentation to the Board of Commissioners, November 17, 2014. Slides #11 and #12. Available at www.columbiana.org, last visited July 25, 2016.

[13] Jones, Rocky Mountain Econometrics. 2016. Appendix 3, pp. 24-25, and OPUD budgets, attached to report from p. 26 to end.

[14] *Id.*

[15] Pub. Util. Distr. No. 1 of Okanogan County, 144 FERC ¶ 62,018 (July 9, 2013) (FERC Order issuing new license) (FERC e-Library Accession No. 20130709-3025).

[16] *Id.* at p. 13-14.

[17] Jones, 2016 at p. 4.

From:	Linda Cattarusa <bella@ncidata.com>
Sent:	Thursday, April 13, 2017 3:39 PM
To:	Baker, Talia (DES)
Subject:	Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely, Linda Cattarusa

Baker, Talia (DES)

From: Amy Charles <strikercharles@yahoo.com>
Sent: Thursday, April 6, 2017 4:41 PM
To: Baker, Talia (DES)
Subject: No Enloe Dam

I have been following the conversation about energizing Enloe Dam for many years. It seems to me that from all the data I have seen and the open meeting at the OPUD last year, that fiscally it is not a wise decision. I realize that a large sum of money has been spent to get the issue to the place it is now, but I do not think it is wise to throw good money after bad.

Baker, Talia (DES)

From: Claire J <riovistaclaire@gmail.com>
Sent: Wednesday, April 12, 2017 9:16 AM
To: Baker, Talia (DES)
Subject: Please don't electrify Enloe Dam. Good Lord, quit wasting taxpayer dollars on this. There are a lot of us out here with the same feeling. It's an historical site and a fantastic place to hike. Please, don't screw it up. You have the research and you kn...

Baker, Talia (DES)

From: Bob's Omak e-mail <uniquebobc4@q.com>
Sent: Wednesday, April 12, 2017 9:02 AM
To: Baker, Talia (DES)
Subject: Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely,

Bob Clark

Baker, Talia (DES)

From: cl_clay@nvinet.com
Sent: Friday, April 14, 2017 2:53 PM
To: Baker, Talia (DES)
Cc: Cl_clay@nvinet.com
Subject: Enloe dam project

I am writing to give my opinion on the enloe dam project. I believe that the project should be shut down . The commissioners are pushing for this project and ignoring the voice of the people. This project is a waste of money. His dam will never produce enough power to pay for itself and its upkeep. Again I urge that this project be abandoned.
Thank you
Chris & Laurie Clay
130 S Locust Ave
Tonasket Wa. 98855
5094862642
Cl_clay@nvinet.com

Baker, Talia (DES)

From: Tom Cloud <tlc@filareefarm.com>
Sent: Thursday, March 23, 2017 9:16 AM
To: Baker, Talia (DES); Deakins, Nancy (DES)
Subject: OPPOSE Enloe Dam Electrification Project.

Dear Ms. Baker & Deakins'

Please reject the OK PUD project to electrify Enloe Dam. It is too high a price to pay for a small amount of power that we don't really need. Construction costs will be paid to contractors outside of our area. Interest on the debt will be paid to investors outside of our area for many years to come. The Okanogan PUD currently operates with approximately $38 million dollars in Debt and pays $3.7 million in debt service annually. It is incumbent on our Public Utility to make management decisions that provide electricity available at the lowest possible rate to the ratepayers.

Thank you for your consideration,

Tom Cloud

Cloud Dancer Farm
298D Cape Labelle Rd
Tonasket WA 98855

American Rivers * American Whitewater * Center For Environmental Law and Policy * Columbia Institute for Water and Policy * Columbiana * North Cascades Conservation Council * Sierra Club – WA State Chapter * Washington Wild * Wild Steelhead Coalition * Wild Washington Rivers

April 17, 2017

Project Review Committee
c/o Talia Baker/Nancy Deakins
PO Box 41476
Olympia, WA 98504-1476
Sent via electronic mail to: talia.baker@des.wa.gov and nancy.deakins@des.wa.gov

Re: Okanogan PUD's Proposal to Re-energize Enloe Dam

Dear Ms. Baker and Deakins:

Thank you for the opportunity to provide comment on Okanogan Public Utility District's ("OPUD") application to the Project Review Committee (PRC) to utilize the Design-Build process for their proposed project to re-energize Enloe Dam on the Similkameen River. We appreciate that the PRC is holding a special hearing to receive comment on this issue.

Our organizations write to express concern regarding OPUD's proposal, as members of our organizations and OPUD ratepayers are raising important questions about the economic viability of the Project. We also believe that it is important to ensure that the PRC is aware that there are significant legal and economic risks involved with this Project that render OPUD unqualified for the Design-Build process under the requirements outlined in RCW 39.10.280.

I. OPUD Does Not Have the Necessary and Appropriate Time to Complete the Project (RCW 39.10.280(2)(c)(iv))

RCW 39.10.280(2)(c)(iv) requires the PRC to determine that the entity seeking to use the Design-Build process has the necessary and appropriate time to properly manage the job and complete the project. The Federal Energy Regulatory Commission ("FERC") requires that OPUD commence construction on Enloe Dam no later than July 9, 2017, and if it fails to do so, FERC will terminate the license. This appears to be an impossible deadline for OPUD to meet, and the Enloe project therefore does not meet the criteria.

Under the Federal Power Act[1] (FPA) OPUD cannot proceed with its plans to re-energize Enloe Dam without a license from FERC. FERC issued OPUD a license to construct and

[1] 16 U.S.C. §§ 791 to 823(d).

operate the Enloe Hydropower Project (FERC Project No. P-12569) on July 9, 2013.[2] Under the FPA, all hydropower developers are required to commence construction within two years of receiving a license, and are allowed to apply for a two year extension just one time.[3] After this point, the only way to further extend the deadline is through an act of Congress.[4]

OPUD's initial deadline to commence construction was in July of 2015.[5] In 2015, OPUD applied for and received an extension to commence construction, and is now required to do so before July 9, 2017.[6] In its December 13, 2016 Request for Qualifications, OPUD acknowledges this deadline and states that it anticipates applying to amend it.[7] OPUD neglects to share with the PRC and prospective Design-Build contractors that it has exhausted its administrative remedies and that in order to succeed, Congress will have to pass legislation granting an extension of time. Rather than simply "applying for an amendment," this will be a significant hurdle to overcome. To date, federal legislators have not introduced legislation to extend OPUD's construction deadline.

Additionally, before OPUD can commence construction, it is required to submit numerous plans to FERC for approval. OPUD has already missed the deadline for submitting several of the required plans.[8]

II. OPUD Does Not Have the Necessary and Appropriate Funding (RCW 39.10.280(2)(c)(iv)), or the Necessary and Appropriate Construction Budget (RCW 39.10.280(2)(c)(vi)) to Properly Manage the Job and Complete the Project.

RCW 39.10.280(2)(c)(iv) requires the PRC to determine that the entity seeking to use the design-build process has the necessary and appropriate funding to properly manage the job and complete the project. RCW 39.10.280(2)(c)(vi) requires the PRC to determine that the entity seeking to use the design-build process has the necessary and appropriate construction budget. As we outline below, OPUD does not meet these

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[2] Public Utility District No. 1 of Okanogan County, WA. 144 FERC ¶ 62,018 (July 9, 2013) (*Order Issuing New License*). FERC Project No. P-12569. FERC eLibrary Accession No. 20130709-3025.
[3] 16 U.S.C. § 806.
[4] For example, S.2012, Title VIII §§ 8001 to 8006–114th Congress sought to reinstate the license and extend the deadline for commencing construction for the following FERC projects: Clark Canyon Dam (P-12429), Gibson Dam (P-12478), Jennings Randolph Dam (P-12715), Cannonsville Dam (P-13287), Gathright Dam (P-12737), and Flannagan Dam (P-12740). The legislation did not pass.
[5] Okanogan PUD. 144 FERC ¶ 62,018 (July 9, 2013) (*Order Issuing New License*). FERC Project No. P-12569. FERC eLibrary Accession No. 20130709-3025.
[6] Federal Energy Regulatory Commission. *Order Granting Extension of Time Pursuant to Article 301.* (July 31, 2015) FERC Project No. P-12569. FERC eLibrary Accession No. 20150731-3032.
[7] Okanogan Public Utility District. Enloe Hydroelectric Project Request for Qualifications (December 13, 2016). Page 21.
[8] FERC. *Order Granting Extension of Time Pursuant to Article 301.* (July 31, 2015). See also FERC eLibrary for docket No. P-12569.

requirements because its ability to generate revenue to pay for the project is highly questionable and its construction budget does not accurately portray the actual costs.

a. Uncertainty Relating to Revenue

OPUD states in its application to the PRC that it will fund the project in the long-term by securing municipal revenue bonds and utilizing revenue from power generation. OPUD neglected to inform the PRC that the amount of water that will be available to produce power at Enloe, and therefore generate revenue, will not be known until *after* the project is fully operational and the costs of construction have already been incurred.

Re-energizing Enloe Dam depends on whether OPUD successfully obtains necessary permits and certifications from the Washington State Department of Ecology ("Ecology"), including a hydropower water right and a Clean Water Act section 401 Water Quality Certification ("401 Certification"). While Ecology has issued these documents, the agency has not yet made a final determination regarding the amount of water that OPUD will be required to spill into the bypass reach to protect aesthetics and fish. As discussed below, this is because the Pollution Control Hearings Board ("Board") required Ecology to conduct an aesthetic flow study to ascertain the flow that OPUD must pass through the bypass reach (and thus not use to generate power) in order to protect aesthetic, fish and other instream values. Given the slim economic margins associated with this Project, it is highly likely that legally-compliant instream flows for the bypass reach will render the Project uneconomical.

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[9] *Ctr. for Envtl. Law & Policy, et al. v. Ecology, PUD No. 1 of Okanogan County*, PCHB No. 12-082 (Findings of Fact, Conclusions of Law & Final Order (As Amended Upon Reconsideration)) (Aug. 30, 2013).

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generate electricity[11] and will render the project economically infeasible. The Washington Court of Appeals recently acknowledged the risks associated with the Project, noting that "the [aesthetic flow] study may indicate that there is no flow level that is protective of both the fishery resource and aesthetics, and Ecology may withdraw the water right permit."[12] In light of this uncertainty, any investment in re-energizing Enloe Dam carries a substantial risk.

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In addition to the uncertainty regarding the ability of Enloe to generate electricity, and therefore bring in revenues, we have significant concerns about the increasing costs of construction for re-energizing Enloe Dam. In its 2008 Final License Application to FERC, OPUD estimated that the cost of constructing the Project would be $31 million.[13] In 2014, OPUD revised its construction cost estimate and reported that inflation would increase the cost to at least $39 million and as much as $45 million,[14] which is consistent with the $42.5 million figure OPUD provided to the PRC in its application. On top of these costs, OPUD invested $13.1 million from general revenues between 2010 and 2015 towards the project, which they refer to as "sunk costs."[15] Further, OPUD budgeted an additional $1.3 million from general funds towards the project in 2016.[16] In total, spending on Enloe could reach $59.4 million, which is nearly twice as much as OPUD initially calculated.

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[12] *Id*. *Ctr. for Envtl. Law & Policy, et al. v. Dep't of Ecology, PUD No. 1 of Okanogan* County, No. 74841-6-I (WA Court of Appeals, Div. 1) (unpublished opinion) (July 11, 2016).

[13] Utility District No. 1 of Okanogan County, Application for Original License, Enloe Hydroelectric Project, FERC Project No. P-12569, August 22, 2008. Exhibit D at p. D-2. (FERC eLibrary Accession Number 20080822-5021.)

[14] Utility District No. 1 of Okanogan County, Power Point presentation to the Board of Commissioners, November 17, 2014. Slides #11 and #12. Available at www.columbiana.org, last visited July 25, 2016.

[15] Jones, Rocky Mountain Econometrics. 2016. Appendix 3, pp. 24-25, and OPUD budgets, attached to report from p. 26 to end.

[16] *Id.*

[17] Pub. Util. Distr. No. 1 of Okanogan County, 144 FERC ¶ 62,018 (July 9, 2013) (FERC Order issuing new license) (FERC e-Library Accession No. 20130709-3025).

enhance a side channel downstream of the project in order to improve holding, spawning and rearing habitat for salmonids. This action is a required condition within the license as part of constructing the project in order to minimize the impact of the project on Upper Columbia River steelhead, which are federally listed under the Endangered Species Act.[18]

III. Conclusion

Re-energizing Enloe Dam is a risky venture, and if OPUD proceeds with this project, the burden of these risks will be placed upon its ratepayers. A recent analysis by Rocky Mountain Econometrics found that if Enloe is re-energized, OPUD ratepayers would pay two to four times the cost of power on the open market.[19] This is a questionable tradeoff given that the maximum amount of power that Enloe could produce is 9 MW, or the equivalent of three wind towers. This is a marginal contribution to the energy market when compared to the 700+ MW of power produced by other regional dams.

Given the significant public resources at stake, and the fact that OPUD does not meet the criteria of 39.10.280(2)(c), we urge the PRC to deny OPUD's application for utilizing the design-build process for re-energizing Enloe Dam.
Thank you for taking the time to consider our comments.

Sincerely,

Serena McClain
Director, River Restoration
American Rivers

Thomas O'Keefe
Pacific Northwest Stewardship Director
American Whitewater

Trish Rolfe
Executive Director
Center for Environmental Law and Policy

Rachael Paschal Osborn
Director
Columbia Institute for Water and Policy

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18 *Id.* at p. 13-14.
19 Jones, 2016 at p. 4.

Jere and Rick Gillespie
President and Vice-President/Secretary
Columbiana

Tom Hammond
President
North Cascades Conservation Council

John Osborn MD
Columbia River Future Project
Sierra Club - Washington State Chapter

Tom Uniack
Executive Director
Washington Wild

Jonathan Stumpf
Board Chair
Wild Steelhead Coalition

Andrea Matzke
Chair
Wild Washington Rivers

Attachment

Aesthetics and recreation issues at the Enloe Hydroelectric Project Expert Witness Report

Prepared by

Doug Whittaker, Ph.D. and Bo Shelby, Ph.D.
Confluence Research and Consulting

Aesthetics and recreation issues at the Enloe Hydroelectric Project

Expert Witness Report

Prepared by

Doug Whittaker, Ph.D. and Bo Shelby, Ph.D.

Confluence Research and Consulting

6324 Red Tree Circle • Anchorage, Alaska 99507

3600 NW Thrush • Corvallis, Oregon 97331

Prepared for

Pollution Control Hearings Board

State of Washington

PCHB No. 12-082

Center for Environmental Law and Policy, American Whitewater, Columbia River Bioregional Education Project, North Cascades Conservation Council, and Sierra Club

v.

Washington State Department of Ecology and Public Utility District No. 1 of Okanogan County WA.

February 4, 2013

Contents

Introduction

The Enloe Hydroelectric Project is located near River Mile 8.8 on the Similkameen River near the town of Oroville, Washington. An existing dam (54 feet tall by approximately 300 feet wide) was built in 1920 and backs up about 1.5 miles of river, creating a 77 acre reservoir. From 1922 to 1958 (36 years) the dam was used to divert up to 1,000 cfs to a 3.2 MW powerhouse on the southwest side of the river (river right). Since 1958 (the last 55 years), the entire flow of the Similkameen River has passed over the dam, creating a 54 foot "Dam Falls." There is a roughly 20 foot natural falls ("Similkameen Falls") about 350 feet downstream.

The Public Utility District No. 1 of Okanogan County (District) has proposed a new hydroelectric project (Project) at the site that would divert up to 1,600 cfs to a new 9 MW powerhouse on the northeast side (river left), while raising the dam five feet with new crest gates. The proposed Project will reduce flows over the Dam Falls and through a bypass reach that includes Similkameen Falls. During a roughly 8.5 month dry period in a typical year, there will be no flow over the dam and only 10 cfs (mid-September through March) or 30 cfs (mid-July through mid-September) will be released from a pipe below the dam into the bypass reach and over Similkameen Falls. By comparison, in the lowest flow month (September) under existing conditions the median flow over the two falls is 506 cfs (USGS gage 12442500, Similkameen River near Nighthawk, 1929-2008 as reported in FLA).

The District filed a Final License Application for this new Project with the Federal Energy Regulatory Commission (FERC) in August 2008, and requested a 401 Water Quality Certification from the Washington State Department of Ecology (Ecology) in February 2010. The District withdrew the request in February 2011 but re-applied on January 30, 2012. Ecology granted a 401 Certification for the Project on July 13, 2012 (Order No. 9007).

Several non-governmental agencies (hereafter referred to as the Appellants, including the Center for Environmental Law and Policy, American Whitewater, the Columbia River Bioregional Education Project, the North Cascades Conservation Council, and Sierra Club) have appealed the 401 Certification for the proposed Project. They assert that by adopting the District's minimum flow proposal, the Certification is inconsistent with the federal Clean Water Act and Washington State water pollution control laws, specifically failing to adequately assess alternative flow options for recreation and aesthetics.

Confluence Research and Consulting (CRC) was asked to review the Project, the recreation and aesthetic values in the area, and related information collected and developed by the District or Ecology during FERC relicensing and the 401 Certification process. CRC was asked to assess whether the District or Ecology developed sufficient information to justify the proposed Project's aesthetic flow regime under Washington's water certification guidelines, to suggest other information or studies that could have helped with aesthetic or recreation flow decision-making, and determine if the District's minimum flow proposal would provide "reasonable assurance" that recreation and aesthetic values were protected. This report documents that review, which will support expert witness testimony in the hearing.

Methods

Information in this report was developed from several sources and analyses, as described below. For clarity, we have also provided summary maps and photos of the proposed Project and identified other recreation or aesthetic features discussed in the report.

Study area

Figure 1 shows the regional setting; Figure 2 provides a closer view of the Project area to identify Project or recreation features. Figures 3, 4, and 5 are photos of the falls and surrounding area which help show the scale of recreation and aesthetic features.

Figure 1. Regional setting: Oroville, Enloe Dam, Similkameen Falls, and the Similkameen River Trail.

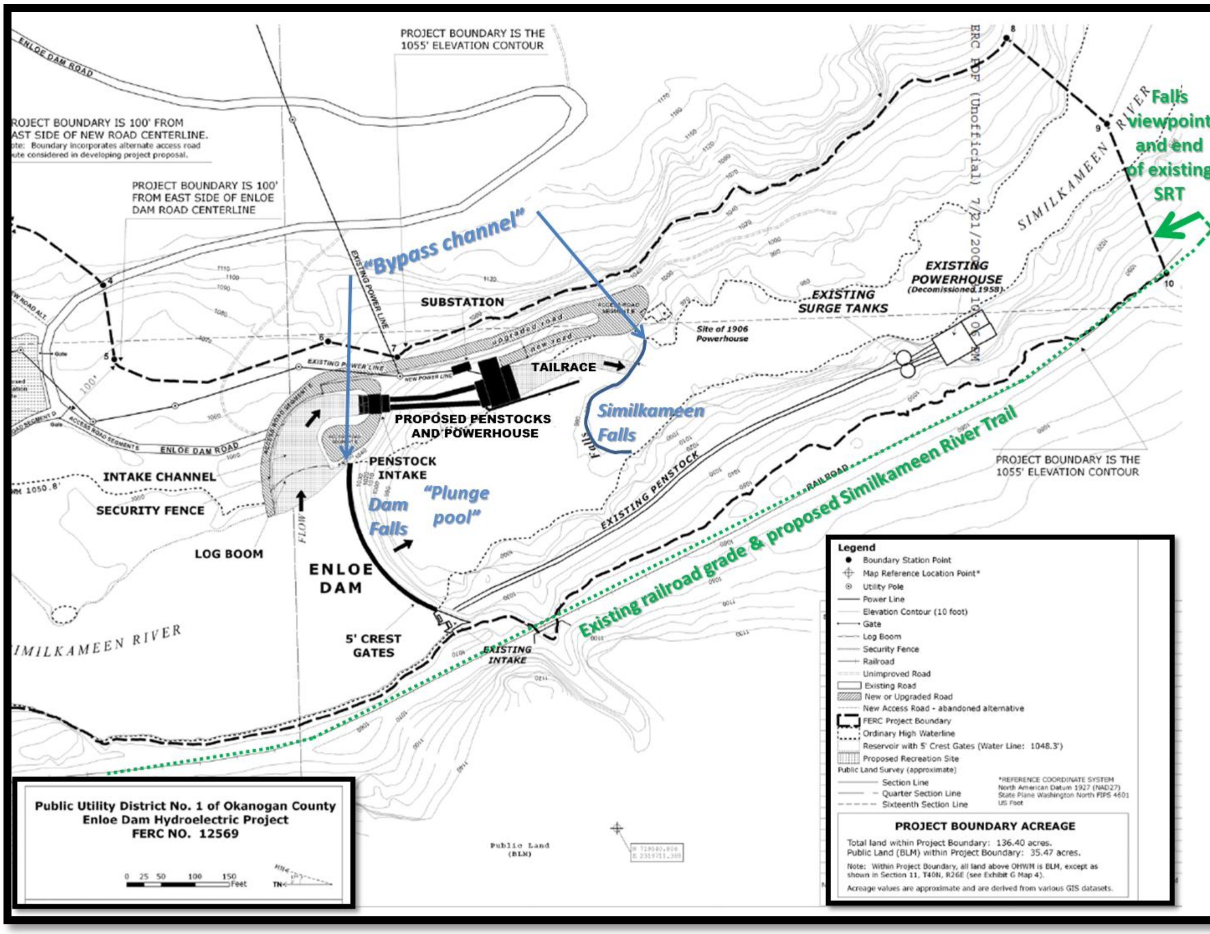

Figure 2. Overview of proposed project and the two falls.

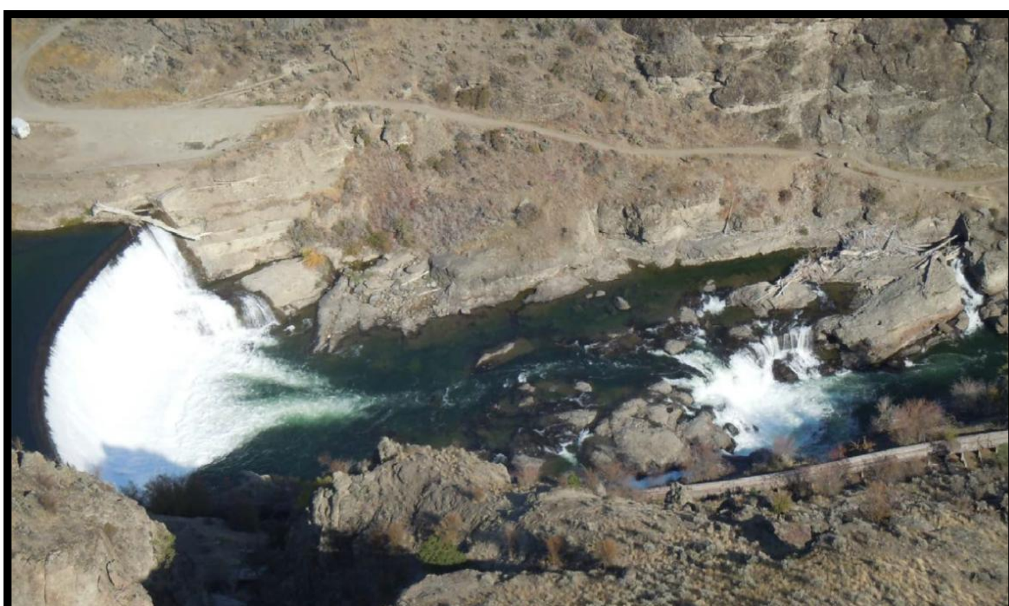

Figure 3. Overhead view of Dam Falls (left) and Similkameen Falls from river right side at about 660 cfs.

Figure 4. Oblique view of Dam Falls and Similkameen Falls from river left side at about 700 cfs.

Figure 5. Front view of Dam Falls and Similkameen Falls at about 700 cfs.

Review of existing information

CRC reviewed documents pertaining to recreation or aesthetic flow issues. These were prepared by the District, its consultants, Ecology, and other agencies/ stakeholders during the FERC and 401 Certification processes from 2005 through 2012. Types of documents are listed below.

- Ecology guidance on setting flows in Washington State.
- Study plans, reports, and memos.
- District draft and final license applications.
- Correspondence or meeting notes from the District, its consultants, Ecology, WDFW, and other agencies/stakeholders involved in the FERC or 401 Certification processes.
- Comment letters from agencies/stakeholders and District or Ecology responses to comments.
- Photos of the Dam Falls and Similkameen Falls at several flows.

CRC also reviewed more general literature about flows, recreation, and aesthetics, including licensing documents for other dams where aesthetics of waterfalls were an issue. They also interviewed a few individuals who participated in relicensing or 401 Certification meetings, or who had other experience or knowledge about Okanogan Valley or statewide recreation opportunities. Specific documents or individual interviews are cited when they are relied upon for findings in this report.

Fieldwork

Both researchers visited the Enloe Project site on October 18 and 19, 2012, accompanied by Tom O'Keefe (American Rivers) and Rich Bowers (Hydro Reform Coalition). The October 18 visit focused on the road-accessible river left side, and included meeting with Joseph Enzensperger, who collected photographs and video of the two falls through a range of flows during the summer and fall of 2012. The USGS reported a provisional mean daily flow of 675 cfs for October 18 for the upstream gage near Nighthawk, but flows during the afternoon visit (after accounting for travel time from the gage and hourly flow levels) were about 700 cfs. A field estimate of the flow in the distinct river left channel (the modified channel that was cut for the 1903-1920 era powerhouse) was 30 to 45 cfs.

The October 19 visit focused on the Similkameen River Trail and the river right side views of the falls, but included a second site visit to the river left side later in the day. Bo Shelby also paddled a kayak in the bypass channel between the two falls. The USGS reported a provisional mean daily flow of 577 cfs for October 19 for the upstream gage near Nighthawk, but flows during the morning and mid-day visit (after accounting for travel time from the gage and hourly flow levels) were about 600 cfs. A field estimate of the flow in the distinct river right channel was 35 to 50 cfs.

Hydrology information

CRC reviewed USGS flow records and statistics for the Nighthawk gage for the entire period of record (October 1, 1928 to December 31, 2012). This gage generally reflects the natural flow regime over the Dam Falls, in the bypass reach, and over Similkameen Falls. Although basin inputs (groundwater or tributaries) between the gage and bypass reach may add more flow during higher flow periods, contributions during low flow parts of the year at issue in this hearing are generally less than 4% (District, FLA Appx. E.6.3, p. 11). Gage information was used to estimate the months of the year in different flow ranges under the natural "existing condition" (no project) and for the proposed Project.

Photo Comparisons

CRC assembled several photos of the two falls at different flow levels from photos in the FERC record; provided by the District, Ecology, or WDFW during discovery; taken during CRC's fieldwork; or taken by Joseph Enzensperger on specific dates under our general direction. For ease of comparison, photos were sometimes cropped to match the perspective or scale of other photos in a series. In all cases, we used flows for the USGS Nighthawk gage to describe the flow portrayed in photos.

CRC also simulated additional photos of lower flows, using information from the modeled cross section in the Bunn Memo (Bunn, 2008), other photos at other flows, flows over similar waterfalls at other sites (e.g., Spokane Falls), and flows estimated in side channels during fieldwork at this site. The mechanics of these simulated photos involved replacing a portion of visible whitewater in the falls in particular parts of the channel with concrete or rock textures. These simulated photos illustrate lower flows or release options, a strategy similar to photo simulations of the proposed tailrace, buildings, and dewatered dam used by the District in relicensing documents (District, FLA E8, 2008; District, May 29 letter with supplemental visual resource information, 2009).

Decision Setting

The State of Washington has several statutes related to instream flows to protect recreation and aesthetic values. Without commenting on the historical or legal issues, we have identified relevant excerpts from hearings or trials about protecting recreation or aesthetic flows, and excerpts from agency guidance about assessing impacts from hydroelectric development during FERC licensing or 401 Certification processes (Ecology and WDFW, 2003; Ecology 2005). These describe our understanding of the context (or "decision setting") for this report.

- Ecology can "impose flow conditions in order to protect beneficial uses of a river as identified in state water quality standards" in a 401 Certification (PUD No. 1 of Jefferson County v. Department of Ecology, 511 U.S. 700, 1994).
- Ecology can require minimum bypass flows in a 401 Certification to ensure "the waters will not be degraded so as to interfere with or injure existing beneficial uses." (PUD No. 1 of Pend Oreille County v. Department of Ecology, 146 Wn. 2d 778, 821, 2002).
- "Aesthetic enjoyment, which is a characteristic use, includes enjoyment of beauty" (Snoqualmie Indian Tribe v. Ecology, PCHB No.03-156 (Final Findings of Fact, Conclusions of Law and Order, April 7, 2004)).
- Ecology can set instream flows for any or all of the listed resources and values, and recognizes that some may "overlap" or "are often clearly related….for example, recreational boating flows for fishing, pleasure, and whitewater are consistent with navigational values. Scenic values likewise support both aesthetic and recreational values" (Ecology and WDFW, 2003, p. 10).
- Instream flow statutes require instream flow "protection" RCW 90.22.010 or "preservation" (RCW 90.54.030(3)(a)) without specifically defining either term, but Ecology cites common dictionary definitions of "keeping from harm or injury" for both and requires "sufficient flows" for the "protection or preservation of fish, wildlife, scenic, recreation, navigation, water quality, and other environmental values…over the long term" (Ecology and WDFW, 2003, p. 10).
- Ecology has developed a "narrative standard" rather numerical standard for recreation and aesthetics in hydropower water quality certifications (Ecology, 2005, p.26). "Narrative criteria are implemented on a case-by-case basis to protect water quality and beneficial uses."
- A two-page section in the 401 Water Quality Certification for Existing Hydropower Dams Guidance Manual focuses on recreation and aesthetic issues (Ecology, 2005, pp. 53-54). The section includes:
    - "Recreation and aesthetics (sight, smell, touch, and taste) are beneficial uses specifically protected in Washington's water quality standards."
    - Recognition of a "curvilinear relationship between instream flow and recreational benefits" (referred to as a "suitability curve").
    - Examples of recreation activities that may be affected by flow or reservoir levels, including "motor boating, fishing, swimming, wading, rafting, canoeing, kayaking, inner-tubing, and aesthetic enjoyment."
    - Recognition that evaluations ("preferences") may be needed to assess how flows affect aesthetics. "Water features are often valued for their aesthetic properties. Beyond the mere presence or absence of water features, however, it also is possible to determine preferences for specific attributes of water features themselves (e.g., flow quantity, water clarity)."

- A list of “possible causes of impairment” that includes 1) “direct dam effects such as river hydraulics, water depth, velocity, wetted perimeter, and turbulence;” and 2) indirect effects to “in-channel features such as sinuosity, sediment movement, channel movement, gravel bars, and beaches. Because of flow changes, there also may be changes to riparian vegetation, which, in turn, may affect the recreation experience.”
- Example aesthetic impairments include “placing river flows through turbines,” and “other structural, operational, and indirect effects of dams on the senses. Growth and decay of aquatic plants; fish kills, boats, litter, and human or pet waste…and other problems contributable (*sic*) to dams or dam operations can affect taste, touch, smell, and sight.”
- Recognition that evaluative information from recreation users is important. “A user-based survey provides an excellent means to get qualitative responses from the user community regarding river conditions. It also offers the opportunity to query users about other aspects of the recreational opportunity in addition to instream flow.”
- Recognition of specific elements in a “comprehensive recreational flow study” as described in “Instream flows for recreation: A handbook on concepts and research methods” (Whittaker et al., 1993):
    - Describe the resource.
    - Determine which resource attributes are important to each subcategory of recreation use.
    - Describe the hydrology—proposed, existing, and pre-project.
    - Describe the relationship between flows and physical conditions in the project setting.
    - Evaluate flow needs for specific opportunities (e.g., boating type, skill level).
    - Integrate flow needs for various opportunities.
    - Develop strategies to protect/provide flows.
- Recognition that flows for recreation and aesthetics may need to be integrated with “flow needs for other values using an interdisciplinary approach. Some accommodation among uses will likely be necessary because it is unlikely that any flow can simultaneously optimize the needs of all uses.”
- The importance of involving the public when allowing “potentially visually controversial facilities.”

Taken together, these guidelines require attention to recreation and aesthetic impacts of the proposed Project and suggest ways to collect and organize information. For the rest of the report, we assess these issues and whether the information assembled by the District or Ecology provides “reasonable assurance” that the proposed aesthetic flow regime adequately protects the area’s recreation and aesthetic beneficial uses.

Findings

This section of the report summarizes findings from our assessment of District and Ecology information and analyses. The findings are organized in three sections: the resource, information and analysis issues, and summary conclusions.

The Resource

Following from Whittaker et al. (1993, pp. 9-11) and the Ecology recreation and aesthetic guidelines for water quality standards (Ecology, 2005, p. 54), a comprehensive study should explicitly describe an area's recreation and aesthetic resource values as a prelude to assessing potential impacts or developing protection, mitigation, or enhancement (PM&E) measures.

Dam Falls and Similkameen Falls are aesthetic features

The ***Dam Falls*** is a waterfall created by the Similkameen River flowing over Enloe Dam's concave spillway and the natural bedrock on both sides of the channel. It produces a visually impressive "block falls" (Plumb, 1998), considerable sound, and mist (at higher flows). At 54 feet tall and about 280 feet wide at its crest, this is a large waterfall on a river with typical spring flows over 6,000 cfs (May-June median flows) and dry season flows over 500 cfs (median monthly flow in September, the driest month). The dam is 93 years old and the river has flowed over it continuously since 1958 (55 years), when the existing powerhouse was decommissioned.

The District and Ecology acknowledge the Dam Falls' aesthetic benefits when discussing flows that will be provided during the 3.5 month high flow period (District 401 consultation meeting notes, Oct. 25, 2010; Ecology 401 Certification, 2012, p.9; Caldwell Biological Rationale for 10-30 cfs flows, Aug. 2012; Gangemi direct, p.20). They also concede the 10 / 30 cfs flow regime "dewaters" the dam during the no spill period (Demuth testimony, p. 6) and that this "would contribute little to the visible or audible values at the site" (Entrix, 2010, p. 23). Proposed PM&Es also include constructing a trail on river left specifically to view the falls, including interpretive displays with photos of water going over the falls so summer dry-season visitors can see what the falls would look like (Demuth testimony, p.7).

Is the Dam Falls part of the pre-Project condition that deserves protection? A parallel situation is providing flows to protect the non-resident fish populations that have developed in the plunge pool below the dam. Ecology is requiring flows to protect these fish resources, some of which might not exist without the dam or upstream reservoir (District analysis of bypass reach flows, Apr 2010). It is our opinion that the Dam Falls would have similar "standing" as an aesthetic resource.

Similkameen Falls is formed by the Similkameen River flowing over a horseshoe-shaped brink about 20 feet tall. At flows under about 1,500 cfs the falls is clearly "segmented," (Plumb, 1998) with three distinct streams broken up by bedrock outcroppings. At unusually low flows some of these may become dry, and at higher flows the three channels merge and resemble a block falls. It is our opinion that Similkameen Falls is an aesthetic resource.

Project effects on both falls. During the roughly 8.5 drier months of the year, the proposed project would provide no flow over the Dam Falls, and only 10 or 30 cfs over Similkameen Falls. This eliminates the Dam Falls, and reduces Similkameen Falls to a relative trickle, 6% or less of median dry season flows (median monthly flows are higher than 500 cfs in Aug., Sep, and Oct). This clearly impairs aesthetic attributes of both falls, including the width of wetted channel; the depth/thickness of the plumes; the power, sound, and mist of the falls; and the presence of three segments in Similkameen Falls.

During the 3.5 months of higher water, flows would be reduced by up to 1,600 cfs. This eliminates the highest peak flows, and through the entire period would reduce the power in the river, the amount of mist, or the depth/thickness of the falls in comparison to the natural flow regime.

The ***plunge pool*** between the Dam Falls and Similkameen Falls is a third aesthetic feature in the bypass reach. It is unlikely to change as much as the two falls as a result of the Project, but if flows are too low, Ecology has acknowledged the wetted pool width could shrink in size by half (Entrix, 2010), which may create "ancillary aesthetic effects such as increased algae blooms with low flows (Ecology 401 consultation notes for July 1, 2009 meeting).

Dam Falls and Similkameen Falls enhance recreation opportunities

Literature shows that people enjoy flowing water in rivers (Shelby, Brown, and Taylor, 1992), and are often strongly attracted to whitewater cataracts and waterfalls in streams (Hudson, 2000). Waterfall viewing is a flow-dependent activity (Whittaker and Shelby, 2002), where the quality of experiences may be particularly reliant on the presence of higher flows (Hudson, 2002). Many other recreation opportunities are enhanced by aesthetics of landscape features such as waterfalls (Whittaker and Shelby, 2002). While activities such as fishing, hiking, or picnicking in a river corridor are often possible at low flows, it is clear that they can be enriched by nearby sights, sounds, and feel (mist) of falling water.

The Dam Falls and Similkameen Falls are dominant landscape features in the Similkameen River corridor between Nighthawk and Oroville, and are obvious attractions for visitors to the area (e.g., both falls are featured in the county brochure for the Similkameen River Trail). The District recognizes this when noting the public "will have the opportunity to enjoy flows much greater than the prescribed minimum instream flows during….periods of spring runoff" (Gangemi testimony, p. 18), and by proposing an interpretive trail as a PM&E measure specifically to view the falls with more water (or during dewatered times, to view interpretive displays showing photos of the falls with more water) (Demuth testimony, p. 7). This indicates the falls are a focal point and enhance recreation opportunities.

Recreation values are higher and use is greater than District/Ecology characterizations

At the same time they acknowledge the falls as attractions, the District downplays their importance to recreation users by suggesting that "Similkameen Falls is not the primary aesthetic attraction on the SRT," "seasonal decreases in flows at the distant Similkameen Falls will not detract from visitors' experiences or reduce visitor use" (Gangemi testimony, p 24); the site does not "represent a high value recreation resource," and the "attraction of the area has more to do with the historical significance of human occupation and use rather than the falls" (Danison testimony, p. 13). Although no study has assessed the contribution of the two falls to overall recreation experiences, dewatering the Dam Falls and severely reducing flows in Similkameen Falls would clearly diminish the attractiveness of the area. We saw and talked to several visitors during our two-day field visit in Oct. 2012, and nearly all mentioned the falls or were observed taking photographs of them.

In a similar vein, the District downplays the level of existing and potential future use of the falls. Data from other waterfall viewing areas such as Idaho's Shoshone Falls (Jones, 2011) and Yosemite Valley (Whittaker et al., 2012) shows higher flows often attract greater use and waterfall guidebooks commonly encourage visitors to view falls at higher flow periods (Plumb, 1998; Hudson, 2002). We expect similar effects would apply here. Based solely on our two-day site visit in late October 2012, we saw more use to the site than the 2006 recreation survey documented on most days during the peak recreation season, as well as considerable signs of use (e.g., user-created trails, user-created driftwood shelters, fishing litter, beverage containers, graffiti).

On the river left side, use is limited by the poor condition of existing access roads, lack of signs, and limited publicity about the site. A major finding from the recreation survey was visitor support for improved river access (District Recreation Needs Assessment, 2009). The project proposes improved roads and additional recreation development that includes a camping and picnic area, an interpretive trail to a falls viewing area, and connecting trails between them all. These will probably induce greater use than would be predicted from estimated population and demographic changes in the county and state (as predicted in the District Recreation Needs Assessment (2009)).

On river right, the opening of the SRT in 2011 has created considerably more use than in 2006 when the Danison recreation survey was conducted. We observed more use (5 vehicles parked at the Taber Trailhead at noon) over a four hour period on a cloudy cool weekday in late October than the 2006 study documented on most days in the peak season. Planned extension of the SRT allowing longer-distance hiking to Nighthawk and through-hiking on the Pacific Northwest Trail (PNT) would further increase this use (the PNT is a 1,200 mile Congressionally-designated National Scenic Trail (2009) connecting the Continental Divide in Glacier National Park to the Olympic Peninsula coast).

Finally, the potential for increased use from tourism is generally understated in District reports or testimony (Danison testimony). In contrast, the recreation survey documents that 65% of visitors to the area were from outside the county. This is a surprisingly high proportion for a resource the District claims is "remote" (Gangemi p. 14) or "represents a local recreational resource" (District Recreation Needs Assessment, 2009, p. 59). In contrast, a 21 mile rail-trail in York County PA (with close access to the Baltimore and DC area populations) attracts only 39% out-of-county users (York County Trails, 2007) and the Ferry County WA rail-trail survey reports only 9% out-of-county users (Ferry County Rail-Trail, 2013). The Project area already attracts a majority of use from non-locals, and the SRT is likely to accentuate that in the future (particularly given the proposed 40 year license of the Project).

Recreation investment and development will induce greater use

The North Okanogan Valley has 18 lodging and 10 camping areas (Okanogan Country, 2013), and regional tourism development is likely to continue growing over the length of the Dam's license (40 years). In recent years the county has seen more growth in retail trade, accommodation, food services, and construction associated with real estate development than traditional agricultural, mining, and manufacturing sectors (Headwaters Economics, 2012). Okanogan County is actively developing recreation resources, including trails and nature viewing activities. The county has recently completed a Draft Recreation Plan (Okanogan County, 2012) that describes substantial investment in several area trails, including enhancing the existing SRT and extending it to Blackhawk as part of the PNT.

Across the border in Canada, the Okanagan Valley and the city of Osoyoos have been nurturing a reputation as the "Palm Springs of Canada" for the dry, warm climate and tourism (e.g., 26 hotels, 19

B&Bs, and 9 RV campgrounds in 2008) and retirement amenities (CanWest Media Works, 2013). As these resident and tourism populations grow, there may be increasing "spillover" visitation across the border that will add use from adjacent US Okanogan communities (Okanogan Country, 2012).

The SRT has already seen substantial investment, and the District has been a major contributor. The donated girder bridge had an estimated value of over $1,000,000 and cost about $10,000 in transaction costs, while the District apparently provided over $50,000 in in-kind value to resurface the bridge for trail use (Danison testimony, p. 12). This is admirable and indicates the District values the public benefits of these resources, but this is at odds with District claims that recreation use in the area is unimportant and unlikely to increase (FLA, Exhibit E.7, p E.7-25, 2008). Initial total estimated costs for the 12.5 mile completed trail (not including the bridge's value) are $1,200,000 (Okanogan County and BLM, 2011). In the County's current Draft Outdoor Recreation Plan (2012), estimates for new projects associated with the SRT (or its extension) include $800,000 for acquisition and improvements, and $107,000 for a restroom at the existing Oroville Trailhead (Okanogan County and BLM, 2011). It seems unlikely that local communities would undertake such investments for unimportant resources or anticipated static use levels.

Finally, designations like the PNT and Greater Columbia Water Trail are likely to increase publicity for, attention to, and use of the area, as the District acknowledges in its Recreation Needs Assessment. This document, which includes revisions of the original recreation trends analyses in the DLA and FLA, concludes "the development of these trails would increase recreation visitation in the area, bringing in hikers, boaters, and possibly bikers. The director of Pacific Northwest Trails estimated that 1,000 hikers per year will use the trail once it becomes a National Scenic Trail and expects 300-400 hikers on the Oroville to Nighthawk segment during the first year it is developed" (District Recreation Needs Assessment, 2009, p. 44). If this prediction is accurate, it will nearly double annual recreation use in the area estimated in the 2006 study and FLA. This supports use of the District's "high growth" scenario.

This information runs counter to Gangemi's opinion (p. 6-7) about the limited appeal of the PNT and that "in the absence of [extension of the trail to Nighthawk], it is unlikely that visitation will increase substantially on the existing section of the trail in the near future." First, it seems likely that the trail will be extended sometime during the term of the Enloe license (40 years). Second, we think the District is underestimating the power of long distance trail designations to induce occasional use of even fragmented trail segments. Gangemi predicts small numbers of "through hikers" on the PNT until the trail develops a reputation, but we think far greater numbers will seek shorter day or overnight trail opportunities on a designated long distance route (similar to how the Pacific Crest Trail and Appalachian Trail attract many more users than just "through hikers").

Information and analysis issues

The District claims it has conducted sufficient analyses to address the flow-aesthetics issue, citing the "Bunn Memo" (Bunn, 2008) and aesthetic evaluations focused on buildings and facilities that included a simulation of "the view of the falls from near the pool below the falls" (Boettger testimony, p.30), discussed further below. Other information from the District or Ecology included a recreation user survey, random photos of the falls, estimates of costs of aesthetic flows due to foregone power generation, and water temperature analyses of 10 and 30 cfs flows. Specific information and analysis issues are described below.

Flow-aesthetics studies should produce a flow evaluation curve

Ecology's guidelines for addressing aesthetic flow needs (Ecology, 2005) point to a curvilinear relationship between aesthetic quality and flow, and cite the need for such curves as discussed in Whittaker et al., (1993) and Whittaker and Shelby (2002). Gangemi elaborates and accurately describes the concept: "aesthetic flow research indicates a sharp increase in approval ratings of aesthetics in the low flow range but minimal change in ratings as flows transition from low to medium to high" (Gangemi testimony, p. 21-22).

We obviously agree, and have advocated that researchers, agencies, and stakeholders develop "flow evaluation curves," sometimes called "suitability curves" (Whittaker et al., 1993; Whittaker et al., 2005). While it is preferable to develop curves from quantitative evaluations, we have also developed and used curves based on expert judgments. Curves make evaluations explicit and transparent, and become a focal point for stakeholder discussions about agreement/disagreement, suitable PM&Es, or tradeoffs between aesthetics and power generation or other resources.

Despite the District's assertion that it has conducted flow-aesthetics analyses, neither the District nor Ecology has produced a single flow evaluation curve. The only time a curve is mentioned is when their expert tells us it is important, or the Ecology manual encourages their development.

Direct evaluations of actual or simulated conditions are most accurate

The most obvious way to develop a curve is to have experts, stakeholders, and/or users evaluate flows directly (Whittaker et al., 1993; Whittaker et al., 2005). Gangemi suggests this will not work for Enloe given 1) little ability to control flows for an onsite study, 2) the difficulty ("challenging if not impossible") of representing lower flows with simulations, 3) limited user or stakeholder knowledge and sensitivity to flows; and 4) low recreation visitation (Gangemi testimony, pp. 4, 15-16). He also disparages the idea of having focus groups evaluate flows because he presumes they can only do so onsite (and the project cannot manipulate flows for onsite evaluations).

Gangemi confuses ***who should evaluate flows*** (focus groups are one choice) with ***what would be evaluated*** (onsite flows, actual photos, and simulated photos are three common choices). In any case, neither the District nor Ecology had anyone besides their "experts" evaluate any flows, and those experts' judgments were flawed (as will be discussed below). Better evaluations typically involve more than one evaluator, reasonable visual representations of the appropriate range of flows, and flow evaluation curves to make evaluations explicit (these topics are further discussed below).

Evaluations from Upper Spokane Falls Study are a good example

It is surprising Gangemi didn't see the applicability of a study he observed. The recent work at Upper Spokane Falls (CH2MHill, 2010) provides an excellent example of methods for conducting flow-aesthetics studies (with some modifications necessary to fit the Enloe situation). We agree that Upper Spokane Falls is a higher profile resource with considerably more visitation than Enloe, but how many people benefit from improved flows is a secondary issue discussed later in this report.

The Spokane study evaluated a range of flows onsite and from photos (along with channel modifications to improve aesthetics). The falls at the bottom of the South Channel is about 20 feet tall and 105 feet wide in a bedrock channel similar to Similkameen Falls, and the study evaluated a range of flows including "leakage" (about 30 cfs) and 400 cfs in the South Channel. Figure 6 shows flow evaluation curves for South Channel, North Channel, and the entire falls taken together, based on photos taken as flows changed through the previous few months. The study suggests a reasonable range of flows to assess at Enloe (given a similar-sized channel and falls). It also shows that the 30 cfs leakage flow produced unacceptable aesthetic quality in a channel 105 feet wide, casting substantial doubt that the District's proposed 30 cfs flow would be acceptable in a wider (145 to 200 foot) channel like Similkameen Falls.

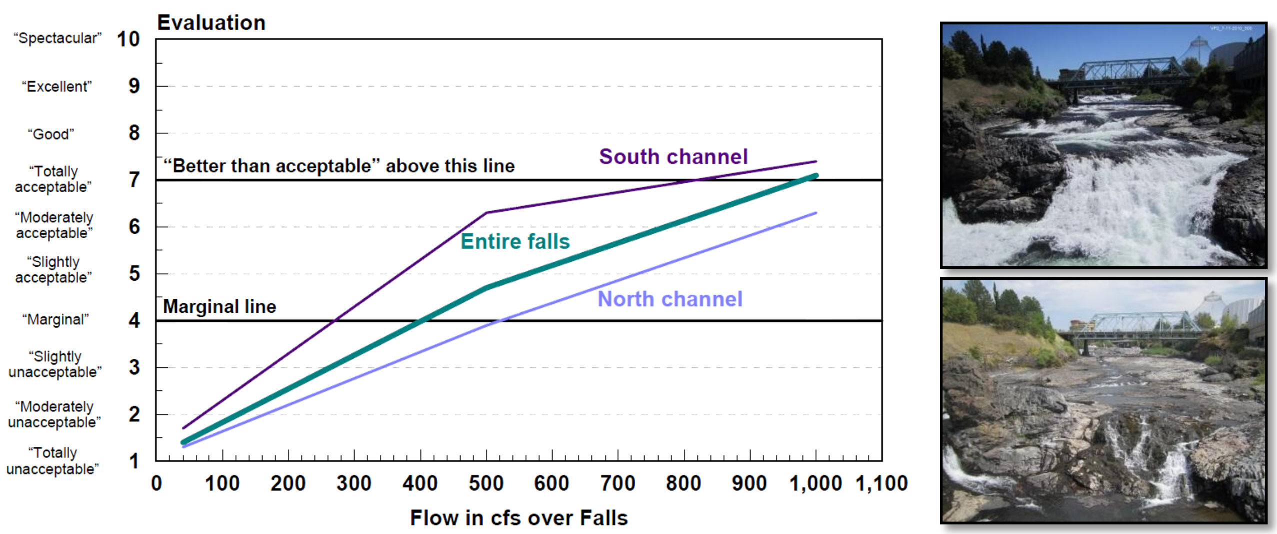

Figure 6. Flow evaluations in Upper Spokane Falls from photos; example photos show 400 cfs (top) and 30 cfs (bottom) in the roughly 105 foot wide South Channel.

Photo evaluations of existing flows are possible for Dam Falls and Similkameen Falls

Gangemi asserts that Spokane-style evaluation techniques are not applicable at Enloe because the inoperative existing dam cannot control flows to produce photos that represent the relevant range (Gangemi testimony, pp. 4, 15-16). But the Similkameen has experienced natural flow variations over several years that offer opportunities to collect a range of photos. The District and Ecology conducted several studies of fisheries during low flow periods in 2006, and there have been other low flow periods since aesthetics became an issue in 2008 that offered opportunities to photograph a relevant range of flows. The District and Ecology did not systematically photograph these flows, or assemble other photos in their possession.

We have started this process (Figures 7 through 14) to show how it could be done. We began by collecting existing photos found on the internet, photos the District or Ecology produced during discovery (they withheld photos from Cultural Resource Work Group field trips, and photos from a low flow visit during preparation for this hearing). We also worked with a local resident in Oroville (Joseph Enzensberger) to take photos at a range of flows through summer and fall 2012.

Figure 7. Dam Falls with unknown low (leakage) flow from 1950s (from Similkameen River Trail Facebook Page).

Figure 8. 236 cfs on Sep 12, 2006 (from District fish studies).


Figure 9. About 365 cfs on Oct. 14, 2012. From Joseph Enzensperger.


Figure 10. About 500 cfs on Sep 8, 2012. From Joseph Enzensperger.


Figure 11. About 365 cfs on Oct 14, 2012. From Joseph Enzensperger.


Figure 12. About 423 cfs on Sep 18, 2012. From Joseph Enzensperger.


Figure 13. About 600 cfs on Oct 19, 2012. From Tom O'Keefe.


Figure 14. About 1,360 cfs on Nov. 15, 2012. From Joseph Enzensperger.

Photo simulations are possible for other important flows

Gangemi correctly points out that photos in the natural range may not be sufficient to assess aesthetics of lower flows (the proposed 10 / 30 cfs flows are far below the lowest flows on record of 120 to 150 cfs, which generally occur during winter freezes). But Gangemi is too pessimistic about simulations of these flows (which he labels "photo montages").

Using information from the lowest flow photos we have found, plus other information about wetted channel widths at different flows, we have developed simulations of both falls to illustrate lower flows or different release options (Figures 15-18). They include:

- A dewatered Dam Falls and Similkameen Falls as initially proposed by the District in the DLA (2007) as described by Boettger testimony (p.25).
- A dewatered Dam Falls with the new crest gates as proposed in the 401 Certification, with 30 cfs in Similkameen Falls.
- 30 cfs in Similkameen Falls as produced by a "thin stream" down the face of the dam as discussed in consultation meetings between Ecology and the District (District 401 consultation meeting notes, Oct 11, 2010).
- 120 cfs flow in Similkameen Falls and over one-third of the Dam Falls. This approximates the lowest natural flow recorded, provided as a release over part of the Dam Falls as discussed in summary of Bypass Flow Technical Memorandum (Entrix, 2010, p. 20).

These simulations were based on careful scrutiny of existing photos at known flows, expert judgments about how water would be distributed through the rocks of the falls, modeling information from the Bunn memo, and limited onsite measurements during our October 2012 site visit or those reported from District or Ecology fieldwork. They are provided as reasonable illustrations of the technique, not the ultimate depictions one might employ if charged with conducting a study (the accuracy of these simulations could be improved with onsite measurements at low flows and basic modeling of water surface elevations). We would collaborate with stakeholders while developing simulations, explaining why simulations depict different flows as they do, and developing consensus about the simulations that are ultimately used.

It is more challenging to simulate flows that are farther from those in existing photos, or that represent smaller contrasts. However, we are confident simulations can distinguish flows "about 30 cfs" from those "about 120 cfs," which can be compared to existing photos and limited measurements at about 265 cfs (and higher). This is sufficient to develop a reasonable flow evaluation curve, which is the goal. The result may not be perfect, but it is better than complaining that the task is so difficult, construction should proceed with no information about aesthetics of the 10/30 cfs flows the Project proposes to deliver (Gangemi testimony, p. 16).

Figure 15. Simulated photo of Dam Falls and Similkameen Falls with 0 cfs flow (proposed in DLA).

Figure 16. Simulated photo of 0 cfs over Dam Falls and 30 cfs over Similkameen Falls.

Figure 17. Simulated photo of 30 cfs in "thin stream" over Dam Falls and 30 cfs over Similkameen Falls.

Figure 18. Simulated photo of 120 cfs over one-third of Dam Falls and over Similkameen Falls.

Empirical ratings can be used to produce flow evaluation curves

With an array of photos through the appropriate range, one can systematically evaluate those flows. Quantitative evaluations on an acceptability scale provide a commonly-used format that has been well-tested (Whittaker et al., 1993; Whittaker and Shelby, 2002). The evaluators could be experts, a focus group or panel of stakeholders, recreation users, or even the general public. In all cases, evaluations become transparent and are put on an empirical basis. Analyses and graphics can help assess similarities or differences among evaluators.

We have provided our own evaluations of the photos and simulations we assembled for the Dam Falls and Similkameen Falls (Figure 19). We used the same evaluation scale as in the Upper Spokane Falls study, which included a 7-point acceptability scale (with a “marginal” mid-point), along with three higher evaluations (“good,” “excellent,” and “outstanding”) to acknowledge that the aesthetics of very high flows are outside the range at issue.

Results show that flows of 30 cfs are rated unacceptable for both falls, because they cover only a small proportion of the bottom of the channel, provide little depth or power, and are unlikely to produce much sound or mist. For the Dam Falls, evaluations improve substantially through 240 cfs, where a 2006 photo shows good coverage across the entire dam and some power in the falls. Above this point, coverage and power in the Dam Falls does not improve as dramatically through 700 cfs (the highest flow we have personally seen on site). The curve shows that flows over the Dam Falls become marginally acceptable about 175 cfs, and are moderately acceptable (6 on the scale) by 250 cfs.

At Similkameen Falls, flows are concentrated in deeper channels and it takes more water to spread out across the full width of the channel. As the literature would predict, however, ratings improve substantially as the three channels fill and water falls over more of the horseshoe-shaped brink. The curve shows that flows over Similkameen Falls become marginally acceptable about 350 cfs, and are moderately acceptable (6 on the scale) about 450 cfs.

Readers need not agree with our evaluations or the curves they produce, just as one may not agree with the District’s expert (Bunn), Ecology’s expert (Caldwell), or the expert-based VRM evaluations of facilities. But our evaluations are transparent and are offered as only one of several that should be collected, unlike evaluations from Ecology and the District which are difficult to assess and essentially presented as a *fait accompli*. Showing evaluations for specific flows (and the full curve connecting them) invites stakeholders to make their own ratings and discuss similarities or differences.

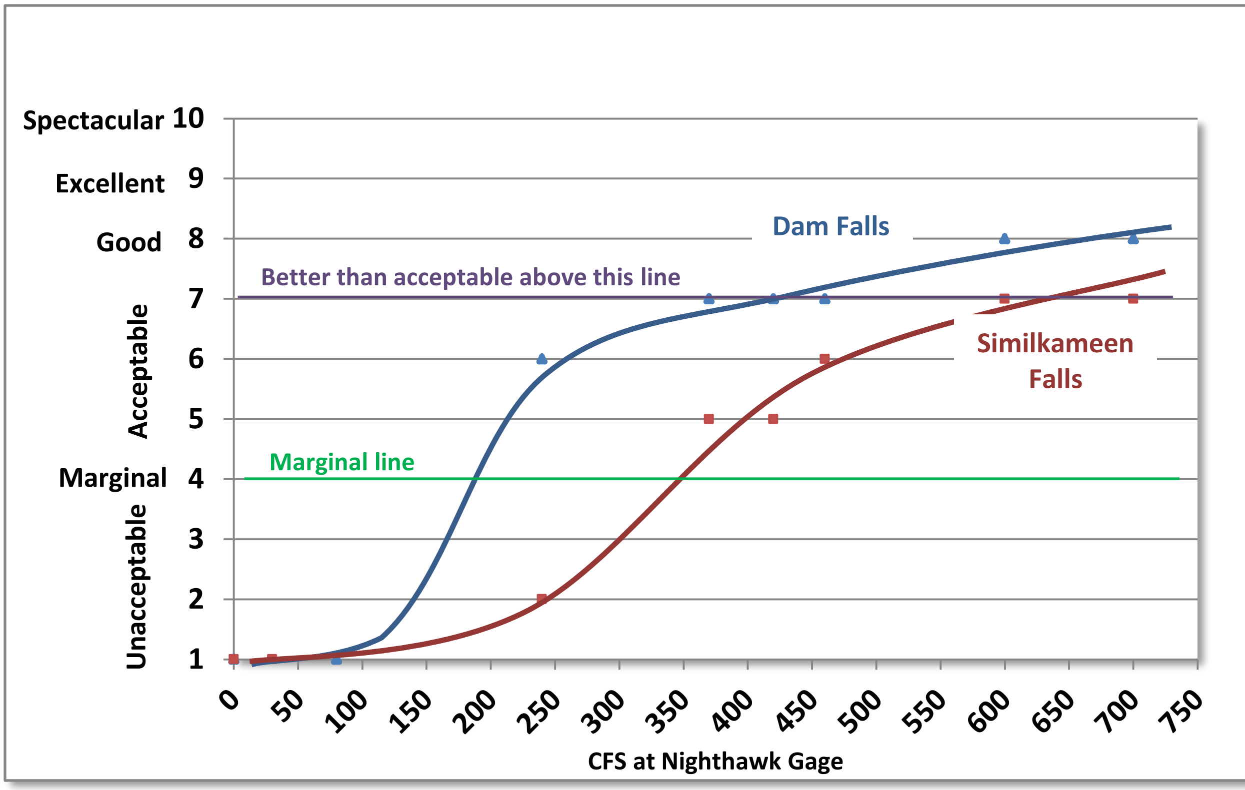

Figure 19. Whittaker and Shelby's expert judgment flow evaluation curves for the Dam Falls and Similkameen Falls based on photos and simulations.

Collaboration can be used to improve evaluations

A goal in an aesthetic study is to represent evaluations of all relevant groups. In a low controversy situation, a single expert's opinion may be sufficient, but in more contentious settings it makes sense to involve concerned stakeholders and possibly recreation users or the general public. This allows empirical analysis to explain similarities and differences.

In the Upper Spokane Falls study (CH2MHill, 2010), which evolved from a settlement of 401 certification litigation, 22 stakeholders formed the evaluation panel. There was representation from the utility, state and federal agencies, several non-governmental organizations (including CELP, a party to this litigation), and consultants for various "sides" concerned about the issue (including ourselves and John Gangemi). In quantitative evaluations and focus groups, there was considerable agreement about the aesthetic evaluations for different flows. Focus group discussions were particularly powerful in creating transparency (opinions were on display and ratings had to be explained).

Gangemi dismisses the focus group approach without seeming to recognize the collaborative value of this process. Convening stakeholders with potentially opposing views, evaluating photos and simulations together, and learning about similarities and differences is what's important. Neither the District nor Ecology ultimately pursued this direct approach, even though they considered the idea in July 2009 (Ecology consultation meeting notes for July 1, 2009).

Other examples of waterfalls over dams with aesthetic flows

Aesthetic flows for a dam are not unprecedented; other minimum-flow bypass reaches produce waterfalls over dams. For example, 200 cfs is required during daylight hours over Lower Spokane Falls, where part of the falls is formed by the diversion dam (Figure 20). At Post Falls on the Spokane River in Idaho, 46 cfs is required on weekends during the summer over a combination of dams and natural falls. For the Upper Collinsville Project on Connecticut's Farmington River, a suitability study (GZA GeoEnvironmental, Inc., 2011) recommends minimum flows over the scenic low head dam that maintain a 6 inch "veil flow" in spring and a 2 inch veil flow during the drier parts of the year (reducing turbine design flow by 500 cfs).

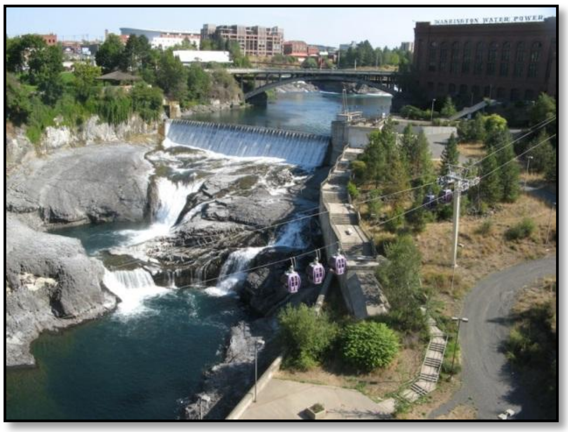
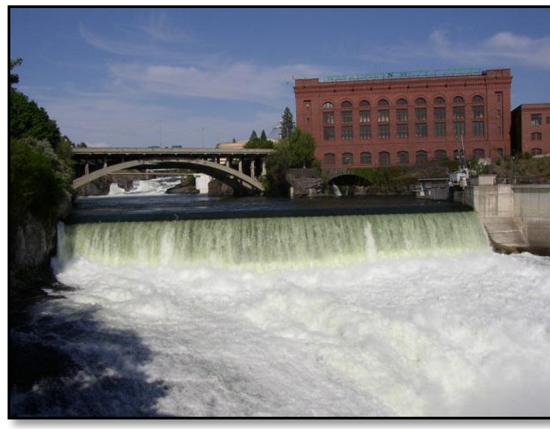

Figure 20. Monroe Street Dam/Lower Spokane Falls at low (left) and high flows (right).

Traditional desktop recommendations

An instream flow specialist for WDFW (Beecher) calculated instream flow recommendations for the bypass reach based on traditional desktop methods (Tennant, 1976; Hatfield and Bruce, 2000). Primarily focused on fish habitat concerns, the Tennant Method provides "rule of thumb" estimates of flow needs as a percentage of a river's mean annual flow (e.g., 30% is good habitat, 60% is excellent to outstanding" etc.). Tennant has claimed that the 30% and 60% estimates are also relevant for general recreation uses, a simple idea that has some usefulness (Whittaker et al., 1993; Shelby and Jackson, 1991).

For the Similkameen with a mean annual flow of 2,238 cfs (at Blackhawk gage), Beecher identifies "severe degradation" and "poor or minimum" habitat would occur below 228 cfs, and flows between 457 and 1,826 cfs provide "fair," "good," "excellent," "outstanding," or "optimum" conditions in different seasons (Beecher, 2009). The Tennant 30% and 60% rules for recreation come to 671 and 1,370 cfs respectively. Beecher also cites flows from Ptolemy (20% of MAF or 457 cfs) and Hatfield and Bruce (475 cfs to 800 cfs for different life stages of rainbow trout). Beecher recommends 465 cfs minimum, plus some diversity of flows through the year.

Desktop "rule of thumb" estimates are easy to calculate and help suggest a range of flows to consider, but more specific information usually improves recommendations. That said, these flows are considerably higher than the District's 10 / 30 cfs proposal, and they fit with physical characteristics of the bypass channel (where it probably takes 450 to 700 cfs to fill the bottom of the channel). This also fits with Ecology's "toe-width method," which uses a single cross section to estimate the flow that covers the full bottom of the channel (the width of the channel from the toe of one bank to toe of the other)(Ecology and WDFW, 2003). This can't be confirmed because Ecology did not conduct a cross section (they tried, but didn't have the right equipment on the days they visited) (Interrogatory response from Ecology, Dec 5, 2012).

In any case, it appears that Beecher was persuaded to focus on narrower fish issues and ignore aesthetics (cite emails that document). In general, flows higher than the 10/30 cfs proposal apparently cost too much in foregone power generation revenues given the District's pre-determined PM&E package (Boetgger testimony, p. 33-34).

The District claims two "aesthetic analyses" address flow issues

1. Bunn Memo (2008)

Calling this an aesthetics study is probably a misnomer. It is actually a memo with two pages of text, three modeling/engineering references, a one-page modeled cross section, and four pages of hydrographs. It appears that no fieldwork was conducted for this analysis, and there is no evidence that the memo reached Ecology (they were asking for cross section information in July 2009; Ecology 401 consultation notes July 1, 2009).

2. Aesthetic Resources Study (2008)

This more elaborate study (28 pages in FLA appendix) focused on landscape-level assessments of how proposed project facilities (e.g., fences, buildings, dam, tailrace, transmission lines) will look. This is important, but not relevant to aesthetics of flows over the Dam Falls or Similkameen Falls.

Bunn Memo analysis of Dam Falls aesthetic flows is theoretical, has no aesthetic criterion

The District accepted some responsibility for providing aesthetic flows over Dam Falls, asking Bunn to calculate a minimum flow to accomplish this. Using office-generated engineering calculations based on weir formulae (and no field measurements), Bunn estimated the flow it would take to cover the dam at a depth of 2.4 inches and provide "nappe separation" (aeration to make the water turn white; see Figure 21). There is no rationale for the implicit aesthetic criteria used here. Why is 2.4 inches over the dam a suitable depth? Why is minimal nappe separation "aesthetic?"

Figure 21. The Dam Falls at 700 cfs showing nappe separation (where falling water becomes aerated).

In spite of this opacity, it is interesting that Bunn's criteria (a uniform depth of 2.4 inches and aeration) result in his version of "the amount that it takes to cover the bottom of the channel" (in this case, the dam face). By his calculations, 80 cfs will accomplish this, but even that flow was apparently too high, and dropped from further consideration by the District. In addition, there is no evidence that Ecology saw or heeded information in the Bunn Memo.

Bunn Memo analysis of Similkameen Falls aesthetic flows is not based on field measurements

The Bunn Memo presents a channel cross section and then models water surface elevations for 20, 40, 80, 120, and 300 cfs flows. In citing this as an important analysis, Gangemi assumes the cross section came from an onsite measurement. However, Bunn recalls building cross section data from a satellite-based contour map, and could not specify the location of the cross section (aside from "perpendicular to the current" (personal communication, 2013). Given the horse-shoe shape of the brink of Similkameen Falls, the tangent that represents the cross section is obviously important. This makes all subsequent analysis highly theoretical and potentially inaccurate. For example, the Bunn Memo shows all three deeper channels have water at 80 cfs and 120 cfs, but photos from 236 cfs in Sep 2006 show no water in the river right channel.

Bunn Memo for Similkameen Falls uses a questionable aesthetic criterion

The Bunn memo says even the lowest flows produce visible whitewater, implying (with no citation or rationale) this is some sort of aesthetic standard. Gangemi agrees by asserting that "flows with contrasting visible differences such as turbulent water (i.e., whitewater) would be present for viewing even at very low flows – at flows lower than 30 cfs flow (sic) that is currently proposed….based on these results…,aesthetic flows were not an issue in the bypassed reach" (Gangemi testimony, p. 10). This "white water" criterion is not based on any literature we know of, it does not fit with the "cover the bottom of the channel" rationale in the literature (Whittaker & Shelby, 2002), and is not supported by "totally unacceptable" evaluations of 30 cfs leakage flows at Spokane Falls. One can produce visible water that is white from a faucet disbursing 2.2 gallons per minute, which is only 5/1,000s of a cfs.

Bunn's Similkameen Falls modeling shows 30 cfs wets very little of the channel

Even given the flaws in this desktop technique (see above), the Bunn memo indicated that lower flows fill very little of the channel. Figure 22 shows the modeled cross section (looking downstream) near the brink of the falls with Bunn's estimates of how 20, 40, 80, 120, and 300 cfs fill the channel (blue lines). Figure 23 shows the water surface width of filled channel for each flow. The green line has been added to show the water surface width when all the mid-channel rocks are covered (147 feet wide, with the falls about 19 feet above the lower pool), and the blue line has been added to show the width at roughly the ordinary high water channel (about 196 feet wide, with the falls about 21 feet above the lower pool).

Bunn's results show that 30 cfs would produce a stream above the falls only about 12 feet wide, while 120 cfs would be about 39 feet wide, and 300 cfs would be about 99 feet wide. These data show substantial improvements in "filling the bottom of the channel" with each of the flow increments, suggesting that aesthetics are increasing substantially based on this criterion from the literature. We think modeling higher flows would show smaller gains in channel coverage from 450 to 650 cfs (illustrated by the dotted purple line). This analysis would benefit from including a typical low flow of 500 cfs, which is a more useful reference point than 300 cfs (the 95% exceedence level) for the issues under consideration here.

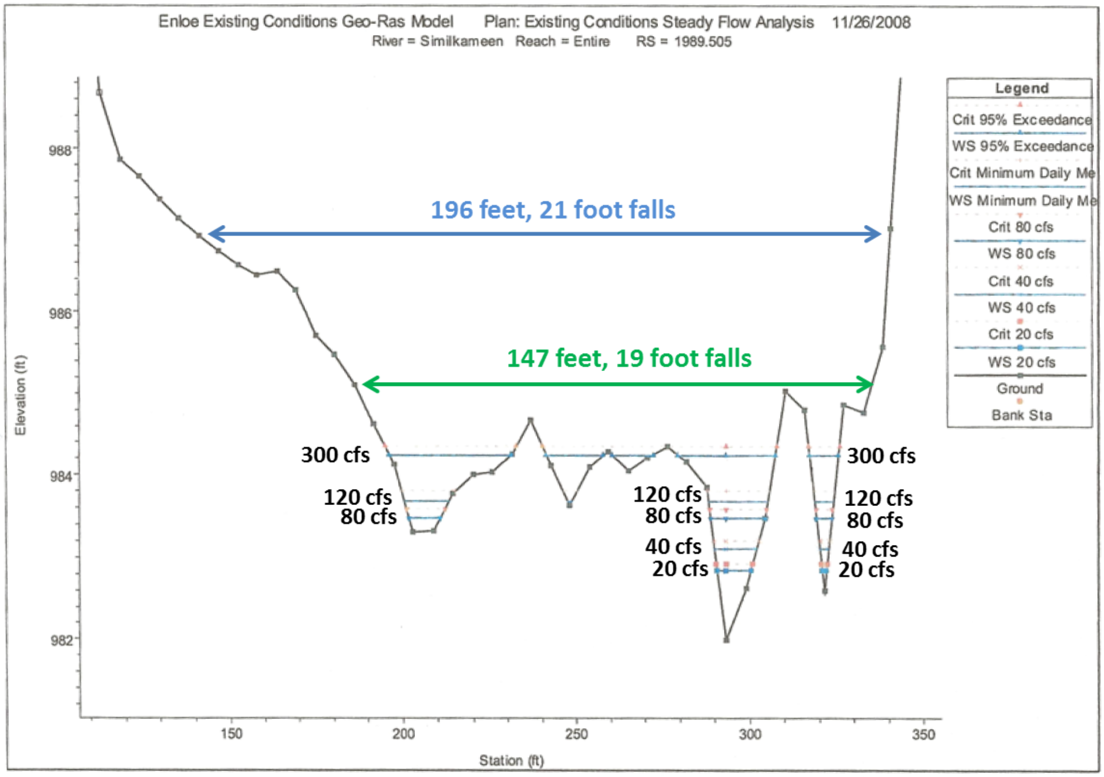

Figure 9. Bunn cross section for 20, 40, 80, 120, and 300 cfs with channel widths at key water surface elevations.

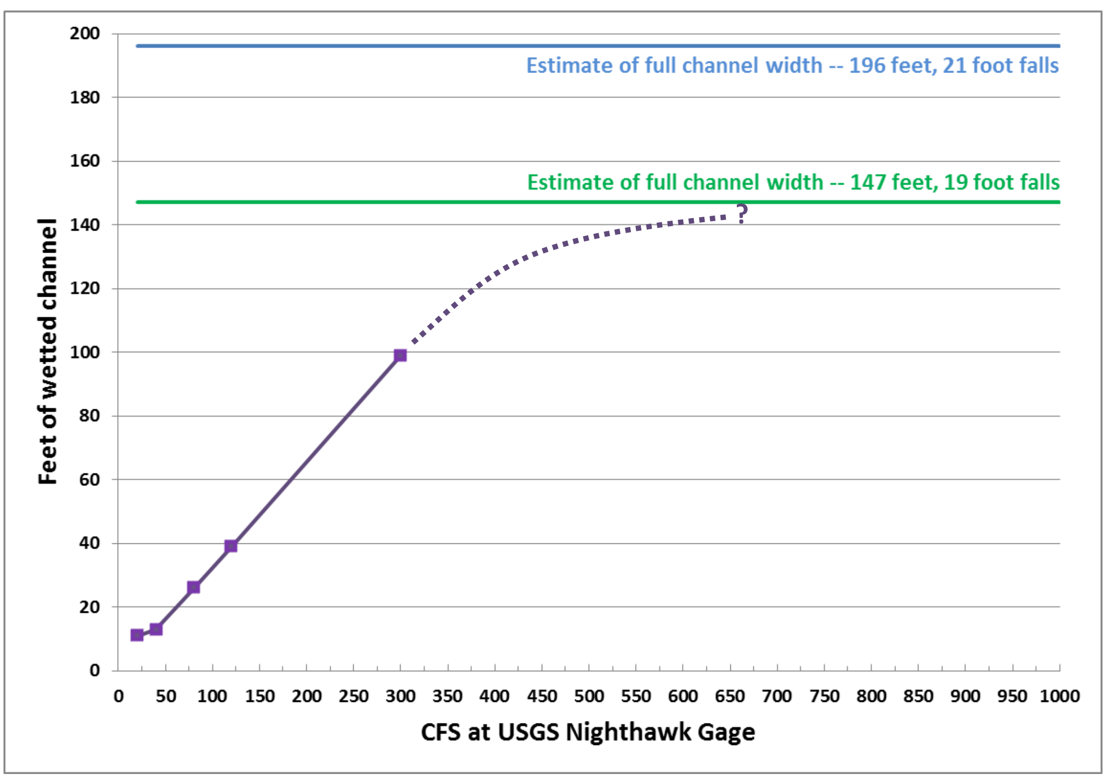

Figure 10. Graphing wetted channel widths vs. flow from Bunn Memo results.

Monetary costs of providing flows are not aesthetic criteria

The Bunn Memo calculates the costs of providing 20, 40, and 80 cfs for 12 hours per day from July through October (Bunn, 2008). This shows the District is interested in the monetary costs of aesthetic flows, but does not show how the information is to be used. While the assumptions in those calculations are different from the District's current proposal, calculations show that 80 cfs would cost about $53,500 annually. This is apparently too high, given the 30 cfs and shorter mid-July to mid-September time period in the District's pre-determined PM&E package (Boetgger testimony, p.33-34).

Monetary costs are important, but they are not the appropriate criteria for evaluating aesthetics of flows. The initial goal of a flow-aesthetic study is to determine how aesthetics change through the flow range. After specifying acceptable aesthetics, a second level analysis focuses on the tradeoffs of providing flows for different resources including aesthetics, recreation, fish, or power generation.

Aesthetic flows need not be available 24-7 to benefit visitors, so there may be creative ways to provide aesthetic flows that minimize lost power, or avoid temperature impacts to fish. The District/Ecology show some interest by considering options for engineering smaller releases (District Nov. 10, 2010) and providing aesthetic flows for shorter periods (e.g., holidays and weekends) (Pratt, May 11 email to Pat Irle, 2009), but these are eventually dropped without explanation of effects on aesthetics. It is challenging to develop such alternatives without knowing the flow-aesthetics relationship.

Landscape level evaluations of facilities are not relevant for aesthetics of flows

The District conducted a landscape aesthetics analysis using the BLM VRM system (District FLA Aesthetics appendix, E8, 2008). This is an expert-based system that rates natural and human-built features at the landscape scale (foreground is 3 to 5 miles) and then assesses the degree of contrast. "Key Observation Points" (KOPs) are used in a desktop analysis that determines which facilities are visible from those places. This is useful for assessing proposed facilities (buildings, fences, transmission lines, etc.), but it did not address aesthetics of flows over Dam Falls or Similkameen Falls. Several issues are listed below for completeness.

- Several simulations show considerable (but unspecified) flows over Dam Falls and Similkameen Falls, even though those flows would not be present 8.5 months of the year.
- The landscape evaluations were conducted by a single expert, and involved no input from stakeholders, users, or the public.
- There are no KOPs on the river right side, where the new SRT and the planned SRT extension provide Falls viewpoints important to visitors.
- Of all the simulations, only two show potential altered flows, and these are only for the dam. There are no simulations of 10 or 30 cfs in Similkameen Falls.
- The VRM system's focus on landscape-level evaluations with a foreground scale of 3 to 5 miles is too far away for assessing flow differences in Dam Falls and Similkameen Falls.
- Some of the photo simulations were unrealistic or used questionable base photos. Examples include:
    - No depiction of the proposed flow valve and 70-foot arcing water jet that would provide 10/30 cfs flows.

- Inaccurate location of the tailrace in the simulation for KOP 7 (District, May 29 supplemental information on Visual Resources, p. 8), compared to the top view schematic of the proposed Project.
- Waterfalls at the end of the tail race which probably will not be present (because head would be lost).
- Water going over a log jam in the tailrace.
- Dam crest gates missing (except some shown in one simulation).
- Snow or ice in base photos (when most recreation use will occur in warmer seasons).
- No "water stains" or algae blooms on the dewatered dam face from potential crest gate leakage (the District estimates 2 cfs).

These flaws give reason to question the landscape evaluations, and recognize they are no substitute for direct evaluations of a range of flows over the Falls. Agencies and NGOs drew similar conclusions in their comments (BLM, 2008; NPS Feb and Oct, 2008; Hydro Reform Coalition, 2012).

2006 Recreation survey issues

The District conducted the Danison recreation user survey in the summer in 2006 (Danison testimony). Findings were adequately summarized in a report that was included in an appendix of the FLA. Findings appear useful to profile existing use and describe some additional recreation management issues. But the study had some weaknesses and didn't directly address flow-recreation issues, summarized below for completeness.

- Low existing use in 2006 on the river left side is not surprising given poor access to the site. The roads to the dam parking area are rutted, can be wet in spring and early summer, and are poorly signed.
- The study showed little use along the abandoned railroad grade on river right because the bridge across the river was not public and the SRT did not exist (it opened in 2011).
- The survey ignored potential winter and spring use. Current access is poor in winter, but the SRT provides winter recreation opportunities.
- The survey did not include "viewing the falls" in the list of recreation activities in the area or directly ask about their importance as attractions, providing no basis for Gangemi's or Danison's assertions that the falls are unimportant to current users.
- The survey had no evaluative questions about…
  - Aesthetic evaluations of specific flows (from photos or simulations) for the two falls.
  - Changes in development levels from new project buildings, inlet, tailrace, transmission lines, or fences that may frame the landscape in which flow-aesthetics evaluations might be made.
- There were no questions about favored seasons, days of the week, or times of day, which might help determine when aesthetic flows should be provided (if given a water budget).

In spite of these flaws, the survey documented that 65% of visitors are tourists (people who live outside the county). It also showed considerable diversity in recreation activities, and documented substantial support for additional access to the river.

Flow aesthetic issues were raised in sufficient time to address the issue

The District's Cultural Resources Work Group raised the issue of flow-related impacts on aesthetics in spring 2007 (Demuth direct testimony, p. 9). Several stakeholders and agencies registered stronger concerns and requested specific studies about the issue after reviewing the DLA in November 2007 (NPS, Feb. 2008; DNR, 2008; BLM 2008). A year and half later (July 1, 2009 401 consultation meeting notes) indicate that direct evaluations of flows in photos or simulations were contemplated by District and Ecology, Demuth's testimony indicates that landscape aesthetics concerns led to additional PM&Es (e.g., the interpretive trail to a falls viewing area with interpretive displays showing photos of the falls with water in them). This suggests that the District and Ecology had sufficient time to conduct better evaluations or collaborate with stakeholders about aesthetics issues.

It is common in a Traditional Licensing Process for the utility to develop and then support some ideas about impacts and the size of PM&E packages that would address them. The problem comes when stakeholders don't learn about specific project proposals or recognize an important impact until the DLA comes out. By this time, a pre-determined PM&E package may have been worked out, and it is more challenging to bring in other measures (as related by Boettger (p-33-34). In the Enloe case, it seems that several agencies and NGOs did not discover how low the minimum flow would be until the DLA, and they immediately asked for more information about impacts on aesthetics. The District has consistently refused to conduct the obvious aesthetics study, presumably because they are unwilling to consider any flows higher than the proposed 10 / 30 cfs regime. They have instead defended the predetermined proposal.

Summary conclusions

1. Flows have a profound effect on the aesthetics of Dam Falls and Similkameen Falls.
2. The proposed 10/30 cfs flow requirement does not protect the aesthetics of Dam Falls or Similkameen Falls. Thirty cfs is a 94% reduction of the 500 cfs natural low flow typically found during dry months of the year, and doesn't come close to filling the bottom of the channel. A flow evaluation curve based on photos of Similkameen Falls (produced in this report) shows that marginal aesthetic flows start at about 350 cfs and become totally acceptable by 450 cfs; for the Dam Falls, marginal aesthetic flows start about 150 cfs and become totally acceptable by 350 cfs.
3. The District studied some flow-related issues, including fisheries, water temperatures, and monetary costs. Although important for other issues, these analyses failed to address the effects of flows on Dam Falls and Similkameen Falls, and are therefore beside the point.
4. Agencies and stakeholders identified aesthetics of flows in the bypass reach as an issue, and specifically requested studies that evaluated relevant flows based on visual representations (such as photos). This was done at a reasonable time in the FERC and 401 Certification processes.
5. Ecology has required minimum flow conditions for aesthetics on other projects based on information from appropriate studies.
6. Although the District responded to some requests for information regarding aesthetics (e.g., by producing additional simulated photos of facilities), they refused to conduct a study that directly evaluated aesthetics of the appropriate range of flows based on reasonable visual representations.
7. An appropriate flow-aesthetics study for the Dam Falls and Similkameen Falls would include flow evaluations of a reasonable range of actual or simulated photos of different flows, output in the form of flow evaluation curves, and stakeholder involvement.
8. The District produced two documents regarding aesthetics, but one was an office/engineering formula-based memo and the other was focused on landscape-level assessments and facilities. Neither specifically evaluated aesthetics of the appropriate range of flows in Dam Falls or Similkameen Falls using reasonable visual representations.
9. As mitigations for dewatering Dam Falls and Similkameen Falls, the District has offered spill flows mostly outside of the peak recreation season, a trail and Falls viewpoint on river left, and interpretive signs with photos of water going over the falls (so summer dry-season recreation visitors can see what Dam Falls and Similkameen Falls ***should*** look like). These are poor substitutes for the aesthetic benefits provided by flows over the Dam Falls or Similkameen Falls.
10. Dam Falls, Similkameen Falls, and the surrounding area are important recreation and aesthetic resources. This conclusion is obvious at face value when visiting the site, but it is supported by investments in the area (such as the Similkameen River Trail) and the local and regional commitment to recreation and tourism. The continued development of the SRT on river right, plus any improvements to access or recreation facilities on river left, will increase the use and value of these resources.
11. It is important to "balance" uses of river flows, but only as a second-level assessment after we know how each resource is affected by flow. The District and Ecology pre-determined the adequacy of the 10/30 cfs flow regime without documenting the effects of flows on aesthetics of Dam Falls and Similkameen Falls, and then refused to seriously consider other aesthetic flows in the reasonable range.

12. In “balancing” uses, knowing how flows affect aesthetics of Dam Falls and Similkameen Falls allows realistic assessment of trade-offs. For example, if 350 cfs produces higher quality aesthetics, it is possible to consider appropriate seasons, days of the week, or times of day that would best utilize a “water budget.”
13. A new study focused on aesthetics could determine effects of flows on Dam Falls and Similkameen Falls, and how these falls fit into the broader context of recreation resources in the area.

Appendix A. Qualifications to testify

Names and occupations of researchers

Bo Shelby
Professor, Department of Forest Ecosystems and Society, College of Forestry, Oregon State University
President, Confluence Research and Consulting
3600 NW Thrush, Corvallis, Oregon 97330

Doug Whittaker
Senior researcher and planner, Confluence Research and Consulting
6324 Red Tree Circle, Anchorage, Alaska 99507

Summary of experience and qualifications

Confluence Research and Consulting conducts studies or planning projects related to natural resource use and management, often with a focus on recreation in river settings. The firm's researchers, Bo Shelby and Doug Whittaker, have been involved in more than a hundred recreation studies or planning projects for federal, state, local, non-profit, or private organizations across the country. They have also been expert witnesses in judicial proceedings, and have conducted training programs on flows and recreation, recreation planning, and river management for multiple local, state, and federal agencies.

CRC has particular expertise with flows for recreation and aesthetics, navigability determinations, visitor impact management, and capacity in river recreation settings. In conducting projects, they have developed and applied "state-of-the-art" concepts and planning frameworks; developed or improved methodological approaches; and applied findings to help make better management decisions.

Skills include: study plans; field reconnaissance; surveys and associated databases; statistical analyses of social and resource data; clear graphics of critical findings; presentations that highlight implications of critical findings; report writing; meeting facilitation; and working within complex and contentious decision processes that involve multiple stakeholders and agencies.

Bo Shelby, PhD. has over 35 years of research experience studying natural resource use and management, and has published hundreds of reports and journal articles. He is nationally recognized as a leading recreation researcher, well known for his work on capacity, visitor impacts, recreation use conflicts, and instream flows for recreation. Dr. Shelby is a professor in the Department of Forest Ecosystems and the Natural Resources Program at Oregon State; he has a PhD. in sociology from the University of Colorado. He is based in Corvallis, Oregon. A complete CV is available separately.

Doug Whittaker, PhD. has over 25 years of experience working on natural resource issues as an outdoor recreation planner with the Bureau of Land Management and National Park Service or as a researcher/consultant. He has published dozens of reports and journal articles, and has made presentations at symposia and conferences across the country. His work is focused on instream flows for recreation, navigability, capacities in recreation settings, crowding, use conflicts, and attitudes toward urban wildlife. Dr. Whittaker has a PhD. in human dimensions of natural resources from Colorado State University. He is based in Anchorage, Alaska. A complete CV is available separately.

Summary of involvement in this project/hearing process

Whittaker and Shelby were first contacted in mid-May 2012 but were not engaged at that time. They received an introductory email about the project and some related information on August 16, 2012 from Rich Bowers, CELP member. A scope of work for the project was first initiated on August 23, 2012. They began reviewing documents and/or conducting interviews with people familiar with the site shortly afterward. Whittaker and Shelby visited the Similkameen River in the vicinity of Dam Falls and Similkameen Falls on Oct 18 and 19, 2012.

Appendix B. Exhibits

To be supplemented at the close of discovery.

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Baker, Talia (DES)

From:	Rose Corso <corose84@gmail.com>
Sent:	Wednesday, April 12, 2017 11:17 AM
To:	Baker, Talia (DES)
Subject:	NO to Enloe Dam

I am a rate payer in the Okanogan PUD. Our rates have skyrocketed in the last few years. Relatives in Seattle and East Wenatchee are paying far lower rates, though they use more electricity with their larger families. Please register this as one more NO to the Enloe Dam Project.

Rose Corso
Tonasket, WA

April 10, 2017

Do Not electrify Enloe Dam. We do not want it. The expenditure is not justified.

I am a Taxpayer and cannot agree with even more burden.

Gayle Crabb
134 Myers Creek Rd
Oroville, WA 98844

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

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Baker, Talia (DES)

From:	Susan Crampton <scrampton@methownet.com>
Sent:	Monday, April 10, 2017 3:49 PM
To:	Baker, Talia (DES)
Subject:	Don't Electrify Enloe Dam

To Ms. Talia Baker
Project Review Committee/

As an Okanogan County citizen since 1993, and a resident of North Central Washington for longer, I join the many residents and electricity users who are strongly opposed to the money losing, debt imposing, and resource damaging proposal from Okanogan PUD to rebuild and energize Enloe Dam. Why the current commissioners are pursuing this project has some speculation but making commissioner change at the next election is in progress.

I am advised that your agency is the contact point for public concerns and PUD oversight. Please accept one more opposition. Thank you for the possibility that you can and will make more independent and sensible oversight for public power.

Sincerely,
Susan Crampton
PO Box 162, Twisp, WA 98856

Baker, Talia (DES)

From: Midge Cross <midgemcross@gmail.com>
Sent: Wednesday, April 12, 2017 3:05 PM
To: Baker, Talia (DES); Deakins, Nancy (DES)
Subject: Enloe Dam

I would like to add my voice to those who believe the re-energization of Enloe Dam is not a worthwhile project. Cost overruns will, of course, be huge, and the power output will not be worth the expense.

Please reconsider this project.

Midge Cross
Mazama

Baker, Talia (DES)

From: Shara Cunningham <sharamcunningham@gmail.com>
Sent: Monday, April 17, 2017 2:18 PM
To: Baker, Talia (DES)
Cc: Deakins, Nancy (DES)
Subject: Project Review Committee Enloe Dam Project

Ms. Talia Baker
Administrative Support
Project Review Committee
talia.baker@des.wa.gov

Dear Project Review Committee,

You have heard the comments that the power available to Okanogan County from Wells Dam beginning in September of 2018 is immense. 22% of Wells Dam is 170 MW. This is the equivalent of 34 Enloe Dams. This is more than double the 77 MW average load we use in the utility district today. Wells Dam and the Columbia are our real future power source.

You have also heard that the Okanogan County PUD plan to re-electrify the Enloe Dam would result in paying significantly higher rates. Also, this project is proposed to cost far more more money that the power it can generate for our needs, which is already available at a lower cost from Wells Dam.

As a property owner and landlord, I am concerned that the local people cannot afford these rate hikes. People are already struggling to pay their bills. That can be quantified by the amount of people Okanogan Community Action Council subsidizes each winter to avoid their power being shut off. Also, there are many more on a waiting list each winter that cannot get served.

This project is not financially smart for Okanogan County or Olympia. Please review the benefit vs. the costs. Thank you for your time to hear the voices of the county.

Sincerely,
Shara Cunningham

Baker, Talia (DES)

From: John Danielson <3ravens@communitynet.org>
Sent: Tuesday, April 4, 2017 2:32 PM
To: Baker, Talia (DES)
Subject: Enloe Dam electricity

Ms Talia Baker
Project Review Committee

Okanogan PUD is forging ahead with their plans to build a powerhouse below Enloe Dam and generate a small amount of power. They have already spent approximately $14 million on this venture and they are projecting to spend another $39 to $45 million to energize the dam and powerhouse. Enloe dam was built in the early 20's and became uneconomical to operate once the large hydro projects were established on the Columbia river providing cheap power. The total amount of power available to Okanogan in 2018 from Douglas County PUD's dams will be 170 megawatts (double the current average daily-load of 77 megawatts). The projected cost for power from Enloe Dam is 8.8 to 10.6 cents per kWh. The power purchased from Douglas County will be 3.4 cents per kWh. We can buy surplus power from neighboring PUDs for less than half the cost of Enloe Dam power and in addition avoid the construction costs, operating costs, and environmental costs.
The Enloe Dam project is a huge boondoggle that is going to saddle the ratepayers in Okanogan with a huge debt. Okanogan PUD employees may feel left out by not having their own dam on the Columbia River like neighboring counties but sinking large sums of money into resurrecting an old (and insignificant) powerhouse project is not economically wise. Why is it an earlier generation understood the economics and shut down Enloe Dam powerhouse? The long term solution for our children is to buy in to projected Columbia River hydroelectric power and tap into wind and solar power as it becomes economically available. Enloe dam is currently a complete blockage to anadromous fish, both steelhead and salmon. We should be looking to partner with government, tribal, and private entities to remove the dam and allow fish to spawn in the Similkameen River well into Canada.

John Danielson
PO Box 854
Omak, WA 98841

Baker, Talia (DES)

From:	Phyllis Daniels <phyllisadaniels@gmail.com>
Sent:	Saturday, April 15, 2017 9:34 AM
To:	Baker, Talia (DES)
Subject:	Enloe Dam

I am a PUD customer. I have a very hard time paying for my electricity as it is. I am very angry to find that Okanogan PUD Commissioners are playing fast and loose with ratepayer money.

The Okangogan PUD has spent $14.6 million dollars on a licence for Enloe Dam. The money has been spent on law firms and consultants. The PUD's attorneys in Washington D.C. earn $350/hour and millions of dollars have been spent on electrifying Enloe. The PUD law firm in the Puget Sound area charges $540/hr. A two-day hearing in Olympia challenging the PUD plan to dewater Similkameen Falls every summer cost the ratepayer $2,000,000 dollars in legal fees and expenses.

The environmental consultants on the Enloe Project have made millions as well. In just the year 2014, one consultant was paid $901,000 dollars.

Clearly, any further spending to electrify Enloe Dam is wasteful spending. Enloe power is not needed, and ratepayers cannot afford to keep financing a losing proposition.

I demand to have this end.

Phyllis Daniels

Ms. Priscilla Degraff
203 E 3rd St
Tonasket WA 98855-8830

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

I am a taxpayer and electricity consumer in Okanogan County. The Enloe Dam project is ill conceived. It will cost far more than the amount of power generated. Our county cannot afford to foot the bill for this and I'm frankly mystified as to why the commissioners think it's a good idea. Please vote NO on Enloe Dam Electrification project [illegible] Priscilla DeGraff

Baker, Talia (DES)

From: JEFF DRAKE <jdrake12@me.com>
Sent: Wednesday, April 12, 2017 9:26 AM
To: Baker, Talia (DES)
Subject: Please do not Electrify Enloe Dam!

Dear Ms. Talia Baker,

My wife and I are concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

Electricity here is already some of the cheapest in the nation. The plan is expensive and Okanogan citizens do not want the burden of the suggested annual payments and interest.

The power that would be generated is not needed. Okanogan PUD has the option to buy cheaper Wells Dam power.

The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley. We hike the trail along the river, and enjoy the scenic drive.

Thank you for your consideration.

Sincerely,
Jeff Drake and Christina Aiken-Drake,
Ellisforde, WA

The project is unnessary debt load. our economy cannot even support the bussinesses that it has. Keep our debt as low as possible. The gas generation project should be producing something???

Mary Lyn Eagle

-OROVILLE-

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

April 13 2017

Dear Ms Baker

We own a house in Winthrop, Wa and are alarmed at the Enloe Dam project.

First of all, having the Wells Dam, we will have abundant power for Okanogan County use. We do not need an expensive, just look at the costs accumulated just for attorneys, expensive attorneys!

Rate payers do not want the burden of financing a new powerhouse. We would not own the powerhouse.

Thank you for your concern for rate payers,

Diane Edmonds
6 Lupine Rd
Winthrop, Wa 98862

From: Mae <farmers16@gmail.com>
Sent: Sunday, April 16, 2017 11:49 PM
To: Baker, Talia (DES)
Subject: The Enloe Dam in Okanogan County

To whom it may concern,
I am opposed to any rebuild or additions to the old Enloe Dam that would breath life back into this out dated site. Why would the Okanogan PUD promote this project when the production cost for the electricity will be as much as 3 times more than purchasing from a neighboring PUD? Especially when the Okanogan PUD is in line to purchase more of Wells Dams output in 2018. The best thing to happen with the Enloe Dam would be to take it down to let the river flow free again.
I do not believe a word that comes out of the mouths of the PUD commissioners. They have a nasty habit of not listening to their rate payers, irresponsibly spending millions of dollars on unneeded projects and forcing their stupid projects on protesting, unwilling rate payers and neighbors to their boondoggles.
Thank you for your concern,
Craig Edwards, Carlton WA

Baker, Talia (DES)

From: Karen K. Edwards <4tarn2swim@methownet.com>
Sent: Wednesday, April 12, 2017 10:28 AM
To: Baker, Talia (DES)
Subject: Enloe Dam

I would like to urge you to not re-energize the Enloe Dam. It is not an economical or environmental thing to do. Opening it up instead would help restore a salmon run.
Thank you for considering our views.
Karen Edwards and Tom Ise
Winthrop WA residents

Baker, Talia (DES)

From: Judy Elven <judyelven@hotmail.com>
Sent: Thursday, March 30, 2017 8:02 AM
To: Baker, Talia (DES)
Subject: Encore dam

Dear Ms. Baker,
I am writing too express my concern over the need for the Enloe Dam project currently being proposed by the Okanogan PUD. It seems to be an expense we taxpayers/ratepayers can ill afford. The kilowatts produced by this project will exponentially increase our electric bill. I understand we can purchase cheaper electricity from other hydroelectric dams in the area so I can see no reason to spend our money on this project. We who live here don't want it, there is no need for it, and it will continue to degrade this wonderful river. Please consider the long term affects of this illogical proposal which does nothing but spend money on a project we don't want and don't need. Why make life harder for rate payers?? My husband and I are both retired and on a fixed income and are very concerned about any increase in our living expenses.

Sent from my iPad

ATTACHMENT 2

Rocky Mountain Econometrics
208-344-0809
208-631-4334 Cell
P.O. Box 1914
Boise, ID. 83701
tjones@design4000.net
www.rmecon.com
Anthony Jones - Principal

REVIEW OF THE ECONOMICS OF RESTORING HYDROPOWER AT ENLOE DAM ON THE SIMILKAMEEN RIVER

ANALYSIS OF THE PUBLIC UTILITY DISTRICT NO. 1 OF OKANOGAN COUNTY'S FINAL LICENSE APPLICATION FOR FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 12569

Prepared for
Columbia River Bioregional Education Project

In Partnership with Hydropower Reform Coalition Members
American Rivers, American Whitewater, Center for Environmental Law and Policy,
North Cascades Conservation Council, Washington Chapter Sierra Club

January 24, 2011

By

Anthony Jones
ROCKY MOUNTAIN ECONOMETRICS
www.rmecon.com

TABLE OF CONTENTS

EXECUTIVE SUMMARY

On August 22, 2008, the Public Utility District No. 1 of Okanogan County (PUD or Applicant) filed its Final License Application for the Enloe Project with the Federal Energy Regulatory Commission (FERC).[1] In its initial statement (page IS-6) the Applicant stated "It is considered economically feasible to redevelop the project with new generating facilities on the east bank, opposite to the original project location."

This report clearly demonstrates that this statement is flawed and that in fact the project is not economically feasible. Further, the report shows that the Enloe project, if built, **will lose at least $26 on every Megawatt-hour (MWh) that it generates.**

Due to a combination of raising construction costs, decreasing open-market energy prices, and an inappropriately inflated forecast of project generation value, the current application,[2] now more than three years old and with many of its key assumptions a year older than that, is far from economic or "the best use of an aging asset (Application D-5, Value of Project Power)."

<u>Major Findings:</u>

- Construction Costs have increased by approximately $10 million (30%) over 2008 estimates and in current August 2011 dollars Enloe will cost more than $40 million to build rather than the Applicant's estimated $31 million.

- Open market prices for electricity, the potential revenue/avoided costs resulting from the project, have retreated by 50% or more, rendering inaccurate the Applicant's estimated value of Enloe produced power.

- In 2008, the Applicant estimated that Enloe Dam would cost $58.20 per MWh to own and operate for the life of the project, and that they would be able to sell Enloe Power for $66 per MWh. This report shows that a better long-term price estimate is $43.55 per MWh and that at that rate Enloe will lose money on every MWh produced.

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[1] FERC eLibrary Accession No. 20080822-5021

[2] This is the Applicant's fourth attempt to relicense the Enloe Project. In each of the previous attempts, FERC has rescinded or denied the project license due to marginal economics (including the cost of providing upstream passage for anadromous fish species). The original project was decommissioned in 1958 because lower cost energy was available from other sources. As FERC stated in its February 23, 2000 Order on Rehearing, Rescinding License, Denying License Application, and Terminating Stay "[T]he obligation to construct and operate a fish ladder would significantly increase the costs of a project that already appears to be uneconomical."

- In the absence of a major jump back up to 2007 - 2008 open market price levels, Enloe's break even operating cost of $58.20 per MWh will remain above the open market price of electricity for many years to come, perhaps in perpetuity.

Finally, this report documents the local and regional tourism-related spending losses associated with eliminating free-flowing water at Similkameen Falls. The value of the falls as a tourist attraction is valued at more than $516,000 per year and has a net present value in excess of $7.5 million. Spread over a 20-year period, one estimate (Table 6, High Estimate) documents that the potential for lost tourism could approach 30 million dollars -- roughly equal to the original cost for renovating Enloe dam. The Applicant did not include this lost revenue in its 2008 valuation of project costs.

In conclusion, this report finds that the Enloe Project, even without the costs associated with fish passage (a major economic requirement in earlier applications), will lose money on every MWh produced, will result in significant losses to local tourism, and is a poor plan for the utility, and for Okanogan ratepayers.

PROJECT COSTS AND FINANCING

CONSTRUCTION COST DISCUSSION

At or near the heart of every application to construct a generating plant are the figures detailing how much it costs to build and operate the plant. This section presents the same numbers the Applicant presented in the original application. The purpose is to remind readers of the key concept underlying the Applicant's claim that, in constant $2007,[3] if this project is approved, energy generated at Enloe Dam is projected to cost $0.582 per KWh for the life of the project. As will be demonstrated in the following pages that would not occur if the plant existed today.

The Final License Application (application) for the proposed Enloe hydroelectric project gives cause for concern, starting with the fact that the application is now more than three years old and many of its key assumptions are a year older than that.

For example, the estimated cost of constructing the Enloe power plant dates from the beginning of 2007. Bids from construction companies are rarely valid for more than a few months from the time of submission. While most sectors of the economy tumbled into recession shortly after that time, such was not the case for most of the electric power industry. Protected by regulatory compacts with state utility commissions granting them monopoly status in their individual service territories, and thus the power to pass costs onto customers, wages and costs at most utilities have continued upward during the current period of economic upheaval. According to the United States Department of Labor, Bureau of Labor Statistics (BLS)[4] the cost of projects such as the rehabilitation of Enloe Dam has increased about 29 percent since the beginning of 2007.[5]

The standard FERC methodology for factoring in inflation is to state all financial numbers in fixed dollars centered on or near the date when the application is submitted. Generally, both the cost of constructing electrical generation plants and the cost of open market power, inflate at or near the same rates. As a result, FERC can simplify most generating plant applications by ignoring inflation altogether. The difference between

[3] The application was filed in 2008 but many of the financial analyses were completed based on data ending in 2007. For this report all dollar amounts, unless stated otherwise, are presented as inflation adjusted $2007.

[4] Enloe Market Prices and Trends1.xlsx, Tab = BLS Power Generation

[5] http://www.bls.gov/ppi/ppipower.htm, The industry index for Electric Power Generation, NAICS 221110, measures price changes for the initial commercial transaction received by power generating establishments. This industry comprises facilities that convert other forms of energy, such as water power, fossil fuels, nuclear power, and solar power, into electric energy for sale to electric power transmission and distribution systems. Within this industry, the PPI divided output into two subcategories: electric power generation by utilities and electric power generation by non-utilities.

generating costs and energy sales prices, i.e., net revenue per kWh, in real terms, tends to remain constant regardless of the inflation rates.

Unfortunately, inflation does play a role in this application. In the case of Enloe, and the rest of the Northwest power industry, plant costs from both construction and operation standpoints have increased at roughly the same rates as they always have. The Producer Price Index (PPI) for generating plants indicates that, over the past three years, the cost of constructing new plants such as Enloe has increased by about 29%. That would put the cost of this project at roughly $40 million.[6] However, as will be demonstrated below, open market wholesale energy prices have not increased. In fact, open market energy prices decreased dramatically in 2009, in both nominal and real terms, and have remained low ever since.

From an analytical perspective, the Applicant developed a firm estimate of what it would cost to renovate Enloe dam in 2007. While it would be possible to estimate the impact of inflation on those costs, it is simpler, and just as accurate, to leave their estimate alone and continue to state everything in 2007 dollars. With that in mind, for a point of reference, the following Table 1 presents the main financial section from the Enloe Application.

[6] Bureau of Labor Statistics, http://www.bls.gov/ppi/, Series ID, PCU20333120,3331 and PCU22111-22111

Table 1[7]

FERC Electric Plant Account		Amounts	Subtotals	Totals
Production Plant				
Hydraulic Production				
330	Land and Land Rights	$0		
331	Structures and Improvements	$3,016,000		
332	Reservoirs Dams and Waterways	$6,547,000		
333	Waterwheels Turbines and Generators	$9,505,000		
334	Accessory Electrical Equipment	$330,000		
335	Miscellaneous Powerplant Equipment	$330,000		
336	Roads Railroads and Bridges	$244,000		
	Subtotal - Hydraulic Production Plant		***$19,972,000***	
TRANSMISSION PLANT				
352	Structures and Improvements	$104,000		
353	Station Equipment	$587,000		
	Subtotal - Transmission Plant		***$691,000***	
OTHER COSTS				
	Environmental Protection, Mitigation and Enhancement Measures	$2,357,000		
	Subtotal - Other Costs		***$2,357,000***	
INDIRECT COSTS				
	Engineering and Construction Management	$3,220,000		
	Environmental Studies	$2,700,000		
	Owners Administrative and Legal Cost	$920,000		
	Interest During Construction	$1,120,000		
	Subtotal - Indirect Costs		***$7,960,000***	
ESTIMATED PROJECT CONSTRUCTION COST (Jan 2007 price levels - rounded)				***$30,980,000***

7 Enloe Final License Application, Exhibit D – Project Costs and Financing, FERC Project # 12569, pp D-1, August 2008

As the final line in Table 2 below indicates, in $2007, the Applicant expected it to cost $0.0582 to generate each kWh of electricity. As will be demonstrated in the following pages, their estimate is too low.

Worse, while their estimated cost of production is too low, it is well above the open market price of wholesale energy.

Table 2[8]
Enloe Hydroelectric Project Estimated Annual Costs (2007 $)

Item	Qty	Cost		
		($)	($/kW)	($/kWh)
Generation Data				
Plant Capacity (MW)	9			
Net Average Annual Generation (GWh)	45			
Capacity Factor (%)	57.00%			
Plant Investment				
Plant Investment Cost		$30,980,000	$3,442	
Annual Costs				
I. Capital Costs				
a. Interest on Capital	4.50%	$1,394,100	$154.90	$0.0310
b. Capital recovery cost (40yr, 4.5%)	0.93%	$289,451	$32.16	$0.0064
Total Capital Costs		$1,683,551	$187.06	$0.0375
II. Insurance	0.20%	$61,960	$6.88	$0.0014
III. Taxes - Privilege Tax (% of first 4 mills/kWh)	5.35%	$9,630	$1.07	$0.0002
IV. Operation and Maintenance (1.9% of Invest Cost)		$600,000	$66.67	$0.0134
V. Environmental Measures (40yr, 4.5%)		$34,624	$4.00	$0.0008
VI. Administrative and General/Contingency	35.00%	$222,118	$24.68	$0.0049
Total Generation Cost		**$2,611,883**	**$290**	**$0.0582**

[8] Enloe Final License Application, Exhibit D – Project Costs and Financing, FERC Project # 12569, pp. D-2, August 2008.

MARKET PRICE DISCUSSION

The previous section presents the Applicant's estimate that, in 2007 dollars, Enloe Dam will cost $58.20 per MWh to own and operate for the life of the project. To avoid operating at a loss the Applicant must sell Enloe power at prices above $0.0582. The Applicant made a case that they would be able to sell Enloe power for $66 per MWh. The following two subsections will show that the Applicant's methodology is flawed and that a better long-term price estimate is $43.55 per MWh. At that level, Enloe will lose money on every MWh produced.

Critique of The Applicant's Forecast

The following paragraphs present evidence that the Applicant inappropriately inflated forecast energy prices. Correcting this error reduces the Applicant's long term fixed price estimate to about $59.13 per MWh, rather than $66 per MWh. As a result, Enloe's operating margin, using the Applicant's numbers, would have been a scant $0.0009 per KWh.

The Applicant, based on the price history from 2002 through September 2007, concluded that $66 per MWh[9] was a realistic long term, constant dollar, trading price at the Mid-Columbia trading hub (Mid-C).

The Applicant's entire methodology is presented in the following few sentences:

> "The projected Mid-Columbia bulk power prices for the license term were estimated using the trend growth (excluding outliers) over the period 2002 through September 2007 for on-peak high, on-peak low, off-peak high, and off-peak low prices. In order to make the most reliable estimates, the trend was progressed over three years, and the projected prices were averaged and held constant in real terms."[10]

Additional insight into the Applicant's methodology was provided in a footnote to Table D-3 in the same document:

> "Source (of the data): ENTRIX elaborations on Mid-Columbia hub weekly prices from Energy NewsData, Western Price Survey, available at: http://www.newsdata.com/wps/archives.html. The trend was progressed over

[9] Enloe Hydroelectric Project Application, Exhibit D – Project Costs and Financing FERC Project # 12569 D-4 August 2008
[10] ibid

three years, and the projected prices were averaged and held constant in real terms for the license term."[11]

Three points about the Applicant's price forecast:

1. Beyond the few brief sentences reproduced above, the Applicant failed to present any of their data, or any details of their analysis.

2. ENTRIX, the firm from whom the Applicant obtained their data on Mid-C pricing, is a private company. With the exception of weekly newsletters, they do not publish electricity price data in a composite public forum. For that reason, the data the Applicant used to develop their forecast is not subject to review and rebuttal.

3. The weekly ENTRIX publications the Applicant cites as the source and basis for their trending analysis present nominal prices. In the absence of a process to convert these prices into constant dollar prices, and since the Applicant makes no mention of any effort to remove inflation from their numbers, any trending the Applicant performed appears to have trended inflation in addition to any changes in real open market energy prices. This point is important because, according to the Bureau of Labor Statistics, depending on the inflation index one chooses, inflation counted for between 19 percent[12] and 33 percent[13] of all open market energy price gains from 2002 through September of 2007.

Using the average of the two inflation measures in the previous paragraph, 26 percent, over a period of 7 years, we see an annual rate of inflation of about 3.36 percent. The Applicant indicates they "progressed" their trend for three years before holding the resulting $66 per MWh price constant for the term of the contract. Please observe, "progressing" 3.36 percent inflation for three years adds about 10.4 percent inflation on top of any changes in real prices. **More to the point, the Applicant appears to have inappropriately inflated forecast energy prices for three years during which they held production costs constant.**

If we deflate Applicant's price estimate of $66 by the same 10.4 percent they apparently inflated it by, the result is a real (in 2007 dollars) price of about $59.13 per MWh. Please note that $59.13 is a scant $0.93 per MWh, $0.0009 per KWh above the projected cost of production of $58.20. Admittedly, this measure shows revenues exceeding costs. However, in this analysts mind a margin as thin as $0.0009 per KWh calls for caution.

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[11] ibid

[12] Bureau of Labor Statistics, http://www.bls.gov/ppi/, Series ID, PCU333120333120 (Construction Machinery Manufacturing).

[13] Bureau of Labor Statistics, http://www.bls.gov/ppi/, Series ID, PCU22111-22111 (Electric Power Generation).

The tiniest increase in costs, or shortage of water, or any number of other unforeseen events, could tip the scales from positive cash flows to negative cash flows.

As we will see below, there is a great deal more wrong with the Enloe project's anticipated revenue stream than whether or not the Applicant did or did not account for inflation.

Rocky Mountain Econometrics (RME) Forecast

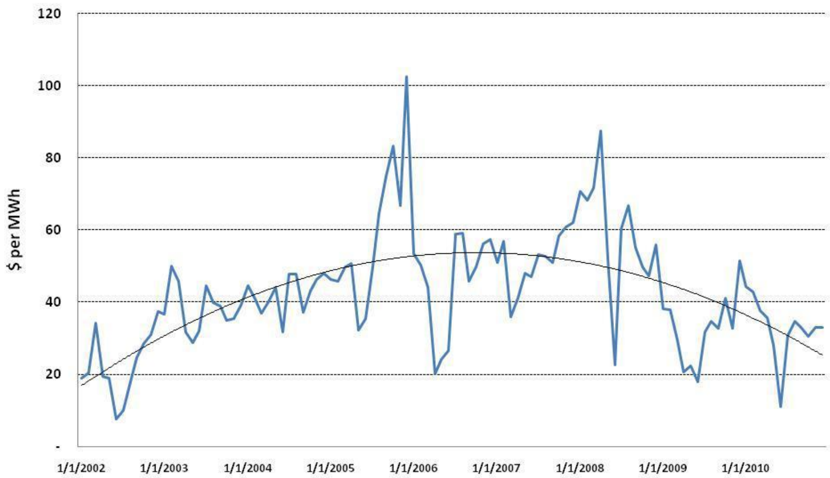
The Applicant made their price forecast of $66 per MWh in the overheated time just before the United States entered the second biggest recession in history. This section details why the Applicant's forecast has already failed and why a much better number to use for open market sales prices, or avoided cost calculations, is more on the order of $43.55 per KWh.

Given that the Applicant was making their forecast at, figuratively, the 23rd hour and 59th minute prior to the beginning of the second biggest recession in US history; it is easy to understand their tendency to overstate the rate at which prices were increasing. In 2007 and 2008, they were far from alone in making economic predictions that subsequently proved unrealizable. However, it is one thing to identify and understand the source of an error in judgment. It is something else entirely to press on as if nothing has changed. Other utilities, such as Avista, have already recognized and incorporated lower open market pricing in their IRPs. The Applicant and their ratepayers also need to recognize that revenue and avoided cost price points have retreated substantially from estimates originally generated in 2007 and rectify their analysis accordingly.[14]

[14] It is equally important that FERC understands that the forecast provided in the PUD's FLA has failed. Licenses must be obtained to dam rivers for the purpose of non-federal hydropower generation. The Federal Power Act (FPA) authorizes FERC to issue hydropower licenses for non-federal projects such as Enloe. As this report demonstrates, the monetary value of Enloe's power is no longer accurate and thus cannot be used by FERC to accurately assess power or non-power values.

Graph 1

Historical Monthly Flat Mid-Columbia Prices[15]



The graph above comes from Avista's 2011 Integrated Resource Plan (IRP) and vividly illustrates the rapid increase of prices at Mid-C from 2002 till 2008, and the subsequent, equally rapid retreat to prices not only below $40, but also occasionally below $20.

The author agrees with the Applicant that Mid-C prices are the most relevant for their sales/cost avoidance calculations. However, Mid-C presents a problem in analyses such as this. First, Mid-C is a relatively small trading hub and trades there are not continuous. Second, prices associated with Mid-C transactions are not publicly reported. The combination of these two problems makes it difficult to track Mid-C prices and use them as a forecasting base.

NP15, the Northern California trading hub, is one of the world's largest trading hubs. It is the western market with perhaps the longest record of price trades. The prices of trades are recorded on a continuous basis as short as 10 minutes and, of critical importance, the prices are published openly and publicly for scrutiny by one and all. For this reason, the author prefers to use NP15 as the primary measure of Northwest open market electrical prices.

Additionally, NP15 is traditionally $4 to $15 per MWh higher than Mid-C. This has a couple of benefits. First, it means it is possible to use NP15 as a mirror of Mid-C prices. Table 3 below presents the average price differentials of the three major Northwest trading hubs from 2006 through 2010. Second, using Mid-C prices in a context such as this provides a measure of insurance. In other words, if a prospective power producer cannot produce power cheaper than NP15, it surely cannot produce power cheaper than Mid-C.

[15] Avista 2011 Electric Integrated Resource Plan, Appendix, August 31,2011, pp. 290.

Table 3
Annual Average Day Ahead On Peak Prices ($/MWh) [16] [17]

	2006	2007	2008	2009	2010	5-Year Avg
Mid-Columbia (Mid-C)	$50.18	$56.57	$65.00	$35.66	$35.90	$48.67
California-Oregon Border (COB)	$55.58	$62.14	$73.86	$38.02	$38.84	$53.70
NP15	$61.08	$66.59	$80.14	$39.29	$40.08	$57.45
Difference, NP15 Minus Mid-C	$10.90	$10.02	$15.14	$3.63	$4.18	$8.78

Based on the preceding Table 3, it is easy to see why, in 2007, the Applicant thought open market prices at Mid-C would hit $66 per MWh, and conceivably keep right on going higher. However, the recession proved a lot of forecasters wrong. The economist Herbert Stein[18] is famous for saying that, "If something cannot go on forever, it will stop." Annual increases in prices in the 10 and 20 percent range, such as were seen in 2007 and 2008, mean that prices will double every 4 to 7 years. Rates of increase of those magnitudes are not normally considered to be sustainable in the long run.

Stein's Law prevailed and the unsustainable increases in prices stopped. In 2009 prices at Mid-C returned to sub $36 per MWh levels where they remain today. NP15 prices dropped by a full 50 percent, from the low $80 per MWh range to roughly $40 per MWh, prices that also still prevail.

The following Graph 2 presents the data in Table 3 in a visual format to emphasize the manner in which all the major west and northwest open market electricity prices move in near lockstep, with NP15 always higher than Mid-C by a range of $3.63 to $15.14 per MWh.

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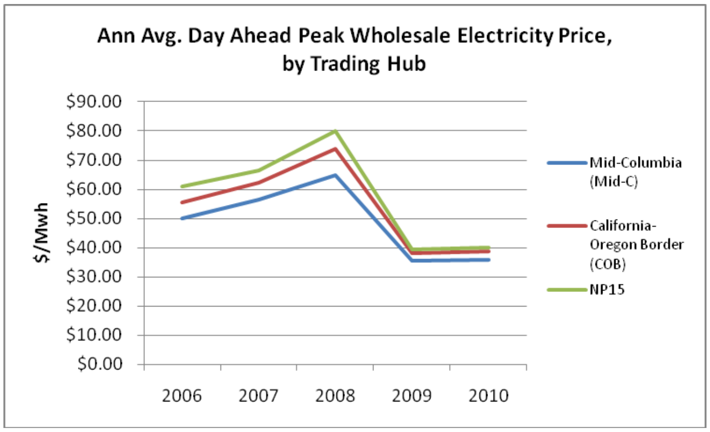
[16] Federal Energy Regulatory Commission • Market Oversight @ FERC.gov, NW, CA, pp. 5, 2011.

[17] NP15, COB, and Mid-C are, in order of magnitude, the three main open market electricity trading hubs in the Pacific Northwest. NP15 represents the Northern California market, COB represents the California Oregon Border, and Mid-C is the Mid Columbia Basin. Mid-C is the most relevant market for Enloe, but it is not publicly reported. The fact that NP15 is publicly reported on the California ISO Open Access Same-time Information System (CAISO/OASIS) site, and that it moves in near lockstep with and is slightly higher than Mid-C, makes it ideal for analyses such as these.

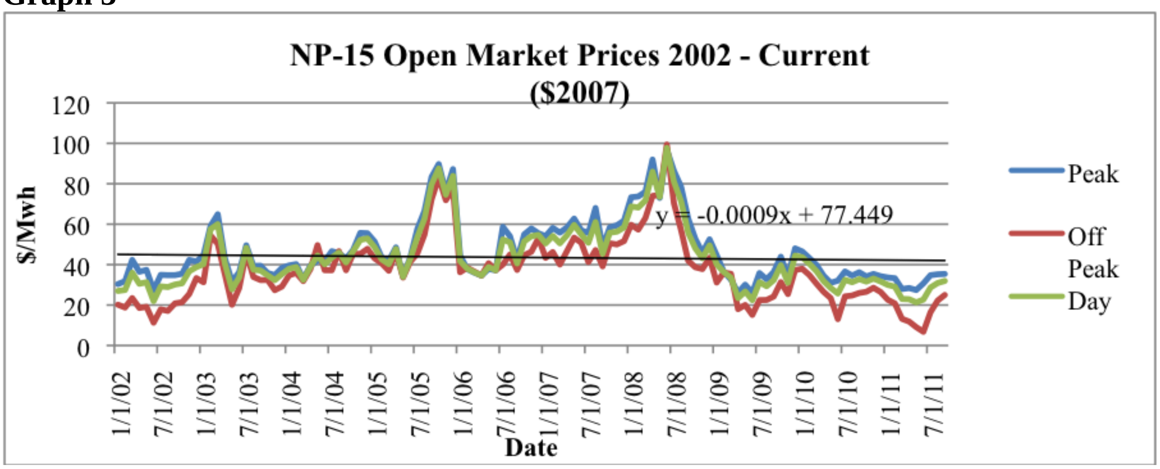
[18] Herbert Stein (August 27, 1916 – September 8, 1999) was a senior fellow at the American Enterprise Institute and was on the board of contributors of The Wall Street Journal. He was chairman of the Council of Economic Advisers under President Nixon and President Ford. From 1974 until 1984, he was the A. Willis Robertson Professor of Economics at the University of Virginia.

Graph 2
Annual Average Day Ahead On Peak Prices ($/MWh) [19]



As this is being written the average for the most recent year at NP15 was only $31.48 per MWh.[20] In fact, for much of the last two years NP15 prices have been less than half the Applicant's price estimate.

Graph 3



If we take the average for the last ten years, in constant (2007) dollars, the average is only $43.55 per MWh at NP15.

It gets worse. The 10-year trend is currently down, not up. If we use NP15 pricing, and ignore the fact that Mid-C is usually about $5 lower, we are left to conclude that the cost

[19] Federal Energy Regulatory Commission • Market Oversight @ FERC.gov, NW, CA, pp. 5, 2011.
[20] Source: CAISO/OASIS, http://oasis.caiso.com.

of building and operating the Enloe project will exceed the revenue/avoided costs associated with the project by more than $14.6 per MWh!

Put another way, based on the 10-year average at NP15, **the Enloe project will lose at least $14.6 on every MWh it generates.**

Additional questions on open market wholesale electricity price trends include: How long will the downward trend continue? How long will prices stay at the currently low levels?

First, the trend is real. Prices from 2002 through mid-2008 were definitely increasing at all the western trading hubs. That said, it is important to remember that over that same time span the economy was running at full speed toward a crash. The crash happened in the latter half of 2008. Following the crash, demand dropped from the super-heated pre-bubble highs of $101per MWh at NP15 in June of 2008 to $25 per MWh in June of 2009.

It is interesting that instead of hitting bottom in 2009 and starting back up, prices since 2009 have continued on a downward path. In May of this year prices at NP15 got as low as $21.31 (in 2007 dollars) per MWh. They have since recovered slightly as the summer progressed, but there is no sign of a major rebound.

Part of the downward pressure on prices is undoubtedly associated with recession related reduction in demand. That said, the recession has officially been over for more than a year[21] with no visible reciprocal demand driven increase in prices.

The recession, which began more than three years ago, reduced the aggregate demand for electricity. It also greatly changed the emphasis that the state of Washington now places on conservation.[22] To the extent that is true, capacity increases over the past few years outpaced increases in demand and put the western market further into a surplus condition than was previously the case. The combination of these two simultaneous events continues to put downward pressure on open market prices.

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[21] Bureau of Economic Analysis, http://www.bea.gov/iTable/,Table 1.1.3., Real Gross Domestic Product, Quantity Indexes,[Index numbers, 2005=100] Seasonally adjusted,

[22] In 2006, Washington state voters passed Initiative I-937, which imposes targets for energy conservation and use of eligible renewable resources on the state's electric utilities that serve more than 25,000 customers. Specifically, these utilities, both public and private, must secure 15 percent of their power supply from renewable resources by 2020. The utilities must also set and meet energy conservation targets starting in 2010. In 2009, Washington State adopted a new energy efficiency code for residential buildings that required a 15% reduction in energy consumption for new homes and in 2011 a federal district court judge cleared the way for Washington State to move forward with a state building energy code for new homes.
http://blog.seattlepi.com/energy/2011/02/09/washington-state-energy-efficiency-victory-helps-homeowners-save-money-and-cuts-pollution-at-the-same-time/

The total quantity demanded will return to pre-2008 levels at some point. The question is, when? If history is an example, it may be a very long time. The great depression started in 1929. As measured by the Gross Domestic Product (GDP), it was about 7 years before the US economy returned to 1929 levels and 10 years before there was sustained growth.[23] As measured by the Dow Jones Industrial Average, economic activity did not return to 1929 levels until 1954, a period of 25 years![24]

One would hope that we are smarter now, and that we will not waste a decade before getting our economic house back in order as was done in the last century. That said, it is going on four years since the most recent recession began. Clear signs of substantive policy changes and resultant economic vitality remain elusive. While abhorrent to contemplate, one has to admit the very real possibility that it will take another six to 10 years for the economy to return to 2008 levels on all fronts.[25]

One may also observe that the substantial, continuing investment in wind energy, and to a lesser extent solar energy, is having a significant impact on open market prices. The average cost of wind energy is not much different than many other conventional energy sources. In fact, it may be slightly more costly from a startup situation. However, from a marginal cost standpoint, and from an open market price standpoint, wind power is much less costly than thermal energy alternatives such as coal and natural gas. Coal and gas fired plants have to pay fuel costs for every KWh produced. Wind power, like hydropower, benefits from the fuel being essentially free. As a result, both wind and hydropower, regardless of their average costs of generation, tend to be the go-to power sources, the least cost power sources traded on the markets. That means as more and more wind is added to the resource stack, the lower the open market price for power.

Further up the resource stack, we find the thermal resources. Increasingly this means natural gas fired power plants. Here too, things have been changing in a manner that point to lower open market energy prices, or at least slower growth in energy prices for many years to come. By that I mean the ever-expanding reserves of natural gas. It would be unrealistic to pretend that current developments in the extraction of natural gas do not have detractors. At the same time throughout the country and the region, from the tar sands of Southern Canada, to Southern Idaho and elsewhere, there is now talk of gas reserves where only a few years ago there was none. All of this leads to lower open market prices for electricity, both now and for the foreseeable future, than anyone could

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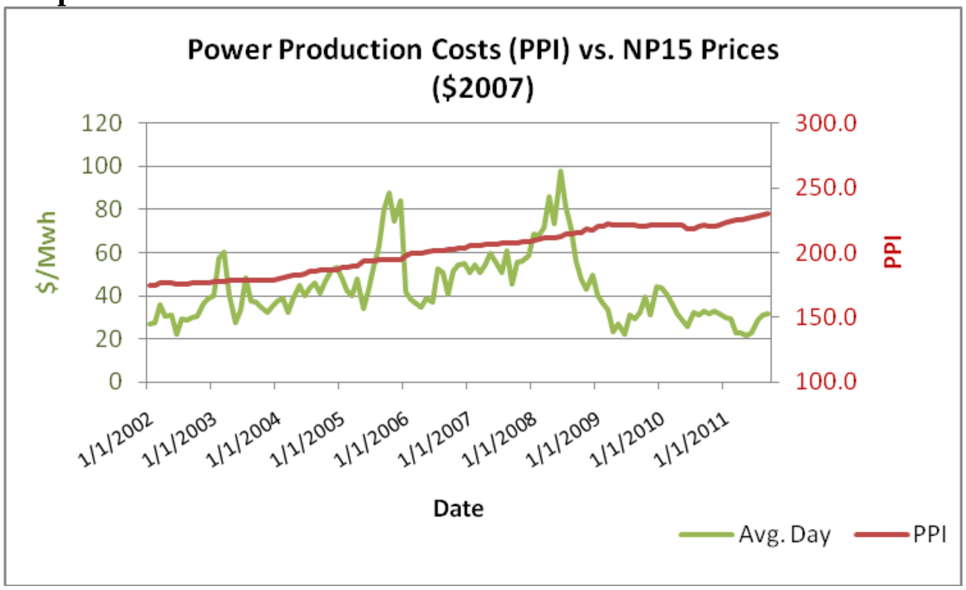
[23] Bureau of Economic Analysis, http://www.bea.gov/iTable/,Table 1.1.3., Real Gross Domestic Product, Quantity Indexes,[Index numbers, 2005=100] Seasonally adjusted,

[24] http://finance.yahoo.com

[25] The author is aware that 2011 GDP as measured in constant dollars now exceeds the GDP of 2008. So, technically, the economy is back to pre-recession levels. That said, outside of a few select industries economic activity is sluggish. In most of the country, unemployment rates remain at nine percent or greater, roughly twice the 2007 rate. And, per capita GDP is still about $1,000 below 2007 levels. Clearly, the recovery, such as it is, has failed to reach large portions of the economy.

have imagined in 2008.

Graph 4[26]



To summarize, a heightened sense of the need to conserve, the addition of low marginal-cost resources, and the expanding development of additional reserves of relatively low cost, low emission natural gas, all point to lower open market electricity prices than the Applicant anticipated in 2007.[27]

Increasing demand levels, the primary offset that leads to increasing real prices, not only has not yet arrived, but it may be years in returning to pre-2008 levels. And even then, renewed higher demand levels will face a different, lower cost, resource stack than existed in 2007 -2008. To hang onto the Applicant's $66 dollar Mid-C open market price forecast would be reckless. Indeed, the constant dollar (in 2007 dollars) ten-year average of $43.54 per MWh at NP15 detailed above is more than generous in this context. As stated earlier, if the Applicant cannot generate power cheaper than NP15, they surely cannot beat Mid-C.

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[26] Bureau of Labor Statistics, http://www.bls.gov/ppi/, Series ID, PCU22111-22111, and RME 2011.

[27] Avista reached a similar conclusion in their most recent IRP, stating, "Major changes from the 2009 plan include reduced amounts of wind generation and the introduction of natural gas-fired peaking resources. The plan includes less wind because of lower expected retail loads resulting from the present economic downturn and increased conservation acquisition. Expected wind generation needs are lower due to a modest change in the modeling method used to represent annual variability from RPS-qualifying resources. The selection of gas-fired peaking resources resulted from a lower natural gas price forecast, lower retail loads, and the need for more flexible generation resources to manage the variability associated with renewable generation." Avista 2011 Electric Integrated Resource Plan, 8/31/2011, pp. 8-1.

The reason this is important for Enloe is that, as Graph 4 above illustrates, the cost of constructing plants has been maintaining a largely uninterrupted upward path while the open market price of energy has retreated by 50 percent or more. And prices show no sign of jumping back up to pre-recession levels. In the absence of a major jump back up to 2007 - 2008 open market price levels, we have to conclude that Enloe's break even operating cost of $58.2 per MWh will remain above the open market price of electricity for many years to come, perhaps in perpetuity.

ESTHETIC VALUE DISCUSSION

There is a value to free flowing water. This is especially true if the water tumbles over a precipice. This section presents the methodology to show that the value of Similkameen Falls as a tourist attraction exceeds $516,000 per year and has a net present value in excess of $7.5 million. If the project stops water from flowing over the falls, this is a value that will be lost to the region, and needs to be included in the Applicant's financial analysis. As it stands, the Applicant's analysis concludes that the value of the loss is zero by not including an estimate of the loss in the project's financials.

If losing $15 per MWh is not indictment enough, keep in mind that that number does not include the esthetic value that will be lost by eliminating free flowing water at Similkameen Falls, and the attendant loss of tourism-related spending at local and regional establishments.

The Applicant conducted only a very rudimentary review of the relative merits of the esthetics of the site, and barely recognized that esthetic values will change with the completion and operation of the project. It is not acceptable to recognize that a waterfall will be eliminated, and with it the attendant esthetic values, and simultaneously, implicitly, conclude that the value of the loss is zero by not including an estimate of the loss in the project's financials. Lessons learned at other western waterfalls indicate that water features, in and of themselves, can be multi-million dollar tourist magnets. Terminating or even reducing water flows associated with these features, result in real, substantive losses.

For this report, we compare the Applicant's approach to Similkameen Falls' water-based esthetics with that of Idaho's Shoshone Falls.

Shoshone Falls' importance relative to Similkameen Falls, at least from a statistician's point of view, lies in the fact that since 1980, the City of Twin Falls has been charging a fee to admit cars to the viewpoint area and recording the associated revenue. This latter action, keeping records of the revenue generated by visitors to a waterfall viewpoint, to this author's knowledge, is unique in the United States, perhaps in the world. This act makes it possible to correlate tourism with varying amounts of water flowing over the falls. And, by extrapolation, establishing a value of Shoshone's esthetics makes it possible to put dollar values on the esthetics of water flowing on other waterfalls such as Similkameen Falls.

Compare the Applicant's approach to Similkameen Fall's water-based esthetics with that of the City of Twin Falls, Idaho. In 2010, a year the director of the city of Twin Falls parks department categorized as an "Ok water year,"[28] the city of Twin Falls received

[28] Appendix 2

$181,605 in parking receipts at the city-owned viewpoint where tourists go to view Shoshone Falls. In 2011, a year the director categorized as having "great flows all year,"[29] parking receipts at the Shoshone Falls viewpoint nearly doubled to $303,148. Adding the travel-based benefits associated with visiting the falls suggests that people spent a minimum of $1.7 million in travel-related expenditures, things like food, fuel, photography, etc., just getting to and from the site. Further, 2011's enhanced revenues are almost entirely attributable to the season-long presence of substantial amounts of water on the falls.

The tally of visitors to Shoshone Falls, combined with records of water flowing in the river at the same points in time, makes it possible to model the degree to which water flowing over the falls stimulates tourism.

By extension this also makes it possible to estimate the degree to which more or less water flowing over the falls affects tourism spending in the area versus the value of the same water to generate electricity, or to be used for irrigation, etc. And, by extending the analysis to other projects such as Enloe, it becomes possible to place an estimate on the value of esthetics lost as a result of drying up Similkameen Falls.[30]

Basis for Valuing the Volume of Water Flowing Over a Waterfall

This subsection details that, by virtue of the manner in which the number of Shoshone Falls viewers are tallied, it is possible to conclude that each additional CFS of water over the falls attracts as many as 5.2 visitors for the month with an economic impact of about $544.

In the absence of water, a waterfall is a cliff. Interesting perhaps, but generally less so than in the presence of its defining commodity, falling water. The Columbia Gorge is a spectacular natural feature by itself, but Multnomah Falls tends to eclipse the gorge. The Snoqualmie River is a lovely watercourse, but it is the falls that make the town of the same name a tourist attraction.

For the relicensing of Avista's Spokane Project,[31] The Land Use and Esthetics group contracted with The Louis Berger Group, Inc. (Berger) to determine the flows that provide visitors to the falls "with acceptable and/or optimum viewing experiences," and

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29 Ibid.

30 The Notice of Availability for Draft Environmental Analysis, issued 5/9/2011 (FERC eLibrary Accession No. 20110509-3039) provides a 30 cubic feet per second (cfs) minimum flow from mid-July to mid-September, and 10 cfs the rest of the year.

31 Avista is an investor-owned utility that provides electric and natural gas service to about 481,000 customers. Avista is headquartered in Spokane, Washington, and the Spokane Project (FERC P-2545) is located on the Spokane River.

"the preferred viewing times at each site." [32]

Without elaborating, The Berger Group subjectively found that:

> " . . . . the participants began to notice flow in the North Channel at Flow C (200 cfs), and the esthetic quality of the flow appeared to be **at least acceptable to most of the participants at flows D (300 cfs), E (400 cfs), and F (500 cfs). Most participants ranked Flow F as their most preferred flow.**"[33]
> (Emphasis added. RME.)

In other words, participants in the Berger study felt that, at Spokane Falls, flows of less than 300 cfs were unacceptable and that each higher level of water flow surveyed was deemed more desirable than each and every lower flow level.

At Similkameen Falls, as with Spokane and other waterfalls used for electricity generation, the issue involves determining whether or not the project is still viable if esthetic flows are maintained. In the past few years, with the relicensing of projects such as Spokane Falls and Snoqualmie Falls in Washington State, and Shoshone Falls in Idaho, FERC backed away from the notion that power production always trumps esthetic considerations and started requiring esthetic flows at the various projects.

In the case of Spokane Falls, Berger presented qualitative evidence that people prefer ever-higher flows over the falls, but he did not present quantitative evidence of that result. With nothing of a quantitative nature in hand, FERC subjectively concluded that beyond 200 cfs at Spokane Falls, the value of lost power production outweighed any esthetic benefits. Had Berger quantified the financial implications of his survey results, or reviewed the data available from Shoshone, it is possible that FERC would have been more generous to the tourists in Spokane's Riverfront Park. Avista seemed to recognize as much, and agreed during negotiations with Center for Justice to esthetic flows even higher than those approved by FERC.

The following paragraphs detail the lessons that can be learned from the record of water flows over Shoshone Falls on the Snake River in southern Idaho, and the documented number of persons who come each year to view the spectacle.

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[32] ESTHETICS STUDY REPORT, SPOKANE RIVER PROJECT, FERC NO. 2545, The Louis Berger Group, Inc., Prepared for Avista Corporation, Recreation, Land Use & Esthetics Work Group, November 2003, pp. 2.

[33] Ibid. pp. 53 – 54.

Methodology

This subsection details the why and how it is possible to develop a regression of visitors to Shoshone Falls relative to the amount of water in cfs flowing over the falls. Depending on various seasonality factors, each additional cfs of water over the falls is consistent with up to 5.2 additional visitors for the month with an economic impact of about $544.

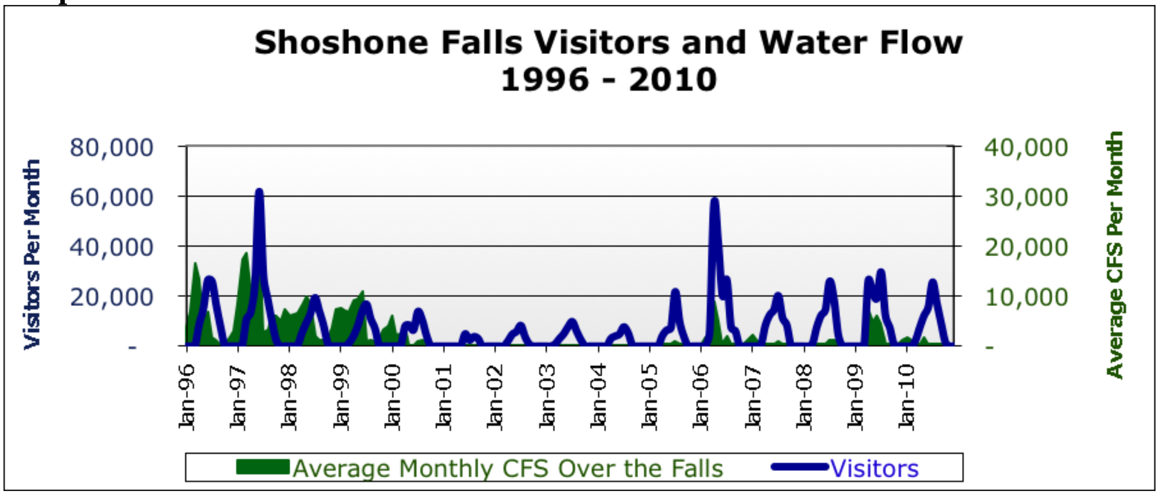
The general problem with waterfalls is the same as with all public goods: it is very difficult to determine who benefits and how extensively from the asset. As a result it is difficult to measure the value of the assets with any degree of accuracy. Fortunately, Shoshone Falls in Southern Idaho is a major exception to this rule.

It may be said that the geography of virtually every waterfall is unique, but this is especially true of Shoshone Falls as it relates to this analysis. The fundamental mechanism of a waterfall results from a stream or river descending a steep slope. Falls are often above the location of the prime viewing places. And there are often a large, uncontrolled number of places to view from, making record keeping of waterfall viewers difficult.

Shoshone Falls differs in that the falls result from a river at the bottom of large deep canyon, dropping several hundred feet over a ledge into an even deeper section of the canyon. The topography is such that Shoshone Falls is hard to find, let alone see, from anywhere other than the city-maintained viewpoint on the south side of the Snake River Canyon, above the falls.

In an effort to offset the cost of maintaining the road to the falls and attendant parking area, the city of Twin Falls charges a nominal per-automobile fee on those entering the park. The city has been running the concession and keeping annual records since 1980. They have been keeping monthly records since 1996. This latter action, combined with the USGS records of Snake River water flows, provides a unique opportunity to directly calculate the value of a waterfall as the esthetics change with varying volumes of water flowing over the falls.

Graph 5



The chart above displays the history of estimated water flows over Shoshone Falls together with the number of visitors to the Shoshone Falls since 1996.

A few observations:

First, there is a distinct seasonality associated with visitation to the falls. Visitation numbers decline to near zero[34] in the depth of winter and peak in the summer, typically in July.

Second, there is a background interest in visiting a semi-non-waterfall portion of the park, namely Dierkes Lake. Dierkes Lake is a swimming area that shares the same entry as the waterfall viewpoint. The falls were dry 2001 through 2004 and the Dierkes Lake portion of the facility still saw approximately 28,000 visitors in July of 2003.

Third, the number of people visiting the park is markedly higher when there is water flowing over the falls. Further, more water flowing over the falls, and longer durations of higher flows, drives visitor counts higher still.

Fourth, timing counts. Tourism, at least waterfall viewing-related tourism, is definitely more extensive in summer. That does not mean it is not a wintertime activity. It simply

[34] For the purposes of this paper visits decline to exactly zero because the park closes in winter and there is no tally of visitors. Even if the park is officially closed, visitors can still see the falls from various alternative, less optimal vantage points. Therefore, the winter visitor numbers presented here must be viewed as fewer than actually occur. Similarly, in the summer, the tally at the park does not include season passes and tourist buses. As a result, summer visitation counts are also underestimated.

means that the correlation coefficients are higher in peak tourism months than in off peak months.

The four years with the lowest recorded visitation numbers are drought years from 2001 through 2004. The periods of highest visitation coincide with the periods of highest water flows. The highest average monthly water flow on record was 23,200 CFS in June of 1997. June of 1997 also saw 61,860 visitors to the park, the highest number of visitors on record.

Table 4 below details the degree to which increased water flowing over the falls stimulates visitors to the park and tourist-related income in the region.

Each additional cubic foot of water over the falls, averaged over the month, stimulates an increase in the number of visitors to Shoshone Falls/Dierkes Park by as few as 0.20 in the October off-season, to as many as 5.23 in the July peak season. As these visitors spend money on fuel, transportation, food, lodging, camera equipment, etc., the initial incremental cubic foot of water over the falls each month generates economic output ranging from $21 in October, to $544 in July (in 2007 dollars).

Table 4
RESPONSE OF VISITORS TO SHOSHONE FALLS RESULTING FROM CHANGES IN VOLUME OF WATER FLOWING OVER THE FALLS

	Off Peak			Peak Months			Off Peak	
	March	April	May	June	July	August	September	October
Regression Statistics								
Multiple R	0.77	0.39	0.42	0.86	0.74	0.70	0.49	0.82
R Square	0.59	0.16	0.18	0.74	0.55	0.49	0.24	0.68
Adjusted R Square	0.52	0.09	0.11	0.72	0.51	0.45	0.18	0.52
Standard Error	2,427	13,808	9,836	7,577	5,992	3,815	2,711	462
Observations	8	14	15	15	15	15	15	4
ANOVA								
df								
Regression	1	1	1	1	1	1	1	1
Residual	6	12	13	13	13	13	13	2
Total	7	13	14	14	14	14	14	3
Coefficients								
Intercept	1,062	6,138	8,892	8,683	12,477	8,123	4,858	844
X Variable 1	**0.4232**	**1.1192**	**1.1937**	**1.8709**	**5.2273**	**4.1634**	**0.9613**	**0.2043**

On an annual basis, each additional cubic foot of water flowing over the falls, from March through October, generates an additional $1,579 of economic output and has a net present value of $22,960.

By extension, every additional 100 cfs of water flowing over the falls from March through October results in an additional $157,918 in economic activity in the Twin Falls area each year, with an addition to Net Present Value of $2,296,018.

Conversely, if the amount of water flowing over Shoshone Falls were to be reduced by the amounts the Applicant is talking about at Similkameen Falls; economic activity in the region would decrease by about $2,065,686 each year with a concurrent decrease in the net present value of the local tourism industry of about $30 million.

In this context, it is legitimate to question whether or not there is an upper limit to the attraction of viewers that ever-higher water flows will generate. Introductory economics texts are rife with the concept of diminishing marginal utility and the suggestion that such must be the case, that every person's demand for goods, even water falls, becomes sated at some point.

The evidence suggests that this might not be the case for water falls, at least not until extremely high levels are achieved. This is so because as flow levels increase, the falls "change." By this it is meant that the viewing experience changes. For example, at low flow levels, one sees water flowing over a falls. At a higher level, mist created by the falling and impacting water becomes an added viewable factor. At still higher flows, the sound of the crashing water starts to become a noticeable part of the experience. At still higher levels, the sound, and mist may start to become visceral, felt as well as seen and heard—an experience that FERC has previously recognized for its religious value to Native Americans.[35] At very high levels, the viewers may perceive that they are, in some way, participants in the pounding, and thunder of the crashing water. In this way, at different flow levels, it may be the same waterfall that is being viewed, but the esthetics the viewer sees may be substantially different. It is this constant change, from month to month, day to day, or even one instant to another, that suggests the concept of diminishing marginal viewer attendance as water flows increase may not be directly applicable. More succinctly, it is not so much that diminishing marginal utility is suspended, but rather that each new viewing event tends to restart each person's measure of their individual utility.

This is consistent with Berger's surveys of visitors to Spokane Falls. Simply put, in Berger's survey respondents consistently rated the esthetics of higher flow levels higher than they did the esthetics of lower flow levels. The lowest flow level surveyed, 200 cfs was deemed unacceptable. The highest flow level surveyed, 500 cfs, was deemed most acceptable.

[35] 110 FERC ¶ 61,200

At Shoshone, regardless of what time of year the regressions were estimated, in each case more water means more visitors. Visitors are more responsive to higher water flows in July than they are in other months. However, for each month for which there are data, the coefficients are uniformly positive. More water flowing over the falls translates directly into more viewers.

<u>Transferability of Results to Similkameen Falls</u>

The previous section developed the methodology for concluding that each additional cfs of water over the falls is consistent with up to 5.2 additional visitors per month with an economic impact of about $544. This section presents the case that the Shoshone model also applies to Similkameen Falls. *Further, if Similkameen Falls is dewatered the regional loss of esthetic value will exceed $516,421 per year, and the net present value of the region's tourist industry will decline by about $7.5 million.*

The remaining question is how do the values for incremental water flow and impact on esthetic values translate from Shoshone to Similkameen Falls?

There are relatively few metrics to guide us in this matter.

Similkameen Falls is a real, natural feature. It would continue to be real in the absence of the dam. As such, it has value individual and separate from the man-made structure above.

Second, the man-made dam does not seem to detract from the falls' ability to attract viewers. Of the four falls profiled in Appendix I, all but Multnomah have: been tapped for power generation; present visible evidence of human alterations; and at various times of the year water flowing over these falls is subject to the whim of the companies operating the power stations. That said these same three falls have annual visitor numbers that reach into the millions.

Conversely, if we go to the website NorthwestWaterfallSurvey[36] and look at the top 100 falls, many of the highest rated falls are very difficult to see, most people have never heard of them, and even the website promoting their excellence often fails to present any images. For example, the site's highest rated falls, Green Lake Falls in Whatcom County, Washington, is described as "requiring at least 3 days to reach safely, and even at that the base of the falls might not be humanly accessible."

The critical issue, when it comes to valuing the esthetics of waterfalls, centers on whether there is water, falling a reasonable distance, in a place where people can see it. By those

[36] http://www.waterfallsnorthwest.com/nws/falls.php?num=3030

criteria Similkameen Falls is a real, viable, visitor-attracting, waterfall that will be missed if it is eliminated.

Similkameen Falls and Shoshone Falls have both differences and similarities. Shoshone Falls is taller but Similkameen Falls typically has higher water flows. Shoshone has a bigger city immediately nearby, but is located in a state with fewer than 1.5 million people, most of them more than 120 miles distant. Similkameen Falls is located in a state with about 6.7 million people, the bulk of which range from 180 to 250 miles distant. If one includes the 2.3 million people in Vancouver, BC, Canada, the functional population base from which Similkameen Falls draws from swells to about 9 million.

The local economies at both falls are primarily based on agriculture. And, both areas have a long history of using their associated rivers for commerce: Similkameen Falls for electricity generation while the Snake River in south-central Idaho is used extensively for both irrigation and power generation.

In Spokane, Berger's survey detailed that people preferred more water flowing over Spokane Falls rather than less. The data from Shoshone Falls is consistent with Berger's survey and quantifies this preference, documenting the degree to which people are willing to take the necessary steps to witness higher flows.

Our goal is to demonstrate that even modest, out-of-the-way water features that are compromised by the manner in which they present themselves or came into being, still generate meaningful levels of economic activity. Further, for someone to terminate a waterfall, even a modest waterfall like Similkameen Falls, means depriving the public of an esthetic asset the economic value of which needs to be directly and explicitly accounted for in the licensing process.

At the very minimum, it is reasonable to conclude that the Okanogan area benefits economically from the falls. According to the study, *Washington State County Travel Impacts 1991-2009, prepared by Washington State Department of Commerce*, travel impacts in Okanogan County account for $129.2 million in spending each year. It results in $39.3 million in earnings and supports 1,640 jobs. Further, these 1,640 jobs represent roughly seven percent of all employment in Okanogan County.

High Estimate - At 6.7 million people, Washington is roughly 4.5 times the size of Idaho. Add in Vancouver BC at 2.3 million, for a total of nine million people, one sees a potential market roughly six times the size of Shoshone Falls' market. If Similkameen Falls is capable of drawing roughly the same number of people from a population base of 9 million as Shoshone is from an Idaho population base of 1.5 million, the total number of potential viewers will be equivalent and we can use the same coefficients, on a month-by-month basis as we see at Shoshone Falls. If that single assumption holds, the process of dewatering Similkameen Falls will be responsible for decreasing tourism-related spending in Okanagan County by $2.1 million per year. **At $2.1 million per year, with net present value of -$30 million, dewatering Similkameen Falls would reduce Okanogan County travel-based economy by about 1.6 percent. It is also worth noting that, at -$30 million; the net loss to the local and regional tourism industry is roughly equal to the cost of renovating the dam!** Please refer to Table 6 below.

Middle Estimate - If Similkameen Falls is only about 8 percent as successful at drawing visitors from Washington and Southern Canada as is Shoshone in Idaho, it will achieve about 50% of Shoshone's total draw, and the economic impact will be a ratio of .5:1. At a 50 percent rate of attraction, the Applicant's dewatering of Similkameen Falls will be responsible for decreasing tourism-related spending in Okanagan County by $1.032 million per year. At $1.032 million per year, dewatering Similkameen Falls would reduce Okanogan County travel-based economy by about 0.8 percent. Please refer to Table 6 below.

Low Estimate - Finally, if Similkameen Falls is only about 4 percent as successful at drawing visitors from Washington and Southern Canada as is Shoshone in Idaho, it will achieve about 25 percent of Shoshone's total draw, and the ratio of economic impact will be .25:1. At a 25 percent rate of attraction, the Applicant's project will be responsible for decreasing tourism-related spending in Okanagan County by about $516,000 per year. At $516,000 per year, dewatering Similkameen Falls would reduce Okanogan County travel based economy by about 0.4 percent. Please refer to Table 6 below.

In a state the recognizes the value of free flowing rivers in their own right, and has demonstrated its willingness to remove counterproductive hydro facilities such as the Condit and Elwha dams, proposing to completely eliminate a waterfall is not a trivial act. While it is an act whose economic consequences are not clearly defined it is abundantly clear that the cost is significantly greater than zero and needs to be included in the Applicant's financial analysis.

Table 5
Visits to Shoshone Falls/Dierkes Park as a Function of Water Flowing Over the Falls (in 2007 dollars)

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Coefficient		0.42	1.12	1.19	1.87	5.23	4.16	0.96	0.20	
R^2		0.59	0.16	0.18	0.74	0.55	0.49	0.24	0.49	
CFS		1	1	1	1	1	1	1	1	
Incremental Visitor		0.42	1.12	1.19	1.87	5.23	4.16	0.96	0.20	
Value @ x per visitor day ($2007)	$104	$44	$117	$124	$195	$544	$434	$100	$21	
Total Memorial Day to 10/30		$44	$117	$124	$195	$544	$434	$100	$21	$1,579
NPV (20 Yrs at 3.25 %)		$641	$1,695	$1,808	$2,833	$7,915	$6,304	$1,456	$309	$22,960
Similkameen Falls Flow Reduction Volume		(770)	(1,600)	(1,600)	(1,600)	(1,600)	(900)	(586)	(690)	
Value of Similkameen Falls Flow Reduction										
$/Month		$(33,947)	$(186,488)	$(198,909)	$(311,752)	$(871,030)	$(390,193)	$(58,691)	$(14,676)	$(2,065,686)
NPV of Similkameen Falls Flow Reduction										
NPV		$(493,568)	$(2,711,407)	$(2,892,002)	$(4,532,677)	$(12,664,207)	$(5,673,148)	$(853,324)	$(213,384)	$(30,033,717)

Table 5 Continued

Potential Value of Incremental Esthetic Flows at Spokane Falls - High Estimate ($2007)

Discount Factor From Shoshone 100%

	Mar	Apr	May	Jun	Jul	Aug	Sep		Total
Value of Select Flow Levels	$(33,947)	$(186,488)	$(198,909)	$(311,752)	$(871,030)	$(390,193)	$(58,691)	$(14,676)	$(2,065,686)
NPV of Select Flow Levels	$(493,568)	$(2,711,407)	$(2,892,002)	$(4,532,677)	$(12,664,207)	$(5,673,148)	$(853,324)	$(213,384)	$(30,033,717)

Potential Value of Incremental Esthetic Flows at Spokane Falls - Middle Estimate ($2007)

Discount Factor From Shoshone 50%

	Mar	Apr	May	Jun	Jul	Aug	Sep		Total
Value of Select Flow Levels	$(16,974)	$(93,244)	$(99,454)	$(155,876)	$(435,515)	$(195,096)	$(29,345)	$(7,338)	$(1,032,843)
NPV of Select Flow Levels	$(246,784)	$(1,355,704)	$(1,446,001)	$(2,266,339)	$(6,332,103)	$(2,836,574)	$(426,662)	$(106,692)	$(15,016,859)

Potential Value of Incremental Esthetic Flows at Enloe Dam - Low Estimate ($2007)

Discount Factor From Shoshone 25%

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Value of Select Flow Levels	$(8,487)	$(46,622)	$(49,727)	$(77,938)	$(217,758)	$(97,548)	$(14,673)	$(3,669)	$(516,421)
NPV of Select Flow Levels	$(123,392)	$(677,852)	$(723,001)	$(1,133,169)	$(3,166,052)	$(1,418,287)	$(213,331)	$(53,346)	$(7,508,429)

Working backward, it is reasonable to ask, based on the results in the previous table, what kind of impact on local tourism are we talking about? How big of a shift in visitors is required to account for numbers of that magnitude?

The high estimate implies that if the Similkameen waterfall is terminated, 20,000 people a year will go other places and do other things. At the other extreme, the low estimate only requires 5,000 people per year to be discouraged by the dewatering of Similkameen Falls, and spend their vacation time and money in other places doing other things.

One has to conclude that dewatering Similkameen Falls will have a negative impact on tourism and a negative impact of 5,000 visitors is about as bare bones of a conclusion as one can make. Keep in mind that while falls such as Multnomah annually attract almost as many visitors as the population of the surrounding region, in the case of Similkameen Falls we are only talking about an impact as few as 0.13 percent of the relevant population base. And yet these bare bones, absolute minimum estimate indicates that the NPV of the negative impact of dewatering Similkameen Falls carries a $7.5 million loss to the region!

Table 6
Esthetic Value of Shoshone Falls vs. Similkameen Falls

	Shoshone Falls (1)	Enloe (High Est)	Enloe (Med. Est)	Enloe (Low Est)
Visitors per Year (1,000)	134	20	10	5
Percent to See the Falls (Est.)	95%	100%	100%	100%
Discounted Visitors (1,000)	127	20	10	5
Spending per person per Day ($2007)5,2	$104	$104	$104	$104
Total Annual Spending (1,000)	$13,238	$2,066	$1,033	$516
NPV (1,000) (20 yrs @3.25%) 4	$192,469	$30,034	$15,017	$7,508

County	**Twin Falls County**	**Okanogan County**	**Okanogan County**	**Okanogan County**
County Population 2010 (1,000) 3	73	41	41	41
Visits as Percent of Local Population (Discounted by % Day Visitors	174%	48%	24%	12%
Average %		28%		

Region	**Southern Idaho**	**Northern and Western WA, and Southern BC**	**Northern and Western WA, and Southern BC**	**Northern and Western WA, and Southern BC**
Regional Population 2010 (1,000) 3	1,500	9,000	9,000	9,000
Visits as Percent of Regional Population (Discounted by % Day Visitors	8%	0.22%	0.11%	0.06%
Average %		0.13%		

1. City of Twin Falls, Parks Department, 2011, and RME, 2011 Est.
2. Washington State Travel Impacts, 1991-2010p, Prepared by Dean Runyan Associates, Inc. per RWC 43.336.060, pp. 17. Adjusted for inflation, RME, 2011.
3. US Census, 2010
4. Prime plus 1%. Prime rate on 11/2/11, http://www.federalreserve.gov/releases/h15/update/.
5, U.S. Department Of Labor, Bureau of Labor Statistics, Consumer Price Index, All Urban Consumers - (CPI-U)
CPI June 2007, 208.299
CPI June 2011, 218.011

In an effort to be as conservative as possible, if we use the lowest estimate above, the additional $516,421 per year will add $0.0115 per KWh to the cost of operating the re-commissioned Enloe Dam, bringing the total operating cost to $0.0696 per KWh.

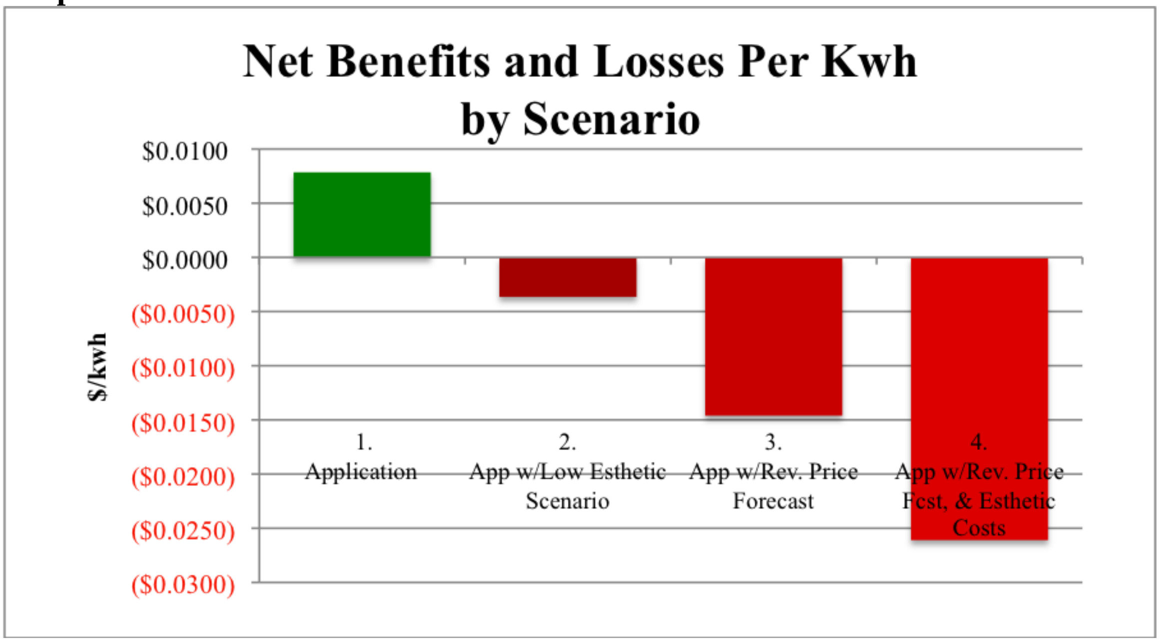
Table 7
Enloe Hydroelectric Project Estimated Annual Costs (2007 $)
(Original Cost Est., With the Addition of Esthetic Costs)

Item	Qty	Cost ($)	($/kW)	($/kWh)
Generation Data				
Plant Capacity (MW)	9			
Net Average Annual Generation (GWh)	45			
Capacity Factor (%)	57.00%			
Plant Investment				
Plant Investment Cost		$30,980,000	$3,442	
Annual Costs				
I. Capital Costs				
a. Interest on Capital	4.50%	$1,394,100	$154.90	$0.0310
b. Capital recovery cost (40yr, 4.5%)	0.93%	$289,451	$32.16	$0.0064
Total Capital Costs		$1,683,551	$187.06	$0.0375
II. Insurance	0.20%	$61,960	$6.88	$0.0014
III. Taxes - Privilege Tax (% of first 4 mills/kWh)	5.35%	$9,630	$1.07	$0.0002
IV. Operation and Maintenance (1.9% of Invest Cost)		$600,000	$66.67	$0.0134
V. Environmental Measures (40yr, 4.5%)		$34,624	$4.00	$0.0008
VI. Administrative and General/Contingency	35.00%	$222,118	$24.68	$0.0049
Total Generation Cost		**$2,611,883**	**$290**	**$0.0582**
Diminished Esthetics (Low Estimate)		$516,421	$57.38	$0.0115
Grand Total Generation Cost		**$3,128,304**	**$348**	**$0.0696**

SUMMARY

In preceding pages we have presented two major alternatives to the application as originally submitted. Table 8 below presents the findings of these alternatives. For comparison purposes, the original application is presented as alternative 1. This alternative costs $30.1 million to build and requires $0.0582 / KWh to operate. This alternative purports to have net revenues of $0.0078 / KWh by selling (or avoiding purchase costs) at $066 / KWh.

Graph 6



Alternative number 2 shows the impact in terms of reduced esthetic value associated with reducing or eliminating water flowing over Similkameen Falls. This alternative uses the same plant cost and sales price as Alternative 1, but the esthetic losses drive the operating cost up to $0.0696. This results in net operating losses of $0.0036 per KWh for the life of the project.

Alternative number 3 presents the situation resulting from selling energy generated by the plant with costs of $0.0585 per KWh in a market consistent with average NP15 prices of $0.0435. In this situation Enloe will lose $0.0146 on every KWh it produces.

Finally, Alternative number 4 presents the combination of the low estimate of esthetic values, together with NP15 price levels. In this situation, Enloe will have production costs of $0.0696 per KWh but will only receive revenues (avoided costs) of $0.0435 per KWh for a loss of $0.0261 on every KWh produced. Please see Graph 6 and Table 8 for details.

Table 8

Enloe Cost Matrix ($2007)				
	1. Application	**2. App w/Low Esthetic Scenario**	**3. App w/Rev. Price Forecast**	**4. App w/Rev. Price Fcst, & Esthetic Costs**
Construction Cost	$30,980,000	$30,980,000	$30,980,000	$30,980,000
Operating Cost ($/kWh)	$0.0582	$0.0696	$0.0582	$0.0696
Energy Price ($/kWh)	$0.0660	$0.0660	$0.0435	$0.0435
Net Revenue (Avoided Cost) ($/kWh)	$0.0078	($0.0036)	($0.0146)	($0.0261)

APPENDIXES

APPENDIX 1: COMPARISON OF SELECT NORTHWEST WATERFALLS

MULTNOMAH

Multnomah Falls, at 611-foot-tall, is one of the most magnificent and memorable falls in the country. The falls is located about 30 miles east of Portland on the south side of the Colombia Gorge. Unlike the other falls profiled in this report, Multnomah is *just* a waterfall. By that, it is meant that, beyond the visitors center, a feature common to many of the more prominent waterfalls, there are no alternative recreation opportunities such as swimming, boating, movies, golfing, etc. The attraction is the falls, and only the falls.

Additionally, of the waterfalls profiled here, Multnomah is the only one that has not been tapped for its power generating potential.

With all this in mind, Multnomah provides a reasonably clear view of the value of falling water in the absence of other competing features.

Multnomah Synopsis

Annual Visitors	2.4 Million
Spending per Day (Avg)	$109
Annual Value of Multnomah	$258,875,000
NPV of Multnomah Waterfall	$3,763,873,000

SNOQUALMIE

"Snoqualmie Falls is one of Washington State's most popular scenic attractions. More than 1.5 million visitors come to the falls every year. At the falls, you will find a two-acre park, hiking trail, observation deck, gift shop, and the famous 270 foot waterfall."[37]

There are two hydroelectric power plants at Snoqualmie Falls, both currently operated by Puget Sound Energy. Power plant 1 was built in 1898 and operates at the base of the falls embedded in the rock 270 feet below the surface. It was the world's first completely underground power plant.[3] Power plant 2 was built in 1910 and further expanded in 1957, and is located a short distance downstream of the falls.[4] Approximately 1% of Puget Sound Energy sales come from the plant. These two power plants provide 41,990 kilowatts of electricity, which is enough to service 16,000 average homes. [5] The 1898 generating system was designated an ASCE Civil Engineering Landmark in 1981.[38]

The Final EIS **places great emphasis on whether the particular flow option provides seasonal variation, provides higher flows during good weather and periods of highest visitation, takes advantage of higher flows at times when higher flows are expected to be available, and affects the ability of the project to follow seasonal load variations. The water quality certification flows meet these criteria, except for September 1. On that date, the certification reduces** 110 FERC ¶ 61,200
flows from 200 to 100 cfs. In light of the high number of visitors that would be expected to visit the Falls on Labor Day weekend, and consistent with the State's determination under the CZMA (see above), we will require Puget to provide a minimum flow release of 200 cfs day and night for that weekend.[39] In a subsequent order on rehearing FERC further determined that "an adjustment to require flows over the Falls of 1,000 cfs (daytime and nighttime), or inflow, if less, throughout the months of May and June is a more appropriate resolution."[40]

Snoqualmie Synopsis

Annual Visitors	1.4 million
Spending per Day (Avg)	$109
Annual Value of Snoqualmie	$155,325,000
NPV of Snoqualmie Waterfall	$2,258,324,000

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37 http://www.snoqualmiefalls.com/
38 http://en.wikipedia.org/wiki/Snoqualmie_Falls
39 107 FERC ¶ 61,331, FEDERAL ENERGY REGULATORY COMMISSION, Puget Sound Energy, Inc. Project No. 2493-006, ORDER ISSUING NEW LICENSE, (Issued June 29, 2004)
40 110 FERC ¶ 61,200

SPOKANE FALLS

The utilization of the Spokane Falls as the motive force to drive industrial production is integral to the city's history. In earlier times the falling water was used to directly drive a variety of mills. Today, the main industrial output of the falls is the generation of electricity by Avista Corp. Avista uses the falls so intensively that for a portion of each year the section of the falls known as Upper Falls is completely denuded of water except for the trickle that seeps past the seals of the diversion dam.

While electrical generation may be the predominant industrial use of the falls, the benefit of the falls, that is the esthetic value of the view of water cascading down over the rocks, is increasingly recognized as both a central component of the Spokane area tourism industry and a significant element of the quality of life of Spokane area residents.

Spokane Falls Synopsis

Annual Visitors	1,190,000
Spending per Day (Avg)	$109
Annual Value of Spokane	$129,710,000
NPV of Spokane Waterfall	$1,885,899,000

SHOSHONE FALLS

Shoshone Falls is located on the main stem of the Snake River in south central Idaho near the City of Twin Falls. At 212 feet, the falls are higher than Niagara Falls.

Shoshone Falls is similar to both Snoqualmie and Spokane Falls in that the falls have been modified to divert a portion of the stream flow for electricity production. When water flows are low, such as in late summer or fall, or anytime during drought years, the diversion may amount to 100 percent of the river flow, thus drying up the falls.

As a result, Shoshone Falls is best viewed during high runoff periods such as spring and early summer.

Similar to the other falls profiled here the neighboring City of Twin Falls tries to make the best of an uncertain situation. In addition to the overlook for Shoshone Falls the City also owns and operates the Dierkes Lake Complex. Dierkes Lake offers playgrounds and hiking trails, landscaped picnic areas, a boat ramp and swimming area, and a scenic overlook.

The complex provides restroom facilities and visitor information, and for a nominal per-car entry fee, visitors can enjoy picnicking and relaxing in the shaded, grassy areas near the falls.

Significantly, this last feature, the per-car entry fee allows the City of Twin Falls to do something that none of the other entities associated with the other waterfalls detailed here can do: Document, with reasonable accuracy, the actual number of visitors to the falls.

Shoshone Falls attracts about 134,000 visitors each year.[41] This number is dwarfed by the visitor numbers estimated for the other falls detailed here, a fact largely attributable to the proximity of much larger cities near the other falls thus presenting much larger numbers of potential day visitors.

Shoshone Falls Synopsis

Annual Visitors	127,000
Spending per Day (Avg)	$109
Annual Value of Shoshone	$13,855,000
NPV of Shoshone Waterfall	$201,442,000

[41] Dennis Bowyer, Director, City of Twin Falls Parks Department.

SUMMARY

The four falls reviewed above were chosen because they are reasonably well known in the Pacific Northwest and because there is a degree of consensus as to the number of people who come to view the falls each year. In this way it is possible to establish a general value of the various falls associated with their ability to attract tourists.

These water features are major economic assets in their respective vicinities. The most remote, most poorly visited of the four falls presented here is Shoshone Falls. Yet it pulls more than $13.8 million per year into the Twin Falls area and has a net present value of over $201 million. At the upper end, Multnomah Falls attracts about 2.4 million visitors each year who spend over $259 million, for a net present value of about $3.8 billion.

It is also important to note that even though the determination in each case was subjective, at the recent relicensing of Snoqualmie, Spokane, and Shoshone, FERC recognized the value of esthetic flows and required the respective Applicants to maintain flows over the falls during normal viewing hours for the bulk of the prime tourist season.

For remote waterfalls like Similkameen Falls, where a tally of visitor numbers is lacking, establishing a value is a bit more problematic. However, it should be clear from the numbers presented above that waterfalls, even remote waterfalls, can be major tourist attractions with substantial economic activity. The waterfalls reviewed above all have facilities of one sort or another in close proximity to the falls. And, in each case, these facilities benefit directly from the falls. However, in each case presented above, it is the indirect benefits, the spending that takes place as visitors travel to and from the various falls that are presented as the benefit of the various falls. In this manner, at Similkameen Falls, even though there are no facilities in place directly targeting waterfall visitors, the region surrounding Similkameen Falls benefits from the presence of the falls, and will suffer economic consequences if the falls are eliminated.

APPENDIX 2, Shoshone Falls Revenue History[42]

Shoshone Falls/Dierkes Lake

Total Revenue - Includes gates fees, season passes, and coupon books

1980	$18,583.00	$1 per vehicle
1981	$18,210.21	
1982	$21,091.00	
1983	$34,321.00	
1984	$47,880.00	
1985	$41,428.00	Season Passes and Coupon Books started - Passes good for up to 3 vehicles at the same residence
1986	$47,631.00	
1987	$43,935.00	
1988	$50,209.16	
1989	$51,074.01	
1990	$75,905.63	$2 per vehicle implemented
1991	$78,957.92	
1992	$80,133.40	
1993	$128,804.23	
1994	$95,136.75	
1995	$144,938.05	
1996	$119,979.93	
1997	$175,617.02	Record flows in June
1998	$145,146.72	OK water year - $3 per vehicle implemented - Season Passes only good for one vehicle
1999	$133,815.27	Low flows
2000	$121,391.08	Low flows
2001	$70,438.12	Low flows - Construction Year, did not open till May 26th
2002	$94,563.54	Low flows - Started selling season passes at the ticket booth
2003	$107,588.84	Low flows
2004	$95,837.46	Low flows
2005	$131,509.50	Low flows - Minimum of 300cfs in effect

[42] Dennis Bowyer, Director, City of Twin Falls Parks Department.2011.

2006	$271,150.72	Great flows in April & May
2007	$163,489.64	OK water year
2008	$174,101.92	OK water year
2009	$213,161.62	Great flows in April & June
2010	$181,605.74	OK water year
2011	$303,148.27	Great flows all year
Total	**$3,480,783.75**	

Currently, coupon books are $30 for 20 tickets, they are good for year after year, after year, after year...
Any type of government vehicle is free, City, County, State, Fish & Game, etc. and also Idaho Power.
City accepts the Golden Age Passport and the Golden Access Passport.
All other types of motorized vehicles have to pay the fee.

Shoshone Falls/Dierkes Lake

Revenue by the Month

	1996		**1997**		**1998**		**1999**		**2000**
March	$-	March 22nd	$8,484.40	March 28th	$728.00	March 27th	$1,699.71		$-
April - Sat/Sun	$9,123.35	April	$12,965.60	April	$9,791.21	April	$8,210.32	April 1st	$12,818.71
May 13th	$16,898.57	May	$24,626.35	May	$18,375.93	May	$17,050.21	May	$17,186.93
June	$30,407.42	June	$58,806.72	June	$29,925.25	June	$30,633.35	June	$21,858.09
July	$31,955.31	July	$33,662.80	July	$40,074.71	July	$36,982.88	July	$33,432.30
August	$20,476.34	August	$22,432.80	August	$28,110.08	August	$24,316.05	August	$23,738.04
Sept 29th	$8,768.94	Sept 28th	$10,432.35	Sept	$13,973.59	Sept 26th	$12,347.75	Sept 24th	$9,107.01
October	$-	October	$1,706.00	October 4th	$1,217.95		$-		$-
		Weekends Only in October							
Gate Fee Totals	$117,629.93		$173,117.02		$142,196.72		$131,240.27		$118,141.08
Coupon Books Passes	$2,350.00		$2,500.00		$2,950.00		$2,575.00		$3,250.00
Sold	94		100		118		103		130
Total Revenue	**$119,979.93**		**$175,617.02**		**$145,146.72**		**$133,815.27**		**$121,391.08**

Revenue by the Month

2001		2002		2003		2004		2005	
March	$-	March	$-	March 29th	$1,060.80	March	$-	March	$-
April	$-	April 1st	$5,764.77	April	$6,835.34	April 3rd	$6,878.11	April 1st	$8,253.73
May 26th	$4,841.10	May	$12,769.00	May	$13,031.81	May	$11,920.54	May	$14,780.80
June	$19,825.89	June	$21,035.04	June	$23,215.71	June	$19,790.17	June	$22,873.10
July	$19,789.60	July	$26,696.62	July	$28,570.16	July	$26,043.34	July	$42,982.52
August	$15,699.10	August	$15,565.96	August	$18,344.15	August	$17,537.30	August	$23,113.10
Sept 30th	$7,657.43	Sept 22nd	$4,872.15	Sept 28th	$6,995.87	Sept 21st	$4,498.00	Sept 25th	$8,581.25
October	$-		$-		$-		$-		
Gate Fee Totals	$67,813.12		$86,703.54		$98,053.84		$86,667.46		$120,584.50
Coupon Books			$1,410.00		$1,260.00		$570.00		$1,100.00
Passes	$2,625.00		$6,450.00		$8,275.00		$8,600.00		$9,825.00
Sold	105		258		331		344		393
Total Revenue	**$70,438.12**		**$94,563.54**		**$107,588.84**		**$95,837.46**		**$131,509.50**

Revenue by the Month

2006		2007		2008		2009		2010	
March 10th	$6,622.00	March 31st	$755.00	March 29th	$1,315.25	March		March 26th	$2,769.00
April	$71,406.60	April	$13,166.50	April	$12,495.50	April 4th	$34,683.60	April	$12,250.00
May	$57,278.00	May	$21,997.00	May	$21,896.61	May	$33,074.40	May	$21,777.50
June	$38,271.50	June	$31,505.50	June	$31,445.12	June	$37,039.52	June	$32,849.44
July	$48,708.25	July	$41,051.52	July	$47,987.80	July	$52,368.75	July	$47,568.75
August	$20,362.10	August	$24,892.25	August	$33,581.55	August	$25,834.55	August	$31,678.00
Sept 30th	$11,312.27	Sept 30th	$14,023.37	Sept 28th	$9,370.09	Sept	$12,917.80	Sept	$14,810.00
October		October		October		October 4th	$668.00	October 3rd	$1,668.05
Gate Fee Totals	$253,960.72		$147,391.14		$158,091.92		$196,586.62		$165,370.74

Misc. Rev		$23.50			
Coupon Books	$ 1,440.00	$1,350.00	$1,260.00	$1,050.00	$510.00
Passes	$15,750.00	$14,725.00	$14,750.00	$15,525.00	$15,725.00
Sold	630	589	590	621	629
Total Revenue	**$271,150.72**	**$163,489.64**	**$174,101.92**	**$213,161.62**	**$181,605.74**

Revenue by the Month

2011		**2012**	**2012**	**2013**	**2014**
March		March	March	March	March
April 1st	$20,739.50	April	April	April	April
May	$56,742.00	May	May	May	May
June	$72,697.70	June	June	June	June
July	$70,997.51	July	July	July	July
August	$39,406.11	August	August	August	August
Sept	$20,201.55	Sept	Sept	Sept	Sept
October 2nd	$1,553.90	October	October	October	October
Gate Fee Totals	$282,338.27				
Misc. Rev					
Coupon Books	$810.00				
Passes	$20,000.00				
Sold	800				
Total Revenue	**$303,148.27**				

April 16, 2017

Project Review Committee

Talia Baker / Nancy Deakins Department of Enterprise Services

Post Office Box 41476 Olympia, WA 98504-1476

Dear Ms. Baker and Ms. Deakins:

The Project Review Committee (PRC) should reject the Okanogan Public Utility Districts (OPUD) application for project approval to use the design-build contracting procedure for the Enloe Dam Hydroelectric Project. This is a very unpopular and highly controversial project that is not supported by the majority of people in Okanogan County. The PRC should find the OPUD has not met the statutory requirements necessary for the PRC to approve this application.

1. The OPUD is not qualified to manage this Project.

RCW 39.10.280 requires that the public body have the requisite management experience with projects of this size and scope to ensure the proper oversite and protection of the public interest as described in RCW 39.10.280 (2)(c)(i)(ii)(v) and 2(d). As detailed in Section 7.7 of the OPUD application (page 6), the management team of Tim DeVries , supported by Dan Boettger, will have day to day decision making authority reporting to the General Manager John Grubich and ultimately the PUD Commissioners. These six individual all lack the necessary experience and knowledge to oversee this process.

Tim DeVries is not listed as having any experience managing a single hydroelectric project. He has only managed a project costing $3 million dollars, a fraction of the $42 million dollar project. The PRC should require OPUD to specify Mr. DeVries's relevant experience that prepares him for direct daily oversite of this Project.

Dan Boettger has been a OPUD employee for 30 years, beginning as a draftsman in 1986. He is listed as having "led many large scale energy projects, including two FERC hydropower projects…" It should be noted by the PRC, that these projects are not listed, though the names of these projects would be extremely relevant to his qualifications. The only two FERC hydroelectric projects undertaken by the OPUD during Mr. Boettger's 30 years of employment are the Enloe Dam Project and a proposed Dam at Shankers Bend, also on the Similkameen River (see attachment 2). Shanker's Bend was never approved or licensed by FERC. Enloe Dam Re-electrification and the Shanker's Bend Project have not been built so it cannot be said that Mr. Boettger has successfully managed the construction of any hydroelectric projects as stated on page 7 of the OPUD Application for D-B. . This should cause the PRC concern and require inquiry into Mr. Boettger's actual experience and qualifications for oversite of the Design-Build process.

As the head of Environmental and Regulatory Affairs at Okanogan PUD, Dan Boettger has been responsible for the OPUD meeting the necessary FERC license requirements for the Enloe Dam Hydroelectric Project.

According to PUD Commissioner Steve Houston a daunting 5 excel spread sheets of FERC license requirements remain undone. Many FERC deadlines have already been missed and the FERC deadline for the start of Construction is July 2017. OPUD is desperate to find a Design-Build Contractor because they are in deep water way over their head. The economics say do not build. Their ratepayers say do not build and still they push ahead. The OPUD lacks the experience and should not be allowed to move forward on this project. Institutional pride is not a justification for construction.

The OPUD Manager John Grubich has no experience with hydroelectric projects of this size and scope. The top three individuals responsible for oversite of the Enloe Dam hydroelectric project are lacking the experience required for a public body submitting an application for the Design-Build Contracting Method, as described in section 7.3 of this application.

On page 1 of the D-B application, Mr. Grubich describes the "development of a new fish rearing facility" as part of the Enloe Dam Hydroelectric Project. What is actually planned is a mitigation measure which involves dumping gravel into the Similkameen River at an accessable site 5 miles downstream of Enloe Dam, south of the City of Oroville. The OPUD also plans the injection of cold water from a drilled well at that site to lower high spawning water temperatures. This is a futile attempt to mitigate water temperatures and the lack of suitable spawning gravels resulting from this project. Fish biologists familiar with the project have said this gravel will be buried in sediments or be swept away by the spring freshet and will be unavailable for spawning the following season. Removal of Enloe Dam is the proper biological remedy. This mitigation is a waste of resources and falls far short of being a "fish rearing facility".

In addition to not having a qualified management team, the OPUD as a public body has never successfully managed a hydroelectric project, (see Attachment D in the OPUD application). None of the projects listed are hydroelectric projects and none of those listed approach the capital expenditures required to electrify Enloe Dam which is projected to cost over $42 million dollars. The largest projects listed by the OPUD are one third the cost of the Enloe Project and the time required to complete Enloe electrification is well beyond the scope of anything previously undertaken by the OPUD .

The Enloe Project also faces multiple environmental challenges including water flows for aesthetics, temperature, and water quality. These serious factors will be impacting federally recognized "threatened species ", including Upper Columbia River Steelhead, Summer Chinook Salmon and Pacific Lamprey. The OPUD has failed to mention any of these concerns in their application to the PRC. Legal challenges will delay the project and significantly raise the cost rendering this project economically infeasible. The OPUD should make the PRC aware of these real possibilities in their application. I request the PRC conduct a transparent analysis of these "environmental restrictions" and their potential impacts to the Enloe Dam Hydroelectric Project.

2. The OPUD has not demonstrated the design-build process will provide substantial fiscal benefit.

In order to approve a project application the PRC must determine "the alternative contracting procedure will provide a substantial fiscal benefit, or the use of the traditional method of awarding contracts in lump sum to the low responsive bidder is not practical for meeting desired quality standards or delivery schedules…" RCW 39.10.280(2)(a). The OPUD asserts that Design-Build contracting "will enable the district to make better risk informed decisions in finalizing the engineering design implementation plan for the project with early contractor input regarding project design configuration." The OPUD has already spent a staggering $14.6 million dollars on risk assessment, engineering, environmental consultants and design engineering. This extensive spending by OPUD has produced no completed design or any accurate risk assessment of this project. An independent economic analysis of the Enloe Project by Rocky Mountain Econometrics of Boise, Idaho,(see attachment 1) estimated the cost of accumulating annual loses from the Enloe Project could reach as high as $273 million dollars within 40 years of construction. This high economic risk should not be dismissed by the OPUD. The Design-Build Contractor if selected, will operate in its own best interest and minimize the risk assessments of the project in order to go forward with construction. The PRC should require OPUD to explain in detail the substantial fiscal benefits of Design- Build over the tradition Design-Bid –Build Contracting in this specific case?

3. The OPUD does not have the necessary and appropriate funding for this Project

RCW 39.10.280 (2)(iv) requires that the public body have "the necessary and appropriate funding and time to properly manage the job and complete the project." And along those same lines condition (2)(vi) requires that the public body have the "necessary and appropriate construction budget." The OPUD application sates that the project will be funded with a $10 million dollar line of credit from a commercial bank and in 2019 will be further financed with $45 million dollars in municipal bond sales. The OPUD suggests that once the project is complete the financial costs of their extensive borrowing will be paid off by the "power generation revenue" of Enloe Dam electrification. Based on the OPUD's November 2014 Enloe Dam Power Point Presentation the output of the new powerhouse will be 45,000 MW annually. Applying a generous open-market price of $40/MWh, this will generate annual revenues of $1.8 million dollars. Annual operating expenses of the new powerhouse also detailed in the 2014 Power Point Presentation include capital costs of $2.58 million dollars and operating expenses of 1.74 million dollars for a total annual operating expense over $4.3 million dollars. This new powerhouse will generate a net loss to the OPUD of $2.5 million dollars annually for the next 20-25 years according to the OPUD Board. They maintain they are willing to absorb those loses, hoping for a benefit far in the future. The OPUD speculates higher energy prices will someday make the project economically viable. That is a very wishful possibility. (see attachment 1 2016 Rocky Mountain Econometrics Report: Appendix 1)

Using the OPUD assessment, "power generation revenues" will not generate any revenue but instead pile debt on the ratepayers living in one of this state's lowest per capita income counties. The" power generation revenue" of this project will be incapable of paying off the long-term loans incurred by its construction (2016 RME Report: Appendix 1).

The OPUD is already carrying $38 million dollars of debt. Borrowing more money from the financial markets and the big banks to fund this debt generating project is entirely inappropriate. The PRC needs to look at the facts presented here and realize the Enloe Dam Hydroelectric Project is not in the "public interest". This is the Washington State mandated responsibility of the Project Review Committee as stated in RCW 39.10.200. The purpose of the Design-Build process is to "prescribe appropriate requirements to ensure that such contracting procedures serve the public interest". As the PRC is aware, it has an obligation to consider all public comments it receives on this project. RCW 39.10.280(3).

The OPUD has failed to inform the Project Review Committee of the Pacific Northwest National Scenic Trail passing directly through the project area along the Great Northern Rail Grade abandoned in the 1960's and now actively used by the hiking community. This is seen as an asset to the local outdoor recreation economy which is growing year by year and helping the Northern Okanogan County to recover from extensive job losses brought by the end of resource extraction, timber and mining, in this area. The OPUD fails to inform the PRC that Enloe electrification will provide less than one-third of the power needed to light even the small town of Oroville, Washington just 3.5 miles from the Dam Site.

4. The OPUD does not have the time necessary to complete the Project.

The OPUD received a two year extension for the start of construction from FERC in 2015. Today, with the 2017 extension of the FERC deadline looming in July and with no congressional legislation introduced to extend that deadline beyond July, it appears the OPUD may have run out of time for the start of construction on the Enloe Project. The inability of the OPUD to meet these project deadlines should raise real doubts about this publically owned municipal corporation's ability to serve the interests of its ratepayers. The OPUD lacks the ability to complete this large scale project on time. Granting Design-Build authority would allow the OPUD to pass these many unfinished tasks on to the contractor, who will have no choice but to include them as part of their cost of services agreements with OPUD. It is the ratepayers who will be paying for the OPUD's failures. Is this project really in the public interest? Is it not time for this State Board to exercise its authority and stop a public works project that has no sound economic basis? The PRC will be doing a disservice to the public interest by approving a project with such negative outcomes for the ratepayers and economy of Okanogan County. Based on the criteria outlined in RCW 39.10.280(2)(iv) the Project Review Committee should deny Design-Build Authority to the Enloe Dam Hydroelectric Project.

I urge the Project Review Committee to consider the weight and merit of the public input they have received regarding the electrification of Enloe Dam. I urge the PRC to make their decision based on the expressed will of the people and the factual evidence that has been presented during this comment period.

Sincerely,

Joseph Enzensperger

921 Central Ave. Oroville, WA 98844

509-476-4072 email: jgenz4@gmail.com

Baker, Talia (DES)

From: Gerry Evans <evansgerry@yahoo.ca>
Sent: Wednesday, April 12, 2017 10:20 AM
To: Baker, Talia (DES)
Subject: Don't Electrify Enloe Dam!

Dear Ms. Talia Baker, As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam. The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest. More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power. In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley. Thank you for handling comments on the Enloe Dam. Sincerely,

Gerald and Helen Evans
81 Homestead Rd
Winthrop, WA 98862

Baker, Talia (DES)

From: Patty Evans <evanspm@charter.net>
Sent: Friday, April 14, 2017 7:13 AM
To: Baker, Talia (DES)
Subject: Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

As a citizen ratepayer I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely,

Patricia Evans
Omak, WA

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

I don't want the
Enloe Dam here. It isn't
need.

Sandra Everly
35 Fancher Dam Rd
Tonasket, WA 98855

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

NO TO ENLOE

William M. Everly
35 Fancher Dam Rd
Tonasket, WA 98855

Baker, Talia (DES)

From: Lisa Eversgerd <lostcreek007@gmail.com>
Sent: Thursday, March 30, 2017 8:18 AM
To: Baker, Talia (DES)
Subject: No to Enloe Dam powerhouse

Please--NO new powerhouse at Enloe Dam. The facts show the how absurd this idea is. The rate payers of Okanogan county do not want this!

-Construction of a new powerhouse will require extensive borrowing that will more than double the annual payments on principle and interest carried by the OPUD.

-OPUD has a Memorandum of Understanding (MOU) with Douglas County PUD to purchase up to 22% of Wells Dam Power in addition to the 8% we now receive. The total amount of power available in 2018 from Douglas County PUD will be 170 megawatts (MW), more than double the current average daily-load of Okanogan County, 77 MW.

-The projected cost for power produced at Enloe Dam is between 8.8 and 10.6 cents per kWh. The power will be purchased from Douglas County at 3.4 cents per kWh.

-The cost of energizing Enloe Dam is projected to be $39.1 million to $45.5 million, according to OPUD.

Thank you for taking the time to consider these points. Please no new powerhouse at Enloe Dam!

Sincerely-Lisa Eversgerd

Baker, Talia (DES)

From: Richard Finch <dpfinch@q.com>
Sent: Thursday, April 13, 2017 12:23 PM
To: Baker, Talia (DES)
Subject: Fwd: Enloe Dam

Begin forwarded message:

From: Richard Finch <dpfinch@q.com>
Subject: Enloe Dam
Date: April 12, 2017 at 11:38:12 AM PDT
To: talia.baker@des.wa.gov

The Enloe Dam on the Similkameen River should not be"recommissioned" it should be removed.

The Similkameen is the major tributary of the Okanogan River, and during the summer, the only source of cool water to the Okanogan River. Enloe Dam as it now exists contributes to the warming of the river. The reservoir is silted in with a depth of about 5 feet during the summer. With a width of over 100 yards in spots, it absorbs much more solar radiation than a natural channel deep in the canyon would. The planned raising of the dam would exacerbate water warming problem.

Steehead and two species of salmon (summer chinook and sockeye) now use the Okanogan/Similkameen system. Spring Chinook disappeared from the system years ago—mainly due to irrigation diversions.

The Summer Chinook run seems to be doing okay. Steelhead are listed as threatened. Sockeye have been a bright spot until the disastrous year of 2015. Warm water throughout the Columbia system decimated the run. In 2015, over half-million sockeye were counted over Bonneville Dam - about 80 percent of which were headed for the Okanogan River. Only 187,000 made it over Wells Dam, and of those, only 37,000 made it over Zoesel Dam that regulates Osoyoos Lake. And by personal account, most of those died before reaching the cooler depths of Lake Osoyoos. We should not do anything that contributes to the warming of any of the Columbia River system.

Removal of the dam may let salmon and steelhead use the upper reaches of the Similkameen.

Dick Finch

Baker, Talia (DES)

From:	cjfisher@ncidata.com
Sent:	Sunday, April 16, 2017 8:57 AM
To:	Baker, Talia (DES)
Subject:	Enloe Dam Hydroelectric Project

Dear Ms. Baker,

I am emailing you to inform you that I am not in favor of the electrification of Enloe Dam.

Ms. Baker, as you know we live in a country where capitalism economy exists and competitive markets is the basis of this type of an economy. Essentially, the phrase, "build a better mouse-trap" is the phrase exemplifies this economy.

In our history, we have progressed from horse-drawn carriages to automobiles, from kerosene lamps to light bulbs and then to LED lighting. Much like these examples, Enloe Dam was functional until 1959, but then hydro-electric projects were constructed and became operational on the Columbia River. When this hydro-power was developed, power production at Enloe Dam was recognized as not being economically viable. Since 1959, other large scale hydroelectric projects came on line and produced power at a further reduce price point. More recently, with the advocacy of green power, developments in wind and solar power have further increased power production in the region. Power demands in other areas of the west, such as the southwest are now constructing large solar fields. These power requests from states such as California, Arizona and Nevada may not exist in the near future. This is recognized by power agencies here in Washington State.

Regarding the cost of constructing the new powerhouse on Enloe Dam, let me inform you that during the fall of 2014, the Okanogan PUD advertised to sell the Enloe Dam power project. There was no reasonable offer received. After which representatives of the Okanogan PUD met with other power producing companies to attempt to sell the project. After no interest was exhibited by other companies, the Okanogan PUD then contracted Energy Northwest to evaluate the project. Energy Northwest estimated the cost of construction developed by the Okanogan PUD was underestimated by 40%. Consequently Energy Northwest did not pursue purchasing the project. The question I pose to you is if this project is as lucrative as the Okanogan PUD commissioners and staff claim, then why is there no other power company interested in purchasing it? Furthermore if Energy Northwest's cost to construct this project is correct (Okanogan PUD's estimate + 40%) then the questionable economics for this project put this in a category of a "non-starter".

Finally, why does the Okanogan PUD pursued this project when they can purchase power from Douglas County PUD at 3.4 cents KWh, at a maximum load of 170 MW, when the current average hourly load in the county is 77 MW? There is more than double the power available to the residents of Okanogan County from one power purchase agreement at a rate less than ½ of the estimated cost of power produced at Enloe Dam.

Building a new powerhouse and producing electricity at Enloe Dam is as economically viable as constructing a kerosene lamp factory.

Thank you.

Chris Fisher

Sent from Mail for Windows 10

Baker, Talia (DES)

From:	David Ford <fordstruc@gmail.com>
Sent:	Wednesday, April 12, 2017 8:56 AM
To:	Baker, Talia (DES)
Subject:	Don't Electrify Enloe Dam!

Dear Ms. Talia Baker,

The more I read the studies that have been done and as my understanding grows concerning this potential boondoggle, I am very concerned about the Okanogan Public Utility Districts efforts to electrify Enloe Dam.

The plan is too expensive and Okanogan citizens cannot afford the outrageous burden of the suggested annual payments and interest.

More importantly, the power that would be generated is not needed. Okanogan PUD has the option to buy 22% of the Wells Dam power, up from the current 8%. It is also cheaper power.

In addition, although the Okanogan PUD does not highly value the aesthetics of the county, it should be considered. The river has high aesthetic value and is valued by the citizens and visitors to the Okanogan Valley.

Thank you for handling comments on the Enloe Dam.

Sincerely,

David Ford Okanogan County land owner

Mark Freiermuth

we Do Not
Enlo Dam
Power Plant

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

Baker, Talia (DES)

From: Marla G <snapsister@hotmail.com>
Sent: Friday, April 14, 2017 8:19 AM
To: Baker, Talia (DES)
Subject: Enloe Dam project

Stop wasting our money trying to electrify the Similkameen! We don't' want or need Enloe Dam electrified. There is absolutely no reason to invest our money in that direction. When is OK Co and the PUD going to start looking for ALTERNATIVE energy sources. With an average of 300 days a year of sun here in our valley, why aren't we using the resources we have in investing in solar energy, or wind? Stop wasting our time and money on a dead horse! Enloe Dam is just fine as it is...leave it alone and stop trying to make it something it is not, nor ever will be: a source of affordable energy. Stop wasting our money!!!!!

Thank you.
Marla Garr

Sent from Mail for Windows 10

S. Gelineau
1124 Aeneas Vly Rd
Tonasket 98855

Project Review Committee
c/o Talia Baker
Dept. of Enterprise Services
POB 41476
Olympia WA 98504-1476

24 MARCH 2017

DEAR MS. BAKER

I AM OPPOSED TO THE CONSTRUCTION OF ENLOE DAM.

- AS A RATEPAYER I DO NOT BELIEVE THIS PROJECT WILL PROVIDE THE BENEFIT TO US AT THE COST WE WILL BE BURDENED WITH BY THIS PROJECT.
- THE PUD HAS NOT HELD SUFFICIENT PUBLIC HEARINGS REGARDING THE IMPACT ON RATE-PAYERS VS IMPACT ON THE ENVIRONMENT. THIS IS, AFTERALL, A PUBLIC UTILITY.
- THE POWER OUTPUT EXPECTED IS NOT NEARLY ENOUGH TO JUSTIFY THIS PROJECT.

I STRONGLY SUPPORT NO ENLOE DAM.

REGARDS, Sarah Gelineau

Baker, Talia (DES)

From: Marion Gerrish <mgerrish295@gmail.com>
Sent: Wednesday, April 12, 2017 9:35 PM
To: Baker, Talia (DES)
Subject: electrifying

Please think about the fact that you are spending money where it is not needed. Things are just fine. Give your money to schools if you feel the need to spend. Help kids that live and will grow up to be good citizens of the Loomis Lake area.

We do not make life better by just spending money needlessly.

Thank you for listening
We enjoy your area and love it.

DR. and Mrs. Gordon F. Gerrish

Baker, Talia (DES)

From:	terrygervais <terrygervais@gmail.com>
Sent:	Friday, April 14, 2017 4:12 PM
To:	Baker, Talia (DES)
Subject:	Enloe Dam

This is wrong for this dam, its going to cost way more than it will ever produce power in revenue. Please don't send our money on this creek wanting to be a river.Thanks Terry.

Sent via the Samsung Galaxy S™III, an AT&T 4G LTE smartphone

Baker, Talia (DES)

From: Jere Gillespie <jere@columbiana.org>
Sent: Tuesday, April 18, 2017 6:02 AM
To: Baker, Talia (DES)
Subject: PRC Comments on Okanogan PUD Design-Build Application
Attachments: Attachment 1 - I.C. Beak 1984 Study.pdf; Attachment 2 - 1872 Earthquake Yields Clues of Future.pdf

Comment to the PRC

Regarding the Okanogan PUD Design-Build Review Process

April 17, 2017

Geraldine K. Gillespie
2055 Chesaw Road
Oroville, WA 98844

Dear Ms. Talia Baker:

My name is Geraldine Kavanagh Gillespie. I am 76 years old, living in retirement; still active in the civic life of the Okanogan community.

In 1986, I became a friend of the Similkameen River when discussions around restoring the Upper Columbia Steelhead population were being examined by the NW Power Conservation Council under its subbasin planning process.

It was also at this time that the U.S. Army Corp of Engineers was studying the possibility of constructing a dam at Shankers Bend on the Similkameen River.

We had recently won a lawsuit against the US Army Corps of Engineers to require them to examine the use of phenoxy chemicals in Lake Osoyoos and the Okanogan River. In order to communicate the issues to the public, we formed a 501(c)(3) federal non-profit organiztion - ***Columbia River Bioregional Education Project, aka, Columbiana, the name of its magazine.*** As co-founder and President, I led the organization for many years.

As an education project, the ***Columbiana*** focused on journalism as one of its main activities.

I began writing a history of the issues involved in the Similkameen River, which had begun in 1920, when the Enloe Dam was first constructed.

Columbiana also sponsored an educational meeting on the Similkameen River in Oroville, in 1986, which drew participants from BPA, Portland; Colville Confederate Tribes, Yakama Nation, and Ministry of the Environment, Penticton, B.C., among others.

A Little River With a Long File.....

After the regional meeting in Oroville, I received a very large box of files from Larry Everson, the project manager of the I.C. Beak studies of the Similkameen River for the Bonneville Power Administration. The Similkameen, he indicated, had the biggest file at the BPA! In it was the record of all the comments of agencies since the 1920 construction of Enloe Dam.

In those records we learn that Enloe Dam has been contested by fisheries management agencies since 1920. In Portland, The Department of Commerce's Steve Morris, said that the Similkameen River was more valuable for salmon than electric power.

By 1920, agencies were calculating the losses of salmonids from over-fishing the Columbia River, which they described as catastrophic. All tributaries to the Columbia were looked at for potential to restore salmonids. Enloe Dam, if constructed, should be equipped with fish passage facilites, the Portland office of the National Marine Fisheries Service concluded.

The Similkameen River, NMFS stated, should provide access to migrating salmonids, as well as provide electricity. Thus commenced 20 years of discussion between the Department of Commerce and fisheries scientists at the Bonneville Power Administration (BPA).

A major examination of the potential of the Similkameen, the I.C. Beak study was sponsored by the BPA. (See Attachment No. 1).

Three potential licenses for generating electricity at Enloe Dam have been rejected by FERC because they did not provide for fish passage.

Now we are asking to simply terminate the discussion about generating electicity at Enloe Dam.

Enloe is an old dam, showing visible signs of deterioration. Pictures of the dam face show that concrete has eroded off the face of the dam. The base of the dam has not been examined, although requirements to do so are part of the current license issued by FERC.

In addition, Enloe Dam sits in an active earthquake zone which experienced a major subduction event in 1872, felt in the region for several years. (See Attachment No. 2).

For these reasons — the closure of salmonid habitat in all tributaries except the Okanogan/Similkameen system, the attempts by fisheries agencies to require fish passage at Enloe Dam since it was constructed in 1920, the continuous refusal by the OPUD to consider fish passage at the dam as well as electrical generation, the earthquake potential at the site of Enloe Dam— we ask the PRC to deny further consideration of electrical generation on the Similkameen River.

Thank you for considering my comments,

Geraldine K. Gillespie

Columbia River Bioregional Education Project
aka Columbiana
2055 Chesaw Road
Oroville, WA 98844

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

AUG 2 8 1985

In reply refer to: PJ

To Interested Parties:

In 1983, Bonneville Power Administration (BPA) commenced implementation of Columbia River Basin Fish and Wildlife Program Measure 704(e)(1)A, Enloe Dam Passage. Having completed this report, BPA is now ready to consult with the fish and wildlife agencies and Tribes, prior to funding implementation of passage at Enloe Dam. Enclosed with this letter is the fiscal year 1984 annual report for this project to comply with Program Consultation, Section 1304 (c)(2).

The annual report outlines BPA's implementation activities, addresses issues raised during consultations concerning passage, and reports the findings of a variety of technical investigations. Attention is particularly directed to sections of the report that deal with fisheries' considerations, passage alternatives, water quality, and baseline information for future compliance with the National Environmental Policy Act (NEPA).

To date, BPA has received varying recommendations from agencies, Tribes, and other interested groups regarding a "preferred" mode of passage at Enloe Dam have varied. After review and comment on the report by these entities, BPA will consult with interested parties to arrive at a concensus for a preferred passage alternative.

If you have any questions please call me at (503) 230-5496 or Larry Everson at (503) 230-5199 at your convenience.

Sincerely,

John R. Palensky, Director
Division of Fish and Wildlife

ENLOE DAM PASSAGE PROJECT
ANNUAL REPORT 1984
VOLUME I

Prepared For:

Larry P. Everson
Program Manager

BONNEVILLE POWER ADMINISTRATION
DIVISION OF FISH AND WILDLIFE
1002 N.E. Holladay Street
Portland, Oregon 97232

Project No. 83-477

Contract No. DE-AC79-83BP11902

Prepared By:

M.L. Fanning
Project Manager

IEC BEAK CONSULTANTS LTD.
10751 Shellbridge Way
Suite 120
Richmond, B.C.
Canada V6X 2W8

3711.1 July, 1985

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K. Bauersfeld, Washington Department of Fisheries
E. Garling, Washington Department of Ecology
S. Mitchell, Washington Department of Ecology

British Columbia Government

A. Pelton, B.C. Minister of Environment
B. Marr, B.C. Deputy Minister of Environment
D. Narver, Director, B.C. Fisheries Branch
H. Sparrow, B.C. Fisheries Branch
G. Taylor, B.C. Fisheries Branch
C. Bull, B.C. Fisheries Branch
L. Sunde, B.C. Fisheries Branch
R. Thomas, B.C. Fisheries Branch
I. Withler, B.C. Fisheries Branch
J. O'Riordan, B.C. Planning and Resource Management Division

Canadian Government

J. Fraser, Federal Minister of Fisheries and Oceans Canada
W. Shiners, Director General, Pacific Region, Fisheries and Oceans Canada
F. Fraser, Fisheries and Oceans Canada
G. Hoskins, Fisheries and Oceans Canada
B. Shepherd, Fisheries and Oceans Canada
T. Carey, Fisheries and Oceans Canada

Indian Tribes

J. Meninick, Chairman, Yakima Tribal Council
B. Tuck, Yakima Tribal Council
L. Hatcher, Yakima Tribal Council
A. Aubertin, Chairman, Colville Tribal Council
G. Marco, Colville Tribal Council
J. Smith, Colville Indian Reservation
T. Wapato, Director, Columbia River Inter-tribal Fish Commission
R. Lothrup, Columbia River Inter-tribal Fish Commission
D. Dompier, Columbia River Inter-tribal Fish Commission
A. Heindle, Columbia River Inter-tribal Fish Commission
E. Allison, Chief, Upper Similkameen Band
B. Allison, Chief, Lower Similkameen Band

Public

H. Warner, Manager, Okanogan County PUD
F. Lieberg, Manager, Douglas County PUD
M. Erho, Douglas County PUD
A. Wright, Mid Columbia Public Utility Districts
P. Barrow, Pacific Northwest Utilities Conference Committee
A. Menzies, Penticton Flyfishers
M. Turner, Save Our Similkameen

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ACKNOWLEDGEMENTS

IEC BEAK Consultants Ltd. would like to acknowledge the contributions of a number of individuals that have provided valuable input to this project. Mr. L.B. Everson, BPA Program Manager and M.L. Fanning, IEC BEAK Consultants Ltd. Project Manager provided overall study direction and review.

Special thanks to Washington Department of Game representatives S. Wright, A. Eldred, D. Guffer, K. Williams, J. Foster, S. Miller, B. Crawford, C. Morrill and S. Roberts; B.C. Fisheries Branch representatives D. Narver, C. Bull, G. Taylor, L. Sunde and P. Slaney; Washington Department of Fisheries representatives L. Phinney and K. Hopper; U.S. Fish and Wildlife representative D. Mulcahy; and Water Budget Centre representative C. McConnaha who provided valuable technical input to many fisheries aspects of the report which was prepared by M.L. Fanning, D. Hickey, B. Lister and J. Buell.

Our gratitude is expressed to OTT Water Engineers Inc. staff members R. Ott, G. Lamb, R. Eldridge, C. Smith and their special consultants M. Bell and K. DeRubertis for the conceptual design of passage alternatives.

We would also like to thank K. Ward of BPA who assisted staff members from BEAK Portland (J. Kiel), IEC BEAK Consultants Ltd. Vancouver (W. Morgan) and J. Buell in preparing the NEPA section of the report.

IEC BEAK Consultants Ltd. would also like to thank T. Griffing for his review and editorial contributions to the final report.

Plate 1: ENLOE DAM ON THE SIMILKAMEEN RIVER

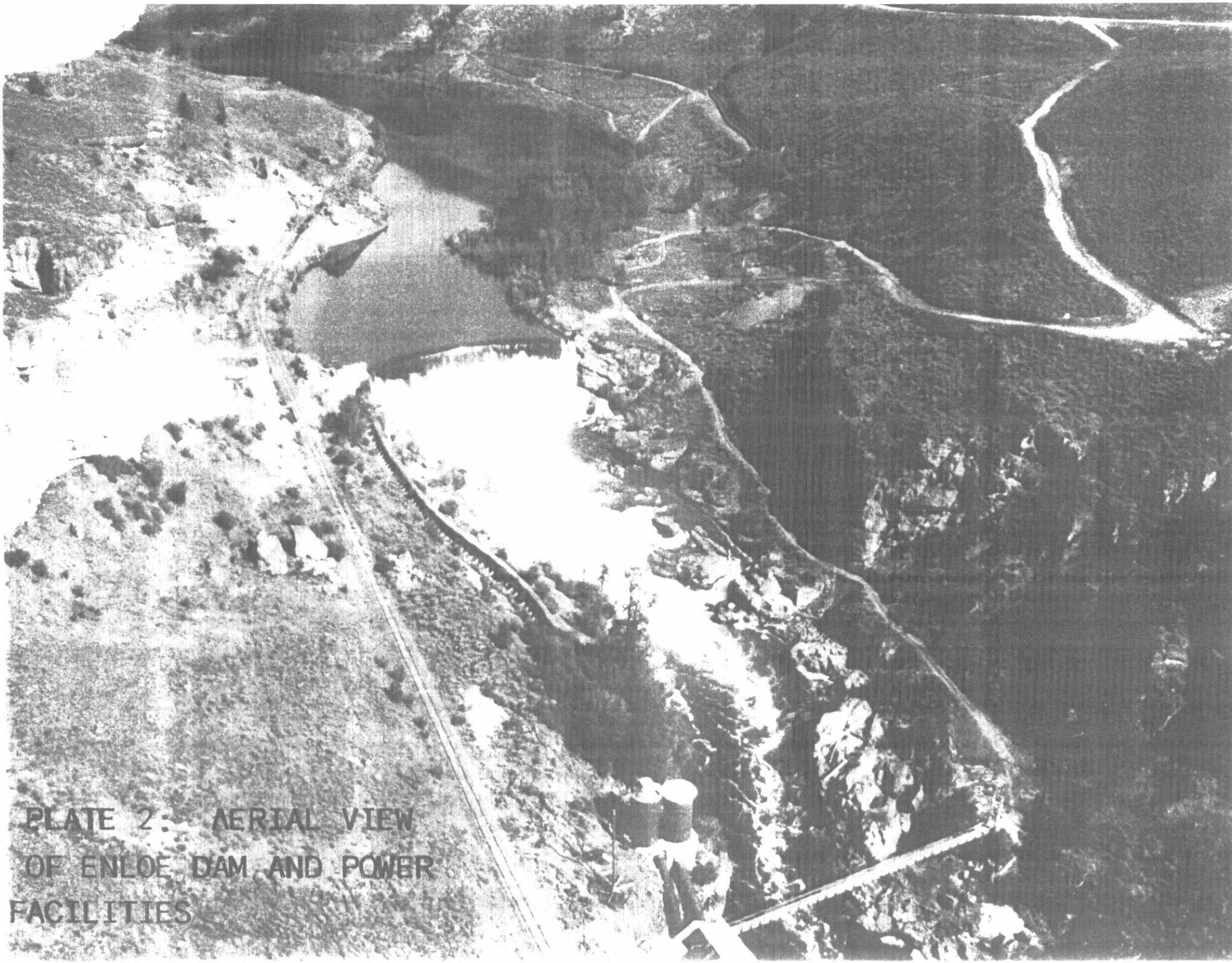


PLATE 2: AERIAL VIEW OF ENLOE DAM AND POWER FACILITIES

1.0 EXECUTIVE SUMMARY

The Northwest Power Planning Council's Columbia River basin Fish and Wildlife Program of 1982 commits measure 704 (e) (i), Table 5 (A) to passage of anadromous fish over Enloe Dam on the lower Similkameen River. Completion of passage and establishment of an anadromous salmonid fish run throughout the more than 320 linear miles of spawning and rearing habitat of the Similkameen basin would be considered as off-site mitigation for juvenile fish losses occurring on the mainstem of the Columbia River.

The Bonneville Power Administration (BPA) is conducting an extensive consultation program with agencies, Tribes and other organizations and groups in both the U.S. and Canada that have an interest in fish passage at Enloe Dam. Part of the response from this consultation program has been the identification of a broad array of issues relating to the feasibility of fish passage and the establishment of anadromous fish in the upper Similkameen basin. It is not the intention of this report to recommend a course of action among the several possible options for fish passage at Enloe Dam and the introduction of anadromous salmonid fish in the upper Similkameen River. Rather it is the intention to report the results of several investigations that address issues that have been raised and to provide an objective analysis of alternative means of fish passage. These issues are addressed in a manner that decision makers may have a more complete understanding of many of the complexities and ramifications that surround their decisions for a future course of action.

IEC BEAK Consultants Ltd. was engaged by BPA in 1983 for a multi-phased plan to conduct certain investigations and to collect information addressing these issues and report on the findings.

The only species of fish being considered for introduction at this time is a summer run of steelhead trout that is well adapted to the upper Columbia basin.

The Similkameen River basin drains an area of approximately 9,600 sq. km (over 3,600 sq. mi) of the eastern slope of the Cascade Mountains along both sides of the boundary between the U.S. and Canada. Of the total basin, 79%, including most of the water courses, lies within Canada. The river empties into the Okanogan River at Oroville, Washington, which in turn enters the Columbia River. Enloe Dam is located 8.8 miles upstream of the Similkameen River mouth and the international border is located at river mile 26.8. Figure 1-1 provides orientation.

Enloe Dam is 54 ft in height and was built of concrete between 1916 and 1923 as a hydroelectric facility but has not been in service since 1959. The dam and powerhouse are owned and were operated by the Okanogan Public Utilities District, who have plans for reactivating the facilities for power generation.

Within the Similkameen basin, most of the population lives in Canada where three communities (Princeton, Keremeos and Hedley) and their outlying agricultural areas represent most of the more than 8,000 residents. Principal economic activities include agriculture, forestry, mining and tourism. The valley of the Similkameen had a significant involvement in the historical development of British Columbia and remains as one of the major transportation corridors between the Pacific coast and the interior.

The hatchery at the Wells Dam on the Columbia River (river mile 515.6) established a stock of summer steelhead trout in the late 1960's from wild summer steelhead stocks that spawned in the mainstem and tributaries of the upper Columbia basin. This stock is the only reasonable choice for summer steelhead introduction into the upper Similkameen and already utilizes the stretch of river below Enloe Dam.

Wells stock adults return to Wells Dam on their upstream migration (passing over a total of 9 dams) between late August and early November with the peak of the run arriving in September and October. Adult size for a 1-ocean fish averages about 62 cm in length and 2.4 kg in weight with 73 cm and 4.0 kg being the average size for a 2-ocean fish. Depending on the year, the run is dominated by 1-ocean or 2-ocean fish. Females are slightly more abundant than males and produce on average about 5,500 to 6,500 eggs each. A small part of the run are captured at the Dam for broodstock each year, but the vast majority spawn freely, particularly in tributary systems. More than 1 million hatchery reared smolts are released annually in April or May and outmigrants move downstream to the estuary of the Columbia before the end of May. A

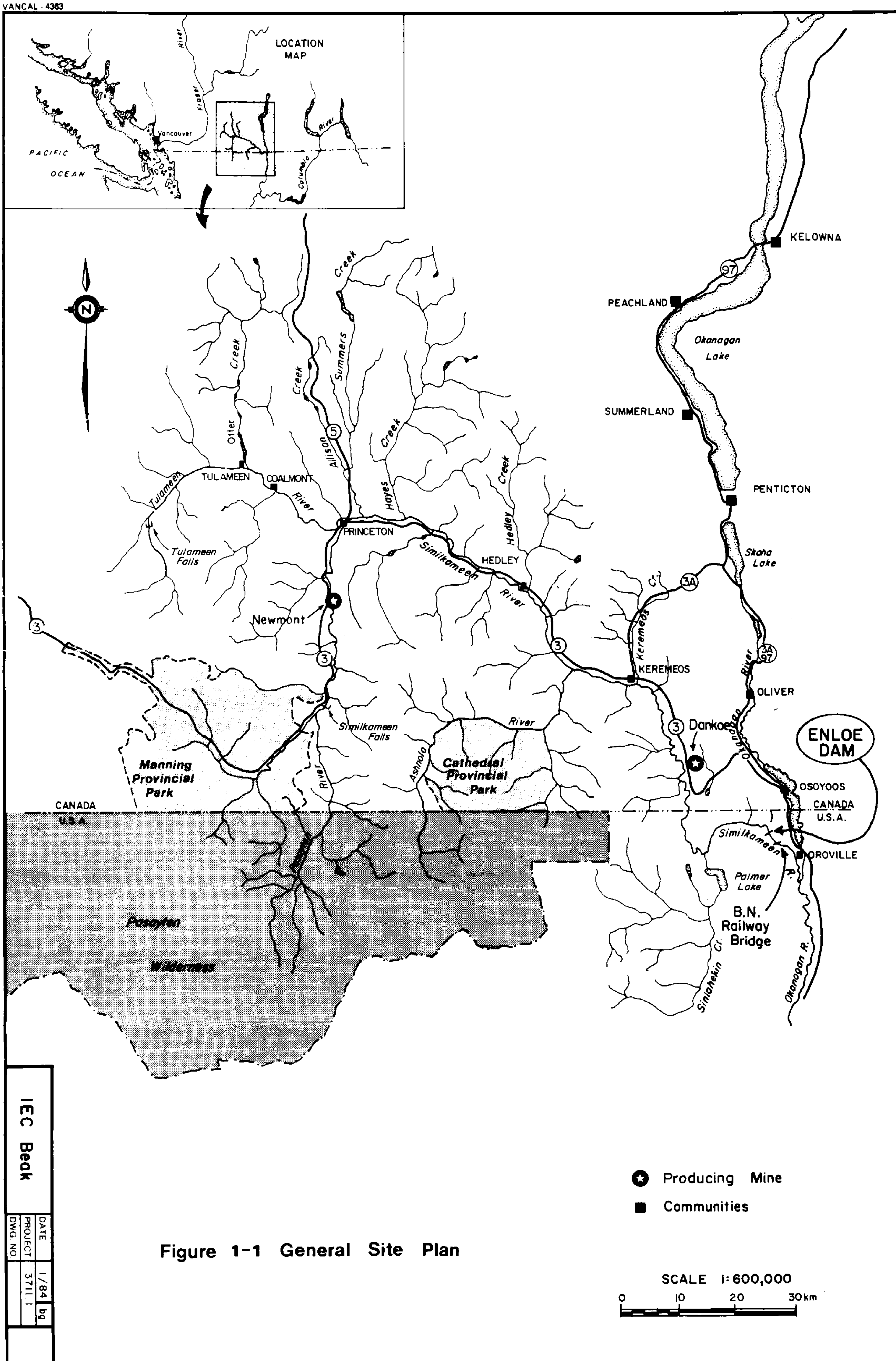


Figure 1-1 General Site Plan

substantial majority of the released smolts residualize in freshwater for periods of 1 to 3 years before undertaking outmigration. The Wells Hatchery stock is not distinguishable genetically from the wild stock spawners. Smolt to adult survival rates have been quite high compared to other upper Columbia basin stocks (in the range of 1.5% - 4.0%) and are improving in recent years. The run returning to Wells Dam has dramatically increased by more than an order of magnitude since 1978 reflecting the runs adaptation to the upper Columbia system, careful hatchery techniques, thorough disease monitoring and a good water source for the hatchery.

Spawning of steelhead at the Wells Hatchery takes place in January and February and rearing to smolt size occurs there as well as at other hatchery facilities in tributary systems. The smolts are released at a wide variety of locations in the upper Columbia basin. At present capacity the Wells Hatchery supplies about 100,000 smolts to the lower Similkameen River, and that capacity will increase to 250,000 with the hatchery expansion scheduled for 1985 or 1986. A vastly greater capacity exists if juvenile fish at younger life stages (ie. fry or parr) were to be the production stage targetted for planting.

The disease history of the Wells summer steelhead stock has been remarkably problem free for an upriver facility. No outbreak of either viral or bacterial diseases has ever occurred and only low and incidental diagnosis of such diseases has occurred while under the scrutiny of a rigorous disease monitoring program. Before fish could be transported into Canada, disease control certification is required as well as obtaining transport permits from appropriate Canadian agencies.

It is expected that the life history and general behaviour of steelhead planted in the upper Similkameen would be similar to that of other upper Columbia River runs; especially that of the Methow River which has very similar basin characteristics and receives Wells Hatchery stock.

Results of an extensive 1983 habitat assessment in the Similkameen River and its tributaries yielded estimates of the capacity of the system to produce steelhead smolts. These estimates ranged from about 400,000 to 700,000 smolts per year. Estimates were also derived of the adult steelhead that would return to the system to spawn using assumptions of average smolt to adult survival rates that have been observed in the upper Columbia River runs (1.5% and 4.0%). The estimates were between 9,100 and 24,000 adult fish. Not surprisingly, estimates of smolt production capacity were not uniform throughout the basin, and over 80% was estimated to originate in the mainstem of the river below Similkameen Falls. Given that adults are most likely to return to spawn in the area where they reared, this same section of the river could expect to receive 80% of the adults that return. The habitat study concluded that rearing habitat, not spawning habitat, was likely to be the factor that is limiting and would therefore establish the upper limit to steelhead trout production in the system.

Based on tests conducted at the falls at White River, Oregon, which have a vertical drop of 140 ft into a plunge pool, it is expected that juvenile mortality would not be excessive from passing over the 54 ft high Enloe Dam on their downstream migration.

An analysis of the existing mortality rates associated with the migration of steelhead was conducted. This addressed the concern that natural production in the Similkameen may have to be continuously supplemented by hatchery production in order to offset migratory mortalities experienced by the fish as they pass over the 9 mainstem Columbia dams plus Enloe Dam. The escapement of adults to the Similkameen River will be determined by the mortality rate per dam and by the rate of exploitation on returning adults. There is evidence that mortality rates are probably in the vicinity of 10% of the smolt population per dam and may have been as high as 15%. For there to be any excess adults available for harvest from a run dependent only on natural production (ie. without hatchery supplementation), the mortality rate must be less than 10% per dam, and in practice would probably have to be in the 5% to 8% range to allow even a modest harvest of 10% to 20% of the returning adults.

A series of projections have been prepared to illustrate how the run would react through time to different rates of exploitation between 0 and 40% and to different losses per dam of either 10% or 15%. A probable scenario for development of the Similkameen River summer steelhead run is presented. It would involve a juvenile loss of 10% per dam, and 10% exploitation below Wells Dam of adults entering the

Columbia River. If 250,000 smolts per year were supplied by the Wells Hatchery and no exploitation of adults occurred above Wells Dam, a spawning escapement of over 15,500 fish could be achieved in years 19 - 24, and natural spawning would be responsible for 71% of the returning adults. If, for the same period of time, an additional 10% harvest of adults (both wild and hatchery origin) were allowed above Wells Dam, the harvest would be about 1,350 fish in years 19 - 24 and the resulting spawning run would be about 12,000 adult fish. These projections serve to illustrate the degree to which harvest rates, mortality rates and rate of hatchery supplementation may be manipulated to achieve a desired run size and desired composition of wild and hatchery spawned fish.

Extending these projections over a fifty year period illustrates that an annual harvest including broodstock could be maintained at levels between 2,000 and 4,000 adult fish at exploitation rates ranging between 10% and 40%.

A benefit analysis was conducted to display the Enloe Dam passage project benefits in terms of present value over a 50 year project life. Monetary value of a sport-caught adult steelhead was placed at $144.00 U.S., and that of a commerical or Indian ceremonial harvested steelhead is $21.81 U.S., and the discount rate used was 3%. The passage project benefits for the three harvest scenarios, using an annual supplementation of 250,000 hatchery reared smolts are:

Harvest	Present Value - U.S. $
10%	$7,215,000
20%	$9,156,000
40%	$11,455,000

The capacity of the Similkameen River and its tributaries to provide suitable spawning substrate and water conditions was estimated from the habitat survey. The total estimated suitable spawning area for steelhead was 961,000 m^2. The spawner capacity was estimated to be about 98,000 steelhead trout for the entire system; of which 54,000 represents the mainstem; 30,000 represents the Tulameen River; 13,000 represents the Ashnola River and 1,000 represents the Pasayten River. The majority of the rearing area for juvenile steelhead was found to occur in roughly the same sections as the majority of the spawning area. Total estimated suitable rearing area for steelhead was in excess of 1.8 million m^2.

The species of resident sport fish with which introduced steelhead trout would most likely compete is the rainbow trout which occur naturally in the Similkameen River system. Several other sport fish species are also present in some sections including mountain whitefish, planted brook trout, cutthroat trout and squawfish. The total population of rainbow trout in the system in 1983 was estimated to be about 143,000, and observed densities were far lower than reported for other B.C. streams. Contrary to what may have been expected, the 1984 creel census indicates that fishing pressure is low and would not account for the very low density and small population size. Low primary and secondary productivity due to low nutrient availability is more likely the cause of observed slow growth, small size range of trout and low population density. Competition between steelhead and rainbow could be expected, but underutilized habitat seems to be available and would tend to lessen the effects of competition. Increased harvest regulations necessary to manage and protect the steelhead would also protect the resident trout and the residualization of steelhead smolts would probably also enhance the trout fishery.

An array of potential and accessable liberation sites for planting the steelhead smolts throughout the basin have been identified and catalogued. It is expected that a liberation strategy of releases throughout the upper Similkameen would enhance the natural homing tendencies of the fish and thus assist in providing a quality fall steelhead fishery by allowing a timely and well dispersed return of adults to the system, while they are still in their most desirable condition for angling. Comparisons of the river characteristics and the steelhead fisheries on other nearby upper Columbia River tributaries supports the notion that a quality fall steelhead fishery can be established on the Similkameen.

Stocking of life stages of steelhead younger than smolts (ie. fry or parr), or establishing low cost rearing facilities in the Similkameen headwaters may be strategies worthy of more in-depth consideration, both from the perspective of cost savings as well as a means of enhancing the quality of the steelhead fishery.

Expansion of the Wells Hatchery is planned, funds have been allocated by the Bureau of Reclamation for expansion and construction is scheduled to begin in 1985 or 1986. This expansion will readily permit the hatchery to provide 250,000 smolts annually for outplanting in the Similkameen system.

In order to assess present angling pressure, the sport fish catch, harvest and angler attitudes about a steelhead fishery, a comprehensive angler survey was conducted in 1984 throughout the Similkameen basin. It was found that angling pressure was light, both in terms of the number of anglers and in hours spent angling; the catch was small, both in numbers and in the size of the fish; the harvest was almost exclusively small sized rainbow and brook trout; the catch per unit effort and harvest per unit effort were discouragingly low; most of the anglers were B.C. residents but were travelling through the basin or were present for primary purposes other than angling; most anglers were in favour of steelhead introductions to the system and most would intensify their angling effort in the system in response to steelhead introductions.

The present harvest of steelhead returning to the Wells Dam is estimated to be divided among three Washington user groups; the recreational fishery is about 8%; the native harvest (mainly incidental) is about 1%; and the incidental commercial harvest is slightly less than 1%. The allocation and management of harvest of upper Similkameen steelhead will have to be designed to accommodate user groups and agency objectives in both B.C. and Washington. The returns and harvest of summer steelhead below Enloe Dam are dramatically increasing as a result of plantings there in recent years.

A profile of disease characteristics was developed for chinook and sockeye salmon which return to the Okanogan River and the lower Similkameen as well as the Wells Hatchery summer chinook stock to provide additional background information concerning the potential of fish disease transmission into the upper Similkameen.

The preferences expressed by agencies, Tribes and other interested organizations concerning the mode of fish passage at Enloe Dam were collected and summarized and reflect a diversity of opinions and considerations. The choices of trap and haul and dam removal were expressed more frequently than was the installation of fish ladders. Significant concern was expressed over the future of hydroelectric power generation on the lower Similkameen.

Six alternatives to provide upstream passage at Enloe Dam were developed to a conceptual level of design, including the categories of fishways, trap and haul systems and dam removal. The generalized layout and locations of these alternatives are diagrammed in Figure 1-2 and include:

1. Fishway from falls (not compatible with power production);

2. Fishway below powerhouse (compatible but some conflicts with power generation);

3. Trap and haul at falls (not compatible with power generation);

4. Trap and haul below powerhouse (compatible but some conflicts with power generation);

5. Trap and haul at railroad bridge (compatible and no conflicts with power generation); and

6. Dam removal (not compatible with power generation)

    a) after dredging trapped sediment; or
    b) natural scouring and release of sediments.

Alternatives 1 and 3 could not function compatibly with power generation because the fish could not be attracted to the fishway entrance. Alternative 6 would result in removal of the power generation option. Alternatives 2 and 4 would reduce the head available for power generation but could function simultaneously with power generation. Alternative 5 has no interaction with power generation. Construction of a barrier dam to deflect the fish would be required for alternatives 2, 4 and 5.

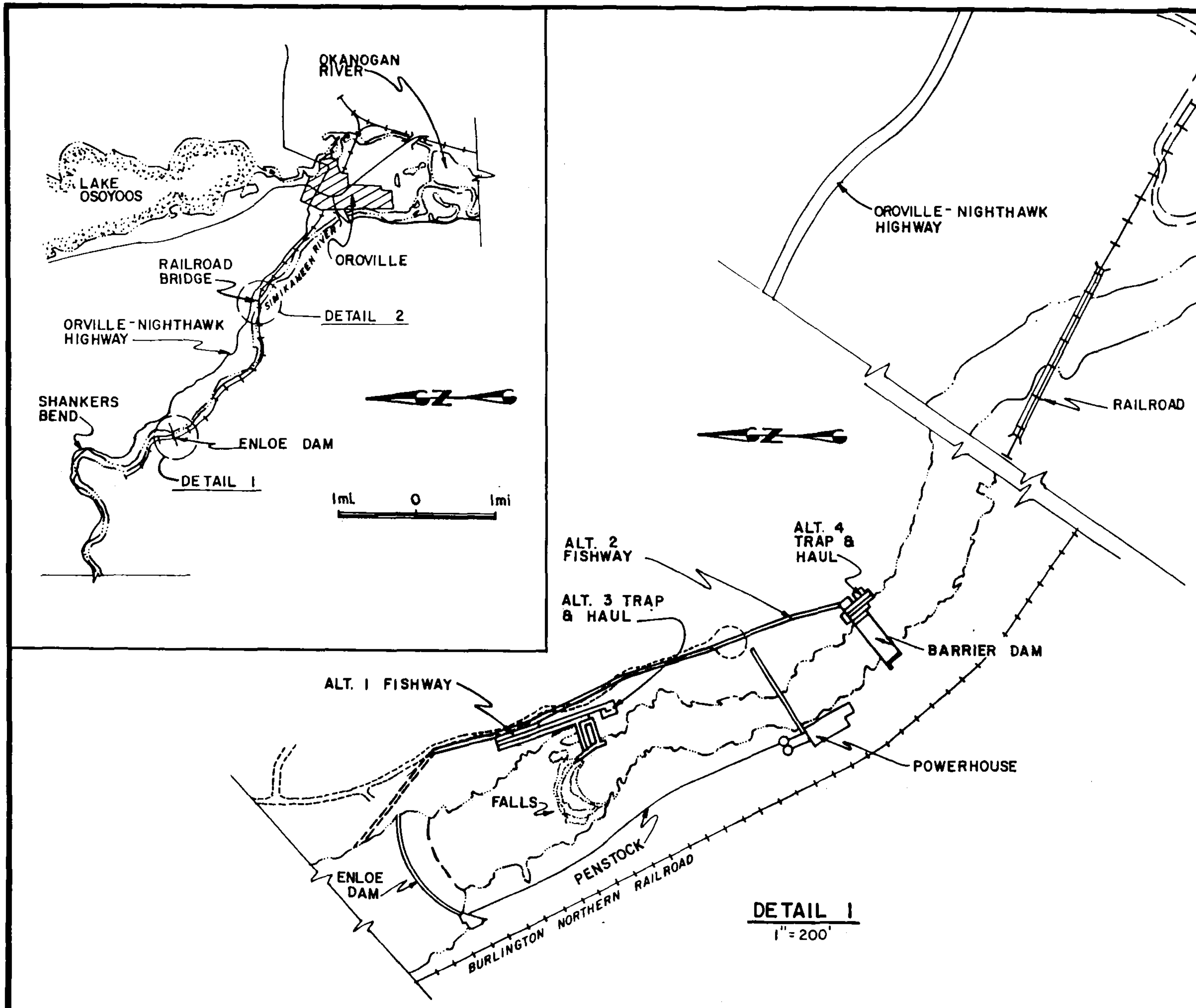


FIGURE 1-2

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVES

DATE JUNE 1985

JOB NUMBER S1030.01

OTT

The key consideration, other than power generation, for alternative 6 (dam removal) is how to deal with the accumulation of the 1.7 million cu yds of sediment deposited behind the dam. Serious hydraulic, flooding and environmental considerations of the downstream river sections are requisite if sediment release is contemplated, otherwise costs associated with dredging and disposal of the sediments are extreme. In either case, a small fishway would also be required to guarantee passage of the falls.

A brief summary of comparative costs of the various alternatives are presented. Annual costs are subjected to present value analysis and included in total costs.

Alternatives	Capital Costs	Total Costs Of Passage Facilities
1 - Fishway - Falls	\$1,787,000	\$2,096,000
2 - Fishway - Powerhouse	\$2,347,000	\$2,656,000
3 - Trap - Falls	\$1,737,000	\$3,611,000
4 - Trap - Powerhouse	\$1,935,000	\$3,809,000
5 - Trap - R.R. Bridge	\$2,101,000	\$3,973,000
6 - Dam Removal		
a) With dredging	\$27,088,000	\$27,371,000
b) Without dredging	\$1,916,000	\$2,199,000

The disbenefits arising from the loss of head for power production in alternatives 2 and 4 are estimated to be about 3.2 and 2.5 million dollars respectively. Detailed breakdowns of costs were developed and are presented in Section 5.2 of the report along with the conceptual designs and descriptions of operation.

A benefit cost analysis was conducted using the adult harvest scenarios of 10%, 20% and 40%, continued supplementation of smolts from Wells Hatchery, the total project costs for the alternative modes of passage, and a project life of 50 years.

The benefit cost ratios are summarized here:

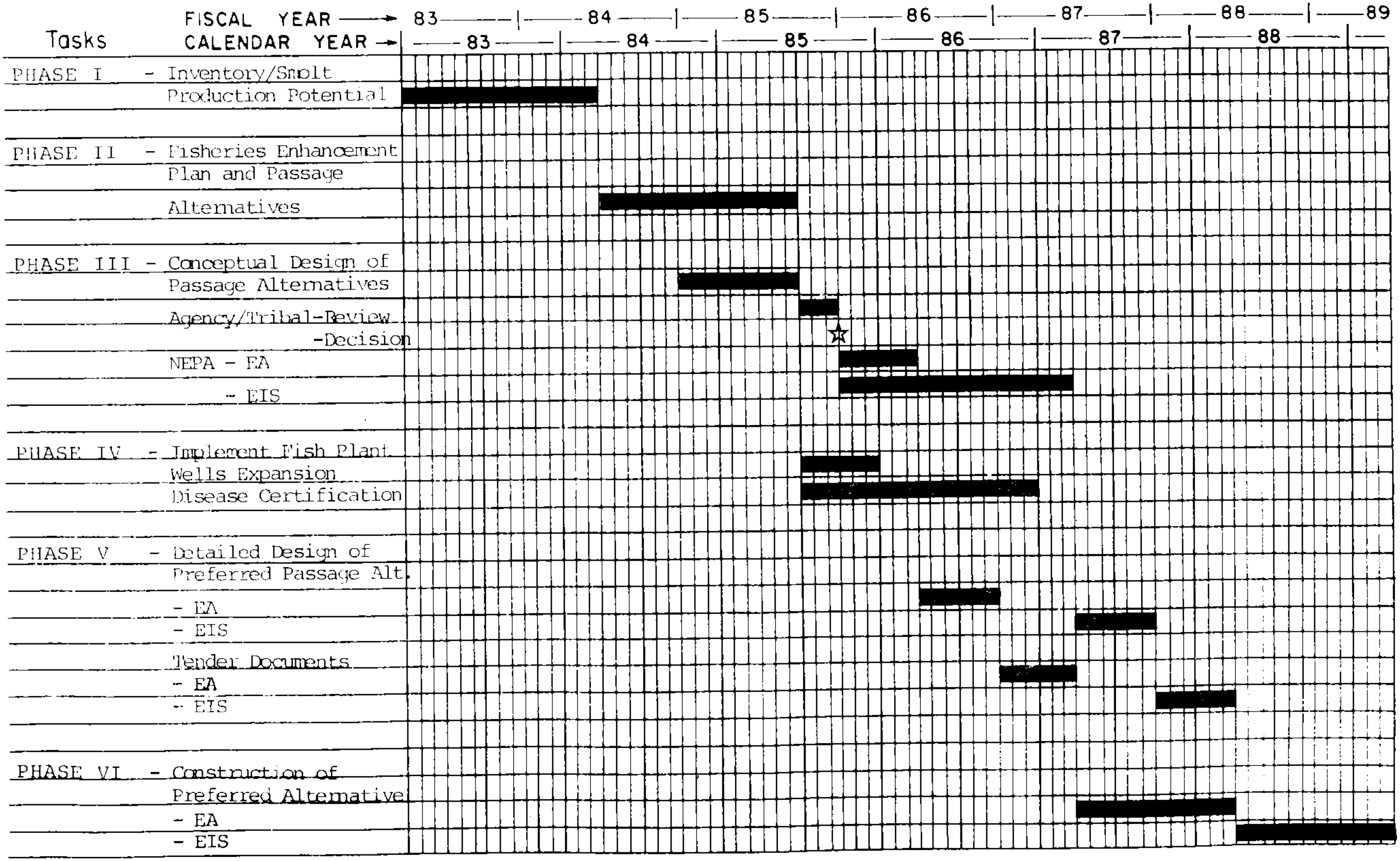
Alternatives	Harvest Rate 10%	20%	40%
1 - Fishway - Falls	1.24	1.58	1.97
2 - Fishway - Powerhouse	0.75	0.95	1.19
3 - Trap - Falls	0.99	1.26	1.58
4 - Trap - Powerhouse	0.73	0.92	1.16
5 - Trap - R.R. Bridge	0.95	1.20	1.50
6a - Removal - dredge	0.23	0.29	0.37
6b - Removal - scour	1.22	1.55	1.94

A preliminary schedule for the fish passage project is presented below (Figure 1-3). Several key milestone events are optimistically accounted for including a possible FERC hearing and the hydropower option, Wells Hatchery expansion and fish disease certification. The fall of 1985 is scheduled for arriving at the decision on the mode of passage.

To address concerns about the water quality in the Similkameen River and its tributaries, an extensive review and summary of existing water quality data from government monitoring agencies was conducted. The large volume of data for the system clearly demonstrates that there are no persistent physical, chemical or microbial characteristics that impose any constraints on introductions or survival of steelhead or other freshwater aquatic organisms to the system. Only occasional minor excursions outside of desirable ranges have occurred at some locations. Nutrient availability is low and may limit aquatic productivity.

A brief review is presented of the U.S., Canadian and international agencies with administrative responsibilities for water resource management in the Similkameen basin.

Figure 1.3
Proposed Project Schedule



As is the requirement for any significant U.S. government action, the NEPA process was begun to assess the potential environmental impacts that would arise from any of the six alternative modes of fish passage over Enloe Dam. At this stage the level of assessment is quite preliminary and is represented in Section 8.0 as basically a scoping document for either an environmental assessment or an environmental impact statement (depending on the severity of the impacts and the nature of the actions).

2.0 INTRODUCTION

In the fall of 1905, the Similkameen Falls Power and Development Company acquired the water rights to the Similkameen River (Bureau of Reclamation, 1976). However, it wasn't until between 1916 and 1923 that the 54 foot high Enloe Dam and hydroelectric facility were constructed by the Okanogan Valley Power Company (Eugene Enloe, President) at river mile 8.8. The rights of this company were subsequently transferred to the Okanogan Public Utility District, the present owner of the dam. Power was generated from the facility until 1959, at which time its operation was deemed economically unfeasible. In 1978, Enloe Dam and its powerhouse were listed on the National Register of Historic Sites (Bureau of Reclamation, 1979).

Since Enloe Dam was not provided with fish passage facilities, discussions among the various Canadian and U.S. agencies on providing passage have occurred since the 1920's without success (Wahle, pers. comm., 1983). The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (the Northwest Power Act) permitted the adoption of recommendations put forth by the U.S. federal and state fish and wildlife agencies, Indian Tribes and other interested parties intended "to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries" (Northwest Power Planning Council, 1982). The Act also gave the Bonneville Power Administration (BPA) the authority and responsibility to use its legal and financial resources "to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project on the Columbia River and its tributaries in a manner consistent with . . . the program adopted by the Council . . . and the purposes of this Act."

As a result of the recommendations requested by the Northwest Power Planning Council, the Council's Columbia River basin Fish and Wildlife Program (1982) commits Measure 704 (e) (i), Table 5(A) to removal or laddering of Enloe Dam, providing access for anadromous salmonids to many miles of spawning and rearing habitat in the upper Similkameen River watershed. Completion of Enloe Dam passage and establishment of an anadromous fish run in the Similkameen River basin would be considered as off-site mitigation for juvenile fish losses occurring on the mainstem Columbia River.

IEC BEAK Consultants Ltd. was engaged by BPA (Contract No. DE-AC79-83BP11902) in 1983 to conduct Phase I of a multi-phase program, intended to achieve the Council's goal of fish passage and anadromous salmonid production above Enloe Dam and fulfill Measure 704 (e) (i), Table 5(A) of the Fish and Wildlife Program.

The first phase, entitled "1983 Similkameen River Habitat Inventory for Enloe Dam Passage (Project 83-477)" is presented in two volumes, the main report (Volume I) and appendices (Volume II).

In fiscal years 1984 and 1985 IEC BEAK Consultants Ltd. was contracted to complete several additional project phases which include:

- Fisheries enhancement plan;
- Conceptual design of passage alternatives; and
- NEPA baseline assessment of passage alternatives

The following report presents the results of studies completed in fiscal years 1984 and 1985. This draft will be submitted in July 1985 to the agencies and Tribes for their review and comments regarding the fisheries enhancement plan and passage alternatives. The final report will be completed by 31 December 1985.

3.0 THE SIMILKAMEEN RIVER BASIN, A PERSPECTIVE

3.1 Overview

The Similkameen River basin drains approximately 9600 sq km of the Pacific Northwest, of which 7600 sq km are located in Canada. Only statistics on the Canadian section of the basin have been used in this brief sketch. This was done for convenience as that data was readily available from Canadian sources, and no simplified and comparable data was equally accessable for the U.S. portion.

From the Cascade Mountains, the Similkameen River flows north through Manning Park to Princeton (Figure 3-1). At Princeton, the Similkameen meets its major tributary, the Tulameen River. It then flows southeasterly to its confluence with the Ashnola River. From this point the river continues to Keremeos and turns south to cross the international border near Nighthawk, Washington. The Similkameen on its final reach flows east for 40 km where it joins the Okanogan River at Oroville, Washington. In total the Similkameen traverses over 200 km from its source to its mouth.

The Similkameen River basin has had a prominent involvement in the historical development of British Columbia. As a consequence of the Oregon Treaty of 1846, all lands south of the 49th parallel came under the jurisdiction of the United States. In response to the need for an all-Canadian route to B.C.'s eastern interior fur trade, the Hudson's Bay Company established a route from Fort Langley to Kamloops in 1849. This new route incorporated the previously unknown headwaters of the Tulameen and Similkameen Rivers. Later in 1860, a route through Allison Pass to the Similkameen valley was developed which was to become the current route of Provincial Highway 3 (Sherwood, 1983).

The Similkameen basin experienced its first major influx of population during the 1850's as a consequence of American placer gold prospectors travelling through the basin to the gravel bars of Yale, Boston Bar and Lillooet on the Fraser River. Cattle ranching was also introduced to the Princeton area during this period while mixed agriculture was begun by the Hudson's Bay Company in Keremeos.

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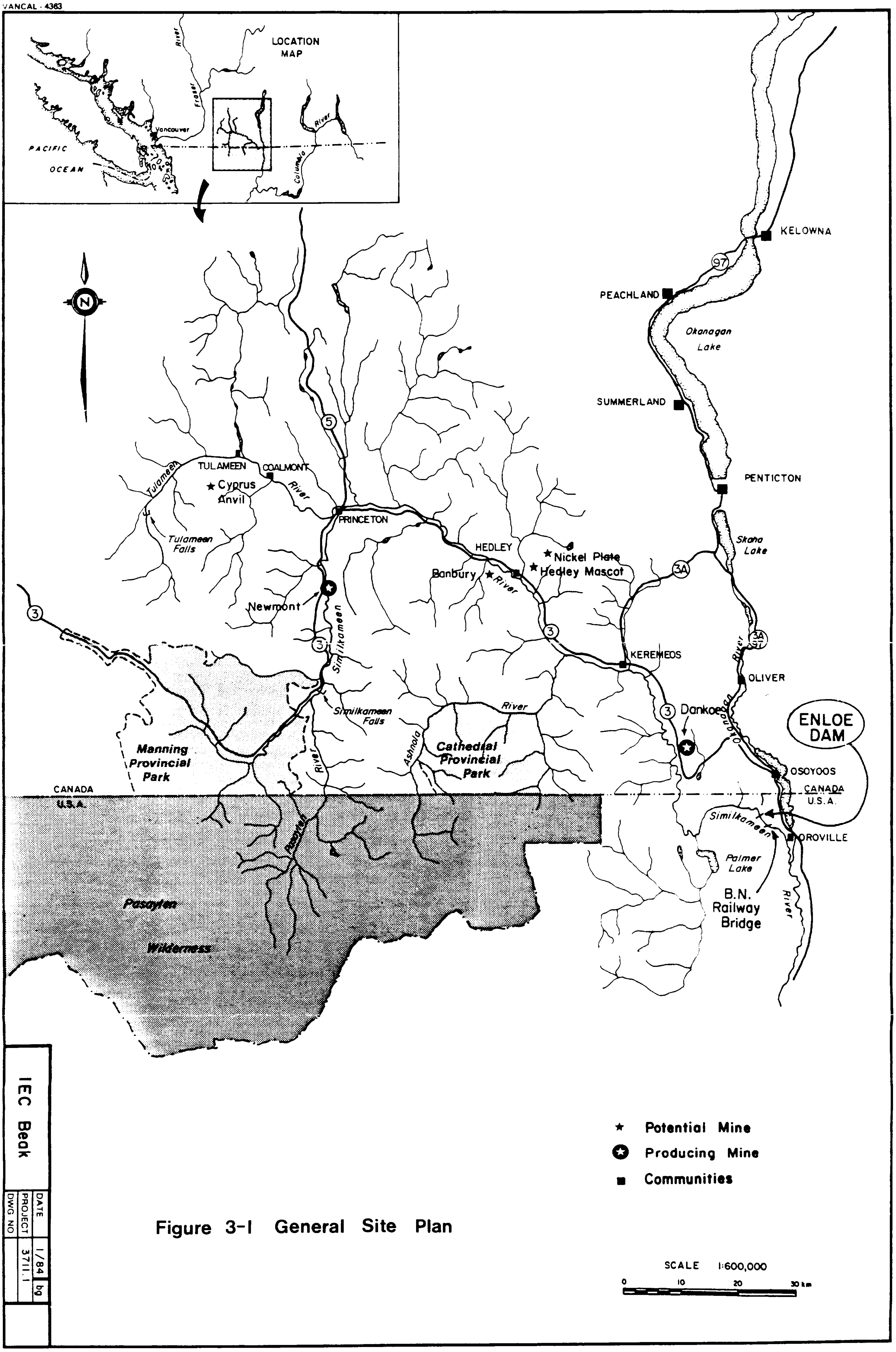

Figure 3-1 General Site Plan

From 1860 to 1870, mining opportunities significantly increased in the area around Princeton. Placer gold was discovered in Granite Creek in 1885 and was later taken from gravel bars along the Similkameen, Tulameen and lesser tributaries. Later in the 1900's two major hard rock mines were established - Copper Mountain (copper) and Hedley (gold).

Since the culmination of World War II, forestry, ranching, agriculture and mining have increasingly developed. These activities complemented by recreation/tourism as a consequence of the opening of the Hope-Princeton Highway (Provincial Highway 3) in 1949 are the key determinants of land use in the Similkameen River basin today (Sherwood, 1983).

3.2 Population Characteristics

According to the report by the Ministry of Environment (1984), Statistics Canada established the 1981 interim population for the basin to be 8,160 people which is a 6.2 percent increase over 1976 compared to a general provincial increase of 10.1 percent. Within the basin those areas dependent on mining or forestry (Princeton and Hedley areas) show greater population fluctuations than those agricultural areas around Keremeos and Cawston which tend to be more stable (Sherwood, 1983). Growth in the Princeton area is projected at 1.1 percent per year compared to 1.5 percent in the Keremeos area.

The labour force in the Princeton area is over 2,000 people which is the largest in the basin. The chief sources of employment are: agriculture, forestry, mining, the provincial government and the Princeton School District. In Keremeos, the labour force is employed chiefly in agriculture related to fruit farming and ranching.

Two Indian Bands have a total of 22 reserves in the basin. The Upper Similkameen Band has an on-reserve population of 33 and the lower Similkameen Band has 179 individuals on-reserve and 31 off-reserve. The Bands are involved in a limited amount of ranching, farming and logging (Sherwood, 1983). Total reserve land for the two Bands is approximately 14,200 hectares. The majority of these lands are located downstream of Hedley.

3.3 Agriculture

Historically, fur trading, mining and the railway provided the original impetus for the development of agriculture in the Similkameen basin. By 1930, cattle ranching had developed in the Princeton area, while the Similkameen valley south of Hedley had become an important tree fruit producing region. Higher yields resulted after World War II with the introduction of intensified orchardry practices and other technological advances. Today, agriculture is ranked as one of the most important industries in the basin in terms of employment and value produced. In addition, agriculture provides important secondary economic activities including processing, packing, cold storage, shipping and service related industries (Sherwood, 1983). Between 1971 and 1981 there has been an increase in the number of farms from 284 to 350. The increase is due to growth in the number of fruit and vegetable, poultry and dairy farms. The number of farms classified as producing cattle have remained unchanged while field crop operations declined (Ministry of Environment, 1984).

The southern Similkameen valley is one of the hottest and driest areas in Canada. The valley produces such crops as apples, cherries, apricots, plums, peaches, melons, grapes, tomatoes, onions, sweet corn and cucumber. Vegetable production has recently declined due to high packaging and transportation costs, and a decline in the acreage of most fruit trees (except cherries and apricots).

Grape production has also become prominent during the 1970's in the Cawston-Keremeos-Oliver-Osoyoos region. The future promotion of small cottage wineries may provide an incentive to small growers to improve their stock and expand acreage. Five commercial vineyards currently operate.

The most significant limitations to agriculture in the basin are adverse topography, lack of rainfall, stoney soil as well as the low moisture-holding capacity of the soil. These limitations are however counter-balanced by the long frost-free growing seasons and warm summer temperatures which characterize the basin. Most of the arable land is found in valley bottoms (Ministry of Environment, 1984).

Ranching constitutes the second most important agricultural activity in the basin. The larger areas of open and semi-open grasslands found at lower elevations in the basin provide ideal range for cattle. As a consequence of logging at higher elevations, summer range lands are also expanding. The Hereford cattle and race horses raised in the Princeton area have a notable reputation in both B.C. and Alberta. The general outlook for the beef cattle industry is for higher prices which will provide incentives for producers to expand their herds. Such expansion opportunities will however, be moderated by a shortage of groundwater for irrigation and spring range (Ministry of Environment, 1984).

3.4 Forestry

Forestry has historically constituted a major element of the economy of the basin. Originally in the 1800's, local mills supplied rail ties for the construction of the Canadian Pacific Railway. As in the case of agriculture, World War II provided a major impetus for the technological advancement of small log harvesting and milling in southern B.C. Today forestry and related industries is the region's major employer (Sherwood, 1983).

The basin lies in the southwestern corner of the Kamloops Forest Region which contains two Public Sustained Yield Units (PSYU) - Similkameen and Ashnola. Approximately 80 percent of the Similkameen PSYU is forested and most of this forested land is productive. It should be noted that less than 20 percent is considered good site and 54 percent is considered medium site. Dominant species in the Similkameen PSYU are: spruce, lodgepole pine, Douglas fir and balsam. While 70 percent of the Ashnola PSYU is productive forest, less than 1 percent is classified good site and 28 percent is considered medium site. The major species logged in the Ashnola PSYU is lodgepole pine, and to a much lesser extent Douglas fir and balsam (Sherwood, 1983).

The largest employer in the region is Weyerhauser Canada Ltd. which operates a sawmill in Princeton with over 350 employees. This particular mill produces over 195 million board feet annually. Also, several smaller mills operate in the basin and supply assorted lumber products to local markets. There are no definite plans for construction of a pulp or groundwood mill in the basin over the next decade (Ministry of Environment, 1984).

3.5 Mining

The Similkameen basin is part of a highly mineralized area which contains several commercial deposits of copper, gold, silver, lead and zinc as well as reserves of low-sulphur thermal coal in the Tulameen area. Currently, there is only one major producing mine located at Copper Mountain and operated by Newmont Mines Limited. The re-activated Copper Mountain property is located on the east side of the Similkameen River while the existing concentrator is on the west side. Ore is now carried across the canyon by a suspension bridge to the concentrator. Mine tailings are slurried back to a pond on the east side. Water is reclaimed and pumped back for reuse at the concentrator. The present operation involves three open-pits with annual production of about 7 million tonnes. Reserves estimated at the end of 1980 are about 120 million tonnes which are adequate for approximately 20 additional years of production. The operation employed 225 people after a lay-off in 1982 (Sherwood, 1983).

The Norm Silver property, operated by Dankoe Mines Limited has historically been a small but notably producing mine. The mine was started over 80 years ago, producing silver, gold and some lead and zinc. The mine has been in production intermittently in recent years.

A mine that appears to be close to production is the gold property near Hedley held by Banbury Mines Limited. In addition, Mascot Gold Mines and GM Resources have undertaken considerable exploration and development work at their Nickel Plate Mountain property since the early 1970's. The Global/Cominco property near Summers Creek is reported to be a fairly significant deposit of copper. In the late 1970's exploration and planing was active on the Cyprus-Anvil Tulameen thermal coal project. Over the last several years this activity has subsided and nothing is known regarding future plans for the deposit.

3.6 Tourism, Recreation and Parks

Tourism in the Similkameen region was originally facilitated by the opening of the Hope-Princeton Highway in 1949. For many tourists, the Similkameen valley constitutes a route from the coast to other destination points in southern B.C. and Alberta. As a consequence, much of the tourist service industry caters primarily to the overnight trade. Summer tourist activities can now include hiking, camping, canoeing, nature observation, fishing, horse riding, hunting, rockhounding as well as visiting historical sites. In the winter, the basin offers such opportunities as alpine skiing, snowmobiling and nordic skiing (Sherwood, 1983).

The basin offers many wilderness campsites, commercial resorts, motels, trailer parks and private campgrounds along the highway. There are two lodges along the Hope-Princeton Highway, Manning Park Lodge and Gateway Lodge. Cathedral Lakes Resort Ltd. operates a lodge and cabins on Quiniscoe Lake in Cathedral Provincial Park. Provincial parks in the basin offer camping facilities for the vehicle camper while less developed facilities are provided by the Ministry of Forests in backroad areas (Sherwood, 1983). Manning Provincial Park has special facilities for visitors interested in nature observation during summer months (Outdoor Recreation Council of B.C., 1984). There are over 100 lakes in the Princeton area and over half are regularly stocked with rainbow trout (Outdoor Recreation Council of B.C., 1984).

Many of the ridges at upper elevations are ideal for horseback riding and a significant number of backcountry trails are available. The upper ridges surrounding Princeton also provide some good hunting terrain. Game animals in the basin include whitetailed deer, mule deer, elk, black bear, mountain goats, moose, grouse and ptarmigan (Outdoor Recreation Council of B.C., 1984).

There are ten provincial parks in the basin. Manning Park is the largest, most accessible and popular of the parks in the region with 70,000 hectares and is equipped for numerous tourist attractions. Cathedral Provincial Park is approximately half the size of Manning and is located in the Okanogan Range. The remaining parks are much smaller and are spread about the basin.

4.0 FISHERIES CONSIDERATIONS

It is not the intention of this report to choose among the several possible options for anadromous fish introductions to the upper Similkameen River. Rather it is the intention to report the results of several investigations that address issues of concern that were raised in the consultative program with the various agencies and Tribes with interests in these matters. The report attempts to address these issues in such a manner that decision makers may have a more complete understanding of some of the ramifications and complexities that surround their decisions regarding a future course of action.

In this section of the report information and analysis is presented on the Wells Hatchery summer steelhead stock, including its characteristics, availability and disease history as well as estimates of steelhead production potential in the river, juvenile mortality, adult return rates, harvest, escapement and supplemention with hatchery smolts, run strength projections and benefits. In addition, considerations are presented that deal with stocking strategy, adult migration timing and potential sport fishery, harvest management and a disease profile of other anadromous fish stocks in the area.

4.1 Description Of The Wells Hatchery Summer Steelhead Stock

When initial considerations were emerging for the introduction of steelhead trout to the Similkameen River above Enloe Dam it became apparent that the most promising source of a stock would be from the Wells Hatchery. The basic reasons were potential availability, general genetic history, present and historical distribution, and the absense of other stocks that met these general criteria in either the U.S. or Canada. This general impression was confirmed in consultation with specialists in the U.S. and Canadian agencies and thus a more detailed assessment of the Wells stock was undertaken. This section reports the findings of that assessment.

Relevant information on the Wells Hatchery summer steelhead stock is contained in a BPA publication entitled, "Columbia River Anadromous Salmonids, Volume III - Steelhead Trout", prepared by the Oregon Department of Fish and Wildlife, the

Washington Department of Fisheries, the Washington Department of Game and the Idaho Department of Fish and Game (1984a). For more detail on the information presented, please refer to the above publication.

4.1.1 History Of The Stock

The Wells stock was developed in the early 1960's at the Wells Hatchery located at Wells Dam on the Columbia River (RM515.6). Eggs were formerly collected at Priest Rapids Dam (RM397) and Wells Dam from wild summer steelhead stocks destined primarily for spawning areas above Priest Rapids Dam. Additional collections were made from Skamania and Yakima stocks (S. Roberts, pers. comm., 1983). Since 1974, fish have been collected at Wells Dam and spawned at Wells Hatchery.

4.1.2 Stock Characteristics

Wells stock adults migrate over Bonneville Dam from July through September, pass Priest Rapids Dam between mid-August and mid-October and reach Wells Dam between late August and early November. The peak of the run at Wells Dam occurs in September and October (K. Williams, pers. comm., 1984).

Wells stock summer steelhead return to the upper Columbia River predominantly as 1- and 2-ocean adults averaging 61.9 and 72.9 cm in length and 2.4 and 4.0 kg in weight, respectively. In several age composition studies conducted from 1978 to 1982, only 2 life history categories were identified. They were found to be age 1.1 and 1.2. A study by Williams (1984b) determined 14.5% of the returning hatchery adults had residulized in freshwater for at least 1 year following their release. He suggested the previous age analyses were incorrect in classifying all steelhead with freshwater ages of 2 or more years as wild-origin. He also noted that two 3-ocean fish he identified were the first observed in the Wells stock and were likely the product of abnormally low marine growth rates. No repeat spawners have ever been found among Wells steelhead sampled above Priest Rapids Dam.

The variable dominance of 1- versus 2-ocean return is characteristic of the Wells stock. The factors responsible for this variation are presently unknown but appear to be independent of flow conditions.

The male/female ratio of the Wells stock is 0.95 (47.5:52.5). In 1978, a 2-ocean dominant run, 139 females spawned at Wells Hatchery averaged 6,795 eggs per female while in 1979, a 1-ocean dominant run, 185 females averaged 5,458 eggs per female.

Wells stock juveniles are released in late April and early May at a size of 11-15 per kilogram. The peak movement of smolts over Priest Rapids Dam occurs in mid-May and Wells outmigrants typically arrive at the Columbia River estuary by the end of May.

Of the hatchery-origin adults returning in 1982, 86% reared in freshwater for one year while the remainder residualized in freshwater for an additional 1 to 3 years. The lower Methow River and Wells Reservoir are believed to be the principal areas utilized by residual Wells stock juveniles.

Loeppke et al. (1983) investigated eight enzyme systems of both hatchery and wild Wells stock spawners and guardedly concluded that the two stocks were genetically indistinguishable. Their conclusion is reasonable considering that some wild fish are used as broodstock at Wells Hatchery and that Wells stock steelhead likely interbreed with wild fish in the natural environment. It should be noted however, that tissue sampling for electrophoresis was biased toward the early portion of the run, and some fish identified as wild-origin may have been residual hatchery steelhead that had spent at least 2 years in freshwater prior to outmigrating. These factors, in addition to the fact that wild broodstock at Wells Hatchery tend to be brighter and later maturing than hatchery fish, indicate that the Wells Hatchery stock may differ in certain genetic characteristics from upriver wild stocks.

4.1.3 Present Status Of The Stock

The summer steelhead rearing and release program at Wells Hatchery has been extremely successful despite the nine mainstem dams that the fish must pass (K. Williams, pers. comm., 1984). A good water source, careful hatchery techniques, thorough disease monitoring and genetic adaptation to the remaining accessible portion of the upper Columbia River are major factors contributing to this stock's success.

The adult returns to Wells Dam have increased since 1978 from about 1600 to over 20,000 in 1983 and 17,000 in 1984 (Table 4-1). Because of the success at Wells Hatchery, it provides sufficient eggs to several Columbia River system facilities to annually release approximately 1,000,000 summer steelhead smolts.

Data for steelhead returns to Wells Dam from smolts released above Wells indicate that fishing rates of between 20 and 68 percent (of fish counted at Wells Dam) have occurred (Table 4-2). This harvest has not hindered hatchery acquisition of broodstock or the provision for increasing escapement. Smolt-to-adult survival rates of smolts planted upstream of Wells Dam presented in Table 4-3 are quite high (2.92 in 1978) in comparison to other upriver stocks, especially during recent years of favourable river flows in the Columbia River. Smolt to adult survival rates averaged 1.52% for the period 1972 to 1981. The percent return rate for 1982, based on the 16,443 1-ocean component returning in 1983 is expected to exceed 4.6%.

4.1.4 Hatchery Production

The spawning of summer steelhead at Wells Hatchery begins in early January, peaks in late January-early February and is completed by early March. Wild fish are often included as broodstock, but they tend to ripen later than hatchery fish.

Steelhead spawned at Wells are reared at Chelan Falls, Leavenworth, Naches and Lyons Ferry hatcheries in addition to Wells. Approximately 1.1 million Wells smolts are released annually.

4.1.5 Availability

The Wells Hatchery has planted summer-run steelhead trout in the Similkameen River in the early 1970's and in 1983, 1984 and 1985. The hatchery presently has the capability of supplying approximately 100,000 steelhead smolts annually for planting in the Similkameen River (K. Williams, pers. comm., 1984). Wells Hatchery also has the ability to provide a much greater number of juveniles at other life stages such as fry or parr if the rearing of the fish to smolt size is not required.

TABLE 4-1
Counts of Adult Steelhead at Wells Dam, Washington, 1978-1984

YEAR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	TOTAL
1978	177	32	12	399	432	528	---	1580
1979	72	2	22	1212	938	1040	355	3641
1980	202	24	15	382	1404	1358	413	3798
1981	139	23	107	623	1902	1401	513	4708
1982	149	7	67	1042	2766	3733	730	8494
1983	26	2	135	1891	11368	5294	1327	20043
1984	153	32	766	5024	7235	3298	778	17286

Note: Approximately 95 percent of the run over the Wells Dam is of hatchery origin.

Source: Unpublished data obtained from Ken Williams, Washington Department of Game (1985).

TABLE 4-2
Harvest, Escapement and Fishing Rate Above Wells Dam of Summer Steelhead Trout, 1967-1983

Year	Dam Count	Catch: Methow	Okanog.	Similk.	Wells Pool	Total	Escapement	Fishing Rate (%)
1967	1410	212	100	24	116	452	958	32
1968	2175	428	22	0	235	685	1440	32
1969	1464	199	0	0	109	308	1156	21
1970	1588	358	29	7	196	590	998	37
1971	3777	764	70	27	419	1280	2497	34
1972	1876	588	14	8	332	932	944	50
1973	1832	565	4	14	310	893	939	48
1974	479	62	2	0	34	98	381	20
1975	516	109	2	0	60	171	454	33
1976	4643	1616	8	0	886	2510	2133	54
1977	5324	1773	9	0	972	2754	2570	52
1978	1580	636	4	0	349	989	591	63
1979	3641	1170	10	0	641	1821	1820	50
1980	3426	1501	0	10	823	2334	1092	68
1981	4097	1674	3	0	265	1942	2155	47
1982	7929	1529	6	13	2124	3672	4257	46
1983	19413	5824	34	17	4640	10464	8949	54

Source: Unpublished data obtained from Ken Williams, Washington Department of Game (1985).

TABLE 4-3
Smolt-to-Adult Survival Rates of Wells Stock Steelhead Juveniles Planted Above Wells Dam, Washington, 1972 through 1981

Release Year	Smolts Released	1-Ocean Component	2-Ocean Component	Total Return	Percent Survival
1972	327,902	1,451 (1973)	569 (1974)	2,020	0.62
1973	146,880	170 (1974)	134 (1975)	304	0.21
1974	182,111	608 (1975)	1,046 (1976)	1,654	0.91
1975	249,279	3,934 (1976)	1,364 (1977)	5,298	2.13
1976	238,405	4,321 (1977)	1,665 (1978)	5,986	2.51
1977	172,978	271 (1978)	160 (1979)	431	0.25
1978	164,259	3,848 (1979)	950 (1980)	4,798	2.92
1979	268,252	2,848 (1980)	4,415 (1981)	7,263	2.71
1980	471,420	332 (1981)	7,412 (1982)	7,744	1.64
1981	358,234	1,107 (1982)	3,610 (1983)	4,717	1.32
1982	354,436	16,443 (1983)			
1983	494,784				
1984	492,558				
				Mean	1.52

1 Unpublished data obtained from K. Williams, Washington Department of Game (1985).

With a proposed expansion of the Wells Hatchery, slated for 1985 - 86, the number of smolts available to the Similkameen River could reach 250,000 (K. Williams, pers. comm., 1984). The programming of hatchery production to produce more fry or parr would also be possible.

4.1.6 Suitability

The Wells Hatchery summer steelhead stock has been successful since its development in the late 1960's. The original broodstock was from stocks that were destined to spawn upstream of Priest Rapids Dam and are therefore suitably adapted to the environmental conditions of the upper Columbia River.

The Wells Hatchery is the furthest upstream hatchery facility in the Columbia River (RM 515.6) and despite the travel distance and the eight other mainstem dams the fish must pass, the run has been building. It is obvious that the donor stock for the Similkameen River must have these traits if a Similkameen River run is to be successfully initiated.

The genetic composition and fitness for the upper Columbia River region and the exceptional disease history, along with the availability of juveniles for stocking, confirms that the Wells summer steelhead stock is the most suitable candidate to be the donor stock for the Similkameen River. In addition, the economics and logistics of transporting juveniles from Wells Hatchery are the most favourable since it is the closest hatchery facility to the Similkameen River basin.

4.2 Stocking History Of Wells Hatchery Steelhead Stock

Juveniles of Wells Hatchery summer steelhead trout are reared at Wells, Chelan Falls, Leavenworth, Naches and Lyons Ferry hatcheries in Washington State (ODFW, WDG, WDF and IDFG, 1984a). Approximately 1.1 million Wells smolts are released annually from these facilities. The Methow and Similkameen Rivers receive a total of 450,000 smolts from Wells Hatchery. The Wenatchee and Entiat Rivers receive 250,000 smolts from Chelan Falls Hatchery (RM 503). The Wenatchee River also periodically receives 100,000 fish from the Leavenworth National Fish Hatchery (on the Icicle River, a

Wenatchee River tributary). The Walla Walla, mainstem Snake, Tucannon and Grande Ronde Rivers and Asotin Creek receive a total of 300,000 smolts from Lyons Ferry Hatchery (Snake RM 63). Other tributaries to the Columbia River in Washington State which have received Wells stock smolts since 1970 include the Big White Salmon, Washougal and Yakima Rivers and Crab and Foster Creeks (ODFW, WDG, WDF and IDFG, 1984a). The Wells stock is, therefore, distributed in the Columbia River from the Big White Salmon River (Columbia RM 168.3) upstream to the Grande Ronde River (Snake RM 168.9) and in the Similkameen River, a tributary to the Okanogan River (Columbia RM 533.5).

A summary of the summer steelhead stock plantings from the Wells Hatchery since 1972 are presented in Table 4-4.

4.3 Disease History Of Wells Stock

The disease history of the Wells summer steelhead stock could be characterized as problem-free until 1983 and 1984 (Roberts, 1985, Appendix 3). Infectious pancreatic necrosis (IPN) virus has been detected at a low level (less than 1%) at the Wells Hatchery during the two-year period (ODFW, WDF, WDG and IDFG, 1984). Tag data suggests that the infected fish were not of Wells origin. All eggs from the infected fish were destroyed. Production fish at Wells Hatchery have never been diagnosed as carriers of IPN. In addition, no IPN outbreaks have ever occurred at the Wells Hatchery or any other Washington Department of Game hatchery (Roberts, 1985, Appendix 3). Bacterial kidney disease (BKD) has also been isolated from smolts at a low level. The spore stage of Ceratomyxa shasta has been observed in adult summer steelhead but the infective stage has not been found in the upper Columbia River system (Roberts, 1985). No outbreaks of bacterial diseases have ever been diagnosed at Wells Hatchery (Roberts, 1985, Appendix 3). Viral disease tests in 1985 on Wells summer steelhead were negative (Hopper, 1985).

TABLE 4-4
Summary of Wells Summer Steelhead Stock Plantings
From Wells Hatchery, 1972-1984

Year		Released	Stream
1972		197,745	Methow River
		12,334	Similkameen River
		117,823	Okanogan River
	Total	327,902	
1973		28,330	Columbia River (Chelan)
		118,550	Methow River
		47,666	Okanogan River
		4,386	Similkameen River
	Total	146,880	
1974		38,038	Columbia River
		144,073	Methow River
	Total	182,111	
1975		31,857	Columbia River
		2,110	Foster Creek
		215,072	Methow River
		20,050	Below Bonneville
		15,075	Washougal River
	Total	284,404	
1976		36,514	Columbia River
		201,891	Methow River
		23,825	Below Bonneville
		14,471	Washougal River
	Total	276,701	
1977		147,922	Methow River
		25,056	Ringold
	Total	172,978	
1978		60,903	Columbia River (Turbine Study)
		23,767	Columbia River
		59,145	Methow River
		20,444	Methow River (Control)
		19,295	Ringold
		20,056	Below Bonneville (Barge)
		19,466	Below Bonneville (Truck)
	Total	223,076	

TABLE 4-4 (Continued)
Summary of Wells Summer Steelhead Stock Plantings From Wells Hatchery, 1972-1984

Year		Released	Stream
1979		64,884	Columbia River
		183,955	Methow River
		19,413	Methow River (Control)
		10,326	Bonneville (Truck)
		18,489	Bonneville (Barge)
	Total	297,067	
1980		268,371	Columbia River (Turbine Study)
		23,505	Columbia River
		179,544	Methow River
	Total	471,420	
1981		358,234	Methow River
1982		15,016	Chewack River (Methow system)
		299,414	Methow River
		25,004	Methow River (Test)
		25,036	Columbia River (Priest Rapids)
		15,002	Twisp River (Methow System)
	Total	379,472	
1983		16,368	Chewack River (Methow system)
		13,086	Columbia River
		20,259	Methow River (Control)
		328,444	Methow River
		16,988	Twisp River
		99,639	**Similkameen River**
		22,379	Columbia River (Priest Rapids)
	Total	517,163	
1984		19,995	Chewack River
		14,336	Twisp River
		356,134	Methow River
		76,080	**Similkameen River**
		24,923	Columbia River below Priest Rapids (Water Budget)
	Total	491,468	
1985		55,534	**Similkameen River**
		36,000	Columbia River (Priest Rapids)
		326,687	Methow River
		36,990	Columbia River (at Wells Hatchery)
	Total	455,211	

Source: Unpublished data obtained from Ken Williams, Washington Department of Game (1985).

4.4 Life Histories Of Other Upper Columbia River Summer Steelhead Stocks

The life histories and general behaviour of other upper Columbia River wild summer steelhead stocks may be useful in predicting how steelhead trout planted in the Similkameen River system might behave. The three river systems in the upper Columbia River drainage nearest to the Similkameen River are the Wenatchee, Entiat and Methow. The life histories of the wild steelhead runs to these systems is presented in a BPA publication entitled "Stock Assessment of Columbia River Anadromous Salmonids, Volume III - Steelhead Trout (ODFW, WDF, WDG and IDFG, 1984a). Table 4-5 presents a summary of the information available on these three stocks.

It is evident, from the data available, that the life histories of the upper Columbia River stocks are almost identical. Exceptions which occur include the variable dominance of 1- or 2- ocean returns and the larger percentage of age 3 and 4 juvenile outmigrants from the Methow River. The reason for the variable dominance of ocean residency is unknown (K. Williams, pers. comm., 1983). However, the additional freshwater rearing time may be attributable to the cold, unproductive water in the Methow River drainage (K. Williams, pers. comm., 1983).

It is reasonable to expect that the general behavior and life history of Similkameen River steelhead trout would follow closely those of other upper Columbia River runs, especially the Methow River whose physical characteristics most closely resemble portions of the Similkameen River. Further evidence for similar life histories stems from the origin of the Wells Hatchery stock which was developed in the late 1960's from wild summer steelhead stocks destined to spawn upstream of Priest Rapids Dam. Some of the original stock that were used to establish the Wells Hatchery stock could have been wild fish from any one or all three of these rivers and also likely from the Columbia mainstem. It is felt that these up-river stocks are most likely to be the best suited for the present conditions prevalent in the accessible upper Columbia River basin.

TABLE 4-5
Life History Summary for Upper Columbia River Wild Summer Steelhead Stocks

Stock	Entry Timing				Spawning Timing			Age at Maturity (%)			Juvenile Migration Timing			Age at Migration (%)			Length at Outmigration (mm)
	Columbia River	Home Stream Start	Home Stream Peak	Home Stream End	Start	Peak	End	1-Ocean	2-Ocean	3-Ocean	Start	Peak	End	2	3	4	
Wenatchee River (wild)	June-Aug.	mid-Aug.	late Sept.	early Nov.	Mar.	early May	June	65	32	3	early Apr.	early May	mid-June	87	13	-	170-200
Entiat River (wild)	June-Aug.	mid-Aug.	late Sept	early Nov.	Mar.	early May	June	88	12	-	mid-Apr.	-	early June	100	-	-	170-200
Methow River (wild)	June-Aug.	mid-Aug.	-	early Nov.	Apr.	-	May	-[a]	-[a]	-	Apr.	mid-May	early June	71	25	4	170-200

[a] 1-ocean/2-ocean dominance often occurs.

Source: ODFW, WDF, WDG and IDFG, 1984a.

4.5 Estimated Summer Steelhead Production For The Similkameen River

The intention of this assessment was to provide estimates of what the Similkameen River and its tributaries would be capable of producing in the way of summer steelhead smolts and returning adults.

Steelhead trout production estimates were determined following an extensive habitat assessment in 1983 (IEC BEAK Consultants Ltd., 1984) and by application of the Slaney Steelhead Production Model (Slaney, 1981). The model was used to predict both mean annual smolt yield/m^2 and mean adult steelhead return for each river reach within the study area. The rates of 1.5% mean and 4.0 % maximum smolt-to-adult survival rates were used to bracket the adult returns to be expected for the number of smolts produced. These survival values were derived from observed rates of Wells Hatchery stock in the Methow River by Washington Department of Game (K. Williams, pers. comm.,1983).

An additional method for calculating potential production estimates was utilized. This method involved using the spatial requirements of juvenile steelhead, ranging from 14.49 m^2 for age class 1+ to 26.14 m^2 for age class 2+ juveniles (Reiser and Bjornn, 1979). The spatial requirement was then divided into the total (gross) wetted stream area to obtain the number of smolts that could be produced from the system. Adult returns were also calculated using 1.5% and 4.0% smolt-to-adult survival rates.

The Slaney Steelhead Trout Model predicts that a total of 609,600 smolts would be produced by the Similkameen River study area. The main adult return, at 1.5% smolt-to-adult survival, would be 9,150 and at 4.0% survival, 24,400.

Slaney's model predicts that over 33% (205,021) of the steelhead smolts produced in the entire drainage would be produced in the mainstem Similkameen River, between Keremeos and Princeton, B.C. Almost 80% (475,347) of all the steelhead smolts produced in the system would emanate from the Similkameen River below Similkameen Falls. Of the remaining smolt production, a predicted 9% (55,337) would be produced from the Tulameen River, 4% (26,199) from the Ashnola River, 4% (21,842) from Sinlahekin Creek (Palmer Lake system), 3% (17,152) from the

Similkameen River above the falls and 2% (11,441) from the Pasayten River. A total production of 28,593 (5%) smolts is predicted from Similkameen River system above Similkameen Falls.

Adult steelhead escapement to the Similkameen River was estimated from the number of smolts determined by Slaney's model and using smolt-to-adult survival rates. Using the number of smolts predicted by Slaney's model, and applying a 1.5% smolt-to-adult survival rate, the estimated number of adults returning to the Similkameen River would be 9,150. Seventy-one hundred of these fish, almost 80% of the total run, would return to the area downstream of the Similkameen Falls. Of the approximately 830 steelhead adults predicted to return to the Tulameen River, almost half of these would return to the first reach, near Princeton, B.C. About 390 steelhead would return to the Ashnola River, with the majority of these moving up into the higher reaches. Sinlahekin Creek would have an estimated adult return of 328. A predicted 258 steelhead adults would return to the Similkameen River, above the falls, distributed evenly throughout all reaches. Of these only an estimated 171 adults are predicted to return to the Pasayten River.

During an exceptional year, with 4.0% smolt-to-adult survival, close to 20,000 adult steelhead would be expected to return from smolts produced in the Similkameen River below the falls. There would be an almost 167% increase in adult returns in the entire system if smolt-to-adult survival increased from 1.5% to 4.0%. A total of approximately 24,400 spawners would return to the whole system.

In addition to the steelhead model calculations, steelhead smolt production was estimated by dividing the spatial requirements of age class 1+ and 2+ smolts, 14.49 m^2 and 26.14 m^2, respectively (Reiser and Bjornn, 1978) into the total area of the Similkameen River system assessed (10,402,947m^2). The range of optimal production was calculated to be from 397,970 to 717,940 smolts. This range is based only on the habitat that was assessed during the 1983 field season, therefore, these calculations do not take into account the minimum 98 miles (160 km) of the Similkameen River system that has not be assessed.

The estimated range of adult returns using these smolt production estimates would be between 5,970 and 10,769 steelhead at 1.5% smolt-to-adult survival. At 4% smolt-to-adult survival, this range would be from 15,919 to 28,718.

It was estimated in the habitat study that rearing habitat is the limiting factor that will establish the upper limit to steelhead trout production in the Similkameen River (IEC BEAK Consultants Ltd., 1984a).

4.6 Estimated Juvenile Passage Mortality Over Enloe Dam

To date, no downstream migrant studies have been conducted to determine mortality of steelhead smolts passing over the 54 foot high Enloe Dam on the Similkameen River. In the absence of power generation at Enloe (it ceased in 1959), juvenile mortalities that would result from passing over the dam could be considered similar to passage over a natural falls. Results from tests for White River, Oregon during high flows (300 to 600 cfs) in 1983 and 1984 indicated juvenile steelhead had 100 percent survival after passing over White River Falls, a drop of 140 feet into a plunge pool. It is reasonable to assume that juvenile mortalities at Enloe Dam would not be excessive for similar conditions.

4.7 Adult Return Rate Estimates

During seaward migration as juveniles and their return as adults, Similkameen River steelhead would encounter a total of nine hydroelectric dams on the Columbia River mainstem, in addition to Enloe Dam on the Similkameen River. Because of the mortalities associated with fish passage at these dams and their associated reservoirs, it must be questioned whether or not natural production of steelhead in the Similkameen River could be be self-sustaining at this time. It is prudent, therefore, to consider supplementing natural production with plants of hatchery-reared juveniles. The purpose of this study, as requested by Washington Department of Game, was to determine through mortality analysis the probable requirement for hatchery supplementation of natural steelhead production.

The study utilized existing information provided by the Washington Department of Game and other agencies involved in fishery resource investigations on the Columbia River.

Requirements for hatchery supplementation are expressed throughout this report as the number of yearling hatchery smolts. Though under-yearling juveniles may be utilized to some extent for the Similkameen project, the lack of information on their survival to adult return precluded consideration of under-yearling stocking in this study.

The analysis required information on the following primary subjects:

1. survival of hatchery-reared smolts from release to adult escapement;

2. the potential productivity of steelhead spawning naturally in the Similkameen River, i.e. the expected number of adults produced per spawner without the influence of dams; and

3. the rates of loss attributable to dams, including losses incurred on both the juvenile and adult migrations.

Information on points (1) and (2) was available for the analysis, but data on losses attributable to dams were extremely limited, particularly for mid-Columbia steelhead. This data gap necessitated development of a range of possible scenarios concerning rates of loss per dam, and exploitation by sport and Indian fisheries.

The following sections explain the derivation of the above parameters and the principal calculations employed.

4.7.1 Adult Returns per Spawner

The starting point was the development of an expected average return rate for natural spawning without losses related to dams. The adult return rate per spawner was calculated from data for mid-Columbia summer steelhead prepared by Washington Department of Game for presentation to Federal Power Commission proceedings (A. Eldred, pers. comm., 1985). These data span the 1950 to 1973 brood years and include estimates of wild steelhead escapements over either Priest Rapids or Rock Island Dams, as well as estimates of commercial and sport fishery harvests of mid-Columbia steelhead in the lower Columbia River (Table 4-6). A graphical plot of adult return against parent escapement shows considerable variability and no clear relationship (Figure 4-1). This reflects, at least partly, the decline in returns per spawner after the 1958 brood year, when successive construction of the Priest Rapids, Rocky Reach, Wanapum and Wells dams affected an increasing portion of the steelhead spawning and rearing habitat in the Columbia River mainstem.

Spawning escapements to the mid-Columbia also increased in the 1960's. This increase in spawners combined with the loss of mainstem habitat likely caused the pronounced decline in return per spawner through the 1960's (Figure 4-2). For this reason, only adult return rates for the first 9 brood years (1950-1958) have been used to develop an average return per spawner for use in the Similkameen analysis.

Adult returns per spawner from the 1950-1958 broods averaged 3.2:1. The highest return rates, 4.5:1 and 7.0:1 from the 1950 and 1956 broods respectively, were produced by the lowest escapements. As these high values tend to skew the distribution of return rates, the median return rate (2.7:1) was considered to be a more appropriate measure of central tendency in the data. For this analysis, however, a conservative value of 2.5 adult returns per spawner was adopted. The rationale for this choice is discussed later in the section.

Return rates of mid-Columbia steelhead are somewhat lower than those reported for all Columbia River steelhead stocks above Bonneville Dam, most of which were destined for the Snake River system (Chapman et al., 1982). As with mid-Columbia stocks, no clear spawner/recruit relationship is apparant in Columbia summer steelhead data, especially when brood years affected by McNary and The Dalles Dams (1951-1958 broods) are removed. The average and median pre-McNary return rates for all Columbia stocks, i.e. 1938-1950 broods, were 3.3 and 3.4:1 respectively. In comparing these return rates to those of mid-Columbia stocks it should be noted that

TABLE 4-6
Spawning Escapements and Subsequent Adult Returns of Wild, Summer Steelhead to the Mid-Columbia River Area 1950-1973 Brood Years[a]

Brood Year	Spawning Escapement[b]	Adult Return[c]	Return per Spawner
1950	2261	10226	4.52
1951	3591	4671	1.29
1952	3693	8745	2.37
1953	4986	13349	2.68
1954	6614	9790	1.48
1955	4780	14567	3.05
1956	2180	15302	7.02
1957	4885	14070	2.88
1958	7498	17039	2.27
1959	5077	9008	1.77
1960	7614	12764	1.68
1961	8625	18665	2.16
1962	8401	11013	1.31
1963	8581	16067	1.87
1964	5422	8531	1.57
1965	8321	6989	0.84
1966	4960	14217	1.19
1967	6166	6959	1.13
1968	7978	8502	1.07
1969	5377	1677	0.31
1970	4475	148	0.03
1971	8938	6058	0.68
1972	4558	4796	1.05
1973	5322	1950	0.37

a Source: A. Eldred, Biologist, Washington Department of Game, Wenatchee.

b Number of adult steelhead passing Rock Island or Priest Rapids dams, minus sport fishery harvest upstream of these sites.

c Rock Island or Priest Rapids dam counts plus commercial and sport fishery harvest downstream from these sites 5 years after brood year.

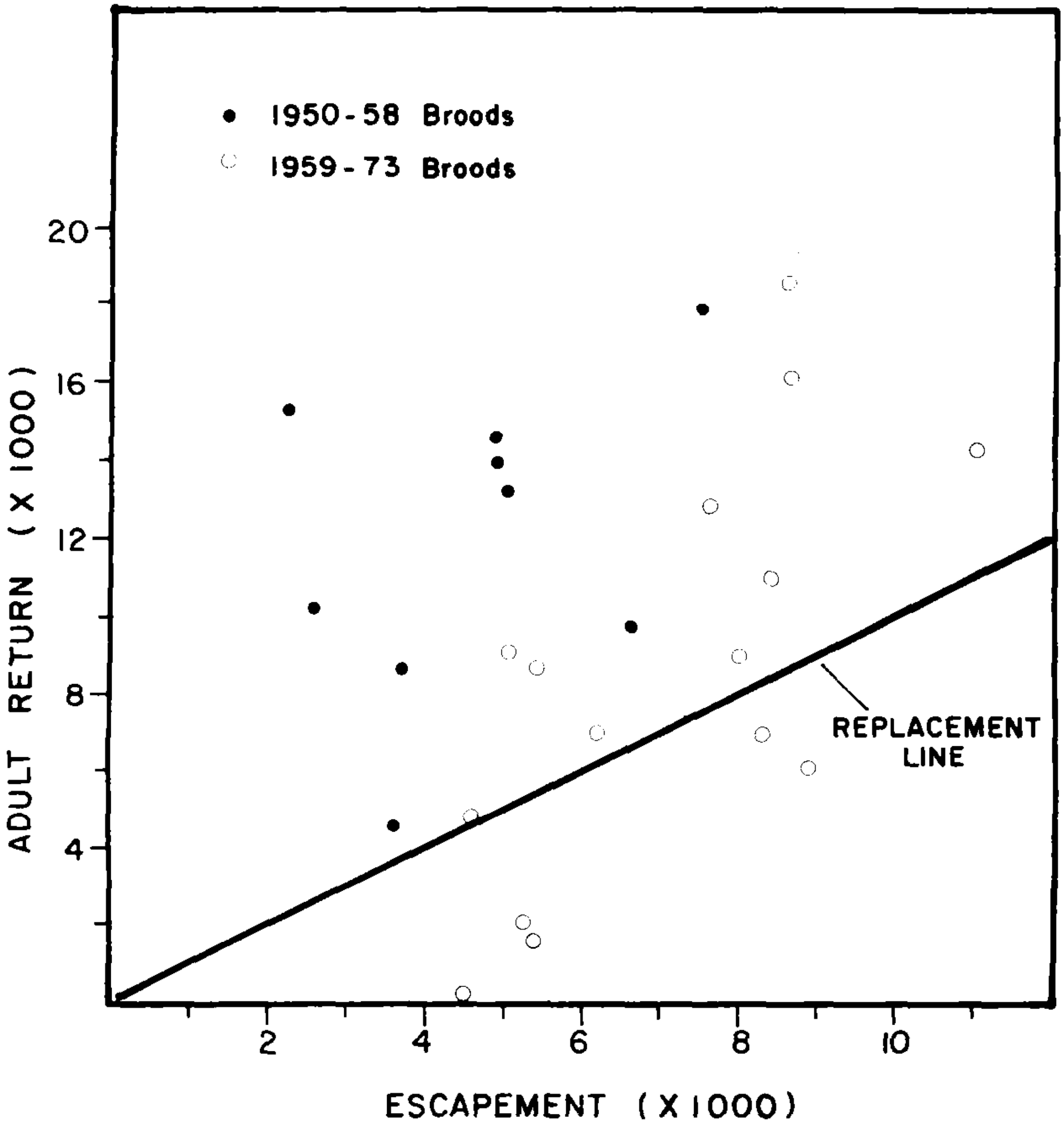

FIGURE 4-1 Relationship between parent escapement and adult return for mid-Columbia summer steelhead, 1950-1973 broods. Data from A. Eldred, Washington Department of Game, Wenatchee.

beak	DATE		
	PROJECT	3711.1	
	DWG. NO.		

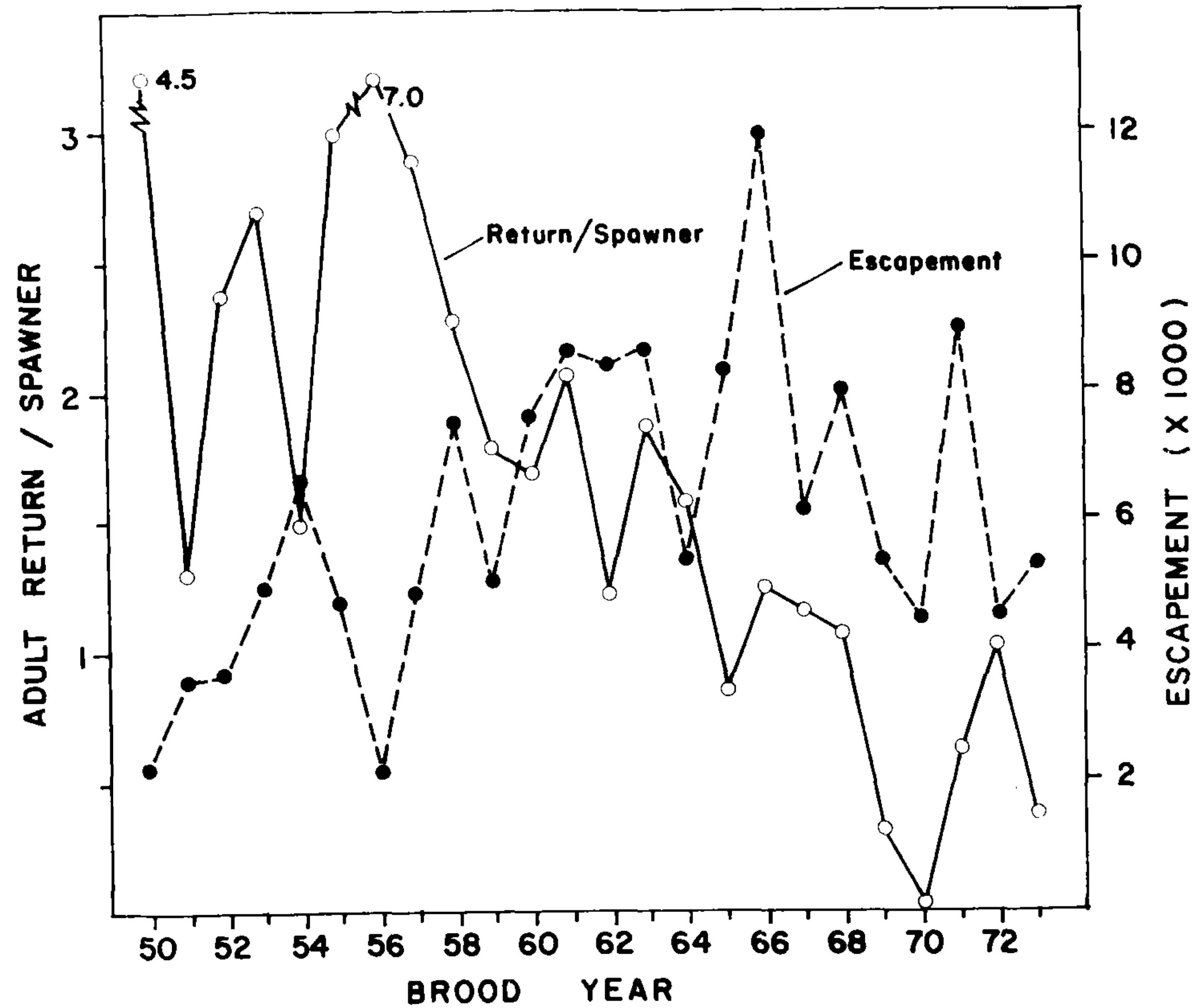

FIGURE 4-2 Trend in escapement and subsequent adult return per spawner for mid-Columbia summer steelhead, 1950-1973 broods. Data from A. Eldred, Washington Department of Game, Wenatchee.

DATE	
PROJECT	3711.1
DWG. NO	

the data base for the latter group came from the post-McNary period (1950-1958 broods).

Selection of a conservative return rate (2.5:1.) for natural spawning in the Similkameen reflects the fact that:

1. Initial returns to the river will not be fully adapted to the new spawning and nursery conditions;

2. Productivity or fitness of Wells stock, which has been subjected to hatchery propagation for 3 generations, will probably be lower than that of a comparable wild stock (Reisenbichler and McIntyre, 1977); and

3. Fry-to-smolt mortality may be higher than normal, because the relatively short growing season in the Similkameen will likely result in an average 3 years rearing before smolt migration, compared to the 2 year average in more southerly mid-Columbia tributaries.

With respect to point (2) there is already evidence of selection for early spawning timing, perhaps inadvertant, in the Wells steelhead stock (K. Williams, pers. comm., 1984). It is this characteristic which is believed to be largely responsible for reduced fitness of hatchery steelhead stocks in the Kalama River (Chilcote et al., 1984).

Initial returns of steelhead to the Similkameen River will experience relatively low spawning and juvenile rearing densities. The positive effects of low density on egg-to-smolt survival will offset, to some extent, the influence of the factors discussed above.

4.7.2 Hatchery Smolt Survival

The average smolt-to-adult survival rate was derived from Wells Hatchery data for the release years 1972 to 1981 (K.Williams, pers. comm., 1985). Over this period, returns of 1-ocean and 2-ocean steelhead to Wells Dam averaged 1.51% of smolts released (Table 4-7). These returns to Wells Dam are not the total returns to the upper Columbia River as they do not include interceptions by the Indian or sport fisheries downstream of Wells Dam.

In Section 4.7.3 below it is estimated that a smolt survival rate of 1.5% represents a loss per dam of approximately 12%. To calculate the smolt survival rates corresponding to losses of 10% and 15% per dam, the scenarios used later in this report, the following relationship was used:

$$\text{Smolt Survival Rate} = \frac{\text{Total survival rate at X\% loss/dam}}{\text{Total survival rate at 12\% loss/dam}} \times 1.51$$

The calculated smolt-to-adult survival rates for losses of 10% and 15% per dam are therefore as follows:

$$\text{10\% Loss Per Dam} \quad \frac{0.387}{0.326} \times 1.51 = 1.79\%$$

$$\text{15\% Loss Per Dam} \quad \frac{0.230}{0.326} \times 1.51 = 1.07\%$$

4.7.3 Losses Related To Dams

No data are available on total dam-related losses of mid-Columbia steelhead, including both the smolt and adult migrations. However, limited data have been obtained on steelhead smolt losses attributable to the 5 mid-Columbia dams (Wells, Rocky Reach, Rock Island, Wanapum and Priest Rapids). Preliminary results from a 1984 investigation by the Water Budget Centre with Wells Hatchery smolts indicated an average loss of 9.4% per dam for the 5 dams in the mid-Columbia reach (C. McConnaha, pers. comm., 1985). Conditions for smolt migration were considered to be relatively good in 1984. A steelhead smolt transport study (C. Morrill. pers. comm., 1985), comparing survival to adult return from Wells Hatchery smolts released below Priests Rapids Dam (transport group) and in the Methow River (control group), indicated losses per dam of 7% and 20% in 1982 and 1983 respectively (Table 4-8).

TABLE 4-7
Adult Returns and Survival Rates of Hatchery-Reared Summer Steelhead Smolts Released from Wells and Skamania Hatcheries, 1972-1981

		Wells Hatchery[a]				Skamania Hatchery[b]		
		Adult Returns[c]						
Smolt Release Year	No. of Smolts Released	1-ocean	2-ocean[d]	Total	Survival (%)	No. of Smolts Released	Adult Returns (2-ocean)	Survival (%)
1972	327,902	1451	518	1969	0.60	129,250	4095	3.17
1973	146,880	170	122	292	0.20	100,200	4402	4.39
1974	182,111	608	952	1560	0.86	103,740	4897	4.72
1975	249,279	3934	1241	5175	2.08	99,320	6399	6.44
1976	238,405	4321	1515	5836	2.45	100,045	6072	6.07
1977	172,978	271	146	417	0.24	116,349	3989	3.43
1978	164,259	3848	865	4713	2.87	115,110	5662	4.92
1979	268,252	2848	4018	6866	2.56	114,896	7911	6.89
1980	471,420	332	6745	7077	1.50	98,434	5041	5.12
1981	258,234	1107	3285	4392	1.70	127,407	1573	1.23
				Mean	1.51		Mean	4.63

a Source: K. Williams, Biologist, Washington Department of Game, Brewster.

b Source: B. Crawford, Biologist, Washington Department of Game, Vancouver.

c Returns to Wells Dam. Total does not include contributions to sport and native fisheries downstream of Wells Dam.

d Annual return equals total 2-ocean fish minus 9% to account for estimated portion of wild 2-ocean fish.

e Annual total return to Washougal River, including returns to hatchery and sport catch, minus 6.6% to account for estimated portion of wild fish. All Skamania stock return after 2-ocean years.

TABLE 4-8
Adult Returns from Releases of Wells Hatchery Steelhead Smolts to Determine Effects of Truck Transport on Survival, and Indicated Rates of Loss Per Dam[a]

Release Year	Release Site [b]	Adult Returns To Bonneville Dam [c]	
1982	Below Priest Rapids (Transport Group)	308	Survival ratio (Control/Transport) = 216/308 = 0.70 Indicated survival per dam (5 dams) = $\sqrt[5]{0.70} = 0.93$ Loss per dam = 1 - 0.93 = 0.07
	Methow River (Control Group)	216	
1983	Below Priest Rapids (Transport Group)	210[d]	Survival ratio (Control/Transport) = 67/210 = 0.32 Indicated survival per dam (5 dams) = $\sqrt[5]{0.32} = 0.80$ Loss per dam = 1 - 0.80 = 0.20
	Methow River (Control Group)	67[d]	

a Adult return data were provided by C. Morrill, Washington Department of Game, Olympia.

b Equal numbers of smolts were released in each group.

c Returns to points upstream of Bonneville Dam were excluded from the calculations because of the possible effect of straying on recoveries from Transport Groups.

d Returns include only the 1-ocean fish in 1984.

For purposes of this analysis, an estimate of average loss per dam was derived by comparing the smolt-to-adult survival rate of Wells Hatchery stock with that of a lower Columbia River summer steelhead stock (Skamania Hatchery on the Washougal River) not directly affected by mainstem dams. During the 10-year period of comparison, the 1972 to 1981 release years, smolt-to-adult survival rates of the Wells and Skamania stocks averaged 1.51% and 4.63% respectively (Table 4-7). The basic assumption was that the difference in average survival rates for the 2 hatchery stocks represented the effect of dams on the smolt and adult migrations. Based on this assumption, average survival rate and loss per dam may be calculated as follows:

$$\text{Proportionate loss related to dams} = \frac{0.463 - .0151}{.0463} = 0.67$$

Proportion surviving the effects of all dams = 1 - 0.67 = 0.33

Indicated survival per dam (9 dams) = $\sqrt[9]{0.33}$ = 0.88

Estimated loss per dam = 1 - 0.88 = 0.12

An important underlying assumption is that Wells and Skamania Hatchery smolts are of similiar quality, i.e. have the same survival potential under comparable conditions. There are apparently no comparative data on quality of Wells and Skamania Hatchery smolts (S. Roberts, pers. comm., 1985). However, it is conceivable that the 2 groups could differ in quality, considering that Wells fish are reared in earthen ponds at lower densities than the raceway-reared Skamania fish. If Wells smolts are of higher quality, the difference in survival of the two stocks is not solely attributable to the effects of dams. Loss per dam would therefore be underestimated. For example, if Wells smolts were of 50% higher quality than Skamania smolts, the survival rate should be 0.22 rather than 0.33 as calculated above. The estimated average loss per dam would consequently increase to 0.16.

4.7.4 Indian Fishery

Before 1977, catches of summer steelhead in the Columbia River Indian fishery (Zone 6 - Bonneville to McNary Dam) were incidental. Since that time Indian catches of steelhead have increased, particularly in 1983 and 1984. Recoveries of tagged 1-ocean steelhead adults in that fishery indicate that the 1982 and 1983 smolt releases from

Wells Hatchery contributed approximately 1% of Indian catches totalling 15,100 and 71,200 steelhead in 1983 and 1984 respectively (C. Morrill, pers. comm., 1985). The Wells Hatchery contribution of 1-ocean fish in 1983, for example, would be estimated at 151 fish, 0.9% of the 1-ocean steelhead escapement (16,443) to Wells Dam in that year (K. Williams, pers. comm., 1985).

It appears unlikely that the Indian fishery had a significant effect on steelhead escapements to Wells Dam during the period considered in this study (1973 to 1983).

4.7.5 Detailed Calculations

Estimates of adult steelhead escapements to the Similkameen River were developed for several scenarios, including 10% and 15% rates of loss per dam and fishery exploitation rates ranging from 0 to 40%. Assumptions made to simplify development of these estimates were as follows:

Saltwater age at return of hatchery-produced adults	1-ocean
Saltwater age at return of wild adults	2-ocean
Freshwater rearing period of wild smolts	3 years
Total age of returning wild adults	6 years
Adult return per spawner from wild (2-ocean) fish	2.5
Adult return per spawner from hatchery-produced (1-ocean) fish	2.2
Incidence of repeat spawning	0
Smolt mortality at Enloe Dam	0

The lower production rate used for returning hatchery produced adults was based on the lower average fecundity of 1-ocean (5,100 eggs) compared to 2-ocean (5,800 eggs) females (K. Williams, pers. comm., 1985). An additional assumption was that wild and hatchery- produced adults would have the same sex ratio.

The basic return rates for naturally-spawning steelhead were corrected downward to account for the effect of dams. Return rates of 2.5 or 2.2:1 were multiplied by a factor of either 0.387 or 0.23, corresponding to total survival rates at respective losses of 10% and 15% per dam.

The production rates used to estimate escapements under each scenario are listed in Table 4-9.

4.8 Surplus Adult Production

In a steelhead population with an average production rate of 2.5 adults per spawner the theoretical average surplus amounts to 1.5 adults or 60% of total production. However, this theoretical surplus does not generally represent the actual harvestable surplus, as some provision must be made for the fact that production rates and subsequent adult returns may vary considerably from year to year. A more conservative harvest rate is normally established to achieve adequate spawning escapements in years of below average survival.

The 9 mainstem Columbia dams would obviously place a significant demand on available surplus production from a naturally-spawning steelhead population in the Similkameen River. The relationship between harvestable surplus and loss per dam is presented in the following table, using a production rate of 2.5 adults per spawner.

	Loss per Dam			
	10%	8%	5%	2%
Total loss related to dams[a]	.60	.53	.37	.17
Surplus Production[b]	0	.15	.37	.52

[a] Total of 9 dams.
[b] Expressed as a portion of the returning adult run.

It is evident that loss per dam must be under 10% before any harvestable surplus would be available from a population which depended solely on natural production. In

TABLE 4-9
Adult Steelhead Production Rates Used to Estimate Spawning Escapements to the Similkameen River at Selected Rates of Exploitation and Loss Per Dam [a]

Loss Per Dam	Exploitation Rate 0	10%	20%	40%
No Loss[b]				
Adult escapement per:				
2-ocean wild spawner	2.50	2.25	2.00	1.50
1-ocean hatchery spawner	2.20	1.98	1.80	1.32
10% Loss Per Dam				
Adult escapement per:				
2-ocean wild spawner	0.97	0.87	0.78	0.58
1-ocean hatchery spawner	0.85	0.77	0.68	0.51
Adult escapement from hatchery smolts	1.79%[c]	1.61%	1.43%	1.07%
15% Loss Per Dam				
Adult escapement per:				
2-ocean wild spawner	0.58	0.52	0.46	0.35
1-ocean hatchery spawner	0.51	0.46	0.41	0.31
Adult escapement from hatchery smolts	1.07%[c]	0.96%	0.86%	0.64%

a The term "escapement" refers here to fish which spawn naturally in the Similkameen River after escaping fisheries, other sources of mortality and the collection of brood stock.

b Return rates at 0 loss per dam are shown here for comparison. Only the 10% and 15% loss per dam scenarios were included in the analysis.

c Derivation of smolt-to-adult survival rates for 10% and 15% loss per dam is explained in Section 2.2.

practise, loss per dam would probably have to be in the order of 5-8% for natural production to sustain even a modest harvest of 10-20% of the returning adults.

4.9 Projected Escapements And Smolt Requirements

The expected escapements from natural production supplemented by annual plantings of 100,000 hatchery smolts in the Similkameen River have been estimated for a range of scenarios, including exploitation rates of 0 to 40% and losses per dam of either 10% or 15% (Figure 4-3). The 100,000 smolt figure was selected simply to illustrate the escapements which could be achieved by a consistent level of hatchery smolt planting, combined with natural production, over a 24 year period. Respective contributions of hatchery and natural production to escapement are tabulated for each scenario in Table 4-10. By year 19, for example, the contribution of natural production to escapement would range from 71% in the best case (10% loss/dam and 0 exploitation) to 31% in the worst case (15% loss/dam and 40% exploitation).

The estimated requirement for supplemental plants of hatchery smolts was also estimated (Figure 4-4). For example, the number of hatchery smolts needed to produce an escapement of 1,000 fish in year 19 could range from 2,000 to 106,000, depending on the scenario for exploitation and loss per dam (Table 4-11).

4.10 Run Strength Projections - A Probable Scenario

The prospects for reducing smolt losses at dams would appear to be promising, considering the programs of smolt collection/transport and controlled dam spillage being implemented on the Columbia River. Survival of steelhead smolts from Wells Hatchery also appears to have improved in recent years, with return rates of the 1978 to 1982 releases ranging from 1.5 to 6.5% and averaging 3.0% (K. Williams, pers. comm., 1985). The use of river water rather than well water during the spring smoltification period is thought to have contributed to better smolt quality at Wells Hatchery since 1978 (S. Miller, pers. comm., 1985). These factors indicate that a loss per dam of 10% or less may be a more realistic assumption for planning than the 15% rate.

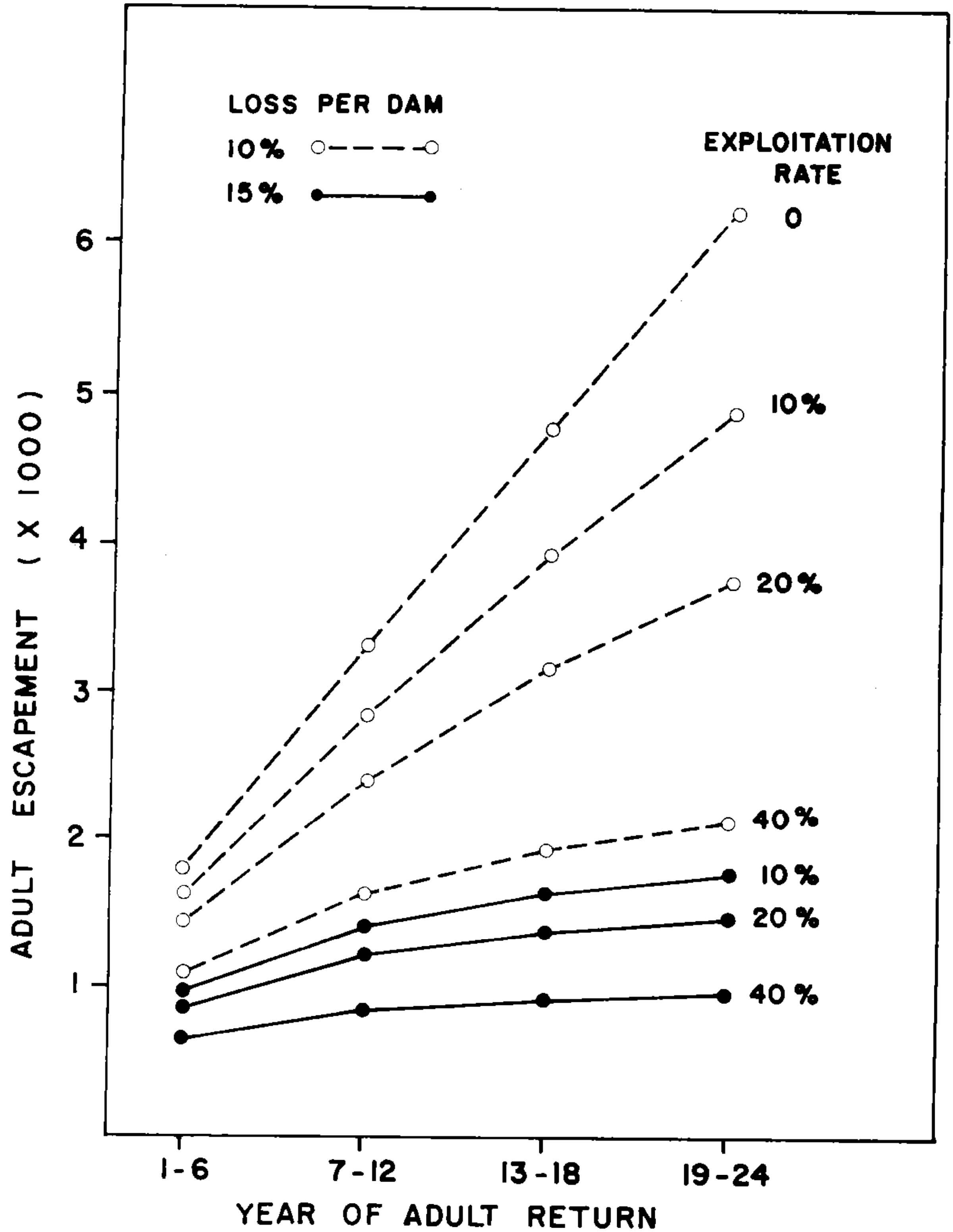

FIGURE 4-3 Estimated adult steelhead spawning escapements to the Similkameen River from annual releases of 100,000 hatchery-reared smolts and natural production, at selected rates of fishery exploitation and loss per dam.

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TABLE 4-10
Estimated Spawning Escapements of Adult Steelhead to the Similkameen River and Respective Contributions of Hatchery and Natural Production From Annual Releases of 100,000 Hatchery-Reared Smolts, at Selected Rates of Exploitation and Loss Per Dam

Exploitation Rate	Return Years	Adult Escapement by Source[a]: Hatchery Smolts	Natural Production by Generation: First	Second	Third	Total Run
		10% Loss Per Dam				
0	1-6	1790	--	--	--	1790
	7-12	1790	1522	--	--	3312
	13-18	1790	1522	1476	--	4788
	19-24	1790	1522	1476	1432	6220
10%	1-6	1610	--	--	--	1610
	7-12	1610	1240	--	--	2850
	13-18	1610	1240	1079	--	3929
	19-24	1610	1240	1079	938	4867
20%	1-6	1430	--	--	--	1430
	7-12	1430	972	--	--	2402
	13-18	1430	972	758	--	3160
	19-24	1430	972	758	592	3752
40%	1-6	1070	--	--	--	1070
	7-12	1070	546	--	--	1616
	13-18	1070	546	317	--	1933
	19-24	1070	546	317	184	2117
		15% Loss Per Dam				
0	1-6	1070	--	--	--	1070
	7-12	1070	546	--	--	1616
	13-18	1070	546	317	--	1933
	19-24	1070	546	317	184	2117
10%	1-6	960	--	--	--	960
	7-12	960	442	--	--	1402
	13-18	960	442	230	--	1632
	19-24	960	442	230	119	1751
20%	1-6	860	--	--	--	860
	7-12	860	353	--	--	1213
	13-18	860	353	162	--	1375
	19-24	860	353	162	75	1450
40%	1-6	640	--	--	--	640
	7-12	640	198	--	--	838
	13-18	640	198	69	--	907
	19-24	640	198	69	24	931

a Refers to fish which escape fisheries and other sources of mortality to spawn.

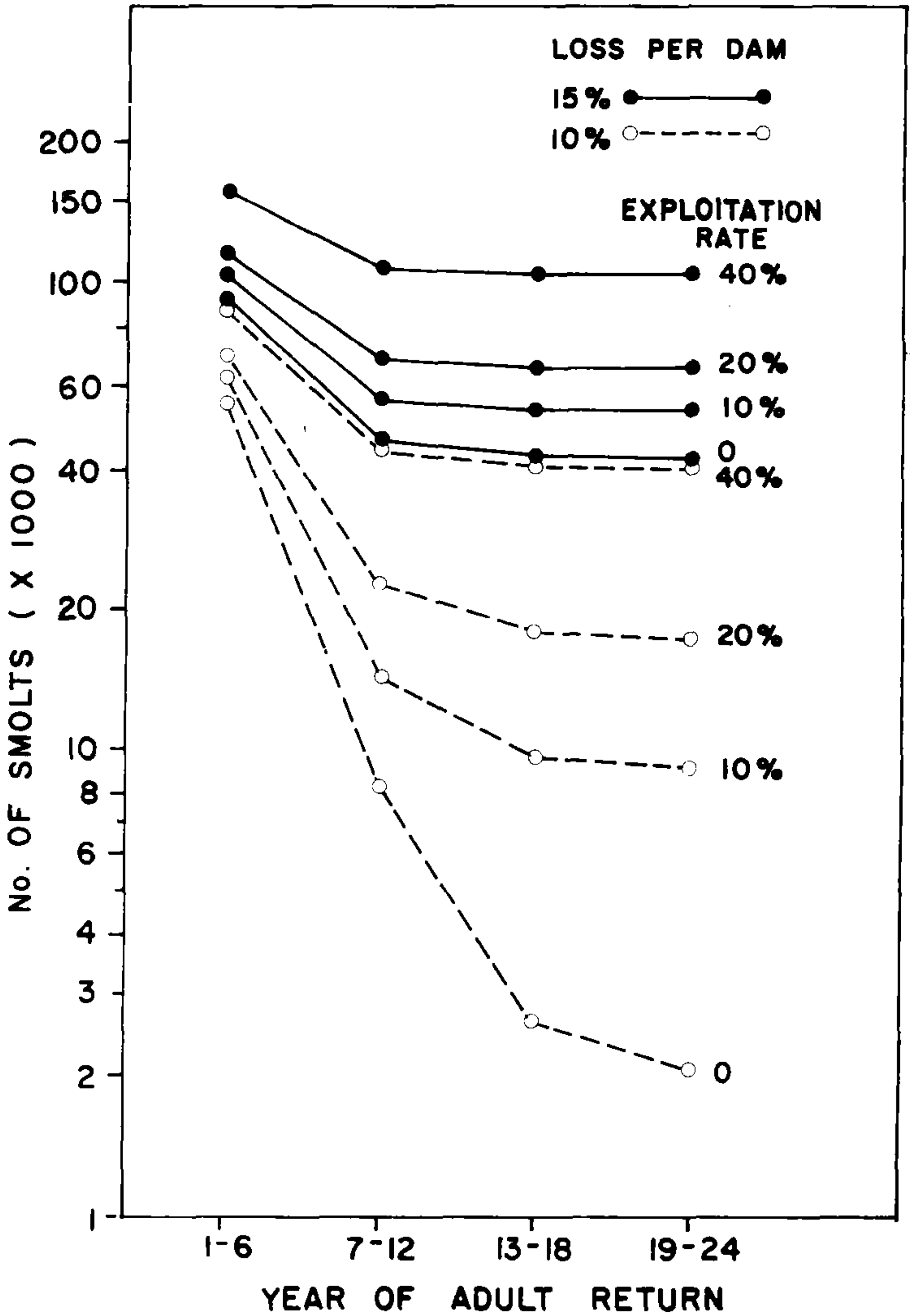

FIGURE 4-4 Estimated hatchery smolt plants required to supplement natural production and achieve escapements of 1,000 adult steelhead to Similkameen River, at selected rates of fishery exploitation and loss per dam.

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TABLE 4-11

Estimated Plants of Hatchery-Reared Smolts Required to Produce Spawning Escapements of 1,000 Adult Steelhead to the Similkameen River and Respective Contributions of Hatchery and Natural Production to Escapement, at Selected Rates of Exploitation and Loss Per Dam

		Adult Escapement by Source[a]				
		Hatchery	Natural Production by Generation			
Exploitation Rate	Return Years	Smolts	First	Second	Third	Total Run
		10% Loss Per Dam				
0	1-6	55,900	1,000	--	--	--
	7-12	8,400	150	850	--	--
	13-18	2,600	47	128	825	--
	19-24	2,000	36	40	124	800
10%	1-6	62,100	1,000	--	--	--
	7-12	14,300	230	770	--	--
	13-18	9,500	153	177	670	--
	19-24	9,000	145	118	154	583
20%	1-6	69,900	1,000	--	--	--
	7-12	22,400	320	680	--	--
	13-18	17,600	252	218	530	--
	19-24	17,200	246	171	170	413
40%	1-6	93,500	1,000	--	--	--
	7-12	45,800	490	510	--	--
	13-18	42,400	454	250	296	--
	19-24	42,200	451	232	145	172
		15% Loss Per Dam				
0	1-6	93,500	1,000	--	--	--
	7-12	45,800	490	510	--	--
	13-18	42,400	454	250	296	--
	19-24	42,200	451	232	145	172
10%	1-6	104,200	1,000	--	--	--
	7-12	56,300	540	460	--	--
	13-18	53,400	513	248	239	--
	19-24	53,200	511	236	129	124
20%	1-6	116,300	1,000	--	--	--
	7-12	68,600	590	410	--	--
	13-18	66,200	569	242	189	--
	19-24	66,200	569	233	111	87
40%	1-6	156,300	1,000	--	--	--
	7-12	107,800	690	310	--	--
	13-18	105,800	677	214	109	--
	19-24	105,800	677	210	75	38

[a] Refers to fish which escape fisheries and other sources of mortality to spawn.

Estimates by Washington Department of Game from 1982 punchcard returns indicate that the sport fishery in the Columbia mainstem below Wells Dam intercepted approximately 8% of the steelhead returning to Wells Dam. Taking into consideration the relatively low contribution (approximately 1%) of Wells steelhead to the 1983 and 1984 Indian fisheries, it may be quite possible to achieve 90% escapement to Wells Dam and, consequently, to the Similkameen River.

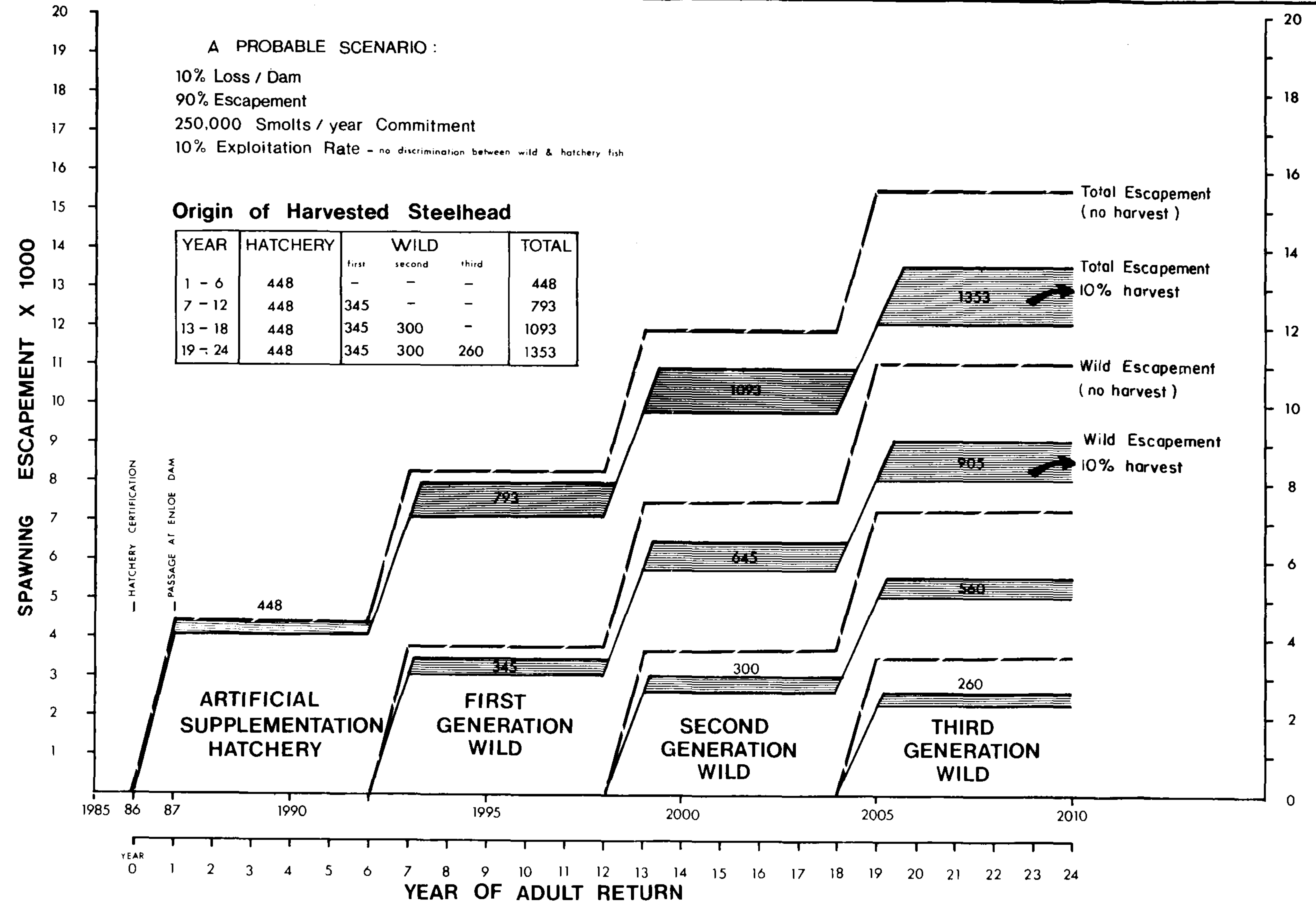
A probable scenario for development of the Similkameen River summer steelhead run would therefore involve 10% loss per dam and 10% exploitation below Wells Dam of adults entering the Columbia River. With a commitment of 250,000 Wells Hatchery smolts per year and no exploitation of returning adults, a spawning escapement of 15,550 could be achieved by years 19-24 (Figure 4-5). This total also includes the broodstock requirement. At that time, the wild component of the run will represent 71.2 percent of the returning adults.

If an additional 10% exploitation is permitted annually above Wells Dam on both wild and hatchery stocks, in years 19-24, 1,353 steelhead could be harvested (including broodstock) and spawning escapement to the Similkameen River would be reduced to 12,168.

In Figure 4-6 the total run, harvest and escapement of steelhead above Wells Dam is presented illustrating the effect of 10%, 20% and 40% exploitation of the run over a 50 year period. As the harvest (including broodstock requirement) increases from 2,228, 3,278 and 3,923 for the 10%, 20% and 40% exploitation rates respectively, the total run is reduced from 22,273 to 9,808.

4.11 Benefits Analysis

Expected run strength of steelhead returning to the Similkameen River as a consequence of providing passage over Enloe Dam, with Wells Hatchery produced smolt supplementation of 250,000 annually is projected to year 50 in order to determine benefits for a reasonable project lifetime.



Origin of Harvested Steelhead

YEAR	HATCHERY	WILD first	WILD second	WILD third	TOTAL
1 - 6	448	–	–	–	448
7 - 12	448	345	–	–	793
13 - 18	448	345	300	–	1093
19 - 24	448	345	300	260	1353

FIGURE 4-5 FORECAST TREND IN SIMILKAMEEN RIVER STEELHEAD ESCAPEMENT UNDER 0% AND 10% EXPLOITATION RATES

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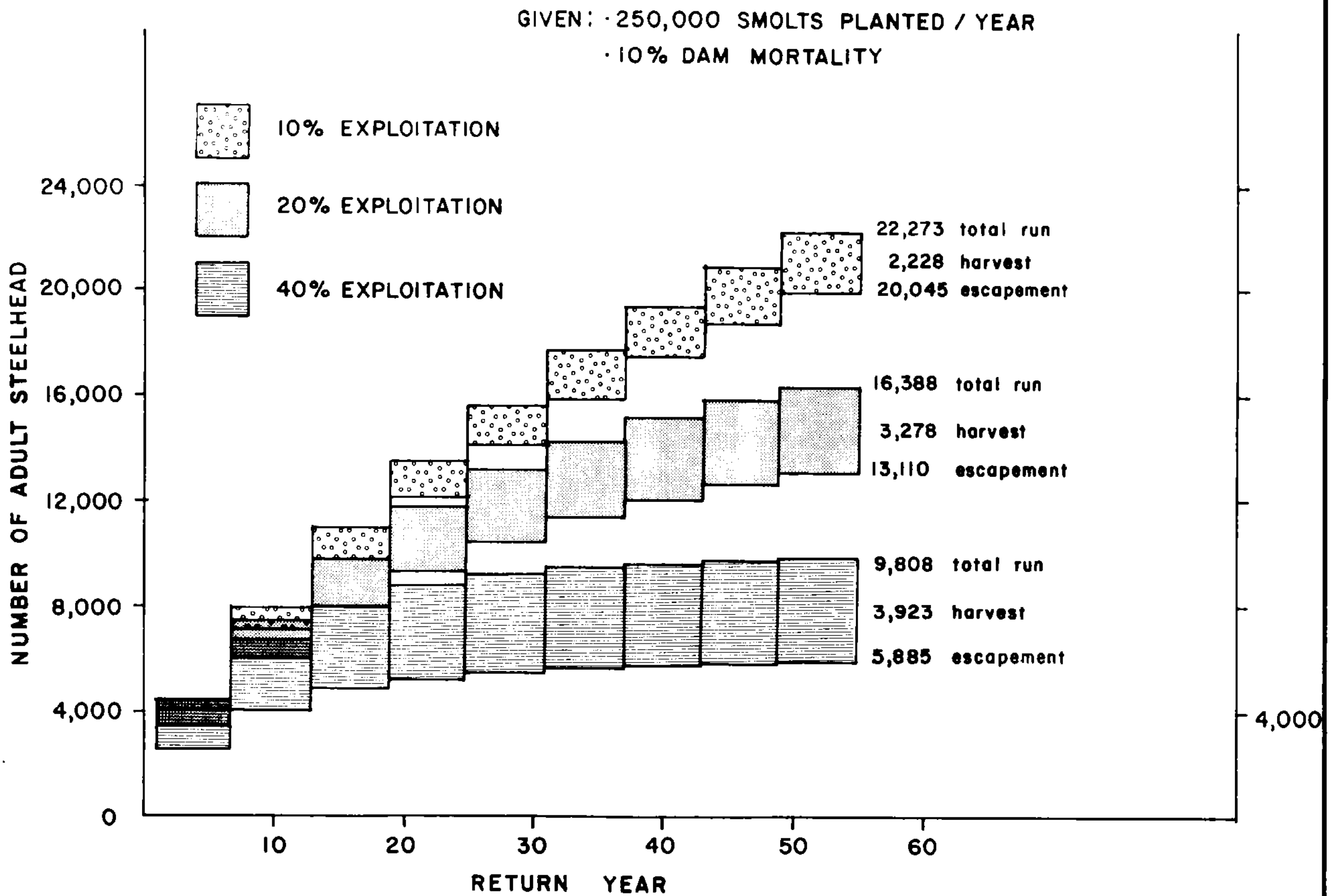

Figure 4-6 Similkameen River Escapement & Harvest

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The previous analysis projects staged increases in run strength at six year intervals, reflecting increases in numbers of returning adults from naturally reproducing parents. Since the rate of increase in run strength is a function of harvest, run strength over time was determined for four assumed harvest intensities: 0%, 10%, 20% and 40% (spawning escapements of 100%, 90%, 80% and 60% of the total run). In order to project benefits from the harvest of returning adult fish, this analysis calculates expected catch over time for each of the four harvest intensities. Naturally, no catch results from a 0% harvest intensity.

This analysis also assumes 115 adult fish are removed as broodstock for eggs and milt to support the 250,000 smolt supplementation program. This assumption is based on the average fecundity of 2-ocean adult females of 5,800 eggs, approximately equal numbers of males and females taken and an egg-to-smolt hatchery mortality of 25% (S. Miller, pers. comm., 1985).

The adult return rates from hatchery smolt plants presented in Table 4-9 are based on returns to Wells Dam, after some harvest by sport, Indian and commercial fisheries in the Columbia River downstream of Wells Dam. These return rates therefore do not represent the total adult steelhead return to the Columbia River. The annual harvest downstream of Wells Dam appears to be in the order of 10%. For purposes of forecasting benefits, adult return rates from hatchery smolt plants shown in Table 4-9 have to be corrected by a factor of 1.11 (100/90). The net result is that total harvest and benefits increase by 11.1% over those predicted with the more conservative return rates used to generate the adult return projections in Table 4-10 and Figures 4-5 and 4-6.

In Table 4-12 projected sport, commercial and Indian harvest above and below Wells Dam is presented. Also included in this table is the spawning escapement which refers to the number of adult steelhead returning to the Similkameen River after escaping all sport, commerical and Indian fisheries and other sources of mortality. Benefits of project implementation are calculated based on these projected catch statistics for each management scenario. Calculations assume realization of annual harvest of adult steelhead trout as presented in the table above with 22% of the catch allocated to the Indian fishery and 78% to the freshwater sport fishery (NMFS, 1984). The

TABLE 4-12
Projected Sport, Commercial And Indian Fishery Harvest Based On 10%, 20% And 40% Fishery Exploitation Rates

Project Years	Spawning Escapement	Brood Stock Requirement	Total Harvest Above Wells Dam	Total Harvest Below Wells Dam	Total Harvest	Sport Fishery 78%	Commerical & Indian Fishery 22%
10% Harvest							
1 - 6	4,025	115	333	497	830	647	183
7 - 12	7,125	115	678	879	1,557	1,214	343
13 - 18	9,823	115	978	1,212	2,190	1,708	482
19 - 24	12,168	115	1,238	1,501	2,739	2,136	603
25 - 30	14,210	115	1,465	1,753	3,218	2,510	708
31 - 36	15,985	115	1,660	1,971	3,631	2,832	799
37 - 42	17,530	115	1,833	2,162	3,995	3,116	879
43 - 48	18,875	115	1,983	2,328	4,311	3,363	948
49 - 50	20,045	115	2,113	2,472	4,585	3,576	1,009
20% Harvest							
1 - 6	3,575	115	780	496	1,276	995	281
7 - 12	6,005	115	1,388	833	2,221	1,732	489
13 - 18	7,900	115	1,860	1,096	2,956	2,306	650
19 - 24	9,380	115	2,233	1,302	3,535	2,757	778
25 - 30	10,533	115	2,518	1,461	3,979	3,104	875
31 - 36	11,433	115	2,743	1,586	4,329	3,377	952
37 - 42	12,135	115	2,920	1,684	4,604	3,591	1,013
43 - 48	12,683	115	3,055	1,760	4,815	3,756	1,059
49 - 50	13,110	115	3,163	1,819	4,982	3,886	1,096
40% Harvest							
1 - 6	2,675	115	1,668	496	2,164	1,688	476
7 - 12	4,040	115	2,578	747	3,325	2,594	731
13 - 18	4,833	115	3,108	894	4,002	3,122	880
19 - 24	5,293	115	3,413	979	4,392	3,426	966
25 - 30	5,558	115	3,590	1,028	4,618	3,602	1,016
31 - 36	5,713	115	3,693	1,057	4,750	3,705	1,045
37 - 42	5,803	115	3,753	1,073	4,826	3,764	1,062
43 - 48	5,855	115	3,788	1,083	4,871	3,799	1,072
49 - 50	5,885	115	3,808	1,089	4,897	3,820	1,077

analysis also assumes a project life of 50 years and realization of first project benefits one year after implementation.

The net monetary value per unit (sport-caught adult steelhead) is placed at $144. This is the interim compensatory value for an adult sport-caught steelhead in an enhanced fishery as simulated by Meyer (1984) and has been adjusted downward signficantly since earlier values were published by the National Marine Fisheries Service (Meyer, 1982). Further revisions are presently being made and NMFS anticipates publication of new revised values in October of this year. The value of commercial or Indian ceremonial steelhead harvest is placed at $21.81 (Meyer, 1984) for purposes of calculating project benefits.

The discount rate chosen for this analysis is 3%. This is the risk-free rate of time preference used by BPA for power system analysis and projected evaluation. It is felt that the choice of this discount rate is consistent with the very conservative assumptions in the model to project run strength.

The present value of projected benefits from the Enloe Dam Fish Passage Project, with supplementation, for 10%, 20% and 40% harvest scenarios in six year cycles and a 50 year project life is summarized in Table 4-13. For calculating the values in Table 4-13 the following formulation by Grant, Ireson and Leavenworth (1976) was used:

$$\text{Present worth} = \sum_{i=1,6}^{50} (P/A,\ 3\%,\ N \text{ yrs}) \times (P/F,\ 3\%,\ (N\text{-}6) \text{ yrs}) \times \$144/\text{fish} \times \#\text{ of fish}$$

where: present worth of year groups = $(P/A) = \dfrac{(1+i)^N - 1}{i\,(1+i)^N}$

and: present worth of each year group at year zero = $(P/F) = \dfrac{1}{(1+i)^N}$

and: N = # of years (50)
i = discount rate (3%)

(NOTE: The Commercial/Indian harvest, valued at $21.81/fish is included in the total.)

TABLE 4-13
Projected Benefits From The Sport, Commercial And Indian Fishery Harvest Based On 10%, 20% And 40% Fishery Exploitation Rates

Project Years	Harvestable Fish		P/A	P/F	Benefit In Dollars		
	Sport	Commercial/Indian	3%, N YRS	3%, N YRS	Sport	Commerical/Indian	Total
10% Harvest							
1 - 6	647	183	5.417	1.000	504,691	21,620	526,311
7 - 12	1,214	343	5.417	0.8375	793,094	33,939	827,033
13 - 18	1,708	482	5.417	0.7014	934,491	39,942	974,433
19 - 24	2,136	603	5.417	0.5874	978,716	41,847	1,020,563
25 - 30	2,510	708	5.417	0.4919	963,101	41,146	1,004,247
31 - 36	2,832	799	5.417	0.4120	910,148	38,892	949,040
37 - 42	3,116	879	5.417	0.3450	838,567	35,828	874,395
43 - 48	3,363	948	5.417	0.2890	758,134	32,368	790,502
49 - 50	3,576	1,009	1.913	0.2420	238,392	10,187	248,579
				TOTAL	**6,919,334**	**295,769**	**7,215,103**
20% Harvest							
1 - 6	995	281	5.417	1.000	776,148	33,199	809,347
7 - 12	1,732	489	5.417	0.8375	1,131,498	48,385	1,179,883
13 - 18	2,306	650	5.417	0.7014	1,261,672	53,863	1,315,535
19 - 24	2,757	778	5.417	0.5874	1,263,258	53,992	1,317,250
25 - 30	3,104	875	5.417	0.4919	1,191,022	50,851	1,241,873
31 - 36	3,377	952	5.417	0.4120	1,085,300	46,339	1,131,639
37 - 42	3,591	1,013	5.417	0.3450	966,398	41,290	1,007,688
43 - 48	3,756	1,059	5.417	0.2890	846,730	36,158	882,888
49 - 50	3,886	1,096	1.913	0.2420	259,057	11,066	270,123
				TOTAL	**8,781,083**	**375,143**	**9,156,226**
40% Harvest							
1 - 6	1,688	476	5.417	1.000	1,316,721	56,237	1,372,958
7 - 12	2,594	731	5.417	0.8375	1,694,635	72,330	1,766,965
13 - 18	3,122	880	5.417	0.7014	1,708,126	72,923	1,781,049
19 - 24	3,426	966	5.417	0.5874	1,569,794	67,039	1,636,833
25 - 30	3,602	1,016	5.417	0.4919	1,382,108	59,045	1,441,153
31 - 36	3,705	1,045	5.417	0.4120	1,190,712	50,866	1,241,578
37 - 42	3,764	1,062	5.417	0.3450	1,012,956	43,287	1,056,242
43 - 48	3,799	1,072	5.417	0.2890	856,423	36,602	893,025
49 - 50	3,820	1,077	1.913	0.2420	254,657	10,874	265,531
				TOTAL	**10,986,131**	**469,203**	**11,455,334**

The total project benefit for the three harvest scenarios is calculated to be:

Harvest	Present Value
10%	\$7,215,100
20%	\$9,156,225
40%	\$11,455,335

The present value figures given above represent a first estimate of benefits expected to accrue from the Enloe Dam fish passage project. A variety of harvest management production/allocation decisions incorporated in this analysis will allow refinements in the production costs and benefits calculations. The production estimates in our opinion are extremely conservative, as they should be at this stage of analysis.

4.12 Stocking Strategy Considerations

This section of the report contains information that could be useful in developing a specific strategy for stocking steelhead in the Similkameen River above Enloe Dam.

4.12.1 Spawning Area Locations

An extensive amount of spawnable area, that portion of the area within a particular reach which meets the criteria for the parameters of depth, velocity and substrate for steelhead trout spawning, was found to be present throughout the Similkameen River system during a thorough habitat assessment conducted by IEC BEAK Consultants Ltd. (1984). A summary of the percentage of spawning substrate area, spawnable area and spawner capacity by stream section is reproduced from that report and is presented in Table 4-14 and Figure 4-7.

The mainstream of the Similkameen River was found to contain an estimated 55.2% or 529,600 m^2 of the available spawnable area in the entire system (961,000 m^2). The majority of spawnable area, 38% or 365,000 m^2, is present in the stream section between Keremeos and Princeton, B.C. Of the remaining area (17.2%), the percentage distributions were from Enloe Dam to Palmer Creek (0%), Palmer Creek to Keremeos (4.7%), Princeton to Similkameen Falls (1.0%) and above the falls (11.5%).

TABLE 4-14
Summary of Similkameen River System Steelhead Trout Spawning Substrate, Spawnable Area and Spawner Capacity by Stream Section

Stream	Stream Section	% of Similkameen River System[1] Area of Spawning Substrate	% of Similkameen River System[1] Spawnable Area/Spawner Capacity[2]	Spawner Capacity No.	Spawner Capacity % Within Stream
Similkameen River	Enloe Dam to Palmer Ck.	0 (0)	0 (0)	0	0
	Palmer Ck. to Keremeos	40.8 (2,168,000)	4.7 (45,000)	4,572	8
	Keremeos to Princeton	31.7 (1,684,000)	38.0 (365,000)	37,228	69
	Princeton to Similkameen Falls	0.7 (38,800)	1.0 (9,600)	976	2
	Above Similkameen Falls	6.4 (340,000)	11.5 (110,000)	11,228	21
	TOTAL	**79.6** (4,231,200)	**55.2** (529,600)	**54,004**	
Ashnola River	Near Mouth	0.6 (32,200)	0.9 (8,400)	856	6
	Near Mouth to above Lakeview Ck.	L 0.1[3] (1,800)	L 0.1 (30)	2	L 1
	Above Lakeview Ck. to Duruisseau Ck.	4.8 (253,000)	12.9 (124,000)	12,628	94

TABLE 4-14 (Continued)
Summary of Similkameen River System Steelhead Trout Spawning Substrate, Spawnable Area and Spawner Capacity by Stream Section

Stream	Stream Section	% of Similkameen River System[1] Area of Spawning Substrate	% of Similkameen River System[1] Spawnable Area/Spawner Capacity[2]	Spawner Capacity No.	Spawner Capacity % Within Stream
Ashnola River (Continued)	Above Duruisseau Ck.	0 (0)	0 (0)	0	0
	TOTAL	**5.4** (287,000)	**13.8** (132,430)	**13,486**	
Tulameen River	Princeton to River Mi. 6.5	6.5 (343,600)	12.2 (117,400)	11,984	41
	River Mi. 6.5 to Lawless Ck.	7.1 (375,500)	17.4 (167,300)	17,072	58
	Lawless Ck. to Falls	0.3 (14,200)	0.4 (4,100)	420	1
	TOTAL	**13.9** (733,300)	**30.0** (288,800)	**29,476**	
Pasayten River	Mouth to River Mi. 3.5	0.8 (44,000)	0.7 (6,800)	698	68
	Above River Mi. 3.5	0.4 (21,200)	0.3 (3,200)	326	32
	TOTAL	**1.2** (65,200)	**1.0** (10,000)	**1,024**	

TABLE 4-14 (Continued)
Summary of Similkameen River System Steelhead Trout Spawning Substrate, Spawnable Area and Spawner Capacity by Stream Section

Stream	Stream Section	% of Similkameen River System[1] Area of Spawning Substrate	% of Similkameen River System[1] Spawnable Area/Spawner Capacity[2]	Spawner Capacity No.	Spawner Capacity % Within Stream
Similkameen River System Above Similkameen Falls	Similkameen River	6.4 (340,000)	11.5 (110,000)	11,228	92
	Pasayten River	1.2 (65,200)	1.0 (10,000)	1,024	8
	TOTAL	**7.6** (405,200)	**12.5** (120,000)	**12,252**	
Similkameen River System	**TOTAL**	**(5,316,800)**	**(960,830)**	**97,990**	

1 Approximate area (m^2) in brackets.

2 Percent spawnable area and percent spawner capacity are equal since spawnable area divided by 19.6, the suggested average area (m^2) required for each spawning pair (Reiser and Bjornn, 1979) times two, equals spawner capacity.

Values for spawnable area (m^2) are in brackets and spawner capacity (no.) in the next column.

3 L less than.

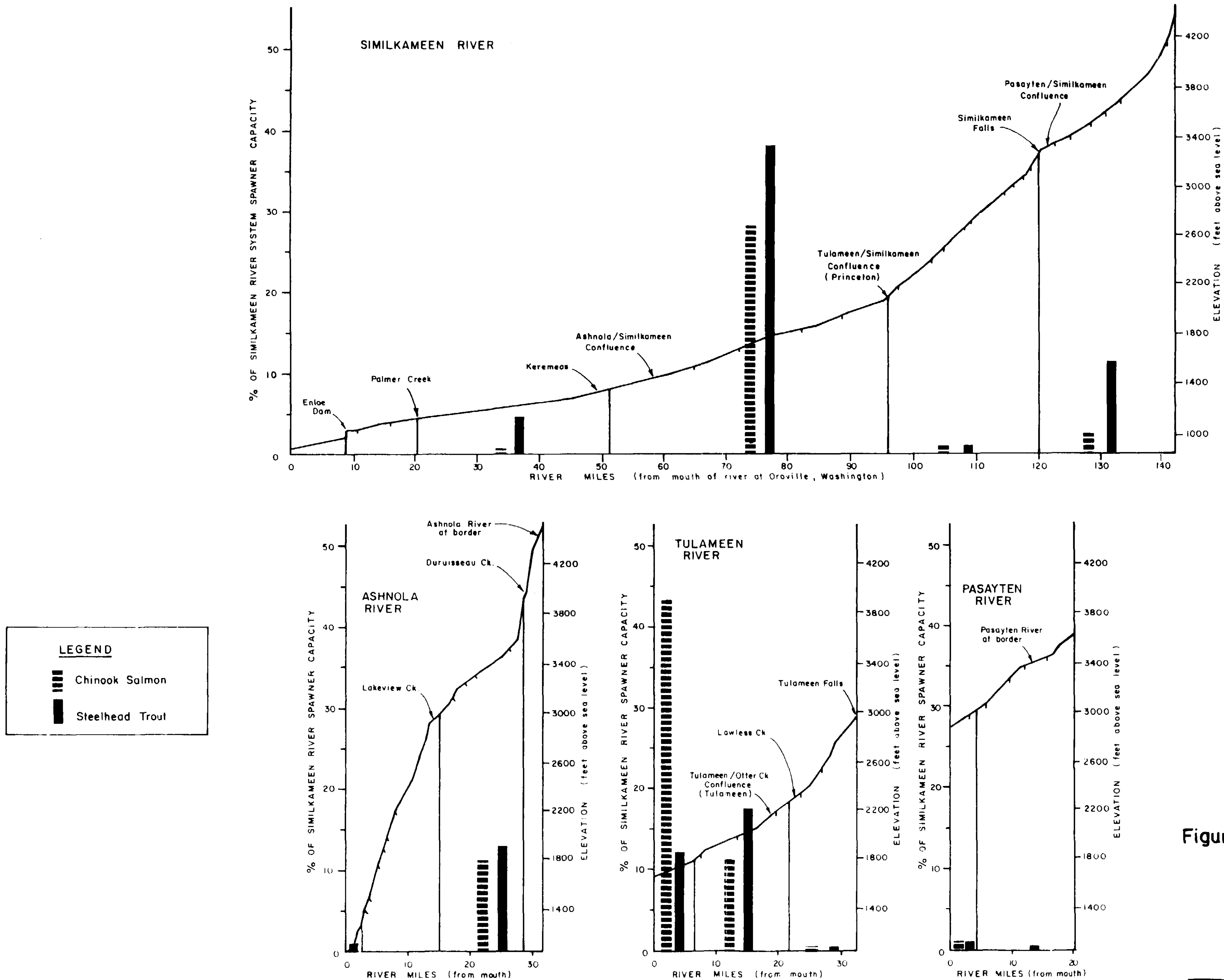

Figure 4-7 : Steelhead Trout and Chinook Salmon Spawner Capacity Distribution Within the Similkameen River System.

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A qualification should be noted regarding the stream section between Palmer Creek and Keremeos. The field habitat sampling criteria used (average depth and velocity) may have seriously underestimated the total spawnable area present in this section. This section has the greatest concentration of spawning gravel of any part of the entire basin (over 2 million m^2). It has been estimated that perhaps as much as 542,000 m^2 of additional spawnable area may exist in that section, and if true that would escalate the spawner capacity of the basin by an additional 50,500 adult fish (IEC BEAK Consultants Ltd., 1984).

The spawner capacity calculated for the entire Similkameen River system was about 98,000 steelhead trout. Of this total, approximately 54,000 would utilize the Similkameen River mainstem, mainly between Keremeos and Princeton (37,000). The other main spawning areas would be above Similkameen Falls (11,000) and between Palmer Creek and Keremeos (4,600). As previously noted, the actual spawner capacity of the latter stream section could increase to 60,000 if the vast areas of potentially suitable spawning area, unaccounted for by the general field sampling techniques, were included.

The Ashnola River has the spawning capacity for nearly 13,500 adult steelhead trout with the majority, 12,600, utilizing the area above Lakeview Creek to Duruisseau Creek. A small number (900) could also use the area just upstream of the Similkameen River confluence.

Approximately 30,000 spawners, or one-third of the basin total, could utilize the Tulameen River, virtually all between Princeton and Lawless Creek.

The Pasayten River contains an area for approximately 1,000 spawners, with the majority (700) located within the first 3.5 river miles. This represents less than 9% of the combined spawner capacity of 12,000 for the river system above Similkameen Falls.

4.12.2 Rearing Area Locations

Potential rearing area for steelhead trout was estimated at about 1,802,600 m^2 for the entire Similkameen River study area (Table 4-15) (IEC BEAK Consultants Ltd., 1984). Figure 4-8 depicts the distribution of potential rearing area in the Similkameen River system, with reference to streambed profile. Sixty-seven percent (1,217,200 m^2) of the entire rearing area is located in the mainstem Similkameen River below Similkameen Falls, with 33% (594,700 m^2) in the portion of the Similkameen River between Keremeos and Princeton, B.C.

The Tulameen River contains a total of 18% (319,400 m^2) of the potential rearing area, with the majority present in the lower reaches.

Of the 3.5% (63,600 m^2) in the Ashnola River, 2.2% (40,200 m^2) is contained in the upper middle reaches between Lakeview and Duruisseau creeks. The limiting factors to potential rearing area in the Ashnola River are the high water velocities and low temperatures.

Above Similkameen Falls, there is a calculated 11% (202,400 m^2) the total potential rearing area in the system of which 3% (47,300 m^2) is in the Pasayten River and 8% (155,100 m^2) in the Similkameen River.

By comparing Figures 4-7 and 4-8 it can be seen, especially in the Similkameen River, that the majority of rearing area is found in the same sections as the majority of spawning area. It should also be mentioned that the spawning and rearing area figures were based on only the sections of the Similkameen River drainage that were habitat inventoried. There is an estimated 98 miles of additional stream that was not inventoried. Therefore, the calculated estimates for spawning and rearing area in the system are probably conservative.

4.12.3 Resident Fish Populations And Potential Competition

Rainbow trout (Salmo gairdneri), which occur naturally in the Similkameen River system, are the main sport species. Their distribution and abundance varies

TABLE 4-15
Summary of Similkameen River System Juvenile Steelhead Trout Potential Rearing Area

Stream	Stream Section	Potential Rearing Area (m^2)	% of Similkameen River System
Similkameen River	Enloe Dam to Palmer Creek	186,647	10.3
	Palmer Creek to Keremeos	314,055	17.4
	Keremeos to Princeton	594,715	33.0
	Princeton to Similkameen Falls	121,791	6.7
	Above Similkameen Falls	155,119	8.6
	TOTAL	**1,372,327**	**76.0**
Ashnola River	Near Mouth	409	0.02
	Near Mouth to Above Lakeview Creek	11,940	0.7
	Above Lakeview Creek to Duruisseau Creek	40,167	2.2
	Above Duruisseau Creek	11,055	0.6
	TOTAL	**63,571**	**3.5**

TABLE 4-15 (Continued)
Summary of Similkameen River System Juvenile Steelhead Trout Potential Rearing Area

Stream	Stream Section	Potential Rearing Area (m^2)	% of Similkameen River System
Tulameen River	Princeton to River Mi. 6.5	94,971	5.3
	River Mi. 6.5 to Lawless Creek	165,300	9.2
	Lawless Creek to Falls	59,137	3.3
	TOTAL	**319,408**	**17.8**
Pasayten River	Mouth to River Mi. 3.5	22,786	1.3
	Above River Mi. 3.5	24,472	1.4
	TOTAL	**47,258**	**2.7**
Similkameen River System Above Similkameen Falls	Similkameen River	155,119	8.6
	Pasayten River	47,258	2.7
	TOTAL	**202,377**	**11.3**
SIMILKAMEEN SYSTEM TOTAL		**1,802,564**	**100.0**

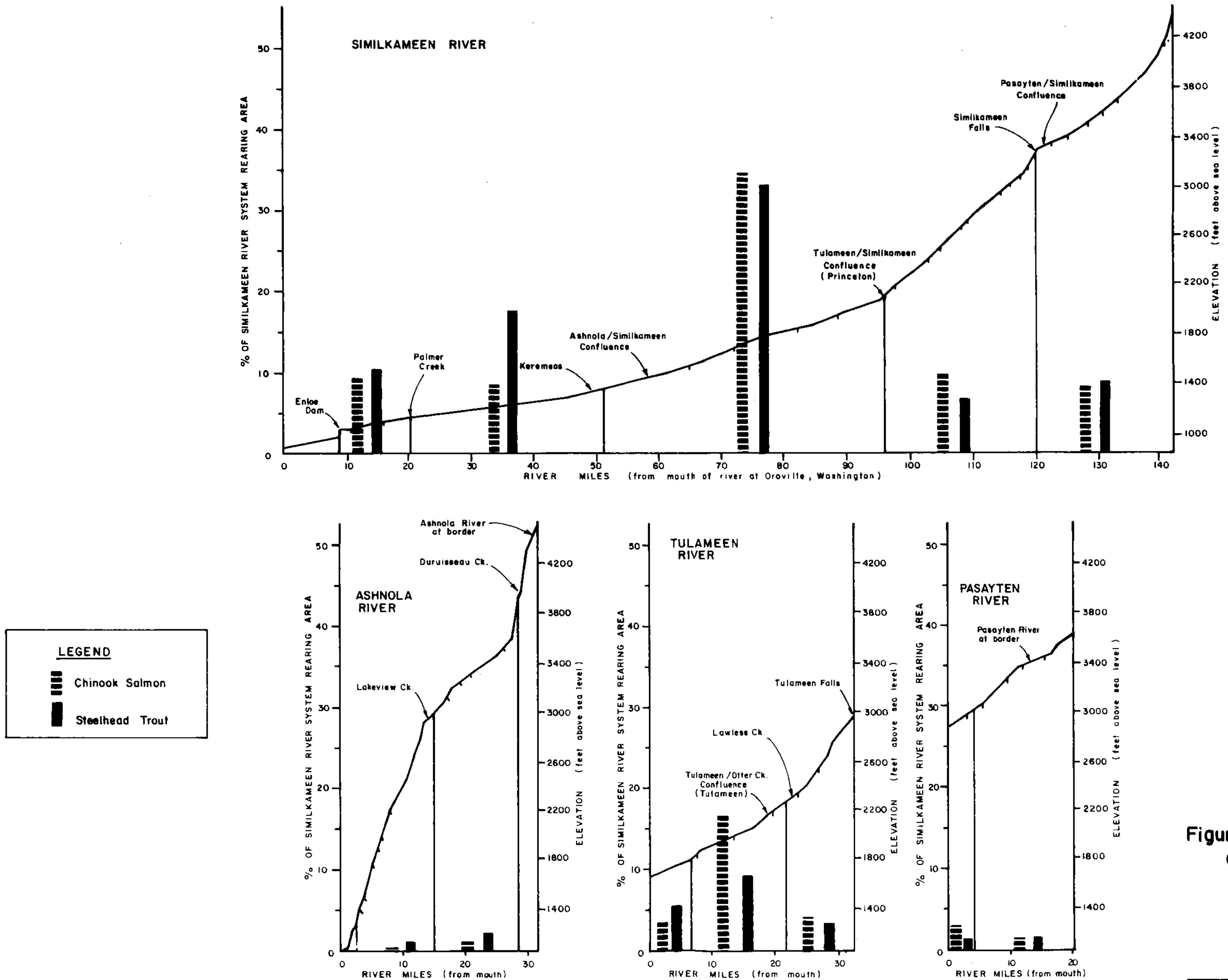

Figure 4-8 Steelhead Trout and Chinook Salmon Rearing Area Distribution Within the Similkameen River System.

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throughout the system with a possible limitation south of the Canada/U.S. border to the Enloe Dam, where none were observed (IEC BEAK Consultants Ltd., 1984). Other fish caught or observed included mountain whitefish (Prosopium williamsoni), bridgelip suckers (Catostomus columbianus), longnose dace (Rhinichthys cataractae), sculpins (Cottus sp.), northern squawfish (Ptychocheilus oregonensis), and black crappie (Pomoxis nigromaculatus). In addition, a small number of kokanee salmon (Oncorhynchus nerka), either dead or spawned out, was observed in Sinlahekin Creek (IEC BEAK Consultants Ltd., 1984). Brook trout (Salvelinas fontinalis) have been stocked in Summers and Allison Creeks and are common there. Cutthroat trout (Salmo clarki) have been captured in the Ashnola River.

The Similkameen River below Similkameen Falls supports the largest diversity of fish but predominated by mountain whitefish and bridgelip suckers. In contract, the Similkameen River above Similkameen Falls and the Pasayten River, supports only two species, rainbow trout and longnose dace.

The most numerous of the species in the main tributary streams of the basin above Enloe Dam was found to sculpins followed in declining order by mountain whitefish, longnose dace, bridgelip suckers and lastly, rainbow trout (IEC BEAK Consultants Ltd., 1984).

Based on densities calculated from the fisheries inventory (IEC BEAK Consultants Ltd., 1984), a total population of rainbow trout in the Similkameen River system was calculated to be 142,318 (Table 4-16).

Densities of rainbow trout throughout the Similkameen River system varied from 0 to 0.20 fish/m^2 (0 to 5.78 g/m^2). The densities of rainbow trout in the Similkameen River system were far lower than those found in other British Columbia streams. Nuaitch Creek in the Nicola River stream (a tributary of the Thompson River which flows into the Fraser River) had average rainbow densities of 2.13 fish/m^2 (10.93 g/m^2) (Tredger, 1980). Ptolemy (1982) found in Louis Creek, a tributary of the North Thompson River, rainbow densities ranged up to 1.95 fish/m^2 (2.28 g/m^2). He also found that these latter values compared favourably with other productive rainbow streams such as 2.89 fish/m^2 (10.4 g/m^2) in Deadman River/Criss Creek (Thompson River tributaries) and 3.2 fish/m^2 (19.5 g/m^2) in the Nicola River mainstem.

TABLE 4-16
Summary of Standing Crop, Fish Population and Density of Rainbow Trout in the Similkameen River System

Stream	Stream Section	Density Range (no./m^2)	Standing Crop Range (kg/ha)	Population Estimate (no.)	Total Standing Crop (kg)
Similkameen River	Enloe Dam to Palmer Creek	0	0	0	0
	Palmer Creek to Keremeos	0-0.0005	0-1.7	408	168.3
	Keremeos to Princeton	0-0.20	0-52.1	42,621	1,393.5
	Princeton to Similkameen Falls	0-0.10	0-57.8	13,047	386.1
	Above Similkameen Falls	0-0.11	0.5-13.8	11,382	206.1
	TOTAL			**67,458**	**2,154**
Ashnola River	Near Mouth	0.01-0.02	0.1-0.1	894	0.5
	Near Mouth to Above Lakeview Creek	0.01-0.19	4.1-33.7	22,675	498.5
	Above Lakeview Creek to Durisseau Creek	0.003-0.11	0.8-19.6	12,546	275.2
	Above Duruisseau Creek	0.16	15.5	11,819	114.5
	TOTAL			**47,934**	**888.7**

TABLE 4-16 (Continued)
Summary of Standing Crop, Fish Population and Density of Rainbow Trout in the Similkameen River System

Stream	Stream Section	Density Range (no./m^2)	Standing Crop Range (kg/ha)	Population Estimate (no.)	Total Standing Crop (kg)
Tulameen River	Princeton to River Mi. 6.5	0	0	0	0
	River Mi. 6.5 to Lawless Creek	0.001-0.01	0.2-3.9	3,061	144.9
	Lawless Creek to Falls	0.02-0.13	4.7-13.4	16,044	276.9
	TOTAL			**19,105**	**421.8**
Pasayten River	Mouth to River Mi. 3.5	0.01	3.1	1,353	41.9
	Above River to Mi. 3.5	0.004-0.04	0.2-6.5	6,468	90.8
	TOTAL			**7,821**	**132.7**
	SIMILKAMEEN RIVER SYSTEM TOTAL			**142,318**	**3,597.2**

The low densities of rainbow trout in the Similkameen River system could be due to several factors. It was felt that perhaps the main one was high fishing pressure (P. Slaney, pers. comm., 1983). Low densities of rainbow were usually found in areas where there was easy access to a stream from a highway. The Ashnola River, which has limited access over most of its length, has higher densities than the rest of the Similkameen River system. The 1984 creel census does not bear this out however (see Appendix 2). It is more likely the case that the primary and secondary productivity in the stream is so low that fish production cannot keep pace with the angling pressure that is exerted. Fishing pressure on catchable-sized (200+ mm) rainbow trout could be reflected in low juvenile recruitment. Other factors contributing to the low density observed may include interspecies competition, low nutrient concentrations in the streams and anchor ice (C. Bull, pers. comm., 1983).

The highest densities of rainbow trout in the mainstem Similkameen River, below Similkameen Falls, were found between Keremeos and Princeton, B.C. (Table 4-16). An estimated population of 42,621 rainbow trout was calculated for this stretch of river. This represents 30% of the population of rainbow in the entire system. Of the total population for the system, 40% (56,076) is in the Similkameen River below the falls. The majority of the remaining fish (13,047) in the Similkameen River, below the falls, were estimated to be in the Similkameen River from Princeton to the falls. Only 408 rainbow trout were estimated from Keremeos, B.C. to the Enloe Dam in Washington.

The second largest estimated population of rainbow trout in the system was in the Ashnola River, where rainbow population densities ranged from 0.01 to 0.19 fish/m^2. This population makes up 34% (47,934) of the total rainbow trout population for the Similkameen River system. The vast majority of the trout in the Ashnola River are found above the lower two reaches of the river. In the Tulameen and Pasayten Rivers, trout densities or a small proportion of the rainbow trout population are also found at or near the mouths of the rivers.

Within the Similkameen River basin, upstream of Enloe Dam, the main fish species with which introduced steelhead would compete is rainbow trout. The population of this species in the system as a whole is depressed (P. Slaney, pers. comm., 1983). We conclude that the rainbow trout habitat in the Similkameen River system is presently underutilized with the possible exception of the Ashnola River. Competition between the steelhead and rainbow is likely to occur, however, due to the habitat presently available, the effect should be minimal. If steelhead were introduced there would probably also be increased fishing regulations implemented such as a 20 cm (8 in) minimum size limit. This regulation exists in British Columbia where both steelhead and rainbow are present (C. Bull, pers. comm., 1985) and would serve to protect the smolts as well as reduce the harvest of resident rainbow trout. More than 57% of the harvested rainbow trout measured during the 1984 creel survey of the Similkameen River system were under 20 cm (IEC BEAK Consultants Ltd., 1985, see Appendix 2). Another effect of steelhead trout introduction would be the indirect enhancement of the resident trout population by the residualization of some percentage of the stocked steelhead smolts. Residualization of some smolts for at least 1 year following release has been noted for the Wells Hatchery summer steelhead stock (K. Williams, pers. comm., 1984). This residualization would, however, tend to increase steelhead/rainbow trout competition.

4.12.4 Potential Liberation Sites, Access And Transportation Considerations

Steelhead smolts, once imprinted to a particular stretch of stream, will usually return as adults to the same section of stream. Lister et al. (1981) in a review of the effects of enhancement strategies on salmonid homing/straying found that the further upstream in a river system the juveniles were planted, the stronger their homing to that stream was. In addition, the tendency to stray into other streams and/or stray back to the facility where they were reared was also signficantly reduced.

The likely planting situation in the Similkameen River system is one in which the returning adults, on their way back to the Similkameen River, would have to pass Wells Hatchery where they have been reared. It is crucial that the adults proceed to the Similkameen River directly, and not stop at the hatchery, in order to provide the optimal angling time on the run and maximum spawner contribution to the Similkameen River system. A tendency has been noted with the Methow River steelhead to remain near the mouth of the Methow River and in the Columbia River until they are ready to move upstream to spawn (K. Williams, pers. comm., 1983).

However, the majority of steelhead smolts are planted in the Methow River between the mouth and 8 miles upstream (S. Miller, pers. comm., 1984). The intension of planting smolts in the lower river is to create a good sport fishery on the hatchery fish in this accessible lower portion (K. Williams, pers. comm., 1984). This planting strategy may explain, to a large extent, the tendency for the returning adults to remain in the lower river.

The objectives of introducing steelhead trout in the Similkameen system would be to produce a quality steelhead fishery (with or without harvest) throughout the majority of the system in both the fall and spring, and to allow the maximum contribution of the returning adults to steelhead propagation. Between 100,000 and 250,000 summer steelhead smolts would likely to be liberated annually in the Similkameen basin for a number of years. In order that the steelhead contribute both to the fishery and to propagation it seems prudent that the smolts be liberated in the upper portions of the watershed. This would allow additional time for the fish to imprint on the system and bring the returning adults far upstream in the Similkameen system. The smolts could be distributed in such a way as to minimize competition with resident rainbow trout as well as utilize the extensive rearing habitat present in the system.

Potential liberation sites were identified on the basis of access for a tanker truck or helicopter and the premise of planting in the upper reaches of the system to better facilitate homing. Also, the sites tend to be upstream of the major areas suitable for spawning and the areas in the vicinity have ample rearing area available with fairly low rainbow trout densities. The portion of the Similkameen River system above Similkameen Falls was not considered for smolt planting due to the partial or complete velocity barrier to upstream migration it poses.

The location of these potential steelhead liberation sites are indicated in Figure 4-9. River mile distances are summarized in Table 4-17. The sites on the Similkameen River are measured on the basis of their distance from the confluence with the Okanogan River. The sites on the Tulameen and Ashnola Rivers are measured in terms of their distance from their confluence with the Similkameen River. The river mile distances provide an indication of how far planted juvenile steelhead would swim within the system on their downstream migration.

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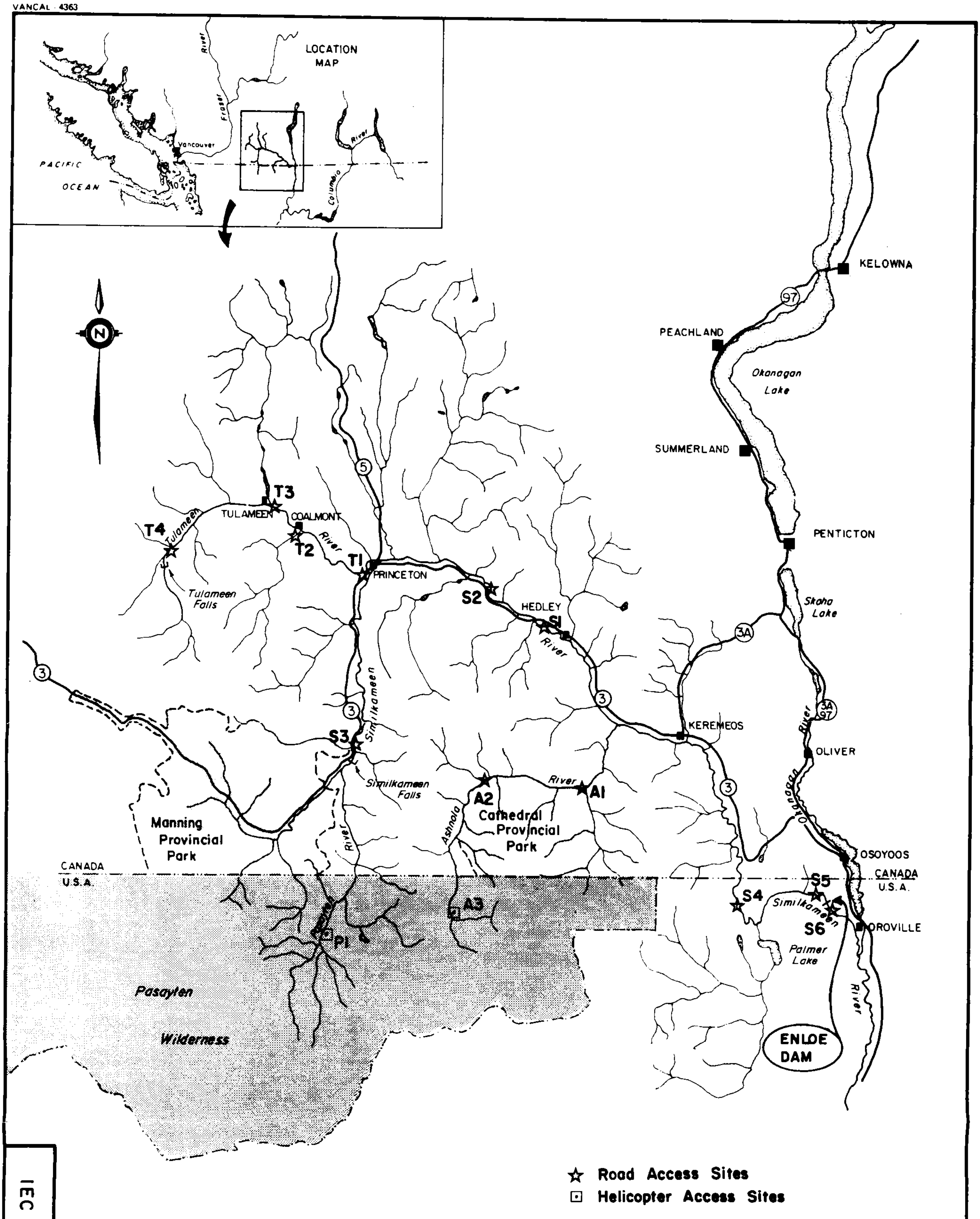

FIGURE 4 – 9 PRELIMINARY STEELHEAD SMOLT LIBERATION SITES

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0 10 20 30 km

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TABLE 4-17
Location of Potential Steelhead Smolt Liberation Sites in the Similkameen River System

Liberation Site	River Mile Distance From Confluence of the Similkameen and Okanogan Rivers	
	Miles	Kilometres
S1	52	84
S2	60	97
S3	96	155
S4	21	35
S5	12	20
S6	5	8
	River Mile Distance From Confluence of the Similkameen and Tulameen Rivers	
	Miles	Kilometres
T1	0.5	0.8
T2	12	19
T3	16	26
T4	28	45
	River Mile Distance From Confluence of the Similkameen and Ashnola Rivers	
	Miles	Kilometres
A1	16	26
A2	28	45
A3	36	60
	River Mile Distance From Confluence of the Similkameen and Pasayten Rivers	
	Miles	Kilometres
P1	18	30

It may become desirable to consider the stocking of other juvenile stages of steelhead such as fry in all or part of the system. Such options may have certain benefits and could utilize these same liberation sites or other sites depending on the strategy being employed.

The location of the potential liberation sites was also measured in relation to its proximity to the Wells Hatchery. Distances and travel times were calculated for tanker truck as well as helicopter modes of transportation and are presented in Table 4-18.

4.12.5 Life Stage Stocking Alternatives

The proposed steelhead smolt stocking program outlined in Sections 4.7 to 4.10 of this report assumes an annual commitment of 250,000 smolts transported to the Similkameen River. The operating and maintenance costs of rearing smolts to a size averaging six fish per pound (S. Miller, pers. comm., 1985) is estimated at $125,000. The smolts are loaded at a density of 0.75 pounds per gallon of truck capacity (2,000 gallons estimated) and transported a relatively long distance (60 miles) from the Wells Hatchery to the closest release points in the lower Similkameen River. The estimated capital, operating, maintenance and transportation costs of producing these high quality smolts is presented in Section 5.3, Table 5-10.

The alternatives for reducing the high costs of production and transport are to:

1. Produce larger numbers of fry or parr which could be transported at much higher densities and lower costs for outplanting taking advantage of natural rearing; or

2. Consider construction of a low cost rearing facility in the lower Similkameen River which would significantly reduce the transportion costs.

A third alternative which was explored at a meeting 7 February 1984 with the B.C. Fish and Wildlife Branch was operation of a rearing facility in the B.C. portion of the

TABLE 4-18
Distance and Travel Time From the Wells Hatchery to Potential Liberation Sites

Liberation Site	Approximate # of Miles/Kilometres From Wells Hatchery by Road		Approximate # of Hours From Wells Hatchery by Road (Tanker Truck/ 40 mph)	Approximate # of Miles/Kilometres From Wells Hatchery by Air		Approximate # of Hours From Wells Hatchery by Air (Helicopter/ 40 mph)a
	Miles	Kilometres		Miles	Kilometres	
S1	136	219	3.5	96	155	2.5
S2	144	232	3.5	104	167	3.0
S3	180	290	4.5	114	184	3.0
S4	95	152	2.5	780	128	2.0
S5	89	142	2.0	73	117	2.0
S6	87	139	2.0	67	107	1.5
T1	156	251	4.0	116	187	3.0
T2	168	270	4.0	124	199	3.0
T3	172	276	4.5	128	206	3.0
T4	184	296	5.0	136	219	3.5
P1[b]				79	122	2.0
A1	126	203	3.0	82	132	2.0
A2	138	222	3.5	90	145	2.0
A3[b]				60	96	1.5

a This assumes 40 mph. However, the actual mph is contingent on the type of helicopter chosen, method of transportation (cargo on board or in a sling) and size of load.

b Not accessable by road.

Similkameen River (see IEC BEAK Consultants Ltd. Progress Report, September, 1984). At the present time, the B.C. government representatives are concerned about the long term commitment to funding the operation of such a facility and would prefer stocking and natural rearing in the Similkameen River and its tributaries.

4.12.6 Stock Availability

The most suitable stock for introduction to the Similkameen River above Enloe Dam appears to be the Wells Hatchery summer steelhead stock which has shown excellent returns to the lower river from the 100,000 and 76,000 smolt plants respectively in 1983 and 1984. In 1985, an additional 55,500 smolts were planted in the lower Similkameen River. At the present time the Wells Hatchery expansion, funded by the Bureau of Reclamation (Appendix 1, minutes of meeting 7 May 1985) appears to be proceeding on schedule with construction planned for late 1985 or early 1986. This facility will provide the capacity to produce 250,000 smolts for outplanting in the Similkameen River system. The Bureau of Reclamation's funding commitment, however, is for a period of five years (Appendix 1, minutes of meeting 7 May 1985) at which time another funding source to cover the future operation and maintenance costs will be required.

4.12.7 Preliminary Stocking Strategy

Summer steelhead smolts have been transported from Wells Hatchery annually in 1983, 1984 and 1985 for outplanting in large numbers below Enloe Dam on the Similkameen River. To date no additional investigations have been undertaken to determine other alternative stocking strategies. Our preliminary evaluations have included the location of potential liberation sites, consideration of other life stage stocking alternatives and discussion of potential rearing facility options for the Similkameen River. The final stocking strategy will be the ultimate responsibility of B.C. Fisheries Branch and Washington Department of Game representatives to initiate after the achievement of fish passage at Enloe Dam.

4.13 Adult Migration Timing

Concern has been expressed by the B.C. Fisheries Branch and Washington Department of Game representatives regarding the expected timing of summer steelhead movement into the Similkameen River as that timing would have a bearing on the expected quality of the sport fishery. The preferred fishery is in the fall when the summer steelhead are recent arrivals and are bright silvery in colour. Overwintering steelhead which pass Wells Dam in the fall and remain in the Okanogan River until early spring, and enter the Similkameen to spawn are usually dark coloured fish which are regarded as less desirable to anglers. This section attempts to address that concern by summarizing information available on timing for upper Columbia River summer steelhead stocks.

One indication of the likelihood that adult summer steelhead would enter the upper Similkameen in time to provide a quality fall fishery can be seen by examining the pattern of their passage over Wells Dam on their return to the Methow, Okanogan and lower Similkameen Rivers. That historical pattern is presented in Table 4-19 in the form of monthly counts during the period from 1967 through 1984. The pattern is consistent in that the vast majority of fish pass the dam in August, September and October. Since 1970 nearly 90% of each year's run passed Wells Dam in these three months. It is also apparent from the data for the most recent 6 years that the summer steelhead run above Wells Dam is increasing dramatically.

An additional indication of a quality fall fishery comes from the monthly sport catch of adult steelhead and thus the relative size of the runs for 5 rivers in the upper Columbia basin as reported in Table 4-20. These data are summarized from Washington Department of Game punchcard returns for the two most recent seasons of available data. The steelhead in all five rivers represent Wells Hatchery stock.

In the rivers with a substantial steelhead fishery (Methow, Entiat and Wenatchee), very significant catches are reported in the fall months. This lends additional credability to the expectation that adults would return to the upper Similkameen River in sufficient numbers to provide a quality fall fishery there.

TABLE 4-19
Monthly Steelhead Count Summaries for Wells Dam[1]

1967, 1968 and 1969

Month	1967	1968	1969	Total	%
April	-	-	73	73	1.38
May	53	671	727	1451	27.33
June	121	29	31	181	3.41
July	53	11	28	92	1.73
August	208	119	186	513	9.66
September	368	777	137	1282	24.15
October	744	566	186	1496	28.18
November	30	95	96	221	4.16
				5309	

1970 to 1979

Month	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Total	%
April	-	3	6	6	-	-	-	-	-	-	15	0.05
May	105	184	299	142	162	55	44	37	177	72	1277	4.48
June	31	12	6	31	19	12	37	22	32	2	204	0.72
July	18	5	2	48	43	21	56	38	12	22	265	0.93
August	132	284	286	339	120	128	530	1034	399	1212	4464	15.68
September	630	1771	766	1006	75	254	2301	1173	788	1180	9944	34.92
October	723	1690	724	782	278	273	1856	2849	528	1165	10868	38.16
November	87	186	88	N/C	42	N/C	156	526	N/C	355	1440	5.06
											28477	

1980 to 1984

Month	1980	1981	1982	1983	1984	Total	%
April	-	-	-	-	-		
May	202	139	149	26	153	669	1.23
June	24	23	7	2	32	88	0.16
July	15	107	67	135	766	1090	2.01
August	382	623	1042	1891	5024	8962	16.50
September	1404	1902	2766	11368	7235	24675	45.42
October	1358	1401	3733	5294	3298	15084	27.76
November	413	513	730	1327	778	3761	6.92
	3798	4708	8494	20043	17286	54329	

1 Unpublished data obtained from Ken Williams, Washington Department of Game (1985).

TABLE 4-20
Monthly Steelhead Trout Sport Catch[1]

Month	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Methow River													
1982	0	0	3	9	193	544	145	16	41	313	262	3	1529
1983	0	2	6	65	1075	1769	753	47	45	512	1550	0	5824
Entiat River													
1982	0	0	0	0	3	9	13	3	13	9	19	0	69
1983	0	0	0	0	17	37	30	0	0	0	90	0	174
Wenatchee River													
1982	0	6	0	16	117	278	104	41	114	63	41	0	780
1983	4	0	0	0	0	0	0	637	400	368	252	0	1661
Similkameen River													
1982	0	0	0	0	0	0	0	0	0	0	13	0	13
1983	0	0	0	0	0	0	0	2	0	0	15	0	17
Okanagan River													
1982	0	0	0	0	0	3	3	0	0	0	0	0	6
1983	0	0	0	0	0	4	13	0	2	6	9	0	34

[1] Data presented for 1982-83 and 1983-84 seasons collated by Washington Department of Game from punchcard returns.

In 1983 the Washington Department of Game planted 100,000 summer steelhead smolts in the lower Similkameen and 76,000 were planted there in 1984, all from the Wells Hatchery. The information available at this time does not allow a fall fishery evaluation comparable to other rivers such as the Methow, Entiat or Wenatchee. Returns from the 1984-85 and 1985-86 seasons, when they become available, should allow such an assessment.

To assist in the interpretation of the preceeding information about the arrival times of adult steelhead in neighboring river systems in the Upper Columbia basin, a comparison of some of their physical characteristics (drainage area, flow and water temperature) of those rivers is presented in Table 4-21. The location and basin configuration is shown in Figure 4-10.

The data indicates that the Similkameen River has the largest drainage area of 9190 km^2 compared with 4589 km^2 for the Methow River. Mean annual discharge is 66.2 m^3/s compared with 45.1 m^3/s. Mean discharge during the peak migration period August-October ranges from 17.4-25.0 m^3/s for the Similkameen compared with 13.9-15.0 m^3/s for the Methow River. Mean monthly discharge as a percent of annual discharge during the peak migration period is similar for all the river systems.

A comparison of mean annual water temperatures indicates the Similkameen River is slightly warmer at 7.9°C than the Methow (7.6°C), Wenatchee (7.4°C), and Entiat Rivers (5.4°C). During the expected period of peak upstream migration, August to October, the mean monthly water temperature declines from 15.4-10.0°C on the Similkameen River, 14.3-9.3°C on the Methow River and 13.9-8.7°C on the Wenatchee River.

A comparison of the physical characteristics of these Upper Columbia River tributaries with the Similkameen River indicates that there are more similarities than differences between the drainages. This is supportive of the expectation that adult summer steelhead would return to the Okanogan-Similkameen River system during the same migration period as the other river systems, and would therefore be the basis of a quality fall fishery.

TABLE 4-21

Physical Comparison of the Wenatchee, Entiat, Methow and Similkameen Rivers[1]

	Drainage Area (km^2) At Gauge	Elevation (m) At Gauge	Mean Annual Unit Runoff ($l/s/km^2$)
Wenatchee River	3370	207	28.4
Entiat River	526	475	20.7
Methow River	4589	274	9.8
Similkameen River	9190	347	7.2

MEAN DISCHARGE IN m^3/s

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Wenatchee River	51.5	53.7	61.0	93.1	230.1	290.6	148.8	51.5	27.2	31.3	48.7	58.5	95.6
Entiat River	2.9	3.1	3.9	7.8	29.7	44.5	19.1	6.5	3.5	3.0	3.2	3.5	10.9
Methow River	11.8	12.1	15.8	38.7	138.0	187.3	64.2	20.6	13.9	15.0	15.0	13.8	45.1
Similkameen River	17.1	18.7	19.4	54.7	227.4	259.7	86.1	26.1	17.4	20.5	25.0	21.7	66.2

MEAN DISCHARGE IN PERCENT OF AVERAGE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Wenatchee River	4.5	4.7	5.3	8.1	20.1	25.4	13.0	4.5	2.4	2.7	4.3	5.1	100.0
Entiat River	2.2	2.4	3.0	6.0	22.7	34.0	14.6	5.0	2.6	2.3	2.5	2.7	100.0
Methow River	2.2	2.2	2.9	7.1	25.3	34.3	11.8	3.8	2.5	2.8	2.7	2.5	100.0
Similkameen River	2.2	2.4	2.4	6.9	28.6	32.7	10.8	3.3	2.2	2.6	3.2	2.7	100.0

MEAN WATER TEMPERATURE (°C)*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Wenatchee River	0.6	1.0	3.0	6.2	9.7	12.6	14.1	13.9	11.9	8.7	5.2	2.3	7.4
Entiat River	0.0	0.5	2.2	4.8	7.5	9.7	10.7	10.4	8.7	6.1	3.4	1.2	5.4
Methow River	0.8	1.0	2.9	6.1	9.7	12.7	14.4	14.3	12.4	9.3	5.7	2.6	7.6
Similkameen River	0.3	0.3	2.4	5.9	9.9	13.4	15.4	15.4	13.4	10.0	6.0	2.5	7.9
Okanogan River	1.0	1.3	4.0	8.2	13.0	16.9	19.1	18.8	16.2	12.0	7.3	3.2	10.0

1 Sources: Water Survey of Canada
USGS - Water Resources Division

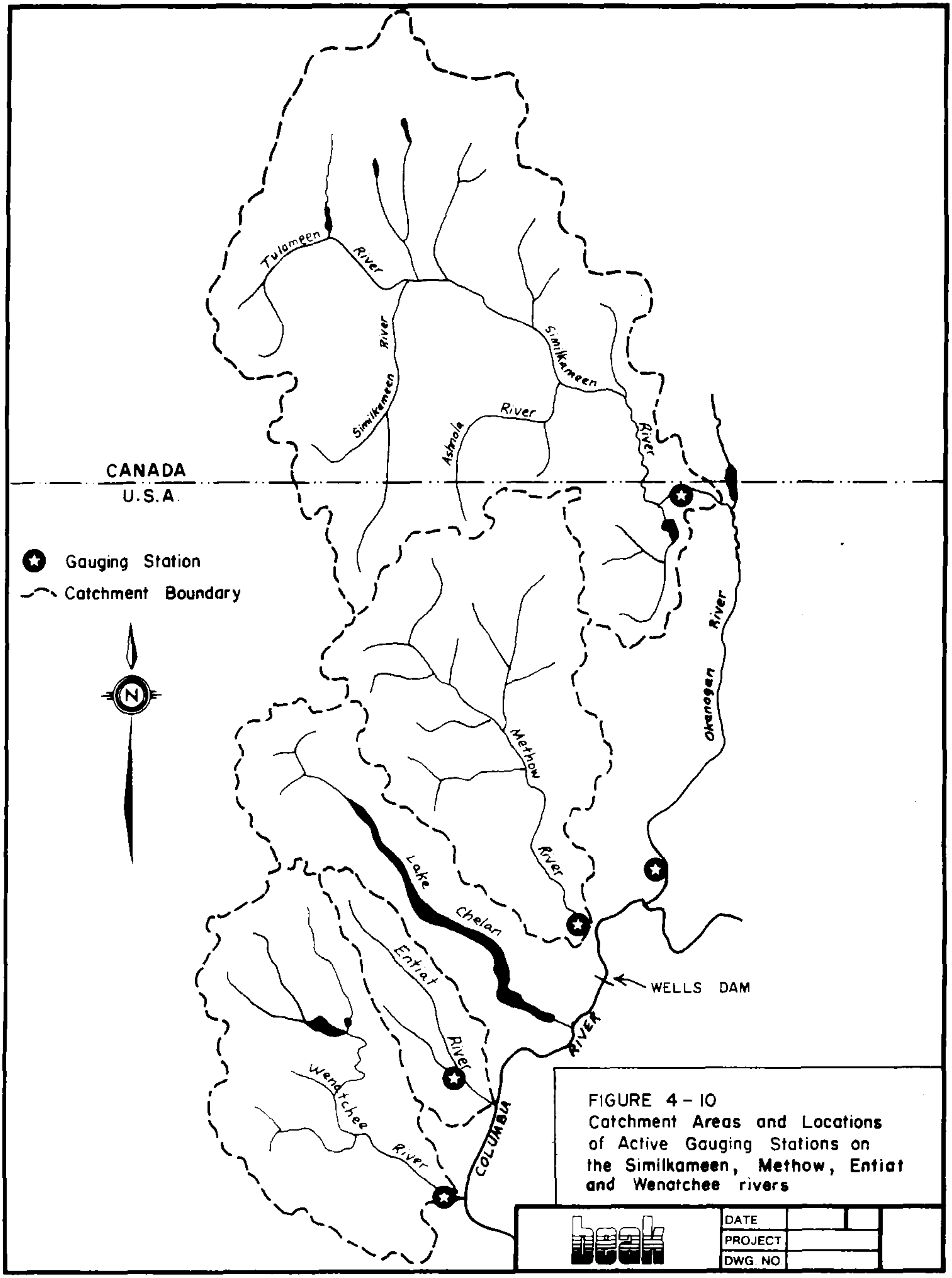


FIGURE 4 - 10
Catchment Areas and Locations of Active Gauging Stations on the Similkameen, Methow, Entiat and Wenatchee rivers

4.14 Potential Sport Fishery

In order to more fully address the various considerations of establishing a sport fishery based on steelhead trout in the Similkameen basin above Enloe Dam, it is instructive to examine the existing fishery there. This section addresses the present fishery based on non-anadromous trout species above Enloe Dam and the growing steelhead fishery below the dam and summarizes some of the features of a potential steelhead fishery above the dam.

4.14.1 Present Resident Sport Fishery Upstream Of Enloe Dam

As part of BPA's program of consultation with the various agencies, Tribes and organizations with interest in potential fish passage of Enloe Dam, significant contact has been ongoing with the B.C. Fisheries Branch. Following from a suggestion by representatives of that agency (C.J. Bull, personal communication, 1984), a detailed survey of Similkameen anglers was conducted in the summer season of 1984 to document several aspects of angling pressure, sport fish harvest and angler attitudes. The census method employed was basically that described by Malvestuto et. al. (1978) with slight modifications. The full report of this effort including the objectives, methods, results and analysis are contained in Appendix 2. Only a brief summary of some of the salient findings are presented here.

The method employed relies on non-uniform probability sampling techniques and stream-side interviews to gather the base data on anglers, their catch and their harvest. This allows statistical extrapolation from the base data to estimates covering both time and distance throughout the basin. A trained field crew, augmented by periodic counts from a spotter aircraft, surveyed approximately 400 km (240 miles) of stream. Interviews were conducted on 62 days, within defined sampling units of the stream, which included weekdays, all weekends and all statutory holidays (to enhance sample size) during the period from 23 June through 8 September 1984.

A total or 336 anglers were interviewed and they reported a total catch of 631 fish with only 229 of those kept (harvested). The breakdown of the catch and harvest by species and size was:

Species	Catch	Harvest			
		Number	% of Catch	x Fork Length	x Weight
Rainbow trout	475	155	32%	19.7 cm	77.5 gr.
Brook trout	138	62	45%	19.0 cm	72.3 gr.
Cutthroat trout	1	1	100%	--	--
Mountain whitefish	10	8	80%	30.7 cm	--
Squawfish	7	3	43%	--	--
Total	**631**	**229**	**36%**		

All of the brook trout came from the tributary system composed of Allison and Summers Creeks, where that species has been stocked.

The origin of the anglers was determined to be 16% from the local area, 71% from elsewhere in B.C., 6% from other provinces and 6% from other countries. Of the local residents, nearly 90% had come to the river specifically to fish, contrasted with only 39% of the non-residents (61% had other primary reasons, mainly family camping and just travelling past, for being on the river). The local residents seem to prefer fishing the headwater lakes that have been stocked. These results reflect the rather poor capability of the Similkameen River to draw anglers despite its extensive stretches of easy access from the highway. The small size of the fish catchable in the system probably has a great deal to do with the poor drawing power.

Effort by anglers was also reported to be low, averaging less than two hours for an angler day. This average varied on a monthly basis between 0.8 and 2.5 hours, and again reflects that the principal recreational activities were other than fishing.

The mean daily catch per unit effort was highest in June at 2.2 fish/hour and declined to below 1 for the remainder of the season (0.4 fish/hour in September). These discouragingly low rates of yield are probably the other major reason for the low power the system has for attracting anglers.

Extrapolations of the base data to the entire system for the four month period resulted in the following average estimates.

Total angler effort = 7,518 days (13,410 hours)

Total catch = 10,791 fish (harvest of 4,619 fish)

Total catch of rainbow trout = 7,554 (harvest 2,493)

Total catch of brook trout = 3,237 (harvest 1,457)

Total catch per unit effort = 1.4 fish/day (0.8 fish/hour)

Total harvest per unit effort = 0.6 fish/day (0.3 fish/hour)

Quite obviously the distribution of effort, catch or harvest was not uniform amongst all sections of the basin. The following estimates were calculated for the four month summer period.

Stream Section	Effort (Angler Days)	Catch (Number)	Harvest (Number)
Allison/Summer Creeks	2,781	5,557	1,879
Old Hedley Road Bridge to Princeton	2,201	840	375
Ashnola River	1,732	7,063	2,405
Above Similkameen Falls	1,723	2,038	648
Tulameen River	449	329	149
Old Hedley Road Bridge to Keremeos	354	87	87
Similkameen Falls to Princeton	Approx. 0	N/A	N/A
U.S. Border - Enloe Dam	Approx. 0	N/A	N/A

During the interviews anglers were asked for their opinions concerning steelhead introductions to the system and how they would respond to such introduction. A total of 88% were in favour of the introductions, 9% were undecided, and only 3% were opposed. In response to the question if they would make a special trip to the Similkameen to fish for steelhead, 49% said yes, 48% said no and 3% were undecided. Of those anglers who said they would spend more time if steelhead were introduced, 46% indicated they would spend at least a weekend, 16% said a week or more and 38% said a day or less. Overall, 30% of the interviewed anglers felt that steelhead introductions would not effect their angling effort and 70% would make a special trip or expend more effort fishing.

4.14.2 Present Sport Fishery Below Enloe Dam

As indicated in Section 4.14.1 above the IEC BEAK Consultants Ltd., 1984 summer creel survey did not include the U.S. portion of the Similkameen River below Enloe Dam or Palmer Lake. In general fishing effort for resident species on the mainstem Similkameen River between Enloe Dam and the confluence with the Okanogan River is relatively light. Major sport fish captured below Enloe Dam include rainbow trout (*Salmo gairdneri*), mountain whitefish (*Prosopium williamsoni*), lingcod (*Lota lota*), smallmouth bass (*Micropterus dolomieui*) and carp (*Cyprinus carpio*).

Angler effort and harvest for summer-run chinook salmon which enter the Similkameen River in August and September is presently light. The small harvest is mainly restricted to avid anglers who are local residents of the area.

The summer steelhead sport fishery which has recently been introduced by the Washington Department of Game 1983 and 1984 smolt stocking program in the Similkameen River seems to have produced excellent results during the 1984-85 season, representing the 1-ocean adult return of the 1983 smolt plant. The Washington Department of Game punchcard data for the 1984-85 season which will provide information on angler effort and harvest will not be available until mid-summer 1985 (K. Williams, pers. comm., 1985).

4.14.3 Potential Steelhead Sport Fishery On Similkameen River

The success of Wells Hatchery summer steelhead returning from smolts planted in the Methow River is indicative of the potential to produce a similar quality sport fishery in the Similkameen River. Preliminary indications from the 1983 and 1984 smolt plants in the Similkameen River are that the 1-ocean year class returned in good numbers providing the best fall and spring steelhead fishery on record (since 1967, Table 4-2) for the Okanogan and Similkameen Rivers. The expansion at Wells Hatchery to provide 250,000 smolts annually for planting in the Similkameen River and achievement of fish passage at Enloe Dam will provide access to extensive spawning and rearing habitat available in the upper watershed. The continued supplementation of artificial production combined with natural production is projected to provide a total steelhead run of 22,300 and harvest of 2,228 in years 49 and 50 based on a 10% annual harvest (Section 4-10). In contrast, at a 40% allowable harvest per year the total run size would be 9,800 in years 49 and 50 with a harvest of 3,923 steelhead.

At the present time the potential for a viable sport fishery on the Similkameen River appears to be excellent. However, many fisheries management decisions are required regarding such issues as the ultimate stocking strategy; harvest allocation among users in Washington, B.C. Tribes and sport fishermen; and protection of wild fish. All of these factors are factors which will influence the eventual size of the run. In addition, many factors relating to the behavior of Wells Hatchery smolts planted in the Similkameen River are still unknown.

4.15 Harvest Management Considerations

In order to assess the potential benefits to be realized from the establishment of a summer steelhead fishery in the Similkameen River by developing a natural run of wild fish with artificial supplementation as outlined in Section 4.10, the most appropriate method of maximizing natural production while controlling the commercial (native and domestic) and recreational harvest in British Columbia and Washington must be determined. The resource user groups which should be considered in development of a unified harvest management strategy and their present estimated harvest of the Wells

Hatchery - Methow River/Okanogan River/Similkameen River stocks in the Columbia River below Wells Dam is as follows:

User Group (1983 and 1984 estimated)	Washington %	B.C. %
Commercial Fishery - domestic - incidental	0 - 1	0
Commercial Fishery - Native - incidental	1	0
Recreational Fishery (1982 WDG punchcard)	8	0

A comparison of the current sport fishing regulations in British Columbia and Washington is presented to illustrate the variety of freshwater fishery management strategies employed in the Pacific Northwest with respect to steelhead and rainbow trout.

4.15.1 British Columbia Fisheries Branch

In British Columbia, the 1985/86 Synopsis provides an annual province wide catch quota of 10 steelhead (rainbow trout greater than 50 cm fork length) for all waters. A maximum daily catch of 0 wild and 2 hatchery steelhead in Vancouver Island Region 1 rivers is permitted where a catch and release fishery has been employed to protect wild stocks. Other general restrictions include use of single barbless hooks, a general bait ban (May 1 - November 30) and a new requirement that after an individual's daily quota is reached, no further fishing is permitted. For the Thompson River in Region 3 only 2 steelhead per month may be harvested. Two daily possession quotas of 1 steelhead or trout over 50 cm are permitted. Aggregate trout for all streams in the Region is set at 4. The annual closure occurs January 1 to May 31 to protect spawners.

The B.C. portion of the Okanogan-Similkameen River system is located in Region 8. The catch quota for trout over 30 cm (Fl) for all streams is 2 and for trout over 50 cm (Fl) for all waters is 1. The aggregate trout daily catch quota (all species, all sizes) is 4 for all streams, 6 for all lakes and 6 for all waters in the Region. A possession limit of 2 daily quotas is in effect. The Okanogan Region is currently considering a minimum size limit for rainbow trout (C. Bull, pers. comm., 1985) of 10 inches in an attempt to improve the quality of the sport fishery. The Similkameen River and its tributaries are exempt from the general spring stream closure which is in effect for other river systems in the Region.

4.15.2 Washington Department Of Game

Washington Department of Game Region II regulations for 1985 which apply to the Okanogan and Similkameen Rivers indicate an annual catch quota of 30 steelhead over 20", with a maximum of 20 captured above Bonneville Dam. In general no distinction is made between wild and hatchery steelhead in Washington State with a maximum daily catch of 2 fish over 20" and a possession limit of 4 fish over 20". In Region II catch quotas for trout are no more than 8, 3 over 14", and 2 over 20". A possession limit is set at 1 catch limit, only 2 steelhead over 20", with a minimum rainbow size limit of 6".

Special regulations include no annual closure in the Okanogan River with closures January 1 to March 31 and May 25 to December 31 for both the Similkameen and Methow Rivers. More restrictive regulations apply to the Wenatchee and Entiat Rivers. For the Entiat River closures occur May 25 to November 30, January 1 to March 31 (trout minimum length 10") and December 1 to December 31. The Wenatchee River from its mouth to the Icicle River Road Bridge is closed May 25 to November 30 (trout minimum length 8", all steelhead over 20" must be released unharmed), January 1 to March 31, and December 1 to December 31 (trout minimum length 10", steelhead daily catch limit of 2 over 20").

4.15.3 Tribes - B.C. And Washington

At the present time, Tribes in British Columbia and Washington support passage at Enloe Dam and development of a summer steelhead fishery in the Similkameen River. Native harvest in Washington State however is generally targetted on chinook salmon with steelhead captured incidentally during their Fall and Winter Treaty fisheries. As mentioned in Section 4.7 Native catches of steelhead have increased in recent years to 151 and 712 in 1983 and 1984 respectively with Wells Hatchery returns representing approximately 1% of their total harvest.

British Columbia Natives have indicated their support for steelhead trout and salmon introduction into the Canadian portion of the Similkameen River. At the present time the Osoyoos Band from Oliver in the Okanogan Region are allocated an annual harvest of sockeye salmon (10% of the run) from the Okanogan River below McIntyre Dam (B. Kurtz, DFO, pers. comm., 1985) by spear and gaff fishing. In 1984, approximately 2000 sockeye were taken from a run estimated at 40,000.

4.15.4 Sport Fishing Associations

Sport fishing organizations in British Columbia (B.C. Wildlife Federation, Penticton Flyfishers, Ospreys, Steelhead Society) are generally supportive of creating a new sport fishery on the Similkameen River, however they rely on the B.C. Fisheries Branch technical representatives to assess the merits and risks of the proposal. Concerns expressed to date include possible disease transfer, requirement for additional management in the Region, harvest allocation and harvest of a less desirable late running steelhead rather than the more preferable fall run.

4.16 Disease Profile Of Other Upper Columbia River Fish Stocks

Although the main emphasis of an anadromous salmonid stocking program in the Similkameen River system upstream of Enloe Dam is presently on summer steelhead, the possibility exists that other anadromous species may be introduced or stray into the upper Similkameen River once passage is achieved. For this reason, a description of the fish diseases documented in other upper Columbia River anadromous stocks has been compiled below.

4.16.1 Wells Hatchery Summer Chinook

The upper Columbia River summer chinook run is currently the dominant component of the Columbia River summer chinook population with the other main component being the Snake River run destined primarily for the Salmon River in Idaho. The present upper Columbia River run is a remnant of a much larger run that was severely impacted by the construction of the Grande Coulee Dam and to a lesser extent, the other mainstem Columbia River dams (ODFW, WDF, WDG and IDFG, 1984b).

Wells Dam Hatchery is presently the primary production facility for upper Columbia River summer chinook.

No viral diseases have been diagnosed at Wells Hatchery however bacterial kidney disease (BKD) was diagnosed in 1984 (K. Hopper, pers. comm., 1985), and eye fluke has also been identified (ODFW, WDF, WDG and IDFG, 1984b).

4.16.2 Similkameen River Summer Chinook

Between October 28 and 31, 1984, IEC BEAK Consultants Ltd. fisheries biologists collected 52 fresh Similkameen River summer chinook carcasses and 16 ovarian fluid samples to be examined for evidence of furnunculosis (Aeromonas salmonicida), enteric redmouth (Yersinia ruckeri), bacterial kidney disease (BKD) (Renibacterium salmoninarum, ceratomyxosis (Ceratomyxa shasta), the proliferative kidney disease etiologic agent (PKD), infectious hematopoietic necrosis (IHN) virus and infectious pancreatic necrosis (IPN) virus.

The salmon carcasses and ovarian fluid samples were shipped the same day they were collected to Bio Med Research Laboratories Inc., Seattle. Bio Med examined the carcasses for non-viral disease agents and along with the ovarian fluid samples, removed tissue samples (spleen and kidney) and delivered them to the National Fishery Research Center in Seattle for viral disease determinations.

The opportunity existed to collect more than 16 ovarian fluid samples however, during the latter part of the sampling period the unusually cold weather (-10°C) caused any fluids collected to freeze thus precluding their use in disease analysis. The tissue samples from all the carcasses were utilized to provide additional information.

The results from the non-viral analyses showed no apparent evidence of furunculosis, enteric redmouth, BKD, KD, or PKD. However, 62 percent of the carcasses had ceratomyxosis infections and all fish had high levels of non- R. salmoninarum bacteria in kidneys and liver (Appendix 3). No viruses were isolated from the 16 ovarian fluid and 52 kidney/spleen samples examined (Appendix 3).

4.16.3 Okanogan River Sockeye

Sixty-five ovarian fluid samples were collected by IEC BEAK Consultants Ltd. from spent sockeye salmon females in the Canadian portion of the Okanagan River near Oliver, B.C. on October 18 and 19, 1984.

The samples were shipped to the National Fishery Research Center, Seattle for infectious hematopoietic necrosis (IHN) virus determination.

The infection rate was found to be 94 percent (61/65 samples). The results were felt to be typical of sockeye salmon populations in general (Appendix 3).

5.0 PASSAGE ALTERNATIVES

5.1 Review Of Agencies And Tribes Preferred Mode Of Passage

BPA has conducted an extensive consultation program with government agencies, Tribes and organizations in both the U.S. and Canada that have an interest in the question of fish passage over Enloe Dam. An indication of that consultation effort is the wide distribution that was given to the progress report (IEC BEAK Consultants Ltd., September 1984). That distribution list is reproduced in Appendix 1 of this report.

One function of that consultation program was to solicit comments from the various groups about their preferred mode of fish passage over Enloe Dam. Probably for a variety of reasons, many groups chose not to identify a preference. Of those that did, there was a diversity of opinion. This section attempts to summarize those opinions and draws heavily on the written communications that are reproduced in Appendix 1 of this report, as well as those in the progress report of September 1984.

The B.C. Fisheries Branch were generally receptive to the proposal to introduce summer steelhead, but indicated several areas of concern. The reader is directed to the letter dated September 4, 1984 from David W. Narver to John Palensky reproduced in Appendix 1. It is this agency's position that the only acceptable passage at this time would be by trap and haul as that would allow full control of escapement, opportunity for disease assessment, full evaluation of the project and appropriate distribution of fish within the system. Should the program be judged as successful, in terms of adult returns, dam removal or a fishway could be considered at some point in the future.

The Colville Confederated Tribes responded in a letter by Al Aubertin to BPA dated December 17, 1984 restating their earlier position that their preference is removal of Enloe Dam, and that they are opposed to hydroelectric development on the river. They cited the reasons of preserving existing runs of salmon and other fish in the Similkameen River and to allow for effective rehabilitation and utilization of the river for fishery purposes (Appendix 1).

In letters to BPA dated December 21, 1984 and January 4, 1985 signed by Donald W. Moos, Director, the Washington State Department of Ecology expressed qualified support for fish passage at Enloe Dam (Appendix 1). Their qualifications were that survival of downstream migrants at mainstem Columbia River dams should be improved first and secondly that the mode of passage should not preclude the restoration of hydroelectric power production at Enloe Dam.

The National Marine Fishery Service, in a letter from Dale R. Evans, Division Chief to L.W. Lloyd of the Bureau of Reclamation dated January 22, 1985, reiterate their support for fish passage at Enloe Dam and identify dam removal as probably the most feasible and cost-effective alternative (Appendix 1). They also note that the Bureau of Reclamation had earlier identified dam removal as the preferred passage alternative in the December 1976 Environmental Impact Statement on the Oroville-Tonasket Unit Extension.

In a Memorandum for Record dated March 14, 1985 which summarized an inter-agency meeting on 26 February 1985, the Army Corps of Engineers outline their feasibility study plan of alternative hydroelectric developments on the lower Similkameen River. They point out on page 6 that the trap and haul alternative for Enloe Dam might be the most easily adaptable passage alternative to the large dam, should it be built, and that laddering may be inconsistent with the large dam depending on the economic life of the passage facilities (Appendix 1).

The Washington Department of Game are on record, via a letter dated June 8, 1984 to John Palensky of BPA from Frank R. Lockard, Director, as favouring dam removal as their first preference for the long term, but recognize the difficulties of accomplishing that. Their second choice is a trap and haul facility which they point out would have several advantages over a ladder, namely:

1. It could be used for collecting and transporting broodstock;

2. It could limit passage of some species;

3. It could trap wild spawners if the dam were removed; and

4. It would allow capture and selection of wild fish for use as hatchery broodstock, (see Appendix A of IEC BEAK Consultants Ltd., 1984 progress report).

The Okanogan Public Utilities District have applied to the Federal Energy Regulatory Commission for a license to reactivate Enloe Dam for hydroelectric power generation and would therefore obviously be opposed to any passage alternative which would infringe upon that possibility or detract from its economic viability, and have not stated a preference for a passage alternative.

5.2 Description Of Passage Alternatives

5.2.1 Introduction

Six alternatives to provide upstream passage at Enloe Dam have been developed to a conceptual level of design. These six alternatives fall into three general categories:

- Fishways;
- Trap and Haul Systems; and
- Dam Removal

These passage schemes were applied to the project site and six conceptual alternatives were developed:

- Alternative 1 - Fishway From Falls;
- Alternative 2 - Fishway Below Powerhouse;
- Alternative 3 - Trap And Haul At Falls;
- Alternative 4 - Trap And Haul Below Powerhouse;
- Alternative 5 - Trap And Haul At Railroad Bridge; and
- Alternative 6 - Dam Removal

The alternatives were developed to provide optimum passage effectiveness, while considering cost, operation and site constraints.

Alternatives 1 through 4 and 6 are located at the Enloe Dam site. Alternative 5 is located further downstream. Figure 5-1 shows the existing Enloe Dam site. The Enloe Dam site is characterized by a 54 ft high gravity arch dam, a 20 ft high natural water fall below the dam and an unused powerhouse and penstock on the right bank. Terrain along the right bank and downstream of the dam is steep and has poor access, it therefore, is less suitable than the left bank for fish passage construction. The left bank has good access and more gradual slopes. To the extent possible, all construction schemes at the Enloe site are located along the left bank.

Alternative 5 is located approximately 2 miles downstream of Enloe Dam. This site is shown in Figure 5-2. Good access is presently available to the left bank of the Alternative 5 site.

In 1981, Public Utility District No. 1 of Okanogan County (PUD) filed a Federal Energy Regulatory Commission license application (Project No. 2062) for redevelopment of hydropower at Enloe Dam. The PUD's proposal has been considered in the development of passage alternatives. Alternatives 2, 4 and 5 are designed to be compatible with hydropower development at Enloe Dam. Alternatives 1, 3 and 6 are not compatible with the PUD's plans. Although Alternatives 2 and 4 were developed to be compatible with hydropower, some conflicts still exist. These are discussed in the following sections.

5.2.2 Alternative 1 - Fishway From Falls

Physical Description

Alternative 1 is a fishway which would be constructed on the left bank of the Similkameen River between Enloe Dam and the falls downstream of the dam. The alignment and details of the fishway are shown in Figures 5-3 through 5-5. Entrances would be located at the base of the falls, and the 78-pool, vertical slot fishway would continue upward along the left bank and exit above the dam. The vertical drop between the entrances and exit is approximately 79 ft.

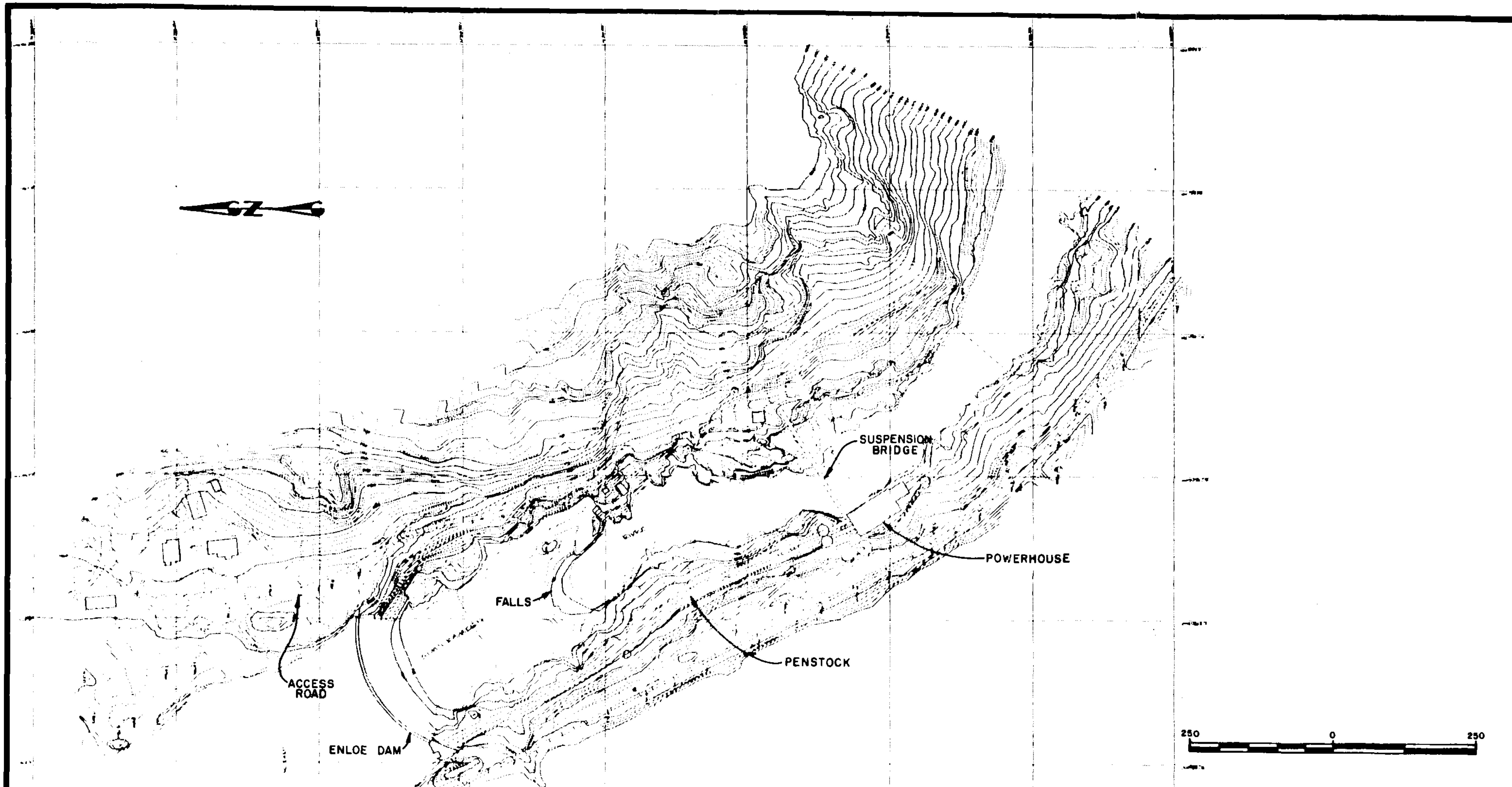


FIGURE 5-1

ENLOE DAM
FISH PASSAGE PROJECT

ENLOE DAM SITE

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

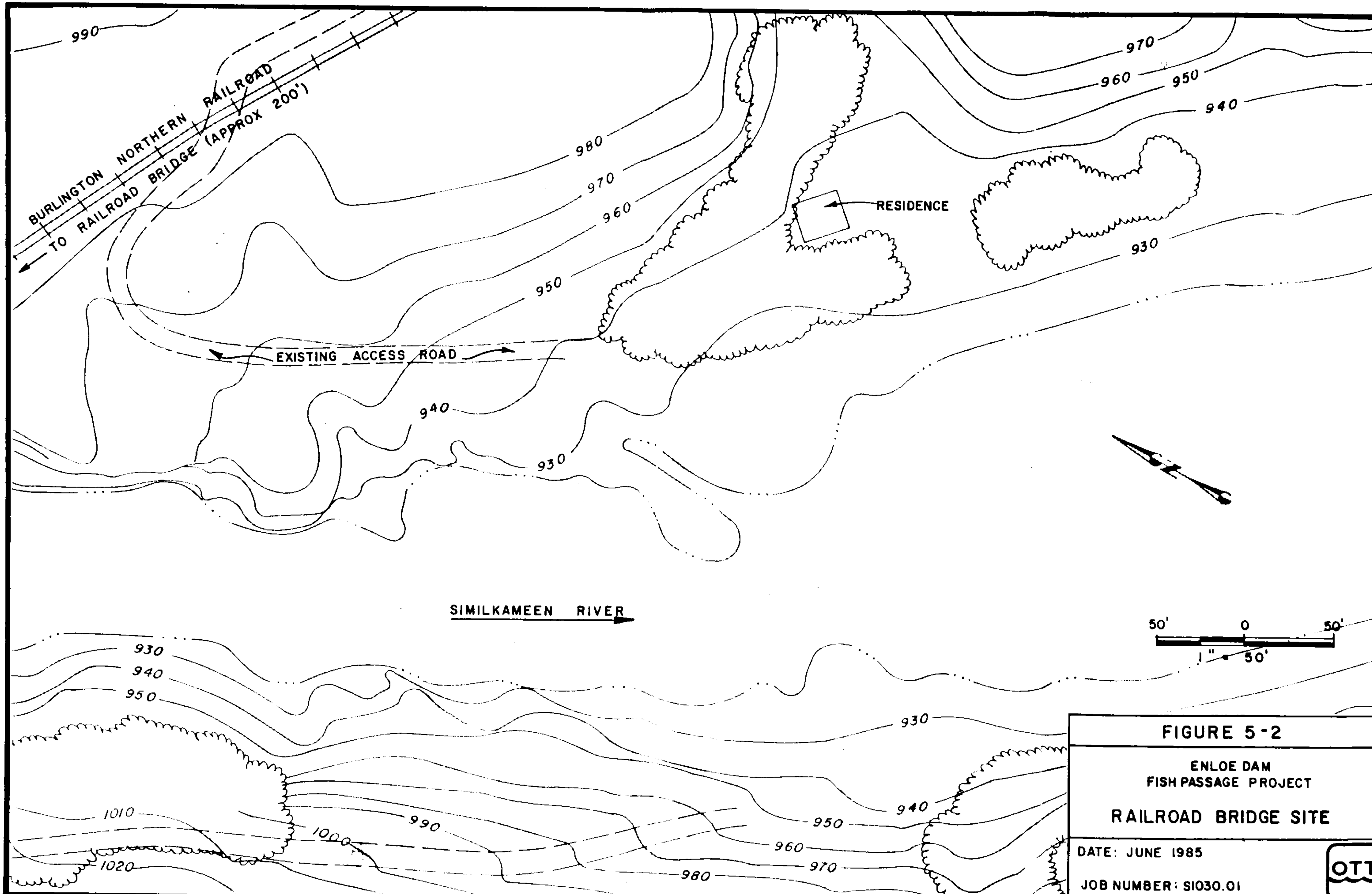


FIGURE 5-2

ENLOE DAM
FISH PASSAGE PROJECT

RAILROAD BRIDGE SITE

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

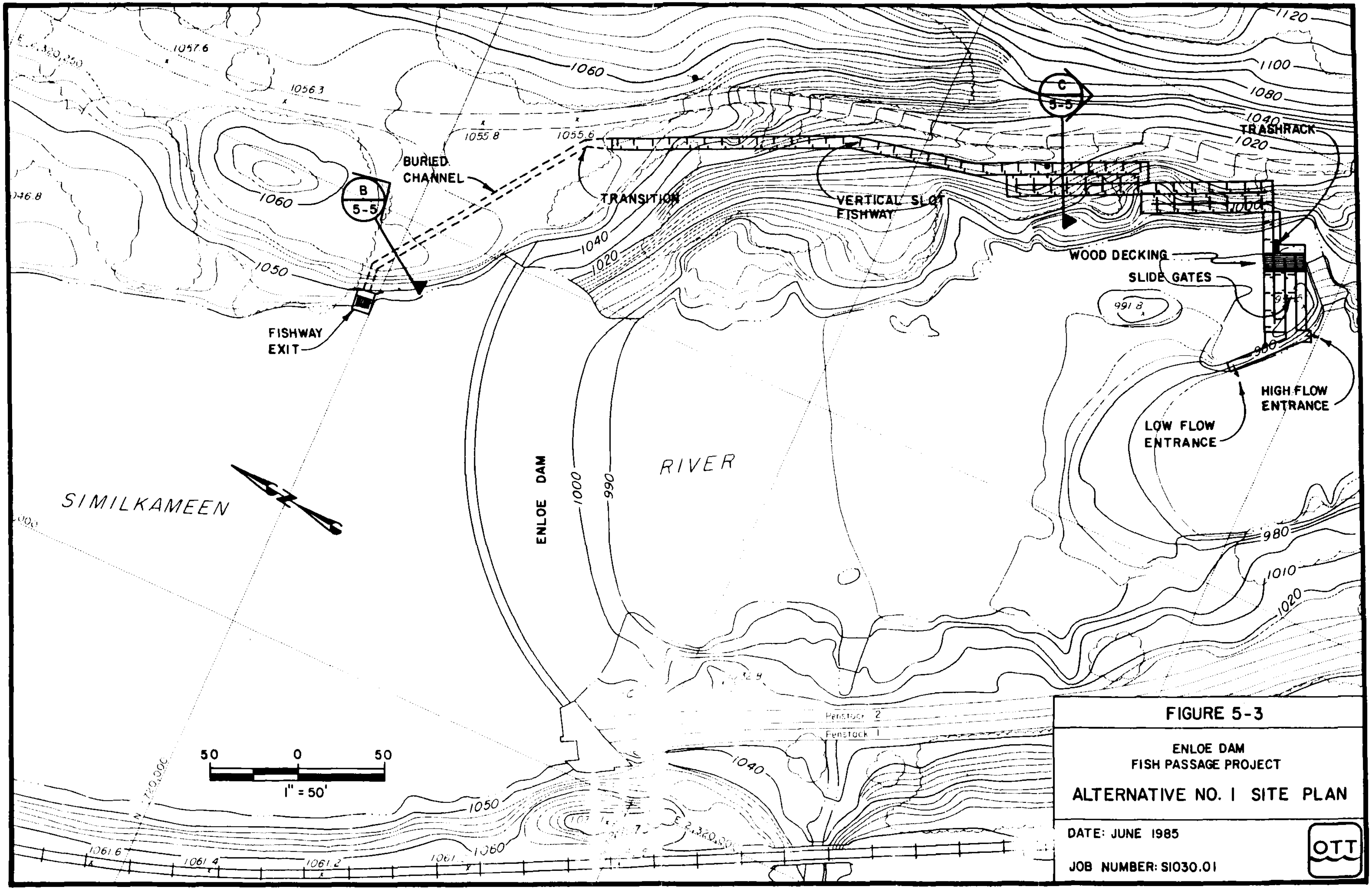


FIGURE 5-3

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 1 SITE PLAN

DATE: JUNE 1985

JOB NUMBER: S1030.01

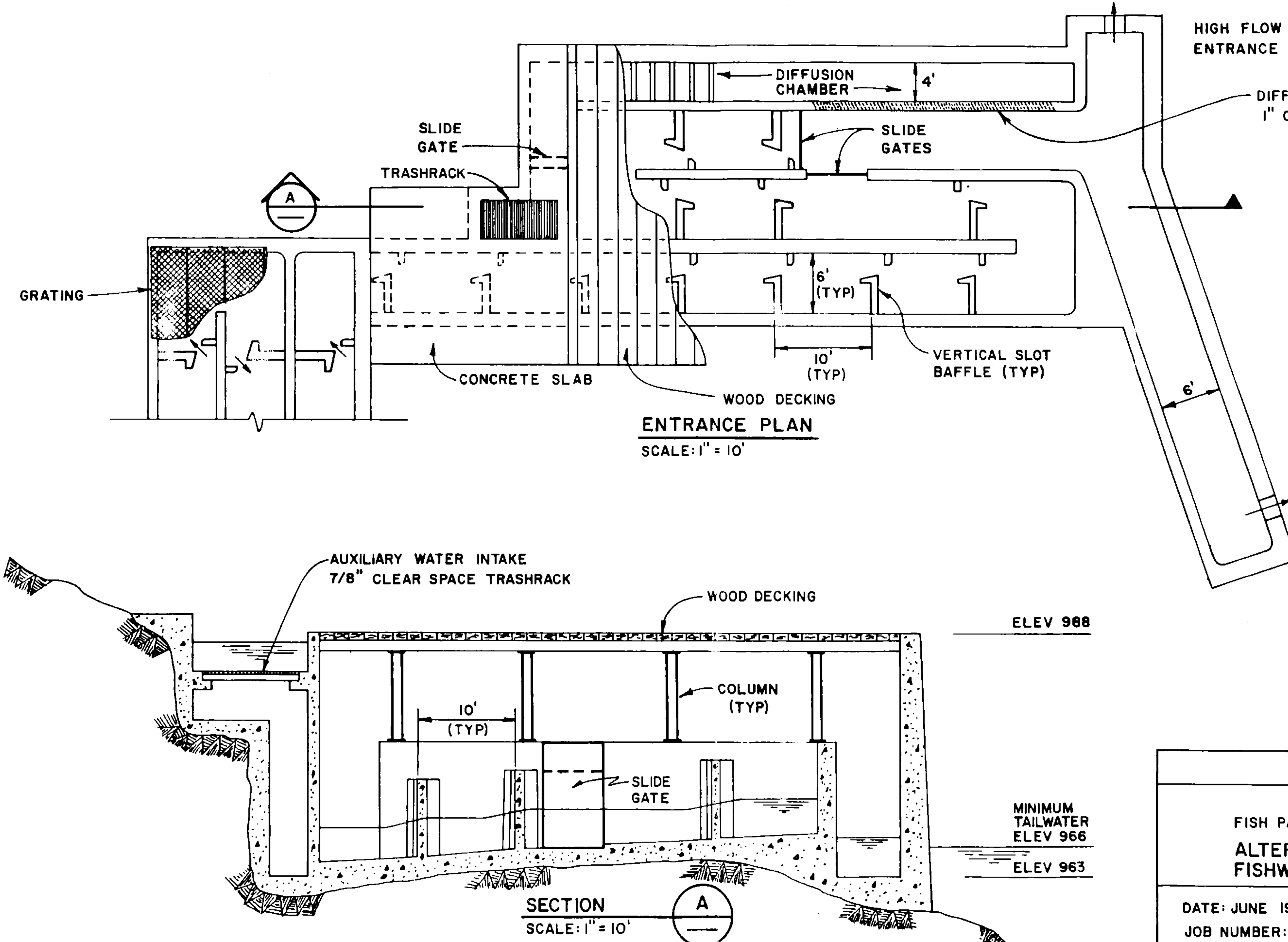


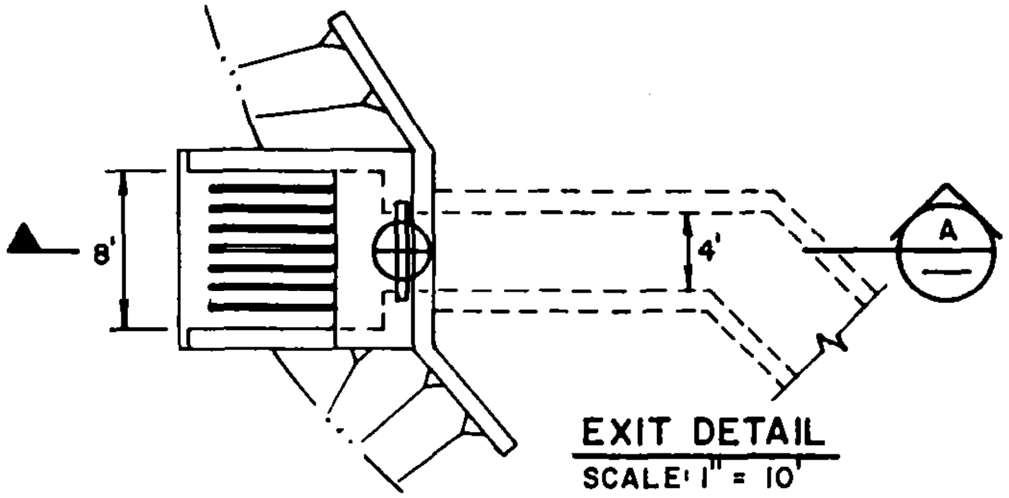
FIGURE 5-4

ENLOE DAM
FISH PASSAGE PROJECT

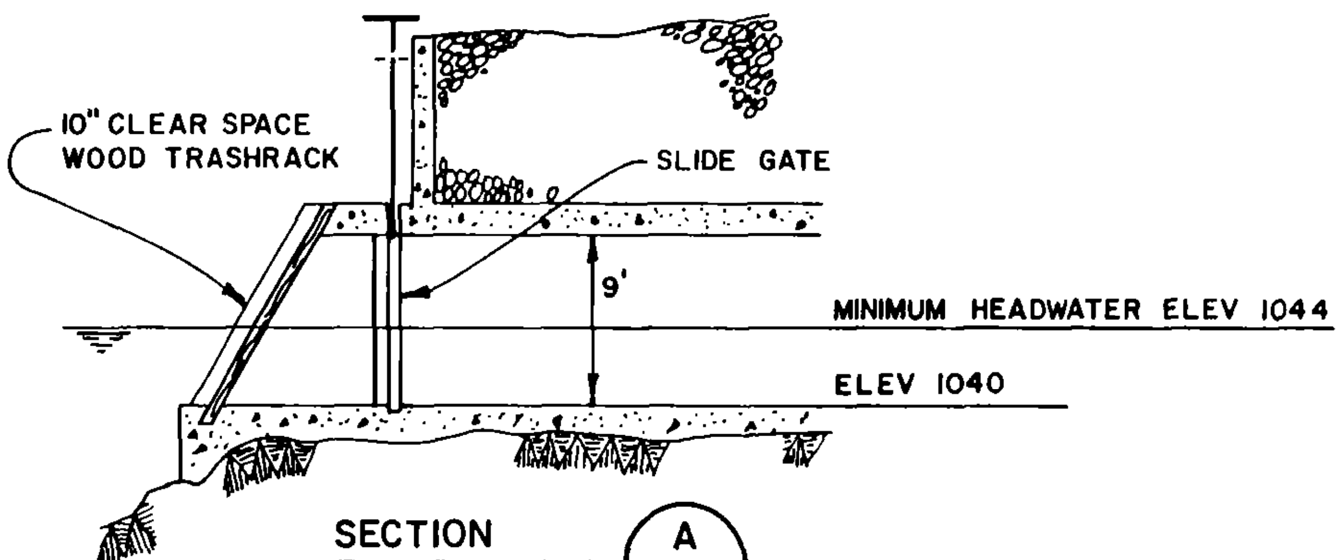
ALTERNATIVE NO. 1
FISHWAY DETAILS

DATE: JUNE 1985
JOB NUMBER: S1030.01

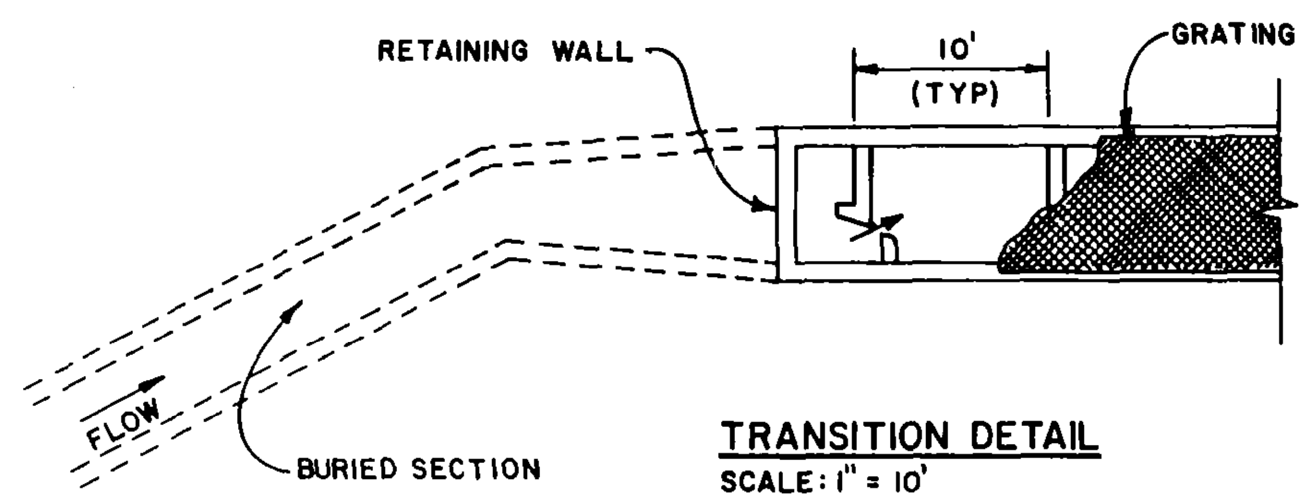
OTT



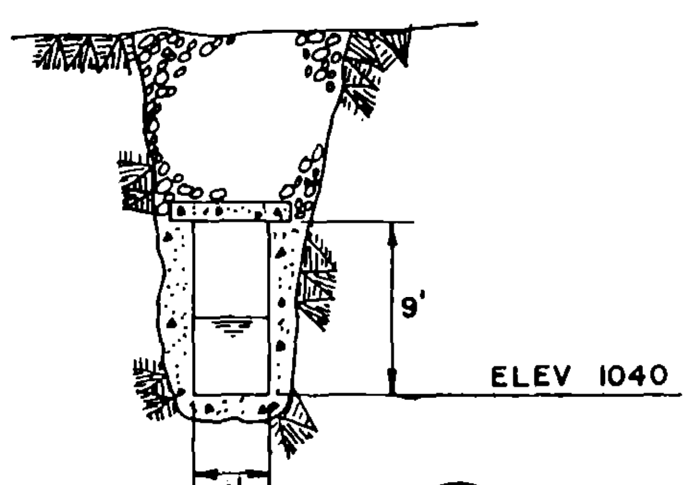
EXIT DETAIL
SCALE: 1" = 10'



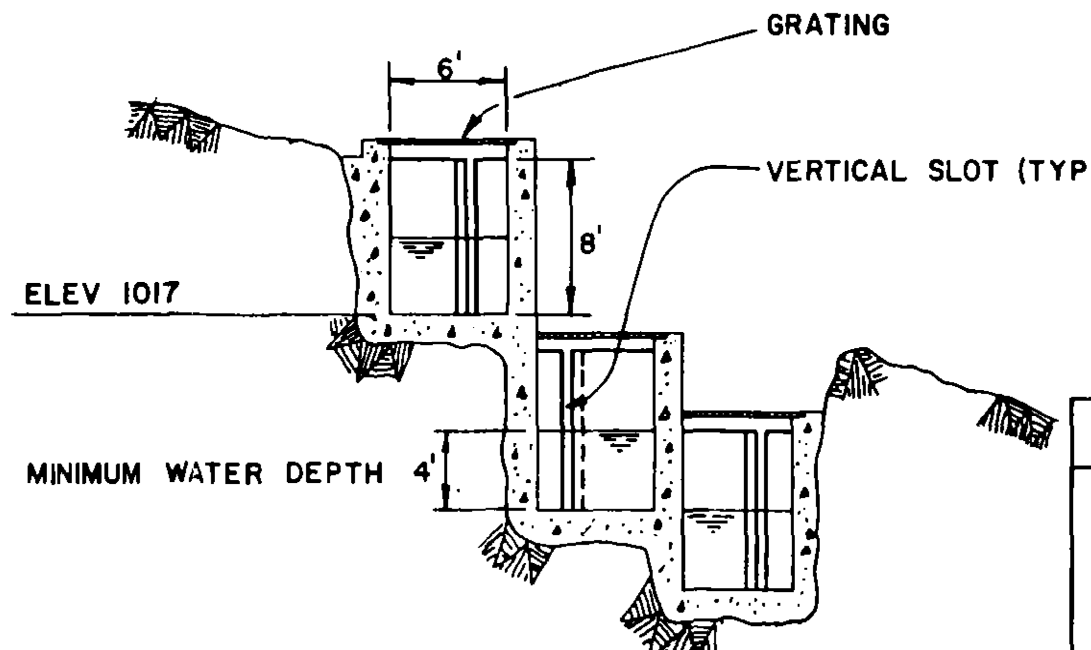
SECTION A
SCALE: 1" = 10'



TRANSITION DETAIL
SCALE: 1" = 10'



SECTION B (5-3)
SCALE: 1" = 10'



SECTION C (5-3)
SCALE: 1" = 10'

FIGURE 5-5

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 1 DETAILS

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

Fish approaching the falls would enter one of two entrances located at the base of the falls. The upstream entrance would be constructed to provide low to mid-flow passage; the downstream entrance would provide mid- to high flow passage. Pools above the entrance pool would be 6 ft wide by 10 ft long with a minimum water depth of 4 ft. Baffles between pools would be the vertical slot type with a 1 ft slot. The maximum drop between pools would be 1 ft. The lower section of the fishway would be twice folded with common walls. This arrangement would provide an economical design through savings in concrete and rock excavation. Two additional folded sections would be required above the falls to maintain a uniform hydraulic gradient.

From the entrance pool to a point approximately adjacent to the dam crest, the fishway slope is 10H:1V (ten horizontal to one vertical). Beyond this point, site characteristics and economical design dictate the fishway be buried and set on a nearly horizontal slope. The width of the buried section would be decreased from 6 ft to 4 ft to maintain sufficiently high transport velocities. The fishway exit would be located at the end of the buried section. The exit would be protected with a 10 in clear space trashrack, sloped 60^{o} from the horizontal.

The entire fishway, including walls, slabs and baffles would be constructed of reinforced concrete. The lower portion of the fishway would be covered by a wood deck to prevent uncontrolled flow from entering the fishway. The remaining fishway section would be covered with a galvanized grating to prevent poaching. The exit trashrack would be constructed of wood to minimize ice formation. The auxiliary water intake trashrack would be submerged approximately 2 ft to prevent ice formation.

Steelhead are estimated to arrive at Enloe Dam in their upstream migration during the period of October through November and February through May, when flows in the Similkameen River vary between 400 cfs and 5,500 cfs. Under these flow conditions, tailwater on the fishway will fluctuate about 7 ft. To compensate for the wide fluctuation in tailwater, the lower four pools would operate with the low flow entrance between flows of 400 cfs to 3,000 cfs. Above 3,000 cfs, the lower four pools would be shunted by slide gates and fish would enter the fifth pool directly from the entrance pool. This operation requires only 4 ft of freeboard beyond the minimum water depth of 4 ft and eliminates the need to construct approximately 3 ft of wall and baffle height over the entire fishway length.

As the flow in the Similkameen rises, flow through the fishway will increase from 30 cfs (at low flow) to 55 cfs (at the peak design flow of 5,500 cfs). Flow in the fishway would be controlled by the vertical slots and the water surface fluctuations of entrance and exit. Since the ladder flow of 30 cfs to 55 cfs would not attract fish under all flow conditions, auxiliary water would be added to the entrance pool. Up to 50 cfs of auxiliary attraction flow would be provided through the intake at the lower ladder section. The trashrack on the intake would have a 7/8 in clear space, with flow controlled by a slide gate. Auxiliary water would be diffused into the entrance pool through a diffusion grating with 1 in clear space. Maximum velocity through the grating would be 0.5 ft/sec.

Operation

Alternative 1 would be capable of effectively passing the estimated fish runs that may be established in the Similkameen River. If fish arrive at the site later than the mid-May estimate, however, the confined area at the site and high flows would make passage very difficult.

This alternative requires a substantial capital investment, but little operation and maintenance cost. Periodic adjustment of gates and clearing of trashracks are the principal maintenance requirements.

5.2.3 Alternative 2 - Fishway Below Powerhouse

Physical Description

Like Alternative 1, Alternative 2 is a vertical slot fishway located on the left bank of the Similkameen River. The 80-pool fishway would begin at a barrier dam located downstream of the old powerhouse, and would continue upstream along the left bank to exit 90 ft upstream of the dam. Alignment and details of Alternative 2 are shown in Figures 5-6 through 5-9.

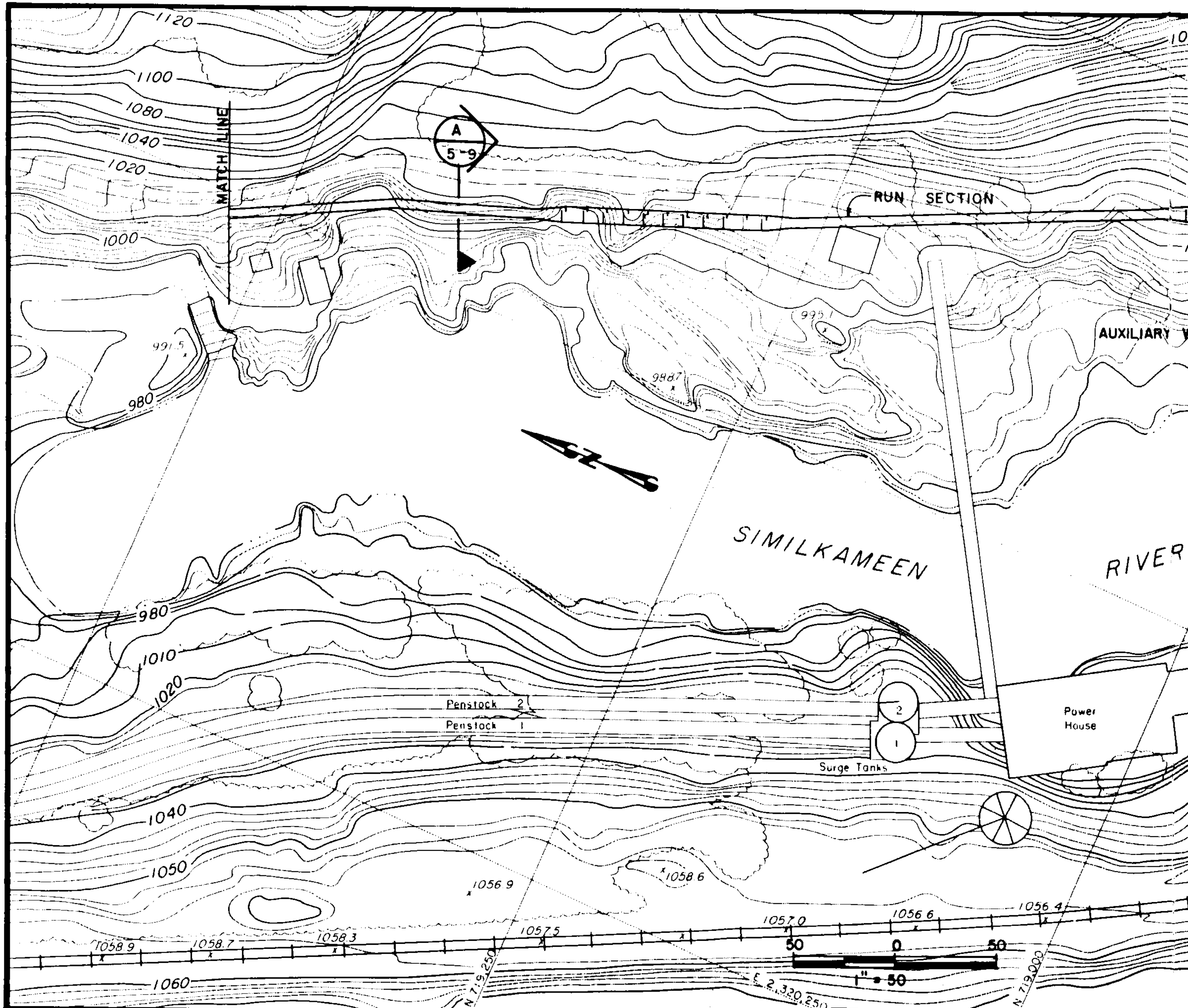


FIGURE 5-6

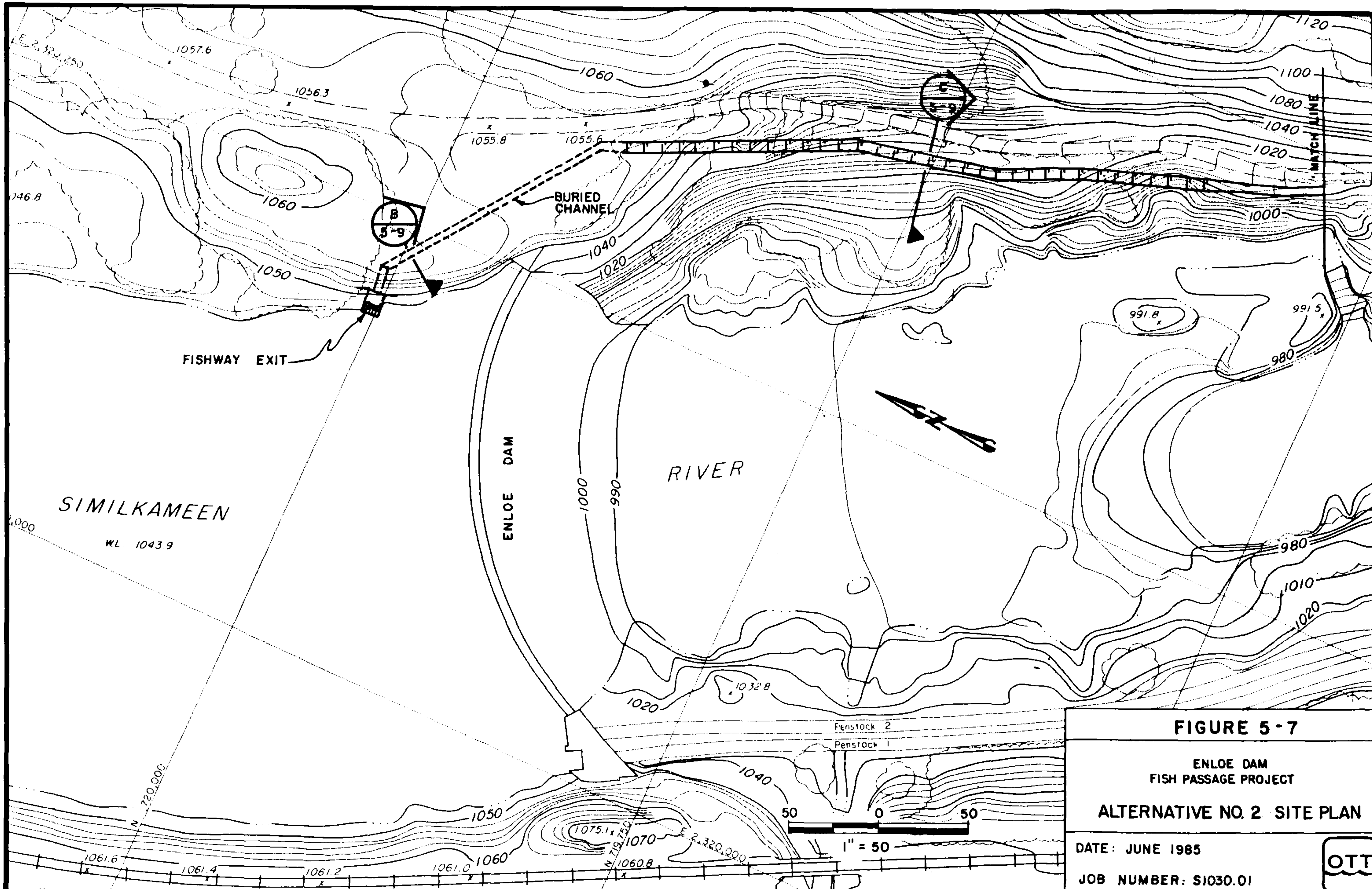
ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO.2 SITE PLAN

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT


BURIED CHANNEL
FISHWAY EXIT
SIMILKAMEEN
WL 1043.9
ENLOE DAM
RIVER
MATCH LINE
Penstock 2
Penstock 1
1" = 50
FIGURE 5-7
ENLOE DAM
FISH PASSAGE PROJECT
ALTERNATIVE NO. 2 SITE PLAN
DATE: JUNE 1985
JOB NUMBER: S1030.01
OTT

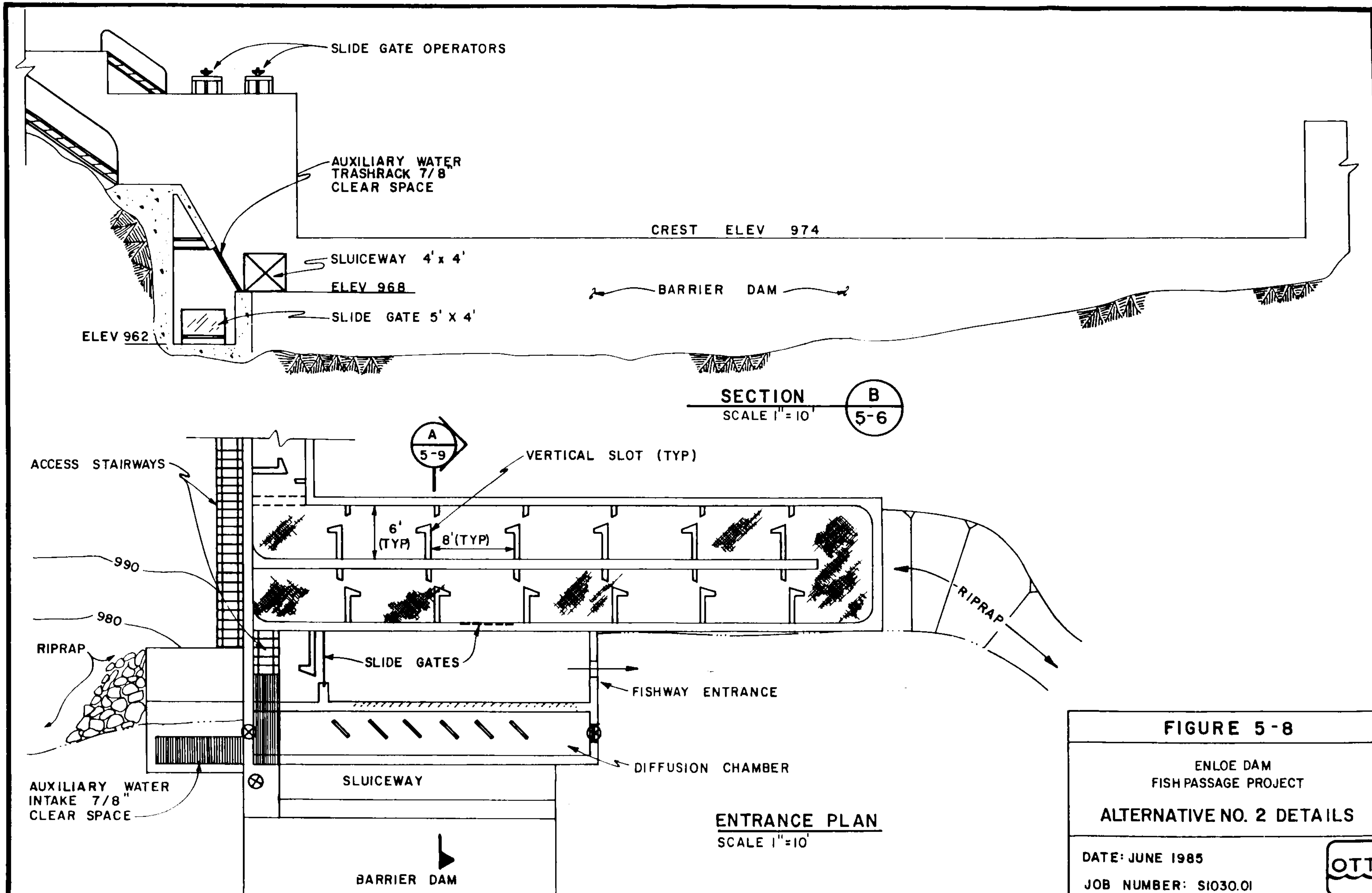


FIGURE 5-8

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 2 DETAILS

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

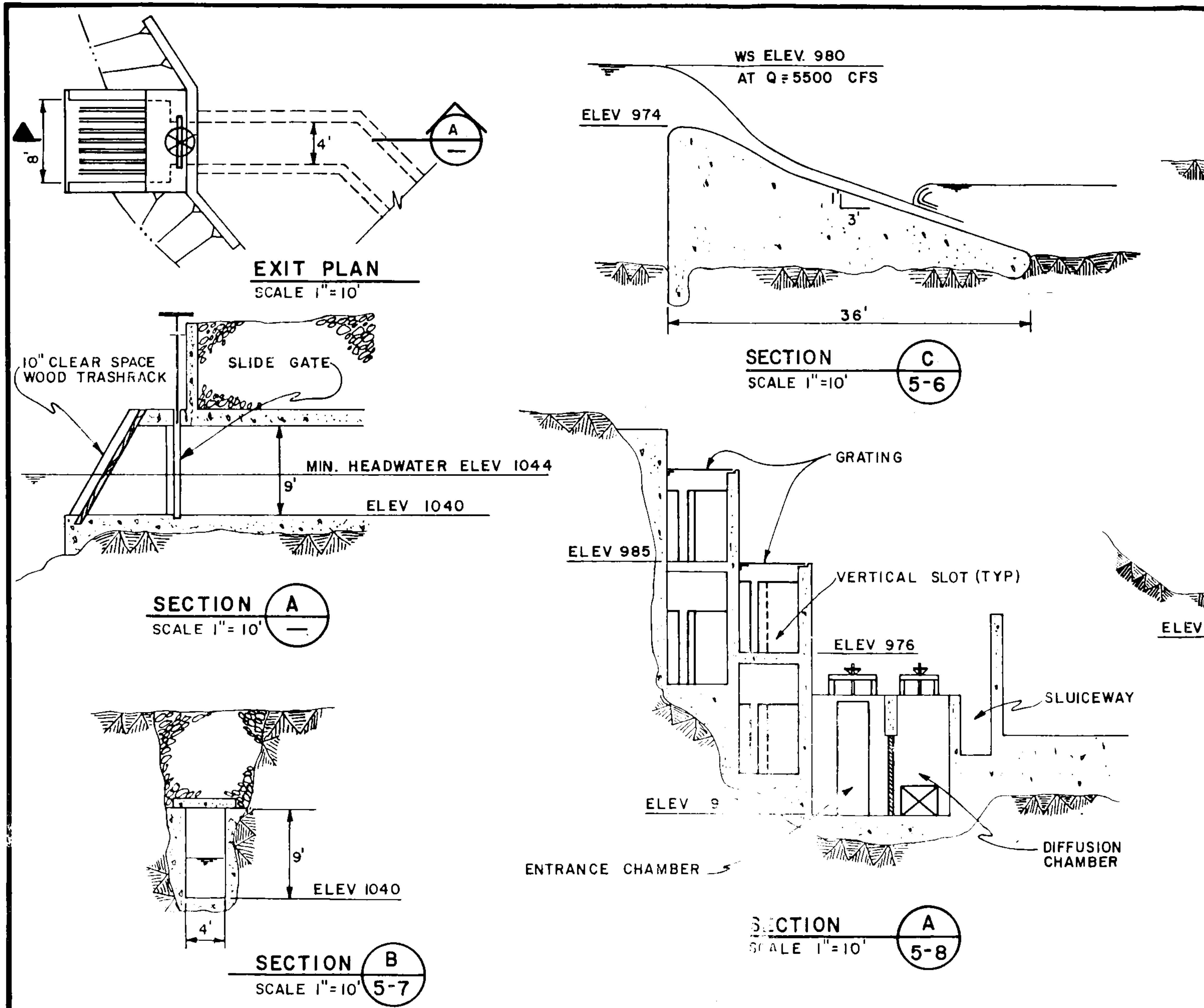


FIGURE 5-9

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 2 DETAILS

DATE: JUNE 1985

JOB NUMBER: S10 30.01

OTT

Fish migrating upstream toward Enloe Dam would be stopped by a swimming barrier located normal to the course of the stream. The hydraulic height of the barrier would be approximately 9 ft. The crest of the barrier would be ogee in shape, with a sloped apron (3H:1V). Fish would enter the ladder at the left abutment of the barrier through a single entrance. Auxiliary attraction flow would be added by a wall diffuser to the entrance pool. Like Alternative 1, fishway pools would be 6 ft wide and 10 ft long with 1 ft of head loss per pool. Depth of flow in the fishway would vary from a minimum of 4 ft to a maximum of 8 ft. The fishway slope would be 10H:1V.

Pools in the lower section of the fishway would be "stacked" in two levels, similar to a parking garage. The lower 16 pools would be founded on rock; the next layer of 16 pools would be set above the bottom 16 pools and supported by common walls. This concept is used to accommodate the steep surrounding slopes. Run or "flat" sections of the fishway with 4 ft widths, as discussed in Alternative 1, would also be used in this alternative.

The barrier dam would be constructed of mass concrete, and the fishway would be constructed of reinforced concrete, with slabs, walls and baffles cast-in-place. Buried sections of the fishway near the exit could be covered with precast concrete. All exposed areas of the fishway would be covered by galvanized grating. The exit trashrack would be constructed of wood to minimize ice formation, and sloped 60° from the horizontal to facilitate raking. Also, the auxiliary water intake would be submerged for ice protection.

Run timing and design flows in the Similkameen River for Alternative 2 are the same as those discussed in Alternative 1. Like Alternative 1, slide gates would be provided in this alternative to control the fluctuation of tailwater and decrease the wall and baffle heights. Auxiliary water requirements for this alternative are the same as those for Alternative 1.

Operation

Alternative 2 is capable of passing fish during the design range of flow in the Similkameen system. It may also be possible to pass fish at much higher flows than the 5,500 cfs that typically occurs in mid-May. The principal advantage of this fishway scheme is its compatibility with hydropower at Enloe Dam. If hydropower is developed in conjunction with this alternative, head would be lost for generation due to the construction of the barrier dam. Loss of head for generation is costly; however, this alternative does not preclude hydropower development. In contrast, Alternative 1 could not reasonably be developed with the proposed hydropower project, since the fishway entrances would lie well upstream of the turbine discharges. This would result in fish being attracted to the turbine discharge rather than to the ladder.

5.2.4 Alternative 3 - Trap And Haul At Falls

Physical Description

Alternative 3 is a trap and haul system that operates at the falls downstream of Enloe Dam. The trap system would include a fishway section leading up to a holding pool, and a trapping and loading facility. The configuration and details of the trap facility are shown in Figure 5-10 through 5-12.

The lower fish ladder section of the trap facility would be similar in location and layout to the Alternative 1 fishway. Two entrances, one for high flow and one for low flow, would be provided in the first pool. The remaining fishway pools would be 6 ft wide by 10 ft long. Weirs between pools would be half Ice Harbor type; notched, with a bottom orifice. Fish may either pass through orifices or jump over the "notched" area in the crest of the weir. The depth of flow in pools would be 7 ft.

Auxiliary water would be added to seven of the lower pools through chimney type overflows. Auxiliary water would be gravity fed from an intake above the falls and controlled by a valve. Auxiliary water would be added to the seven pools to maintain a sufficiently high transport velocity through pools as the tailwater rises and floods the lower pools. A transport, or average, velocity of 1 to 2 ft/sec would be maintained to attract fish through the ladder. Auxiliary flow would be split evenly between pools; total flow would vary between 25 and 50 cfs.

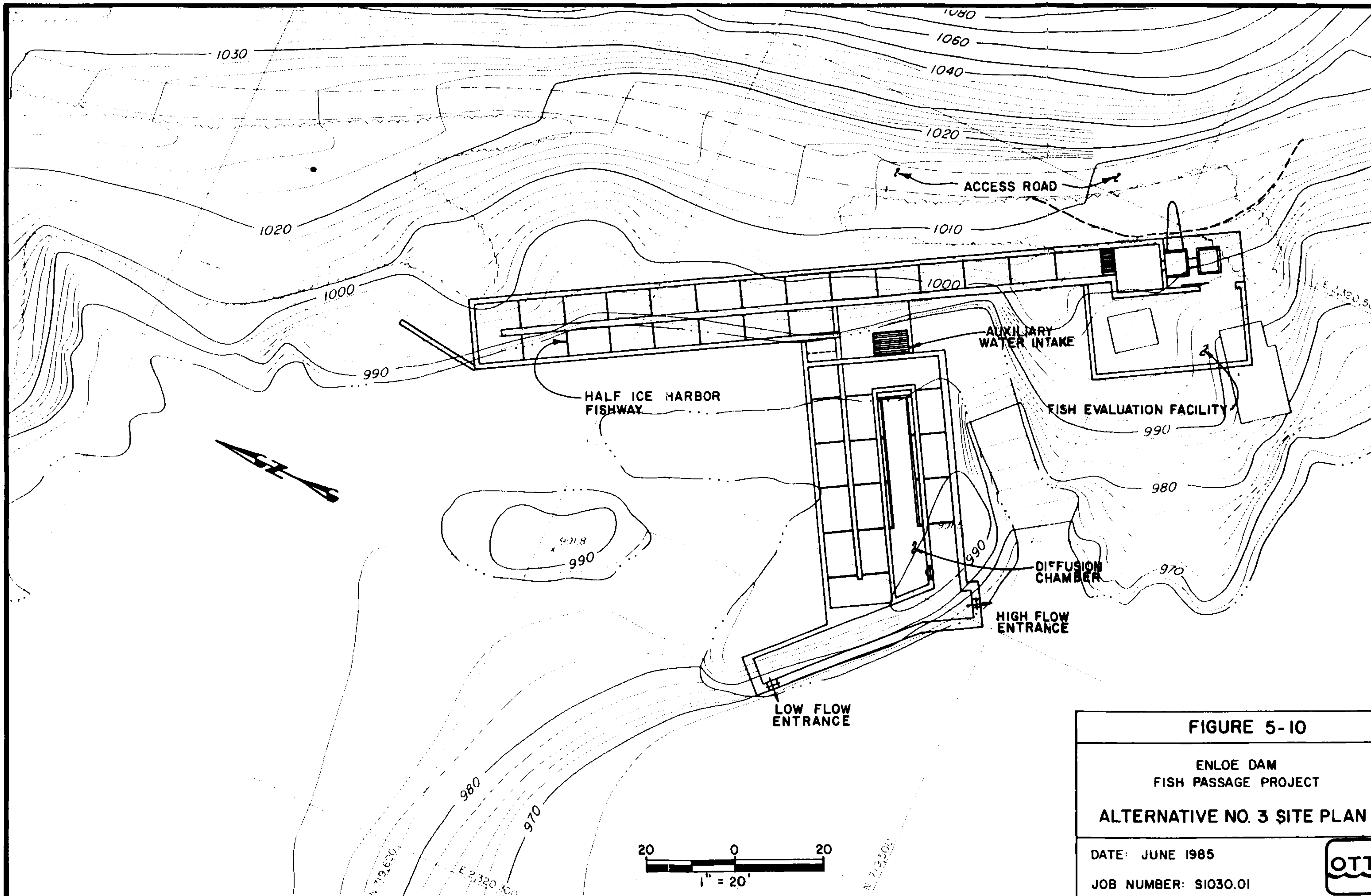


FIGURE 5-10

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 3 SITE PLAN

DATE: JUNE 1985

JOB NUMBER: S1030.01

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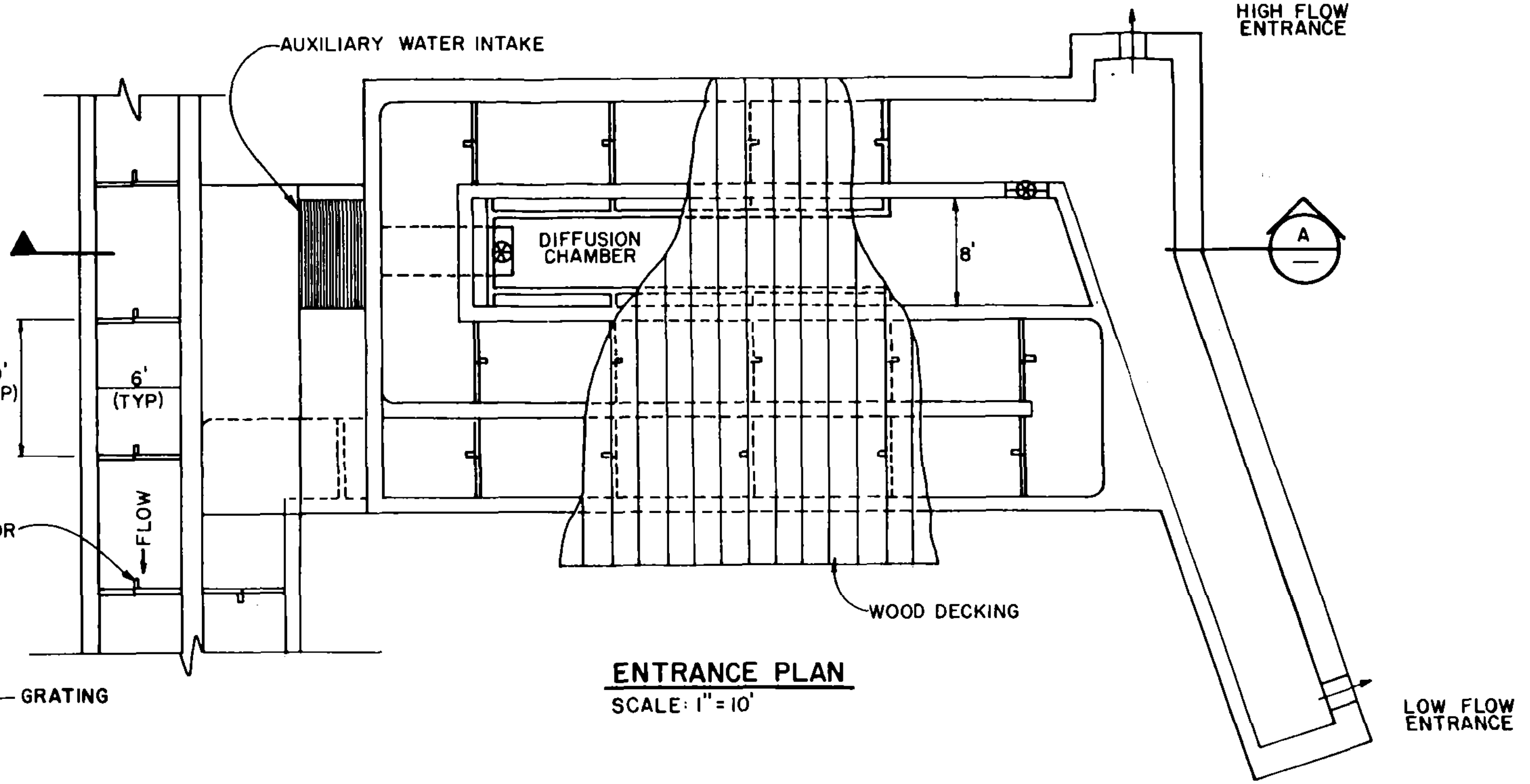

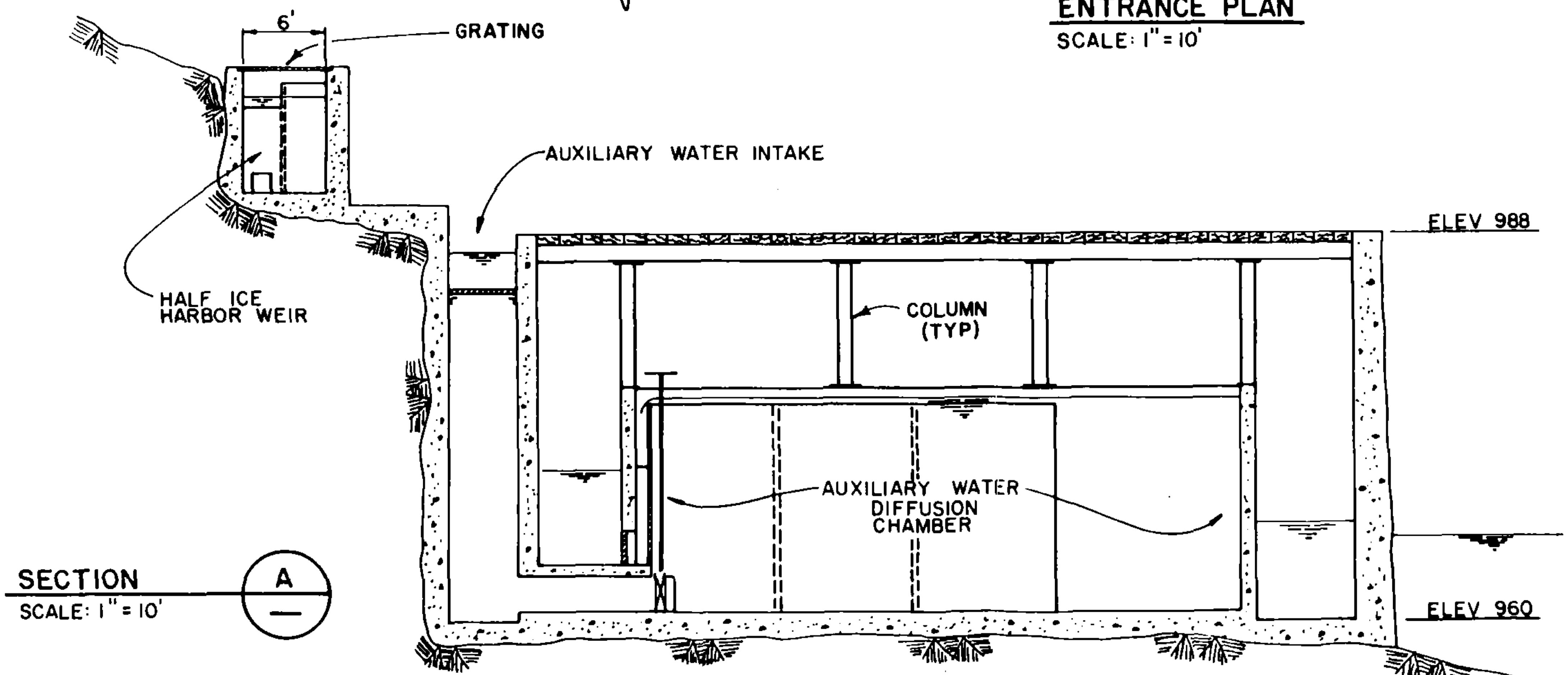

FIGURE 5-11

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 3
ENTRANCE DETAILS

DATE: JUNE 1985

JOB NUMBER: S1030.01

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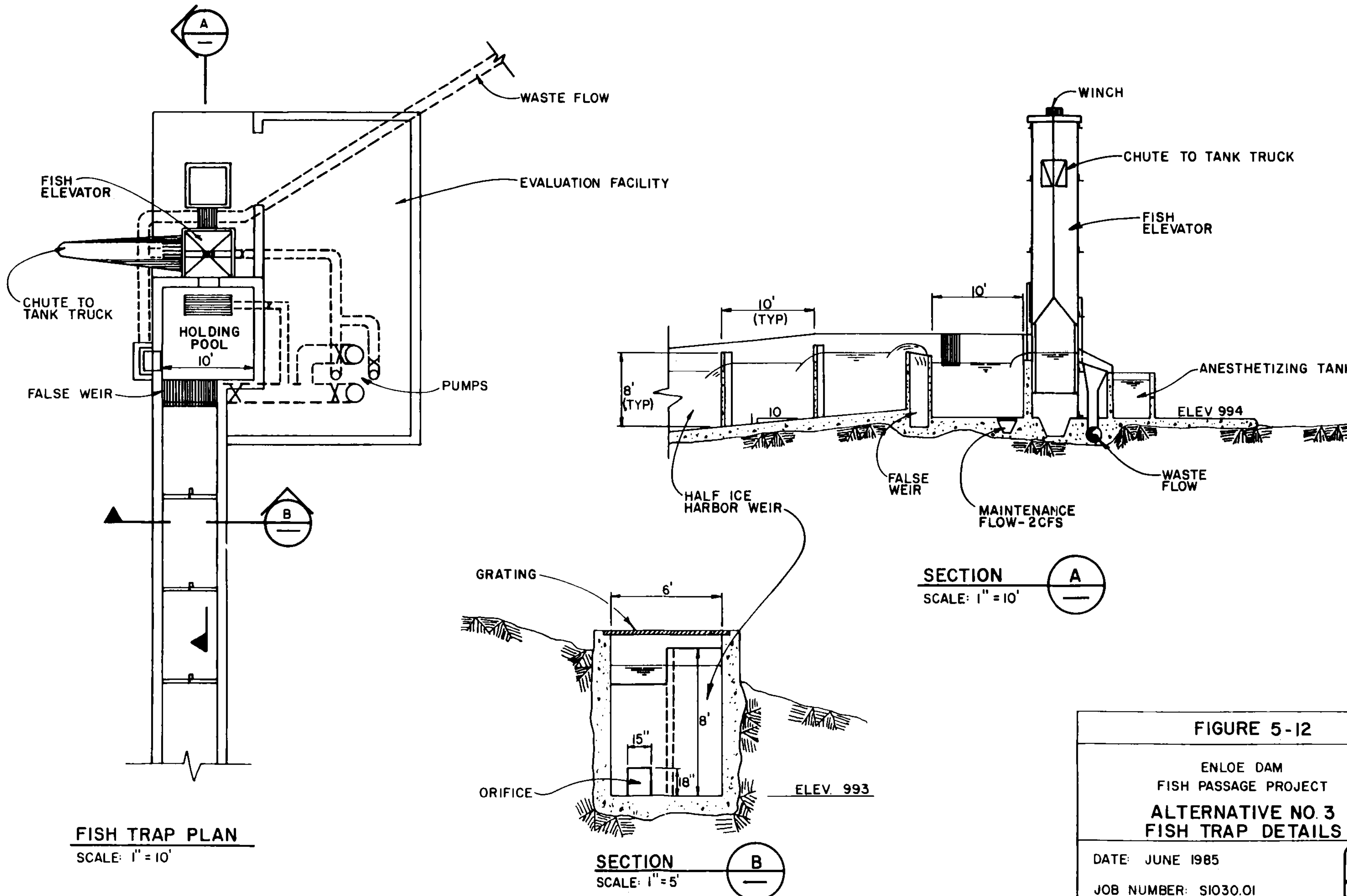


FIGURE 5-12

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 3
FISH TRAP DETAILS

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

A false weir would be provided at the upstream end of the fishway to supply approximately 25 cfs along the fishway. The false weir would supply "fresh" flow to the fishway, separate from the water in the holding pool. Water would be pumped to the false weir from a source above the falls and would be directed downstream by vanes.

The holding pool would be 10 ft wide by 10 ft long with a depth of 6 ft, and would have the capacity to hold approximately 200 adult fish. A flow of 2 cfs of fresh water would be supplied to the holding pool by a floor diffuser to meet the oxygen requirements of 200 adult fish. Excess flow from the holding pool would be released into the stream.

Fish in the holding pool would be crowded toward the elevator with a vertical aluminum punched plate. Fish would move from the holding pool to the elevator by jumping over a weir. Water pumped into the elevator would then raise the fish to the elevation of the loading chute. Once loaded into the 2,000 gallon tank truck, fish would be hauled from the trap facility to the upper watershed.

Access to the trap site is currently available by an irrigation canal road along the left bank of the stream. Improvements, however, would be required along the 1-1/2 miles of canal road. The minimum haul distance for fish off-loading would be approximately four miles per round trip. The average haul distance for the early years of the project is assumed to be 60 miles per round trip.

Operation

In order to pass steelhead, the fish trap would be required to operate for approximately six months. It is estimated that one and one-half full-time employees would be necessary to operate the trap and perform routine facility maintenance.

This alternative is not compatible with the PUD's plans for power generation for the same reason discussed in Alternative 1.

5.2.5 Alternative 4 - Trap And Haul Below Powerhouse

Physical Description

Alternative 4 is a trap and haul facility located at a barrier dam that would be constructed immediately downstream of the existing powerhouse. The entrance to the trap facility would be located at the left abutment of the barrier dam. Details of the trap facility are shown on Figures 5-13 and 5-14.

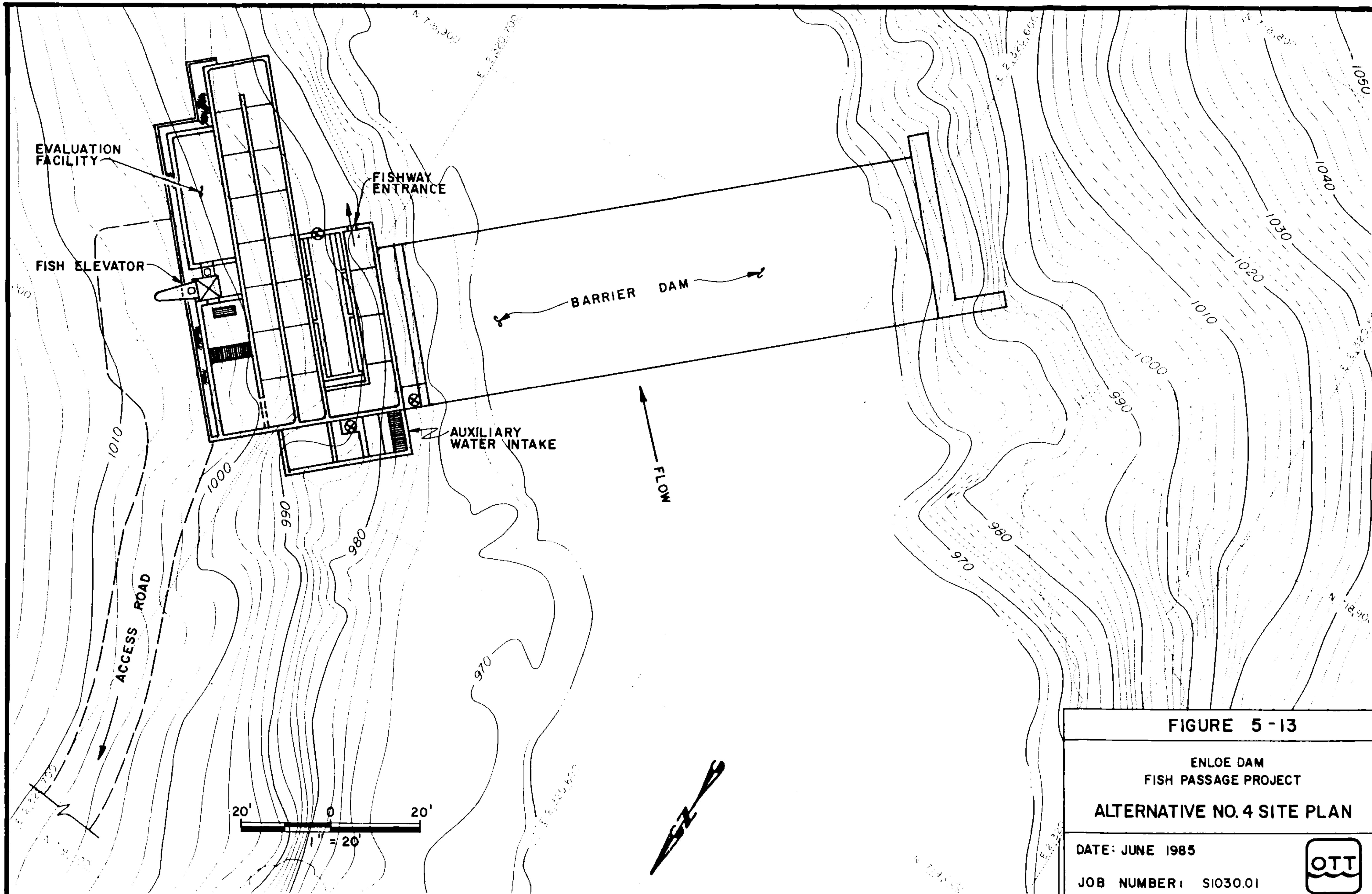
The fishway section below the holding pool and elevator would use the "stacked" design discussed in Alternative 2. The fishway pools would be the half Ice Harbor design discussed in Alternative 3. The auxiliary water, holding pool and fish elevator would be similar in design and operation to those discussed in Alternative 3.

The pool upstream of the barrier dam would eventually fill with sediment and plug the 7/8 in auxiliary water trashrack. To prevent this, a sluiceway would be provided to clear the immediate area upstream of the intake. A sluice gate would be used to control flow in the sluiceway. The sluiceway would be operated only to clear material; it would not operate continuously.

Access for fish hauling is available along the irrigation canal road to the county road, and from the county road to selected off-loading sites in the upper watershed. A section of new road would be necessary between the trap facility and the suspension bridge to the old powerhouse. Slope failures have occurred in two locations on the old access road between the suspension bridge and the dam. These slopes could be rehabilitated with fill and the toe of the slopes protected from high river flows. The access road should be graded, drained and surfaced with crushed rock prior to project construction.

Operation

Alternative 4 is designed to pass fish effectively through the steelhead migration period of October through November and February through May. For these six months of operation, a labor requirement of one and one-half full-time employees is


EVALUATION FACILITY
FISHWAY ENTRANCE
FISH ELEVATOR
BARRIER DAM
AUXILIARY WATER INTAKE
FLOW
ACCESS ROAD
1050
1040
1030
1020
1010
1000
990
980
970
20'
0
20'
1" = 20'
FIGURE 5-13
ENLOE DAM
FISH PASSAGE PROJECT
ALTERNATIVE NO. 4 SITE PLAN
DATE: JUNE 1985
JOB NUMBER: S1030.01
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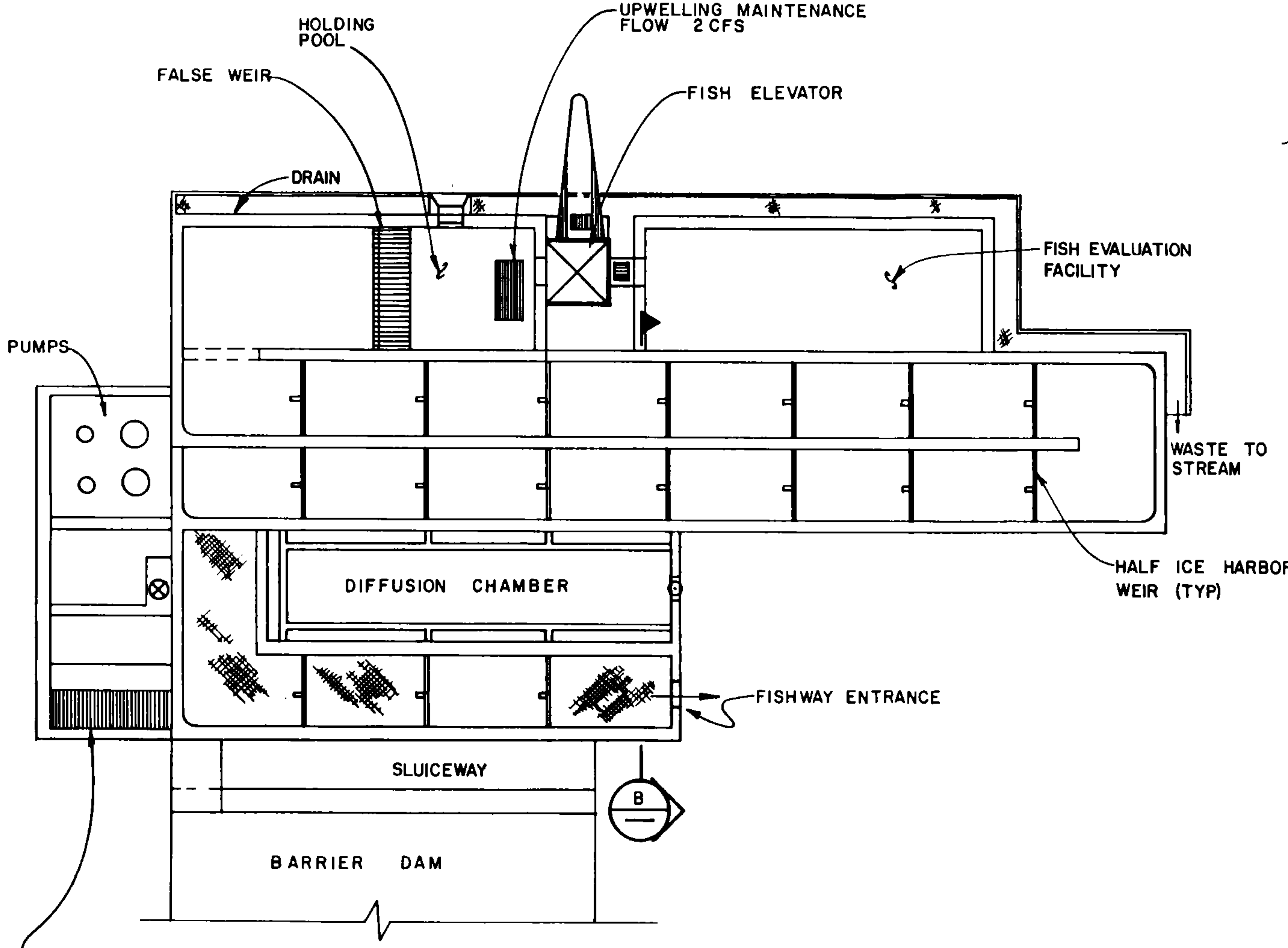
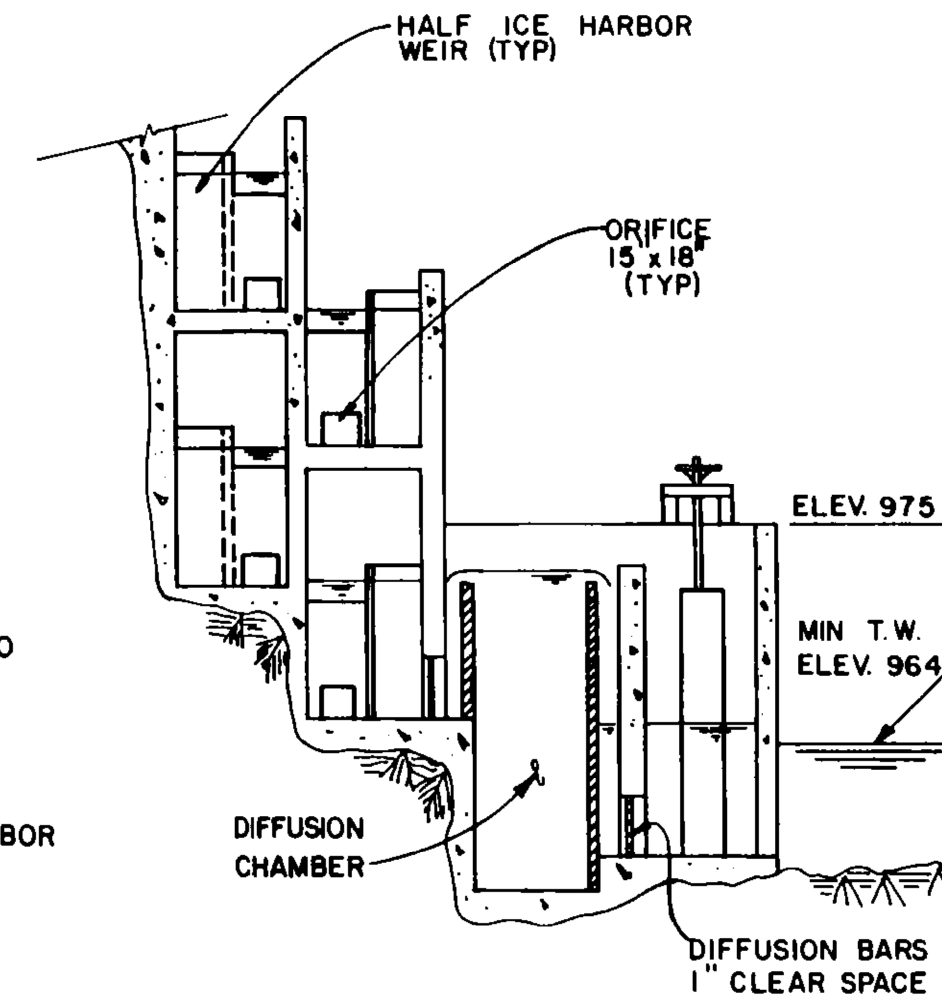


ENTRANCE PLAN

SCALE: 1" = 10'



SECTION B

SCALE 1"=10'

FIGURE 5-14

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 4
FISH TRAP DETAILS

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

estimated. If species other than steelhead are stocked in the Similkameen River, labor requirements would increase.

Like Alternative 2, this trap and haul alternative is compatible with hydropower redevelopment at Enloe Dam. The barrier dam would, however, decrease the available head at the proposed powerhouse.

5.2.6 Alternative 5 - Trap And Haul At Railroad Bridge

Sitings for the four previous alternatives were based on considerations of operation, constructability, cost and hydropower redevelopment at Enloe Dam. Redevelopment of hydropower at Enloe Dam is a serious issue. The PUD believes they can rehabilitate the Enloe facility and produce power at a competitive cost in the near future. From the perspective of the PUD, any alternative that would substantially reduce the hydraulic head of their project, Alternatives 2 and 4, is unacceptable. In response to the PUD's concerns, Alternative 5 has been developed. This alternative has no effect on redevelopment of hydropower at Enloe Dam.

Physical Description

Alternative 5 is a trap and haul facility located approximately two miles downstream of Enloe Dam, and approximately 200 ft downstream of the Burlington Northern Railroad bridge. Facilities would include a barrier dam, short ladder section, holding pool, fish elevator and evaluation facilities. Details of Alternative 5 are shown in Figures 5-15 through 5-17.

The barrier dam would be oriented normal to the flow of the Similkameen River. The crest would be ogee in shape and the downstream face would be sloped 3H:1V. The hydraulic height of the structure would be approximately 9 ft. The maximum height of the structure would be roughly 35 ft due to the deep stream channel in that location. The crest length of the barrier dam would be approximately 125 ft. A sluiceway would be constructed at the left abutment of the barrier to clear the auxiliary water intake.

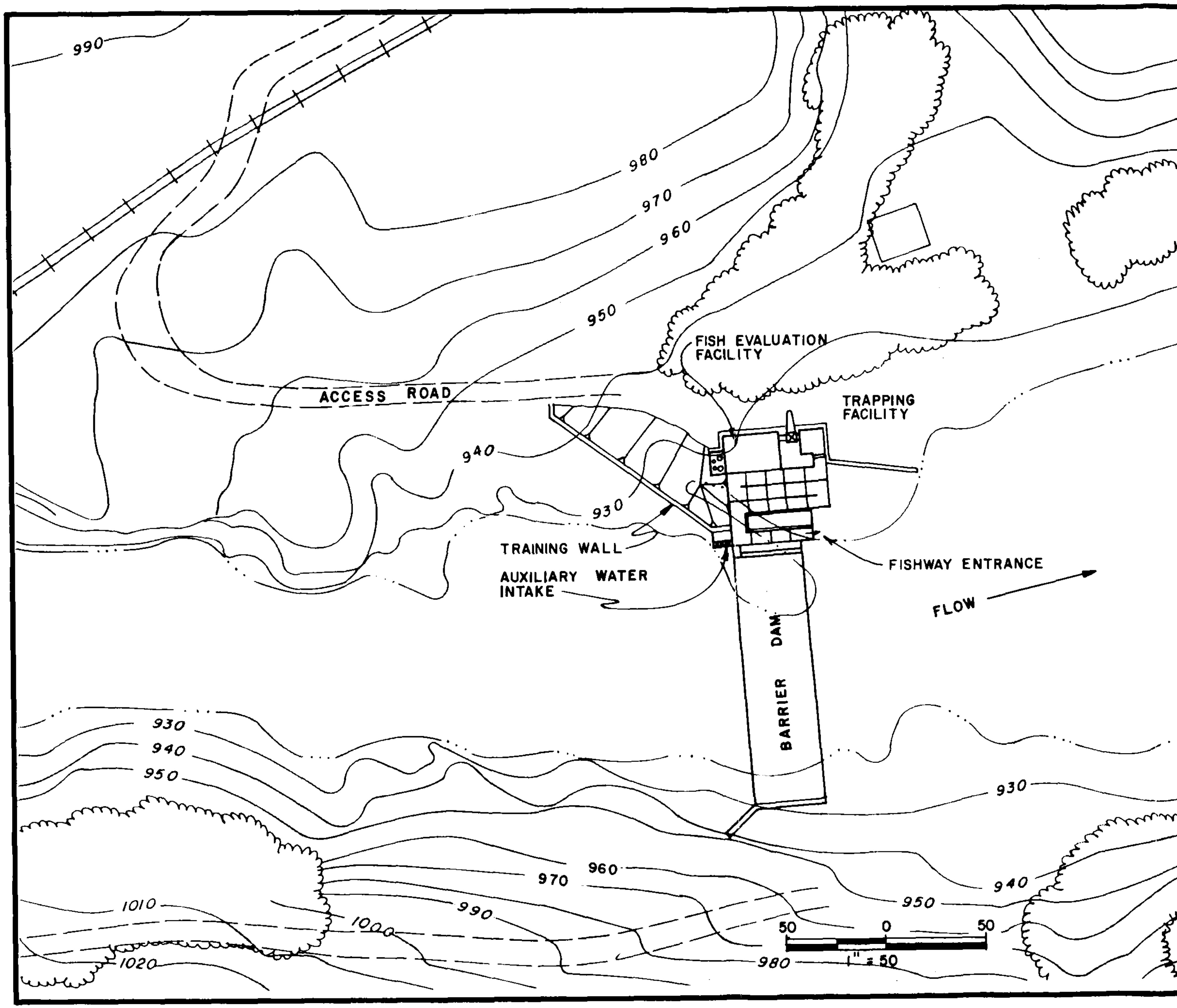


FIGURE 5-15

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 5 SITE PLAN

DATE JUNE 1985

JOB NUMBER S1030.01

OTT

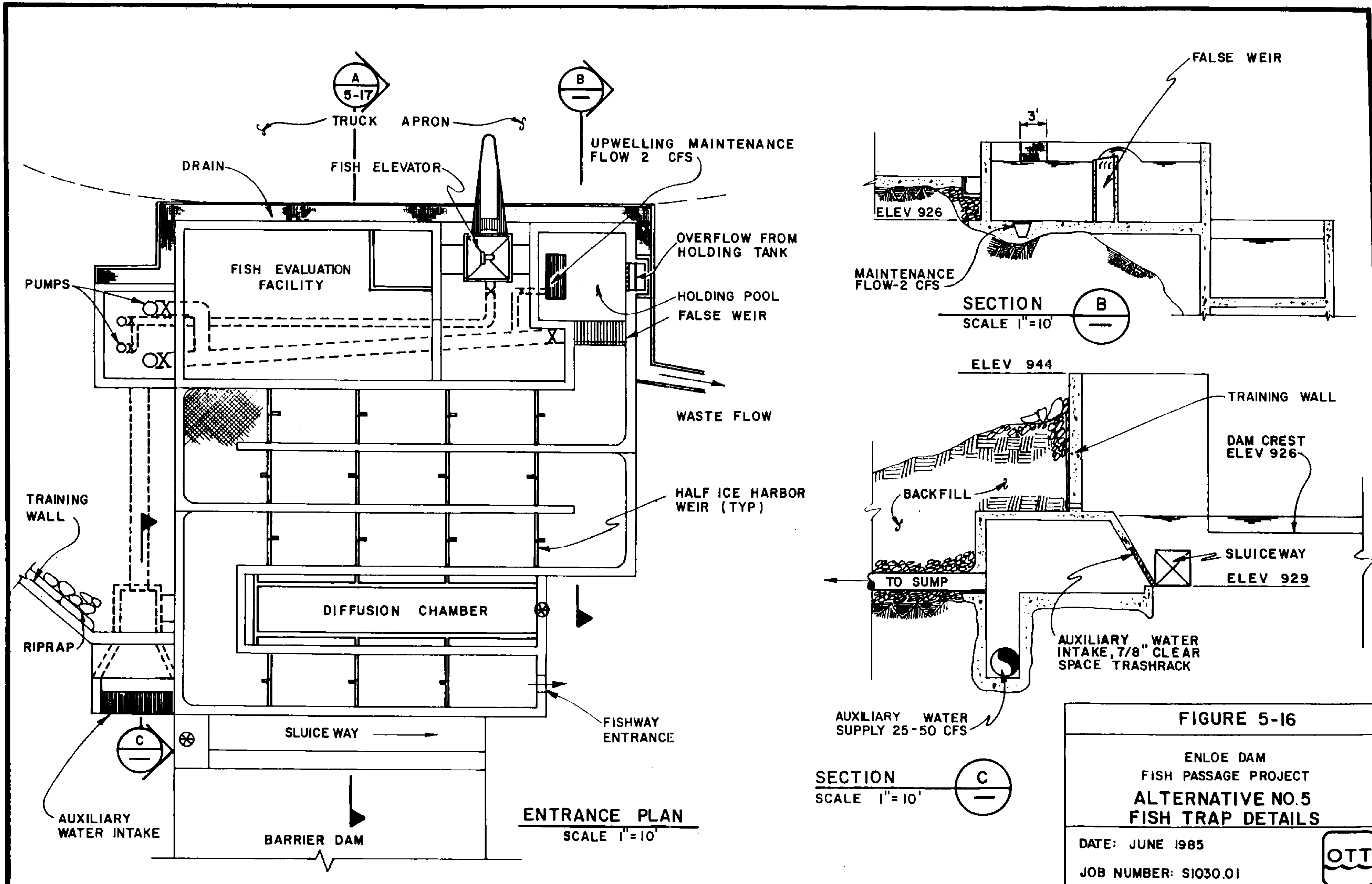


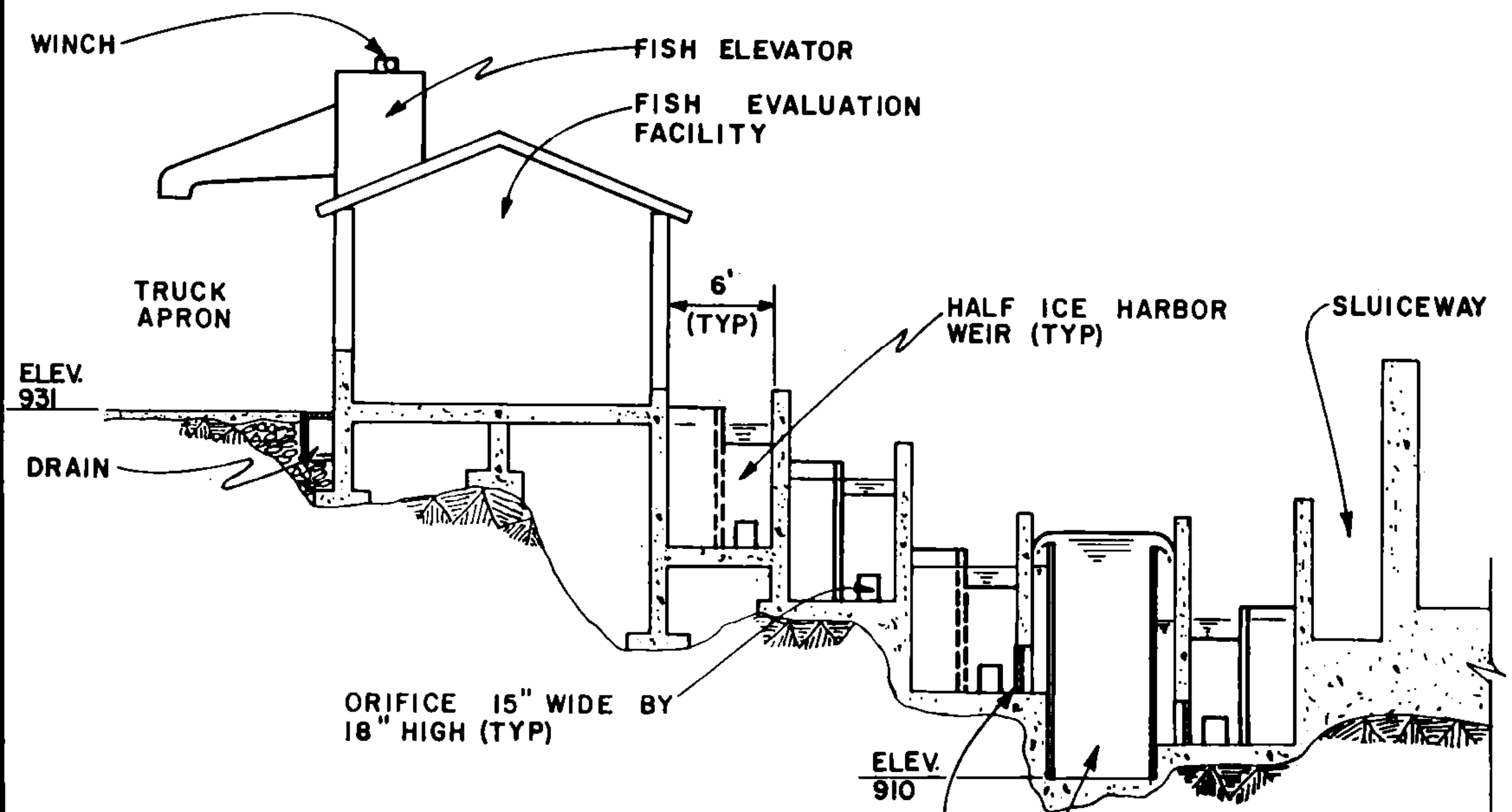
FIGURE 5-16

ENLOE DAM
FISH PASSAGE PROJECT

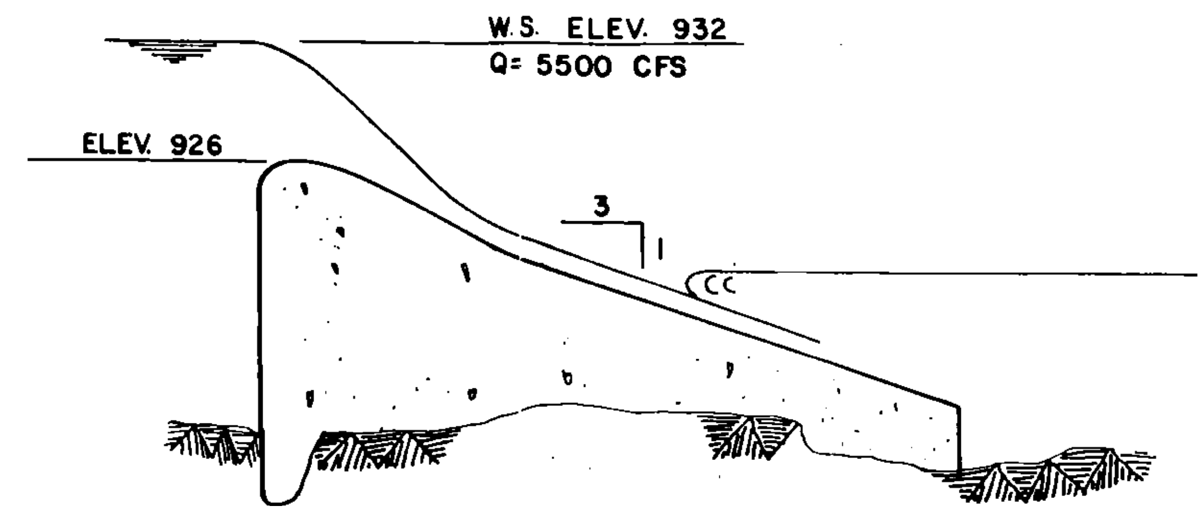
ALTERNATIVE NO. 5
FISH TRAP DETAILS

DATE: JUNE 1985

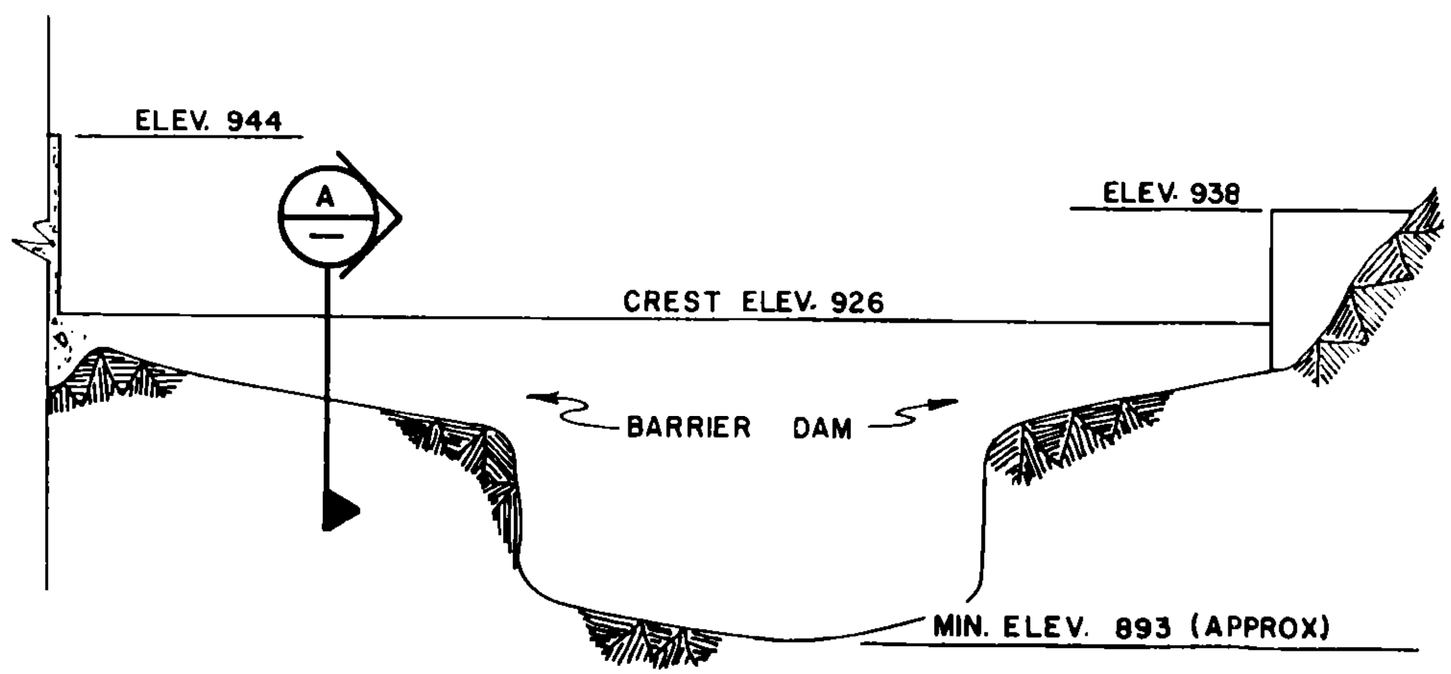
JOB NUMBER: S1030.01



SECTION A 5-16
SCALE 1" = 10'



TYPICAL SECTION A —
SCALE 1" = 10



BARRIER DAM ELEVATION
SCALE 1" = 10'

FIGURE 5-17

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO.5 DETAILS

DATE: JUNE 1985

JOB NUMBER: S103 0.01

OTT

A single fishway entrance would be located at the left bank, adjacent to the sluiceway. Fishway pools would be half Ice Harbor type, sized 6 ft wide by 10 ft long. Auxiliary water would be gravity fed from an intake upstream of the barrier dam. The auxiliary water, between 25 cfs and 50 cfs, would be split evenly between the lower seven pools. Flow to the upper ladder would be provided by a false weir at the head of the last pool. The operation of the trap facility would be the same as Alternatives 3 and 4.

Truck access to the trap facility is favorable for this alternative. An existing 1,300 ft access road connects the site to the county road. Although several grades of the road are steep and one curve has a short radius, regrading and alignment do not pose significant problems. The road should also be surfaced with crushed rock. Easement across the private land should not be difficult to acquire.

Operation

Performance of Alternative 5 is comparable with all the upstream alternatives (1 - 4), but has the advantages of better access and complete compatibility with hydropower redevelopment at Enloe Dam.

5.2.7 Alternative 6 - Dam Removal

Physical Description

Enloe Dam presents a 54 ft barrier to fish passage. Alternative 6 proposes the removal of Enloe Dam with subsequent laddering of the falls below the dam to provide upstream passage for fish.

Blasting of pools into the falls has been considered to provide passage at the falls. During low flows in the Similkameen River, this would be an effective means of passage. However, as flows increase toward the peak design flow of approximately 5,500 cfs, passage would be difficult, and weaker fish could be substantially delayed. A second consideration is the nature of the rock that forms the falls. This rock is a joint-controlled conglomerate that may not blast in a predictable manner. Therefore, preliminary planning assumes passage at the falls would be provided with a vertical slotted fishway similar to that discussed in Alternative 1. The principal difference is the location of the ladder exit. The Alternative 6 ladder exit would be located upstream of the falls and below Enloe Dam. Figures 5-18 and 5-19 show the fishway location and configuration.

Two considerations in the dam removal portion of Alternative 6 include:

1. Demolition of the structure; and

2. Disposal of the sediment that has accumulated upstream of the dam.

The key consideration is the disposal of sediment. Enloe Dam reservoir is approximately 1.5 miles long and contains approximately 1.70 million cubic yards of sediment (Nelson, 1972). Sediment in the upstream portion of the reservoir is graded between cobbles and sands. Sediment in the lower portion of the reservoir is graded between sands and fines. This volume and composition of sediment cannot be released in an uncontrolled manner without severe environmental consequences, including: increased flooding, water quality degradation and deposition of sediments upon spawning gravels. In an effort to lessen the environmental consequences associated with dam removal, two alternative schemes for removal have been investigated:

1. Dredging of sediments in the Enloe reservoir and subsequent demolition of the dam; and

2. Sequential removal of horizontal sections of the dam crest and release of sediment through natural scour.

Dredging

The dredging scheme could be accomplished by use of a suction-dredge that is supported on floats. Dredged material would be placed on-site for a sufficient length of time to dehydrate before hauling off-site. If a 20 in suction-dredge is used, with a

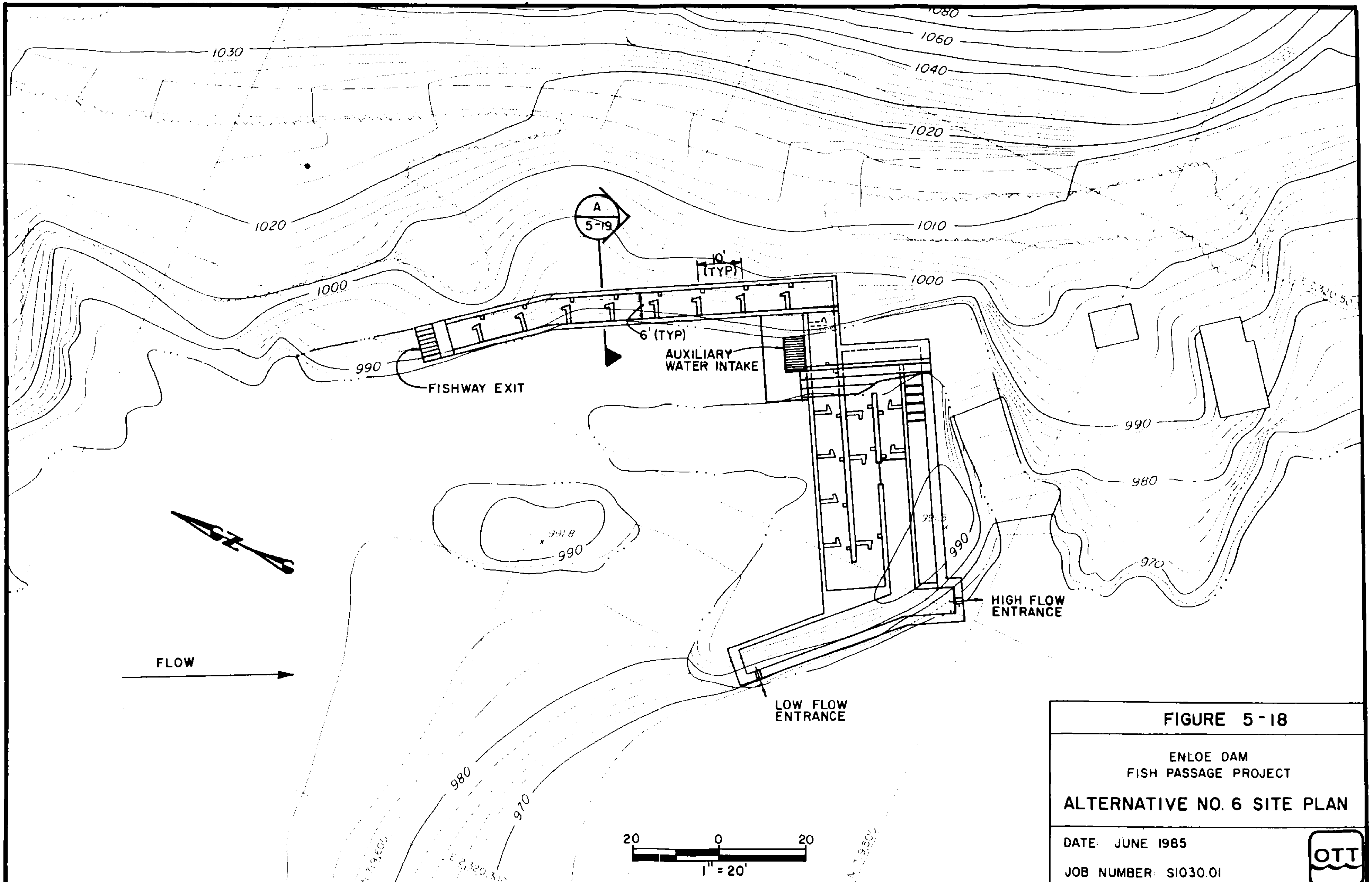


FIGURE 5-18

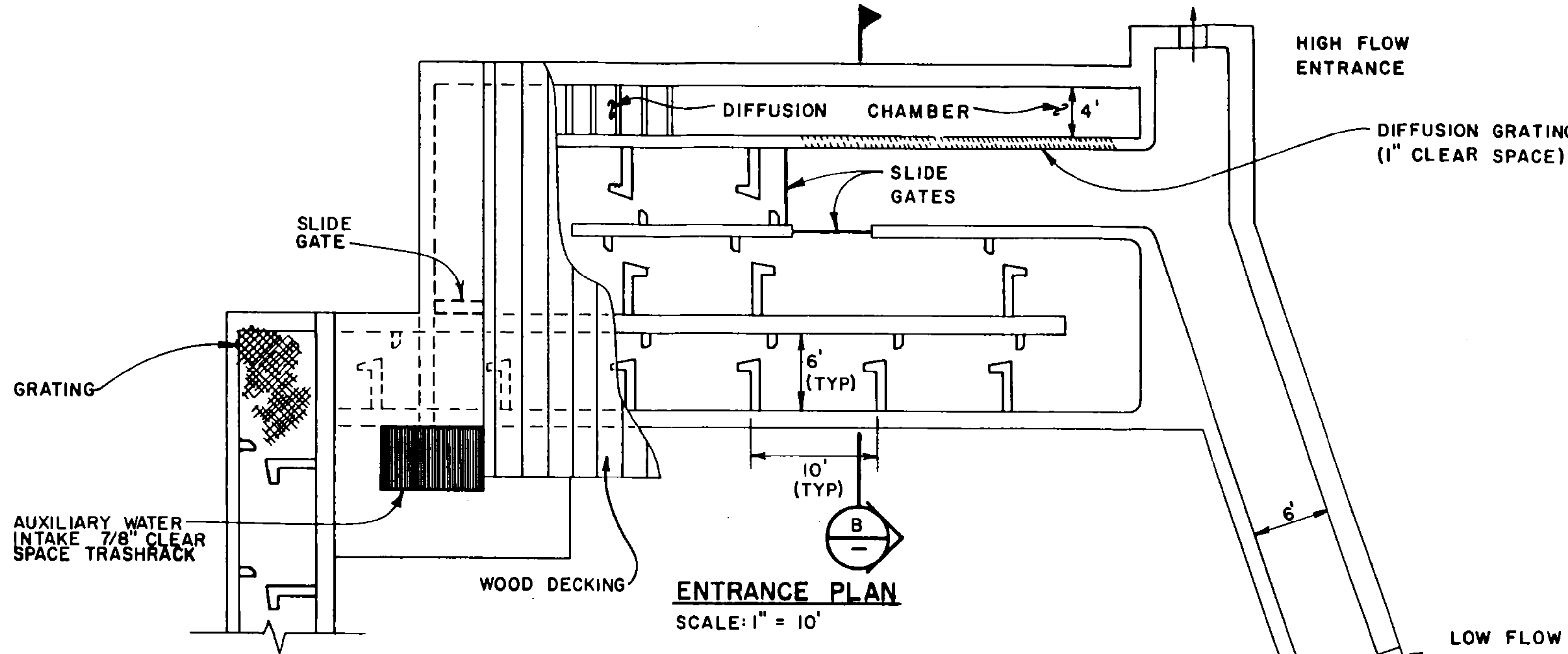
ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 6 SITE PLAN

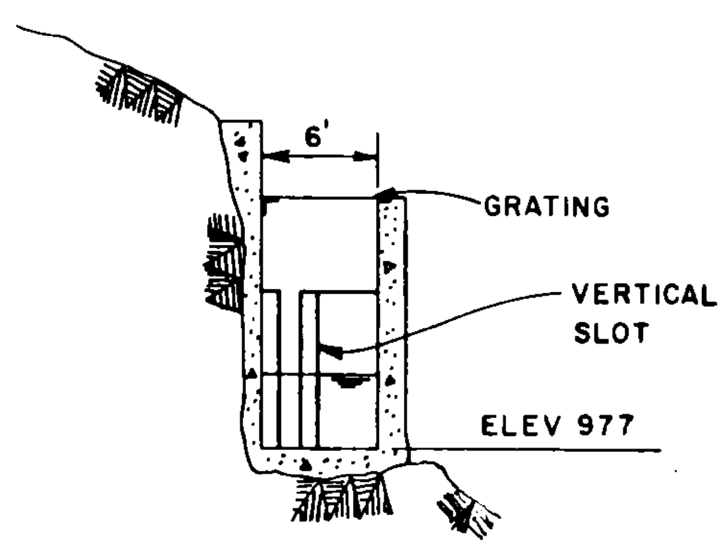
DATE: JUNE 1985

JOB NUMBER: S1030.01

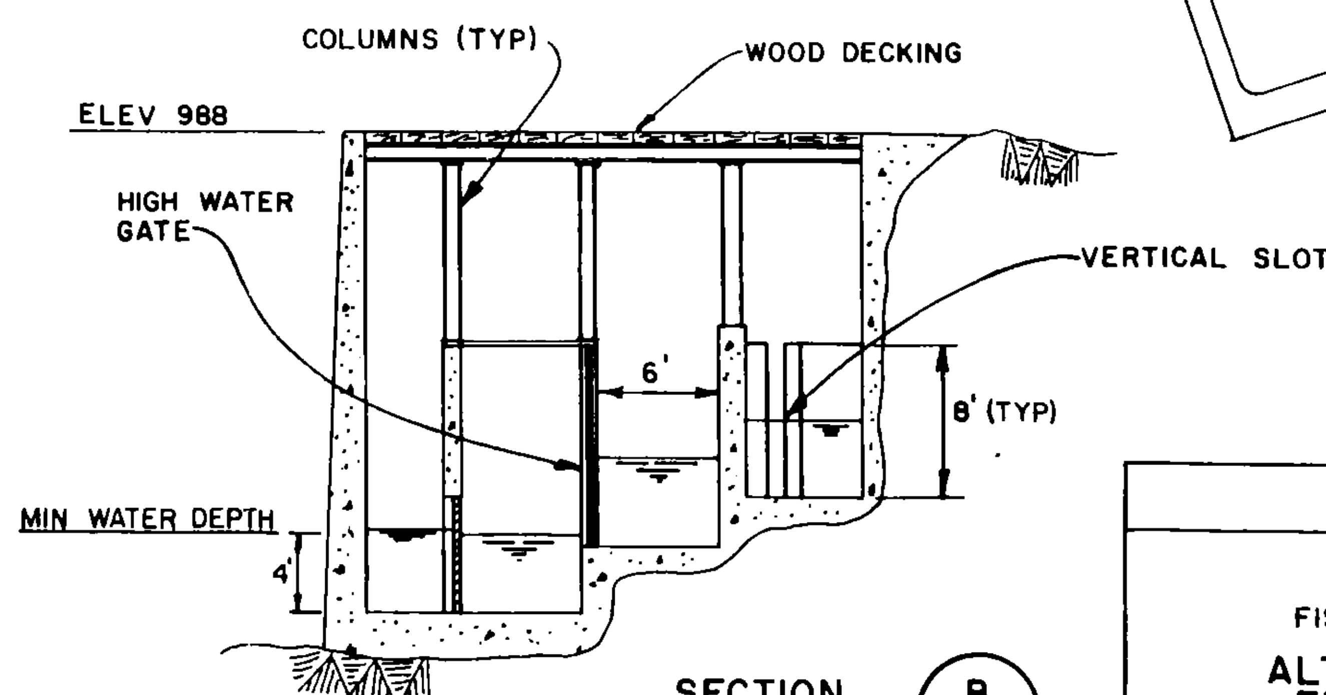
OTT



ENTRANCE PLAN
SCALE: 1" = 10'



SECTION A 5-18
SCALE: 1" = 10'



SECTION B
SCALE: 1" = 10'

FIGURE 5-19

ENLOE DAM
FISH PASSAGE PROJECT

ALTERNATIVE NO. 6
FISHWAY DETAILS

DATE: JUNE 1985

JOB NUMBER: S1030.01

OTT

capacity of approximately 15,000 cubic yards per day, the 1.79 million cubic yards of sediment could be removed in approximately four months. Demolition of the dam could be undertaken after the dredging operation. The dam crest could be removed in horizontal lifts; each lift spanning one-half of the crest length. This would simplify dewatering substantially.

Sediment would be hauled to a waste area near the site and graded for stability. Slopes of the waste pile could be revegetated by hydroseeding. Because the sediment may contain high concentrations of toxic metals and/or compounds, due to past mining and agricultural activities in the watershed, careful sediment disposal and removal may be necessary. Preliminary analysis of toxic/hazardous materials performed by IEC BEAK Consultants Ltd. in 1984, however, suggests that sediment composition will not control disposal.

Sediment Release

Dam removal by the second scheme involves blasting horizontal lifts of the dam and allowing sediment to be scoured from the reservoir by high flows. The Similkameen River has the capacity of carrying approximately 320,000 cubic yards of the reservoir sediment in an average water year. If the entire volume, 1.79 million cubic yards, of sediment is assumed to be released downstream, it would take approximately six years to flush the reservoir.

This method of dam removal would involve approximately six separate mobilizations of a blasting crew. A monitoring program to determine the extent of the sediment after each high water event would also be necessary. The actual rate of degradation will depend upon the stream flows and may vary significantly from the six year estimate. The controlling consideration in the release of sediment downstream is the carrying capacity of the lower Similkameen River and the Okanogan River below its confluence with the Similkameen. Accelerated deposition of alluvial material in these low gradient areas could dramatically increase the flooding in the Oroville-Tonasket areas. The U.S. Bureau of Reclamation (1975) and U.S. Army Corps of Engineers (1978) indicate that flooding is a significant problem in the area, even on an annual basis. Before sediment is released from the Enloe reservoir, a comprehensive analysis should be performed to determine the extent of flooding and flood damages that could result.

Costs have been estimated for both dam removal schemes and are presented in Section 5.3.2. It is possible that a combination of sediment release and sediment removal would yield the most economic and environmentally sound solution, if the BPA and other State and Federal agencies elect to remove the dam to provide fish passage into the upper Similkameen watershed.

5.3 Benefit Cost Analysis

A Benefit Cost Analysis was performed for the Enloe Dam Passage project to determine the benefit cost ratios (B/C) for the six passage alternatives. The analysis consists of identifying and quantifying project benefits and costs, and determining the B/C ratios. The analysis was performed on a present worth basis. A Federal discount rate of 3 percent and a project life to 50 years were assumed. This is consistent throughout the economic analysis in the project.

There are four components to the Benefit Cost Analysis, including a determination of:

- Benefits;
- Disbenefits;
- Costs; and
- B/C Ratios

These are explained in the following sections.

5.3.1 Benefits

Benefits of the project are assumed to be realized only from the harvest of steelhead trout. Three harvest scenarios have been investigated in the analysis, including a 10, 20 and 40 percent harvest of returning adult fish. It is interesting to note that as the harvest of returning adults increases, the run builds at a slower rate; however, the catch is still greater and the project benefit increases.

In an effort to place a monetary value on fish, Meyer's (1984) estimate of \$144.00 per adult sport caught and \$21.81 for commercial/Indian caught steelhead trout was used. Table 5-1 shows the number of harvestable steelhead trout for the 10, 20 and 40 percent harvest scenarios. A brood stock of 115 fish has been removed from the harvest estimates. Since these fish are not caught, they are assumed to have no economic value.

Using the 3 percent discount rate, the present worth of project benefits was determined. Results are given in Table 5.2.

5.3.2 Disbenefits

Of the six upstream passage alternatives, three were developed assuming the PUD would not redevelop hydropower at the Enloe site (Alternatives 1, 3 and 6). Alternative 5 was developed without regard for hydropower redevelopment; since it has no impact on the PUD's proposal. Alternatives 2 and 4, however, were developed to be compatible with hydropower. As mentioned in previous sections, Alternatives 2 and 4 cause the PUD to lose head for power generation and thereby reduce the economic benefit of their proposed project. Also, Alternative 2 would require the PUD to bypass flow for fishway operation. Since the loss of power would be caused by the Enloe Dam Passage project, it is considered a project disbenefit.

In conjunction with the PUD staff, the potential economic loss was calculated for Alternatives 2 and 4. The present worth of losses were determined to be:

- \$3,259,000 - Alternative 2; and
- \$2,467,000 - Alternative 4

TABLE 5-1
Number Of Harvestable Steelhead For 10%, 20% and 40% Harvest Scenarios By Project Year[1]

Project Years	10% Harvest	20% Harvest	40% Harvest
1 - 6	830 (183)	1,276 (281)	2,164 (476)
7 - 12	1,557 (343)	2,221 (489)	3,325 (731)
13 - 18	2,190 (482)	2,956 (650)	4,002 (880)
19 - 24	2,739 (603)	3,535 (778)	4,392 (966)
25 - 30	3,218 (708)	3,979 (875)	4,618 (1,016)
31 - 36	3,631 (799)	4,329 (952)	4,750 (1,045)
37 - 42	3,995 (879)	4,604 (1,013)	4,826 (1,062)
43 - 48	4,311 (948)	4,815 (1,059)	4,871 (1,072)
49 - 50	4,585 (1,009)	4,982 (1,096)	4,897 (1,077)

1 Numbers represent estimated total harvest by sport, commercial and Indian fisheries. Numbers in brackets represent the Indian harvest only.

TABLE 5-2
Present Worth Of Project Benefits For 10%, 20% And 40%
Harvest Scenarios

Harvest Scenario	Present Worth
10%	$7,215,100
20%	$9,156,225
40%	$11,455,335

5.3.3 Costs

Project costs were estimated for each of the six passage alternatives. The total project costs include estimates for:

- Capital Costs;
- Annual Costs; and
- Replacement Costs.

Capital costs are those costs incurred at the beginning of the project, including: construction, engineering services and equipment. Annual costs include costs of labor and facility maintenance. Replacement costs are incurred periodically for replacement of mechanical equipment.

A present value analysis was performed to place capital, annual and replacement costs on a consistent basis. A 50 year project life and a 3 percent discount rate were used in the analysis. Tables 5-3 through 5-9 show the detailed cost summaries for the six alternatives. This information is an estimate based on the level of detail completed to date.

Cost estimates made by the U.S. Bureau of Reclamation for smolt production and outplanting were used in the analysis. The Bureau of Reclamation has committed $425,000 for expansion of the Wells Hatchery, $125,000 per year for operation and maintenance of the Wells Hatchery expansion and outplanting and $65,000 for the purchase of a fish hauling truck (Appendix 1, MOM - 7 May 1985). After 5 years of operation, the Bureau of Reclamation intends to give ownership of the Wells expansion to Douglas County PUD. It is assumed that if the BPA were to construct a smolt production facility, for the period after Douglas County PUD takes ownership of the Wells expansion, it would not cost any more to operate than the Bureau's estimate. In estimating the fish hauling requirements of Alternatives 3, 4 and 5, the purchase of a fish hauling truck was included. Therefore, the cost of the Bureau of Reclamation truck is not included in the Alternative 3, 4 and 5 estimates.

TABLE 5-3
Capital And Annual Costs For Construction, Engineering, Operation And Maintenance For Alternative 1 - Fishway From Falls

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	$ --	$25,000
Dewatering	LS	--	--	$60,000
Earthwork				$154,000
Excavation, Rock	CY	7200	20	144,000
Backfill	CY	1100	8	9,000
Riprap	CY	40	25	1,000
Reinforced Concrete				$578,000
Slabs	CY	310	225	70,000
Walls	CY	1380	350	483,000
Precast	CY	110	225	25,000
Metals				$182,000
Trashracks	LS	--	--	4,000
Diffusers	LS	--	--	6,000
Valves & Gates	LS	--	--	55,000
Grating	LS	--	--	117,000
Wood				$15,000
Exit Trashracks	LS	--	--	1,000
Decking	LS	--	--	14,000
Miscellaneous				$67,000
Drainage	LS	--	--	4,000
Access Road	LS	--	--	63,000
Civil Site Work				$15,000
Subtotal				$1,096,000
10% Contractor O & P				110,000
20% Contingency				241,000
TOTAL				$1,447,000

TABLE 5-3 Continued
Capital And Annual Costs For Construction, Engineering, Operation And Maintenance For Alternative 1 - Fishway From Falls

Item	Unit	Quantity	Unit Cost	Total Cost
Engineering Services				
Permits				$30,000
Design				
Basic Services				160,000
Surveying				15,000
Geotechnical Investigation				25,000
Testing				20,000
Inspection				90,000
TOTAL				$340,000
TOTAL CAPITAL COSTS				$1,787,000
Annual Costs				
Labor, 1/4 FTE @ 32,000/Year				$8,000
Maintenance/Year				4,000
TOTAL ANNUAL COSTS				$12,000
Present Value				
Annual Costs				$309,000
TOTAL PROJECT COST				**$2,096,000**

TABLE 5-4
Capital And Annual Costs For Construction, Engineering, Operation And Maintenance For Alternative 2 - Fishway Below Powerhouse

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	$ --	$25,000
Dewatering	LS	--	--	$135,000
Earthwork				$163,000
Excavation, Rock	CY	7450	20	149,000
Backfill	CY	1600	8	13,000
Riprap	CY	40	25	1,000
Reinforced Concrete				$862,000
Slabs	CY	620	225	140,000
Walls	CY	1580	350	553,000
Mass	CY	1120	135	151,000
Precast	CY	80	225	18,000
Metals				$192,000
Trashracks	LS	--	--	9,000
Diffusers	LS	--	--	6,000
Valves & Gates	LS	--	--	45,000
Grating	LS	--	--	132,000
Wood				$1,000
Exit Trashracks	LS	--	--	1,000
Miscellaneous				$81,000
Drainage Facility	LS	--	--	7,000
Access Road	LS	--	--	74,000
Civil Site Work				$20,000
Subtotal				$1,479,000
10% Contractor O & P				148,000
20% Contingency				325,000
TOTAL				$1,952,000

TABLE 5-4 Continued
Capital And Annual Costs For Construction, Engineering, Operation And Maintenance For Alternative 2 - Fishway Below Powerhouse

Item	Unit	Quantity	Unit Cost	Total Cost
Engineering Services				
Permits				$30,000
Design				
Basic Services				180,000
Surveying				15,000
Geotechnical Investigation				45,000
Testing				25,000
Inspection				100,000
TOTAL				$395,000
TOTAL CAPITAL COSTS				$2,347,000
Annual Costs				
Labor, 1/4 FTE @ 32,000/Year				$8,000
Maintenance/Year				4,000
TOTAL ANNUAL COSTS				$12,000
Present Value				
Annual Costs				$309,000
TOTAL PROJECT COST				**$2,656,000**

TABLE 5-5
Capital, Annual And Replacement Costs For Construction, Engineering, Operation And Maintenance For Alternative 3 - Trap And Haul At Falls

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	$ --	$25,000
Dewatering	LS	--	--	$60,000
Earthwork				$111,000
Excavation, Rock	CY	5400	20	108,000
Backfill	CY	350	8	3,000
Reinforced Concrete				$332,000
Slabs	CY	209	225	47,000
Walls	CY	790	350	277,000
Precast	CY	36	225	8,000
Metals				$110,000
Trashracks	LS	--	--	4,000
Diffusers	LS	--	--	30,000
Piping	LS	--	--	4,000
Valves & Gates	LS	--	--	59,000
Elevator	LS	--	--	11,000
Fencing	LS	--	--	2,000
Wood				$14,000
Decking	LS	--	--	14,000
Equipment				$229,000
Generator	LS	1	16,000	16,000
Winches	LS	2	1,000	2,000
Truck	LS	1	140,000	140,000
Pumps	LS	--	--	61,000
Miscellaneous	LS	--	--	10,000
Miscellaneous				$167,000
Evaluation Facility	LS	--	--	63,000
Drainage	LS	--	--	2,000
Access Road	LS	--	--	102,000

TABLE 5-5 Continued
Capital, Annual And Replacement Costs For Construction, Engineering, Operation And Maintenance For Alternative 3 - Trap And Haul At Falls

Item	Unit	Quantity	Unit Cost	Total Cost
Civil Site Work	LS	--	--	$10,000
Subtotal				$1,058,000
10% Contractor O & P				106,000
20% Contingency				233,000
TOTAL				$1,397,000
Engineering Services				
Permits				$30,000
Design				
Basic Services				160,000
Surveying				15,000
Geotechnical Investigation				25,000
Testing				20,000
Inspection				90,000
TOTAL				$340,000
TOTAL CAPITAL COSTS				$1,737,000
Replacement Costs				
Tractor - Replace @ Year 10, 20, 30 & 40				$80,000
Pumps - Replace 2 @ Year 25				30,000
Annual Costs				
Truck Maintenance/Year				$ 4,500
Labor, 1/4 FTE @ 32,000/Year				48,000
Maintenance/Year				8,000
Power				5,500
TOTAL ANNUAL COSTS				$66,000
Present Value				
Replacement Costs				$ 176,000
Annual Costs				1,698,000
TOTAL PROJECT COST				**$3,611,000**

TABLE 5-6
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 4 - Trap And Haul Below Powerhouse

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	--	$25,000
Dewatering	LS	--	$ --	$135,000
Earthwork				$80,000
Excavation, Rock	CY	3850	20	77,000
Backfill	CY	350	8	3,000
Reinforced Concrete				$352,000
Slabs	CY	120	225	27,000
Walls	CY	480	350	168,000
Mass	CY	1110	135	150,000
Precast	CY	30	225	7,000
Metals				$141,000
Trashracks	LS	--	--	9,000
Diffusers	LS	--	--	30,000
Piping	LS	--	--	9,000
Valves & Gates	LS	--	--	63,000
Elevator	LS	--	--	10,000
Fencing	LS	--	--	2,000
Grating	LS	--	--	18,000
Equipment				$229,000
Generator	LS	1	16,000	16,000
Winches	LS	2	1,000	2,000
Truck	LS	1	140,000	140,000
Pumps	LS	--	--	61,000
Miscellaneous	LS	--	--	10,000
Miscellaneous				$187,000
Evaluation Facility	ls	--	--	63,000
Drainage	LS	--	--	2,000
Access Road	LS	--	--	122,000

TABLE 5-6 Continued
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 4 - Trap And Haul Below Powerhouse

Item	Unit	Quantity	Unit Cost	Total Cost
Civil Site Work				$10,000
Subtotal				$1,159,000
10% Contractor O & P				116,000
20% Contingency				255,000
TOTAL				$1,530,000
Engineering Services				
Permits				$30,000
Design				
Basic Services				190,000
Surveying				15,000
Geotechnical Investigation				45,000
Testing				25,000
Inspection				100,000
TOTAL				$405,000
TOTAL CAPITAL COSTS				$1,935,000
Replacement Costs				
Tractor - Replace @ Year 10, 20, 30 & 40				$80,000
Pumps - Replace 2 @ Year 25				30,000
Annual Costs				
Truck Maintenance/Year				$ 4,500
Labor, 1/4 FTE @ 32,000/Year				48,000
Maintenance/Year				8,000
Power				5,500
TOTAL ANNUAL COSTS				$66,000
Present Value				
Replacement Costs				$ 176,000
Annual Costs				1,698,000
TOTAL PROJECT COST				**$3,809,000**

TABLE 5-7
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 5 - Trap And Haul At Railroad Bridge

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	$ --	$25,000
Dewatering	LS	--	--	$225,000
Earthwork				$45,000
Excavation, Rock	CY	600	20	12,000
Backfill	CY	2000	15	30,000
Riprap	CY	120	25	3,000
Reinforced Concrete				$502,000
Slabs	CY	150	225	34,000
Walls	CY	400	350	140,000
Mass	CY	2400	135	324,000
Precast	CY	18	225	4,000
Metals				$161,000
Trashracks	LS	--	--	9,000
Diffusers	LS	--	--	30,000
Piping	LS	--	--	8,000
Valves & Gates	LS	--	--	68,000
Elevator	LS	--	--	10,000
Fencing	LS	--	--	2,000
Grating	LS	--	--	34,000
Equipment				$222,000
Generator	LS	1	16,000	16,000
Winches	LS	2	1,000	2,000
Truck	LS	1	140,000	140,000
Pumps	LS	--	--	54,000
Miscellaneous	LS	--	--	10,000
Miscellaneous				$90,000
Evaluation Facility	ls	--	--	63,000
Drainage	LS	--	--	7,000
Access Road	LS	--	--	20,000

TABLE 5-7 Continued
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 5 - Trap And Haul At Railroad Bridge

Item	Unit	Quantity	Unit Cost	Total Cost
Civil Site Work				$15,000
Subtotal				$1,285,000
10% Contractor O & P				128,000
20% Contingency				283,000
TOTAL				$1,696,000
Engineering Services				
Permits				$30,000
Design				
Basic Services				190,000
Surveying				15,000
Geotechnical Investigation				45,000
Testing				25,000
Inspection				100,000
TOTAL				$405,000
TOTAL CAPITAL COSTS				$2,101,000
Replacement Costs				
Tractor - Replace @ Year 10, 20, 30 & 40				$80,000
Pumps - Replace 2 @ Year 25				27,000
Annual Costs				
Truck Maintenance/Year				$ 4,500
Labor, 1/4 FTE @ 32,000/Year				48,000
Maintenance/Year				8,000
Power				5,500
TOTAL ANNUAL COSTS				$66,000
Present Value				
Replacement Costs				$ 174,000
Annual Costs				1,698,000
TOTAL PROJECT COST				**$3,973,000**

TABLE 5-8
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 6a - Dam Removal With Dredging

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	--	$250,000
Dewatering	LS	--	--	$70,000
Earthwork				$19,177,000
Excavation, Rock	CY	4400	$ 20	88,000
Hauling	CY	1,790,000	8	14,320,000
Dredging	CY	1,790,000	2.5	4,475,000
Demolition	CY	11,300	26	294,000
Reinforced Concrete				$258,000
Slabs	CY	145	$225	33,000
Walls	CY	630	350	221,000
Precast	CY	18	225	4,000
Metals				$71,000
Trashracks	LS	--	--	4,000
Diffusers	LS	--	--	6,000
Valves & Gates	LS	--	--	45,000
Grating	LS	--	--	16,000
Wood				$15,000
Exit Trashracks	LS	--	--	1,000
Decking	LS	--	--	14,000
Miscellaneous				$263,000
Access Road	LS	--	--	63,000
Disposal Site	LS	--	--	200,000

TABLE 5-8 Continued
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 6a - Dam Removal With Dredging

Item	Unit	Quantity	Unit Cost	Total Cost
Civil Site Work				$20,000
Subtotal				$20,124,000
10% Contractor O & P				2,012,000
20% Contingency				4,427,000
TOTAL				$26,563,000
Engineering Services				
Permits				$50,000
Design				
Basic Services				200,000
Surveying				15,000
Geotechnical Investigation				60,000
Testing				100,000
Inspection				100,000
TOTAL				$525,000
TOTAL CAPITAL COSTS				$27,088,000
Annual Costs				
Labor, 1/4 FTE @ 32,000/Year				8,000
Maintenance/Year				3,000
TOTAL ANNUAL COSTS				$11,000
Present Value				
Annual Costs				283,000
TOTAL PROJECT COST				**$27,371,000**

TABLE 5-9
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 6b - Dam Removal With Sediment Release

Item	Unit	Quantity	Unit Cost	Total Cost
Mobilization & Demobilization	LS	--	--	$130,000
Dewatering	LS	--	--	$120,000
Earthwork				$382,000
Excavation, Rock	CY	4400	$ 20	88,000
Demolition	CY	11,300	26	294,000
Reinforced Concrete				$358,000
Slabs	CY	145	$ 225	33,000
Walls	CY	630	350	221,000
Precast	CY	16	225	4,000
Metals				$71,000
Trashracks	LS	--	--	4,000
Diffusers	LS	--	--	6,000
Valves & Gates	LS	--	--	45,000
Grating	LS	--	--	16,000
Wood				$15,000
Exit Trashracks	LS	--	--	1,000
Decking	LS	--	--	14,000
Miscellaneous				$63,000
Access Road	LS	--	--	63,000

TABLE 5-9 Continued
Capital, Annual And Replacement Costs For Construction, Engineering Operation And Maintenance For Alternative 6b - Dam Removal With Sediment Release

Item	Unit	Quantity	Unit Cost	Total Cost
Civil Site Work				$15,000
Subtotal				$1,054,000
10% Contractor O & P				105,000
20% Contingency				232,000
TOTAL				$1,391,000
Engineering Services				
Permits				$50,000
Design				
Basic Services				200,000
Surveying				15,000
Geotechnical Investigation				60,000
Testing				100,000
Inspection				100,000
TOTAL				$525,000
TOTAL CAPITAL COSTS				$1,916,000
Annual Costs				
Labor, 1/4 FTE @ 32,000/Year				8,000
Maintenance/Year				3,000
TOTAL ANNUAL COSTS				$11,000
Present Value				
Annual Costs				283,000
TOTAL PROJECT COST				**$2,199,000**

5.3.4 B/C Ratios

The B/C ratios have been determined for the six alternatives, for each of the three harvest scenarios. The benefits, disbenefits and costs of each passage alternative are given in Table 5-10. The B/C ratios for each of the alternatives are given in Table 5-11.

5.4 Implementation Schedule

A preliminary schedule outlining the various phases of the Enloe Dam passage project is presented in Figure 5-20. This schedule traces the project from its original inception in December 1982, through detailed design and construction of the preferred passage alternative in 1987 or 1988. Several key milestone events critical to the maintenance of this schedule are optimistically accounted for. These include a possible FERC hearing on the hydropower option, WElls Hatchery expansion funded by the Bureau of Reclamation, and fish certification at the hatchery to obtain a Canadian transport permit. Review of this report by the agencies, Tribes and other interested groups is scheduled for the summer of 1985 and a concensus decision on the preferred mode of passage is scheduled to be reached by the end of September, 1985. Detailed design and construction of the preferred passage alternative is scheduled for completion in an eighteen month time frame.

TABLE 5-10
Benefits And Costs For The Six Passage Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6a	Alternative 6b
10% Harvest Benefit	7,215,100	7,215,100	7,215,100	7,215,100	7,215,100	7,215,100	7,215,100
20% Harvest Benefit	9,156,225	9,156,225	9,156,225	9,156,225	9,156,225	9,156,225	9,156,225
40% Harvest Benefit	11,445,335	11,445,335	11,445,335	11,445,335	11,445,335	11,445,335	11,445,335
Disbenefit	--	3,259,000	--	2,467,000	--	--	--
Passage Facility Total Cost	2,096,000	2,656,000	3,611,000	3,809,000	3,973,000	27,371,000	2,199,000
Outplanting And Rearing Cost	3,706,000[1]	3,706,000	3,641,000[2]	3,641,000	3,641,000	3,706,000	3,706,000
		7,252,000	9,917,000	7,614,000	7,614,000	31,077,000	5,905,000

1 Wells Expansion - $425,000
Hauling Truck - $65,000
Present Worth of $125,000 O & M for 50 years @ 3% - $3,216,000
Total - $3,706,000

2 Wells Expansion - $ 425,000
Present Worth of $125,000 O & M for 50 Years @ 3% - 3,216,000
Total - $3,641,000

TABLE 5-11
Benefit Cost Ratios For The Six Passage Alternatives For
10%, 20% And 40% Harvest Scenarios

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6a	Alternative 6b
10% Harvest	1.24	0.75	0.99	0.73	0.95	0.23	1.22
20% Harvest	1.58	0.95	1.26	0.92	1.20	0.29	1.55
40% Harvest	1.97	1.19	1.58	1.16	1.50	0.37	1.94

Figure 5-20

Proposed Project Schedule

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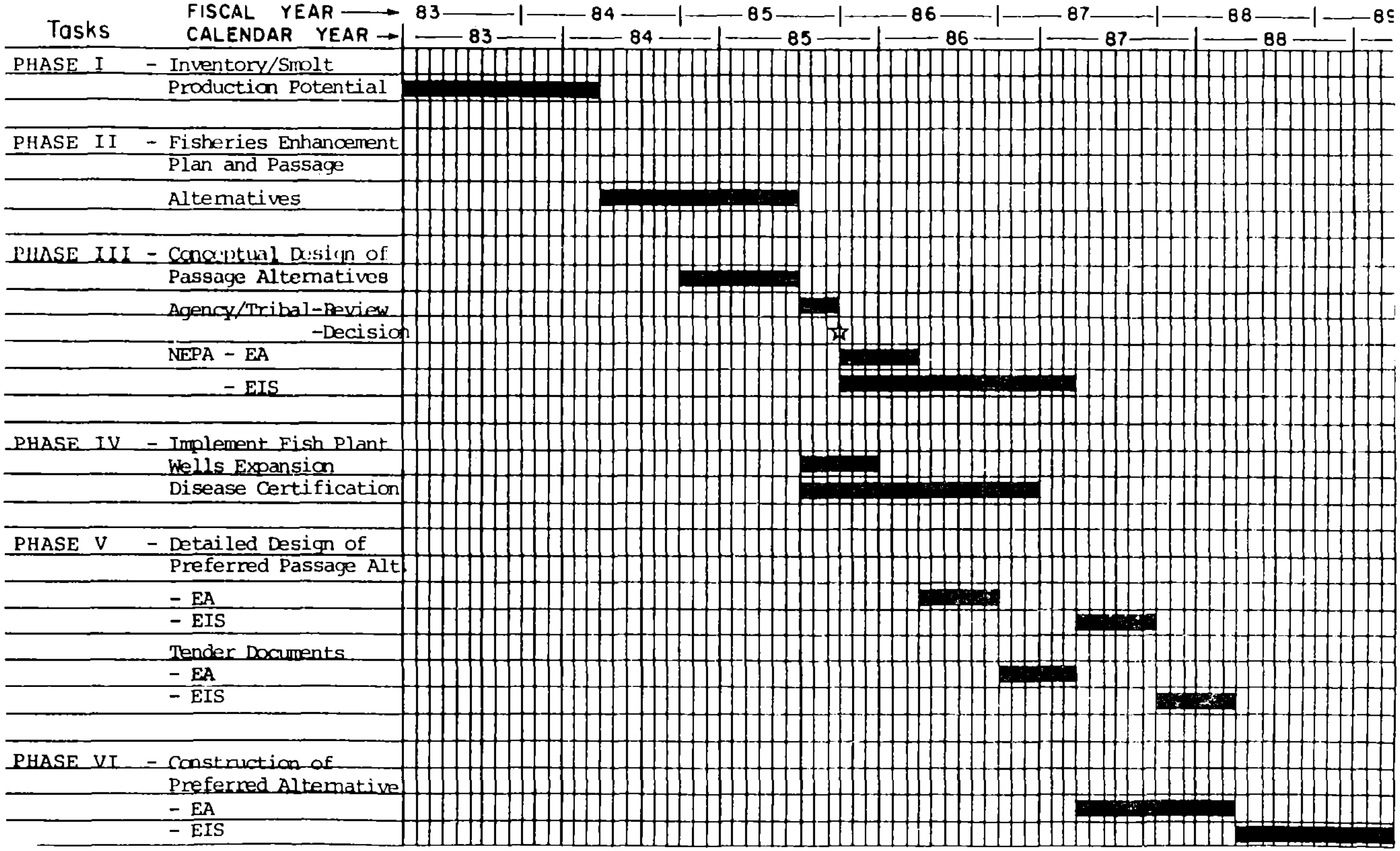


6.0 SIMILKAMEEN RIVER SYSTEM WATER QUALITY ASSESSMENT

Among the many factors which influence the water quality of any particular watershed are natural factors such as geology, soils, climate, vegetation, etc. plus influences by man such as mining, forestry, towns and villages, livestock production, irrigation and agricultural production. All of these factors are at play in the Similkameen watershed to varying degrees in each section of the basin. The drainage areas and mean annual runoff for each main tributary and segment of the Similkameen River are presented in Table 6-1.

The water quality historical data base in the Similkameen watershed is quite extensive. In order to characterize the water quality, data from monitoring stations on the mainstem and where possible a station on each major tributary were selected for review. In total, 19 stations are reported herein and reviewed, 13 of which are on the mainstem between the headwaters and the confluence of the Similkameen and Okanogan Rivers near Oroville, Washington.

General and specific water quality criteria have been developed for almost every major water use ranging from agricultural use, livestock use, human consumption, aquatic life and recreational use for instance. Since the primary purpose of this project deals with the feasibility of the Similkameen River system for steelhead enhancement, the primary focus of this water quality assessment is therefore upon criteria established for freshwater aquatic life. Table 6-2 lists the criteria used to assess the historical water quality of the Similkameen and its tributaries.

6.1 Upper Similkameen River

The upper Similkameen River drains the Manning Park and Pasayten River watersheds as well as a section of the Thompson Plateau south of Princeton. In this section, with the exception of Manning Park, the population is small. One large copper mine is active in the area and two older mine dumps exist east of the river mainstem between the Park boundary and Princeton. The livestock population in this section is estimated to be around 500 animals. Five effluent discharges are under provincial permit in this section for discharge to the ground only and none directly to the stream (Figure 6-1).

TABLE 6-1
Similkameen River Drainage Areas and Mean Annual Runoff

Drainage Areas*	Area $(km)^2$	Mean Annual (m^3/s)	Annual Runoff (dam^3)
Similkameen Above Goodfellow Ck.	407	8.13	256,000
Pasayten River Above Calcite Ck.	562	7.90	249,000
Similkameen at Princeton	1850	24.6	770,000
Tulameen River at Princeton	1760	23.3	732,000
Allison Creek Near Princeton	593	1.5+	47,000+
Hayes Creek Near Princeton	769	3.5+	110,000+
Wolf Creek at Mouth	215	0.494	15,600
Similkameen Near Hedley	5590	50.1	1,586,000
Hedley Creek Near Mouth	389	2.52	79,400
Ashnola River at Keremeos	1050	8.33	263,000
Keremeos Creek Near Olalla	183	0.774	24,400
Similkameen Near Border	8504	65	2,046,000
Sinlahekin Creek Above Palmer Lake (USA)	686	1.58	48,000
Similkameen Above Enloe Dam (Night Hawk) USA	9190	66.3	2,094,000

+ Estimate
1 km^2 = 0.386 Square miles.
1 dam^3 = 0.81 Acre-feet
1 m^3/s = 35.32 Cubic feet/sec.

TABLE 6-2
Criteria for Freshwater Aquatic Life

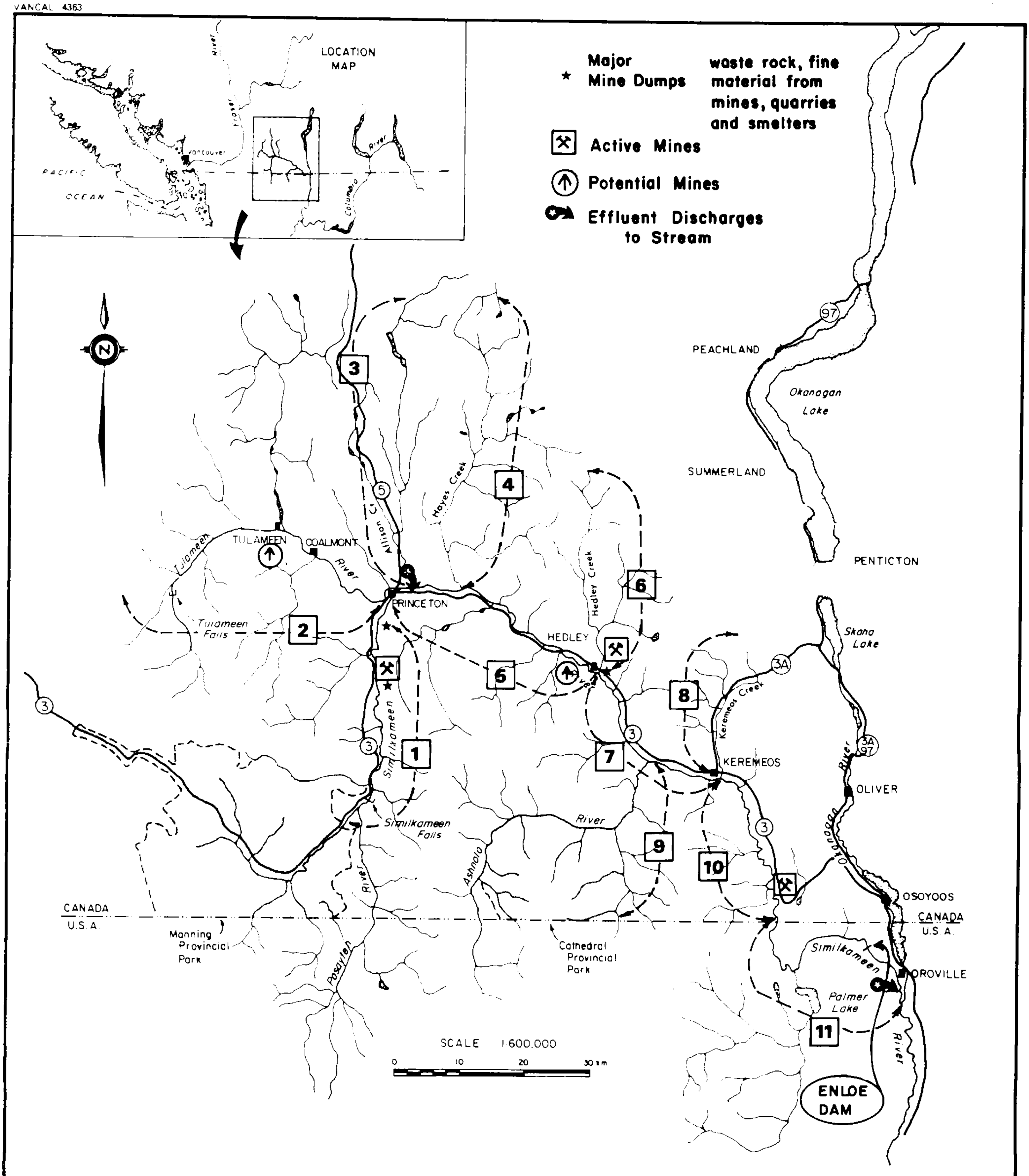
	U.S. Max. 24 hr.	U.S. Max. Any One Time	REF	Canadian Max.	REF
Alkalinity	GT 20	-	4	GT 20	1
BOD_5	-	-		-	
Carbon organic	-	-		-	
Carbon inorganic	-	-		-	
Chloride	-	-		-	
COD	-	-		-	
Coliform - fecal	100/100 ml	-	3	100/100 ml*	1
Colour	-	-		LE 100 units*	1
Cyanide	-	-		LE 0.005	1
Fluoride	-	-		-	
Hardness	-	-		-	
Metals					
Aluminum	-	-		LE 0.100	1
Arsenic	-	0.44	2	LE 0.05	1
Barium	-	-		-	
Boron	-	-		-	
Cadmium	0.000012	0.0015	2	LE 0.0002	1
Chromium	0.00029	0.021	2	LE 0.04	1
Cobalt	-	-		-	
Copper	0.0056	0.012	2	LE 0.005	1
Iron	-	1.0	4	LE 0.300	1
Lead	0.00075	0.074	2	LE 0.03	1
Manganese	-	-		-	
Mercury	0.0002	0.0041	2	LE 0.0001	1
Molybdenum	-	-		-	
Nickel	0.056	1.1	2	LE 0.025	1
Silver	-	0.0012	2	-	
Zinc	0.047	0.180	2	LE 0.030	1
Nitrogen					
Ammonia	0.02	-	4	LE 0.02	
Nitrate	-	-		-	
Nitrite	-	-		-	
Total Organic	-	-		-	
Total Kjeldhal	-	-		-	

LE = less than equal
GT = greater than
* Guideline for Recreational Waters

TABLE 6-2 (Continued)
Criteria for Freshwater Aquatic Life

	U.S.			Canadian	
	Max. 24 hr.	Max. Any One Time	REF	Max.	REF
Oil & Grease	Compound Specific		4	LE 5*	1
Oxygen - dissolved	GT 8	-	3	GT 4.0	1
Oxygen - % Saturation	LE 110%	-	3	-	
Pesticides					
Aldrin	-	0.003)	2	LE 0.000001	1
BHC	-	-		-	
Chlordane	0.0000043	0.0024)	2	LE 0.00001	1
DDE	-	-		-	
DDD	-	-		-	
P,P-DDT	0.000001	0.00011	2	LE 0.000001	1
Dieldrin	0.0000019	0.0025	2	-	
Endrin	0.0000023	0.00018	2	LE 0.000002	1
Heptachlor	0.0000038	0.00052	2	LE 0.000001	1
Methoxychlor	0.00003	-	4	LE 0.00003	1
Thiodan	-	-		-	
pH	6.5-8.5	-	3	6.5-9.0	1
Phosphorus - Total	-	-		LT 0.025	1
Total Dissolved	-	-		-	
Ortho Dissolved	-	-		-	
Polychlorinated	-	-		-	
Biphenyls	0.000014	-	2	LE 0.000001	1
Potassium	-	-		-	
Silica	-	-		-	
Sodium	-	-		-	
Solids - Total	-	-		-	
Solids - Dissolved	-	-		-	
Solids - Suspended	-	-		LE 25	1
Specific Conductivity	-	-		-	
Sulphate	-	-		-	
Temperature	LE 18°C	-	3	-	
Toxicity	-	-		-	
Turbidity	-	-		-	

LE i= Less than or equal
LT = Less than
GT = Greater than.



Section	Active Mines	Effluent Discharges to Ground (Permits)	Effluent Discharges to Stream (Permits)	Livestock Population
1. Upper Similkameen	1 (copper)	5	-	(?)
2. Tulameen River	-	4	-	810
3. Allison Creek	-	1	-	910
4. Hayes Creek	-	-	-	320
5. Similkameen - Princeton to Hedley	-	2	1 (Princeton Sewage Plant)	2240
6. Hedley Creek	1 (gold)	-	-	-
7. Similkameen - Hedley to Keremeos	-	3	-	1676
8. Keremeos Creek	-	5	-	1110
9. Ashnola River	-	(?)	(?)	(?)
10. Similkameen Keremeos to Border	1 (gold)	2	-	1895
11. Similkameen - Border to Oroville	-	-	1 (Oroville Sewage Plant)	(?)

FIGURE 6-1
MINES, EFFLUENT DISCHARGES,
LIVESTOCK IN THE WATERSHED

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PROJECT	3711.1	
DWG NO		

A total of 11 licenced water withdrawals from the Similkameen River exist in this section with total amounts of 174,750 m^3/d for mining, 9.6 m^3/d domestic, and 327 m^3/d for municipal waterworks. Irrigation licences account for 346,916 m^3/yr (Figure 6-2). This section of the watershed represents about 20 percent of total drainage area but contributes about 36 percent of the annual discharge. Mean annual runoff in this section is about 770,000 dam^3 (624,000 acre-feet) equivalent to about 416 dam^3 per km^2 (918 acre-feet per mi^2)

Historical water quality data has been collected by the province at four major stations on the Similkameen River mainstem in this section (Stations 0500075, 0500417, 0500418 and 0500629) (Figure 6-3). Detailed summary water quality data are listed in Tables 1 to 4 (Appendix 4).

The water quality in the Upper Similkameen River, as represented at Similkameen Falls (Station 0500075, Table 1, Appendix 4), indicates that while there is considerable fluctuation in parameter levels seasonally the quality on the average exceeds the criteria considered desirable for freshwater aquatic life. The records indicate some occurrences of reduced dissolved oxygen (Minimum 5.8 mg/l) below the U.S. criteria (minimum 8.0 mg/l) but still well above Canadian criteria (minimum 4.0 mg/l). Trace metals are low as are nutrients. No data exists for pesticide levels in this section.

Data from stations located on the Similkameen River above and below Newmont Mines are reported in Appendix 4, Tables 2 and 3 (Stations 0500417 and 0500418) which indicates no apparent influence on the water quality of the mainstem opposite the mine.

The resulting water quality of the entire Upper Similkameen watershed as represented by the monitoring data at Princeton just upstream of the Tulameen River confluence (Station 0500629, Table 4, Appendix 4) indicates the dissolved trace metals remain low and, based on only one sampling, pesticides were all less than detectable. Dissolved oxygen minimums reported were higher than further up river. Temperature has been reported to exceed the desirable level (18°C U.S. criteria) but averages a very acceptable 6.4°C.

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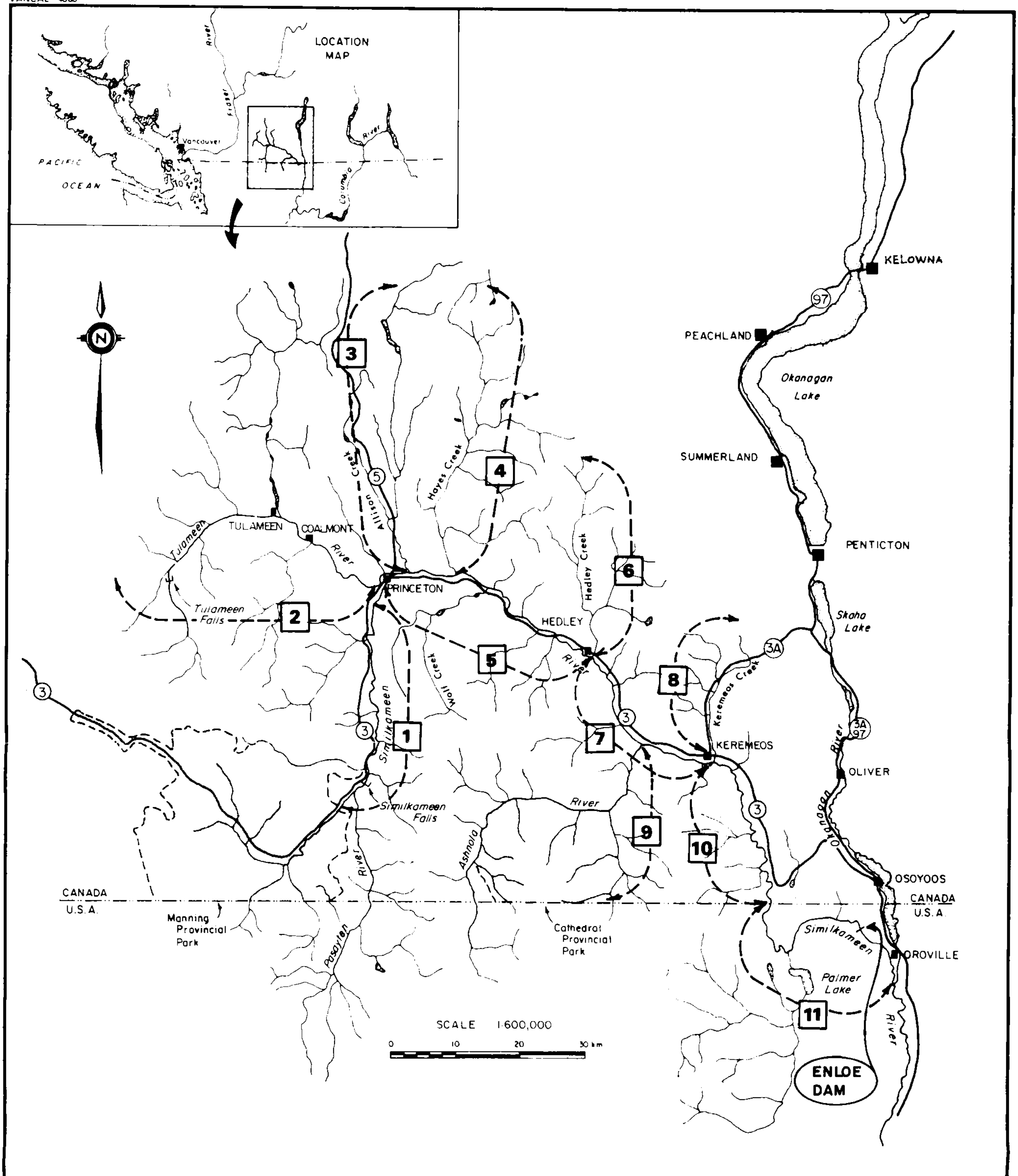

Section	Mining m^3/d	Irrigation m^3/yr	Domestic m^3/d	Water-works m^3/d	Total No.	Notes
1. Upper Similkameen to Princeton	174,750	346,916	9.6	327.0	11	
2. Tulameen River	-	9,250	27.3	9,600.0	10	
3. Allison Creek	-	2,001,620	108.0	-	70	
4. Hayes Creek	-	1,296,365	44.3	222.5	48	
5. Similkameen Princeton to Hedley	-	2,706,373	35.9	-	24	Incl. Wolf Cr.
6. Hedley Creek	6,806	222,020	682.0	796.0	4	
7. Similkameen - Hedley to Keremeos	-	3,756,568	13.7	341.0 (Ind.)	25	
8. Keremeos Creek	-	2,275,900	81.8	5,184.0 (Ind.)	32	
9. Ashnola River	-	1,387,667	40.9	-	?	
10. Similkameen - Keremeos to Border	909	4,608,569	15.0	-	34	
11. Similkameen - Border to Oroville	-	64,000,000	-	-	1	To be phased out in 1986

FIGURE 6-2
WATER LICENCES FOR WITHDRAWAL

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DWG NO

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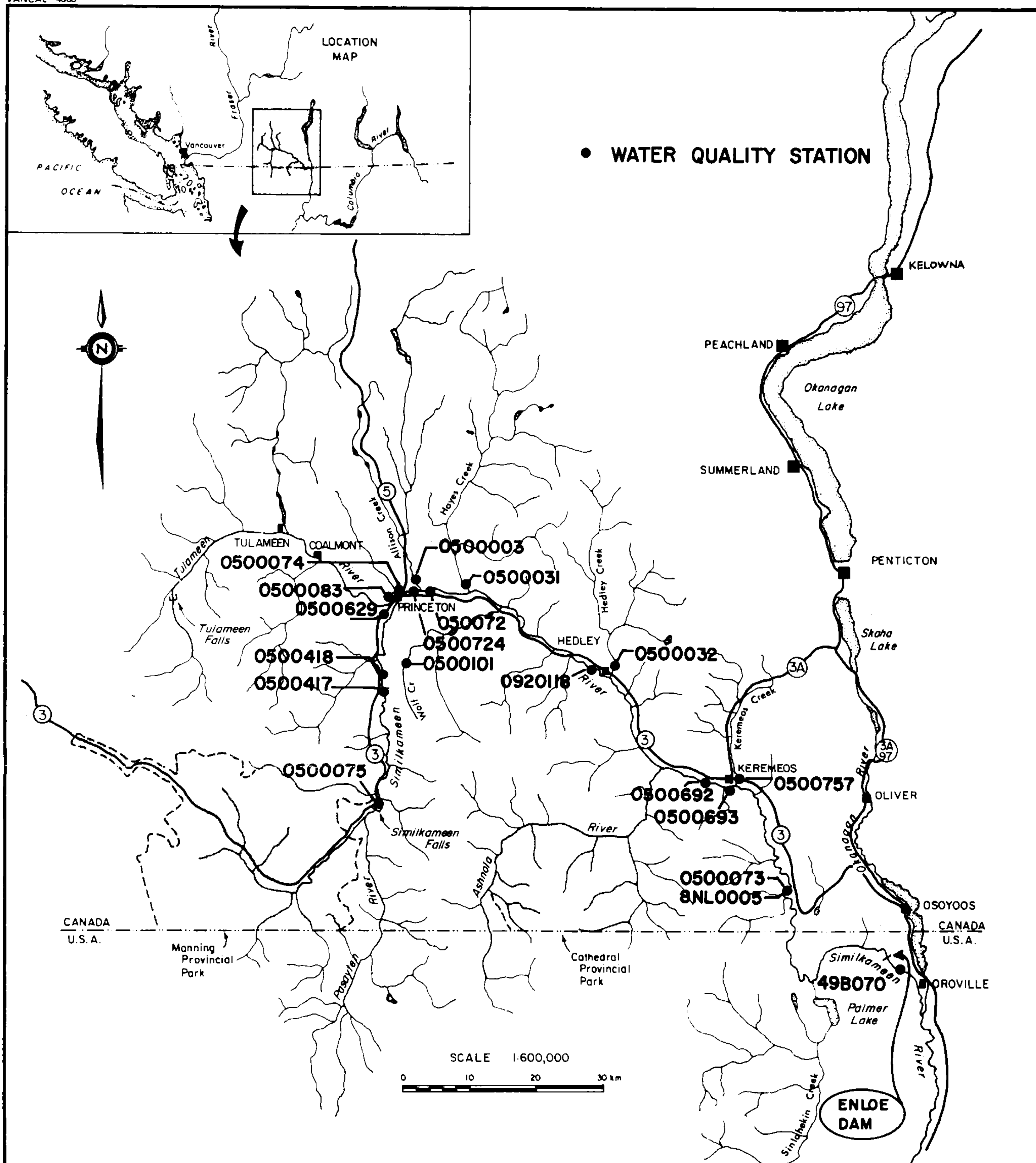

Station	Description	Status	Agency
0500075	Similkameen River at Similkameen Falls	Active	M.O.E.
0500417	Similkameen River Upstream of Newmont Mines	Active	M.O.E.
0500418	Similkameen River Downstream of Newmont Mines	Active	M.O.E.
0500629	Similkameen River at Princeton	Active	M.O.E.
0500083	Tulameen River at Highway #5 Bridge	Active	M.O.E.
0500003	Allison Creek Near Mouth	Active	M.O.E.
0500074	Similkameen River Above Allison Creek	Inactive	M.O.E.
0500724	Similkameen River Above Sewage Plant - Princeton	Active	M.O.E.
0500725	Similkameen River Below Sewage Plant - Princeton	Active	M.O.E.
0500031	Hayes Creek at Road Bridge Near Mouth	Active	M.O.E.
0500101	Wolf Creek Downstream of Newmont Mines	Active	M.O.E.
0920118	Similkameen River at Hedley	Inactive	M.O.E.
0500032	Hedley Creek at Highway #3	Active	M.O.E.
0500692	Similkameen River Upstream of Keremeos	Active	M.O.E.
0500693	Similkameen River Downstream of Keremeos	Active	M.O.E.
0500757	Keremeos Creek Near Mouth	Active	M.O.E.
0500073	Similkameen River Downstream of Cawston	Active	M.O.E.
08NL0005	Similkameen River 9 km from U.S. Border	Active	Env. Can.
49B070	Similkameen River at Oroville, Washington		D.O.E.

FIGURE 6-3
MAJOR WATER QUALITY STATIONS

IEC Beak

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PROJECT 3711.1
DWG NO

The total mean annual dissolved material load at this point in the system averages about 57,000 tonnes per year (31 tonnes per square kilometre) (Table 6-3). The total nutrient load based on mean annual discharge and parameter levels averages about 123 tonnes nitrogen and 20.7 tonnes phosphorous (66 kilograms nitrogen and 11 kilogram phosphorous per square kilometre of drainage area). The non-dissolved load as represented by suspended solids averages 36,300 tonnes per year (19.6 tonnes per square kilometre of drainage area).

6.2 Tulameen Watershed

The Tulameen watershed drains a portion of the Thompson Plateau region of British Columbia. There are no active mines in the system at present. The livestock population is estimated to be around 800 animals. There are four registered discharges of effluent to the ground and none to the stream. A total of 10 licenced water withdrawals are recorded from the Tulameen River with amounts totalling 27.3 m^3/d domestic, 9,600 m^3/d waterworks and 9,250 m^3/yr for irrigation.

The Tulameen watershed represents about the same size drainage area as the Upper Similkameen and contributes on a mean annual runoff basis an almost equivalent amount (732,000 dam^3 versus 770,000 dam^3 for the Upper Similkameen). The Tulameen runoff equates to 415 dam^3 per km^2 (917 acre-feet per mi^2).

Historical water quality of the Tulameen River represented by monitoring at the mouth (Station 050083) is presented in detail in Table 5, Appendix 4. While the quality in general is not significantly different than the Similkameen, the system carrys somewhat higher organic load as evidenced by the dissolved organic carbon levels (Mean 10.4 mg/l versus 4.3 mg/l for the Upper Similkameen). Alkalinity and hardness are slightly greater than the Upper Similkameen. Dissolved metals are low however the mean copper level (0.006 mg/l exceeds very slightly the desired levels (0.0056 mg/l U.S. and 0.005 mg/l Canadian). Pesticide levels were all below detection based on one sampling in 1974. Dissolved oxygen levels have been recorded as low as 4 mg/l which with average being 11.1 mg/l (Minimum desirable is 4.0 mg/l Canada Criteria). The river temperature can, according to the data, rise to 20.6°C but averages 6.5°C (Maximum desirable 18.0°C U.S. Criteria).

TABLE 6-3
Similkameen River Dissolved Material Mean Annual Loads

Drainage Areas*	Mean Dissolved Solids Load			Mean Nutrient Load			
				Nitrogen		Phosphorous	
	mg/L	tonnes/ year	tonnes/ km^2	tonnes/ year	kg/ km^2	tonnes/ year	kg/ km^2
Similkameen Above Goodfellow Ck.	65**	16,600	40.9	-	-	-	-
Pasayten River Above Calcite Ck.	60**	14,900	26.6	-	-	-	-
Similkameen at Princeton	73.9	56,900	30.7	123	66	20.7	11
Tulameen River at Princeton	90.9	66,500	37.8	125	68	10	5.4
Allison Creek Near Princeton	265*	12,400	21.0	18	30	2.3	4
Hayes Creek Near Princeton	74*	8,100	10.5	33	42	2.3	3
Wolf Creek at Mouth	264	4,100	19.1	5	22	1	4
Similkameen Near Hedley	106	168,000	30.1	***	***	***	***
Hedley Creek Near Mouth	34*	2,700	6.9	13	33	1	3
Ashnola River at Keremeos	63**	16,600	15.8	-	-	-	-
Keremeos Creek Near Ollala	48*	3,600	19.7	28	148	2.5	13
Similkameen Near Border	113	231,000	27.0	410	48	70	8
Sinlahekin Creek Above Palmer Lake (USA)	200**	9,600	14.0	-	-	-	-
Similkameen Above Enloe Dam (Night Hawk) USA	107*	224,000	24.4	-	-	84	9

* From conductivity data (TDS = 0.65 x COND)
** IEC BEAK data (one sampling only)
*** Data considered too old.

The total mean annual dissolved material load of the Tulameen River averages about 66,500 tonnes per year (38 tonnes per square kilometre). The total nutrient load averages about 125 tonnes nitrogen and 10 tonnes phosphorous per year (68 kg nitrogen and 5.4 kg phosphorous per square kilometre per year) which is higher than the Upper Similkameen for nitrogen load but only about half the contribution for phosphorous. The non-dissolved solids load as represented by suspended solids averages 11,600 tonnes per year (6.6 tonnes per square kilometre of drainage area), less than half the aerial contribution of the Upper Similkameen River.

6.3 Lower Similkameen Watershed

Several major creeks and one river drain the watershed of the Similkameen between Princeton and Oroville. In the section between Princeton and Keremeos where the Similkameen valley runs eastward before turning south, the major tributaries in order of occurrence are: Allison and Hayes Creeks north of Princeton, Wolf Creek south of Princeton, Hedley Creek north of the Similkameen about midway between Princeton and Keremeos and lastly the Ashnola River southwest of Keremeos. Between Keremeos and Oroville where the river turns southeast the main tributaries of signifiance are: Keremeos Creek from the north of Keremeos and Sinlahekin Creek which drains a large area south of the International Border west of Oroville and above the Enloe Dam and reservoir. In this water quality review, the watershed between Princeton and Keremeos is termed the "western section of the Lower Similkameen" and between Keremeos and Oroville is termed the "southern section of the Lower Similkameen".

6.3.1 Western Section - Lower Similkameen

The western part of the lower Similkameen watershed contains the majority of the basins' population which is located in and around Princeton, Hedley and Keremeos. Two areas of mining and exploration activity occur in this section of the watershed. Newmont Mine, described earlier, has part of its operation in the upper drainage of Wolf Creek which drains apart of the north flank of Copper Mountain. Much small scale gold mining activity has periodically occurred near Hedley in the area drained by Hedley Creek. In total, there are 6 effluent discharges under Provincial permit, with

5 of these ground disposal and only one (Princeton Sewage Plant) with approval to discharge directly to the Similkameen River. The total livestock population is estimated at around 5,200 animals. A total of about 170 licenced water withdrawals occur in this western section, approximately 45 of which are from the mainstem of the Similkameen. The quantities by category are 6,806 m^3/d for mining, 884 m^3/d for domestic use, 1,360 m^3/d for waterworks and a total annual licenced irrigation quantity of 9,983,000 m^3 (8086 acre-feet).

The western section of the Lower Similkameen (between Princeton and Keremeos) represents a drainage area about similar in size to the combined Upper Similkameen and Tulameen watersheds and contributes an estimated mean annual runoff of about 120 dam^3 per km^2. This amount is only about one third of the upper Similkameen and Tulameen contribution which is indicative of this drier portion of the watershed.

Historical water quality data has been collected at many stations in the western section of the Lower Similkameen. Detailed data are presented in Tables 6 to 15, Appendix 4. Five stations are on the mainstem and at least one station representative of the major tributaries (4 creeks) have been included in this review. No water quality monitoring station is located on the Ashnola River and only minimal water quality data is available for this major tributary.

Allison Creek water quality as represented by a monitoring station near its mouth (Station 0500003, Table 7, Appendix 4) indicates the dissolved oxygen can be quite low at times (minimum recorded 3.5 mg/l). Elevated dissolved copper and zinc have been recorded (0.15 mg/l and 0.01 mg/l and 0.77 mg/l and 0.046 mg/l maximum and mean recorded respectively for copper and zinc). These compare with Canadian water quality criteria for aquatic life of less than 0.005 mg/l for copper and less than 0.03 mg/l for zinc (Table 6-2). The dissolved material concentration is higher than the Upper Similkameen and Tulameen as represented by dissolved solids and conductivity. Nutrient load averages 18 tonnes per year (30 kg per km^2) nitrogen and 2.3 tonnes per year (4.0 kg per km^2) phosphorous.

Hayes Creek water quality (Station 0500031 - Table 10, Appendix 4) indicates the dissolved oxygen levels are satisfactory, however temperature can exceed the desirable range. Dissolved iron, mercury and zinc are slightly elevated at times but on average are within the normal range. Coliform levels have also been recorded elevated at times. Nutrient load averages 33 tonnes per year (42 kg/km^2) nitrogen and 2.3 tonnes per year (3 kg/km^2) phosphorous.

Wolf Creek water quality (Station 0500101, Table 11, Appendix 4), downstream from Newmont Mines operation in this watershed, indicates dissolved oxygen and temperature to be slightly outside desirable range at times. Dissolved copper and zinc are also considerably elevated at times above the water quality criteria desirable for freshwater aquatic life. On average however, zinc levels are satisfactory (no data available on the mean level for dissolved copper). Nutrient loads in Wolf Creek are 5 tonnes per year (22 kg/km^2) nitrogen and 1.0 tonne per year (4 kg/km^2) phosphorous.

Hedley Creek water quality (Station 0500032, Table 13, Appendix 4) indicates that dissolved oxygen and temperature are within the desirable criteria range. Trace metal levels all appear to be low. Nutrient loads on average are 13 tonnes/year (33 kg/km^2) nitrogen and 1 tonne/year (3 kg/km^2) phosphorous. The dissolved solid load is very low (6.9 $tonnes/km^2$) by comparison with the mainstem (30.1 $tonnes/km^2$ Similkameen at Hedley).

The Ashnola River water quality is essentially undocumented as no permanent monitoring stations are located on the system. The drainage is largely uninhabited and constitutes about 30 percent (1050 km^2) of the total area of the Similkameen system between Princeton and Keremeos. The mean annual runoff is about 260,000 dam^3 with an aerial unit runoff of about 250 dam^3/km^2. The nutrient load, although unknown is likely to be quite low. If one half average values for the watershed are used, the nutrient load would amount to 27 tonnes/year (26 kg/km^2) nitrogen and 4 tonnes/year (4 kg/km^2) phosphorous.

Historical water quality data on the mainstem between Princeton and Keremeos are available for five locations (Tables 8, 9, 12, 14 and 15, Appendix 4). The records for the monitoring site near Hedley are quite dated (1966-1974) and may not represent present conditions but they are included for completeness.

The two stations on the mainstem near Princeton, above and below the town's sewage entry point (Stations 0500724 and 0500725, Tables 8 and 9), indicate dissolved oxygen levels are near to or above the desired range and temperature levels have been recorded that exceed the upper desirable limit. Based on only three samplings, elevated dissolved zinc levels have been reported downstream of the sewage outfall. Nutrient levels are similar at both stations indicating little detectable influence of any treated sewage on nitrogen and phosphorous concentrations.

The only data available on pesticide levels in this section of the watershed are from a site on the river just upstream of Hedley (Station 0920118, Table 12). These data indicated all pesticides and polychlorinated biphenyls were below detection limits.

The water quality of the mainstem, near Keremeos, as represented by two sites (Stations 0500692 and 0500693, Tables 14 and 15), indicate dissolved oxygen levels are satisfactory and temperature levels can, at times, reach or exceed the desirable upper limits ($18^{\circ}C$ maximum). Dissolved metals levels are all low. The nutrient load at this point based on the data available, is approximately 385 tonnes per year (53 kg/km^2) nitrogen and 25 tonnes per year (3.5 kg/km^2) phosphorous.

6.3.2 Southern Section - Lower Similkameen

The southern section of the Lower Similkameen watershed includes the Keremeos Creek drainage (192 km^2) north east of Keremeos and a few other very small creeks before reaching the international border. On the Washington side, the runoff from the Sinlahekin Creek/Palmer Lake system (686 km^2) is the only major tributary prior to the Similkameen confluence with the Okanogan River at Oroville. One small mine is intermittently active near the Similkameen River just north of the border and there are several known old mine workings in this section of the watershed (including tributaries) on both sides of the border. In total, there are eight effluent discharges under provincial permit, all of which are for ground disposal excepting the treated sewage disposal into the Similkameen at Oroville. The total livestock population in this section is estimated at 200 animals. A total of 67 licenced water withdrawals occur, with slightly more than half on the mainstem. The quantities by category as presented in Figure 6-2 are 909 m^3/d mining, 138 m^3/d domestic, 5184 m^3/d

waterworks and 72,300,000 m^3/yr irrigation (58,500 Acre-feet). The southern section of the Lower Similkameen represents a drainage area of around 2000 km^2 with a mean annual runoff of about 85 dam^3/km^2 reflecting the driest climate of the basin.

Water quality records for this section are available for Keremeos Creek, and three sites on the mainstem. No records were available for the Sinlahekin Creek tributary.

Keremeos Creek water quality (presented in Table 16, Appendix 4), based on only a few samplings, indicates dissolved oxygen and temperature were within the acceptable range. Fecal coliform levels documented were above the desirable range, indicative of the presence of contamination. Dissolved iron levels were also elevated at the time of the one sampling on record (1980). Nutrient load based on available data are estimated at 28 tonnes per year (148 kg/km^2) nitrogen and 2.5 tonnes per year (13 kg/km^2) phosphorous. These aerial loads are more than double the average of other major tributary creeks to the Similkameen River.

Water quality of the mainstem near the international border is monitored by both the B.C. Ministry of Environment (Station 0500073, Table 17) and Environment Canada (Station 8NL 0005, Table 18). Minimum dissolved oxygen levels recorded are 5.8 mg/l, somewhat below the desirable level, but mean values reported are 10.5 mg/l. Maximum temperature and fecal coliform levels as reported indicate some excursions above the desirable levels, however mean values are still within range. The mean dissolved copper levels are slightly higher than desirable. The nutrient loads on average are 410 tonnes per year (48 kg/km^2) nitrogen and around 70 tonnes per year (8 kg/km^2) phosphorous. The total dissolved material load averages 231,000 tonnes per year (27 $tonnes/km^2$).

As indicated previously, no water quality data were available for review from the Sinlahekin Creek/Palmer Lake system which enters the Similkameen south of the international border.

The last water quality monitoring site on the mainstem for which data were reviewed is from a station near Oroville between the Enloe Dam and the confluence of the Similkameen and Okanogan rivers (Station 49B070, Table 19, Appendix 4). This station would not reflect any changes in water quality that may be present as a result of discharge of treated sewage (2400 m^3/day or 0.63 USMGD) from the Oroville secondary treatment plant situated just upstream of the confluence of the Similkameen and Okanogan Rivers.

The water quality records indicate that dissolved oxygen levels are satisfactory however, fecal coliform and temperature maximums, while on average are satisfactory, excursions have been recorded above the desirable levels for freshwater aquatic life. No data are available for pesticide or other organic contaminants. Dissolved zinc levels have been recorded above the desirable (0.05 mg/l versus 0.03 mg/l Canadian Criteria) however, on average are well under this objective. The nitrogen nutrient load at this point is not estimatable due to lack of complete nitrogen analysis data. The phosphorpus load is slightly higher than at the station just north of the border and, based on data available, averages 84 tonnes per year (9 kg/km^2). The total dissolved material load is projected at 224,000 tonnes per year (24.4 kg/km^2).

6.4 System Comparisons

The Similkameen River water quality, based on the records reviewed, does not appear to have any major constraints in terms of persistent detrimental physical, chemical or microbiological characteristics. While the records indicate periodic excursions outside the desirable range for a few parameters at certain points on the mainstem or in some tributaries in the watershed, overall the system water quality does not present any primary limitations for freshwater fisheries or organic life. The productivity of the system, in terms of primary biomass and therefore ultimately fish production capability, may be limited due to nutrient availability which is a function of the natural watershed characteristics and activities within. A comparison of the nutrient aerial contribution of selected steelhead rivers in British Columbia is presented in Table 6-4. It is apparent that the nitrogen load in the Similkameen is low by comparison to other systems and may be a limiting factor. The phosphorous load appears roughly comparable to the other river systems examined, but is toward the low end of the range.

TABLE 6-4
Comparison of Aereal Runoff and Nutrient Loads for Several B.C. Steelhead Rivers

River	Location	Drainage Area (km^2)	Runoff (dam^3/km^2)	Nitrogen (kg/km^2)	Phosphorus (kg/km^2)
Similkameen R.	**Interior**	**9200**	**227**	**48**	**9**
Chilliwack R.	Coastal/ Interior	1230	1756	350	19
Coquihalla R.	Coastal/ Interior	741	1417	210	18
Thompson R.	Interior	54,900	428	73	5
South Thompson R.	Interior	16,200	551	84	6
North Thompson R.	Interior	19,600	693	147	8
Squamish R.	Coastal	2330	3253	390	110

Data Source: Environment Canada, 1983 Stream Flow Summary Inland Waters Directorate
Ministry of Environment, Equis File, Victoria, B.C.

7.0 SIMILKAMEEN RIVER WATER FLOW ADMINISTRATION AND RELEASE OBLIGATIONS

The Similkameen River originates near the British Columbia - Washington border and flows north to Princeton, B.C., where it turns to trend in a southeast direction to cross the border near Nighthawk, Washington. Parts of the headwaters of two of the largest tributaries, the Pasayten and Ashnola Rivers, are located south of the international boundary. These rivers flow north into the Similkameen River, the lowest 44 kilometres (27 miles) of which flow through Washington to the Okanogan River at Oroville. The fact that the river crosses the U.S. - Canada boundary makes it, by definition, an international river.

In British Columbia, both the provincial and federal governments play a role in development of water resources, and in Washington State both the state and federal governments are involved in managing the state's waters. Since the Similkameen is an international river, the International Joint Commission has jurisdiction under authority of the Boundary Waters Treaty of 1909 (Appendix 5).

The lower Similkameen River valley, especially downstream of Hedley, B.C. is an important agricultural production area, and subsequently requires large quantities of irrigation waters. These waters are drawn from the river itself, with additional (but unquantifiable) waters drawn from wells. The peak demand for these irrigation waters coincides with the natural summer low flow of the river, and as a result water shortages commonly occur in the lower reaches of the river. The possibility of creating storage reservoirs in the Canadian portion of the basin has been periodically investigated with the aim of providing additional flow for late summer users, but no development has resulted. The Canadian portion of the river is considered "Fully Recorded", and no further licenses are available for withdrawal of water during the irrigation season.

7.1 Water Administration

7.1.1 Administration Of Water In British Columbia

Although the government of Canada is involved in development and management of water resources, its involvement is mainly limited to co-sponsorship with the provincial governments or in matters of national or regional interest.

The two pieces of federal legislation which authorize water-related activities are the *Canada Water Act* (1970) and the *International River Improvements Act* (1955), both administered by Environment Canada. The Canada Water Act has four parts (Environment Canada, 1983). The first part provides for cooperative arrangements with the provincial governments for management of water resources. This part also enables Environment Canada to conduct research, collect data and establish inventories associated with the water resources. Parts two and three deal with water quality issues, and part four deals with the general administration of the Act. The International River Improvements Act allows for the establishment of regulations regarding the construction, operation and maintenance of dams, obstructions, canals, reservoirs or other works, the purpose or effect of which is:

a) *To increase, decrease or alter the natural flow of an international* river; and

b) To interfere with, alter or affect the actual or potential use of the international river outside Canada.

The Act, and its associated regulations, require the licensing of all international river improvements, except those:

a) Constructed under authority of another federal Act;

b) Situated within boundary waters as defined in the Boundary Waters Treaty (see 7.1.3 below); or

c) Constructed, operated or maintained solely for domestic, sanitary or irrigation purposes or other similar consumptive uses.

The federal government is also responsible for international arrangements, including those regarding the cooperation between Canada and the United States in matters related to waters common to both countries. At present, the federal government of Canada is undertaking a review of its role in water management, incuding its role in international water administration (Inquiry on Federal Water Policy, 1984).

In Canada, all water is owned by the Provincial Crowns. The allocation of this publicly owned water amongst competing users is administered by the Provincial Governments. In British Columbia, the provincial Water Act states:

> "The property in and the right to the use and flow of all the water at any time in any stream in the Province are for all purposes vested in the Crown in the right of the Province....." (Chapter 405, Section 3).

The right to the use of water is granted only to those who apply for and receive a water license. Licenses entitle the holder to make beneficial use of a specified quantity of water, at a specific location and during a specific period. Every license has priority date, usually the date that the licensee filed his application. When more than one license has been issued on the same stream, the person with the earliest priority license has first right to the use of the water. The holder of the license with the next later priority date has second right and so on. If a stream does not carry enough water at times to satisfy all of the licensed diversions from it, the person holding the latest priority license is the first who must stop using water, because his license is subject to the prior rights of the other licensees.

The Water Act is administered by the Water Management Branch of the B.C. Ministry of Environment. The policy of the Okanogan-Similkameen regional branch has in the past aimed to provide water supply to support all licensed withdrawals and designated instream flow reserves for four out of any five year period (Ministry of Environment, 1984). The Similkameen River is presently designated "Fully Recorded", and therefore the issuance of further licenses on the stream is restricted. At present, water licenses are required only for surface water. Groundwater withdrawals do not require licenses, although the Water Act (Section 4) provides for future application of the Act to groundwater.

7.1.2 Administration Of Water In Washington State

The waters of Washington State are managed by both state, federal and regional agencies (Washington State Department of Ecology, 1983). Federal agencies are, in general, concerned with the integrated development of natural resources, including water. Examples of some of these agencies include the Army Corps of Engineers, Department of the Interior, Environmental Protection Agency and the Federal Power Commission. The Northwest Power Planning Council is an example of a regional agency involved in management of water resources in Washington. The Council is mandated with developing long range regional energy plans and compensating for losses of fish and wildlife caused by hydroelectric development of the Columbia River. There are eight members of the council; two from each of the states of Washington, Orgeon, Idaho and Montana. Most water resources management activities, however, are the responsibility of the state, including the administration of water rights. Waters of the state are allocated in accordance with the doctrine of prior appropriation, as stipulated in the Surface Water Code of 1917 (RCW [1] 90.03) and the Ground Water Code of 1945 (RCW 90.44). The Washington Department of Ecology (WDOE) administers water allocations through a permitting procedure, and is also vested with exclusive authority to set minimum instream flows and levels on state waters. A formal process to establish instream flows and lake levels for the protection of fish, wildlife, recreation, aesthetics and water quality was established in Chapter RCW 90.22 (Minimum Water Flows and Levels), enacted in 1969. Although this legislation provided the hearing procedures necessary to establish the minimum flows and levels, it did not define the criteria to determine them. The Water Resources Act of 1971 (RCW 90.54) required WDOE to "develop and implement a comprehensive state water resources program" and allowed the department to establish instream flows. In 1976, pursuant to RCW 90.54, the Water Resources

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1 RCW - Revised Code of Washington.

Management Program (Chapter 173 -500 WAC[2]) was initiated. The state was divided into 62 Water Resources Inventory Areas (WRIAs), and WDOE began formulating a water resources management program for each WRIA (or group of WRIAs). The Okanogan River basin Water Resources Management Program (Chapter 173-549 WAC) was adopted in July, 1976 and revised in June, 1984. This act provides for the adoption in the Washington Administrative Code of measures "designed to preserve and protect instream resource values, which include minimum instream flows and closure of streams and lakes to further consumptive water rights appropriation". Minimum discharges for the Similkameen River between the international border and the Okanogan River were determined. They are tabulated for the beginning and middle of each month (Table 7-1) and illustrated for the whole year by a hydrograph (Figure 7-1). The intention of these instream flows is "to protect streams from consumptive use appropriations approved after adoption of the flows. When the flow of a stream falls to or below a specified minimum instream flow, those water rights provisioned with those flows must cease or reduce diversion until the instream flow is exceeded". No consumptive use water rights will be issued for streams closed to further consumptive appropriation (during the period of closure). Chapter 173-549 WAC also specifies that in cases where the flow of a stream is reduced in only a portion of its length (eg. hydroelectric projects which bypass a portion of a stream) the use will be considered consumptive only for the affected portion of stream. These flows may be tailored to the particular project or stream reach. The program also specifies that existing water rights are not affected.

7.1.3 Administration Of International Waters

The waters of all lakes, rivers and connecting waterways through which the boundary between Canada and the United States passes are defined as boundary waters. In order to prevent disputes regarding these waters an international agreement was made between Canada and the United States. This agreement is the Boundary Waters Treaty, signed in 1909. The Treaty deals not only with boundary waters, but also rivers which drain into or out of boundary waters, and rivers which flow across the

[2] WAC - Washington Administration Code.

TABLE 7-1

Minimum Instream Flows
Similkameen River Confluence With
Okanogan River To Canadian Border

Monitoring to take place at: Similkameen River at Nighthawk (12442500)

		Minimum Discharge				Minimum Discharge	
Month	Day	cfs	m^3/s	Month	Day	cfs	m^3/s
January	1	400	11.3	July	1	1900	53.8
	15	400	11.3		15	1070	30.3
February	1	400	11.3	August	1	690	19.5
	15	400	11.3		15	440	12.5
March	1	425	12.0	September	1	400	11.3
	15	450	12.7		15	400	11.3
April	1	510	14.4	October	1	450	12.7
	15	650	18.1		15	500	14.2
May	1	1100	31.2	November	1	500	14.2
	15	3400	96.3		15	500	14.2
June	1	3400	96.3	December	1	500	14.2
	15	3400	96.3		15	450	12.7

See Also: Figure 7-1 Minimum Instream Flow Hydrograph for definition of minimum instream flows on those days not specifically identified above.

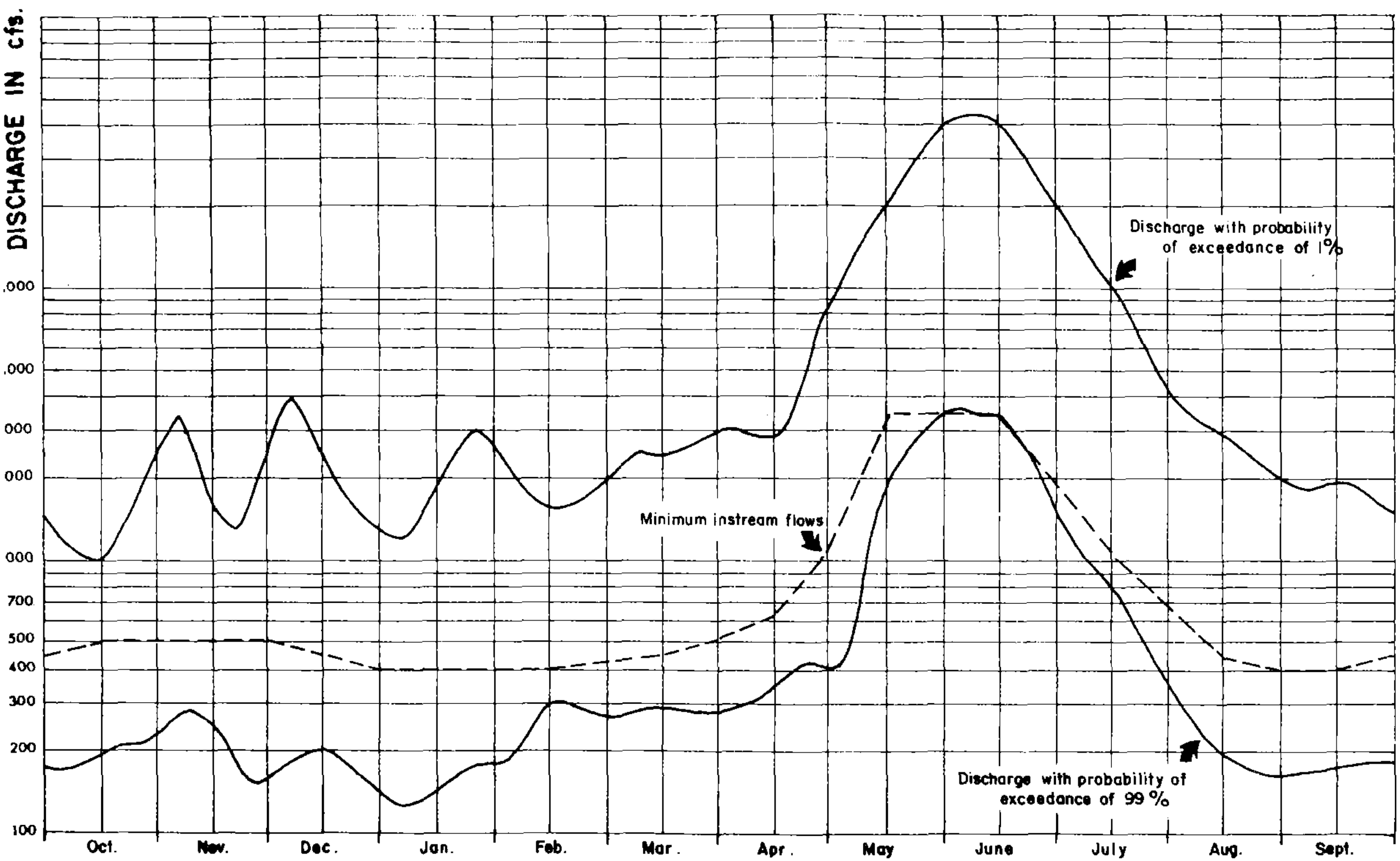

FIGURE 7-1: Minimum Instream Flows and Discharge Duration Hydrograph (Similkameen River near Nighthawk, Wash.)

	DATE	11/84	bg

boundary (international rivers). The Treaty (summarized in Appendix 5) established the International Joint Commission (IJC), made up of three commissioners from Canada, and three from the United States. The IJC has jurisdiction over cases where the level, flow or quality of boundary waters is altered in one country causing adverse impacts in the other country. The development of boundary waters/international rivers is allowed only with the approval of the IJC, or under some other international agreement (eg. The Columbia River Treaty).

Since its inception, the IJC has rendered one decision regarding the Similkameen River, and one decision regarding the Okanogan River. In 1945, a proposal was made to divert water from the Similkameen River near Cawston, B.C. for irrigation purposes. The proposal was protested by Washington State on the grounds that flows in the river were already too low, and the project would not provide sufficient flow to meet the power and irrigation requirements in Washington. The IJC approved the project in 1949 subject to Cawston using only waters stored from the spring freshet.

Late in 1982, the IJC issued an Order of Approval for the construction of a new control structure at the outlet of Osoyoos Lake, which lies on the international boundary near Oroville, Washington. The lake, through which the Okanogan River flows, has its level controlled by the Zosel Dam, which presently is in disrepair. The State of Washington and the Province of British Columbia shall share in the cost of a new dam.

7.2 Water Use And Water Supply

7.2.1 The Similkameen River In British Columbia

There are presently over 1,000 water licenses in the Canadian portion of the Similkameen River. The major purpose for which water is withdrawn is irrigation, mostly in the lower part of the river between Princeton and the border. The B.C. Ministry of Environment has recently (1984) estimated that the total of all licensed diversions from the Similkameen River during the irrigation season is equivalent to a continuous flow of 6.13 m^3/s (216 cfs). However, many surface water license holders use groundwater (which presently does not require licensing in B.C.) and may not be using their surface license at all, while many others use less water than they are licensed to withdraw. Unlicensed, non-consumptive uses of the waters of the Similkameen include maintenance of flow for fisheries, recreational and aesthetic purposes.

Water supply problems in the Similkameen River basin are two-fold due to the seasonal variability of flow. In the spring and early summer, the river experiences its freshet, which results from melting of the high elevation snowpack. This event commonly results in flooding in the lower valley, although extensive dyking has protected much of these lands. The other water supply problem is water shortage. By the end of the summer the streams are reduced to baseflow and irrigation withdrawals further reduce the flows. There is very little lake/reservoir storage in the basin to supplement the late summer flows. Seven-day average low flows for the irrigation season (June - September) were estimated for most streamflow gauging stations in the basin by the B.C. Ministry of Environment (1984). The mean annual and 50-year return period low flows at the gauging station near Nighthawk, Washington are 13.9 m^3/s (491 cfs) and 6.13 m^3/s (216 cfs), respectively. Since only one major tributary (Palmer Creek) to the Similkameen River enters between the gauging station and the border, these flows are representative of extreme flow conditions at the border. Extreme low flows from Palmer Creek (outlet of Palmer Lake) are probably in the order of only 0.1 m^3/s (3.5 cfs).

7.2.2 The Similkameen River In Washington State

The Similkameen River flows only 44 km (27 miles) from the border to its confluence with the Okanogan River at Oroville, Washington. Although there is some irrigation in this reach, most licensed withdrawals are for small quantities (less than 2 cfs). The Oroville-Tonasket Irrigation District holds a license to divert irrigation water from the Similkameen River near Nighthawk. These waters are used mainly in the Okanogan River Valley. The licensed quantities are:

April 1 - 15	50 cfs	(1.42 m^3/s)
April 15 - 30	107 cfs	(3.03 m^3/s)
May 1 - 31	124 cfs	(3.51 m^3/s)

June 1 - 30	149 cfs	(4.22 m^3/s)
July 1 - 31	186 cfs	(5.27 m^3/s)
August 1 - 31	165 cfs	(4.67 m^3/s)
September 1 - 30	128 cfs	(3.63 m^3/s)
October 1 - 15	50 cfs	(1.42 m^3/s)

The Oroville-Tonasket Irrigation District also has a 1954 certificate for 150 cfs (4.25 m^3/s) from the Similkameen River. However the combined discharge under the water license and the certificate are not to exceed 200 cfs (5.66 m^3/s) during the period April 1 through October 15 (U.S. Department of the Interior, 1980).

The only two other major water licenses issued for the Similkameen River are held by the Okanogan County Public Utility District. Both were issued for the Enloe Dam and Powerhouse. The first was issued in 1919 for 250 cfs (7.08 m^3/s) and the second was issued in 1925 for 750 cfs (21.24 m^3/s).

The proposed Oroville-Tonasket Unit Extension would replace the irrigation canal presently used to transport water from the Similkameen with a pumphouse at Osoyoos Lake and will involve the transfer of the water rights. This will then increase the available water supply below the intake structure to the mouth of the river. The potential exists, however, for use of this canal to transport water to a drop structure near the Enloe Dam, reducing instream flow only in the reach between the dam and the intake structure.

7.3 Development Of Enloe Dam And Its Effect On Water Rights

Various fish passage schemes have been proposed for Enloe Dam. These include dam removal, laddering and trap and haul. If the dam is to be left and fish are passed, a major concern would be whether or not power generation would be resumed.

In the event that Enloe Dam is removed, the two existing water licenses will be relinquished. Since these licenses are still held by the Okanogan County Public Utility District (PUD) they are still exercisable. The PUD has applied for a license from the Federal Energy Regulatory Commission (FERC) to rejuvinate the dam and powerhouse to provide hydroelectric power. If the dam is rejuvenated the PUD would be responsible for providing fish passage at the dam (Northwest Power Planning Council, 1982), however this would likely be funded by federal sources. The issue of fish passage at the dam is being dealt with regardless of whether power generation recommences again or not.

If the dam is left intact and fish passage is provided past the dam by either a ladder or trap and haul facility, then an additional water license would be required to provide for operation and attraction flows of the passage facilities.

If the dam is recommissioned the existing water licenses will be required for power production. The PUD has been exempted from relinquishment of their water rights (for non-use) by making annual payment of power license fees. The water required for operation of the fish passage facilities would reduce the water available for power production during periods of low flow. The PUD proposes to divert water to run their turbines at a maximum rate of 750 cfs when flow is available (Moos, 1981). When the flow of the river is less than 750 cfs (about 193 days in an average flow year) all river flow is to be routed through the penstocks to the turbines. Water used to run the passage facilities would reduce power production at Enloe Dam, unless water is stored upstream during the freshet to augment low flows. The development of a dam at Shankers Bend is also being investigated by the U.S. Army Corps of Engineers. The intent of this project would be to provide storage which could be used to provide flow to run the Enloe powerhouse at capacity year-round.

Development at Enloe Dam will in no way effect the existing water rights of Canadian water users. The 1949 decision of the IJC was that no further consumptive withdrawals could be made without storage from the spring freshet, but all existing licenses were not to be affected. Under the B.C. Water Act (Section 20) water licenses are subject to cancellation only for reasons such as failure to make beneficial use, nonpayment of fees, or non-compliance with the license or Water Act. Development of the Similkameen River downstream of the border will not involve any changes in the flow regime at the border. The potential construction of an additional dam at Shankers Bend will require approval of the IJC if flooding upstream of the border is involved. A high dam at Shankers Bend would result in a vast amount of agriculturally productive Canadian soil being flooded. It is not likely that such a proposal would be approved. Alternate plans for a lower dam at Shankers Bend which would flood the Similkameen River valley only as far as the international boundary are being considered along with other options, by the U.S. Army Corps of Engineers.

8.0 NEPA SCOPING DOCUMENT

8.1 Executive Summary

The Bonneville Power Administration (BPA) is investigating alternative methods for facilitating anadromous salmonid fish passage in the Similkameen River upstream of Enloe Dam. This section of the Draft Final Report on Enloe Dam Fish Passage is an objective preliminary environmental scoping document addressing each of the six proposed alternatives. Each alternative was given equal consideration in this analysis, as no "preferred" alternative exists at this time. This NEPA scoping document is designed to provide agency decision-makers with a summary of background environmental information and to serve as a precursor to either an Environmental Assessment (EA) or Environmental Impact Statement (EIS) which will ultimately be required by NEPA if BPA proceeds with the Project.

Reconnaissance level information was gathered for all elements of the physical, biological, and human environment which could potentially be impacted by any of the six proposed alternatives. The alternatives are:

Alternative 1 -	Fishway from falls, incompatible with hydropower generation
Alternative 2 -	Fishway below powerhouse, compatible with hydropower generation
Alternative 3 -	Trap and haul at falls, incompatible with hydropower generation
Alternative 4 -	Trap and haul below powerhouse, compatible with hydropower generation
Alternative 5 -	Trap and haul at railroad bridge, compatible with hydropower generation

Alternative 6 - Dam removal, incompatible with hydropower generation

Environmental information was obtained through a brief survey of the study area in October 1984; from available literature; and from contacts with appropriate local, state, and federal agency personnel. The report summarizes the baseline information gathered for each aspect of the environment and makes preliminary assessments as to the level of potential impacts which could result from each of the six alternatives. This preliminary impact assessment will aid decision-makers in determining whether an EA or EIS should be prepared in order to comply with NEPA.

Aspects of the environment which will not be affected or which will be affected minimally (either in an adverse or beneficial manner) are only reviewed at a preliminary level of analysis and detail in this report. Those aspects of the environment which could potentially be significantly affected (either in an adverse or beneficial manner) are treated with a proportionately greater level of detail. Table 8-1 summarizes the potential level of environmental impact on each aspect of the environment resulting from each of the six alternatives. The impact matrix presented here is a culmination of the reconnaissance level studies conducted from October 1984 through May 1985. The values shown in Table 8-1 are preliminary at this time due to the level at which studies were conducted. These values should be viewed as indicators of the potential level of impacts, rather than as absolute values defining impact.

Several quite obvious issues have been identified that will require more extensive examination is a future NEPA document. These include: wildlife resources (in particular, the potential beneficial effect of fish passage on bald eagles), fish resources, power production potential, recreation (particularly with regard to sport fishing), potential for toxic or hazardous materials in sediments behind the dam, hydraulic modifications and potential flooding affects, and cultural and historical resources. The effects of the project on three of these focal issues (wildlife, fish and recreation) are anticipated to be beneficial for all six alternatives and have international implications. The effects on the other focal issues (power production potential, toxic/hazardous materials potential, hydraulic modifications and potential

TABLE 8-1
Enloe Dam Project Matrix Of Potential Impacts

	Alternatives						
	1	2	3	4	5	6	
	Fishway	Fishway	Trap & Haul	Trap & Haul	Trap & Haul	Dam Removal	
nvironmental Concern	Without Power	With Power	Without Power	With Power	At Railroad Bridge	Sediment Removal	No Sedime Dredging
th Resources	X	X	X	X	X	Y	Y
Resources	0	0	0	0	0	0	0
er Resources	X	X	X	X	X	X	Y
etation Resources	0	0	0	0	0	X	Y
llife Resources	B	B	B	B	B	A	A
Resources	A	A	A	A	A	A	B
er Production tential	0	X	0	X	0	0	0
se	0	0	0	0	0	0	0
ic/Hazardous aterials	0	0	0	0	0	X	Y
d Use, Population, using, and ansportation	0	0	0	0	0	0	0
thetics	X	X	X	X	X	C	B
reation	B	B	B	B	B	B	B
oric & Cultural sources	X	X	0	0	?	Y	Y
iculture	0	0	0	0	0	0	0

act Matrix Ranking system:

Very Beneficial
Moderately Beneficial
Minimally Beneficial
Neutral

X = Minimally Adverse
Y = Moderately Adverse
Z = Very Adverse

? = Archaeological survey of Alternative Si 5 has not been conducted; thus, no value can be assigned in terms of potential impacts.

flooding and historical/cultural resources) vary with alternatives. A summary of the environmental and engineering advantages and disadvantages of each of the six alternatives are presented in Table 8.2. This table, in conjunction with the impact matrix (Table 8-1), provides an overview of the entire range of considerations currently under study. The main text of this NEPA Scoping Document describes these considerations in greater detail.

8.2 Introduction

8.2.1 <u>Need For NEPA Assessment</u>

The Enloe Dam Fish Passage Project is currently in the preliminary stages of evaluation. Fisheries habitat studies in the U.S. and Canadian Similkameen River reaches have recently been completed in order to determine the feasibility of establishing a run of steelhead and/or salmon above the Enloe Dam. The results of these studies are presented in the preceding sections of this report.

The proposed Enloe Dam Fish Passage Project may constitute a "major Federal action," thus requiring compliance with the 1969 National Environmental Policy Act (NEPA), the CEQ governing regulations published in the Federal Register July 18, 1979 (40 CFR Parts 1500-1508), and DOE NEPA guidelines published March 28, 1980 (45 FR 20694-20701). The DOE guidelines provide supplemental implementing procedures required by CEQ regulations. Moreover, these guidelines were issued pursuant to, and to be used only in conjunction with, the CEQ regulations cited above.

This section 8.0 of the Draft Final Report on Enloe Dam Passage is intended to serve as a preliminary scoping document for fulfilling the requirements and meeting the intent of NEPA and its pursuant regulations and guidelines. In that this report section is a precursor to the final environmental document for the Enloe Dam Fish Passage Project, it has therefore been structured as a discrete report, capable of standing alone without the preceding sections. Thus, a certain amount of redundancy may occur between this and other report sections. The reader is encouraged to view this section as a summary document which presents an overview of the environmental implications of fish passage at Enloe Dam. These implications involve not only the

TABLE 8-2
Environmental And Engineering Considerations Of Alternatives 1 Through 6

ALTERNATIVE	ENVIRONMENTAL Advantages	ENVIRONMENTAL Disadvantages	ENGINEERING Advantages	ENGINEERING Disadvantages
1 - Fishway at Falls	. Anadromous fish in Upper Similkameen . Benefit to eagles . Benefit to sport fishery	. Minor erosion and water quality impacts	. Natural barrier . relatively short fishway . Low O & M cost	. Difficult high flow passage . Incompatible with hydro-power . High capital cost
2 - Fishway Below Powerhouse	. Anadromous fish in Upper Similkameen . Benefit to eagles . Benefit to sport fishery	. Minor erosion and water quality impacts . Loss of small stream segment to fish utilization	. Well defined barrier . Low O & M cost . Allows power production	. Power generation loss . Long fishway . Requires barrier dam . High capital cost
3 - Trap at Falls	. Anadromous fish in Upper Similkameen . Benefit to eagles . Benefit to sport fishery	. Minor erosion and water quality impacts	. Natural barrier	. High O & M cost . Incompatible with hydro-power
4 - Trap Below Powerhouse	. Anadromous fish in Upper Similkameen . Benefit to eagles . Benefit to sport fishery	. Minor erosion and water quality impacts . Loss of small stream segment to fish utilization	. Well defined barrier . Allows power production	. Power generation loss . Difficult access . Requires barrier dam . High O & M cost
5 - Trap at Railroad Bridge	. Anadromous fish in Upper Similkameen . Benefit to eagles . Benefit to sport fishery	. Minor erosion and water quality impacts . Potential loss of some spawning habitat	. Compatible with hydropower . Easy access	. Deep channel . Requires barrier dam . High O & M cost
6 - Dam Removal	. Anadromous fish in Upper Similkameen . Benefit to eagles . Benefit to sport fishery	. Water quality degradation . Erosion of reservoir banks . Potential loss of wetlands, vegetation and cultural site . Sediment deposition on spawning gravels downstream	. Short fishway . Low O & M cost	. High capital cost . Sediment disposal . Incompatible with hydro-power

potential effects on fishery resources, but also those effects on all other aspects of the environment.

8.2.2 Regional And Historical Setting

Enloe Dam is located in a steep rocky canyon on the lower Similkameen River in north central Washington near the City of Oroville, as shown on Figure 8-1. The dam is situated 5 mi upstream of the confluence of the Similkameen River with the Okanogan River. Nearly 2 mi of slack water is created by the dam when the reservoir extends upstream to Shanker's Bend. The Similkameen Valley in the vicinity of the dam is narrow, with clearly defined terraces at approximately 1,100 ft above mean sea level. These terraces form a bench 500 to 600 ft wide and have been utilized for an irrigation canal and railroad corridor. Beyond the terraces, the valley walls rise steeply to rounded rolling hills with crest elevations of about 2,800 ft.

The climate of the Similkameen River Valley is influenced by the prevailing westerly air flow over the Northern Cascades which block the saturated Pacific marine air masses and result in a semi-arid climate. The mean annual precipitation is 12 in, most of which occurs as winter snowfall. Temperature extremes are common, although mean summer and winter temperatures are quite moderate. The vegetation of the immediate area around Enloe Dam reflects the climate and topography and is predominately a shrub-steppe association in which big sagebrush and bitterbrush are the dominant shrubs. Scattered ponderosa pine and Douglas fir occur on moist north and east facing slopes and narrow bands of riparian vegetation occur along the edge of the river in some areas.

The Enloe Dam itself is a concrete gravity arch structure, approximately 54 ft in height. The structure operates as an uncontrolled spillway with 276 ft of crest length. Enloe Dam was constructed between 1919 and 1923 as a part of a hydroelecrtic facility and since that time no upstream fish passage has occurred. A powerhouse operated in conjunction with the dam still stands and is located approximately 800 ft downstream of the dam on the west bank of the river. Hydropower generation was discontinued in 1959. The location of the dam and powerhouse are shown on Figure 8-2. The natural falls is located between the dam and

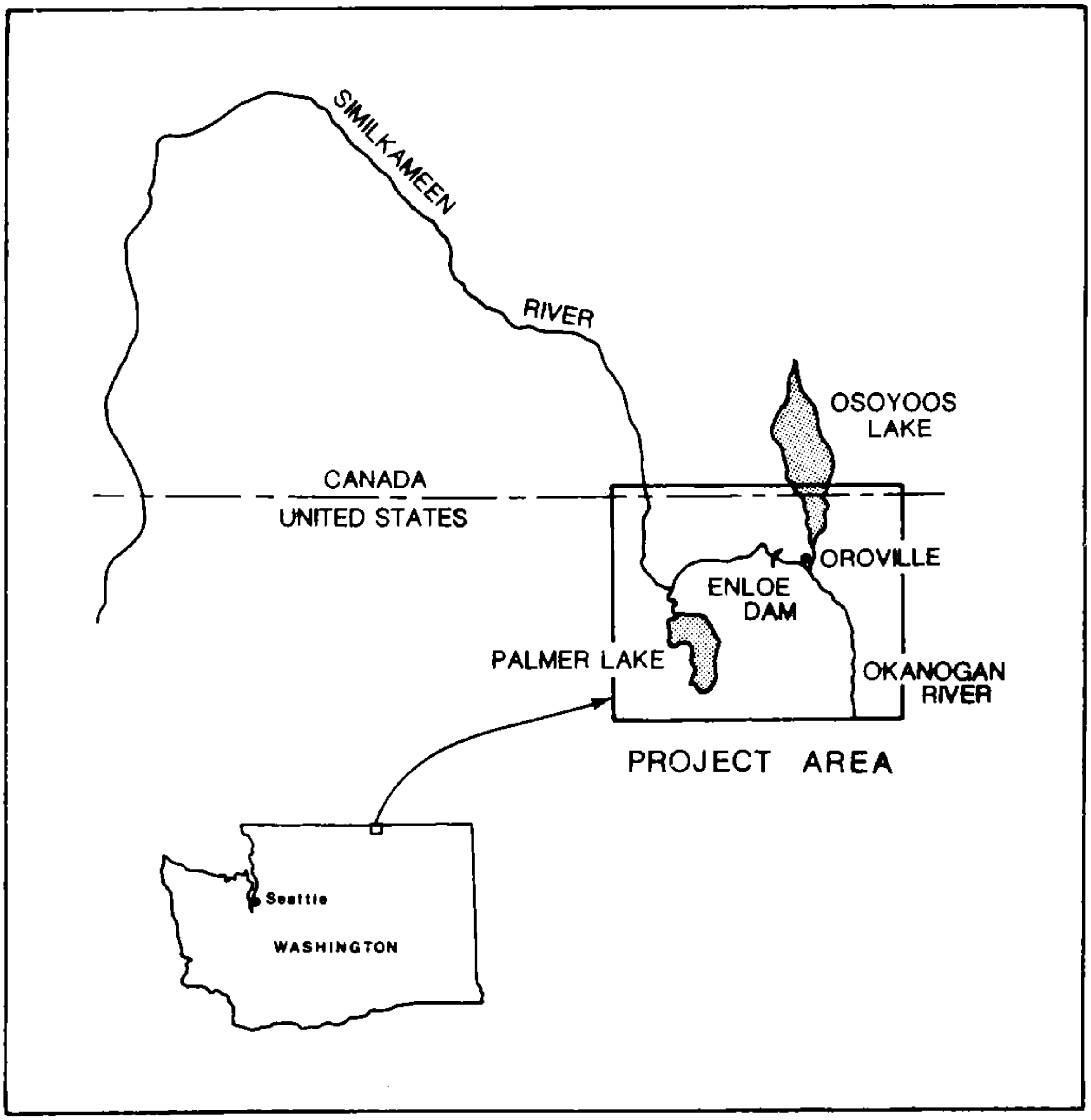

Figure 8 – I Enloe Dam Fish Passage Project location map.

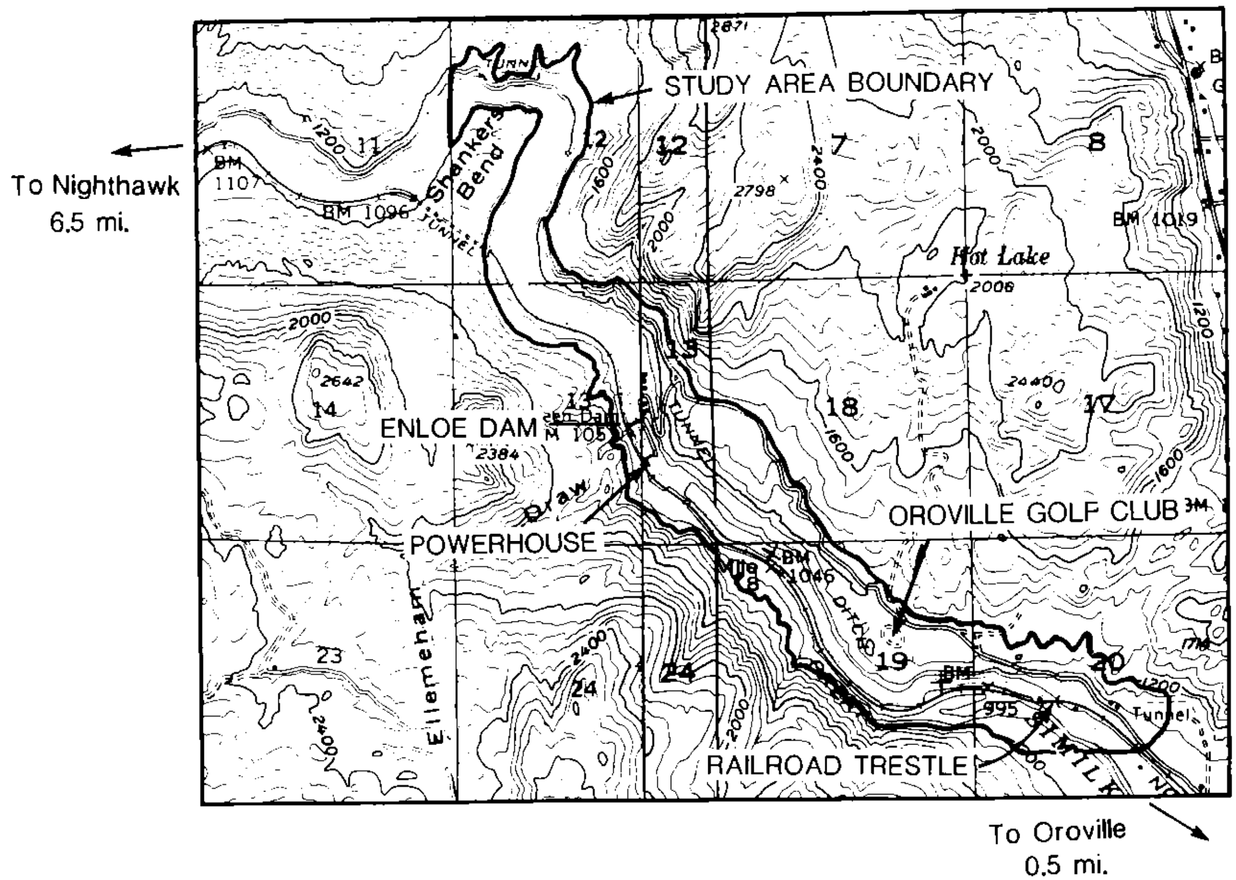

Figure 8-2 Enloe Dam study area for preliminary NEPA compliance report.

the powerhouse, approximately 300 ft downstream of the dam. The falls is approximately 20 ft in height. Figure 8-3 shows the immediate area of the dam, falls and powerhouse in topographic detail.

Boundaries of the Study Area were defined for the purposes of this preliminary NEPA compliance report and are shown on Figure 8-2. This Study Area extends from Shanker's Bend upstream of the dam to just below the railroad trestle approximately 2 mi downstream from the dam, following the 1,200 ft contour along the west river bank and the existing county road along the east river bank. Reconnaissance level field surveys conducted in October 1984 were concentrated within this Study Area boundary. Quite obviously some of the issues which will need to be addressed in a later NEPA document will extend beyond this Study Area. A series of tables and figures addressing this broader area is included in Appendix 6 as supplemental information which may be incorporated into the future NEPA document.

8.2.3 Enloe Dam Fish Passage Alternatives Descriptions

Six alternative passage schemes were investigated by Ott Water Engineers of Bellevue, Washington. As described in Section 5.2, these include: two fishway alternatives (one compatible with hydropower generation and one incompatible with hydropower generation); three trap and haul alternatives (two compatible with hydropower generation, one not); and the removal of Enloe Dam combined with a short fishway over the natural falls (obviously not compatible with hydropower generation).

The design and placement of passage alternatives is influenced by the potential redevelopment of hydropower at Enloe Dam. In 1981, Public Utility District No. 1 of Okanogan County (Okanogan PUD), filed a FERC licence application to redevelop hydropower at Enloe Dam. Okanogan PUD's plans include installation of new turbine/generator units at the existing powerhouse, and replacement of the penstock running along the right bank between the dam and powerhouse. The existing intake and outlet works would be rehabilitated.

If hydropower at Enloe Dam is redeveloped as the Okanogan PUD plans, its operation must be considered in passage design to ensure optimum passage effectiveness. The

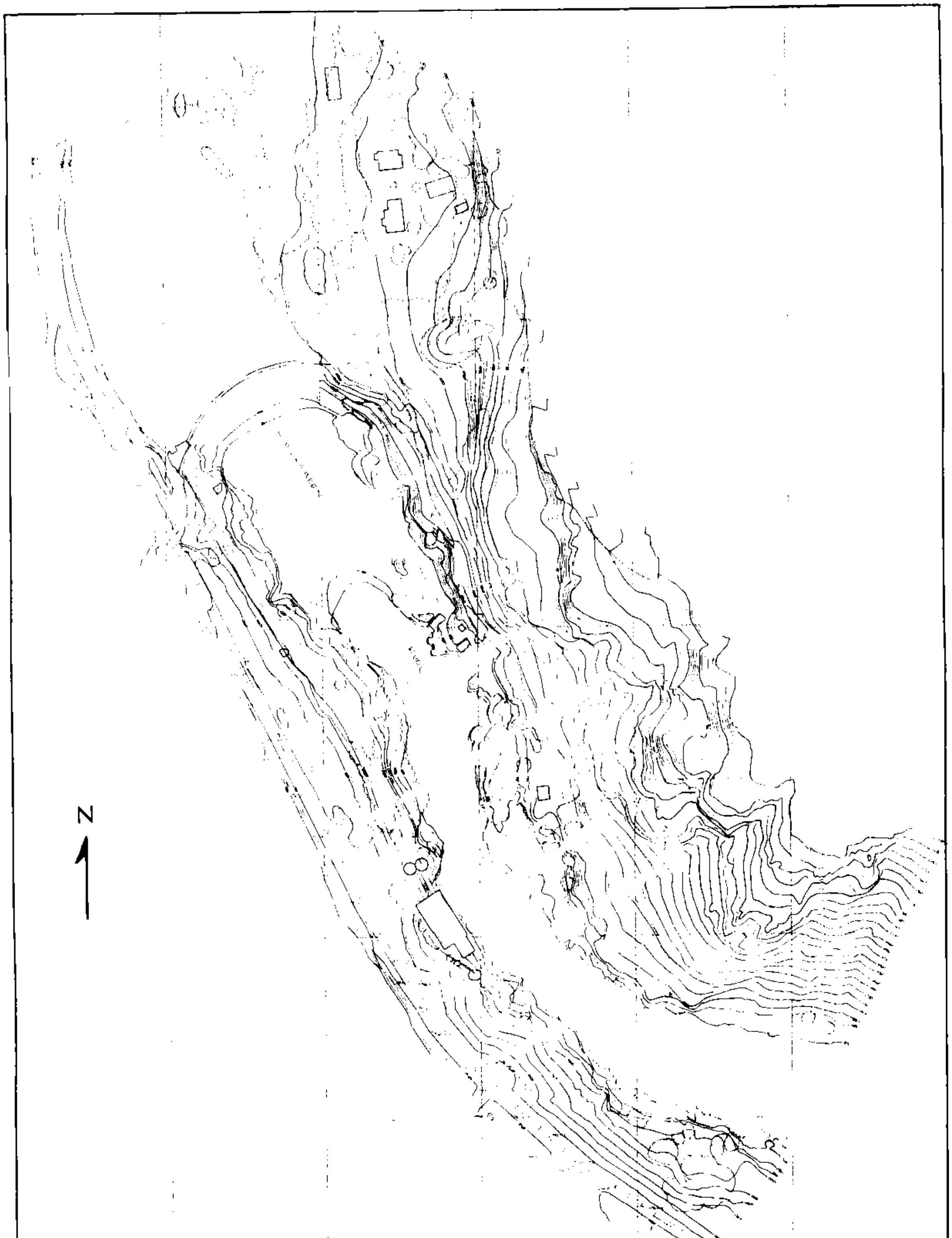

Figure 8 – 3 Topographic detail map of Enloe Dam and powerhouse immediate vicinity.

principal concern is the location of turbine discharge relative to fishway or fish trap entrances. In general, if the turbine discharge is located downstream of ladder entrances, fish have a difficult time passing the turbine discharge and finding upstream entrances, since most of the available flow is passing through turbines. This can cause substantial delay in upstream migration and significantly compromise passage effectiveness.

In that the redevelopment of hydropower at Enloe Dam was not certain at the time of writing this report, alternatives have been developed which are both compatible and incompatible with Okanogan PUD's hydropower plans. In the following subsections, the six passage alternatives are briefly described in the context of information needed for impact analysis. The reader is referred to Section 5.2 for the technical details of alternatives conceptual design.

All six of the alternatives are similar in that they are located within a 2 mile reach of the Similkameen River. Five of the alternatives involve construction of major passage facilities; the sixth involves removal of the existing Enloe Dam and construction of a short fishway at the falls below the dam. Most work within the flood plain would probably be accomplished during July through December low flow period. Access for construction would be available on existing roads with only minor improvements. Access to Alternatives 1 through 4 and 6 would be via the existing canal road which cuts through the cottonwood grove on the east bank of the reservoir. Grades on this road are not excessively steep, thus making access for construction vehicles relatively easy. A short section of road would have to be constructed downstream of the powerhouse suspension bridge on the left bank for Alternatives 2 and 4. Access for Alternative 5 (at the railroad bridge) would be via an existing road requiring little upgrading. Access roads used for construction would continue to be used for maintenance and operation of the facilities. Passage facilities would be required to operate from about October through November and from February through May for upstream steelhead migration. If summer chinook are to be managed in the watershed, the passage facilities would also need to operate between about mid-August and October 1.

Alternative 1 - Fishway From Falls. Alternative 1 is a fishway beginning at the base of the falls below the dam and exiting above the dam. This alternative is not compatible with the proposed hydropower redevelopment. Fishway entrances would be located at the left bank, at the base of the falls. Low and high flow entrances are provided for in the design. Flow in the ladder would vary between about 30 and 50 cfs. The fishway exit is located approximately 90 ft upstream from the left abutment. Auxiliary water would be supplied to the ladder entrances to provide attraction flow for fish. Auxiliary flows may be as high as 50 cfs. The flow would be added to the lower pools through wall diffusers. Flow to the diffusion chambers would be gravity fed from above the falls.

Alternative 2 - Fishway Below Powerhouse. Alternative 2 is a fishway beginning at a barrier dam downstream of the Enloe Dam powerhouse and exiting above the dam on the left abutment. The barrier dam would be approximately 9 ft in height and would prevent fish from moving past the ladder entrance. A single entrance to the fishway would be located on the left bank, at the toe of the barrier dam. With the entrance located downstream of the powerhouse, this alternative would be compatible with hydropower. The fishway would continue up the left bank to an exit above Enloe Dam. Design characteristics and ladder and auxiliary flows from this structure would be similar to those of Alternative 1. This alternative would impact the proposed development of hydropower by the Okanogan PUD. The barrier dam would cause the tailwater of the powerhouse to be raised and therefore decrease the head available for hydropower production by about 7 ft.

Alternative 3 - Trap And Haul at Falls. Alternative 3 is a trap and haul system at the falls. The fishway section leading to the trap is the same location and configuration as the lower portion of Alternative 1. This trap and haul alternative is not compatible with hydropower development at Enloe Dam. Similarly to Alternative 1, fish would enter one of two ladder entrances at the left bank immediately below the falls. Fish would continue up the ladder to an elevation out of the flood way and enter the trap. Auxiliary water would be added to the lower pools of the fishway. The trap consists of a holding pool and elevator at the upstream end of the fishway section. Fish entering the holding pool would be supplied with "fresh" water through an upwelling supply. Fish in the holding pool would be crowded into the elevator and loaded from the elevator, by way of a chute, to a tank truck.

Alternative 4 - Trap and Haul Below Powerhouse. Alternative 4 is a trap and haul system which would be located at a barrier dam below the powerhouse. The alternative consists of a ladder section leading to a holding pool and elevator. The barrier dam and ladder location are similar to those in Alternative 2. As with Alternative 2, this alternative would impact the proposed development of hydropower by decreasing the available head.

Alternative 5 - Trap and Haul at Railroad Bridge. Alternative 5 is a trap and haul facility located approximately 2 mi downstream of Enloe Dam. The alternative consists of a barrier dam with a ladder section to a trap. A trap and haul facility at this site does not conflict in any way with hydropower redevelopment at Enloe Dam. No loss of available head would be associated with this alternative because of the stream gradient in the 2 mi distance between the powerhouse and the barrier dam.

Alternative 6 - Dam Removal. If Enloe Dam is not developed for its hydropower potential, it could be removed. Passage then could be provided at the falls and the watershed would be open to upstream migrating fish. The falls could be laddered in a manner similar to Alternative 1. The key consideration, however, is removal of the dam and sediment behind it.

Two methods of dam and sediment removal are currently being investigated. The first is suction-dredging the sediment behind the dam and wasting it near the dam site. Once the sediment is removed the dam could be demolished in successive levels by blasting techniques. Concrete removed from the structure could be wasted near the site as well.

The second method of dam removal is to remove successive levels of the dam crest and allow the sediment to be transported downstream. This release of sediment would be somewhat controlled. However, the magnitude of high stream flows in any given year cannot be predicted. This method of sediment removal may not be practical since the lower reaches of the Similkameen and Okanogan Rivers may not be able to handle high sediment loads without significant changes in stream course and flood limits.

8.2.4 Other Issues Of Concern

Official NEPA documents are required to address "related actions" and "other issues of concern". Only one other proposal is currently known to fall into either of these categories. This proposal is the ongoing feasibility study being conducted by the U.S. Army Corps of Engineers and sponsored by the Okanogan PUD, the Oroville-Tonasket Irrigation District and Okanogan County. Two alternatives have been proposed with regard to this feasibility study. The first is a 230 ft dam at Similkameen River Mile 6.6 with a 100,000 acre-foot storage capacity and a maximum pool elevation of 1,155 ft. The second is a three dam alternative involving rehabilitation of the existing facility at the Enloe Dam site, construction of a smaller dam at River Mile 6.6 and construction of a third dam above Enloe at Shanker's Bend (RM 10.5).

The Corps of Engineers is currently proceeding with environmental studies for their two proposed alternatives. Although the Corp's proposal is, at this time, unrelated to BPA's Enloe Dam Fish Passage Project, the fact that it is in such close proximity to Enloe Dam puts it in the category of "other issues of concern". Any change in the status of the Corps' proposal will be communicated promptly to the BPA under the existing "cooperating agency" agreement between the two agencies.

8.3 Physical And Biological Environment

8.3.1 Earth Resources

Existing Conditions

Bedrocks of the study area consist of Tertiary nonmarine sedimentary rock, primarily sandstone and conglomerate with small amounts of siltstone and shale. The Similkameen River in the Study Area lies within a steep, rocky canyon which extends approximately 15 miles to the broad, flat lands north of Palmer Lake. Terraces approximately 500-600 ft wide, lying at about 1,100 ft elevation, flank both sides of the river. The irrigation canal and railroad have been constructed on these terraces. Steep valley walls and cliffs rise to rounded hills with elevations of up to 3,000 ft

(Lenfesty, 1980). Additional details regarding the site geology, both at Enloe Dam and at the railroad bridge are available from a variety of sources. This information is not included in this scoping document because the relatively low level of projected impacts to geological resources from each of the six alternatives does not warrant the inclusion of extensive data.

Soils in the Study Area impact zone, near the dam and along the east side of the river include Nighthawk extremely stony loam, 25-65 percent slopes, which has high to very high erosion susceptibility, and lithic Xerochrepts-Nighthawk complex, 15-45 percent slopes, which have moderate to high erosion potential. The soils at the east side of the railroad bridge are Pague extremely stony fine sandy loams, 25-65 percent slopes, which also have moderate to high erosion potential. The existing railroad and access road have periodically washed out in the past, apparently from erosion at the toe of the slopes. Proper stabilization of cut slopes will be essential during the construction process. A small patch of Nighthawk loam, 8-15 percent slopes, located along the railroad just south of Shanker's Bend, is classed as "Land of Statewide Importance" by the Soil Conservation Service (1979). This soil is neither being used for crop production at this time, nor will it be affected by any of the project Alternatives proposed.

The Study Area is within a region of historically low seismicity, designated "Zone 2 - moderate damage" by the Uniform Building Code (Anonymous, 1976). On the basis of regional intensity records published by Rasmussen (1967), the area is classified as "Zone 1 - minor damage".

Potential Impacts

None of the Alternatives will affect geological resources within the Study Area to any major extent. Due to high erosion hazards of soils in some portions of Study Area, erosion and sedimentation to the river could occur during construction of fishway and trap and haul facilities as well as during access road upgrading and construction. Careful planning, use of sedimentation structures and timely stabilization of cut slopes will result in minimizing erosion and slumping during construction. Erosion impacts are expected to be short term and will terminate shortly after completion of construction activities.

8.3.2 Air Resources

Existing Conditions

Okanogan County's existing air quality is good, typical of rural counties, and is classed as attainment (meeting Federal and State air quality standards). Monitoring results from 1977, the most recent year for which data are available from the Oroville area, were a 24-hour maximum of 70 ug/m^3 Total Suspended Particulates (TSP), well under the primary and secondary 24-hour standards of 260 ug/m^3 and 150 ug/m^3, respectively. The annual geometric mean TSP of 15-30 ug/m^3 was well within the primary and secondary standards of 75 ug/m^3 and 60 ug/m^3 (Washington Department of Ecology, pers. comm., 16 May 1985).

Potential Impacts

Air quality impacts from any of the alternatives would be temporary, minor,and would not significantly affect TSP levels in Okanogan County.

8.3.3 Water Resources

8.3.3.1 Surface Water Hydrology/Floods/Low Flows

Existing Conditions

The drainage area of the Similkameen River above Enloe Dam is approximately 3600 mi^2, most of which is in British Columbia. The majority of the basin is characterized by its semi-arid climate, except for the relatively wet and mountainous western region. Most of the basin's runoff originates at high elevations from snowpack melts during the spring and early summer. The steep topography and lack of storage in the basin makes it susceptable to both floods and droughts.

An international streamflow gauging station is located on the Similkameen River approximately 7 mi upstream of Enloe Dam at Nighthawk, Washington (Station

#12442500). The station has been in operation since 1911 (continuously since 1929). The mean annual discharge of the river at the Nighthawk station is 2340 cfs. Approximately 61 percent of the annual flow of the river occurs during the months of May and June, with mean monthly discharges of 8028 cfs and 9169 cfs, respectively. Mean monthly discharges for the months of August through March, inclusive, range from 2.2 to 3.3 percent of the total annual discharge (604 to 921 cfs).

The mean annual flood for the Similkameen River at Nighthawk, determined for the period 1929 to 1983 is 16,260 cfs. Annual maximum daily discharges have ranged from a low of 4750 cfs (May 1941) to the recorded high of 44,800 cfs (June 1972). The calculated return period of the 1972 flood is approximately 180 years. The water level was estimated to be 13 ft above the spillway crest at Enloe Dam during the 1972 flood. The probable maximum flood has been estimated to be as high as 320,000 cfs, a flow which would result in a water surface elevation of over 45 ft over the spillway crest.

Annual maximum discharges at the Nighthawk station have occurred exclusively during spring/early summer through the period of record. However, winter floods associated with the inland penetration of coastal storms have occasionaly been of similar magnitude to these spring/early summer freshets. The winter floods although rare, are usually associated with ice flows.

In general, minimum discharges for the Similkameen River at the dam occur between late summer and late spring. However, a slight increase in river discharge in response to fall rain storms usually follows the late summer low flow period. The flow recedes again during the winter months as precipitation turns to snow and the river freezes over. The recorded minimum daily discharge for the Similkameen River at Nighthawk is 130 cfs which occurred on 8 January 1974.

Potential Impacts

Each of the six proposed alternatives is likely to exert different effects on the hydrologic regime of the river. The periods of operation for all proposed fishway and trap and haul facilities are October through November, February through May and, if summer chinook are to be passed, mid-August through October. Potential effects of each of the alternatives on the flow regime are summarized in the following paragraphs.

Impacts of Alternative 1 on streamflow would be restricted to the stretch of river between the entrance and the exit of the fishway. The flow to be diverted would be between 24 and 42 cfs for ladder operations, plus as much as another 75 cfs for attraction flow. Assuming the maximum diversion for both ladder operation and attraction flows, 117 cfs would be diverted around Enloe Dam through either the ladder or a diversion conduit. This amount is less that the recorded minimum daily discharge for the site (130 cfs). Therefore, sufficient flows should always exist, although conditions may approach those of no flow over the Enloe Dam spillway.

Under conditions of power generation at the Enloe Dam site (Alternative 2), 24 to 42 cfs would still be required for fishway operation. However, since the fish passage facilities would instead be constructed below the powerhouse, the water required for attraction flow could be diverted from below the tailrace, thereby reducing the amount of water diverted from above Enloe Dam for ladder operations. Thus, a maximum amount of only 42 cfs would be diverted around the dam to a point below the powerhouse. Since maximum penstock discharge exceeds the natural flow of the river for a large portion of the year, power generation alone (without a fishway) would result in the complete diversion of water around the dam for about 193 days in an average flow year. The addition of the fishway may extend the period of no flow over the spillway by as much as another 10 days per year (on average). The impacted area is, however, limited only to the length of the river between the fishway exit and the fishway entrance.

Hydrological impacts associated with Alternative 3 are identical to those of the Alternative 1, except that all flows for the fishway operation and attraction flow would be diverted from above Enloe Dam via a conduit. The instream flow would be reduced by as much as 117 cfs between the diversion point above the dam and the fishway entrance below the barrier dam.

The hydrological impacts associated with Alternative 4 (a trap and haul facility operated in conjunction with the powerhouse) are similar to those associated with Alternative 2. Again, the flows for ladder operation could be diverted from above the Enloe Dam and powerhouse and the additional attraction flow could be obtained below the powerhouse. Instream flows would be as much as 42 cfs between diversion points above the dam and the fish ladder entrance, and reduced by an additional 75 cfs, for a total of 117 cfs, between the powerhouse tailrace and the fish ladder entrance. As with Alternative 2, this alternative would increase the number of days per year in which there is no flow over the Enloe Dam spillway. The impacted area of a trap and haul facility built and operated below the railroad tressel (Alternative 5) would be limited to the stretch of river between the water intake(s) for ladder operation and the entrance of the ladder.

The removal of Enloe Dam (Alternative 6) would eventually restore the river to its natural state. As it exists presently, the dam and reservoir regulate the flow of the river downstream of the Enloe Dam, but the amount of regulation is negligible. If Enloe Dam were removed without first suction dredging sediment, flows downstream would be impacted to a far greater extent by the transport and deposition of sediment which has accumulated in the reservoir since the Enloe Dam's construction. In 1972, the USGS estimated the amount of sediment in the reservoir to be about 1.79 million cubic yards. Although most of these sediments would eventually be carried to the Columbia River, as they would have been if the dam had never been built, much of the sand and coarser materials would be deposited in a 17 mi stretch of the Okanogan River immediately below the mouth of the Similkameen River. As a consequence of this deposition, the Okanogan River valley would become more susceptable to flooding as the cross-sectional area of the river is reduced. Loss of side channels and a change in the course of the Okanogan River would likely also result from the addition of these sediments. These impacts would not be associated with Alternative 6 if sediments were dredged prior to dam removal.

8.3.3.2 Surface Water Quality

Existing Conditions

The water quality of the Similkameen River, as recorded from monitoring at a site between the Enloe Dam and the confluence of the river with the Okanogan River (Station 49B070-Washington State Department of Ecology), indicates that the dissolved oxygen levels are high and on average exceed complete saturation levels (maximum recorded: 120.9 percent saturation; average: 104.3 percent saturation). These dissolved oxygen levels are undoubtedly due to the effect of the Enloe Dam spillway and plunge pool. Dissolved nitrogen gas levels are not available for review. However, it is probable that these may also be above 100 percent saturation levels which, if excessive (i.e., supersaturated), can have detrimental effects on fish. Fecal coliform levels in excess of acceptable standards have occassionally been recorded, although average fecal coliform levels are within the acceptable range. Average dissolved trace metals are low, although dissolved zinc above desirable levels has been recorded at times. Data also indicate that river temperatures can exceed (on occasion) the desirable upper level for freshwater aquatic life. Maximum temperatures normally occur in peak summer hot spells. It is unlikely the Enloe Dam reservoir is contributing significantly to additional increases in temperatures. In that the reservoir is essentially filled with sediments, water in the reservoir has a very low residence at times. Extensive sediment deposition in the reservoir is likely responsible for suspended solids levels downstream of the dam (range: 1 to169 mg/l) which are similar to levels in the river at a monitoring site well above the reservoir (Station 8NL0005, range 1 to 140 mg/l). No pesticide or other trace organic water quality data were available for review. Detailed water quality data are presentd in Table 19 (Appendix 4).

Near the mouth of the Similkameen, the Oroville sewage plant discharges treated municipal effluent into the river. The plant is currently licensed to discharge through a multiport diffuser 2400 m^3/day (0.63 U.S. MGD) of effluent containing 30 mg/l BOD_5 (30 kg/d), 30 mg/l suspended solids (30 kg/d), a fecal coliform maximum of 200 per 100 ml. No limitations are placed on nutrient levels or residual chlorine. The sewage plant is not presently required to monitor the receiving environment.

Potential Impacts

With the exception of short term effects during construction, principally as potentially elevated suspended solids levels, the passage alternatives (excluding the effect of reactivating power) other than Dam Removal are not projected to have any major effects on the water quality of the Similkameen River. A summary of the anticipated project effects of each alternative on water quality is presented in Table 8-3.

The dam removal alternative has the most potential for significant impact on water quality. Removal of the dam without first dredging sediments would result in the accumulated reservoir sediments being flushed downriver and ultimately into the Okanogan system. The quantity of sediment movement depends largely upon the procedures undertaken prior to the dam removal. The reservoir is estimated to contain 1.8 million yards of sediment accumulated over 60 years. It is, in essence, not accumulating any further net amount. In this context, the quantity of sediment flushed out of the reservoir annually in freshet is roughly equivalent to the incoming sediment load.

If dam removal occurred without prior dredging of a channel through the reservoir for the river to follow, a considerably larger quantity of sediment would be flushed downstream. The river would cut through the accumulated sediment and ultimately carve out a river bed down to the original river bed elevation in a matter of a few years. During annual freshets, additional sediment would slough into the river from the remaining sediment-based river banks within the old reservoir. This erosion would be significantly reduced if measures were taken to stabilize banks and provide extensive riprap protection throughout the old reservoir. Estimates made by others (Nelson, 1972) indicate that in an unmitigated case, the quantity of sediment flushed during a year of average discharge would be approximately 320,000 cubic yards or 18 percent of the existing reservoir sediment content. The potential downstream effects would include elevated suspended solids levels and sediment deposition over a 17 mi reach of the Similkameen River immediately downstream of its confluence with the Okanogan River. The implication of such sediment deposition on the hydrology and biology of the Okanogan are discussed elsewhere in this report.

TABLE 8-3
Effect of Passage Alternatives on Water Quality

Similkameen River

	Alternative	Probable Effect	Duration
#1	Fish Ladder Without Power	Increased Suspended Solids	Short Term Construction Period Only
#2	Fish Ladder With Power	Increased Suspended Solids	Short Term Construction Period Only
#3	Trap and Haul Without Power	Increased Suspended Solids	Short Term - Construction Period Only
#4	Trap and Haul With Power	Increased Suspended Solids	Short Term - Construction Period Only
#5	Trap and Haul With Power Lower River Site	Increased Suspended Solids	Short Term - Construction Period Only
#6	Dam Removal	Increased Suspended Solids	Potential Long Term (Each Freshet) Until Equilibrium Reached Depending on Method Used
		Sediment Deposition In Lower Similkameen With Potential Biological Impact (Fish Spawning and Primary Producer Habitat Loss)	Potential Long Term Until Reservoir Area Reaches Equilibrium
		Decreased Dissolved Gas Saturation Levels	Permanent

TABLE 8-3 (Continued)
Effect of Passage Alternatives on Water Quality

Okanagan River

	Alternative	Probable Effect	Duration
#1	Fish Ladder Without Power	Slightly Noticeable Increase Suspended Solids	Short Term Construction Period Only
#2	Fish Ladder With Power	Slightly Noticeable Increase Suspended Solids	Short Term Construction Period Only
#3	Trap and Haul Without Power	Slightly Increased Suspended Solids	Short Term - Construction Period Only
#4	Trap and Haul With Power	Slightly Increased Suspended Solids	Short Term - Construction Period Only
#5	Trap and Haul With Power Lower River Site	Slightly Increased Suspended Solids	Short Term - Construction Period Only
#6	Dam Removal	Increased Suspended Solids	Potential Long Term Until Equilibrium Reached Depending on Method Used
		Sediment Deposition For Several Miles Below Confluence With Potential Biological Impact (Fish Spawning and Primary Producer Habitat Loss)	Potential Long Term Until Equilibrium Reached Possible Permanent Habitat Loss

Since about 96 percent of the sediment in the reservoir is sand (0.05-2 mm), the sediment portion that will remain suspended in the water column for any significant period would be the much smaller fraction, consisting of fine silts and clays. Based on a projected total sediment movement per year, after dam removal, of 320,000 cubic yards at 4 percent fines, and specific weight of 100 lbs/ft^3, the total quantity of reservoir fines that would enter the river water could approach 18,000 tons. Using this value and the annual average discharge of the Similkameen, the average annual increment of suspended solids (fines) would equate to 8 mg/l. During freshets, the increment will likely be at least 3 times this value, or 24 mg/l. The present suspended solids level in the Similkameen averages around 40 mg/l on a mean annual basis, and upwards of 140 mg/l during freshets. Therefore, the projected incremental resuspension and transport of reservoir fines could theorectically increase the suspended solids concentrations by about 20 percent.

The other scenario for removing the dam with prior river channel dredging in the reservoir would result in less intense short term impacts on the Similkameen River and the downstream Okanogan River from load and turbidity (suspended solids). If all of the sediment were dredged prior to dam removal, few if any of the impacts discussed in the preceding paragraphs would result.

Additional studies in which sediment loads are modeled would be initiated during the formal NEPA process, assuming Alternative 6 continues to be considered as a probable alternative.

8.3.3.3 Groundwater

Existing Conditions

The groundwater table in the soils and bedrock of the reservoir sides is relatively high, primarily due to the presence of Enloe Reservoir. The quality of groundwater seepage and drainage from the reservoir and side walls is not documented. Other groundwater considerations are not of particular relevance to the project in this initial scoping phase and therefore are not discussed in this report.

Potential Impacts

Development of fish passage facilities, with the exception of the dam removal option, would not alter the existing groundwater equilibrium in the reservoir area. With removal of the dam, the groundwater table in the reservoir side walls would be lowered and would ultimately reach the original natural state. Rapid lowering of the dam could conceivably cause side wall sloughing due to liquifaction/shear failures caused by the relatively high groundwater table in these areas. The rate of groundwater subsidence in the reservoir sediments and sidewalls is dependent upon the permeability of these deposits. Analysis of reservoir sediment composition (Section 8.4.3) indicated no significant presence of pesticides or hazardous trace elements. The quality of groundwater seepage subsequent to dam removal from these deposits is not projected to cause any impairment of river or groundwater quality.

8.3.3.4 Water Use and Public Supplies

Existing Conditions

The community of Oroville obtains its public water supplies from wells in the Okanogan drainage basin. Three surface water licenses have been issued on the Similkameen River in Washington State.

The Okanogan PUD holds license for 250 cfs and 750 cfs on the Similkameen River for power production at Enloe Dam and the adjoining power plant. This license is currently not in active use.

The Oroville-Tonasket Irrigation District holds two licenses on the Similkameen River, one for water rights and one for water storage. The water rights license is for 50 to 186 cfs between 1 April and 15 October, depending on the specific month. The approximate maximum withdrawal allowed on this water right is 52,000 acre feet per year, with a maximum withdrawal at any given time of 200 cfs. This license is active, with about 50 percent of the maximum licensed amount withdrawn from the river in 1984. A new Oroville-Tonasket Irrigation District system is currently being implemented on the Okanogan River. The current license is expected to remain in place or to be modified after completion of the Oroville-Tonasket system on the Okanogan River, thus allowing make-up water to be drawn from the Similkameen River when conditions in the Okanogan system dictate a need. The Oroville-Tonasket Irrigation District also holds a storage permit for 10,500 acre feet of water on the Similkameen River. This permitted storage option has never been exercised.

New irrigation licenses are not issued on the Similkameen River on the British Columbia side, except for use of freshet flows or if an equal amount of storage is provided.

Potential Impacts

The development of a fish passage facility is not projected to have any effect on the present active water use and public water supplies in the project vicinity, as the passage facility would not be located near the irrigation canal or water supply wells. Removal of the dam would not impact the present irrigation canal or public water supplies of the community of Oroville or the Oroville-Tonasket Irrigation District.

8.3.4 Vegetation Resources

Existing Conditions

The Similkameen River Valley is part of the Okanogan Highlands physiographic province described by Franklin & Dyrness (1973). The valley is in a transitional zone between the Cascade Mountains to the west and Okanogan Highlands to the east. The valley vegetation is a complex mosiac of three steppe vegetation zones including the Big Sagebrush/Bluebunch Wheatgrass Zone (*Artemisia tridentata/ Agropyron spicatum*), Bitterbrush/Idaho Fescue Zone (*Purshia tridentata/Festuca idahoensis*), and Treetip Sagebrush/Idaho Fescue Zone (*Artemisia tripartita/Festuca idahoensis*) (Franklin & Dyrness, 1973). The complex patterns of these plant communities is influenced by soil, slope, aspect, topography and past grazing. This area is the northern most extension of the Columbia basin steppe vegetation.

The Study Area lies along the Similkameen River which flows through a moderately steep canyon with narrow terraces on each side of the river. Beyond the terraces,the valley walls rise steeply to rocky rolling hills that reach an elevation of about 2,800 ft.

There are four major vegetation communities in the Study Area vicinity. One of these, an open ponderosa pine (Pinus ponderosa) forest, occupies the highest hillside slopes. The dominant understory shrub is bitterbrush with mixed grasses as the predominant herbaceous vegetation. On the lower slopes, ponderosa pine becomes scattered, and two shrub/steppe communities replace pine woodlands. A bitterbrush/Idaho fescue community occurs on steeper, rocky slopes while a big sagebrush/bluebunch wheatgrass community is found on gentler slopes. Associated species include threetip sagebrush, rabbitbrush (Chrysothamnus), balsamroot (Balsamorhiza), prickly pear (Opuntia polyacantha), and grasses such as bluegrass (Poa) and cheatgrass (Bromus tectorum). Invader species including knapweed (Centaurea), thistles (Cirsium) and tumble mustard (Sysimbrium altissimum) are also common, and are indicative of the disturbance in the area.

A fourth plant community which occurs frequently on the slopes above the reservoir is a shrub/steppe association dominated by smooth sumac (Rhus glabra) and cheatgrass. Other shrub species include big sagebrush, bitterbrush, wild rose (Rosa), and serviceberry (Amelanchier alnifolia). Common herbaceous species are flannel mullein (Verbascum thapsus), curly dock (Rumex crispus), knapweed and tumble mustard. The displacement of native grasses by cheatgrass, an introduced species, on much of the Study Area indicates that these areas have been heavily grazed at some time (Daubenmire, 1970).

Along portions of the riverbank edge, upland vegetation is replaced by riparian vegetation. Occurrence of riparian vegetation is sporadic, patchy, and varied in composition. Willow (Salix) is the most common woody species and can vary from thin lines of seedlings to large dense thickets. Cottonwood (Populus) stands occur occasionally. One large stand of cottonwood is near Enloe Dam on the east side of the river. Associated species include Rocky Mountain maple (Acer glabrum), willow, red-ozier dogwood (Cornus stolonifera), and serviceberry. Also present are some introduced horticultural species including maples (Acer), juniper (Juniperus), yucca

(Yucca), and lilac (Syringa). Other trees commonly found on riparian sites included Douglas-fir (Pseudotsuga menziesii), water birch (Betula occidentalis) and thin-leaf alder (Alnus tenuifolia). Common herbaceous species included clematis (Clematis), rushes (Juncus), sedges (Carex), and horsetail (Equisetum).

According to FERC No. 2062 Exhibit E (Okanogan County PUD, 1981), there are several wetland areas in shallows along the shoreline of the reservoir. None were identified during field reconnaissance. However, evaluation of wetland distribution and composition will be undertaken prior to preparing an EA or EIS for the project.

No federally threatened or endangered plant species occur in or near the Study Area (Bottorf, pers. comm., 21 November 1984).

Potential Impacts

Five of the six alternatives would have little effect on the vegetation of the Study Area. Only a very small area would be disturbed by construction or rehabilitation of existing structures or roadway development. The sixth alternative, dam removal, would result in loss of riparian and wetland vegetation on the reservoir edges. This could eventually be replaced to some degree through development of a new riparian or wetland communities along the rechanneled edge of the river. The development of these new riparian areas could actually result in more productive wetland communities than those currently existing.

8.3.5 Wildife Resources

Existing Conditions

Based on a reconnaissance level survey on 22 and 23 October 1984, available literature and telephone contacts, it is apparent that the wildlife of the Study Area are diverse and typical of the habitats present. These habitats basically include: the Similkameen River; poorly vegetated rocky river shoreline; riparian tree and shrub communities; drier shrub-steppe and open conifer forest communities on the valley slopes, including open ponderosa pine forest, bitterbush/Idaho fescue and big sagebrush/bluebunch wheatgrass communities, cliffs, and orchards and a golf course on flat terraces near the railroad bridge.

Wildlife species identified by the Washington Department of Game (WDG) as important in the Study Area include the mule deer (Odocoileus hemoinus), chukar (Alectoris chukar), gray partridge (Perdix perdix), California quail (Callipepla californica), bald eagle (Haliaeetus leucocephalus), and golden eagle (Aquila chrysaetos) (Okanogan County PUD, 1981). A wintering population of bald eagles, (classed as threatened in both Washington State and the U.S.), exists along the Similkameen between its mouth and the Palmer Lake area (Shapiro and Associates, 1984; Bottorf, pers. comm., 21 November 1984; Marr, pers. comm., 1 November 1984). The extent of use of the Study Area by bald eagles has not been identified, although nesting pairs are reported from Palmer Lake and the mouth of the Similkameen River (Okanogan PUD, 1982). Peregrine falcons may occasionally pass through the Study Area during spring and/or fall migration seasons. Peregrines are not known to nest in the vicinity. Most of the Study Area is probably within the home range of the pair of golden eagles nesting on the cliffs of Kruger Mountain above the Study Area. This resident pair is known to the Washington Natural Heritage Data System (1985), and local WDG personnel. The pair was observed during the October 1984 site reconnaissance. In addition, the Natural Heritage Data System (1985) reports that the pallid crescent spot butterfly (Phycoides pallida), classed as a proposed monitor species by WDG (1983), occurs in Sec. 13 (T40N, R26E). Ospreys (Pandion haliaetus), classed as proposed monitor species by WDG (1983), are reported to nest at Palmer Lake and the mouth of the Similkameen (Okanogan PUD, 1982), and may hunt within the Study Area. These are the only two proposed monitor species known to occur in the Study Area.

A number of other special status wildlife species have not been recorded but may occur in the Study Area. A summary of species known or likely or occur, based on habitat affinity, are listed in Table 8-4. Proposed monitor species which may occur are not included in this Table.

In a general sense, none of the local wildlife species are likely to be adversely affected over the long term by implementation of any of the six fish passage

TABLE 8-4
Special Status Wildlife Species Which Occur or May Occur in the Enloe Study Area. Potentially Occurring Proposed Monitor Species are not Included

Species	Status In: U.S.	Status In: Washington	Occurrence
Bald Eagle, *Haliaeetus leucocephalus*	Threatened (T)	T	Present. Small wintering populatio (L25) in vicinity, nesting pairs at Palmer Lake and the mouth of the Similkameen
Golden Eagle, *Aquila chrysaetus*	-	Proposed Sensitive (PS)	Present. Nesting pair on Kruger Mountain above Study Area.
Osprey, *Pandion haliaetus*	-	Proposed Monitor (PM)	Almost certainly occurs. Nesting pairs reported at Palmer Lake and mouth of Similkameen.
Pallid Crescent Spot Butterfly, *Phycoides pallida*	-	PM	Present. Occurs in dry gullies in mountain foothills.
Northern Goshawk *Accipiter gentilis*	-	PS	May occur in mature conifer stands
Merlin, *Falco columbarius*	-	PS	May occur, nests in tree cavities or cliffs, hunts in open country.
Peregrine Falcon *F. peregrinus*	Endangered (E)	E	May occur during migration for sho periods.
Prairie Falcon, *F. mexicanus*	-	PS	May occasionally occur, apparently does not nest in area.
Burrowing Owl, *Athene cunicularia*	-	PS	Possibly occurs, suitable sbrub-step habitat exists.
White-headed Woodpecker, *Picoides albolarvatus*	-	PS	May occur at higher elevations in ponderosa pines.
Townsend's Big-eared Bat *Plecotus townsendii*	-	Proposed Threatened	May occur, potential roost habitat i railroad tunnel.
White-tailed Jackrabbit *Lepus townsendii*	-	PS	May occur in sage-grass at higher elevations.

alternatives proposed for this project. Fish- or carrion-eating species such as mergansers, bald eagles, ospreys, otters, racoons, bears and gulls may benefit over the long term from the presence of an anadromous fishery above Enloe Dam. It will be necessary to prepare a biological assessment of the probable impacts of the project on bald eagles (Bottorf, pers. comm., 21 November 1984). This biological assessment will be prepared concurrently with the formal NEPA document. Minor, adverse, short-term and long-term impacts on wildlife will result, in differing locations and degrees, and in areas far from the local Study Area, from implementation of each alternative. These are briefly discussed below.

Potential Impacts

Alternatives 3 and 5 would eliminate the least amount of habitat on the east bank of the river. Alternative 1 eliminates more habitat along the length of the fishway. Alternatives 2 and 4 both would require extension of the existing road and in addition, Alternative 2 would eliminate habitat along its length. Alternative 6 would require no new road and construction and may create additional riparian habitat when the river returns to a free-flowing state. In addition, if sediment dredging was implemented, there would be temporary terrestrial range losses until material dredged from behind the dam was reclaimed. All of these construction-related losses are minor in relation to the increased food supply to fish-eating species that would be produced by the new fish runs in the upper Similkameen.

8.3.6 Fisheries Resources

Existing Conditions

A considerable number of fish species are currently present both in the basin upstream of Enloe Dam and in the Similkameen and Okanogan Rivers downstream of the dam. A listing of the fish species known to exist in the regions noted above is presented in Table 8-5. The most common species of fish above Enloe Dam in the Similkameen River and its main tributary streams are sculpins (Cottus sp.), followed in declining order by mountain whitefish (Prosopium williamsoni, longnose dace (Rhinichthys cataractae), bridgelip suckers (Catostomus columbianus, and rainbow trout (Salmo gairdneri) (IEC BEAK Consultants Ltd., 1984).

TABLE 8-5
Species List of Fish Known to be Present in the Similkameen River Above and Below Enloe Dam and in the Okanogan River Downstream of Osoyoos Lake

Species	Known Distribution
ABOVE ENLOE DAM (Simikameen River System)	
Rainbow Trout (Salmo gairdneri)	All lakes and streams.[1,2]
Cutthroat Trout (Salmo clarki lewisi)	Alpine lakes in Ashnola River drainage, Ashnola River.[1,2]
Brook Trout (Salvelinus fontinalis)	Allison and Summers creeks, Sinlahekin Creek (Palmer Lake system).[1,2,3]
Lake Trout (Salvelinus namaycuch)	Otter Lake.[2]
Kokanee (Oncorhynchus nerka)	Missezula Lake (Allison/Summers Creek drainage), Palmer Lake.[1,2,3]
Mountain Whitefish (Prosopium williamsoni)	Similkameen River to Similkameen Falls, Tulameen River, lower portion of Ashnola River.[1,2]
Lingcod (Lota lota)	Palmer Lake.[4]
Smallmouth Bass (Micropterus dolomieui)	Palmer Lake.[4]
Largemouth Bass (Micropterus salmoides)	Palmer Lake.[4]
Black Crappie (Pomoxis nigromaculatus)	Similkameen River downstream of Palmer Lake, Palmer Lake.[1,4]
Northern Squawfish (Ptychocheilus oregonensis)	Similkameen River to Princeton, Palmer Lake.[1,4]
Peamouth Chub (Mylocheilus caurinus)	Palmer Lake, Similkameen River.[4]
Northern Mountain Sucker (Catostomus platyrhynchus)	Similkameen River downstream of Princeton, Tulameen River.[2]

TABLE 8-5 (Continued)
Species List of Fish Known to be Present in the Similkameen River Above and Below Enloe Dam and in the Okanogan River Downstream of Osoyoos Lake

Species	Known Distribution
Redside Shiner (*Richardsonius balteatus*)	Similkameen River.[1,4]
Bridgelip Sucker (*Catostomus columbianus*)	Similkameen River to Princeton, Tulameen River.[1,2]
Carp (*Cyprinus carpio*)	Palmer Lake.[4]
Longnosed Dace (*Rhinichthys cataractae*)	All streams.[1]
Sculpins (*Cottus* spp.)	Entire system.[1]
BELOW ENLOE DAM (Similkameen River)	
Steelhead Trout (Summer) (*Salmo gairdneri*)	Mouth to dam.[4,5]
Chinook Salmon (Summer) (*Oncorhynchus tshawytscha*)	Mouth to dam.[5]
Sockeye Salmon (*Oncorhynchus nerka*)	Observed in river to dam.[6]
Rainbow Trout (*Salmo gairdneri*)	Mouth to dam.[5]
Mountain Whitefish (*Prosopium williamsoni*)	Mouth to dam.[5]
Lingcod (*Lota lota*)	Observed near railroad bridge.[5]
Smallmouth Bass (*Micropterus dolomieui*)	Observed in lower section.[5]
Northern Squawfish (*Ptychocheilus oregonensis*)	Observed downstream of railroad bridge.[5]

TABLE 8-5 (Continued)
Species List of Fish Known to be Present in the Similkameen River Above and Below Enloe Dam and in the Okanogan River Downstream of Osoyoos Lake

Species	Known Distribution
Bridgelip Sucker (Catostomus columbianus)	Observed downstream of railroad bridge.[5]
Carp (Cyprinus carpio)	Observed upstream of mouth.[5]
ADDITIONAL SPECIES PRESENT IN OKANOGAN RIVER	
Brown Trout (Salmo trutta)	Captured in lower river.[8]
Pacific Lamprey (Entosphenus tridentatus)	Captured in lower river.[7,8]
Chiselmouth (Acrocheilus alutaceus)	Captured in lower river.[7,8]
Redside Shiner (Richardsonius balteatus)	Captured in lower river.[7,8]
Largescale Sucker (Catostomus platyrhyncus)	Captured in lower river.[7,8]
Brown Bullhead (Ictalurus nebulosus)	Captured in lower river.[7,8,9]
Yellow Perch (Perca flavens)	Captured in lower river.[7,8,9]
Torrent Sculpin (Cottus rhotheus)	Captured in lower river.[7,8,9]
Pumpkinseed (Lepomis gibbosus)	Captured in lower river.[8,9]
Peamouth Chub (Mylocheilus caurinus)	Captured in lower river.[8]
Largemouth Bass (Micropterus salmoides)	Captured in Okanogan River below Zosel Dam at outlet of Osoyoos Lake.[9]

TABLE 8-5 (Continued)
Species List of Fish Known to be Present in the Similkameen River Above and Below Enloe Dam and in the Okanogan River Downstream of Osoyoos Lake

Species	Known Distribution
Bluegill (*Lepomis macrochirus*)	Captured in Okanogan River below Zosel Dam at outlet of Osoyoos Lake.[9]
Tench (*Tinca tinca*)	Captured in Okanogan River below Zosel Dam at outlet of Osoyoos Lake.[9]

[1] IEC BEAK Consultants Ltd., 1984.

[2] Ministry of Environment, 1984.

[3] IEC BEAK Consultants Ltd., 1985 (Appendix 2).

[4] K. Williams, pers. comm., 1983.

[5] IEC BEAK snorkle surveys in 1984.

[6] Washington Department of Fisheries, unpubl. data, 1984.

[7] Parametrix, Inc., 1981.

[8] McGee and Truscott, 1982.

[9] McGee et al., 1983.

The main sport fish in stream and lakes above Enloe Dam is rainbow trout. Other sport fish occurring in lakes of the Similkameen basin are: kokanee (Oncorhynchus nerka), lake trout (Salvelinus namaycush), cutthroat trout (Salmo clarki lewisi) and brook trout (Salvelinus fontinalis). Streams of the basin support brook trout and mountain whitefish, in addition to rainbow trout.

No anadromous fish occur above Enloe Dam at present. The summer steelhead production potential of the basin upstream of Enloe Dam is presented in Section 4.5 of this report. Downstream of the Enloe Dam, three species of anadromous salmonids are present, namely, summer steelhead trout (Salmo gairdneri), summer chinook salmon (Oncorhynchus tshawytscha) and sockeye salmon (Onchorhychus nerka). Steelhead trout and chinook salmon have been documented to spawn downstream of Enloe Dam, with sockeye presence and spawning occasionally noted (Washington Department of Fisheries, unpubl. data, 1984).

The anadromous salmonids which occur in the lower Similkameen River system presently migrate a distance of approximately 825 km (516 mi) over nine Columbia River mainstem dams (Wells Dam being the last) prior to entering the Okanogan River at Brewster, Washington. The fish then migrate about 120 km (74 mi) to the Okanogan/Similkameen confluence. Enloe Dam is situated at river mile 8.8 on the Similkameen River.

No fish species listed as threatened or endangered by the U.S. Fish and Wildlife Service are known to occur in the Similkameen River system.

Potential Impacts

The overall effects and feasibility of fish passage at Enloe Dam are discussed in detail in Section 4.0 of this report. The general conclusion of the intensive fisheries studies conducted over the past two years is that fish passage at Enloe Dam will have a very positive effect on the Similkameen River system fishery, both in Canada and in the U.S. The Similkameen River system drains about 9,300 square km (3,620 mi^2) of the Pacific Northwest. Approximately 560 km or 350 mi of stream would be accessible to anadromous salmonids in this basin, should passage be achieved at Enloe Dam. This extensive increase in fish spawning and rearing habitat is obviously of great benefit overall.

Although the overall effect of fish passage at Enloe Dam is anticipated to be very positive, certain issues of concern have been raised with regard to potential problems. The first of these is the issue of competition among introduced anadromous species and resident sport fish. A second concern expressed by the B.C. provincial government relates to the potential of the anadromous species introducing fish disease into the watershed including the effects this could have on resident rainbow trout populations. Competition among sport fish and introduced anadromous species is discussed at length in Section 4.12.3. It is also addressed in the recreation subsection of this NEPA report (Section 8.4.6). The disease issue is discussed in Sections 4.3 and 4.16.

In assessing the potential impacts of the six passage alternatives on the fishery resource, the location and type of facility (or procedure) are the most significant considerations. Alternative 1 (fishway from the falls without hydro-power) and Alternative 3 (trap and haul at the falls without hydropower) have the least impacts in terms of lost or restricted fish habitat. Access and use of the existing habitat is maintained with both of these alternatives. At least in theory, specific fish species can be selected for transport above Enloe Dam with the trap and haul facility which is not the case with a fishway (assuming all fish species could navigate the fishway equally well). Although in some instances the ability to select certain species is an advantage of a trap and haul facility, this ability is not felt to be of major importance at Enloe Dam since the majority of the fish known to be present below the dam are already in the watershed upstream of the barrier. The non-sport and non-anadromous species are not considered to be detrimental to either the existing populations or the introduced anadromous species, so the trap and haul facility would result in no major benefits with regard to enhancement of the population distribution when compared with the fishway. Additionally, it is quite possible that the fishway would inhibit or stop the passage of some less desirable species due to its length, height of drop structures and/or water velocities.

Alternative 2 (fishway below the powerhouse, compatible with hydropower) and Alternative 4 (trap and haul below the powerhouse, compatible with hydropower) have slightly increased impacts over Alternatives 1 and 3 with regard to fish utilization of the stream just below the natural falls. Alternative 4, like Alternative 2 would allow selection of species for transport above Enloe Dam. As previously discussed, however, this issue is not of great importance at Enloe. Alternatives 2 and 4 include a barrier dam constructed approximately 30 m (100 ft) downstream of the powerhouse. The barrier dam would prevent fish from utilizing the 200 m (650 ft) section of stream from the barrier to the natural falls as an adult holding area prior to spawning. The current extent of utilization of this area for holding is not known, but is felt to be minimal. Use of this area for juvenile rearing would not be altered. No anadromous salmonid spawning area exists in the vicinity. As with all of the alternatives, the potential for passage of fish species not presently known to be above Enloe Dam also exists.

Alternative 5 which involves a trap and haul facility located approximately 3 km (2 mi) downstream of Enloe Dam (and is compatible with hydropower generation) will reduce the adult holding area presently available in this stream section by eliminating access to several large, deep pools which occur here. A very small component of the anadromous salmonid spawning area present below Enloe Dam (approximately 10 percent) will also be cut off, but this loss will be very minor when compared to the extensive spawning and rearing areas available in the upper Similkameen River watershed when passage is achieved. Alternative 5 also permits the selection of fish species to be trucked above Enloe Dam.

Removing Enloe Dam and providing a fishway over the falls (Alternative 6) has a much greater variety of potential impacts than the other alternatives. Sediment load in the lower river would temporarily increase if sediment behind the dam was not first removed via suction dredging. Silting of existing spawning and rearing areas in the Similkameen and Okanogan rivers potentially could occur as a result of sediment release. Water quality would be affected, with possible negative effects on fish species residing in the rivers. The length of time required for the sedimentation and water quality effects of dam removal to dissipate is uncertain, but could reduce or alter fish production and use of the lower river for a signficant time period and thereby have relatively long-term effects on fish populations. Dredging of sediment prior to dam removal would alleviate these adverse effects to a large extent. Alternative 6 would require only a short, low fishway over the natural falls and would permit fish passage with a minimal amount of physical stress on the fish. Thus, unimpeded access for fish to the upper Similkameen River would be provided with this alternative once the effects of sediment release dissipate.

8.4 Human Environment

8.4.1 Power Production Potential

Existing Conditions

No power is currently being generated at Enloe Dam.

Potential Impacts

Some of the alternatives for fish passage at Enloe Dam have implications on the potential for hydropower production at that site. Okanogan PUD has filed an application with FERC to develop a facility with new generators located at the old powerhouse site below the falls. Although ultimate development of the site is uncertain at this time, the possibilities for reduction in hydropower generating potential as a consequence of providing fish passage must be taken into account.

Six alternatives for passage have been developed to date. Of these, Alternative 1, 3 and 6 are "incompatible" with hydropower production and assume no power development at Enloe Dam. Alternatives 2 and 4 are "compatible" with hydropower development at Enloe Dam and incorporate certain design features which take that potential development into account. These alternatives would cause some reduction of power production potential, however. Alternative 5 is located outside any area of potential influence on hydropower development at Enloe Dam and makes no assumption regarding power development at that site. The anticipated effects of each alternative on the potential for hydropower production at Enloe Dam are described in more detail below.

Alternative 1 - Fishway from Falls. This alternative assumes no hydropower development; therefore, no power production or revenues are foregone.

Alternative 2 - Fishway Below Powerhouse. This alternative includes the construction of a fish barrier dam below the proposed powerhouse and a nominal flow of about 40 cfs down the major portion of the fish ladder. Both of these project features would have an influence on power production potential at the Enloe Dam site. The fish barrier dam would reduce the gross operating head available for power production by about 7 ft. This reduction would vary with discharge somewhat, but for this analysis a consistent 7 ft is assumed. The nominal fishway flows of 40 cfs would reduce water flows available for power generation by that amount. Although the fishway will not necessarily be in operation at all times during which power would be generated, a consistent removal of 40 cfs is assumed in this analysis. In this regard, this analysis is conservative on the side of lost power production potential.

Alternative 3 - Trap and Haul at Falls. This alternative assumes no hydropower development; therefore, no power production or revenues are foregone.

Alternative 4 - Trap and Haul Below Powerhouse. This alternative includes the construction of a fish barrier dam below the proposed powerhouse. Unlike Alternative 2, no stream flows would be taken from above the hydropower facility for operation of the fish passage facility. Therefore, the only effect this alternative would have on hydropower production potential would be a reduction in gross operating head of about 7 ft.

Alternative 5 - Trap and Haul Near Railroad Bridge. This alternative lies outside the area of influence on any potential hydropower development at Enloe Dam; therefore, no power production or revenues are foregone.

Alternative 6 - Dam Removal. This alternative assumes no hydropower development; therefore, no power production revenues are foregone.

The effects of various alternatives on annual energy production of the proposed hydropower facility were determined by modeling energy output under existing stream flow and head conditions and under various other conditions which simulate the implementation of relevant fish passage alternatives. The computer program used is called "HYDRO-CALC", is in the public domain, and is available through BPA, as well as from other sources. Input data and results of the modeling effort, performed for this project by the Okanogan PUD, are given in the first portion of Appendix 6.

The alternatives which have some effect on hydropower potential are Alternatives 2 and 4. The effects of Alternative 2 are most closely simulated by Run 6, which assumes a seven foot gross operating head loss and a 40 cfs bypass to operate the fishway. According to the model, this alternative would result in a loss of 6,799,794 kwh/yr from a fully developed project. The effects of Alternative 4 are most closely simulated by Run 2, which assumes a 7 ft gross operating head loss and no bypass. According to the model, this alternative would result in a loss of 5,178,629 kwh/yr from a fully developed project.

In order to put these potential losses into perspective and to compare them to gains in anadromous fish production potential represented by the fish passage project, foregone power production potential must be converted to dollars of present worth. This involves incorporating some assumptions into present worth calculations relating to dates of completion of various phases of power development, project life, price for power and discount rate (including inflation). Based on discussions with representatives of Okanogan PUD and BPA, the following assumptions regarding power development at the Enloe Dam were made:

- <u>Fast Track Schedule</u> - All permits will be granted, construction of Phase I of power development will be complete and turbines 1 and 2 will be on line and generating power in the fall of 1989. Phase II of power development will be complete and turbine 3 will be on line and generating power in the fall of 1992.

- <u>Ten Year Delay Schedule</u> - This schedule assumes that the entire hydropower production schedule at Enloe Dam is delayed for 10

TABLE 8-6
Results Of Analysis Of The Effects Of Various Fish Passage Alternatives
At Enloe Dam On Power Production Potential At That Site

	Energy Loss, kwh/yr At Full Development	Revenue Loss, $/yr[1] At Full Development	Present Worth (1985)[2] Of Foregone Power Potentia
Alternative 1			
Assumes No Power Development	No Loss	No Loss	No Loss
Alternative 2			
Fast Track Schedule	6,799,794	149,596	3,258,899
Ten Year Delay	6,799,794	149,596	2,165,923
Alternative 3			
Assumes No Power Development	No Loss	No Loss	No Loss
Alternative 4			
Fast Track Schedule	5,178,629	113,929	2,466,589
Ten Year Delay	5,178,629	113,929	1,638,079
Alternative 5			
No Influence On Power Development	No Loss	No Loss	No Loss
Alternative 6			
Assumes No Power Development	No Loss	No Loss	No Loss

[1] Assumes $0.022 per kwh.

[2] Assumes development schedule outlined in text and 3% discount rate with 54 year project life beginning in 1985.

years. This schedule is included in this analysis to sensitize for the effects of any uncertainty inherent in the permitting and construction schedules in the project proposed by Okanogan PUD. This schedule assumes that turbines 1 and 2 will be on line and generating power in 1999 and that turbine 3 will be on line and generating power in 2002.

- In order to compare results of this analysis directly to those of the benefits analysis, project life is placed at 54 years, beginning in 1985.

- Price for power is placed at $0.022 per kwh. This is the price presently reflected in the Bonneville Power Administration (BPA) rate schedule. According to Okanogan PUD, BPA intends to maintain that rate until the fall of 1986 and then let it rise with inflation. The inflationary rise in the rate schedule is accounted for in the choice of a discount rate.

- The discount rate used in this analysis is 3 percent. This is the risk-fee rate of time preference used by BPA, the Northwest Power Planning Council and PNUCC for power system analysis. This discount assumes that power rates follow inflation, thus taking inflationary price rise into account internally. It should be noted that an identical 3 percent discount rate was used in the analysis of fish passage benefits, thus internalizing the inflationary price rise for that resource. The results of the two analyses can therefore be compared directly.

The results of the cost analysis summarizing the effects of Alternatives 2 and 4 on power production potential at the Enloe Dam Site are given in Table 8-6.

8.4.2 Noise

Existing Conditions

Current noise levels in the study area include low level traffic noise from the secondary county arterial road. Water passing over the dam and falls creates higher constant noise levels in the vicinity of the dam.

Potential Impacts

Noise produced during construction will be generated by vehicular traffic, drilling, blasting, road construction and/or upgrading, machinery operation, barrier dam construction and installation of other facilities. Construction noise for all alternatives will exceed current noise levels. However, the extent, location and duration of increased noise levels will vary with the alternatives. Construction noise will not exceed DOE noise standards, but may be noticeable from the secondary county arterial. Noise from the blasting may be heard in Oroville and Nightthawk.

Noise produced during operation of passage facilities would be generated by traffic and machinery operation. This noise would be minimal and intermittent and therefore non-disruptive to both humans and wildlife in the vicinity.

8.4.3 Toxic/Hazardous Materials

Existing Conditions

As part of the baseline studies for the preliminary NEPA assessment of fish passage options, a sediment composition sampling program was undertaken in the Enloe Dam Reservoir, the Similkameen River and the Okanogan River. The objective of the sampling/analysis program was to assess any potential risk of toxic element contamination from these sediments, particularly as such contamination might be linked to any of the six alternatives under consideration. An additional source of potential contamination exists at the old powerhouse near Enloe Dam (i.e., the powerhouse may be a source of polychlorinated biphenyls (PCB's)). Although none of the six Enloe Dam passage alternatives would directly affect the dispersal of PCB's from the powerhouse, the fact that renovation of the powerhouse is assumed within the scope of Alternatives 2, 4 and 5 does link the possible presence of PCB's with the Enloe Dam Fish Passage Project. Therefore, although potential contamination of PCB's at the powerhouse is in the purview of the Okanogan PUD rather than the BPA, a rudimentary sampling of powerhouse soils/residues was determined to be a useful addition to the sediment sampling program.

Sediment sampling site locations are shown on Figure 8-4. Sediment samples were collected from a total of six reservoir and river sites. Analyses were conducted on samples from only four of these sites; sediment samples collected at sites S1 and OK2 in the Lower Similkameen and in the Okanogan River just above the confluence were stored for possible analysis subsequent to the initial findings. Thus, three samples taken from the reservoir and one sample taken from the Okanogan River were analyzed. In addition to the collection of sediment sampling, a composite sample was collected (PH1) from soil and residue in and around the powerhouse. This composite sample was analyzed only for PCB's.

The sediment sampling program was conducted in October 1984. Samples consisted of shallow cores and surface sediments. No deep cores were collected at any of the sites. Samples were analyzed for total element content rather than extractable element content. This method was chosen based on consultation with EPA (Seattle) and in consideration of the fact that the sampling program was intended as a baseline screening survey, not as a definitive program providing absolute information on potential release of toxic elements to the environment.

The parameters for sediment analysis included basic sediment character (moisture, percent volatiles, particle size and nutrients) as well as analysis of major cations (aluminum, calcium, magnesium, iron, manganese, sodium, and potassium), trace metals, and priority pesticides and polychlorinated biphenyls (PCB's). As stated previously, the soil/residue sample at the powerhouse was tested only for PCB's. The results of the analysis program are presented in Tables 8-7 to 8-9.

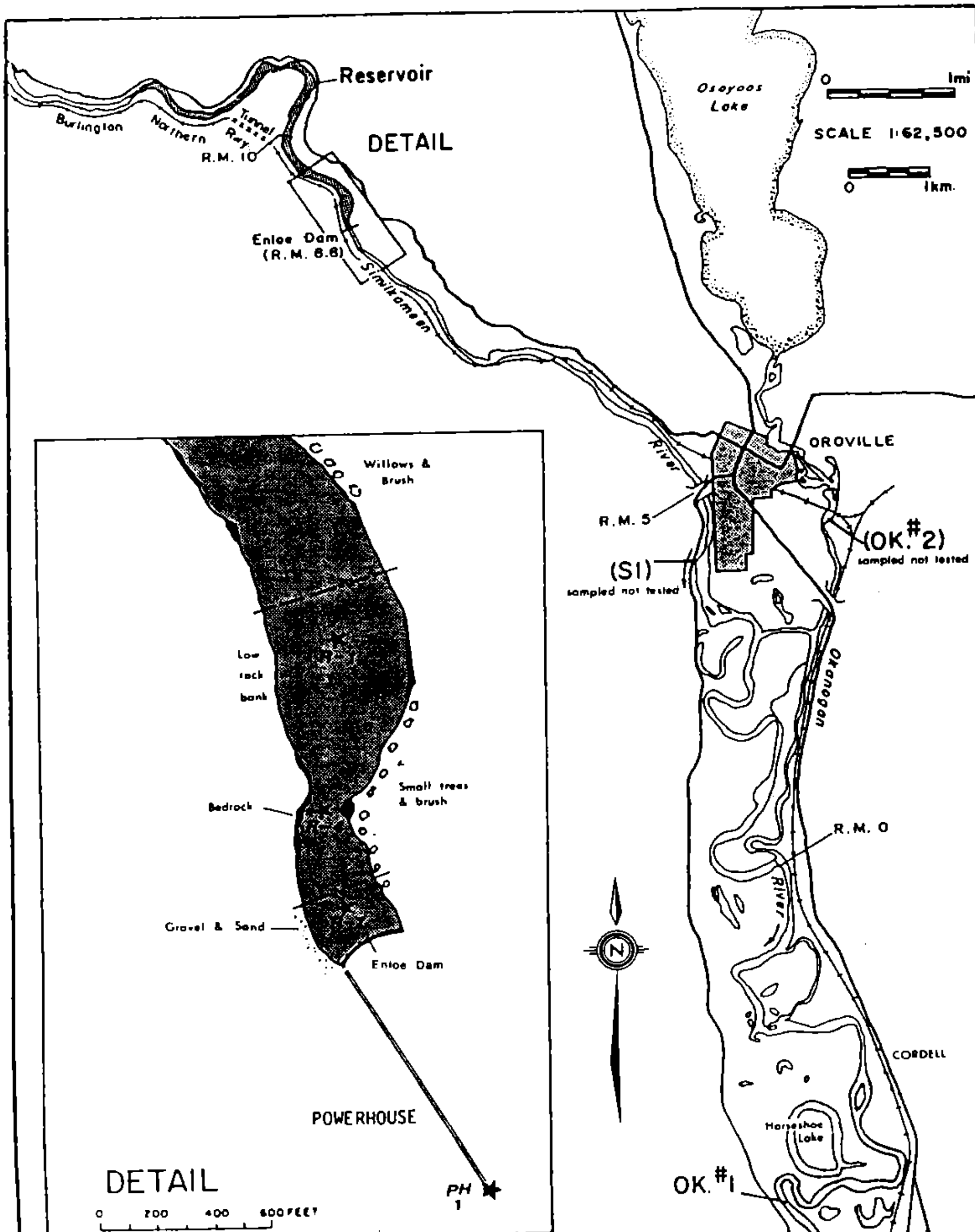

Figure 8-4 Sediment and composite soil sampling stations.

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TABLE 8-7
Reservoir and River Sediment Analyses - Basic Characteristics and Major Constituents

Parameter	Station					Method
	PH #1 Composite	R1	R4	R7	OK #1	
Core Length (inches)	-	6	18	10	2	-
Water Depth (feet)	-	2	50	10	1	-
Moisture (%)	20.3	20.3	25.0	21.5	27.7	105°C
Loss on Ignition (%)	18.6	1.24	2.01	1.18	1.23	600°C
Particle Size (%)						
Sand (L2 mm)	-	98.0	93.6	97.7	86.4	Sieving &
Silt (L50u)	-	0.8	4.1	0.8	10.2	Hydrometer
Clay (L2u)	-	1.2	2.3	1.5	3.4	
Nutrients (ug/g)						
Phosphorus	-	562	542	-	857	Colorimetric
Kjeldahl Nitrogen	-	18	60	-	140	Electrode
Sulfide (ug/g)	-	L5.	L5.	-	L5.	Colorimetric
Cyanide (ug/g)	-	L1.	L1.	-	L1.	Colorimetric
Aluminum	-	8522	10,000	8420	11,600	I.C.A.P.
Calcium	-	5010	5980	5100	7120	I.C.A.P.
Iron	-	14,600	16,200	14,000	19,000	I.C.A.P.
Magnesium	-	5690	6270	5430	7910	I.C.A.P.
Potassium	-	510	735	560	909	I.C.A.P.
Sodium	-	220	264	213	353	I.C.A.P.

L = Less than
ug/g = micrograms per gram of sediment

All results expressed on a dry weight basis except moisture which is expressed on an as received basis.

TABLE 8-8
Reservoir and River Sediment Analyses - Trace Metals

Parameter	Station R1	R4	R7	OK #1	Detection Limit	Method
Arsenic (As)	14.2	26.3	14.9	31.5	0.01	A.A.
Barium (Ba)	53.5	74.5	49.3	89.5	0.01	I.C.A.P.
Beryllium (Be)	0.16	0.21	0.16	0.25	0.01	I.C.A.P.
Bismuth (Bi)	L2.5	L2.5	L2.5	L2.5	2.5	I.C.A.P.
Cadmium (Cd)	L0.15	L0.15	L0.15	L0.15	0.15	A.A.
Cobalt (Co)	6.02	7.08	5.72	9.22	0.1	I.C.A.P.
Chromium (Cr)	15.2	15.7	12.4	21.6	0.1	I.C.A.P.
Copper (Cu)	16.6	26.8	16.4	43.0	0.1	I.C.A.P.
Molybdenum (Mo)	0.35	0.46	L0.40	0.41	0.4	I.C.A.P.
Nickel (Ni)	10.7	11.9	9.58	16.8	0.1	I.C.A.P.
Lead (Pb)	2.08	3.21	1.86	4.19	0.5	A.A.
Antimony (Sb)	L1	L1	L1	L1	1	I.C.A.P.
Vanadium (V)	31.8	36.4	31.3	40.5	0.1	I.C.A.P.
Strontium (Sr)	35.0	48.6	37.1	60.7	0.1	I.C.A.P.
Zinc (Zn)	34.4	39.3	31.8	52.6	0.1	I.C.A.P.
Mercury (Hg)	L0.010	L0.010	L0.010	0.020	0.01	A.A.
Gold (Au)	-	-	L0.01	-	0.01	A.A.

L = Less than

All results expressed on a dry weight basis except moisture which is expressed on an as received basis.

Results are expressed as micrograms of element per dry gram of sediment.

TABLE 8-9
Reservoir and River Sediment Analyses - Priority Pesticides and PCB

Parameter	Station PH #1 Composite	R1	R4	OK #1	Method
2,4 -D	-	L0.020	-	-	-
Aldrin	-	ND	ND	ND	GC/MS
Alpha-BHC	-	ND	ND	ND	GC/MS
Beta-BHC	-	ND	ND	ND	GC/MS
Gamma-BHC	-	ND	ND	ND	GC/MS
Delta-BHC	-	ND	ND	ND	GC/MS
Chlordane	-	ND	ND	ND	GC/MS
4,4'-DDT	-	L0.001	ND	ND	GC & GC/MS
4,4'-DDE	-	L0.001	ND	ND	GC & GC/MS
4,4'-DDD	-	L0.001	ND	ND	GC & GC/MS
Dieldrin	-	ND	ND	ND	GC/MS
Alpha-Endosulfan	-	ND	ND	ND	GC/MS
Bata-Endosulfan	-	ND	ND	ND	GC/MS
Endrin	-	L0.001	ND	ND	GC & GC/MS
Heptachlor	-	ND	ND	ND	GC/MS
Heptachlor Epoxide	-	ND	ND	ND	GC/MS
PCB-1016	L0.010	L0.01	L0.010	L0.010	GC/MS
PCB-1221	L0.010	L0.010	L0.010	L0.010	GC/MS
PCB-1232	L0.010	L0.010	L0.010	L0.010	GC/MS
PCB-1242	L0.010	L0.010	L0.010	L0.010	GC/MS
PCB-1248	L0.010	L0.010	L0.010	L0.010	GC/MS
PCB-1254	L0.010	0.010	L0.010	L0.010	GC/MS
PCB-1260	0.89	0.010	L0.010	L0.010	GC/MS
Toxaphene	-	ND	ND	ND	GC/MS

- = Not analysed.
ND = Not detected - detection limit is 0.05 ug/gram.
L = Less than detection limit shown.
All results expressed as ug/gram dry weight.

The analysis results indicate the Enloe Dam reservoir sediments are composed principally of sand (averaging 96.4 percent sand and 3.6 percent fines). The organic fraction, as represented by loss on ignition, is low and averaged 1.5 percent. The Okanogan River sediment has a higher percentage of fines (13.6 percent), but similar organic fraction. Nutrient levels are higher in the Okanogan River sediments by a factor of 1.5 for phosphorus and 3.5 for nitrogen. Major cations were not significantly different at the three reservoir sampling sites (R1, R4, R7), but were somewhat lower than those at the Okanogan River sampling site (OK #1) (Table 8-7).

Trace metal analysis of the four sediment samples (Table 8-8) indicated that all trace elements fell within or below reported naturally occurring ranges (Bowen, 1966; Underwood, 1971; Chapman, 1966; U.S. Geological Survey, 1970). Slightly higher levels of most elements were found at reservoir Site R4 than at the other two reservoir sites (R1, R7). Site R4 was located in a deep pool where, based on the data, a slightly greater percentage of fines settled out (6.4 percent fines at R4 versus 3.2 percent average of sites R1 and R7). This suggests that fines contain a higher percentage of trace metals than do sand fractions. Levels of the more toxic elements (i.e., cadmium and mercury) were below detection limits at all three reservoir sampling sites and cadmium was also below the detection limit in the Okanogan River sample (OK 1). Mercury was detected in the Okanogan River sediment at a level of 0.02 ppm, well within the range that can be encountered in soils naturally (0.05 ppm) (U.S. Geological Survey, 1970).

Arsenic levels ranged from 14.2 to 31.5 ppm and are therefore somewhat higher than might have been expected. Literature sources report naturally occurring levels in soils to be generally less than 10 ppm (micrograms per gram, dry basis) (Bowen, 1966; Underwood, 1971; Chapman, 1966). The levels detected are not, however, outside the range reported as naturally occurring (1-40 ppm). The slightly elevated arsenic levels in the Enloe Dam reservoir sediment may reflect natural phenomena and/or mining activities, as it is known that are some arsenopyritic deposits in the watershed.

The analysis for priority pollutant pesticides in reservoir and river sediments indicates all are below the detection limit (Table 8-9). Analysis for PCB's in the reservoir indicated a positive detection at one site only (R1) at a level of 0.01 ppm, which is marginally above the detection limit (less than 0.01 ppm).

The powerhouse composite soil/residue sample indicated a positive PCB level. The exact location(s) of the contamination cannot be established from this one composite sample, as it was only intended to be a screening test. The test result does, however, indicate that some level of contamination exists at the old powerhouse. A further survey in which discrete samples are collected is required to determine the significance of initial findings, as well as to establish the magnitude of any risk to the environment. The history of PCB use at the powerhouse site has not been examined in the present project study. PCB's are known to be very persistent once in the environment and have a very high bioconcentration factor. The Okanogan PUD has been advised of the findings of the sampling results obtained in the baseline survey undertaken for this project. In addition, both the EPA (Seattle) and Washington Department of Ecology (Yakima) are aware that a potential PCB contamination problem may exist at the old powerhouse.

Potential Impacts

Alternatives 1 through 5 presume that sediments behind the reservoir would remain in their current location and thus would have no effect on the downstream environment. Alternative 6, the dam removal option, could result in a large amount of reservoir sediment being flushed into the Similkameen and Okanogan River sections below the dam. Since none of the other alternatives result in a potential contamination problem, the screening survey conducted for this report was aimed primarily at assessing potential contamination effects resulting from implementation of Alternative 6. Given the relatively low level of all trace metals and priority pollutants reported in Tables 8-7 through 8-9, contamination due to reservoir sediments seems highly unlikely. It should be noted, however, that these samples were from shallow cores and surface collection; thus, composition of deeper-lying sediments remains unknown and because of the history of the basin their composition should not be assumed.

None of the alternatives would directly result in increased dispersion of PCB's which may occur at the powerhouse. However, as previously mentioned, Alternatives 2, 4 and 5 do assume that the powerhouse may be renovated. Should powerhouse renovation occur, precise quantification and perhaps clean-up of PCB's in the area would be required.

8.4.4 Land Use, Population, Housing And Transportation

Existing Conditions

The Okanogan County Regional Planning Commission's (OCRPC) 1964 Comprehensive Plan for Okanogan County is still quite accurate in relation to the Study Area. The zoning regulations were amended in 1982 (Burgor, pers. comm., 15 February and 22 May 1985). The Comprehensive Plan (OCRPC 1964, Plate 1) shows the immediate vicinity of Enloe Dam (the Study Area) as Open Land or Unclassified. The Oroville Golf Club above the east bank is identified, and orchard lands near the railroad bridge crossing are shown as intensive agricultural lands. Plate V of the Comprehensive Plan (OCRPC 1964) shows a future generalized land use element for the county, and shows no changes in the Enloe Study Area. In the plan, intensive agricultural areas will be maintained and protected from inappropriate land uses, and "allowed to continue to expand without interference from non-agricultural uses" (OCRPC 1964:10). The open-unclassified lands, which comprise most of the Study Area, consist of the following general use categories in the plan: forests, dryland farming, and grazing. These areas are not expected to undergo significant urbanization. The plan further states that uses of these lands should not be restricted as long as the proposed use does not create a nuisance definable by law.

The Generalized Land Use Map for Okanogan County (U.S. Department of Agriculture, Soil Conservation Service, 1979) classified the vicinity of the railroad bridge as irrigated cropland and the remainder of the Study Area as rangeland. This is very similar to that shown in the Comprehensive Plan.

Population and housing in the vicinity of the Study Area are quite sparse, and associated with the orchard lands near the railroad bridge.

Lands in the Study Area are under a mixture of public and private ownership. The Bureau of Land Management (BLM) owns the immediate vicinity of the dam and powerhouse as well as much of the rest of Section 13, T40N R26E. The Okanogan PUD holds a patent to 144 acres on which Enloe Dam and the powerhouse are located. The remainder of Section 13, consisting of higher terrain to the west and south, is privately owned. Lands in the vicinity of the railroad bridge and the site of Alternative 5 (Section 20, T40N, R27E), are privately owned between the secondary county arterial road and the north bank of the river. The existing access road which would be used for Alternative 5 crosses private land.

The road which parallels the river is shown as a secondary county arterial. There are no current plans for upgrading or expanding this road (King, pers. comm., 15 February, 1985), and most of the traffic is to the Nighthawk-Palmer Lake area.

Mining activity has been an excepted land use in the Similkameen River vicinity for many years. Several old mines are evident upstream in the Nighthawk area. A high grade gold placer deposit is reported to exist at Similkameen Falls, and it is possible that signficant deposits also exist beneath the dam and reservoir (U.S. Geological Survey, 1905; Washington State, 1956). Information on mining claims in the Study Area will be obtained from the Washington Department of Natural Resources, Geology and Earth Resources Division and the BLM office in Spokane, Washington.

Potential Impacts

None of the Alternatives is expected to affect land use, population, housing and transportation in the Study Area to any great extent. Fish passage facilities or dam removal are compatible with the current zoning ordinance, which classifies the area as a "minimum requirement district". Thus, no special permits will be required. Alternatives 1 through 4 and 6 would affect only lands owned by BLM. Most of the land to be affected by these alternatives is currently under patent to the Okanogan PUD.

Land use in the vicinity of Enloe Dam Reservoir would change somewhat if Alternative 6 were implemented. Restoring the free-flowing river through this area would probably ultimately result in a small increase in the amount of grazing land available. In addition, implementation of Alternative 6 is likely to stimulate interest in exploitation of these known and potential deposits. If properly regulated and therefore complying with water quality standards, such exploitation would not be incompatible with Alternative 6.

Implementation of Alternative 5, located on private land, could affect the private landowner(s) to some extent. Due to the small amount of area involved, this impact is anticipated to be minor.

Population, housing and transportation in the Study Area vicinity would not be significantly affected by any of the alternatives. The construction of passage facilities would employ only a few people on a short term basis. Even though the area is sparsely populated, the influx of so few construction personnel is not anticipated to create housing shortages or transportation problems.

8.4.5 Aesthetics

Existing Conditions

BLM's (1980) Visual Resource Management (VRM) System is a well documented system that provides ways of evaluating aesthetic qualities of the landscape in objective terms. The character of a landscape is mainly determined by four basic visual elements: form, line, color, and texture. These elements exert varying degrees of influence on a particular site, and the stronger the influence of these elements, the more interesting the landscape. Generally, landscapes with more variety are more aesthetically pleasing, to the extent that the variety must be harmonious. Cultural modifications can degrade landscape quality when they are not carefully designed.

The landscape of the Study Area is dominated by form and line elements, with lesser influences of texture and color. The adjacent cliffs and large hills provide form elements, while the reservoir, river, roads, railroad, and penstocks all provide line elements to the landscape. Texture is provided by the contrasts between cliffs, hillsides, and patches of conifers, while color contrast is evident between the predominantly pale brown landscape,the river and reservoir.

Potential Impacts

Aesthetically, the dam, associated facilities, and access roads blend moderately well with the site, considering the presence of the railroad and county road. Addition of various fishway or trap and haul facilities proposed in Alternatives 1-5 would simply provide varying amounts of line elements additional to those already existing at the dam site. The least visual impact would result from Alternatives 3 (Trap and Haul at Falls) and 5 (Trap and Haul at Railroad Bridge). These alternatives require no additional roads and minor ladder type facilities to holding pools. Alternative 1 (Fishway from Falls) would have slightly more impact as the fishway would go to the reservoir but no new roads need be built. Alternatives 2 (Fishway Below Powerhouse) and 4 (Trap and Haul Below Powerhouse) would both require extension of the existing access road, and Alternative 2 would also add a fishway paralleling the road from below the powerhouse. Dam removal (Alternative 6) would have the most far-reaching, but not necessarily adverse, effects on the aesthetics of the Study Area. Return to free running river with its riffle-pool variety and associated variety of shore-line vegetation and topography would lend increased visual contrast to the area, assuming that if material is dredged from behind the dam it will be blended into the topography of the vicinity and effectively reclaimed.

8.4.6 Recreation

8.4.6.1 Non-Fishery Related Recreation

Existing Conditions

The only developed recreation site within the study area is the Oroville Golf Club, located on a terrace between the county secondary arterial road and the Similkameen River 0.5 miles west of the railroad bridge. Unstructured recreational use of the study area includes low levels of picnicking and walking/sightseeing near the dam. Boating use of the reservoir is minimal, given the nearby availability of high quality boating waters such as Lake Osoyoos and Palmer Lake.

The County Land Use Plan (OCRPC, 1964) devotes considerable effort to an assessment of existing and future recreational facilities and needs in the county. The Similkameen Dam is listed as a Class II proposed recreation site. Class II sites are defined as general outdoor recreation areas, typically subject to signficant development for a variety of specific uses. Examples of these uses include fishing, skiing, camping, picnicking and boating. Facilities can include campsites, picnic areas, swiming areas, trailer parks, and boat launching ramps. Development of facilities in the vicinity of the dam is given intermediate or secondary priority by the county. Nearby Palmer and Osoyoos Lakes, in contrast, are given the highest priority for recreational development. A development at the Enloe site would be classed as a roadside type park. It is expected to be used mainly by local residents during the week and by visitors from outside the county during summer and fall weekends.

Potential Impacts

A preliminary assessment of potential impacts on non-fishery related recreation in the immediate vicinity of Enloe Dam indicates there would probably not be any great differences between the attractiveness to potential visitors with regard to implementation of the various alternatives. Alternatives 1-4 and 6, being located at or near the dam site, may support significant visitation if they are open to the public.

8.4.6.2 Fishery Related Recreation

Existing Conditions

The recreational component of the Similkameen fishery was measured within the context of the Summer 1984 Creel Survey of the Similkameen River system. The reader is referred to Section 4-14 and Appendix 2 for specific numbers and details gained from this creel census, as well as for an overview of the sport fishery in the river system. The Similkameen River system provides a sport fishery, mainly for summer visitors passing through the basin and for campers who fish occasionally. Almost half of all fishing effort for the season concentrated in three main areas; Ashnola River; Similkameen River - above Similkameen Falls; and Similkameen River - between Princeton and Old Hedley Road Bridge.

During the summer of 1984 a Similkameen River system creel survey revealed that the 336 anglers interviewed had caught a total of 631 fish, 299 of which were kept despite the small size (range: 5 - 12 in). The catch and harvest, broken down by species comprised the following: 475 rainbow trout (62 kept); 10 whitefish (8 kept); 138 brook trout (62 kept); 1 cutthroat trout (1 kept); and 7 squawfish (3 kept). Not surprisingly, given the level of angler effort in various stream sections, the largest proportion of fish caught in the Similkameen River system were caught in the Ashnola River. On the mainstem Similkameen River, the section above Similkameen Falls had the greatest catch and harvest.

The total estimated catch of all species of fish for the entire river system from June through September 1984 was about 11,000 fish. The estimated harvest was less than 7,000 fish, the majority of these being rainbow trout. Brook trout made up about 30 percent of the catch and harvest in the system, all coming from two small tributaries near Princeton.

Although no creel census surveys have been undertaken in the lower Similkameen River to date, it provides a popular sport fishery for rainbow trout, summer steelhead and summer chinook salmon. However, the sport catch from the lower Similkameen is only a fraction of that from the Methow and Wenatchee River systems on the basis of punchcard data tabulated by Washington Department of Game. Anglers in B.C. and Washington have expressed hope that the Similkameen River steelhead sport fishery can be developed to meet or exceed the harvest presently enjoyed on the Methow and Wenatchee River systems.

Potential Impacts

Potential impacts of the Enloe Dam Fish Passage Project on fishery-related recreation resources can be separated into (1) the overall issue of the introduction of sport fish into the upper Similkameen system and (2) the alternative-dependent issues of habitat losses resulting from some of the proposed alternatives. The first issue, introduction of sport fish into the upper Similkameen system, requires consideration of potential enhancement opportunities for summer chinook and summer steelhead and potential competition-related impacts to the existing resident sport fishery. It is quite apparent that passage at Enloe Dam will provide a substantially improved recreational sport fishery for summer chinook in August and September and summer steelhead from October to April. Passage to the upper watershed apparently would allow extensive natural spawning and rearing to occur. While the potential impact of fish passage on the resident sport fishery is difficult to assess, the planned annual release of 250,000 Wells Hatchery steelhead smolts should provide some residualization to add to the present rainbow harvest. Implementation of a restricted minimum 8 inch rainbow fishery would protect the introduced and naturally reared steelhead and provide a larger-sized rainbow trout fishery. The benefits of providing B.C. and Washington State anglers with a quality summer chinook and steelhead fishery would far outweigh the anticipated losses in production of other resident species.

The second issue, alternative-related habitat losses, is relatively minor as compared to the overall passage issue. These impacts are also discussed in Section 8.3.6, to which the reader is referred for more detail. Overall, however, Alternatives 1, 3 and 6 provided unrestricted passage for fish species in the Similkameen River without creating new barriers to fish movement. Alternatives 1 and 3 result in no loss of access to, or use of existing habitat. Alternative 6 would result in at least a temporary change in habitat value due to sediment release which would accompany dam removal. Alternatives 2, 4 and 5 provide additional instream barriers which restrict upstream access to small portions of the Similkameen River between the barriers and Enloe Dam. These areas consist of deep pools and runs over bedrock substrates which probably provide rearing habitat for many of the coarse fish species as well as overwintering habitat for steelhead trout. The benefits of providing fish passage for chinook and steelhead to the extensive habitats located above Enloe Dam would far outweigh the loss of habitat in these small river sections.

8.4.7 Cultural Resources

Existing Conditions

The first known Euro-American entry in the vicinity of the Study Area was in 1811. Later activities related to fur trading based at Fort Okanogan on the Columbia River were disruptive to Native American societies through the inadvertent introduction of disease and exhaustion of the fur resource. From 1858 to the 1880's, gold miners were in direct conflict with Native Americans, which led to the removal of the resident native population and their relocation on the Colville and Moses Reservations.

Euro-American settlement of the area begin in the 1870's, with a county government established in 1888. Hard rock mining and intensive agricultural development were encouraged in the early 1900's by the entry of the railroad. The Similkameen Power Company obtained rights to the river water in 1905, designed the dam and associated structures in 1916, and built the complex between 1916 and 1923, apparently as a new business entity, the Okanogan Valley Power and Light Company. Eugene Enloe, owner of the new company, completed construction and operated the facility until 1923, when the system was purchased by the Washington Water Power Company. At this time three cottages for dam operators were constructed, disturbing a prehistoric site. This prehistoric site has been given Smithsonian number 45-Ok-367. There are no other prehistoric sites in the Study Area listed with the Washington State office of Archaeology and Historic Preservation (Whitlam, pers. comm., 16 October 1984). However, the area surveyed included only that portion of Section 13 T40N R26E along the river. The vicinity of the railroad bridge has not been surveyed.

The Okanogan PUD purchased the dam and associated facilities in 1942, and shut down the generators when BPA transmission lines were switched on in the area in 1958. Enloe Dam and its associated structures remain standing today, although the powerhouse has been extensively vandalaized and has not been maintained since the 1958 closure of the facility. The Enloe Dam complex is well-described in the nomination document for the National Register of Historic Places (NRHP). It was listed on the register effective October 18, 1978 and is listed as site number 45-Ok-368H. One other historic structure which exists in the area is the roadbed of the Great Northern Railway. Although not included in the NRHP nomination form, the siding which was constructed to bring materials to the site is described as significant to its completion.

Although Enloe Dam is the only known historic site in the Study Area, other historic sites could exist and would most probably be associated with mining, Euro-American fishing, or Native American fishing. If they exist, such sites may be recoverable only through interviews, as they may have been destroyed by construction of the Enloe Dam. A description of the historic context of the Study Area is presented in Salo and Munsell (1977).

Previous archaeological surveys of the Similkameen River system and the related Okanogan system is described in Salo and Munsell (1977). They characterize knowledge of the local prehistory as incomplete and based on scant information. Their current work, as well as that of the BLM archaeologist Joe Randolf, will improve this data base, and should be available in report from by the end of 1985. In addition, the cultural chronology and stage sequence in the project area probably will parallel those from the Chief Joseph Project (Munsell and Salo, pers. comm., 9 May 1985).

Surveys in the Similkameen Valley show that prehistoric sites occur at springs and on nearly every alluvial fan and terrace along the river, above and below Palmer Lake. The terrace structures at the dam site are younger than some present at Palmer Lake which apparently contain Mazama ash, dating them to 6,750 radiocarbon years before the present (A.D. 1950).

Archaeological materials recovered by surveyors indicate use of the Similkameen Valley for at least the last 6,000 years, approximately the span of time since the devastating ash fall from Mount Mazama. While older sites may be present, these probably will not be found on the valley floor. Instead, they will be at higher elevations, since downcutting of the river channel has periodically scoured older terraces away.

Strand lines above Palmer Lake suggest a higher lake level and associated river system sometime in the past. If the present level of the river at the project area is relatively recent, due to downcutting in the not too distant past, then Similkameen Falls may not have been a barrier to migrant salmonids until downcutting revealed the rock structure. Oral histories collected from Native Americans recount a higher Palmer Lake and a salmon run at least as far as Princeton, where a weir was visible until recently. Native oral histories also speak of a slide dam at Shanker's Bend which caused the Similkameen to back up and produce the higher lake and its strand lines. Whether the slide dam blocked fish runs or permitted them is not known. In addition, the relationship of the disappearance of this dam to the appearance of Similkameen Falls is unknown, although its washout may have rapidly downcut the channel and revealed the falls (Bouchard and Kennedy, 1984:27; Munsell and Salo, pers. comm., 9 May 1985).

According to native respondents, Similkameen Falls and the channel downstream were signficant fish harvesting sites in late prehistoric times. Sites at Oroville were remembered as being so productive that several thousand people would come annually for the harvest from as far away as Penticton, British Columbia, and Spokane (Bouchard and Kennedy, 1984:25, 30).

The one known prehistoric site, 45-Ok-367, was reported to lie on the terrace holding the foundations of the three cottages built in 1923 for the operators of the dam. The project anthroplogist surveyed the area in October 1984 and found no diagnostic materials, but did observe what appeared to be a few minimally used flakes of basalt, on the surface of the disturbed area used as a parking lot on the east bank of the river just downstream from the dam abutment. One flake was found on rocks overlooking the east abutment of Enloe Dam, and another on a basalt promontory several meters upstream of this abutment. No other artifacts were seen. An April 1985 survey by Lawr Salo of the Corps of Engineers produced a Nispelum Bar projectile point, datable by cross-reference to dated points to between 2,000 to 3,000 years ago.

Apparently the site held more artifacts on its surface in the past, since pestles and projectile points were reported to have been present. That the site was a major harvest station suggests the presence or former presence of a larger and possibly deep site. Observations of tree girth and age further suggest that part of the site may be buried under silty deposits upstream and adjacent to the dam abutment on the east bank, and within soils under the historic road and foundations of the three cottages.

If in fact, the series of shelves we see today in the riverbed, and the base of the dam represent the fish harvest locus, an unknown portion of the original aboriginal site may have been destroyed during road construction and parking lot leveling on the east bank. Blasting for the first powerhouse penstocks altered the bedrock structure and also may have contributed to the loss of part of the site.

Above the parking lot, close to the highway and near the gravel road leading to the parking lot on the east side of the canyon, is a spring. According to Lawr Salo, who surveyed this elevated area, the spring probably is a prehistoric site or a use area associated with the fish harvest station (Munsell and Salo, pers. comm., 9 May 1985).

The nature of this site is not clearly known, although spring sites were invaribly sacred and utilized by Native Americans. While not in the impact zone, and road modifications must take this site into account.

On the west wall of the Canyon of the Similkameen and above the Study Area, are the remnants of the trail from native sites near the confluence of the Similkameen with the Okanogan, and those near Nighthawk, near Palmer Lake. There may have been a feeder trail to the falls on the west side, but it was not observed during the survey. Air photo examination is suggested to clearly locate the trail relative to the project impact area.

While known sites have been described there are other "hot spots" which should be considered and which may not provide surface indications of use. Each and every niche large enough to provide shelter to a single human in the project area may have been used by Native Americans during their quest for a guardian spirit. In that water, waterfalls and rapids were and are sacred, there were few better places for the spirit vigil than in one of the niches near a waterfall. Often they were identified by red pictographs, some of which remain near Palmer Lake, although none were reported or observed in the Study Area. Circles of portable rocks were said to mark these sites but none were observed in the Study Area. Whether pictographs or stone circles were present is not known. Directed interviews may find the answers.

The Study Area lies in an area occupied successively by two cultural groups known to enthographers and historians. The earlier of the two known groups, the Nicola, were an Athabaskan group living in the midst of Interior Salish groups. Little is known of them, other than a few words and place names. They apparently occupied the Similkameen watershed almost to or just beyond the confluence of the Similkameen and the Okanogan, and held territory which included the Nicola Valley in British Columbia (Wyatt, in press: 1-5).

The Okanogan were the most recent occupants of the project area. Respondents among the Okanogan estimated that the Nicola were assimilated into Okanogan groups between 150 and 300 years ago. The last of the Native Americans who had any knowledge of the Nicola-Similkameen language died in the 1940's. Whether beliefs and meanings which respondents reported about the sites in and near the project area reflect only Okanogan experience or an overlay of Okanogan on Nicola is not known, and probably will not be known without an extensive comparative review of Athabaskan and Salish story notifs. Okanogan respondents are the only ones left with knowledge of the Similkameen. However, it seems likely that since the Nicola were absorbed rather than annihilated, they were quizzed about places and meanings, and that some of that data has been retained in oral histories collected about the valley (Bouchard and Kennedy, 1984).

The most recent ethnohistoric research among the Okanogan was of place names in the Similkameen, from Oroville to the Canadian border, including data from Native Americans residing in Canada (Bouchard and Kennedy, 1984). What was not asked during that data collection and needs to be asked now, are the present-day meanings and associations, values and beliefs, which living Okanogan hold for the Similkameen Falls area. While we have recorded statements about the possible and probable meanings elicited from living respondents by excellent researchers, what those living now feel about the project area is not known. Before the area is further impacted, this set of questions should be directed to those who would know.

Potential Impacts

Alternatives 1-4, in a general sense, would not adversely affect the powerhouse and associated facilities listed on the National Register of Historic Places. Adoption of Alternatives 1 or 3, which are incompatible with reestablishment of power generating facilities, may not foster continued preservation of the powerhouse as well as Alternatives 2 or 4. This is also the case with Alternative 6, which would, in addition, call for removal of the Enloe Dam. Any course of action involving dam removal or further degeneration of the facilities on the National Register will require additional consultation with the National Advisory Council on Historic Preservation and the Washington State Historic Preservation Office. The two fishway alternatives (1 and 2) have potential for causing additional disruption to part of the already disturbed prehistoric site 45-Ok-367, should it extend to the proposed construction area of the fishways.

Alternative 5 cannot be evaluated because its site has not been surveyed. Information on this site is expected to be included in forthcoming reports from the U.S. Army Corps of Engineers, Seattle district.

8.4.8 Agricultural Crops

Existing Conditions

Agriculture in the study area consists of irrigated orchards located on both sides of the Similkameen River near the railroad bridge. There are currently no plans to increase irrigated croplands within the study area according to the Water and Power Resource Service (WPRS (formerly Bureau of Reclamation), 1980). The Oroville-Tonasket Irrigation District (OTID) will be reconstructing their system in the next few years. The former Similkameen River intake will be abandoned and replaced by an intake on Osoyoos Lake. Water will be pumped up from this intake to the irrigated lands in the study area.

Potential Impacts

This system would not be affected by any of the six alternatives. The existing canal will have to be maintained to augment the level of Osoyoos Lake when necessary. As this canal passes through a tunnel along the east side of the study area, the six alternatives for fish passage will not have any effect on the existing system (WPRS, 1980; Thompson, pers. comm., 20 May 1985).

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The Seattle Times

Tuesday, July 22, 2003 - Page updated at 12:00 AM

Mysterious 1872 quake yields clues for future

By Alison Bickerstaff
Seattle Times staff reporter

The mighty Columbia River ran dry.

Indians near Entiat feared the wrath of subterranean bulls.

Women singing "Joy to the World" at an Olympia church thought "the Lord has come."

It was the earthquake of 1872, the largest crustal earthquake in Washington state's history.

For decades, researchers were almost as clueless about its origin as the natives and early settlers terrified by the earthquake's furor and aftereffects. Now, researchers believe they've pinpointed the location and magnitude of the quake: a shallow, 6.8 temblor that hit near the Chelan County town of Entiat, about 15 miles northeast of Wenatchee.

"The things that have occurred in the past," said University of Washington professor Ruth Ludwin, one of the researchers, "there's some likelihood that they will reoccur."

Ludwin and fellow researchers, including three U.S. Geological Survey scientists, say a deeper knowledge of the earthquake will help to define the risks other quakes pose east of the Cascades. And while they can't say when another huge quake will hit, they now have a much better idea of where it might be centered and who might be affected the most.

But before they could figure that out, they faced the problem that their data, the lifeblood of modern science, was limited to stories passed down from more than a century ago.

Over the years, Ludwin and other researchers before her studied newspaper accounts, reports from those who felt the quake and other anecdotes.

Dozens of communities reported shaking in Washington, Oregon, British Columbia, Idaho, Montana and Alberta. A year later, residents of Wenatchee, Entiat and Lake Chelan still reported mild shaking.

In more modern times, as scientists have recorded earthquakes in the Entiat area, they've measured ongoing low-level seismic activity and occasionally somewhat larger earthquakes, Ludwin said.

"There's a lot of people that live in Wenatchee, and if there's another earthquake there, it's going to cause damage," she said.

But intensity, what people report they see and feel when a quake hits, is the only quantitative means scientists have to compare earthquakes that predate seismometers with the quakes of today. Scientists assign intensity values ranging from Roman numeral I, the least severe, to Roman numeral XII, the most severe, to specific sites.

The deep-magnitude 6.8 Nisqually quake that rocked the Puget Sound region Feb. 28, 2001, for example, for the most part caused Intensity VI and VII, or strong to very strong, shaking across the region. Objects fell, buildings were damaged, and some people had trouble standing. The highest intensity reported for the 3.0 quake July 5, which was centered 11 miles south-southwest of Bremerton, was Intensity III, which causes vibrations similar to the passing of light trucks.

Researchers believe the shaking at Entiat may have been Intensity VIII — enough to cause chimneys to fall and heavy damage to buildings and foundations today. Although it was also a 6.8 temblor like the Nisqually quake, it was much more shallow and so shook the Earth's surface with greater intensity.

Based mainly on newspaper accounts, researchers have assigned intensity values to different locations shaken by the quake the night of Dec. 14. According to the tales, a full moon cast an eerie glow on that clear, windless evening. The main shock hit around 10 p.m., and two hours later, a mountain north of Entiat violently shrugged half of itself off. Tons of rock dammed the Columbia River.

"It was a paralyzing experience," said Sam Miller, keeper of a nearby trading post, according to a 1960 retrospective in the Wenatchee Daily World. "I would have given every gray hair on my head to have been out of the country."

By the next day, the water overcame the debris, now inundated behind Rocky Reach Dam.

Residents in the area, though, were few and far between. Reports were sparse and at times speculative. These include oil oozing from a nearby mountain, a gold-encrusted lake buried by a landslide, and a geyser attracting droves of curious Indians.

The reports from Entiat and Wenatchee perhaps were the most trying for researchers attempting to gauge how much the earthquake had shaken those areas.

John McBride, who had sold Miller his trading post, gave his "eye witness" in the Jan. 11, 1873, edition of the Washington Standard. It was the only contemporary account from the area.

McBride and his partner, who were sleeping, suddenly were thrown to the floor. As they rode to the trading post six miles away, the ground undulated beneath them.

They found Miller frantic, convinced Indians had attacked his store. Outside, great landslides muddied the river, which rose 3 feet in 10 minutes. Settlers made preparations to abandon the sinking countryside, and Indians exclaimed that the world was ending. McBride recalled 64 shocks, eight severe.

Although he had had a criminal record and a reputation as a "border ruffian" who sold whiskey to Indians and escaped prison, researchers have considered his account reliable because it is the only contemporary account from the vicinity.

But Ludwin said such ambiguity made it hard for her team to assign intensity values to the area.

By using intensity values assigned to 12 20th-century Pacific Northwest earthquakes for which instrumental records exist, the researchers came up with a model describing how the intensities attenuate, or die off, with increasing distance from their origins. They then applied this model to intensity assignments for the 1872 quake to get its approximate location and magnitude.

The researchers suspect that the Entiat area, bound by the North Cascades and the Columbia Plateau, is underlain by what are known as blind faults, ones that don't reach the surface of the Earth. Perhaps one of these, they say, is responsible for the great quake.

Alison Bickerstaff: abickerstaff@seattletimes.com

Baker, Talia (DES)

From:	Stuart Rick Gillespie <rickg@columbiana.org>
Sent:	Monday, April 17, 2017 9:00 AM
To:	Baker, Talia (DES); Deakins, Nancy (DES)
Subject:	Columbiana's Comments to PRC
Attachments:	Columbiana Online Masthead 1 inch.tif; Stuart R Gillespie 1.5.tif; Attachment 1- Shankers Bend Dam.pdf; Attachment 2 -2016 Enloe Economic Report.pdf

April 17, 2017

Project Review Committee
c/o Ms. Talia Baker/Nancy Deakins
Department of Enterprise Services
Post Office Box 41476
Olympia, WA 98504-1476

Dear Ms. Baker and Deakins:

The Project Review Committee ("PRC") should reject the Okanogan Public Utility District's ("OPUD") application for project approval to use the design-build alternative contracting procedure on the Enloe Hydroelectric Project (the "Project"). As the PRC is well aware, this is a highly controversial project in the Okanogan County community, and should be considered carefully as ratepayers and citizens of Okanogan County do not want this project to shackle them with unnecessary debt. Ultimately, the PRC should find that the OPUD has not met the statutory requirements necessary for the PRC to approve this application.

1. The OPUD is not qualified to manage this Project.

RCW 39.10.280 is the relevant statute here, providing the process by which the PRC must adhere when reviewing a project for approval. First, the application submitted must include a description of the public body's qualifications. *Id.* at (1). The requirements that the public body have the requisite management experience is also incorporated into RCW 39.10.280(2)(c)(i), (ii), and (v), as well as (2)(d). In this case, the PRC should find that the OPUD is not properly qualified to oversee this project. At section 7.7 of the OPUD's application (pg 6), it gives a brief summary of the construction experience of the organization's project management team. The management team at OPUD includes Tim DeVries and Dan Boettger. Mr. DeVries is not listed as having **any** experience managing a hydroelectric project and is only listed as having managed projects costing around $3 million, a small fraction of the cost of this $42 million Project. Please require OPUD to identify Mr. DeVries's relevant experience, if any.

Dan Boettger, on the other hand is listed as having "led many large scale energy projects, including two FERC hydropower projects ..." Notably, the names of these two projects are not listed, though the names of these projects would be highly relevant here. When will that information be provided to the public? Columbiana asserts that these two FERC hydropower projects referenced in the application are actually the Enloe Dam at issue here and the failed Shankers Bend Dam. Columbiana believes that these are the two projects referenced because these appear to be the only two projects that have been conducted by the OPUD since Mr. Boettger began working at the OPUD in 1986, 30 years ago. *See* OPUD Application at pg 7 ("Dan Boettger joined the District in 1986"). Of course, the Enloe Dam Project has not yet been constructed and thus it cannot be said that Mr. Boettger successfully managed something that has not yet been completed. The Shankers Bend Dam was never constructed, after the OPUD voluntarily surrendered its preliminary permit to build the dam. *See* Attachment 1. Of course, having not been built, it cannot be said that Mr. Boettger has successfully managed the building of this hydroelectric project. At the very least, the PRC should inquire as to what two FERC projects Mr. Boettger has allegedly managed and provide that information to the public. Aside from these two questionable projects, Mr. Boettger is not listed as having any experience managing hydropower projects.

In all, Mr. DeVries and Mr. Boettger do not have the statutorily required experience necessary to manage this Project. While the OPUD has hired consultants with relevant experience (described at section 7.3 of the application) the public body itself lack such experience. As such, the PRC should reject the OPUD's application to utilize the design-build process.

Second, in addition to not having a qualified management team, the OPUD demonstrates in its application that the OPUD itself has not ever successfully managed a hydropower project. The OPUD has provided a chart at Attachment D to its application. Most importantly, none of the projects listed are hydropower projects. Second, the budgets of the projects listed were at most, one-third of the budget proposed for the Project here. The timelines for the projects listed are at most, 2 years and 4 months, with most of the projects listed having a timeline closer to one year. The proposed timeline for this Project is four years. And finally, the project called "PT 115v Transmission Line" was proposed as taking 8 months, to be completed in December 2016. According to Attachment D, that project is still ongoing and has been delayed for "environmental restrictions." This four month delay should be concerning to the PRC, as should the reason for the delay. Many local and regional environmental groups (including American Rivers, American Whitewater, Center for Environmental Law and Policy, North Cascades Conservation Council, Sierra Club, Wild Steelhead Coalition, Wild Washington Rivers, and Columbiana) are concerned about the Project at issue here, leaving the potential for a delay here due to "environmental restrictions." Given the result in the "PT 115v Transmission Line" project, and concerns with the instant Project, the undersigned request that the PRC conduct a transparent analysis as to whether "environmental restrictions" may cause a delay here, and the OPUD's ability to successfully manage such issues.

2. The OPUD has not shown that the design-build process will provide a substantial fiscal benefit.

The next statutory requirement for the PRC to approve a project application is that the PRC must determine that "[t]he alternative contracting procedure will provide a substantial fiscal benefit of the use of the traditional method of awarding contracts in lump sum to the low responsive bidder is not practical for meeting desired quality standard or delivery schedules …" RCW 39.10.280(2)(a). The only support in the OPUD's application that this project will provide a substantial fiscal benefit is found at section 6, pages 3-4. The application states that the design-build project delivery "will enable the District to make better risk-informed decisions in finalizing the engineering design and implementation plan for the project with early contractor input regarding project design configuration, equipment procurement, cost, schedule, and construction planning." Does the PRC contend that this is enough to meet the statutory requirement of showing that the design-build process will provide a *substantial fiscal benefit*? Will the PRC require the OPUD to provide further justification regarding the fiscal benefit of the use of the design-build process on this Project?

3. The OPUD does not have the necessary and appropriate funding for this Project

Next, RCW 39.10.280 requires that the public body have the necessary experience or qualified team to carry out the alternative contracting procedure. *Id.* at (2)(c). The requirements of condition (2)(c)(i), (ii), and (v) were discussed above. Condition (2)(iv) requires that the public body have "the necessary and appropriate funding and time to properly manage the job and complete the project." Similarly, condition (2)(vi) requires that the public body have the "necessary and appropriate construction budget." Regarding the funding for this project, the OPUD application states that it will fund the design and construction of this Project on short-term credit from commercial banks, and then once the Project is complete, the cost of the Project will be secured by "power generation revenue." *See* section 3.B. Is Columbiana correct in understanding that this Project, including its commercial bank financing, will ultimately be paid for by the ratepayers of Okanogan County?

Importantly, the third study conducted by Rocky Mountain Econometrics in 2016, attached hereto as Attachment 2, found that this Project is not economically feasible. Ultimately, the study concludes that if the Project is built, it will lose at least $26 on every Megawatt-hour (MWh) that it generates. The PRC should review this study in its consideration of whether the OPUD has the "necessary and appropriate construction budget" for this Project and should conclude that it does not. In light of this study, does the PRC agree that the Project is economically infeasible?

4. Approval of this Project is not in the public interest.

Finally, RCW 39.10.200 defines the purpose of RCW Chapter 39.10, which outlines the requirements for the design-build process, stating in part that the purpose is "to prescribe appropriate requirements to ensure that such contracting procedures **serve the public interest**." (emphasis added). As such, in considering the OPUD's application, the PRC should keep the public interest in mind. It is clear from the resistance the OPUD has seen to this Project that the public feels that this Project is not in its best interest. The Rocky Mountain Econometrics study (Attachment 2) confirms the public sentiment that this Project is not in its best interest. This Project will lose money, and the ratepayers of the County will be left paying the bill. As the PRC is aware, it is obligated to consider all public comments it receives on this Project. RCW 39.10.280(3).

Columbiana urges the PRC to consider this letter as well as all the other comments received on this Project. The PRC should ultimately conclude that the OPUD failed to meet the obligations required for project approval, and that approving this application to allow the OPUD to utilize the design-build process is not in the public interest. At the very least the PRC should require the OPUD to submit a more thorough application, which the PRC could then reconsider at a later date.

Sincerely,

Stuart R. Gillespie
Columbiana
2055 Chesaw Road
Oroville WA 98844
509.485.3844

ATTACHMENT 1

The Columbia Basin Weekly Fish & Wildlife News Bulletin

Okanogan PUD Decides Not To Pursue Building New Dam/Reservoir On Similkameen River

Posted on Friday, September 30, 2011 (PST)

The Okanogan County Public Utility District in a letter dated Monday, Sept. 26 asked the Federal Energy Regulatory Commission to accept the district's offer to voluntarily surrender its preliminary permit to build the Shankers Bend Dam on the Similkameen River in north-central Washington.

The surrender petition can be found at:
http://www.okanoganpud.org/shankers/Shankers%20Bend%20Voluntary%20Surrender%20Letter%209-26-11.pdf

The preliminary permit was issued by FERC on Dec. 18, 2008, and gave the PUD 36 months to conduct investigations and secure data necessary "to determine the feasibility of the proposed project and, if said project is found to be feasible, prepares an acceptable application for license."

"The district has diligently pursued its studies and analysis of the option of developing and licensing the project, as detailed in the progress reports filed under this preliminary permit. Due to a variety of district concerns that become evident in the district's studies of the potential project and also experience gained in the course of the ongoing licensing proceeding for Enloe Hydroelectric Project…, the district concludes that it would not be prudent to pursue the licensing of the project at this time," the Okanogan County PUD's letter says.

The proposed dam and associated facilities were to be located just upstream of the district's Enloe Dam at approximately river mile 7.3 in what is commonly referred to as Shanker's Bend. The Similkameen River is a tributary to the Okanogan River, which feeds into the Columbia.

The project was proposed for study in coordination with the state of Washington's Columbia River Water Management Program. The 2006 Washington Legislature approved legislation to develop new water supplies and improve water management. The legislation included a commitment of $216 million.

In 2007, the Washington Department of Ecology provided $300,000 through the water management program for the PUD to conduct an appraisal level review of the site. The appraisal level analysis concluded that constructing any of the three dam height alternatives being considered on the Similkameen River were potentially viable from an engineering standpoint.

The Shanker's Bend Project studied various alternatives including dam heights ranging from 90 to 260 feet. At 260 feet the dam will be approximately 1,200 feet long and impound an 18,000 acre reservoir with a storage capacity of 1.7 million acre-feet.

Environmental advocates criticized the proposal because of the prospect of flooding riparian habitat. They also protested the potential relicensing of Enloe without requiring fish passage,

"The Similkameen River is an international river and treasure," said John Osborn, a Spokane physician, board president of Center for Environmental Law and Policy and coordinator of Sierra Club's Columbia River Future project. "Not building the Shanker's Bend dam is the right decision for taxpayers and the river." He noted that Canadian interests had also lobbied, and testified, against the proposal because the new dam would have also inundated lands north of the border.

The 156-mile-long river drains the east slope of the Cascade Mountains. Most of the 3,600 square mile watershed -- 90 percent -- is in Canada. The Similkameen River flows into the U.S. section of the

Okanagan River south of Osoyoos Lake, which straddles the border. CELP and other groups have asked that passage for salmon and steelhead be required at Enloe Dam as part of any new FERC license, or that the long idle dam be removed.

"Enloe Dam is the remaining obstacle for salmon," said Osborn. "Earlier this month we watched dam removal begin on the Elwha River in western Washington. The Enloe Dam also needs to come down. Enloe Dam removal has long been proposed to help mitigate for salmon run extinctions and damage from massive dams on the mainstem Columbia River."

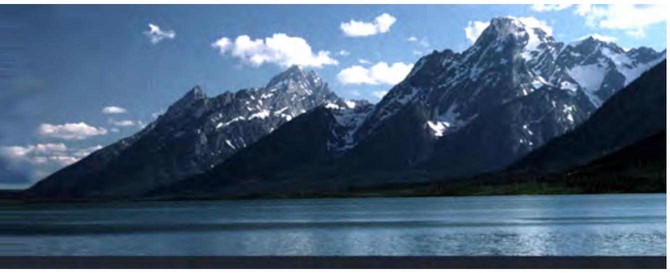
Enloe Dam was completed in 1920 by Eugene Enloe to serve the mining community of Nighthawk upstream from the project and the crossroads town of Oroville downstream, near the Canadian border. It was purchased by the PUD in 1945.

Due to obsolescence of the generating equipment and the availability of cheaper power from other sources, the PUD ceased operations in 1959. The facilities have since sunk into extreme disrepair.

Since the late 1970s the PUD has sought and received operating licenses that would have allow restoration of the facility, but those licenses were all subsequently rescinded by FERC over disagreements with respect to upstream fish passage at Enloe Dam.

The final application now under consideration, which was submitted in August 2008, focuses on providing downstream habitat improvements for fish rather than providing passage to the upper reaches of the river. That process is now in its final stages.

Rocky Mountain Econometrics
208-344-0809 P.O. Box 1914 tjones@design4000.net
208-631-4334 Cell Boise, ID. 83701 www.rmecon.com
Anthony Jones - Principal



2016
3rd REVIEW OF THE ECONOMICS
OF RESTORING HYDROPOWER AT ENLOE DAM
ON THE SIMILKAMEEN RIVER

ANALYSIS OF THE PUBLIC UTILITY DISTRICT NO. 1 OF OKANOGAN COUNTY'S FINAL LICENSE APPLICATION FOR FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 12569

Prepared for

Columbia River Bioregional Education Project
Columbiana

July 1, 2016

By

Anthony Jones
ROCKY MOUNTAIN ECONOMETRICS
www.rmecon.com

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EXECUTIVE SUMMARY

Enloe Dam is located on the Similkameen River in north-central Washington, approximately four miles upriver from the town of Oroville. The dam was completed in the early 1920's, and produced hydropower until the project was decommissioned in 1958.[1] Since that time, the dam and its related power-generating facilities have sat dormant, although the owner of the dam, the Okanogan Public Utility District (OPUD), has attempted to re-energize Enloe four times over the years. OPUD began its most recent effort to update and repower the project in 2005 with a proposal to modify and upgrade the dam. OPUD submitted a Final License Application for re-energizing Enloe Dam on August 22, 2008, and the Federal Energy Regulatory Commission (FERC) issued a new license for the project on July 8, 2013. OPUD proposes to increase the annual generation at Enloe to 45,000 MWH, up from its original annual output of 22,500 MWH.

In its 2008 Final License Application, OPUD estimated that it would cost $31 million to construct the project. In 2011 Rocky Mountain Econometrics (RME) reviewed OPUD's FERC application, and noted that OPUD had failed 1) to predict the sharp downturn and lower long-term open market energy prices, and 2) to recognize the aesthetic value of Similkameen Falls, which are located immediately downstream of the dam. OPUD's omission of these issues meant that the cost of power generated by the proposed project would be more expensive than anticipated. While OPUD initially estimated that power from Enloe would be $9.79 / MWH cheaper than power on the open market, RME's 2011 review showed that the cost of power generated by the proposed project would actually be $31.16 / MWH more than power purchased on the open market.

In 2014, RME reviewed the Enloe project a second time, and reported that inflation would drive the cost of the project up to about $38 million. And, contrary to OPUD predictions, the price of open market power at MID-C (OPUD's least cost alternative) had decreased by fifty percent or more. Not only had open market prices precipitously declined, they were showing no signs of a major upturn.

In 2014, RME also detailed the impact of the uncertainty surrounding Enloe's ultimate level of energy production. The Department of Ecology (DOE) has set initial flows at 10/30 cfs. The actual flows required for aesthetic purposes will be determined by the DOE after studying three years of power house operations.

[1] *Federal Energy Regulatory Commission,* Notice of Availability of Final Environmental Assessment Environmental Assessment, Public Utility District No. 1 of Okanogan County, Washington, Project No. P-12569, p. viii, (August 31, 2011) (FERC eLibrary Accession No. 20110831-3040)

Even if the aesthetic flows were only 10-30 cfs, construction cost increases would drive the cost electricity produced at Enloe to about $47 / MWH more than energy purchased on the open market. If aesthetic flows in excess of the 10-30 cfs were required, Enloe production costs per MWH would be higher still. At an aesthetic flow of 300 cfs, the cost of power from Enloe would reach $102 / MWH, which is more than double the cost of open market power.

RME's 2016 analysis shows the cost of constructing Enloe Dam has continued to increase since the 2014 review. OPUD submitted a revised estimate of construction costs in their November 17, 2014 Enloe Power Point presentation. OPUD estimated the cost of the proposed power house at between $39 million and $45 million.

In addition to this new and increased cost of construction, OPUD also revealed that it had invested $13 million from general revenues towards the project between 2010 and 2015.

OPUD's budget for 2016 proposes an additional $1.3 million of general funds be spent on Enloe, bringing total pre-construction spending on the project by the end of 2016 to $14.4 million.[2] OPUD refers to these additional, pre-construction costs as "sunk costs." When taking these costs into account, total spending on Enloe would be at least $53.4 million, and could easily reach $59.4 million or more.

There are three possible future cost scenarios for the project. The least restrictive future for Enloe Dam assumes that the cost of construction is $39 million ignores pre-construction "sunk cost" spending, and assumes that aesthetic flow requirements will be as lenient as possible. Under this scenario, power produced by Enloe Dam will cost about $83 / MWH. This is more than double the price of power on the open market.

The next scenario assumes that the cost of construction remains $39 million, includes a 10/30 cfs aesthetic flow and $14.4 million in preconstruction "sunk cost" spending by the end of 2016. Under this scenario, the cost to produce power at Enloe Dam will be about $110 / MWH. If this scenario proves accurate OPUD ratepayers will be paying close to three times the cost of open market power.

The worst-case scenario assumes that total cost will be $59.9 million. This includes construction costs of $45 million, $14.4 million in preconstruction "sunk cost" spending, and assumes the highest possible aesthetic flow of 300 cfs. Under this scenario, the cost to produce power at Enloe Dam will be about $149 / MWH. If this alternative comes to pass, OPUD ratepayers will be paying nearly four times as much for Enloe energy than power purchased on the open market.

[2] See Appendix 3.

The issues that RME outlined in our 2011 and 2014 reports remain today. These include:

- Inflation has driven up the cost of Enloe Dam construction.
- The cost of acquiring power on the open market has not inflated.
- There is still no determination regarding the amount of water that would be required for aesthetic flows, and it remains uncertain how much power Enloe would ultimately produce.
- The total costs for the project are ballooning to as much as $59 million, which is about double the original cost estimate. The ratepayers will be responsible for paying these costs.

ENLOE DAM ENERGY PRODUCTION COST ESTIMATE

OPUD's application to FERC lists the cost of constructing Enloe as $31 million.[3] In 2014 RME estimated that inflation would increase the cost of the project to about $38 million. In November of 2014 OPUD reviewed the project and concluded that inflation would drive the cost of the project even higher, to about $39 million.[4]

2014 brought the awareness that the $39 million estimate was only for a portion of the project. As much as one-third of the cost of the project was, and is, being funded via yearly cash flow distributions as high as $3.1 million. The cost of Enloe, once thought to be $31 million, now appears to be headed for nearly double that amount, perhaps more.

None of the FERC application documents mention that OPUD intended to finance a large portion of the project from annual cash flows. Consistent with the FERC application, RME assumed OPUD's annual spending on Enloe was a part of, rather than an addition to, the $31 million FERC estimated cost. OPUD's 2014 PowerPoint presentation[5] showed RME's assumption to be invalid.

The first mention that OPUD was spending significant amounts of money on Enloe above and beyond the $31 million construction cost estimate was in a 2014 PowerPoint presentation to the OPUD Board of Commissioners. In that presentation total cost for Enloe is listed as $50.2 million, with the cost to complete the project listed as $39.1 million. Inflation can only account for the increase in cost from the original $31 million to the $39.1 million cost to complete. Sunk Costs are listed as $11.1 million

It is normal and customary for utilities to spend a portion of their administrative costs investigating and maintaining plans for servicing future load growth. These activities are usually called something like Integrated Resource Plans (IRPs). And, it is not unusual for IRPs to delve superficially into the specifics of potential future resources.

In the event that a particular new generation project is identified as needed and the decision is made to pursue said project, it is appropriate to establish an account for the project and direct all costs associated with the project towards that account. This includes all consulting, planning and permitting costs as well as the ultimate brick and mortar construction costs. The planning and permitting costs are a component of the ultimate capital cost of a project the same way that the cost of an engineering drawing is an essential part of the fabrication of a generator or a turbine.

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[3] 144 FERC ¶ 62,018 ,UNITED STATES OF AMERICA, FEDERAL ENERGY REGULATORY COMMISSION Public Utility District No. 1 of, Okanogan County, Washington, Project No. 12569-001, ORDER ISSUING NEW LICENSE, (July 9, 2013).

[4] Board of Commissioners Meeting, Enloe Hydroelectric Project, Public Utility District No. 1 of Okanogan County, November 17, 2014

[5] Ibid.

Table1, Enloe Dam Production Cost Possibilities

		OPUD Scenarios[6]			RME Scenarios[7]			
	Scenarios	1	2	3	4	5	6	7
Notes	Title / Description	Enloe 2014 (Minus Sunk)	Enloe 2014 Adverse Cost (Minus Sunk)	Enloe 2014 Adverse Cost (w / Sunk)	RME 10-30 (w / Sunk Thru 2016)	RME 100 (w / Sunk Thru 2016)	RME 300 (w / Sunk Thru 2016)	RME 300 (w / Sunk Thru 2016)
	Date of Estimate	2014	2014	2014	2016	2016	2016	2016
	Capital Cost ($1,000)	$39,100	$45,500	$56,560	$53,500	$53,500	$53,500	$59,900
1	Levelized Ann. Operating Cost ($1,000)	$3,684	$4,236	$5,190	$4,926	$4,926	$4,926	$5,478
2	Est. Avgas Ann. MWH	44,963	44,963	44,963	44,963	42,246	36,705	36,705
3	Operating Cost ($/MWH)	$81.93	$94.21	$115.43	$109.56	$116.61	$134.21	$149.25

Table 1, above, presents 7 production cost scenarios for Enloe dam. Scenarios 1 – 3 are taken almost verbatim from OPUD's 2014 PowerPoint presentation. They show the cost of construction ranging from $39.1 million without sunk costs to as much as $56.6 million with potential cost overruns and the inclusion of sunk costs. These construction costs will result, respectively, in annual operating costs ranging from a low of $3.7 to $5.2 million. Under the least restrictive esthetic flow requirement, the 10-30 alternative, the project will generate about 45,000 aMwh of energy. Dividing the annual operating costs by the annual generation results in the potential energy from Enloe costing somewhere between $82 and $115 per MWH. To reiterate, these three scenarios close reproductions of OPUD's analysis.

Scenarios 4 – 7 are RME scenarios. These scenarios build on the cost estimates provided in OPUD's 2014 PowerPoint presentation. They also incorporate the effect of reduced levels of generation as a result of pending determinations regarding required esthetic flow requirements.

Scenarios 4 – 6 each use total capital cost of $53.5 million as a starting point. This is based on $39.1 million construction cost plus $14.4 sunk costs through the end of 2016. These construction costs will result in annual operating costs of $4.9 million. Under the least restrictive esthetic flow requirement, the 10-30 alternative, the project will generate about 44,963 aMwh of energy. Under the most restrictive scenario, the requirement for 300 cfs esthetic flows will limit energy output to 36,705 aMwh. Dividing the annual operating costs by the annual generation results in the potential energy from Enloe costing somewhere between $109 and $134 per MWH.

Scenario 7 presents a worst-worst production cost scenario. In this case, OPUD's adverse cost estimate of $45.5 million is added to sunk costs of $14.4 through 2016 for a total cost of $59.9

[6] Ibid.

[7] Source, OPUD and RME.

million. This generates an annual operating cost of $5.5 million. Under the most restrictive, 300 cfs, flow alternative there will be only 36,705 aMW to absorb annual costs resulting in Enloe energy costing $149 / MWH.

To summarize, it appears that the $31 million cost estimate in the FERC application only refers to the brick and mortar portion of Enloe dam. Inflation since 2007 has driven this cost up to about $39 million and potentially more. Off budget spending on Enloe beginning in about 2010 now totals in excess of $13 million. The budget for 2016 proposes an additional $1.3 million to be spent on Enloe, bringing total cash flow spending on the project at the end of 2016 to about $14.4.[8] Adding the latter amount to the brick and mortar portion brings the total potential cost of the project to at least $53 million. <u>Under the least stringent esthetic flow scenario, the 10-30 cfs option, the cost to produce Enloe power will be about $110 / MWH.</u>

A worst-worst scenario that includes the cost over-runs documented in the 2014 PowerPoint by OPUD, the $14.4 cash flow spending from budgets 2010 – 2016, and the 300 cfs esthetic flow restrictions, will result in power produced by Enloe Dam costing about $149 / MWH.

[8] See Appendix 1

LEAST COST ALTERNATIVE POWER - OPEN MARKET ENERGY

In this section RME will show that open market energy is a cheap and reliable source for the equivalent amount of energy that Enloe would produce.

Pacific Northwest Power Resources

Table 2, below, illustrates total annual average northwest energy portfolio of 28,900 aMW.

Table 2, Pacific Northwest Energy Supply Sources[9]

Resource	Pacific NW Regional Annual Energy Resources (aMwh)	Percent of Total
Hydro	11,862	41.0%
Large Thermal and Combustion Turbines	11,851	41.0%
Cogeneration and Renewables	4,418	15.3%
Imports, Small Thermal & Misc.	769	2.7%
Total PW Regional Resources	28,900	100.0%

Source White Book 2014 pp. 43

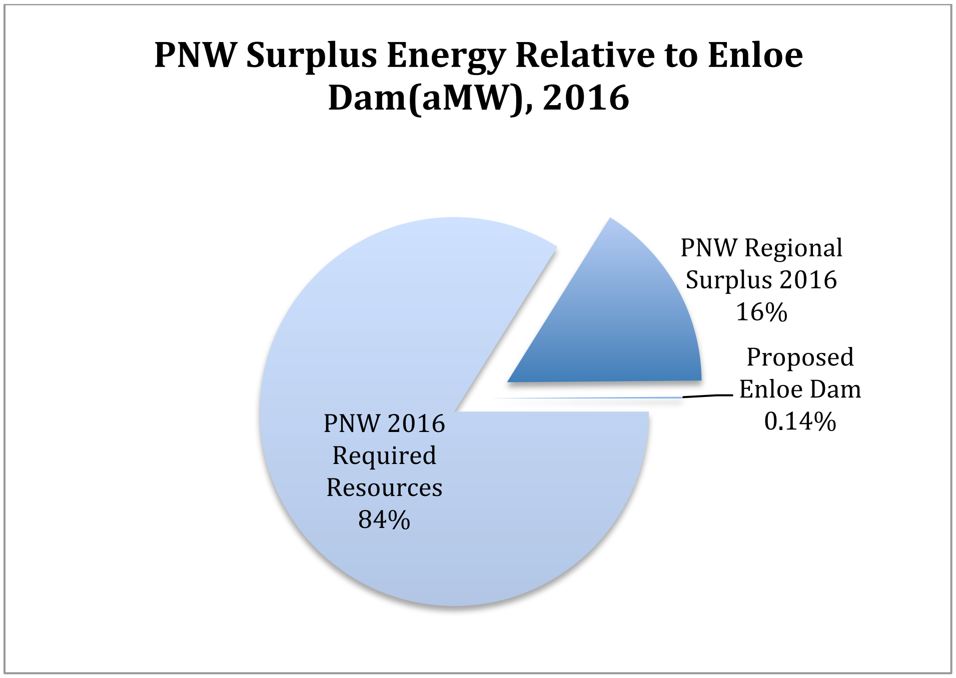
In 2016, the Pacific Northwest will use about 84 percent of its energy generating potential.

Table 3, Pacific Northwest Energy Surplus Quantities[10]

Enloe v Surplus Energy	2016	%
PW Regional Surplus 2016	4,616	15.97%
Proposed Enloe Dam	40	0.14%
PNW 2016 Required Resources	24,244	83.89%
Total PNW Regional Resources	28,900	

[9] Source: Bonneville Power Administration, 2014 Pacific Northwest Loads and Resources Study, January 2015, Table 1-6, PNW Regional Resources, OY 2016, 1937-Critical Water Conditions, pp.12, and RME.
[10] Source White Book 2014 pp. 43

<u>Chart 1, Pacific Northwest Energy Surplus</u>



At roughly 40 aMW of generation on a good year, Enloe dam would amount to less than two-tenths of one percent of total northwest capacity. If built, the dam would only amount to 0.87% of northwest surplus generation.

More simply, Enloe Dam relative to either the generating capacity of the rest of the northwest, or to the more limited surplus capacity in the northwest, is simply too small to have any measureable impact. In calculations relative to sourcing Enloe amounts of energy via the open market, Enloe is a non-factor.

Open Market Price Expectations

The six year span from 2002 to 2008 saw western open market prices slightly more than double from about $30 / MWH to about $70 / MWH in 2008, the year of the crash.

The rate at which open market energy prices inflated was extreme by historical standards but not as extreme as the rate at which they deflated during the recession.

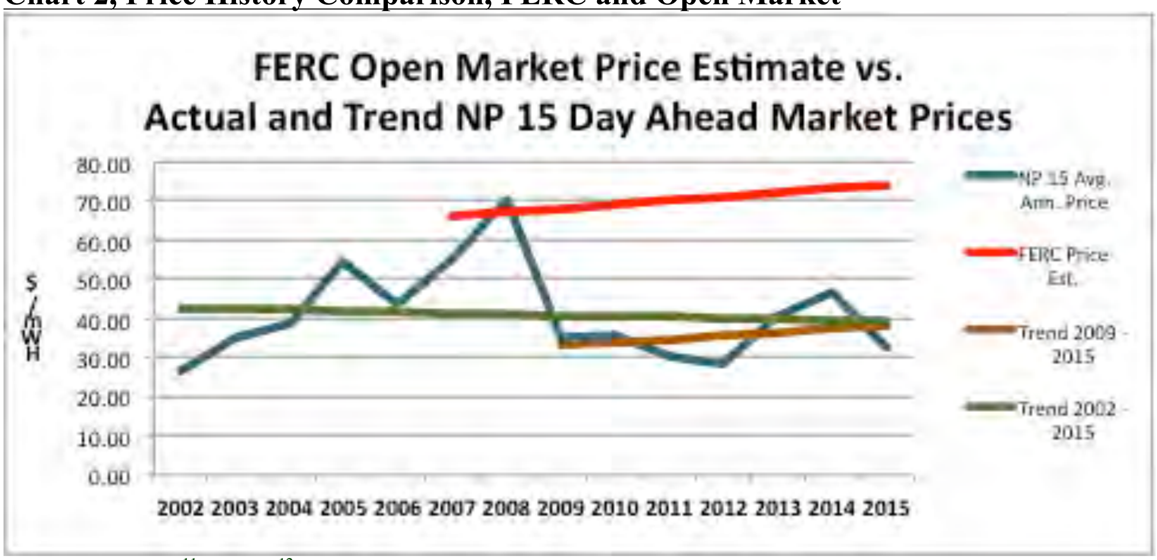
While it took 6 years for open market energy prices to increase from $30 to $70, it only took one year for them to drop all the way back down. The recession undoubtedly deserves much of the credit for the price decline, but other factors came into play as well. In addition to static or even declining demand, significant new amounts of wind generation, solar generation and other resources in the NW also get credit. The addition of significant amounts of wind and solar is important in this context because they have very low, perhaps zero, marginal generation cost. This is in addition to the pre-existing situation whereby the west in general and the northwest in particular are hydropower intensive. Similar to wind and solar, hydropower also has minimal marginal production cost.

The issue of zero, or near zero, marginal production cost is important. Energy markets such as MIDC or NP15 are open markets, similar to auctions. Prices in these markets are based on marginal costs and unlike regulated utilities the price of energy in these markets is not required to recover fixed costs.

In these markets willing sellers offer energy to willing buyers at whatever price the parties agree. If prices are too low for a seller to recoup their variable costs, things like fuel costs, they will usually not put their power for sale on the market. If prices are high enough that a seller can cover their variable costs, and at least some of their overhead, they will offer their power in this market. They obviously would prefer to sell at higher prices than at lower prices. However, selling at prices that cover all their variable costs and at least some of their overhead is better than not selling anything at all. Without the requirement of cover fixed costs energy in these markets routinely sells in the teens or low single digits.

On average, in the northwest, energy supply exceeds demand by about 16 percent. That number is higher most nights, and substantially higher in the spring when rivers are at peak runoff. During those times utilities flood the market with their surplus power at bargain basement prices. There is less surplus energy available during peak hours, particularly during late summer when river flows are lower. However, there is ample surplus energy to supply the minor amounts of energy we are talking about for OPUD. And on average, energy prices remain low.

Chart 2, Price History Comparison, FERC and Open Market



Sources: CAISO[11], FERC[12], and RME.

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[11] http://oasis.caiso.com/mrioasis/logon.do

In 2008, NP15 prices were above 100 / MWH for the month of June, and averaged 70.43 / MWH for the entire year. By 2011 prices at NP15 had dropped to 30 / MWH and it appeared they would continue even lower.

Since RME's review of this subject in 2014, prices have been as high as the mid $40s, and as low as $28 for full years. The price of energy at NP15 in 2015, at $32.45 / MWH, was the forth lowest in the past 14 years.

For a working number for this analysis RME looked at the average for the past 14 years, the trend for the past 14 years, and the trend for the post recession years, 2009-2015.

Open market NP15 day ahead energy prices were $26.39 / MWH in 2002. Six years later prices had escalated to $70.44 for 2008, before crashing back down to $35.11 the following year. Since then, price variations have stayed in a much narrower range, between $28.32 in 2012 and $40.70 in 2014. The average for the full 14 year period is $40.88 / MWH.

If we look at the trend line associated with NP15 prices since 2002 we see a downward sloping line with a value of $39.19 / MWH in 2015. RME is an admitted proponent of open market energy for utilities with modest means. At the same time, RME is hesitant to hang its hat on long term downward sloping price curves.

Table 4, Price History Comparison, FERC and Open Market

Year	NP 15 Avg. Ann. Price	Trend 2009 - 2015	Trend 2002 - 2015	FERC Price Est.
2002	**26.39**		**42.58**	
2003	**35.02**		**42.32**	
2004	**38.54**		**42.06**	
2005	**54.74**		**41.80**	
2006	**43.47**		**41.54**	
2007	**54.79**		**41.27**	**66.00**
2008	**70.44**		**41.01**	**67.00**
2009	**35.11**	**32.95**	**40.75**	**68.00**
2010	**35.78**	**33.82**	**40.49**	**69.00**
2011	**30.01**	**34.70**	**40.23**	**70.00**
2012	**28.32**	**35.57**	**39.97**	**71.00**
2013	**40.60**	**36.44**	**39.71**	**72.00**
2014	**46.70**	**37.31**	**39.45**	**73.00**
2015	**32.45**	**38.19**	**39.19**	**74.00**
Average	40.883			

Sources: CAISO,[13] FERC[14], RME.

[12] Op. Cit. 1.

[13] Op. Cit. 20.

[14] Op. Cit. 1.

In effort to separate post economic crash numbers from the longer price curve RME looked at the price trend beginning in 2009. For the seven-year period 2009 through 2015 the NP15 price curve is upward sloping and gains about 2.65 percent per year. In other words, open market energy prices have increased at about the same rate as inflation for the past 7 years.

RME finds it interesting that three separate statistical approaches arrive at a range of prices separated by only $2.69 / MWH. With a high of $40.88 and a low of $38.19, for the purposes of this analysis, RME took a middle point of $40.00 / MWH to use as the alternative energy cost to compare against the various Enloe Dam Scenarios.

To summarize, RME admits that open market prices are more volatile than the known price of a fixed investment such as Enloe. However, the most optimistic estimate for the cost of Enloe power is worse than the worst full year average of open market prices in the past 14 years.

ENLOE DAM – PROFIT (LOSS) ESTIMATION

Table 4 below reprises Table 1 on page 6 and adds additional rows at the bottom for the purpose of comparing estimated Enloe production costs to open market prices.

Looking at the three OPUD scenarios on the left, Enloe Dam production cost is estimated to range from a low of $81.93 to a high of $115.43. With open market alternative power costing only $40 / MWH, Enloe, under these three scenarios, will lose between $42 and $75 on each MWH of energy it produces. On an annual basis under these three scenarios, if Enloe is built, OPUD will be spending between $1.9 million and $3.4 million more for energy than if they sourced the same amount of power on the open market.

Table 5, Enloe Dam Production Cost Estimates

		OPUD Scenarios			RME Scenarios			
	Scenarios	1	2	3	4	5	6	7
Notes	Title / Description	Enloe 2014 (Minus Sunk)	Enloe 2014 Adverse Cost (Minus Sunk)	Enloe 2014 Adverse Cost (w / Sunk)	RME 10-30 (w / Sunk Thru 2016)	RME 100 (w / Sunk Thru 2016)	RME 300 (w / Sunk Thru 2016)	RME 300 (w / Sunk Thru 2016)
	Date of Estimate	2014	2014	2014	2016	2016	2016	2016
	Capital Cost ($1,000)	$39,100	$45,500	$56,560	$53,500	$53,500	$53,500	$59,900
1	Levelized Ann. Operating Cost ($1,000)	$3,684	$4,236	$5,190	$4,926	$4,926	$4,926	$5,478
2	Est. Avgas Ann. MWH	44,963	44,963	44,963	44,963	42,246	36,705	36,705
3	Operating Cost ($/MWH)	$81.93	$94.21	$115.43	$109.56	$116.61	$134.21	$149.25
4	Open Market Price for Power ($/MWH)	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00
5	Value of Enloe Power Production ($1,000)	$1,799	$1,799	$1,799	$1,799	$1,690	$1,468	$1,468
6	Profit (Loss) (Relative to Alternative Power) ($1,000)	$(1,885)	$(2,437)	$(3,391)	$(3,128)	$(3,236)	$(3,458)	$(4,010)
7	Profit (Loss) ($/MWH)	$(42)	$(54)	$(75)	$(70)	$(77)	$(94)	$(109)

Looking at the four RME scenarios on the right, production cost is estimated to range from a low of $109.56 to a high of $149.25. With open market alternative power costing $40 / MWH, Enloe will lose between $70 and $109 on each MWH of energy it produces. On an annual basis under these four scenarios, if Enloe is built, OPUD will be spending between $3.1 million and $4 million more for energy, every year for 40 years, than if they sourced the same amount of power on the open market.

Chart 3, Enloe Dam Operating Cost vs. FERC Thermal and Open Market Energy

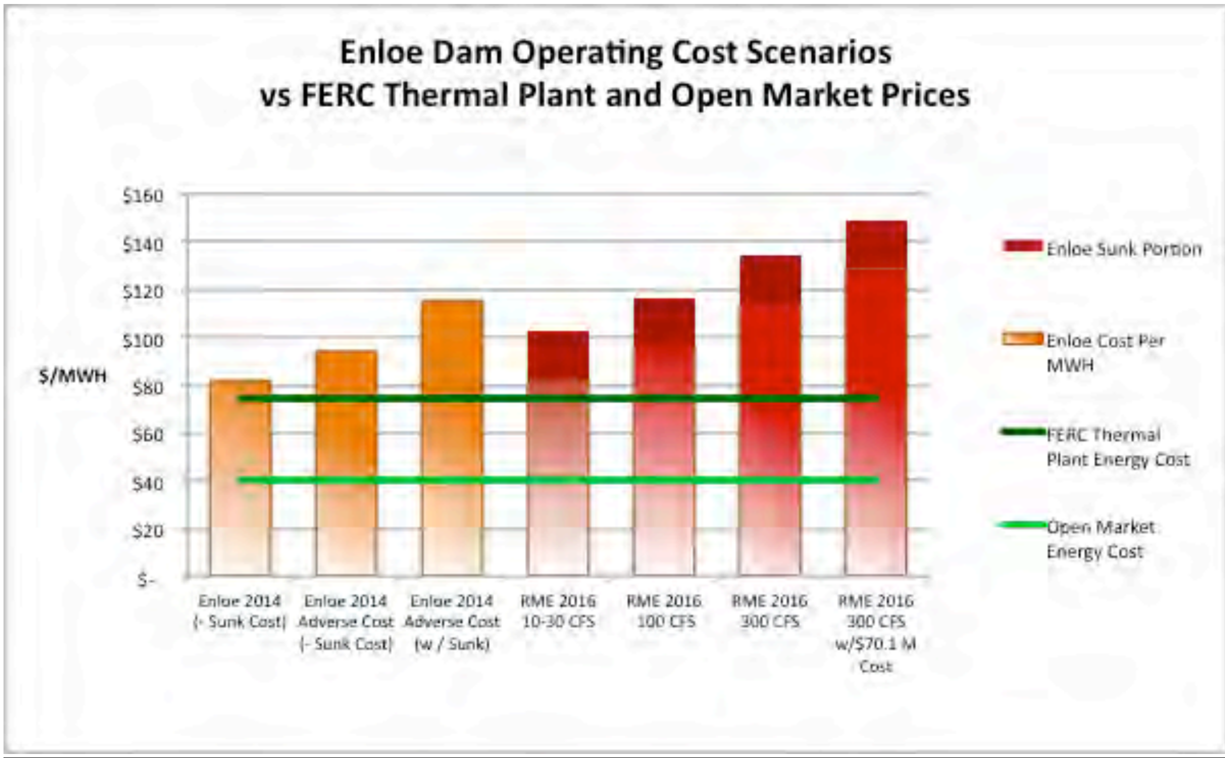


Chart 3 above graphically presents the finding in Table 5 on the previous page. Additionally this chart also shows both the open market and FERC price hurdles Enloe energy needs to stay under for Enloe to be deemed a desirable investment.

If we ignore sunk costs, and the possibility of a substantial requirement for esthetic flows over the falls, Enloe power will cost about $83 / MWH. That is what Enloe power will cost, every year for the next 40 years. At that level, it is reasonably close to the FERC's alternative cost of $79 per MWH. However, at $83 / MWH, best case Enloe will be more than double the average cost of open market power. It will even be higher, by $13 / MWH, than the worst-case open market power in the last 14 years at $70 / MWH.

At the right hand end of the list of scenarios, the worst-worst case shows Enloe energy costing $149 / MWH. If built, that will mean Enloe power will come in at 270% higher than energy readily available on the open market.

APPENDIXES

Appendix 1, Could OPUD run Enloe at a loss while the construction debt is being retired and then become profitable in later years?

This is a common belief among energy developers, particularly hydroelectric developers.

The issue, in economic terms, is whether or not the developer can ever get “in front” of the interest on the original debt.

The general idea is that, if a developer can build a project, and can hang on until the construction debt is retired, decades into the future, the project will then be much cheaper to operate and will then be become sufficiently profitable that it makes up for all the previous year’s losses.

The concept is technically possible but in practice the occurrence is rare. The reason is that the debt from each succeeding year gets stacked on top of the debt from all the preceding years, in addition to all the interest on all the debt from all the preceding years. As time marches on the pile of debt gets bigger and bigger to the point where the accumulated debt becomes bigger, much bigger than the original investment.

For a project to successfully follow this path the interest rate has to be low, the annual losses have to be minimal, the time period of initial losses has to be short (usually less than 5 years) and the post–debt-payoff profitability has to be high. Enloe fails on every factor except the interest rates.

Anyone who has looked at an annuity knows how this works. If you put a sum of money in a savings account each year for decades at a time, the accumulated total, plus interest will result in a surprisingly large amount after the passing of three or four decades. The same is true in reverse. If the loses are incurred each year, for decades at a time, the resulting pile of debt, plus interest, will be disturbingly large after the passing of several decades.

The example presented in Table 7 below illustrates the problem. This example assumes the project produces 44,409 MWH of energy. In the first year of operation the avoided cost price of power (NP 15 Open Market Power) is $40 / MWH, and revenues are $2.1 million per year. The Capital cost of the plant is $39.1 million that, at 4.5% interest for 40 years, requires an annual payment of $2.125 million. Insurance, taxes, M&O, etc. bring total year one operating costs to $3.3 million. This results in a net loss in the first year of operation, relative to open market prices, of $1.5 million. In following years all costs and all prices, with the exception of the fixed construction loan and the loan for environmental features, are inflated at 3% per year. The loans for construction and environmental features remain fixed for the life of the loans.

Another simplifying assumption, in Enloe’s favor, is that there will be no need for additional capital expenditures for such things as repair and replacement of control gates, turbines, substations, etc., ever.

The question becomes one of how to handle the annual losses. Strictly speaking, OPUD can raise rates and cover the cost. However, that does not alter the fact that their ratepayers would be paying more than would be the case if OPUD acquired the same amount of power at NP15. For the purpose of this example RME rolls each year's losses into the equivalent of a running line of credit with a 20-year amortization schedule at 5.5% interest.

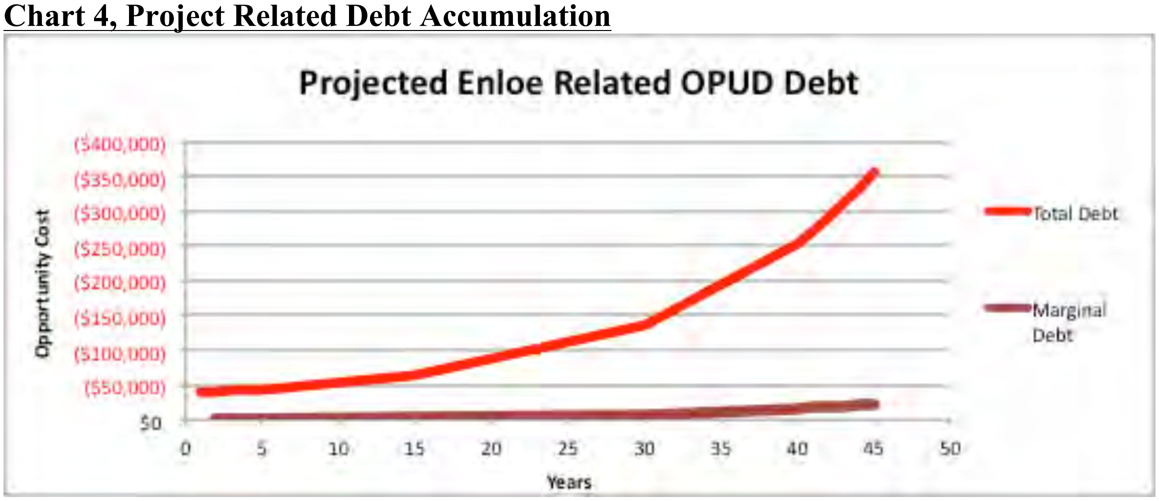
In the first few years of the project, the problem does not appear to be too severe. Losses in year one are $1.5 million. In years two through five the annual losses continue to get a little bigger but they still seem manageable. Total debt in the line of credit in year 5 is has grown to $6.4 million.

The problem starts to become more evident out around year 15. At that point, even though the annual losses are only up to the $2.5 million range, the year after year accumulation, plus interest, is starting to pile up. In year 15 the line of credit is up to $31.4 million, within 20 percent of the construction cost of the dam.

By year 30 it is clear things are have gotten out of hand for OPUD ratepayers. In year 30 the annual accumulation of debt, and interest on the debt, has driven debt in the line of credit account to $118 million, more than triple the cost of the project. At that point the cost of servicing the original debt, plus the cost of servicing the line of credit, drives annual losses up to $9.6 million, roughly 6 times the annual losses in year one.

Fast forward to year 42 of the project. The original loan for the project will be paid off at the end of year 40, or the beginning of year 41. That is the good news. That means the annual debt service associated with that debt, $2.1 million per year would cease. The bad news is the debt in the line of credit account will have risen to $273 million, which is more than 7 times the original construction cost. At that point the project will be losing about $20 million per year and the amount will keep going up until the line of credit devours OPUD. The result is presented graphically in Chart 4 below.

Chart 4, Project Related Debt Accumulation



Again, these are not literal loses to OPUD, the company. They will not, strictly speaking drive OPUD bankrupt. However, they are literal losses to OPUD Ratepayers. These numbers represent real loses to ratepayers who have a reasonable expectation for OPUD to provide power in a least cost fashion.

Table 6, OPUD Dept. Accumulation Example - Original Debt Payoff in 40 Years

Year		**1**	**2**	**5**	**15**	**30**	**40**	**41**	**42**	**43**	**44**
Annual Generation (MWH)		45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Open Market Price		$0.04	$0.04	$0.05	$0.06	$0.09	$0.13	$0.13	$0.13	$0.14	$0.14
"Revenue"		$1,800	$1,854	$2,026	$2,723	$4,242	$5,701	$5,872	$6,048	$6,229	$6,416
Plant Investment											
Plant Investment Debt		$39,100	$38,735	$37,537	$32,184	$18,122	$2,033				
Annual Cost											
I. Construction Debt Service											
a. Interest on Capital	**4.5%**	$1,760	$1,743	$1,689	$1,448	$816	$91				
b. Capital recovery cost (40yr, 4.5%)	0.93%	$365	$382	$436	$677	$1,309	$2,033				
Total Plant Debt Service		$2,125	$2,125	$2,125	$2,125	$2,125	$2,125				
			$747	$1,999	$7,593	$22,287	$39,100				
Line of Credit - Operating Debt											
Total Operating Debt			1,453	6,379	31,415	118,901	253,421	272,824	291,526	311,597	333,140
a. Interest on Capital	**4.5%**		65	287	1,414	5,351	11,404	12,277	13,119	14,022	14,991
b. Capital recovery cost (20yr, 5.5%)			46	203	1,001	3,790	8,078	8,697	9,293	9,933	10,619
Total Op. Debt Service			112	490	2,415	9,141	19,482	20,974	22,411	23,954	25,611
II. Insurance	0.2%	$76	$78	$86	$115	$179	$241	$248	$256	$263	$271
III. Taxes - Privilege Tax (% of first 4 mills/kWh)	5.4%	$10	$10	$11	$15	$23	$30	$31	$32	$33	$34
IV. Operation and Maintenance (1.9% of Invest Cost)		$737	$759	$830	$1,115	$1,737	$2,335	$2,405	$2,477	$2,551	$2,628
V. Environmental Measures (40yr, 4.5%)		$35	$35	$35	$35	$35	$35	$35	$35	$35	$35
VI. Administrative and General/Contingency	35.%	$270	$278	$304	$409	$637	$856	$881	$908	$935	$963
Total Generation Cost		**$3,253**	**3,397**	**$3,880**	**$6,228**	**$13,876**	**$25,103**	**$24,574**	**$26,119**	**$27,772**	**$29,542**
Profit (Loss)		$(1,453)	$(1,543)	$(1,854)	$(3,505)	$(9,634)	$(19,403)	$(18,702)	$(20,071)	$(21,543)	$(23,126)
CPI (Inflation Rate)		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

Appendix 2, Could OPUD sell Enloe production as "green" power and receive premium prices? Alternately, could Enloe provide extra value, and receive higher prices as a backstop to wind or solar projects?

A. It appears unlikely that OPUD could try to sell Enloe power as green power. Green-e, the green power certificating agency, remains skeptical of conventional hydro projects like Enloe. Green-e rules exclude projects that, "… increase water storage capacity or the head of an existing water reservoir," which would exclude Enloe.[15]

B. In the unlikely event Enloe managed to qualify as green power the next question is whether or not the premium would be enough to cover Enloe's losses. Referring back to Table 5, Enloe, as currently configured, would lose between $70 and $109 per MWH of production depending on the required level of esthetic flow. For green power premiums to move Enloe into the realm of profitability, green power premiums would have to be high enough to cover those losses. The highest green power premium on record is $60 / MWH for a solar plant in California. The average premium in Washington and neighboring states is much lower, at $16.45 / MWH. Given those numbers, it is very unlikely that a green power premium would be sufficient to make Enloe profitable.

Table 6, below, presents a sampling of green power premiums in western states.

[15] http://www.green-e.org/docs/energy/Appendix%20D_Green-e%20Energy%20National%20Standard.pdf, pp. 2 – 3.

Table 7, Green Power Premiums[16]

State	Type	$ / MWH	Statistical Measure	Green Power (Hydro) Premium ($ / MWH)
CA	wind, solar	15.00	Avg.	16.45
CA	various renewables	20.00	Med	15.00
CA	wind, hydro and PV	30.00	Mode	15.00
CA	100% renewable	10.00	Max	60.00
CA	100% local solar	60.00	Min	0.90
CA	wind, PV	15.00		
ID	wind, solar and biomass	3.50		
ID	wind	19.50		
MT	wind, PV	20.00		
MT	various renewables	0.90		
MT	wind, hydro	12.50		
MT	wind	11.00		
OR	PV, wind	20.00		
OR	wind	15.00		
OR	wind and landfill gas	8		
OR	various renewables	12.5		
OR	wind	15.00		
OR	landfill gas	19.00		
OR	wind, landfill gas, low-impact hydro	8.00		
OR	wind	3.00		
OR	various	10.00		
WA	wind, solar and biomass	3.50		
WA	landfill gas	17.00		
WA	PV, wind	15.00		
WA	wind, PV	8.00		
WA	wind	20.00		
WA	wind, hydro	40.00		
WA	landfill gas	10.50		
WA	wind	15.00		
WA	wind, hydro, biogas, solar	12.50		
WA	geothermal, biomass, wind, hydro	15.00		

[16] http://apps3.eere.energy.gov/greenpower/markets/pricing.shtml, Source: National Renewable Energy Laboratory, Golden, Colorado., Notes: Utility green pricing programs may only be available to customers located in the utility's service territory.

The current minimum premium for hydro green power is $0.90 / MWH in Montana. The average premium, $16.45 / MWH, the Median premium, $15 / MWH, and the most common premium, $15.00 / MWH, are all too low to move Enloe into profitable territory relative to open market prices of $40 / MWH

C. What about the potential for Enloe to provide backup reserve capacity for wind or solar projects and thus get higher prices?

The concise answer is that this is not a good fit for Enloe. For hydro to be a good symbiotic fit with wind the project has to be able to increase production, often for days at a time to cover for wind turbines when winds are calm, and then throttle back production to recharge the reservoir when the wind is blowing. Similarly for solar, Enloe would have to be able to ramp up production at night and when it is cloudy, again for days at a time, and then throttle back production to refill the reservoir during sunny periods.

As a small project with a small reservoir the length of time Enloe can throttle the project up or down is extremely limited. And, at 9 MW, Enloe will be smaller than most state of the art wind farms, so Enloe cannot be of much help there.

According to OPUD, "The mean hydraulic residence time is estimated to be about 2.4 hours for the mean annual flow. It reduces to just 45 minutes at the mean annual peak flow of 16,100 cfs, and increases to 7.3 hours at the mean September flow of 596 cfs. Residence time would exceed 20 hours at flows less than 200 cfs.[17]

In other words, in all but the driest months, even if OPUD wanted to operate the project in a dispatchable fashion, they can usually only do so for, at most, a few hours at a time.

The bigger point is that Enloe, as currently proposed and licensed, is not dispatchable. In the application OPUD proposed to operate the project in a run-of-river fashion.[18] In FERC's license they require OPUD to provide detailed descriptions of how the licensee will document compliance with run-of-river operation.[19]

Since the project will not be dispatchable, it cannot provide backup for intermittent wind and solar projects and thus it cannot demand premium pricing in that context.

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[17] pp. A-13
[18] pp. B-18
[19] Project No. 12569-001, pp. 53

Appendix 3, Enloe Dam Detail in OPUD Budgets, 2010 – 2016[20]

OPUD Treatment of Enloe Dam in Budgets 2010 - 2016

Budget Year	Detail	Amount	Total Year	Notes
2010			$2,160,000	Enloe expenditures not mentioned in the summary. Total in the detail section is $2,160,000.
	Misc. Contractual Services			
	PUD Enloe Emergency Action Plan	$80,000		
	Enloe PM&Es (water rights, etc.)	$200,000		
	Enloe Road Repair	$200,000		
	Capital - Contractual Services			
	Enloe Dam - Entrix and Others	$1,600,000		
	Capital - Materials and Supplies			
	Enloe Dam - EAP	$50,000		
	Enloe Dam - EAP Equipment	$30,000		
2011			$2,010,000	Enloe listed at $1.9 million. The detail comes in a little bigger at about $2.01 million.
	Misc. Contractual Services			
	PUD Enloe Emergency Action Plan	$30,000		
	Enloe Maintenance and Repair	$200,000		
	Capital - Contractual Services			
	Enloe Dam - Engineering and Design	$500,000		
	Enloe Dam - License/Compliance/Permitting/Legal	$750,000		
	Enloe Dam - Construction	$500,000		
	Capital - Materials and Supplies			
	Enloe Dam - EAP	$30,000		

[20] Source, OPUD Budgets, 2010 – 2016.

Budget Year	Detail	Amount	Total Year	Notes
2012	Enloe Dam	$1,300,000	$1,300,000	Enloe appears in the summary, but not in the detail
2013	Enloe Dam	$3,100,000	$3,100,000	Enloe appears in the summary, but not in the detail
2014	Enloe Dam	$2,750,000	$2,750,000	Enloe appears in the summary, but not in the detail
2015	Enloe Dam $1,764,000.	$1,764,000	$1,764,000	Enloe in summary. Only about $30,000 shows up in detail.
2016			$1,338,000	Amount listed in summary is $1.056 million, roughly $300,000 less than mentioned in detail.
	Misc. Contractual Services			
	Enloe Dam Dewatering	$1,000,000		
	Enloe Dam Inspection	$38,000		
	Capital - Contractual Services			
	Enloe Dam - On Call Engineering Support	$300,000		
Total, 2010 - 2016			$14,422,000	

Appendix 4, Sunk Cost Discussion

There is a tendency to ignore sunk costs on the grounds that, since they are not recoverable, it is just as well to ignore them.

1. This is inappropriate because when a company has spent, and is continuing to spend money on a project, even if the spending is not recoverable, it represents real money being spent on behalf of ratepayers. OPUD rates could be lower if the money were not being spent.

2. If the spending is being dedicated to a given project, in this case Enloe Dam, it is more transparent to book it as such. In that manner both management and ratepayers can more easily focus on the degree to which the project is or is not desirable. It is only fair for ratepayers to know how much is going to be spent in this fashion. It seems reasonable that ratepayers should have been informed of the magnitude of off-budget cash flows that were, and are, being dedicated to Enloe. It would have been prudent to inform ratepayers that management was committing the utility to a power source that might result power costing at least $83 / MWH and perhaps as much $149 / MWH energy.

3. There is a tendency, after some poorly defined point in time, to use sunk costs as justification for going forward with projects. In the case of Enloe Dam, at this moment in time, this would be poor reasoning. As an analogy, a rafter may float for years down a river headed towards a waterfall and certain death. Regardless of the amount of time invested upstream, it always makes sense to get out of the river before the falls, even if it is only inches before the falls. In the case of Enloe, something in excess of $11 million has already been spent. Spending by the end of 2016 looks to be in excess of $14 million. Spending another $39 million, or more, on the physical structure would amount to throwing good money after bad. The debt service on just the $39 million portion will result in Enloe power costing $83.04 / MWH. That is more than double the price of readily available open market power.

ATTACHMENTS, OPUD BUDGETS 2010 - 2016

RESOLUTION NUMBER 1494

A RESOLUTION of the Board of Commissioners of Public Utility District No. 1 of Okanogan County, Washington, Adopting the Final Budget for the Year 2010.

WHEREAS, in conformity with Section 54.16.080, Revised Code of Washington, this Commission prepared a proposed budget of the contemplated financial transactions of the District for the ensuing year 2010, and filed the same in the records of the Commission on October 6, 2009, and proof was made that notice of the hearing on said proposed budget was given publication in the OMAK CHRONICLE once a week for two consecutive weeks.

WHEREAS, the Commission of said District met this day in the office of the District in Okanogan, Washington, at 1:30 p.m. being the time and place designated for approval of the final budget for the year 2010;

WHEREAS, the Commission deems it to be in the best interest of the District that the budget for the year 2010 be finally determined and adopted;

NOW, THERFORE, BE IT RESOLVED that the Board of Commissioners of Public Utility District No. 1 of Okanogan County hereby adopt the budget as finally determined, and fix the final amount of expenditures for the ensuing year as set forth in the budget summary as attached to this Resolution, and by this reference made a part of this Resolution as fully as though set out at length herein.

PASSED AND APPROVED this 15th day of December, 2009.

Trish Butler

Trish Butler, President

David Womack

David Womack, Vice President

ATTEST:

Ernest J. Bolz

Ernest J. Bolz, Secretary

APPROVED:

Michael D. Howe

Michael D. Howe

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 1, 2009
BUDGET SUMMARY

Description	Electric	Wholesale Telecom	Total
REVENUE			
Sales - Retail	33,337,000		33,337,000
Sales - Wholesale	4,937,000	1,900,000	6,837,000
Interest	262,000		262,000
Miscellaneous	531,000		531,000
Rental Income	118,000		118,000
Construction Contribution	542,000		542,000
Total Revenue	**39,727,000**	**1,900,000**	**41,627,000**
EXPENDITURES			
Wages	7,261,600	220,900	7,482,500
Benefits	2,541,600	77,300	2,618,900
Travel	232,200	12,500	244,700
Training, Tuition and Meeting Fees	183,500	12,500	196,000
Transportation	737,500	19,500	757,000
Insurance	320,500		320,500
Utilities	75,600		75,600
Postage, Printing and Stationary	117,200		117,200
Advertising	31,500		31,500
Conservation Expenditures	276,000		276,000
Misc. Contractual Services	2,915,200	79,200	2,994,400
Legal Services	359,100	5,000	364,100
Maintenance Contracts	130,600	26,800	157,400
Software Licenses and Support	244,500	20,000	264,500
Permits and Fees	18,400	86,000	104,400
Rents and Leases	54,600	93,700	148,300
Materials and Supplies	860,500	71,500	932,000
Small Tools (under $1,000)	68,300	1,000	69,300
Miscellaneous	101,000		101,000
Purchased Power	24,158,000		24,158,000
Taxes	2,008,900	11,300	2,020,200
Total Expenditures	42,696,300	737,200	43,433,500
CAPITAL OUTLAY			
Capital - Contractual Services	11,208,000		11,208,000
Capital - Materials and Supplies	8,489,000	307,000	8,796,000
Capital - Meter Purchases	1,500,000		1,500,000
Capital - Transformer Purchases	500,000		500,000
Capital - Tools and Equipment	13,500		13,500
Capital - Buildings	3,094,000		3,094,000
Capital - Equipment (Over $2,000)	1,447,800	10,000	1,457,800
Capital - Vehicles	(175,000)		(175,000)
Capital - Personal Computers	70,600		70,600
Unforeseen Contingencies	100,000		100,000
Total Capital Outlay	26,247,900	317,000	26,564,900
DEBT SERVICE			
Debt Service - Principal	715,000	155,000	870,000
Debt Service - Interest	421,300	262,800	684,100
Total Debt Service	1,136,300	417,800	1,554,100
Total Use of Resources	**70,080,500**	**1,472,000**	**71,552,500**
TRANSFER TO/(FROM) RESERVES	**(30,353,500)**	**428,000**	**(29,925,500)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2009 ADOPTED BUDGET COMPARED TO 2010 ADOPTED BUDGET
DECEMBER 15, 2009

	Electric System				Wholesale Telecommunications				Total			
REVENUE	Adopted 2009	Projected 2009	Adopted 2010	2009 Adopted/ 2010 Adopted	Adopted 2009	Projected 2009	Adopted 2010	2009 Adopted/ 2010 Adopted	Adopted 2009	Projected 2009	Adopted 2010	2009 Adopted/ 2010 Adopted
Sales - Retail	31,290,700	30,399,700	33,337,000	2,046,300				0	31,290,700	30,399,700	33,337,000	2,046,300
Sales - Wholesale	7,489,500	3,464,000	4,937,000	(2,552,500)	1,168,200	1,754,200	1,900,000	731,800	8,657,700	5,218,200	6,837,000	(1,820,700)
Interest	1,246,000	1,031,500	262,000	(984,000)				0	1,246,000	1,031,500	262,000	(984,000)
Miscellaneous	746,700	546,100	531,000	(215,700)				0	746,700	546,100	531,000	(215,700)
Rental Income	118,000	117,000	118,000	0				0	118,000	117,000	118,000	0
Construction Contribution	1,600,000	719,800	542,000	(1,058,000)				0	1,600,000	719,800	542,000	(1,058,000)
Total Revenue	42,490,900	36,278,100	39,727,000	(2,763,900)	1,168,200	1,754,200	1,900,000	731,800	43,659,100	38,032,300	41,627,000	(2,032,100)
EXPENDITURES												
Wages	6,979,900	5,929,600	7,261,600	281,700	197,900	253,400	220,900	23,000	7,177,800	6,183,000	7,482,500	304,700
Benefits	2,303,300	2,447,000	2,541,600	238,300	65,300	85,100	77,300	12,000	2,368,600	2,532,100	2,618,900	250,300
Travel	255,100	118,200	232,200	(22,900)	12,500	4,000	12,500	0	267,600	122,200	244,700	(22,900)
Training, Tuition and Meeting Fees	168,300	80,500	183,500	15,200	11,000	1,900	12,500	1,500	179,300	82,400	196,000	16,700
Transportation	681,300	737,100	737,500	56,200	14,100	16,800	19,500	5,400	695,400	753,900	757,000	61,600
Insurance	219,300	293,700	320,500	101,200				0	219,300	293,700	320,500	101,200
Utilities	73,100	74,400	75,600	2,500				0	73,100	74,400	75,600	2,500
Postage, Printing and Stationary	122,700	111,500	117,200	(5,500)		100		0	122,700	111,600	117,200	(5,500)
Advertising	28,500	27,600	31,500	3,000				0	28,500	27,600	31,500	3,000
Conservation Expenditures	203,700	247,000	276,000	72,300				0	203,700	247,000	276,000	72,300
Misc. Contractual Services	2,281,800	1,964,300	2,915,200	633,400	68,400	70,200	79,200	10,800	2,350,200	2,034,500	2,994,400	644,200
Legal Services	373,300	274,600	359,100	(14,200)	1,500	4,000	5,000	3,500	374,800	278,600	364,100	(10,700)
Maintenance Contracts	92,600	46,900	130,600	38,000	34,500	27,500	26,800	(7,700)	127,100	74,400	157,400	30,300
Software Licenses and Support	187,700	182,700	244,500	56,800		8,200	20,000	20,000	187,700	190,900	264,500	76,800
Permits and Fees	14,300	14,300	18,400	4,100	102,100	99,800	86,000	(16,100)	116,400	114,100	104,400	(12,000)
Rents and Leases	59,700	62,300	54,600	(5,100)	94,700	94,700	93,700	(1,000)	154,400	157,000	148,300	(6,100)
Materials and Supplies	682,100	672,700	860,500	178,400	38,300	104,000	71,500	33,200	720,400	776,700	932,000	211,600
Small Tools (under $1,000)	43,300	63,000	68,300	25,000	1,000	1,000	1,000	0	44,300	64,000	69,300	25,000
Miscellaneous	64,000	56,900	101,000	37,000				0	64,000	56,900	101,000	37,000
Purchased Power	21,213,700	21,213,700	24,158,000	2,944,300				0	21,213,700	21,213,700	24,158,000	2,944,300
Taxes	1,920,900	1,849,000	2,008,900	88,000	6,100	12,100	11,300	5,200	1,927,000	1,861,100	2,020,200	93,200
Total Expenditures	37,968,600	36,467,000	42,696,300	4,727,700	647,400	782,800	737,200	89,800	38,616,000	37,249,800	43,433,500	4,817,500
CAPITAL OUTLAY												
Capital - Contractual Services	10,158,000	2,237,000	11,208,000	1,050,000				0	10,158,000	2,237,000	11,208,000	1,050,000
Capital - Materials and Supplies	9,064,000	5,827,100	8,489,000	(575,000)	262,100	417,100	307,000	44,900	9,326,100	6,244,200	8,796,000	(530,100)
Capital - Meter Purchases	595,000	259,000	1,500,000	905,000				0	595,000	259,000	1,500,000	905,000
Capital - Transformer Purchases	1,166,000	522,000	500,000	(666,000)				0	1,166,000	522,000	500,000	(666,000)
Capital - Tools and Equipment	10,200	10,200	13,500	3,300				0	10,200	10,200	13,500	3,300
Capital - Buildings	6,984,500	3,504,500	3,094,000	(3,890,500)				0	6,984,500	3,504,500	3,094,000	(3,890,500)
Capital - Equipment (Over $2,000)	770,100	738,600	1,447,800	677,700	335,000	35,000	10,000	(325,000)	1,105,100	773,600	1,457,800	352,700
Capital - Vehicles	351,000	351,000	(175,000)	(526,000)				0	351,000	351,000	(175,000)	(526,000)
Capital - Personal Computers	58,600	51,600	70,600	12,000				0	58,600	51,600	70,600	12,000
Unforeseen Contingencies	100,000	42,000	100,000	0		8,000		0	100,000	50,000	100,000	0
Total Capital Outlay	29,257,400	13,543,000	26,247,900	(3,009,500)	597,100	460,100	317,000	(280,100)	29,854,500	14,003,100	26,564,900	(3,289,600)
DEBT SERVICE												
Debt Service - Principal	680,000	680,000	715,000	35,000	155,000	155,100	155,000	0	835,000	835,100	870,000	35,000
Debt Service - Interest	459,800	493,600	421,300	(38,500)	262,800	277,100	262,800	0	722,600	770,700	684,100	(38,500)
Total Debt Service	1,139,800	1,173,600	1,136,300	(3,500)	417,800	432,200	417,800	0	1,557,600	1,605,800	1,554,100	(3,500)
Total Use of Resources	68,365,800	51,183,600	70,080,500	1,714,700	1,662,300	1,675,100	1,472,000	(190,300)	70,028,100	52,858,700	71,552,500	1,524,400
TRANSFER TO/(FROM) RESERVES	(25,874,900)	(14,905,500)	(30,353,500)	(4,478,600)	(494,100)	79,100	428,000	922,100	(26,369,000)	(14,826,400)	(29,925,500)	(3,556,500)

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Engineering	Operations	Environmental	Customer Service	Conservation	General Administration	Information Systems	Commissioners	Wholesale Telecom	Internal Communications	Total
EXPENDITURES													
010 Wages	111,300	112,000	831,100	3,426,200	113,500	805,500	116,200	1,240,700	278,600	81,200	220,900	145,300	7,482,500
011 Benefits	39,000	39,200	290,900	1,199,200	39,700	281,900	40,700	434,200	97,500	28,400	77,300	50,900	2,618,900
020 Travel	18,500	25,000	26,600	30,000	13,300	10,200	15,000	42,300	10,300	31,000	12,500	10,000	244,700
021 Training, Tuition and Meeting Fees	9,600	7,500	19,200	42,000	8,000	6,800	4,000	34,400	33,000	2,800	12,500	16,200	196,000
030 Transportation	6,600	1,400	32,800	618,700	1,500	58,300	6,600	3,500	2,000		19,500	6,100	757,000
040 Insurance								320,500					320,500
050 Utilities								75,600					75,600
060 Postage, Printing and Stationary			1,600	1,700	200	100,100	7,800	5,500				300	117,200
070 Advertising	2,500		2,000	6,200	1,000	800	18,000	1,000					31,500
071 Conservation Expenditures							276,000						276,000
080 Misc. Contractual Services	564,500	828,000	10,400	973,200	5,400	65,600	18,500	435,800	13,800		79,200		2,994,400
081 Legal Services								359,100			5,000		364,100
082 Maintenance Contracts				53,000				11,700	27,900		26,800	38,000	157,400
083 Software Licenses and Support	2,500	3,000	67,600	44,100	2,000				117,100		20,000	8,200	264,500
084 Permits and Fees	2,000		1,000	11,100		200		1,100			86,000	3,000	104,400
085 Rents and Leases	7,200			900		4,800		19,800	13,800		93,700	8,100	148,300
090 Materials and Supplies	3,000	1,000	20,600	682,000	2,000	38,800	7,500	48,200	5,000	1,400	71,500	51,000	932,000
091 Small Tools (under $1,000)			2,500	54,500		2,500		2,300	5,500		1,000	1,000	69,300
092 Miscellaneous				5,800		32,500	300	61,100		1,300			101,000
120 Purchased Power		24,158,000											24,158,000
210 Taxes								2,008,900			11,300		2,020,200
Total Expenditures	766,700	25,175,100	1,306,300	7,148,600	186,600	1,408,000	510,600	5,105,700	604,500	146,100	737,200	338,100	43,433,500
CAPITAL OUTLAY													
581 Capital - Contractual Services	3,600,000			7,525,000								83,000	11,208,000
591 Capital - Materials and Supplies	100,000			8,304,000							307,000	85,000	8,796,000
592 Capital - Meter Purchases				1,500,000									1,500,000
593 Capital - Transformer Purchases				500,000									500,000
710 Capital - Tools and Equipment				11,500				2,000					13,500
711 Capital - Buildings				94,000				3,000,000					3,094,000
712 Capital - Equipment (Over $2,000)			71,000	147,500				625,000	155,300		10,000	449,000	1,457,800
713 Capital - Vehicles				(175,000)									(175,000)
714 Capital - Personal Computers									70,600				70,600
901 Unforeseen Contingencies								100,000					100,000
Total Capital Outlay	3,700,000	0	71,000	17,907,000	0	0	0	3,727,000	225,900	0	317,000	617,000	26,564,900
DEBT SERVICE													
810 Debt Service - Principal								715,000			155,000		870,000
811 Debt Service - Interest								421,300			262,800		684,100
Total Debt Service	0	0	0	0	0	0	0	1,136,300	0	0	417,800	0	1,554,100
Total Use of Resources	4,466,700	25,175,100	1,377,300	25,055,600	186,600	1,408,000	510,600	9,969,000	830,400	146,100	1,472,000	955,100	71,552,500

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**39,727,000**
	001	Sales - Retail	33,337,000	
	002	Sales - Wholesale	4,937,000	
	003	Interest	262,000	
	004	Miscellaneous	531,000	
	005	Rental Income	118,000	
	006	Construction Contributions	542,000	
2		**Wholesale Telecom**		**1,900,000**
	002	Sales - Wholesale	1,900,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
		TOTAL REVENUE		**41,627,000**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	10		**Generation**			**4,466,700**
		010	Wages		111,300	
		011	Benefits		39,000	
		020	Travel		18,500	
		021	Training, Tuition and Meeting Fees		9,600	
		030	Transportation		6,600	
		070	Advertising		2,500	
		080	Misc. Contractual Service		564,500	
			BLM Fencing and Signs	30,000		
			PUD Enloe Emergency Action Plan	80,000		
			Enloe PM&Es (water rights, etc.)	200,000		
			Enloe Road Repair	200,000		
			NWHA (Hydro)	1,500		
			Van Rentals (tours)	3,000		
			Other Misc.	50,000		
		083	Software License and Support		2,500	
			Stella Systems	2,500		
		084	Permits and Fees		2,000	
			Dam Inspection Fees and ROW	2,000		
		085	Rent and Leases		7,200	
			Ophir Site Lease	7,200		
		090	Materials and Supplies		3,000	
		581	Capital - Contractual Services		3,600,000	
			Enloe Dam - Entrix and Others	1,600,000		
			Shankers Feasibility Study	2,000,000		
		591	Capital - Materials and Supplies		100,000	
			Enloe Dam - EAP	50,000		
			Enloe Dam - EAP Equipment	30,000		
			Unforeseen Materials and Supplies	20,000		

Div.	Dept.	Activity	Description			Budget Amount
1	11		**Power Supply**			**25,175,100**
		010	Wages		112,000	
		011	Benefits		39,200	
		020	Travel		25,000	
			Power Resources	22,800		
			Leadership	2,200		
		021	Training, Tuition and Meeting Fees		7,500	
			Power Resources	5,700		
			Leadership	1,800		
		030	Transportation		1,400	
		080	Misc. Contractual Services		828,000	
			Douglas County PUD	344,500		
			Slice Implementation Services	400,000		
			PNGC (Slice Audit/Legal Fees)	3,500		
			The Energy Authority	3,500		
			Miscellaneous Professional Services	50,000		
			Annual Dow Jones Subscription	1,500		
			Central Washington Power Authority	25,000		
		083	Software Licenses and Support		3,000	
			Support Fee COP Monitor	3,000		
		090	Materials and Supplies		1,000	
		120	Purchased Power		24,158,000	
			Other	0		
			BPA - Slice	10,827,000		
			BPA - Block	4,864,000		
			BPA - Transmission	2,071,000		
			Wells	3,765,000		
			Nine Canyon	2,631,000		

Div.	Dept.	Activity	Description			Budget Amount
1	20		**Engineering**			**1,377,300**
		010	Wages		831,100	
		011	Benefits		290,900	
		020	Travel		26,600	
			Engineering	21,600		
			Leadership	5,000		
		021	Training, Tuition and Meeting Fees		19,200	
			Engineering	15,000		
			Leadership	4,200		
		030	Transportation		32,800	
		060	Postage, Printing and Stationary		1,600	
		070	Advertising		2,000	
		080	Misc. Contractual Services		10,400	
			Janitorial Services	10,400		
		083	Software Licenses and Support		67,600	
			AutoCad	2,000		
			ESRI	5,000		
			Futura	14,700		
			GeoNav	3,000		
			Sag10 ver 3.10	4,500		
			Staker	29,400		
			SynerGee	4,000		
			TL-PRO Design Studio	5,000		
		084	Permits and Fees		1,000	
			City Franchises	900		
			Miscellaneous	100		
		090	Materials and Supplies		20,600	
		091	Small Tools (under $1,000)		2,500	
			Misc.	2,500		
		712	Capital - Equipment (Over $2,000)		71,000	
			Milsoft Engineering Analysis System	61,000		
			Misc.	10,000		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	21		**Operations**			**25,055,600**
		010	Wages		3,426,200	
		011	Benefits		1,199,200	
		020	Travel		30,000	
			Operations	22,500		
			Leadership	7,500		
		021	Training, Tuition and Meeting Fees		42,000	
			Operations	35,700		
			Leadership	6,300		
		030	Transportation		618,700	
		060	Postage, Printing and Stationary		1,700	
		070	Advertising		6,200	
		080	Misc. Contractual Services		973,200	
			CDL Testing Program	4,500		
			Employee Dispatch	9,600		
			Oroville Office Paint and Window	7,500		
			Osmose Exacter System Review	15,000		
			Pole Testing	250,000		
			Safety Training	55,000		
			Tree Trimming	600,000		
			Underground Locate Service	1,500		
			Vehicle Tracking Activation	600		
			Vehicle Tracking Annual Fee	8,500		
			Weed Control	20,000		
			Miscellaneous	1,000		
		082	Maintenance Contracts		53,000	
			Landscape Maintenance/Sweeping/Snowplowing	3,000		
			Regulator and Oil Circuit Breaker	50,000		
		083	Software Licenses and Support		44,100	
			Mechanics Diagnostic Software Upgrade	1,300		
			OSI	14,000		
			TWACS Handheld Support	28,800		
		084	Permits and Fees		11,100	
			Railroad Licenses	7,800		
			Right of Ways - USFS/Dept. of Int.	3,100		
			Miscellaneous	200		
		085	Rents and Leases		900	
			Pole Contacts	900		
		090	Materials and Supplies		682,000	
			General	600,000		
			Special Projects - Meter Bases	50,000		
			Fire Resistant Clothing	16,000		
			Wild Fire Clothing	16,000		
			PPE for Wild Fires			
		091	Small Tools (under $1,000)		54,500	
			Brewster	10,000		
			Okanogan	30,000		
			Oroville	10,000		
			Mechanics Specialty Tool Replacement	4,500		
		092	Miscellaneous		5,800	
			Lineman Rodeo (Fees, Travel and Supplies)	5,500		
			Safety Meeting Refreshments	300		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
		581	Capital - Contractual Services		7,525,000	
			AMI Implementation Labor (trenching at subs)	100,000		
			Brewster Substation Modifications (Carryover)	20,000		
			Contract Labor - Large System Projects	500,000		
			Engineering - Large System Projects	250,000		
			Gold Creek Sub Construction	505,000		
			MTP Line Construction	4,560,000		
			MTP Mitigation/Roads	550,000		
			MTP Permits, Tetra Tech, Training, etc.	140,000		
			MTP ROW/Easements	400,000		
			Pole Replacements	200,000		
			Underground Replacements	250,000		
			Okanogan 115 Dirtwork	50,000		
		591	Capital - Materials and Supplies		8,304,000	
			Normal Replacements and Extensions	2,500,000		
			AMI Equipment	1,000,000		
			Gold Creek Substation Materials	820,000		
			MTP Transmission and Distribution Materials	2,270,000		
			OCB, Regulators, Switches, etc.	220,000		
			Sandflat Substation Materials (steel for new bay)	150,000		
			SCADA Equipment	140,000		
			Loup Loup Substation	60,000		
			Whitestone Substation	11,000		
			Ellisforde Substation	48,000		
			Pinecreek Substation	1,000,000		
			Power Transformer Retrofill	70,000		
			Omak Substation Fencing	15,000		
		592	Capital - Meter Purchases		1,500,000	
			TWACS Meter Replacements	1,500,000		
		593	Capital - Transformer Purchases		500,000	
			Normal Additions/Replacements	500,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		11,500	
		711	Capital - Buildings		94,000	
			Materials Storage Building (Carryover)	60,000		
			Oroville Equipment Storage Completion	25,000		
			Mechanics Storage Racks	1,000		
			Lockers for Line Room	6,000		
			Drying Rack for Boots and Gloves	2,000		
		712	Capital - Equipment (Over $2,000)		147,500	
			Trailer - SF6 Gas Trailer (Carryover)	21,000		
			Trailer - Replace Wire Pulling Trailer (Carryover)	70,000		
			Warehouse Sweeper (Carryover)	30,000		
			Dielectric Tester	9,000		
			Grounds Tester	2,500		
			Vehicle Tracking GPS/Cell	9,000		
			Fair Trailer Completion	6,000		
		713	Capital - Vehicles		-175,000	
			Flatbed Truck - Replace (1)	40,000		
			Meterman Truck - Replace (1)	40,000		
			Bucket Truck Rebuild	33,000		
			Less: Transportation System Depreciation	(288,000)		

Div.	Dept.	Activity	Description			Budget Amount
1	22		**Environmental**			**186,600**
		010	Wages		113,500	
		011	Benefits		39,700	
		020	Travel		13,300	
			Environmental	10,300		
			Leadership	3,000		
		021	Training, Tuition and Meeting Fees		8,000	
			Environmental	5,500		
			Leadership	2,500		
		030	Transportation		1,500	
		060	Postage, Printing and Stationary		200	
		070	Advertising		1,000	
		080	Misc. Contractual Services		5,400	
			Miscellaneous	700		
			Environmental Consulting	4,700		
		083	Software Licenses and Support		2,000	
		090	Materials and Supplies		2,000	

Div.	Dept.	Activity	Description			Budget Amount
1	30		**Customer Service**			**1,408,000**
		010	Wages		805,500	
		011	Benefits		281,900	
		020	Travel		10,200	
			Customer Service	8,000		
			Leadership	2,200		
		021	Training, Tuition and Meeting Fees		6,800	
			Customer Service	5,000		
			Leadership	1,800		
		030	Transportation		58,300	
		060	Postage, Printing and Stationary		100,100	
			Postage	80,100		
			Printing	10,000		
			Stationary	10,000		
		070	Advertising		800	
		080	Misc. Contractual Services		65,600	
			Collection Service Credit Bureau	3,500		
			Credit Reporting Agency	8,300		
			Electronic Payments Fees	20,000		
			NISC Bill Print Fees	33,800		
		084	Permits and Fees		200	
			Miscellaneous Fees (Notaries, etc.)	200		
		085	Rents and Leases		4,800	
			Office Rent MVCC	4,500		
			Miscellaneous (PO Boxes, etc.)	300		
		090	Materials and Supplies		38,800	
			General	36,800		
			Fire Resistant Clothing	2,000		
		091	Small Tools (under $1,000)		2,500	
			Unforeseen	2,500		
		092	Miscellaneous		32,500	
			Miscellaneous Expenses	600		
			Net Account Receivable Writeoffs	31,900		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	35		**Conservation/Consumer Information**			**510,600**
		010	Wages		116,200	
		011	Benefits		40,700	
		020	Travel		15,000	
		021	Training, Tuition and Meeting Fees		4,000	
		030	Transportation		6,600	
		060	Postage, Printing and Stationary		7,800	
		070	Advertising		18,000	
		071	Conservation Expenditures		276,000	
			CRC Program	271,000		
			CRC Renewables	5,000		
		080	Misc. Contractual Services		18,500	
			Electric Education Programs	18,500		
		090	Materials and Supplies		7,500	
		092	Miscellaneous		300	

Div.	Dept.	Activity	Description			Budget Amount
1	40		**General Administration**			**9,969,000**
		010	Wages		1,240,700	
		011	Benefits		434,200	
		020	Travel		42,300	
			General	24,500		
			Accounting and Finance	11,200		
			Human Resource	2,200		
			Leadership	4,400		
		021	Training, Tuition and Meeting Fees		34,400	
			General	9,600		
			Accounting and Finance	6,600		
			Human Resource	4,600		
			Leadership	3,600		
			Education Reimbursement Program	10,000		
		030	Transportation		3,500	
		040	Insurance (Property/Liability)		320,500	
		050	Utilities		75,600	
			Cell Phone Service	6,900		
			Electrical Service	3,900		
			Telephone Service	45,900		
			Water/Sewer/Garbage	18,900		
		060	Postage, Printing and Stationary		5,500	
		070	Advertising		1,000	
		080	Misc. Contractual Services		435,800	
			APPA Dues	10,700		
			Audit Costs	70,000		
			Banking Fees	11,700		
			Benefits Administration	6,000		
			Bond Admin Fee	1,000		
			Bond Counsel and Insurance Costs	25,000		
			Chamber Dues	1,000		
			CWPU/UIP Expenses	33,000		
			Document Destruction	1,600		
			Economic Alliance	6,000		
			Employee Assistance Program	3,500		
			Equity Management Plan and Financial Studies	25,000		
			Cost of Service Update	25,000		
			Foundation for Water and Energy	2,000		
			Janitorial Services	28,000		
			Legislative Consultant	26,000		
			Misc. Services/Consulting	17,000		
			NW Public Power Assoc. Dues/NW Wage & Hour	28,200		
			Public Power Council Dues	25,100		
			PPC - NW River Partners	12,200		
			Standard and Poors	7,800		
			WA PUD Association Dues	65,000		
			WA PUD Miscellaneous Surveys/Studies	5,000		
		081	Legal Services		359,100	
			General Counsel	234,100		
			Misc. Attorney Fees	125,000		
		082	Maintenance Contracts		11,700	
			Copier Maintenance	6,400		

Div.	Dept.	Activity	Description			Budget Amount
			Landscape Maintenance/Sweeping/Snowplowing	5,300		
		084	Permits and Fees		1,100	
			WA State Purchasing Coop	600		
			WA State L&I Right to Know	300		
			Business Licenses	200		
		085	Rents and Leases		19,800	
			Copier Lease	5,100		
			Modular Building Rent	13,000		
			P.O. Box Rent	400		
			Storage	1,300		
		090	Materials and Supplies		48,200	
		091	Small Tools (under $1,000)		2,300	
		092	Miscellaneous		61,100	
			Clothing for Identification	1,500		
			Deductibles/Damage Claims	13,300		
			Election Costs	6,200		
			Employee Day	2,400		
			Interview/New Employee Expenses	15,000		
			Meeting Expenses	6,200		
			Recycling/Disposal Office Materials	5,000		
			Service Awards and Costs	1,500		
			Wellness Program Expenses	10,000		
		210	Taxes		2,008,900	
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000	
		711	Capital - Buildings		3,000,000	
			Headquarters Building - Completion	3,000,000		
		712	Capital - Equipment (Over $2,000)		625,000	
			Headquarters Building - Furniture	625,000		
		810	Debt Service - Principal		715,000	
		811	Debt Service - Interest		421,300	
		901	Unforeseen Contingencies		100,000	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	41		**Information Systems**			**830,400**
		010	Wages		278,600	
		011	Benefits		97,500	
		020	Travel		10,300	
			Information Systems	9,500		
			Leadership	800		
		021	Training, Tuition and Meeting Fees		33,000	
			Training	20,000		
			NISC ABS Upgrade Training	12,000		
			Leadership	1,000		
		030	Transportation		2,000	
		080	Misc. Contractual Services		13,800	
			Neopost Postal Rate Change	1,200		
			Network Consulting	10,000		
			RDS	500		
			Security System Monitoring	2,100		
		082	Maintenance Contracts		27,900	
			BlackBerry Support	1,000		
			GWAVA	1,200		
			Itron	4,800		
			NetApp SAN Hardware/Software	8,500		
			SCADA Server Maintenance	3,000		
			SonicWall	1,700		
			Symantec	4,000		
			Veritas Backup Exec	500		
			VMWare Software	3,200		
		083	Software Licenses and Support		117,100	
			M+RFM Bundle (Spam & Archive)	2,200		
			NISC	105,100		
			PC Software	9,800		
		085	Rents and Leases		13,800	
			Axis Capital Lease	11,100		
			Neopost Lease	2,700		
		090	Materials and Supplies		5,000	
		091	Small Tools (under $1,000)		5,500	
			Digi Servers	2,500		
			Small Printers	3,000		
		712	Capital - Equipment (Over $2,000)		155,300	
			Upgrade Network for High Availability	100,000		
			Servers, Software, Configuration & Data Backup	33,800		
			Firewall Hardware	10,000		
			Software Update - NISC ABS	7,500		
			Printer	4,000		
		714	Capital - Personal Computers		70,600	

Div.	Dept.	Activity	Description		Budget Amount
1	50		**Commissioners**		**146,100**
		010	Wages	81,200	
		011	Benefits	28,400	
		020	Travel	31,000	
		021	Training, Tuition and Meeting Fees	2,800	
		090	Materials and Supplies	1,400	
		092	Miscellaneous	1,300	

Div.	Dept.	Activity	Description			Budget Amount
2	60		**Wholesale Telecommunications**			**1,472,000**
		010	Wages		220,900	
		011	Benefits		77,300	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		12,500	
		030	Transportation		19,500	
		080	Misc. Contractual Services		79,200	
			Consulting - Stimulus Fund Application	75,000		
			NoaNet Calea Services	4,200		
		081	Legal Services		5,000	
		082	Maintenance Contracts		26,800	
			Eaton Powerware UPS	1,800		
			Cisco Smartnet	5,400		
			WWP Lightning Edge Devices	15,000		
			RADcare (Optimux and IPMux)	2,600		
			Motorola Canopy Hardware/Software	2,000		
		083	Software Licenses and Support		20,000	
			Ciena Element Management Software	15,000		
			Solar Winds IP Monitor Software Support	5,000		
		084	Permits and Fees		86,000	
			Internet Fees - NoaNet	81,000		
			ARIN ASN & IP Address Allocation	5,000		
		085	Rents and Leases		93,700	
			DCPUD Lit Services Ethernet	3,000		
			DCPUD Dark Fiber Lease	34,600		
			NoaNet Dark Fiber Lease	32,100		
			CenturyTel Dark Fiber Lease	0		
			Wireless Site Lease	24,000		
		090	Materials and Supplies		71,500	
			Misc. Switch/Network HW Upgrades	10,000		
			Fiber Plant Maintenance - Wholesale	50,000		
			Battery Maintenance & Replacement	6,500		
			UPS/Rectifier Replacement	5,000		
		091	Small Tools (under $1,000)		1,000	
		210	Taxes		11,300	
		591	Capital - Material and Supplies		307,000	
			Rackmount Servers	10,000		
			Replace Switches (End of Life)	75,000		
			Fiber Distribution Builds	25,000		
			New Ethernet Node	25,000		
			Wireless Towers	75,000		
			Wireless Subscriber Units	97,000		
		712	Capital - Equipment (Over $2,000)		10,000	
			Test Equipment	5,000		
			Tools	5,000		
		810	Debt Service - Principal		155,000	
		811	Debt Service - Interest		262,800	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	61		**Internal Communications**			**955,100**
		010	Wages		145,300	
		011	Benefits		50,900	
		020	Travel		10,000	
			Communications	7,000		
			Leadership	3,000		
		021	Training, Tuition and Meeting Fees		16,200	
			Communications	12,000		
			Leadership	4,200		
		030	Transportation		6,100	
		060	Postage, Printing and Stationary		300	
		082	Maintenance Contracts		38,000	
			Fire Alarm System	2,000		
			Landscape Maintenance/Sweeping	6,000		
			UHF Radio System	19,000		
			Telephone System - Shortel	7,500		
			UPS Okanogan and Omak	3,500		
		083	Software Licenses and Support		8,200	
			Cisco Smartnet	700		
			MapInfo Software	1,000		
			Fiber Mapping Software	4,500		
			Lenel OnGuard Software	2,000		
		084	Permits and Fees		3,000	
			Right of Way - USFS, DOT, etc.	3,000		
		085	Rents and Leases		8,100	
			UHF Site Lease - Little Buck Mtn.	2,500		
			UHF Site Lease - Aeneas Mtn.	2,500		
			UHF Site Lease - Goat Mtn.	600		
			UHF Site Lease - Omak Mtn.	2,500		
		090	Materials and Supplies		51,000	
			General Materials and Supplies	50,000		
			Dell Powerconnect 3448P - Stock Spare (2)	1,000		
		091	Small Tools (under $1,000)		1,000	
		581	Capital - Contractual Service		83,000	
			NoaNet Assessments	83,000		
		591	Capital - Material and Supplies		85,000	
			Fiber Rework - Eastside Node	15,000		
			Fiber Rework - Armory Node	15,000		
			Fiber Rework - 3rd Street Node Okanogan	15,000		
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000		
			Fiber Build - New HQ Office Building	15,000		
			Miscellaneous	10,000		
		712	Capital - Equipment (Over $2,000)		449,000	
			UHF Radio System Overhaul	406,000		
			Shoretel Shoregear 120/24 - Stock Spare	4,500		
			Miscellaneous Contingencies	38,500		
			TOTAL EXPENDITURES AND CAPITAL OUTLAY			**71,552,500**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
LABOR AND PERSONNEL (WAGES ONLY)

Department	Title		12/31/2009
Generation	Overtime		0
		Sub-Total	0
Power Supply	Power Resource Manager		87,360
	WECC Compliance Officer		62,000
		Sub-Total	149,360
Engineering	Chief Engineer		113,261
	Distribution Engineer		49,698
	Distribution Engineer		67,074
	Distribution Engineer		49,640
	Distribution Engineer		65,728
	Distribution Engineer		59,575
	Systems Engineer		83,088
	Systems Engineer		82,371
	Systems Engineer		66,076
	GIS Technician		59,630
	Engineering Aid		43,536
	Temporary Engineer		15,000
	On Call Compensation		31,200
		Sub-Total	785,877
Operations	Construction Superintendent		91,956
	Area Manager		86,412
	Area Manager		93,472
	Purchasing Agent/Facilities Manager		74,799
	Right of Way Superintendent		61,119
	Assistant Construction Superintendent		79,475
	Serviceman		72,696
	Serviceman		72,696
	Serviceman		72,696
	Serviceman		72,696
	Foreman		81,702
	Journeyman Lineman		72,696
	Journeyman Lineman		72,696
	Journeyman Lineman		72,696
	Foreman		81,702
	Journeyman Lineman		72,696
	Journeyman Lineman		72,696
	Apprentice Lineman		60,507
	Foreman		81,702
	Journeyman Lineman		72,696
	Apprentice Lineman		64,938
	Apprentice Trainee		46,550
	Foreman		81,702
	Journeyman Lineman		72,696
	Journeyman Lineman		72,696
	Apprentice Trainee		43,202
	Journeyman Lineman/Locator		72,696
	Wireman Foreman		81,702
	Wireman		72,696
	Apprentice Wireman		64,938

Department	Title	12/31/2009
	Journeyman Meterman	72,696
	Apprentice Meterman	61,776
	LA Meter Replacement Specialist	51,709
	HazMat Specialist	56,098
	Facilities Maintenance Worker	58,053
	Facilities Maintenance Worker	38,334
	Shop Foreman	65,312
	Mechanic	54,122
	Limited Assignment Mechanic	54,122
	Warehouseman	49,275
	Warehouseman	53,435
	Temporary Labor Lineman	30,000
	Temporary Labor Groundman	20,000
	Part-time Student Labor	27,000
	On Call Compensation	18,720
	Overtime	350,000
	Sub-Total	3,254,274
Environmental	Director of Regulatory and Environmental Affairs	96,487
	Environmental Coordinator	56,677
	Environmental Coordinator	58,787
	Sub-Total	211,951
Customer Service	Customer Service Supervisor	81,391
	Customer Records Coordinator	54,035
	Credit/Collections Specialist	43,715
	Account Clerk	41,122
	Account Clerk	41,122
	Account Clerk	41,122
	Account Clerk	25,896
	Account Clerk	41,122
	Account Clerk	36,275
	Account Clerk	41,122
	Account Clerk	41,122
	Meter Reader	44,970
	Meter Reader	44,970
	Meter Reader	44,970
	Fulltime Relief Account Clerk	41,122
	Fulltime Relief Account Clerk	36,275
	Fulltime Relief Account Clerk	33,696
	Overtime	23,000
	Sub-Total	757,047
Conservation	Energy Services Coordinator	54,811
	Energy Services Coordinator	54,811
	Sub-Total	109,622
General Administration	General Manager	165,000
	Operations Manager	131,800
	Director of Finance/Auditor	115,911
	Administrative/Executive Assistant	53,860
	Administrative Assistant	53,684

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET - DECEMBER 15, 2009
LABOR AND PERSONNEL (WAGES ONLY)

Department	Title	12/31/2009
	Human Resource Director	92,776
	Communications Director	99,467
	Chief Accountant/Deputy Treasurer	82,353
	Treasurer/Accountant	76,698
	Financial Analyst	59,658
	Accountant	55,630
	Accountant	61,338
	Payroll/Employee Records Coordinator	46,534
	Secretary/Bookkeeper	40,348
	Project Manager	36,400
	Overtime	1,300
	Sub-Total	1,172,757
Information Systems	Information Systems Supervisor	88,285
	Information Systems Technician	62,045
	Information Systems Technician	55,000
	Information Systems Technician	57,494
	Sub-Total	262,824
Commissioners	Commissioner	26,600
	Commissioner	26,600
	Commissioner	28,000
	Sub-Total	81,200
Telecommunications	Network Engineer	87,965
	Telecommunications Technicians	61,714
	Telecommunications Technicians	61,714
	Telecommunications Technicians	61,714
	Overtime	35,000
	Sub-Total	308,107
	Wage Increases (Step and Cost of Living)	389,481
	Total Labor Costs	**7,482,500**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
OVERVIEW

HIGHLIGHTS

1) $22.4 million transfer from reserves, which is an decrease of $7.5 million over the 2010 adopted budget.
2) Revenues do not cover operating expenses by $600,000, an improvement over the 2010 adopted budget's $1.8 million.
3) Retail Electric Sales increase of $1.7 million - predicting a 1% load growth, less mild weather and reflects the previously approved rate adjustments. Similar assumptions were used in the 2010 adopted budget.
4) Wholesale Electric Sales increase of $553,000 - predicting 3/4 to median water and prices based on the last two market prices.
5) Miscellaneous Income increased by $218,000 - revenues that previously were netted against expenses are now being categorized as revenue (green tag sales, Nine Canyon Wind transmission, operating reserves, etc.).
6) Construction Contributions increased $278,000 - contributions continue to beat expectations.
7) Misc. Contractual Services decreased $486,000 - primary driver behind the decrease is a reduction in tree trimming and pole testing budgets.
8) Permits and Fees increased $264,000 - increases include: Enloe ROW $200,000, railroad licenses $28,000 and increase in wholesale telecommunications internet costs of $34,000.
9) Purchased Power - the largest operating expenditure in the budget increased over $1.2 million to $25.4 million. The 2011 proposed budget reflects expected cost increases for Wells and BPA power purchases.
10) Capital Outlays account for $18.3 million - see a summary of capital projects below.
11) Debt Service increased $1.9 million - reflects the issuance of the 2010 Bonds.

REVENUES of $44.4 million - Assumptions Used

- **Retail Electric Sales:** Estimated using 1% load growth, less mild weather conditions and previously approved rate adj.
- **Wholesale Electric:** Sales based on a 3/4 to median water year and previous two years average market pricing,
- **Wholesale Telecommunications:** Based on updated revenue forecasts, which reflect stable revenues.
- **Interest:** Return of .5% on investments expected to mature in 2011.
- **Miscellaneous:** Previous twelve months revenue adjusted for netted power transactions and no grant revenue.
- **Rental Income:** Same as previous year with no growth.
- **Construction Contributions:** Estimated using 2010 year to date with a proration for the remaining of the year.

EXPENDITURES $45.0 million - Assumptions Used

- **Wages:** Four less fulltime employees than the 2010 adopted budget and overall average wage increase of 2.7%. The overall average wage increase includes current bargaining agreement step increases.
- **Benefits:** Based on July 2009 thru June 2010 actual percentage of wages. Methodology changed to allocate costs more appropriately by estimating costs by department with a percentage range of 30 to 46% (33.1% average).
- **Purchased Power:** Wells Project costs effective September 2010 and BPA's new contract effective October 2011.
- **Other Expenditures:** Other expenses are based on known 2011 costs, if costs are not specifically known a 3% increase was estimated, except transportation which a 5% estimate was used.

CAPITAL OUTLAY $18.3 million - Summary Listing

- Methow transmission line and substation $9.4 million.
- Operations normal replacements and line extensions of $1.2 million.
- Enloe Dam Permitting and EAP $1.9 million.
- AMI implementation $870,000.
- Pinecreek Substation Construction $250,000.
- Upgrade/Expand UHF radio system $590,000.
- Wholesale Telecommunications capital of $542,000.
- Regulator and switch purchases $220,000.
- Bucket Truck Replacement $210,000.
- SCADA implementation continuation $137,000.
- Virtual environment hardware and software $105,000.
- Large system project engineering $100,000.
- Contract Labor $100,000.
- Underground replacements $100,000 (trenching costs).
- Cutout replacements $100,000.
- Other capital Items $476,000.

DEBT SERVICE $3.4 million

- **Principal and Interest:** Per debt service schedules.

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
BUDGET SUMMARY

Description	Electric	Wholesale Telecom	Total
REVENUE			
Sales - Retail	35,001,000		35,001,000
Sales - Wholesale	5,490,000	2,000,000	7,490,000
Interest	207,000		207,000
Miscellaneous	749,000		749,000
Rental Income	118,000		118,000
Construction Contribution	820,000		820,000
Total Revenue	**42,385,000**	**2,000,000**	**44,385,000**
EXPENDITURES			
Wages	7,474,800	222,000	7,696,800
Benefits	2,477,300	67,300	2,544,600
Travel	173,400	12,500	185,900
Training, Tuition and Meeting Fees	123,400	12,500	135,900
Transportation	887,500	16,000	903,500
Insurance	310,000		310,000
Utilities	97,200		97,200
Postage, Printing and Stationary	198,400		198,400
Advertising	37,700		37,700
Conservation Expenditures	372,800		372,800
Misc. Contractual Services	2,364,400	144,200	2,508,600
Legal Services	309,100	5,000	314,100
Maintenance Contracts	152,100	25,500	177,600
Software Licenses and Support	282,400	35,000	317,400
Permits and Fees	248,300	120,000	368,300
Rents and Leases	63,900	221,200	285,100
Materials and Supplies	828,900	101,500	930,400
Small Tools (under $1,000)	67,800	1,000	68,800
Miscellaneous	74,100		74,100
Purchased Power	25,373,000		25,373,000
Taxes	2,108,300	10,700	2,119,000
Total Expenditures	44,024,800	994,400	45,019,200
CAPITAL OUTLAY			
Capital - Contractual Services	10,500,000		10,500,000
Capital - Materials and Supplies	5,104,700	532,000	5,636,700
Capital - Meter Purchases	440,000		440,000
Capital - Transformer Purchases	500,000		500,000
Capital - Tools and Equipment	13,200		13,200
Capital - Buildings	42,000		42,000
Capital - Equipment (Over $2,000)	989,600	10,000	999,600
Capital - Vehicles	30,000		30,000
Capital - Personal Computers	57,300		57,300
Unforeseen Contingencies	100,000		100,000
Total Capital Outlay	17,776,800	542,000	18,318,800
DEBT SERVICE			
Debt Service - Principal	1,035,000	155,000	1,190,000
Debt Service - Interest	1,978,300	262,800	2,241,100
Total Debt Service	3,013,300	417,800	3,431,100
Total Use of Resources	**64,814,900**	**1,954,200**	**66,769,100**
TRANSFER TO/(FROM) RESERVES	**(22,429,900)**	**45,800**	**(22,384,100)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2010 ADOPTED BUDGET COMPARED TO 2011 FINAL BUDGET
NOVEMBER 16, 2010

	Electric System				Wholesale Telecommunications				Total			
	Adopted 2010	Projected 2010	Final 2011	2010 Adopted/ 2011 Final	Adopted 2010	Projected 2010	Final 2011	2010 Adopted/ 2011 Final	Adopted 2010	Projected 2010	Final 2011	2010 Adopted/ 2011 Final
REVENUE												
Sales - Retail	33,337,000	31,632,000	35,001,000	1,664,000				0	33,337,000	31,632,000	35,001,000	1,664,000
Sales - Wholesale	4,937,000	5,074,000	5,490,000	553,000	1,900,000	1,900,000	2,000,000	100,000	6,837,000	6,974,000	7,490,000	653,000
Interest	262,000	201,000	207,000	(55,000)				0	262,000	201,000	207,000	(55,000)
Miscellaneous	531,000	531,000	749,000	218,000		1,000		0	531,000	532,000	749,000	218,000
Rental Income	118,000	118,000	118,000	0				0	118,000	118,000	118,000	0
Construction Contribution	542,000	828,000	820,000	278,000				0	542,000	828,000	820,000	278,000
Total Revenue	**39,727,000**	**38,384,000**	**42,385,000**	**2,658,000**	**1,900,000**	**1,901,000**	**2,000,000**	**100,000**	**41,627,000**	**40,285,000**	**44,385,000**	**2,758,000**
EXPENDITURES												
Wages	7,261,600	6,858,600	7,474,800	213,200	220,900	224,000	222,000	1,100	7,482,500	7,082,600	7,696,800	214,300
Benefits	2,541,600	2,401,000	2,477,300	(64,300)	77,300	71,000	67,300	(10,000)	2,618,900	2,472,000	2,544,600	(74,300)
Travel	232,200	95,000	173,400	(58,800)	12,500	12,500	12,500	0	244,700	107,500	185,900	(58,800)
Training, Tuition and Meeting Fees	183,500	66,000	123,400	(60,100)	12,500	12,500	12,500	0	196,000	78,500	135,900	(60,100)
Transportation	737,500	891,000	887,500	150,000	19,500	16,000	16,000	(3,500)	757,000	907,000	903,500	146,500
Insurance	320,500	274,000	310,000	(10,500)				0	320,500	274,000	310,000	(10,500)
Utilities	75,600	82,000	97,200	21,600				0	75,600	82,000	97,200	21,600
Postage, Printing and Stationary	117,200	92,000	198,400	81,200				0	117,200	92,000	198,400	81,200
Advertising	31,500	21,000	37,700	6,200				0	31,500	21,000	37,700	6,200
Conservation Expenditures	276,000	375,000	372,800	96,800				0	276,000	375,000	372,800	96,800
Misc. Contractual Services	2,915,200	1,961,500	2,364,400	(550,800)	79,200	95,000	144,200	65,000	2,994,400	2,056,500	2,508,600	(485,800)
Legal Services	359,100	234,100	309,100	(50,000)	5,000	2,000	5,000	0	364,100	236,100	314,100	(50,000)
Maintenance Contracts	130,600	80,600	152,100	21,500	26,800	13,000	25,500	(1,300)	157,400	93,600	177,600	20,200
Software Licenses and Support	244,500	224,500	282,400	37,900	20,000	1,000	35,000	15,000	264,500	225,500	317,400	52,900
Permits and Fees	18,400	12,000	248,300	229,900	86,000	71,000	120,000	34,000	104,400	83,000	368,300	263,900
Rents and Leases	54,600	57,000	63,900	9,300	93,700	102,000	221,200	127,500	148,300	159,000	285,100	136,800
Materials and Supplies	860,500	751,000	828,900	(31,600)	71,500	110,000	101,500	30,000	932,000	861,000	930,400	(1,600)
Small Tools (under $1,000)	68,300	43,300	67,800	(500)	1,000	7,000	1,000	0	69,300	50,300	68,800	(500)
Miscellaneous	101,000	76,000	74,100	(26,900)				0	101,000	76,000	74,100	(26,900)
Purchased Power	24,158,000	24,158,000	25,373,000	1,215,000				0	24,158,000	24,158,000	25,373,000	1,215,000
Taxes	2,008,900	1,932,000	2,108,300	99,400	11,300	11,000	10,700	(600)	2,020,200	1,943,000	2,119,000	98,800
Total Expenditures	42,696,300	40,685,600	44,024,800	1,328,500	737,200	748,000	994,400	257,200	43,433,500	41,433,600	45,019,200	1,585,700
CAPITAL OUTLAY												
Capital - Contractual Services	11,208,000	3,208,000	10,500,000	(708,000)				0	11,208,000	3,208,000	10,500,000	(708,000)
Capital - Materials and Supplies	8,489,000	5,889,000	5,104,700	(3,384,300)	307,000	307,000	532,000	225,000	8,796,000	6,196,000	5,636,700	(3,159,300)
Capital - Meter Purchases	1,500,000	500,000	440,000	(1,060,000)				0	1,500,000	500,000	440,000	(1,060,000)
Capital - Transformer Purchases	500,000	375,000	500,000	0				0	500,000	375,000	500,000	0
Capital - Tools and Equipment	13,500	13,500	13,200	(300)				0	13,500	13,500	13,200	(300)
Capital - Buildings	3,094,000	4,194,000	42,000	(3,052,000)				0	3,094,000	4,194,000	42,000	(3,052,000)
Capital - Equipment (Over $2,000)	1,447,800	1,447,800	989,600	(458,200)	10,000	10,000	10,000	0	1,457,800	1,457,800	999,600	(458,200)
Capital - Vehicles	(175,000)	(175,000)	30,000	205,000				0	(175,000)	(175,000)	30,000	205,000
Capital - Personal Computers	70,600	70,600	57,300	(13,300)				0	70,600	70,600	57,300	(13,300)
Unforeseen Contingencies	100,000	100,000	100,000	0				0	100,000	100,000	100,000	0
Total Capital Outlay	26,247,900	15,622,900	17,776,800	(8,471,100)	317,000	317,000	542,000	225,000	26,564,900	15,939,900	18,318,800	(8,246,100)
DEBT SERVICE												
Debt Service - Principal	715,000	715,000	1,035,000	320,000	155,000	155,000	155,000	0	870,000	870,000	1,190,000	320,000
Debt Service - Interest	421,300	295,600	1,978,300	1,557,000	262,800	262,800	262,800	0	684,100	558,400	2,241,100	1,557,000
Total Debt Service	1,136,300	1,010,600	3,013,300	1,877,000	417,800	417,800	417,800	0	1,554,100	1,428,400	3,431,100	1,877,000
Total Use of Resources	**70,080,500**	**57,319,100**	**64,814,900**	**(5,265,600)**	**1,472,000**	**1,482,800**	**1,954,200**	**482,200**	**71,552,500**	**58,801,900**	**66,769,100**	**(4,783,400)**
TRANSFER TO/(FROM) RESERVES	**(30,353,500)**	**(18,935,100)**	**(22,429,900)**	**7,923,600**	**428,000**	**418,200**	**45,800**	**(382,200)**	**(29,925,500)**	**(18,516,900)**	**(22,384,100)**	**7,541,400**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Engineering	Operations	Environmental	Customer Service	Conservation	General Administration	Information Systems	Commissioners	Wholesale Telecom	Internal Communications	Total
EXPENDITURES													
010 Wages	117,600	99,300	865,400	3,669,300	120,200	763,500	126,800	1,196,100	282,200	87,000	222,000	147,400	7,696,800
011 Benefits	41,200	30,900	283,900	1,130,100	41,800	330,600	45,900	387,500	91,700	39,900	67,300	53,800	2,544,600
020 Travel	12,000	25,000	13,500	17,500	7,000	5,100	15,000	31,500	12,500	24,300	12,500	10,000	185,900
021 Training, Tuition and Meeting Fees	5,000	7,500	9,500	22,500	4,500	3,400	4,000	28,000	20,000	2,800	12,500	16,200	135,900
030 Transportation	6,200	2,300	36,700	762,600	4,200	47,500	9,600	8,300	2,000		16,000	8,100	903,500
040 Insurance								310,000					310,000
050 Utilities								97,200					97,200
060 Postage, Printing and Stationary			1,600	1,700	200	177,200	10,000	7,400				300	198,400
070 Advertising			2,000	6,200	1,000	800	25,000	2,700					37,700
071 Conservation Expenditures							372,800						372,800
080 Misc. Contractual Services	331,500	843,000	8,500	500,600	5,000	33,300	19,400	508,700	14,400		144,200	100,000	2,508,600
081 Legal Services								309,100			5,000		314,100
082 Maintenance Contracts				54,800				18,500	28,300		25,500	50,500	177,600
083 Software Licenses and Support		3,000	64,300	33,400	2,000				171,000		35,000	8,700	317,400
084 Permits and Fees	202,000		1,000	39,000		600		2,700			120,000	3,000	368,300
085 Rents and Leases	7,900			900		5,000		8,200	16,100		221,200	25,800	285,100
090 Materials and Supplies	3,000	1,000	20,800	649,800	2,000	29,800	15,000	46,200	10,000	1,300	101,500	50,000	930,400
091 Small Tools (under $1,000)			2,500	33,000		2,500		2,300	25,500		1,000	2,000	68,800
092 Miscellaneous				6,300		17,900	500	48,000		1,400			74,100
120 Purchased Power		25,373,000											25,373,000
210 Taxes								2,108,300			10,700		2,119,000
Total Expenditures	726,400	26,385,000	1,309,700	6,927,700	187,900	1,417,200	644,000	5,120,700	673,700	156,700	994,400	475,800	45,019,200
CAPITAL OUTLAY													
581 Capital - Contractual Services	1,850,000			8,650,000									10,500,000
591 Capital - Materials and Supplies	50,000			5,022,200							532,000	32,500	5,636,700
592 Capital - Meter Purchases				440,000									440,000
593 Capital - Transformer Purchases				500,000									500,000
710 Capital - Tools and Equipment				10,000				2,000	1,200				13,200
711 Capital - Buildings				20,000				22,000					42,000
712 Capital - Equipment (Over $2,000)			105,000	94,600				0	140,000		10,000	650,000	999,600
713 Capital - Vehicles				30,000									30,000
714 Capital - Personal Computers									57,300				57,300
901 Unforeseen Contingencies								100,000					100,000
Total Capital Outlay	1,900,000	0	105,000	14,766,800	0	0	0	124,000	198,500	0	542,000	682,500	18,318,800
DEBT SERVICE													
810 Debt Service - Principal								1,035,000			155,000		1,190,000
811 Debt Service - Interest								1,978,300			262,800		2,241,100
Total Debt Service	0	0	0	0	0	0	0	3,013,300	0	0	417,800	0	3,431,100
Total Use of Resources	2,626,400	26,385,000	1,414,700	21,694,500	187,900	1,417,200	644,000	8,258,000	872,200	156,700	1,954,200	1,158,300	66,769,100

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**42,385,000**
	001	Sales - Retail	35,001,000	
	002	Sales - Wholesale	5,490,000	
	003	Interest	207,000	
	004	Miscellaneous	749,000	
	005	Rental Income	118,000	
	006	Construction Contributions	820,000	
2		**Wholesale Telecom**		**2,000,000**
	002	Sales - Wholesale	2,000,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
		TOTAL REVENUE		**44,385,000**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	10		**Generation**			**2,626,400**
		010	Wages		117,600	
		011	Benefits		41,200	
		020	Travel		12,000	
		021	Training, Tuition and Meeting Fees		5,000	
		030	Transportation		6,200	
		080	Misc. Contractual Service		331,500	
			PUD Enloe Emergency Action Plan	30,000		
			Enloe Maintenance and Repair	200,000		
			NWHA (Hydro)	1,500		
			Other Misc.	100,000		
		084	Permits and Fees		202,000	
			ROW and Agency Processing	200,000		
			Dam Inspection Fees and ROW	2,000		
		085	Rent and Leases		7,900	
			Ophir Site Lease	7,900		
		090	Materials and Supplies		3,000	
		581	Capital - Contractual Services		1,850,000	
			Enloe Dam - Engineering and Design	500,000		
			Enloe Dam - License/Compliance/Permitting/Legal	750,000		
			Enloe Dam - Construction	500,000		
			Misc. and Unforeseen	100,000		
		591	Capital - Materials and Supplies		50,000	
			Enloe Dam - EAP	30,000		
			Unforeseen Materials and Supplies	20,000		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	11		**Power Supply**			**26,385,000**
		010	Wages		99,300	
		011	Benefits		30,900	
		020	Travel		25,000	
		021	Training, Tuition and Meeting Fees		7,500	
		030	Transportation		2,300	
		080	Misc. Contractual Services		843,000	
			Douglas County PUD	351,500		
			PNGC (Slice Audit/Legal Fees)	3,500		
			The Energy Authority	3,500		
			Miscellaneous Professional Services	31,000		
			Annual Dow Jones Subscription	1,500		
			Central Washington Power Authority	5,000		
			Aces Power Marketing	297,000		
			Lands Energy - New Slice Implementation	150,000		
		083	Software Licenses and Support		3,000	
			Support Fee COP Monitor	3,000		
		090	Materials and Supplies		1,000	
		120	Purchased Power		25,373,000	
			Other	0		
			BPA - Slice	10,657,000		
			BPA - Block	5,884,000		
			BPA - Transmission	2,071,000		
			Wells	3,975,000		
			Nine Canyon	2,786,000		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	20		**Engineering**			**1,414,700**
		010	Wages		865,400	
		011	Benefits		283,900	
		020	Travel		13,500	
			Engineering	11,000		
			Leadership	2,500		
		021	Training, Tuition and Meeting Fees		9,500	
			Engineering	7,500		
			Leadership	2,000		
		030	Transportation		36,700	
		060	Postage, Printing and Stationary		1,600	
		070	Advertising		2,000	
		080	Misc. Contractual Services		8,500	
			Janitorial Services	8,500		
		083	Software Licenses and Support		64,300	
			AutoCad	2,000		
			ESRI	5,000		
			Futura	14,800		
			GeoNav	3,000		
			Sag10 ver 3.10	4,500		
			Staker	30,000		
			TL-PRO Design Studio	5,000		
		084	Permits and Fees		1,000	
			City Franchises	900		
			Miscellaneous	100		
		090	Materials and Supplies		20,800	
		091	Small Tools (under $1,000)		2,500	
			Misc.	2,500		
		712	Capital - Equipment (Over $2,000)		105,000	
			Milsoft Engineering Analysis System	15,000		
			Futura/Itron Interface and Upgrade	25,000		
			SCADA - Server/Software Upgrade	55,000		
			Misc.	10,000		

Div.	Dept.	Activity	Description			Budget Amount
1	21		**Operations**			**21,694,500**
		010	Wages		3,669,300	
		011	Benefits		1,130,100	
		020	Travel		17,500	
			Operations	15,000		
			Leadership	2,500		
		021	Training, Tuition and Meeting Fees		22,500	
			Operations	20,000		
			Leadership	2,500		
		030	Transportation		762,600	
		060	Postage, Printing and Stationary		1,700	
		070	Advertising		6,200	
		080	Misc. Contractual Services		500,600	
			CDL Testing Program	4,500		
			Employee Dispatch	9,600		
			Safety Training	55,000		
			Tree Trimming	400,000		
			Underground Locate Service	1,500		
			Vehicle Tracking Annual Fee	9,000		
			Weed Control	20,000		
			Miscellaneous	1,000		
		082	Maintenance Contracts		54,800	
			Landscape Maintenance	1,800		
			Snowplowing and Sweeping	3,000		
			Regulator and Oil Circuit Breaker	50,000		
		083	Software Licenses and Support		33,400	
			OSI	14,000		
			TWACS Handheld Support	5,000		
			ACLARA/TWACS/Enhanced Level of Support	13,000		
			Cummins Tool Software	1,400		
		084	Permits and Fees		39,000	
			Railroad Licenses	36,000		
			Right of Ways - USFS/Dept. of Int.	2,800		
			Miscellaneous	200		
		085	Rents and Leases		900	
			Pole Contacts	900		
		090	Materials and Supplies		649,800	
			General	559,800		
			Special Projects - Meter Bases	70,000		
			Fire Resistant Clothing	20,000		
		091	Small Tools (under $1,000)		33,000	
			Brewster	5,000		
			Okanogan	20,000		
			Oroville	5,000		
			Mechanics Specialty Tool Replacement	3,000		
		092	Miscellaneous		6,300	
			Lineman Rodeo (Fees, Travel and Supplies)	6,000		
			Safety Meeting Refreshments	300		
		581	Capital - Contractual Services		8,650,000	
			AMI Implementation Labor (trenching at subs)	20,000		
			AMI/Fiber to Ellisforde and Whitestone Subs	500,000		
			Contract Labor	100,000		

Div.	Dept.	Activity	Description			Budget Amount
			Engineering - Large System Projects	100,000		
			Gold Creek Sub Construction	505,000		
			MTP Line Construction	6,000,000		
			MTP Mitigation/Roads	650,000		
			MTP Permits, Tetra Tech, Training, etc.	175,000		
			MTP ROW/Easements	500,000		
			Underground Replacements	100,000		
		591	Capital - Materials and Supplies		5,022,200	
			Normal Replacements and Extensions	2,500,000		
			AMI Equipment	150,000		
			Gold Creek Substation Materials	320,000		
			MTP Transmission and Distribution Materials	1,250,000		
			OCB, Regulators, Switches, etc.	220,000		
			Sandflat Substation Materials (steel for new bay)	25,000		
			SCADA Equipment	137,200		
			Pinecreek Substation/Includes AMI Equipment	250,000		
			Power Transformer Retrofill	70,000		
			Cutout Replacement	100,000		
		592	Capital - Meter Purchases		440,000	
			AMI Meters to Complete Project	200,000		
			Metering Special Projects	70,000		
			Normal Meter Replacements	170,000		
		593	Capital - Transformer Purchases		500,000	
			Normal Additions/Replacements	500,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		10,000	
		711	Capital - Buildings		20,000	
			Vehicle Shop - Energy Efficient Lighting	12,500		
			Warehouse - Dock Ramp (Sweeper/Forklift)	7,500		
		712	Capital - Equipment (Over $2,000)		94,600	
			Complete Safety Demo Trailer	5,000		
			Tools and Supplies Vending Machine	4,500		
			Gas Powered Jack Hammer	5,000		
			Meter Test Board	38,000		
			Travelers	4,800		
			Hot Arms	9,800		
			Hydraulic Torque Wrench	10,000		
			Parts Washer	13,000		
			Fresh Air Welding Helmets and Air Unit	4,500		
		713	Capital - Vehicles		30,000	
			Bucket Truck - Replacement	210,000		
			Service Truck - Replacement	45,000		
			Telecommunications Truck	70,000		
			Less: Transportation System Depreciation	(295,000)		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	22		**Environmental**			**187,900**
		010	Wages		120,200	
		011	Benefits		41,800	
		020	Travel		7,000	
			Environmental	5,000		
			Leadership	2,000		
		021	Training, Tuition and Meeting Fees		4,500	
			Environmental	3,000		
			Leadership	1,500		
		030	Transportation		4,200	
		060	Postage, Printing and Stationary		200	
		070	Advertising		1,000	
		080	Misc. Contractual Services		5,000	
			Miscellaneous	5,000		
		083	Software Licenses and Support		2,000	
		090	Materials and Supplies		2,000	

Div.	Dept.	Activity	Description			Budget Amount
1	30		**Customer Service**			**1,417,200**
		010	Wages		763,500	
		011	Benefits		330,600	
		020	Travel		5,100	
			Customer Service	4,000		
			Leadership	1,100		
		021	Training, Tuition and Meeting Fees		3,400	
			Customer Service	2,500		
			Leadership	900		
		030	Transportation		47,500	
		060	Postage, Printing and Stationary		177,200	
			Postage - NISC	78,000		
			Postage - PUD	30,700		
			Printing - Bill Print	48,800		
			Printing - Customer Packets	10,000		
			Printing - Misc.	9,700		
		070	Advertising		800	
		080	Misc. Contractual Services		33,300	
			Collection Service Credit Bureau	5,000		
			Credit Reporting Agency	8,300		
			Electronic Payments Fees	20,000		
		084	Permits and Fees		600	
			Miscellaneous Fees (Notaries, etc.)	600		
		085	Rents and Leases		5,000	
			Office Rent MVCC	4,800		
			Miscellaneous	200		
		090	Materials and Supplies		29,800	
			General	28,800		
			Fire Resistant Clothing	1,000		
		091	Small Tools (under $1,000)		2,500	
			Unforeseen	2,500		
		092	Miscellaneous		17,900	
			Miscellaneous Expenses	600		
			Net Account Receivable Writeoffs	17,300		

Div.	Dept.	Activity	Description			Budget Amount
1	35		**Conservation/Consumer Information**			**644,000**
		010	Wages		126,800	
		011	Benefits		45,900	
		020	Travel		15,000	
		021	Training, Tuition and Meeting Fees		4,000	
		030	Transportation		9,600	
		060	Postage, Printing and Stationary		10,000	
		070	Advertising		25,000	
		071	Conservation Expenditures		372,800	
			CRC Program	271,000		
			Energy Conservation Agreement	100,000		
			CRC Renewables	1,800		
		080	Misc. Contractual Services		19,400	
			Electric Education Programs	19,400		
		090	Materials and Supplies		15,000	
		092	Miscellaneous		500	

Div.	Dept.	Activity	Description			Budget Amount
1	40		**General Administration**			**8,258,000**
		010	Wages		1,196,100	
		011	Benefits		387,500	
		020	Travel		31,500	
			General	20,300		
			Accounting and Finance	5,400		
			Human Resource	2,500		
			Leadership	3,300		
		021	Training, Tuition and Meeting Fees		28,000	
			General	5,900		
			Accounting and Finance	2,900		
			Human Resource	6,500		
			Leadership	2,700		
			Education Reimbursement Program	10,000		
		030	Transportation		8,300	
		040	Insurance (Property/Liability)		310,000	
		050	Utilities		97,200	
			Cell Phone Service	8,200		
			Electrical Service	7,800		
			Telephone Service	44,200		
			Water/Sewer/Garbage	37,000		
		060	Postage, Printing and Stationary		7,400	
		070	Advertising		2,700	
		080	Misc. Contractual Services		508,700	
			APPA Dues	11,400		
			Audit Costs	85,000		
			Banking Fees	52,400		
			Benefits Administration	6,000		
			Bond Admin Fee	2,000		
			Chamber Dues	700		
			CWPU/UIP Expenses	24,000		
			Economic Alliance	6,000		
			Financial Studies	50,000		
			Fire Alarm Monitoring	400		
			Foundation for Water and Energy	2,000		
			Janitorial Services	53,500		
			Legislative Consultant	36,000		
			Misc. Services/Consulting	29,400		
			NW Public Power Assoc. Dues/NW Wage & Hour	28,800		
			PPC - Dues	25,100		
			PPC - NW River Partners	12,600		
			Standard and Poors	7,800		
			WA PUD Association Dues	71,000		
			WA PUD Miscellaneous Surveys/Studies	4,600		
		081	Legal Services		309,100	
			General Counsel	234,100		
			Misc. Attorney Fees	75,000		
		082	Maintenance Contracts		18,500	
			Copier Maintenance	5,800		
			Elevator Maintenance	3,300		
			Landscape Maintenance/Sweeping/Snowplowing	9,400		
		084	Permits and Fees		2,700	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
			WA State Purchasing Coop	2,000		
			WA State L&I Right to Know	300		
			Misc.	400		
		085	Rents and Leases		8,200	
			Copier Lease	6,600		
			P.O. Box Rent	300		
			Storage	1,300		
		090	Materials and Supplies		46,200	
		091	Small Tools (under $1,000)		2,300	
		092	Miscellaneous		48,000	
			Clothing for Identification	1,500		
			Deductibles/Damage Claims	2,600		
			Election Costs	0		
			Employee Day	2,000		
			Interview/New Employee Expenses	20,000		
			Meeting Expenses	4,800		
			Misc. Expenses	300		
			Recycling/Disposal/Destruction Office Materials	5,000		
			Service Awards and Costs	1,800		
			Wellness Program Expenses	10,000		
		210	Taxes		2,108,300	
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000	
		711	Capital - Buildings		22,000	
			HQ Building - 2nd Avenue Signage	10,000		
			HQ Facilities - Gate Card Readers and Fencing	12,000		
		712	Capital - Equipment (Over $2,000)		0	
		810	Debt Service - Principal		1,035,000	
		811	Debt Service - Interest		1,978,300	
		901	Unforeseen Contingencies		100,000	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	41		**Information Systems**			**872,200**
		010	Wages		282,200	
		011	Benefits		91,700	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		20,000	
		030	Transportation		2,000	
		080	Misc. Contractual Services		14,400	
			Neopost Postal Rate Change	1,200		
			Network Consulting	10,000		
			RDS	500		
			Security System Monitoring	2,700		
		082	Maintenance Contracts		28,300	
			Itron	3,600		
			Key Card System	5,000		
			M+RFM Bundle (Spam & Archive)	3,000		
			NetApp SAN Hardware/Software	9,000		
			SonicWall	2,500		
			Symantec	1,200		
			VMWare Software	4,000		
		083	Software Licenses and Support		171,000	
			NISC	109,400		
			AV Licenses	800		
			Backup Exec	1,200		
			Exchange Server	2,100		
			MS Server	1,000		
			PC Software	8,500		
			Remote Agents	3,000		
			SharePoint	45,000		
		085	Rents and Leases		16,100	
			Mailing Equipment Lease	11,100		
			Postage Machine Leases - Branch Offices	3,000		
			Postage Meter Rental - Okanogan	2,000		
		090	Materials and Supplies		10,000	
		091	Small Tools (under $1,000)		25,500	
			Misc. Peripherals	20,000		
			Small Tools	5,500		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		1,200	
		712	Capital - Equipment (Over $2,000)		140,000	
			eBill Server	5,000		
			Video Conferencing - Okanogan	7,000		
			Video Surveillance - Branch Offices and Subs	18,000		
			Virtual Environment	105,000		
			VPN Appliance	5,000		
		714	Capital - Personal Computers		57,300	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description		Budget Amount
1	50		**Commissioners**		**156,700**
		010	Wages	87,000	
		011	Benefits	39,900	
		020	Travel	24,300	
		021	Training, Tuition and Meeting Fees	2,800	
		090	Materials and Supplies	1,300	
		092	Miscellaneous	1,400	

Div.	Dept.	Activity	Description			Budget Amount
2	60		**Wholesale Telecommunications**			**1,954,200**
		010	Wages		222,000	
		011	Benefits		67,300	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		12,500	
		030	Transportation		16,000	
		080	Misc. Contractual Services		144,200	
			NoaNet Calea Services	4,200		
			Professional Services - Network Vulnerability	60,000		
			Professional Services - WDM Implementation	80,000		
		081	Legal Services		5,000	
		082	Maintenance Contracts		25,500	
			Eaton/Powerware UPS Towers	3,500		
			Cisco Smartnet	5,400		
			WWP Lightning Edge/Ciena Devices	12,000		
			RADcare (Optimux and IPMux)	2,600		
			Motorola Canopy Hardware/Software	2,000		
		083	Software Licenses and Support		35,000	
			Element Management Software	30,000		
			Solar Winds IP Monitor Software Support	5,000		
		084	Permits and Fees		120,000	
			Internet Fees - NoaNet	115,000		
			ARIN ASN & IP Address Allocation	5,000		
		085	Rents and Leases		221,200	
			DCPUD Lit Services Lease	3,000		
			DCPUD Dark Fiber Lease	58,300		
			DCPUD Colocation	1,800		
			Protect Path Ring (Canada/Seattle/Wenatchee)	102,000		
			NoaNet Dark Fiber Lease	32,100		
			CenturyTel Dark Fiber Lease	0		
			Wireless Site Lease	24,000		
		090	Materials and Supplies		101,500	
			Battery Maintenance & Replacement	6,500		
			Fiber Plant Maintenance - Wholesale	50,000		
			HVAC Maintenance and Repair	30,000		
			Misc. Switch/Network HW Upgrades	10,000		
			UPS/Rectifier Replacement	5,000		
		091	Small Tools (under $1,000)		1,000	
		210	Taxes		10,700	
		591	Capital - Material and Supplies		532,000	
			Fiber Buildout	10,000		
			Fiber Distribution Builds	50,000		
			Network Hardware Replacements	75,000		
			New Ethernet Node	25,000		
			Rackmount Servers	20,000		
			WDM Infrastructure	230,000		
			Wireless Remote Subscriber Units	97,000		
			Wireless Towers	25,000		
		712	Capital - Equipment (Over $2,000)		10,000	
			Test Equipment	5,000		
			Tools	5,000		
		810	Debt Service - Principal		155,000	

Div.	Dept.	Activity	Description		Budget Amount
		811	Debt Service - Interest	262,800	

Div.	Dept.	Activity	Description			Budget Amount
1	61		**Internal Communications**			**1,158,300**
		010	Wages		147,400	
		011	Benefits		53,800	
		020	Travel		10,000	
			Communications	7,000		
			Leadership	3,000		
		021	Training, Tuition and Meeting Fees		16,200	
			Communications	12,000		
			Leadership	4,200		
		030	Transportation		8,100	
		060	Postage, Printing and Stationary		300	
		080	Misc. Contractual Services		100,000	
			UHF System Re-Design	50,000		
			NoaNet Assessments	50,000		
		082	Maintenance Contracts		50,500	
			Fire Alarm System	2,000		
			Landscape Maintenance/Sweeping	6,000		
			UHF Radio System	19,000		
			Telephone System	10,000		
			UPS Maintenance	13,500		
		083	Software Licenses and Support		8,700	
			Cisco Smartnet	200		
			MapInfo Software	1,500		
			Fiber Mapping Software	7,000		
		084	Permits and Fees		3,000	
			Right of Way - USFS, DOT, etc.	3,000		
		085	Rents and Leases		25,800	
			UHF Site Lease - Little Buck Mtn.	2,500		
			UHF Site Lease - Aeneas Mtn.	2,500		
			UHF Site Lease - Goat Mtn.	600		
			UHF Site Lease - Omak Mtn.	2,500		
			Dark Fiber Lease - Brewster to Wells Dam	17,700		
		090	Materials and Supplies		50,000	
			General Materials and Supplies	50,000		
		091	Small Tools (under $1,000)		2,000	
		591	Capital - Material and Supplies		32,500	
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000		
			Fiber Build - Okanogan County Fairgrounds	7,500		
			Miscellaneous	10,000		
		712	Capital - Equipment (Over $2,000)		650,000	
			UHF Radio System Overhaul	590,000		
			Miscellaneous Contingencies	60,000		

Div.	Dept.	Activity	Description	Budget Amount
			TOTAL EXPENDITURES AND CAPITAL OUTLAY	**66,769,100**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 FINAL BUDGET - NOVEMBER 16, 2010
LABOR AND PERSONNEL (WAGES ONLY)

Department	Title	12/31/2010
Generation	Overtime	0
	Sub-Total	0
Power Supply	Power Resource Manager	96,096
	WECC Compliance/Power Analyst	46,300
	Sub-Total	142,396
Engineering	Chief Engineer	118,924
	Distribution Engineer	51,686
	Distribution Engineer	51,626
	Sr. Distribution Engineer	69,422
	Sr. Distribution Engineer	68,357
	Sr. Distribution Engineer	61,660
	Systems Engineer	86,412
	Systems Engineer	85,665
	Systems Engineer	72,155
	GIS Technician	59,629
	Engineering Aid	45,277
	Intern Engineer	20,000
	On Call Compensation	41,600
	Overtime	10,000
	Sub-Total	842,413
Operations	Construction Superintendent	96,554
	Area Manager	89,436
	Area Manager	98,145
	Purchasing Agent/Facilities Manager	77,790
	Right of Way Superintendent	63,563
	Assistant Construction Superintendent	82,653
	Serviceman	75,234
	Serviceman	75,234
	Serviceman	75,234
	Serviceman	75,234
	Foreman	84,552
	Journeyman Lineman	75,234
	Journeyman Lineman	75,234
	Journeyman Lineman	75,234
	Foreman	84,552
	Journeyman Lineman	75,234
	Journeyman Lineman	75,234
	Apprentice Lineman	67,205
	Foreman	84,552
	Journeyman Lineman	75,234
	Lineman	75,234
	Apprentice Lineman	60,507
	Foreman	84,552
	Journeyman Lineman	75,234
	Journeyman Lineman	75,234
	Apprentice Lineman	63,939

Department	Title	12/31/2010
	Journeyman Lineman/Locator	75,234
	Wireman Foreman	84,552
	Wireman	75,234
	Wireman	75,234
	Journeyman Meterman	75,234
	Journeyman Meterman	75,234
	LA Meter Replacement Specialist	53,518
	HazMat Specialist	58,053
	Facilities Maintenance Worker	60,091
	Facilities Maintenance Worker	39,686
	Shop Foreman	67,600
	Mechanic	57,990
	Mechanic	57,990
	Warehouseman	55,307
	Warehouseman	55,307
	Temporary Labor Lineman	30,000
	Temporary Labor Groundman	20,000
	Part-time Student Labor	27,000
	On Call Compensation	18,720
	Overtime - Cutout Changes	150,000
	Overtime	350,000
	Sub-Total	3,578,026
Environmental	Director of Regulatory & Environmental Affairs	101,311
	Environmental Coordinator	58,662
	Environmental Coordinator	61,140
	Overtime	10,000
	Sub-Total	231,113
Customer Service	Customer Service Supervisor	83,832
	Customer Records Coordinator	55,116
	Credit/Collections Specialist	45,901
	Account Clerk	42,557
	Account Clerk	42,557
	Account Clerk	42,557
	Account Clerk	32,157
	Account Clerk	42,557
	Account Clerk	42,557
	Account Clerk	42,557
	Account Clerk	42,557
	Meter Reader	46,550
	Meter Reader	46,550
	Meter Reader	46,550
	Relief Account Clerk	21,300
	Relief Account Clerk	21,300
	Relief Account Clerk	18,800
	Overtime	25,000
	Sub-Total	740,955

Department	Title	12/31/2010
Conservation	Energy Services Coordinator	56,730
	Energy Services Coordinator	56,730
	Overtime	10,000
	Sub-Total	123,460
General Administration	General Manager	165,000
	Operations Manager	144,899
	Director of Finance/Auditor	121,705
	Administrative/Executive Assistant	55,744
	Administrative Assistant	55,563
	Human Resource Director	97,415
	Chief Accountant/Deputy Treasurer	84,824
	Treasurer/Accountant	78,998
	Financial Analyst	61,447
	Accountant	57,298
	Accountant	61,338
	Payroll/Employee Records Coordinator	47,929
	Accounts Payable Clerk	37,800
	LA Project Analyst	90,000
	Overtime	4,000
	Sub-Total	1,163,960
Information Systems	Information Systems Supervisor	90,933
	Information Systems Technician	64,526
	Information Systems Technician	59,218
	Information Systems Technician	59,218
	Sub-Total	273,895
Commissioners	Commissioner	29,000
	Commissioner	29,000
	Commissioner	29,000
	Sub-Total	87,000
Telecommunications	Network Engineer	91,485
	Telecommunications Technicians	63,877
	Telecommunications Technicians	63,877
	Telecommunications Technicians	63,877
	Overtime	28,000
	Sub-Total	311,116
	Wage Increases (Step and Cost of Living)	202,498
	Total Labor Costs	**7,696,832**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2012 FINAL BUDGET - DECEMBER 20, 2011
OVERVIEW

HIGHLIGHTS

- → $19.9 million transfer from reserves, which is a $2.5 million decrease over the 2011 adopted budget.
- → Revenues, not including Grant Proceeds, cover operating expenses by $2.8 million.
- → Retail Electric Sales increased $2.5 million to $37.5 million.
- → Wholesale Electric Sales decreased $2.7 million - Decrease in electricity available for sale, due to 5.8 mWa less power available from BPA.
- → Miscellaneous Income budget increased by $755,000 - Build America Bond reimbursement of almost $500,000.
- → Construction Contributions increased $239,000 - continues to outperform expectations.
- → Grant Proceeds of $5.4 million - A new category used to account for BPA Conservation & ARRA Project reimbursements.
- → Unforeseen Operating Contingency $100,000 - A new category to be used for improved budget tracking.
- → Purchased Power - the largest operating expenditure in the budget decreased over $2.2 million to $23.2 million. The 2012 proposed budget reflects expected cost decrease driven by less power available from BPA.
- → Capital Outlays account for $24.6 million - see a summary of capital projects below.
- → Debt Service Coverage Ratio is estimated at 1.60 times annual debt service payments, bond covenants require 1.25 times.
- → Total TIER (times interest earned ratio) is estimated at .86, District's target is 1.5 times.

REVENUES of $50.9 million - Assumptions Used

- → **Retail Electric Sales:** Predicting a 1% load growth, 1.5 mW step up for expansion of several large general service customers and previously approved rate adjustments.
- → **Wholesale Electric:** Sales based on a 3/4 to median water year and previous two years average market pricing,
- → **Wholesale Telecommunications:** Based on current revenue levels and a slight increase for broadband buildout.
- → **Interest:** Return on investments of between .17%(LGIP) and .25%(CDs).
- → **Miscellaneous:** Previous twelve months revenue and Build America Bond reimbursement of $446,000.
- → **Rental Income:** Same as previous year with no growth.
- → **Construction Contributions:** Estimated using previous two years average.
- → **Grant Proceeds:** Anticipated reimbursements of $460,000 from BPA and $5.0 million from RUS.

EXPENDITURES $42.7 million - Assumptions Used

- → **Wages:** One less employee than the 2011 adopted budget and overall average wage increase of 3.0%. The overall average wage increase includes current bargaining agreement step increases.
- → **Benefits:** Based on August 2010 thru July 2011 actual percentage of wages. Range of 32.9% through 48.6% (ave. 36%).
- → **Purchased Power:** Wells Project costs effective September 2011 and BPA's new contract effective October 2011.
- → **Other Expenditures:** Other expenses are based on known 2012 costs, if costs are not specifically known a 2% increase was estimated, except transportation .5%, taxes 3% and postage 4%.

CAPITAL OUTLAY $24.6 million - Summary Listing

- → Methow transmission line and substation $9.4 million.
- → ARRA Broadband Project $8.3 million.
- → Operations normal replacements and line extensions of $2.0 million.
- → Enloe Dam $1.3 million.
- → Wholesale Telecommunications capital of $758,000, non-ARRA.
- → Upgrade/Expand UHF radio system $590,000.
- → Information Systems $274,000 (network, phone, access control and surveillance systems).
- → Bucket Truck Replacement $250,000.
- → Warehouse Truck Replacement $250,000.
- → Tonasket to Oroville Fiber Build $250,000.
- → Regulator and switch purchases $170,000.
- → SCADA implementation continuation $140,000.
- → Underground replacements $200,000.
- → Other capital Items $718,000.

DEBT SERVICE $3.5 million

- → **Principal and Interest:** Per debt service schedules.

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2012 FINAL BUDGET - DECEMBER 20, 2011
BUDGET SUMMARY

Description	Electric	Wholesale Telecom	Total
REVENUE			
Sales - Retail	37,475,000		37,475,000
Sales - Wholesale	2,742,000	2,500,000	5,242,000
Interest	80,000		80,000
Miscellaneous	1,504,000		1,504,000
Rental Income	118,000		118,000
Construction Contribution	1,059,000		1,059,000
Grant Proceeds	460,000	4,961,000	5,421,000
Total Revenue	**43,438,000**	**7,461,000**	**50,899,000**
EXPENDITURES			
Wages	7,364,100	262,900	7,627,000
Benefits	2,626,200	90,200	2,716,400
Travel	158,300	12,500	170,800
Training, Tuition and Meeting Fees	116,300	12,500	128,800
Transportation	806,500	22,800	829,300
Insurance	308,000		308,000
Utilities	85,800		85,800
Postage, Printing and Stationary	193,000		193,000
Advertising	22,300		22,300
Conservation Expenditures	460,000		460,000
Misc. Contractual Services	2,205,400	8,400	2,213,800
Legal Services	309,100	10,000	319,100
Maintenance Contracts	138,400	47,500	185,900
Software Licenses and Support	429,500	15,700	445,200
Permits and Fees	60,500	100,000	160,500
Rents and Leases	66,700	213,300	280,000
Materials and Supplies	700,500	96,500	797,000
Small Tools (under $1,000)	42,300	1,000	43,300
Miscellaneous	100,300		100,300
Unforeseen Operating Contingency	100,000		100,000
Purchased Power	23,220,100		23,220,100
Taxes	2,286,800	11,900	2,298,700
Total Expenditures	41,800,100	905,200	42,705,300
CAPITAL OUTLAY			
Capital - Contractual Services	9,593,000	93,400	9,686,400
Capital - Materials and Supplies	4,024,000	9,027,400	13,051,400
Capital - Meter Purchases	90,000		90,000
Capital - Transformer Purchases	225,000		225,000
Capital - Tools and Equipment	12,000		12,000
Capital - Buildings	7,500		7,500
Capital - Equipment (Over $2,000)	1,041,000	10,000	1,051,000
Capital - Vehicles	315,300		315,300
Capital - Personal Computers	48,100		48,100
Unforeseen Capital Contingency	100,000		100,000
Total Capital Outlay	15,455,900	9,130,800	24,586,700
DEBT SERVICE			
Debt Service - Principal	1,387,000	168,000	1,555,000
Debt Service - Interest	1,685,300	233,700	1,919,000
Total Debt Service	3,072,300	401,700	3,474,000
Total Use of Resources	**60,328,300**	**10,437,700**	**70,766,000**
TRANSFER TO/(FROM) RESERVES	**(16,890,300)**	**(2,976,700)**	**(19,867,000)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2011 ADOPTED BUDGET COMPARED TO 2012 FINAL BUDGET
DECEMBER 20, 2011

	Electric System				Wholesale Telecommunications				Total			
REVENUE	Adopted 2011	Projected 2011	Final 2012	2011 Adopted/ 2012 Final	Adopted 2011	Projected 2011	Final 2012	2011 Adopted/ 2012 Final	Adopted 2011	Projected 2011	Final 2012	2011 Adopted/ 2012 Final
Sales - Retail	35,001,000	33,756,000	37,475,000	2,474,000				0	35,001,000	33,756,000	37,475,000	2,474,000
Sales - Wholesale	5,490,000	6,269,000	2,742,000	(2,748,000)	2,000,000	2,253,000	2,500,000	500,000	7,490,000	8,522,000	5,242,000	(2,248,000)
Interest	207,000	101,000	80,000	(127,000)				0	207,000	101,000	80,000	(127,000)
Miscellaneous	749,000	1,274,000	1,504,000	755,000				0	749,000	1,274,000	1,504,000	755,000
Rental Income	118,000	118,000	118,000	0				0	118,000	118,000	118,000	0
Construction Contribution	820,000	1,210,000	1,059,000	239,000				0	820,000	1,210,000	1,059,000	239,000
Grant Proceeds	0		460,000	460,000		900,000	4,961,000	4,961,000	0	900,000	5,421,000	5,421,000
Total Revenue	**42,385,000**	**42,728,000**	**43,438,000**	**1,053,000**	**2,000,000**	**3,153,000**	**7,461,000**	**5,461,000**	**44,385,000**	**45,881,000**	**50,899,000**	**6,514,000**
EXPENDITURES												
Wages	7,474,800	7,037,400	7,364,100	(110,700)	222,000	281,000	262,900	40,900	7,696,800	7,318,400	7,627,000	(69,800)
Benefits	2,477,300	2,533,000	2,626,200	148,900	67,300	101,000	90,200	22,900	2,544,600	2,634,000	2,716,400	171,800
Travel	173,400	148,400	158,300	(15,100)	12,500	12,500	12,500	0	185,900	160,900	170,800	(15,100)
Training, Tuition and Meeting Fees	123,400	87,800	116,300	(7,100)	12,500	12,500	12,500	0	135,900	100,300	128,800	(7,100)
Transportation	887,500	801,000	806,500	(81,000)	16,000	28,000	22,800	6,800	903,500	829,000	829,300	(74,200)
Insurance	310,000	310,000	308,000	(2,000)				0	310,000	310,000	308,000	(2,000)
Utilities	97,200	86,400	85,800	(11,400)				0	97,200	86,400	85,800	(11,400)
Postage, Printing and Stationary	198,400	159,100	193,000	(5,400)				0	198,400	159,100	193,000	(5,400)
Advertising	37,700	22,000	22,300	(15,400)				0	37,700	22,000	22,300	(15,400)
Conservation Expenditures	372,800	410,000	460,000	87,200				0	372,800	410,000	460,000	87,200
Misc. Contractual Services	2,364,400	1,814,800	2,205,400	(159,000)	144,200	16,200	8,400	(135,800)	2,508,600	1,831,000	2,213,800	(294,800)
Legal Services	309,100	289,100	309,100	0	5,000	17,000	10,000	5,000	314,100	306,100	319,100	5,000
Maintenance Contracts	152,100	109,500	138,400	(13,700)	25,500	25,500	47,500	22,000	177,600	135,000	185,900	8,300
Software Licenses and Support	282,400	259,600	429,500	147,100	35,000	35,000	15,700	(19,300)	317,400	294,600	445,200	127,800
Permits and Fees	248,300	111,400	60,500	(187,800)	120,000	120,000	100,000	(20,000)	368,300	231,400	160,500	(207,800)
Rents and Leases	63,900	63,900	66,700	2,800	221,200	139,200	213,300	(7,900)	285,100	203,100	280,000	(5,100)
Materials and Supplies	828,900	718,300	700,500	(128,400)	101,500	101,500	96,500	(5,000)	930,400	819,800	797,000	(133,400)
Small Tools (under $1,000)	67,800	63,300	42,300	(25,500)	1,000	1,000	1,000	0	68,800	64,300	43,300	(25,500)
Miscellaneous	74,100	97,300	100,300	26,200				0	74,100	97,300	100,300	26,200
Unforeseen Operating Contingency			100,000	100,000				0	0	0	100,000	100,000
Purchased Power	25,373,000	25,373,000	23,220,100	(2,152,900)				0	25,373,000	25,373,000	23,220,100	(2,152,900)
Taxes	2,108,300	2,108,300	2,286,800	178,500	10,700	10,700	11,900	1,200	2,119,000	2,119,000	2,298,700	179,700
Total Expenditures	44,024,800	42,603,600	41,800,100	(2,224,700)	994,400	901,100	905,200	(89,200)	45,019,200	43,504,700	42,705,300	(2,313,900)
CAPITAL OUTLAY												
Capital - Contractual Services	10,500,000	1,290,000	9,593,000	(907,000)		900,000	93,400	93,400	10,500,000	2,190,000	9,686,400	(813,600)
Capital - Materials and Supplies	5,104,700	3,411,700	4,024,000	(1,080,700)	532,000	402,000	9,027,400	8,495,400	5,636,700	3,813,700	13,051,400	7,414,700
Capital - Meter Purchases	440,000	380,000	90,000	(350,000)				0	440,000	380,000	90,000	(350,000)
Capital - Transformer Purchases	500,000	425,000	225,000	(275,000)				0	500,000	425,000	225,000	(275,000)
Capital - Tools and Equipment	13,200	13,200	12,000	(1,200)				0	13,200	13,200	12,000	(1,200)
Capital - Buildings	42,000	42,000	7,500	(34,500)				0	42,000	42,000	7,500	(34,500)
Capital - Equipment (Over $2,000)	989,600	355,000	1,041,000	51,400	10,000	10,000	10,000	0	999,600	365,000	1,051,000	51,400
Capital - Vehicles	30,000	(196,900)	315,300	285,300				0	30,000	(196,900)	315,300	285,300
Capital - Personal Computers	57,300	57,300	48,100	(9,200)				0	57,300	57,300	48,100	(9,200)
Unforeseen Capital Contingency	100,000	100,000	100,000	0				0	100,000	100,000	100,000	0
Total Capital Outlay	17,776,800	5,877,300	15,455,900	(2,320,900)	542,000	1,312,000	9,130,800	8,588,800	18,318,800	7,189,300	24,586,700	6,267,900
DEBT SERVICE												
Debt Service - Principal	1,035,000	1,035,000	1,387,000	352,000	155,000	155,000	168,000	13,000	1,190,000	1,190,000	1,555,000	365,000
Debt Service - Interest	1,978,300	1,978,300	1,685,300	(293,000)	262,800	262,800	233,700	(29,100)	2,241,100	2,241,100	1,919,000	(322,100)
Total Debt Service	3,013,300	3,013,300	3,072,300	59,000	417,800	417,800	401,700	(16,100)	3,431,100	3,431,100	3,474,000	42,900
Total Use of Resources	**64,814,900**	**51,494,200**	**60,328,300**	**(4,486,600)**	**1,954,200**	**2,630,900**	**10,437,700**	**8,483,500**	**66,769,100**	**54,125,100**	**70,766,000**	**3,996,900**
TRANSFER TO/(FROM) RESERVES	**(22,429,900)**	**(8,766,200)**	**(16,890,300)**	**5,539,600**	**45,800**	**522,100**	**(2,976,700)**	**(3,022,500)**	**(22,384,100)**	**(8,244,100)**	**(19,867,000)**	**2,517,100**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2012 FINAL BUDGET - DECEMBER 20, 2011
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Engineering	Operations	Environmental	Customer Service	Conservation	General Administration	Information Systems	Commissioners	Wholesale Telecom	Internal Communications	Total
EXPENDITURES													
010 Wages	116,800	112,200	837,400	3,674,000	120,000	648,100	123,400	1,134,300	360,600	85,800	262,900	151,500	7,627,000
011 Benefits	43,300	41,400	288,900	1,241,800	42,400	287,800	46,900	420,800	118,600	41,700	90,200	52,600	2,716,400
020 Travel	10,000	12,500	12,500	17,500	8,000	5,000	8,000	40,500	15,000	24,300	12,500	5,000	170,800
021 Training, Tuition and Meeting Fees	5,000	7,500	7,500	30,000	4,500	2,500	5,800	25,700	20,000	2,800	12,500	5,000	128,800
030 Transportation	6,200	2,100	30,000	700,000	4,200	35,700	6,000	6,900	1,200		22,800	14,200	829,300
040 Insurance								308,000					308,000
050 Utilities								85,800					85,800
060 Postage, Printing and Stationary			1,000	1,400		174,000	8,000	7,800		500		300	193,000
070 Advertising			500	3,000		800	15,000	3,000					22,300
071 Conservation Expenditures							460,000						460,000
080 Misc. Contractual Services	50,000	893,500	8,500	583,100	1,000	20,000	23,300	598,000	28,000		8,400		2,213,800
081 Legal Services								309,100			10,000		319,100
082 Maintenance Contracts				10,000		400		20,000	81,000		47,500	27,000	185,900
083 Software Licenses and Support		50,000	60,000	27,300	4,500	12,300			266,000		15,700	9,400	445,200
084 Permits and Fees	50,000		500	4,000		300		2,700			100,000	3,000	160,500
085 Rents and Leases	8,200			1,000		5,200		11,000	15,500		213,300	25,800	280,000
090 Materials and Supplies	3,000	1,000	15,000	520,000	22,000	30,000	2,000	46,200	10,000	1,300	96,500	50,000	797,000
091 Small Tools (under $1,000)			2,000	18,000		3,000		2,300	15,000		1,000	2,000	43,300
092 Miscellaneous				10,000		38,700	200	50,000		1,400			100,300
099 Unforeseen Operating Contingency								100,000					100,000
120 Purchased Power		23,220,100											23,220,100
210 Taxes								2,286,800			11,900		2,298,700
Total Expenditures	292,500	24,340,300	1,263,800	6,841,100	206,600	1,263,800	698,600	5,458,900	930,900	157,800	905,200	345,800	42,705,300
CAPITAL OUTLAY													
581 Capital - Contractual Services	1,240,000			8,353,000							93,400		9,686,400
591 Capital - Materials and Supplies	42,000			3,957,000							9,027,400	25,000	13,051,400
592 Capital - Meter Purchases				90,000									90,000
593 Capital - Transformer Purchases				225,000									225,000
710 Capital - Tools and Equipment				10,000				2,000					12,000
711 Capital - Buildings				7,500									7,500
712 Capital - Equipment (Over $2,000)			73,000	39,000		5,000			274,000		10,000	650,000	1,051,000
713 Capital - Vehicles				315,300									315,300
714 Capital - Personal Computers									48,100				48,100
901 Unforeseen Capital Contingency								100,000					100,000
Total Capital Outlay	1,282,000	0	73,000	12,996,800	0	5,000	0	102,000	322,100	0	9,130,800	675,000	24,586,700
DEBT SERVICE													
810 Debt Service - Principal								1,387,000			168,000		1,555,000
811 Debt Service - Interest								1,685,300			233,700		1,919,000
Total Debt Service	0	0	0	0	0	0	0	3,072,300	0	0	401,700	0	3,474,000
Total Use of Resources	1,574,500	24,340,300	1,336,800	19,837,900	206,600	1,268,800	698,600	8,633,200	1,253,000	157,800	10,437,700	1,020,800	70,766,000

REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**43,438,000**
	001	Sales - Retail	37,475,000	
	002	Sales - Wholesale	2,742,000	
	003	Interest	80,000	
	004	Miscellaneous	1,504,000	
	005	Rental Income	118,000	
	006	Construction Contributions	1,059,000	
	007	Grant Proceeds	460,000	
2		**Wholesale Telecom**		**7,461,000**
	002	Sales - Wholesale	2,500,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
	007	Grant Proceeds	4,961,000	
		TOTAL REVENUE		**50,899,000**

Div.	Dept.	Activity	Description			Budget Amount
1	10		**Generation**			**1,574,500**
		010	Wages		116,800	
		011	Benefits		43,300	
		020	Travel		10,000	
		021	Training, Tuition and Meeting Fees		5,000	
		030	Transportation		6,200	
		080	Misc. Contractual Service		50,000	
			Emergency Action Plan (EAP) Yearly Review	20,000		
			Yearly Dam Inspection	15,000		
			Yearly Monitoring Historical Structures	5,000		
			Other Misc.	10,000		
		084	Permits and Fees		50,000	
			Other Misc.	50,000		
		085	Rent and Leases		8,200	
			Ophir Site Lease	8,200		
		090	Materials and Supplies		3,000	
		581	Capital - Contractual Services		1,240,000	
			BLM Cost Recovery Agreement	50,000		
			Cardno Entrix	400,000		
			Christensen & Associates	400,000		
			GKRSE - FERC/Federal Legal Council	75,000		
			Longview Associates	35,000		
			Other Cost Recovery Agreements	50,000		
			PM&E Implementation	200,000		
			WDOE Cost Recovery Agreement	30,000		
		591	Capital - Materials and Supplies		42,000	
			Enloe Dam - EAP	7,000		
			Materials and Supplies	35,000		

Div.	Dept.	Activity	Description			Budget Amount
1	11		**Power Supply**			**24,340,300**
		010	Wages		112,200	
		011	Benefits		41,400	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		7,500	
		030	Transportation		2,100	
		080	Misc. Contractual Services		893,500	
			Douglas County PUD	346,000		
			Miscellaneous Professional Services	31,000		
			Annual Dow Jones Subscription	1,500		
			Central Washington Power Authority	5,000		
			Slice Scheduling Software	500,000		
			Slice Implementation Group	10,000		
		083	Software Licenses and Support		50,000	
			Software Support Fee	50,000		
		090	Materials and Supplies		1,000	
		120	Purchased Power		23,220,100	
			BPA - Slice	7,909,700		
			BPA - Block	6,086,100		
			BPA - Transmission	2,337,100		
			Wells	4,073,800		
			Nine Canyon	2,813,400		

Div.	Dept.	Activity	Description			Budget Amount
1	20		**Engineering**			**1,336,800**
		010	Wages		837,400	
		011	Benefits		288,900	
		020	Travel		12,500	
			Engineering	12,500		
		021	Training, Tuition and Meeting Fees		7,500	
			Engineering	7,500		
		030	Transportation		30,000	
		060	Postage, Printing and Stationary		1,000	
		070	Advertising		500	
		080	Misc. Contractual Services		8,500	
			Janitorial Services (BR, TO, and OR)	8,500		
		083	Software Licenses and Support		60,000	
			AutoCad	2,000		
			ESRI	5,000		
			Futura	15,000		
			GeoNav	3,000		
			Acent GIS (Aerials)	1,200		
			Staker	28,800		
			TL-PRO Design Studio	5,000		
		084	Permits and Fees		500	
			Miscellaneous	500		
		090	Materials and Supplies		15,000	
		091	Small Tools (under $1,000)		2,000	
			Misc.	4,000		
		712	Capital - Equipment (Over $2,000)		73,000	
			Staker w/ Analysis	65,000		
			CMMS	8,000		

Div.	Dept.	Activity	Description			Budget Amount
1	21		**Operations**			**19,837,900**
		010	Wages		3,674,000	
		011	Benefits		1,241,800	
		020	Travel		17,500	
			Operations	17,500		
		021	Training, Tuition and Meeting Fees		30,000	
			Operations	30,000		
		030	Transportation		700,000	
		060	Postage, Printing and Stationary		1,400	
		070	Advertising		3,000	
		080	Misc. Contractual Services		583,100	
			CDL Testing Program	4,000		
			Employee Dispatch	9,600		
			Facility Gates	10,500		
			Pole Testing	250,000		
			Safety Training	38,000		
			Tree Trimming	250,000		
			Underground Locate Service	2,000		
			Weed Control	15,000		
			Miscellaneous	4,000		
		082	Maintenance Contracts		10,000	
			Landscape Maintenance	8,000		
			Snowplowing and Sweeping	2,000		
		083	Software Licenses and Support		27,300	
			Cummins Tool Software	700		
			Fastenal Tool Inventory	1,200		
			OSI	14,300		
			Trimble Field Inspector	4,100		
			Zonar Vehicle Tracking	7,000		
		084	Permits and Fees		4,000	
			Right of Ways - USFS/Dept. of Int.	3,000		
			Miscellaneous	1,000		
		085	Rents and Leases		1,000	
			Pole Contacts	1,000		
		090	Materials and Supplies		520,000	
			General	500,000		
			Fire Resistant Clothing	20,000		
		091	Small Tools (under $1,000)		18,000	
			Brewster	3,200		
			Okanogan	9,600		
			Oroville	3,200		
			Mechanics Specialty Tool Replacement	2,000		
		092	Miscellaneous		10,000	
			Lineman Rodeo (Fees, Travel and Supplies)	9,600		
			Safety Meeting Refreshments	400		
		581	Capital - Contractual Services		8,353,000	
			Contract Labor	100,000		
			Engineering - Large System Projects	100,000		
			Tonasket to Oroville Fiber Construction	123,000		
			Gold Creek Sub Construction	505,000		
			MTP Line Construction	6,000,000		
			MTP Mitigation/Roads	650,000		

Div.	Dept.	Activity	Description			Budget Amount
			MTP Permits, Tetra Tech, Training, etc.	175,000		
			MTP ROW/Easements	500,000		
			Underground Replacements	200,000		
		591	Capital - Materials and Supplies		3,957,000	
			Normal Replacements and Extensions	1,800,000		
			AMI Equipment	50,000		
			Tonasket to Oroville Fiber Materials	127,000		
			Gold Creek Substation Materials	320,000		
			MTP Transmission and Distribution Materials	1,250,000		
			OCB, Regulators, Switches, etc.	170,000		
			SCADA Equipment	140,000		
			Cutout Replacement	100,000		
		592	Capital - Meter Purchases		90,000	
			Metering Special Projects	75,000		
			Normal Meter Replacements	15,000		
		593	Capital - Transformer Purchases		225,000	
			Normal Additions/Replacements	225,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		10,000	
		711	Capital - Buildings		7,500	
			Warehouse - Emergency Generator	7,500		
		712	Capital - Equipment (Over $2,000)		39,000	
			Hydraulic Oil Filter Machine	11,200		
			Ironworker	20,000		
			Trimble Field Inspector Handheld	7,800		
		713	Capital - Vehicles		315,300	
			Bucket Truck - Replacement	250,000		
			Warehouse Truck - Replacement	250,000		
			Dump Trailers	15,000		
			Used 4x4 Line Truck	80,000		
			Less: Transportation System Depreciation	(279,700)		

Div.	Dept.	Activity	Description			Budget Amount
1	22		**Environmental**			**206,600**
		010	Wages		120,000	
		011	Benefits		42,400	
		020	Travel		8,000	
			Environmental	8,000		
		021	Training, Tuition and Meeting Fees		4,500	
			Environmental	4,500		
		030	Transportation		4,200	
		080	Misc. Contractual Services		1,000	
			Miscellaneous	1,000		
		083	Software Licenses and Support		4,500	
		090	Materials and Supplies		22,000	

Div.	Dept.	Activity	Description			Budget Amount
1	30		**Customer Service**			**1,268,800**
		010	Wages		648,100	
		011	Benefits		287,800	
		020	Travel		5,000	
		021	Training, Tuition and Meeting Fees		2,500	
		030	Transportation		35,700	
		060	Postage, Printing and Stationary		174,000	
			Postage - NISC	76,400		
			Postage - PUD	24,500		
			Printing - Bill Print	51,800		
			Printing - Customer Packets	10,000		
			Printing - Misc.	11,300		
		070	Advertising		800	
		080	Misc. Contractual Services		20,000	
			CIS Programming	5,000		
			Collection Service - Credit Bureau	2,500		
			Credit Reporting Agency	3,200		
			Electronic Payments Fees	9,300		
		082	Maintenance Contracts		400	
		083	Software Licenses and Support		12,300	
			RemitPlus Check Scanning and Recognition License	8,000		
			RemitPlus Check Scanning and Recognition Support	4,300		
		084	Permits and Fees		300	
			Miscellaneous Fees (Notaries, etc.)	300		
		085	Rents and Leases		5,200	
			Office Rent MVCC	4,900		
			Miscellaneous	300		
		090	Materials and Supplies		30,000	
			General	30,000		
		091	Small Tools (under $1,000)		3,000	
			Mini Payment Kiosk - Okanogan	3,000		
			Okanogan Counter 3rd Workstation	0		
		092	Miscellaneous		38,700	
			Miscellaneous Expenses	600		
			Net Account Receivable Writeoffs	38,100		
		712	Capital - Equipment (Over $2,000)		5,000	
			Check Scanning Hardware	5,000		

Div.	Dept.	Activity	Description			Budget Amount
1	35		**Conservation/Consumer Information**			**698,600**
		010	Wages		123,400	
		011	Benefits		46,900	
		020	Travel		8,000	
		021	Training, Tuition and Meeting Fees		5,800	
		030	Transportation		6,000	
		060	Postage, Printing and Stationary		8,000	
		070	Advertising		15,000	
		071	Conservation Expenditures		460,000	
			Conservation Programs	460,000		
		080	Misc. Contractual Services		23,300	
			Electric Education Programs	23,300		
		090	Materials and Supplies		2,000	
		092	Miscellaneous		200	

Div.	Dept.	Activity	Description			Budget Amount
1	40		**General Administration**			**8,633,200**
		010	Wages		1,134,300	
		011	Benefits		420,800	
		020	Travel		40,500	
			General	22,500		
			Accounting and Finance	8,200		
			Human Resource	3,800		
			Leadership	6,000		
		021	Training, Tuition and Meeting Fees		25,700	
			General	1,900		
			Accounting and Finance	2,300		
			Human Resource	1,500		
			Leadership	10,000		
			Education Reimbursement Program	10,000		
		030	Transportation		6,900	
		040	Insurance (Property/Liability)		308,000	
		050	Utilities		85,800	
			Cell Phone Service	6,800		
			Electrical Service	6,400		
			Telephone Service	46,400		
			Water/Sewer/Garbage	26,200		
		060	Postage, Printing and Stationary		7,800	
		070	Advertising		3,000	
		080	Misc. Contractual Services		598,000	
			APPA Dues	12,600		
			Audit Costs	74,200		
			Banking Fees	45,000		
			Benefits Administration	14,000		
			Bond Admin Fee	2,800		
			Chamber Dues	800		
			CWPU/UIP Expenses	30,000		
			Economic Alliance	6,000		
			Financial Studies	150,000		
			Fire Alarm Monitoring	400		
			Foundation for Water and Energy	2,000		
			Janitorial Services (OK and OM)	55,200		
			Legislative Consultant	39,700		
			Misc. Services/Consulting	20,000		
			NW Public Power Assoc. Dues/NW Wage & Hour	28,400		
			PPC - Dues	24,900		
			PPC - NW River Partners	12,400		
			Standard and Poors	7,700		
			WA PUD Association Dues	71,900		
		081	Legal Services		309,100	
			General Counsel	234,100		
			Misc. Attorney Fees	75,000		
		082	Maintenance Contracts		20,000	
			Copier Maintenance	11,700		
			Elevator Maintenance	700		
			Landscape Maintenance/Sweeping/Snowplowing	7,600		
		084	Permits and Fees		2,700	
			WA State Purchasing Coop	2,000		

Div.	Dept.	Activity	Description			Budget Amount
			WA State L&I Right to Know	300		
			Misc.	400		
		085	Rents and Leases		11,000	
			Copier Lease	8,100		
			P.O. Box Rent	300		
			Postage Machine Rent	2,600		
		090	Materials and Supplies		46,200	
		091	Small Tools (under $1,000)		2,300	
		092	Miscellaneous		50,000	
			Clothing for Identification	1,200		
			Deductibles/Damage Claims	10,000		
			Election Costs	4,700		
			Employee Day	3,400		
			Meeting Expenses	10,600		
			Misc. Expenses (Wellness, Interview and Moving Exp)	17,600		
			Service Awards and Costs	2,500		
		099	Unforeseen Operating Contingency		100,000	
		210	Taxes		2,286,800	
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000	
		810	Debt Service - Principal		1,387,000	
		811	Debt Service - Interest		1,685,300	
		901	Unforeseen Capital Contingency		100,000	

Div.	Dept.	Activity	Description			Budget Amount
1	41		**Information Systems**			**1,253,000**
		010	Wages		360,600	
		011	Benefits		118,600	
		020	Travel		15,000	
		021	Training, Tuition and Meeting Fees		20,000	
		030	Transportation		1,200	
		080	Misc. Contractual Services		28,000	
			Network Consulting	20,000		
			SharePoint and Webpage Consulting	5,000		
			Security System Monitoring	3,000		
		082	Maintenance Contracts		81,000	
			Eaton Powerware - Datacenter UPS	38,000		
			Eaton Powerware - Omak Network UPS	10,000		
			Eaton Powerware - Remote Monitoring	5,000		
			Key Card System Maintenance	5,000		
			NetApp SAN Hardware/Software Maintenance	18,500		
			SonicWall	2,500		
			Server Hardware Maintenance	2,000		
		083	Software Licenses and Support		266,000	
			Aclara - TWACS Support	18,000		
			Digi Cert for Exchange Server	500		
			eBill Certificate	600		
			Exchange 2010 User Cals	1,400		
			Exchange 2010 Server Standard	1,200		
			LocalTel Phone System Maintenance	12,000		
			MS Office 2010	8,800		
			MS Server 2008 User Cals	600		
			MS Server 2008 R2	5,000		
			M+RFM Bundle (Spam & Archive)	3,000		
			NISC Custom Programming	5,000		
			NISC Maintenance	120,000		
			NISC MDMS	15,000		
			NISC MDMS Annual Fee	13,600		
			OCR for RICOH Scanner	40,000		
			SharePoint 2010	2,300		
			Symantec Software and Support	8,200		
			Soniclear Recording Software	800		
			VMWare Software Support (IS)	5,000		
			VMWare Software Support (Telecom)	5,000		
		085	Rents and Leases		15,500	
			Okanogan Mailing Equipment	12,500		
			Branch Office Mailing Equipment	3,000		
		090	Materials and Supplies		10,000	
		091	Small Tools (under $1,000)		15,000	
		712	Capital - Equipment (Over $2,000)		274,000	
			Virtual Server Environment - Hardware	47,500		
			Virtual Server Environment - Software	20,000		
			SIEM - Log Management	15,000		
			Phone System - Phones and Switch	6,500		
			Keycard Systems - Backend Server Hardware	10,000		
			Keycard Systems - Readers and Controllers	50,000		
			Video Systems - Backend Server Hardware	30,000		

Div.	Dept.	Activity	Description			Budget Amount
			Video Surveillance Software	15,000		
			Video System Cameras - Subs, Yards and Fence Line	60,000		
			Video System Cameras - Branch Offices	10,000		
			Video Conferencing	10,000		
		714	Capital - Personal Computers		48,100	

Div.	Dept.	Activity	Description		Budget Amount
1	50		**Commissioners**		**157,800**
		010	Wages	85,800	
		011	Benefits	41,700	
		020	Travel	24,300	
		021	Training, Tuition and Meeting Fees	2,800	
		060	Postage, Printing and Stationary	500	
		090	Materials and Supplies	1,300	
		092	Miscellaneous	1,400	

Div.	Dept.	Activity	Description			Budget Amount
2	60		**Wholesale Telecommunications**			**10,437,700**
		010	Wages		262,900	
		011	Benefits		90,200	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		12,500	
		030	Transportation		22,800	
		080	Misc. Contractual Services		8,400	
			NoaNet Calea Services	8,400		
		081	Legal Services		10,000	
		082	Maintenance Contracts		47,500	
			Cisco Smartnet	13,500		
			WWP Lightning Edge/Ciena Devices	27,500		
			RADcare (Optimux and IPMux)	4,500		
			Motorola Canopy Hardware/Software	2,000		
		083	Software Licenses and Support		15,700	
			NetZoom	700		
			Misc. Software Upgrades	15,000		
		084	Permits and Fees		100,000	
			Internet Fees	95,000		
			ARIN ASN & IP Address Allocation	5,000		
		085	Rents and Leases		213,300	
			DCPUD Leases	79,200		
			Protect Path Ring	78,000		
			NoaNet Dark Fiber Lease	32,100		
			Wireless Site Lease	24,000		
		090	Materials and Supplies		96,500	
			HVAC Maintenance and Repair	15,000		
			Fiber Trailer Maintenance - HVAC/Floor/Generator	10,000		
			Misc. Switch/Network HW Upgrades	10,000		
			Fiber Plant Maintenance - Wholesale	50,000		
			Battery Plant - Maintenance and Replacement	6,500		
			UPS/Rectifier - Maintenance and Replacement	5,000		
		091	Small Tools (under $1,000)		1,000	
		210	Taxes		11,900	
		581	Capital - Contractual Services		93,400	
			Fiber Engineering - OKPUD to Robinson Canyon	33,800		
			Fiber Engineering - Johnson Cr. to Greenacres	29,600		
			Site Engineering - Alternative Microwave Back Haul	30,000		
		591	Capital - Material and Supplies		9,027,400	
			PAMAL Node Rework	10,000		
			BRHSP Node Rework	10,000		
			TOUSB Node Rework	10,000		
			Fiber Buildout - OKPUD HQ to 3rd Street Node	16,000		
			Wifi Sites - Omak/Okanogan	120,000		
			Fiber Buildout - OKPUD to Nichols and R. Canyon	147,800		
			Fiber Buildout - Johnson Creek to Greenacres	129,400		
			Alternative Microwave Back Haul	65,000		
			Network Hardware Replacements - End of Life	75,000		
			Fiber Distribution Builds	50,000		
			Ethernet Node	25,000		
			Wireless Towers	25,000		
			Wireless Remote Subscriber Units	75,200		

Div.	Dept.	Activity	Description			Budget Amount
			ARRA Broadband Project	8,269,000		
		712	Capital - Equipment (Over $2,000)		10,000	
			Test Equipment	5,000		
			Tools	5,000		
		810	Debt Service - Principal		168,000	
		811	Debt Service - Interest		233,700	

Div.	Dept.	Activity	Description			Budget Amount
1	61		**Internal Communications**			**1,020,800**
		010	Wages		151,500	
		011	Benefits		52,600	
		020	Travel		5,000	
		021	Training, Tuition and Meeting Fees		5,000	
		030	Transportation		14,200	
		060	Postage, Printing and Stationary		300	
		080	Misc. Contractual Services		0	
			NoaNet Assessments	0		
		082	Maintenance Contracts		27,000	
			Fire Alarm System	2,000		
			Landscape Maintenance/Sweeping	6,000		
			UHF Radio System	19,000		
		083	Software Licenses and Support		9,400	
			Cisco Smartnet	900		
			MapInfo Software	1,500		
			Fiber Mapping Software	7,000		
		084	Permits and Fees		3,000	
			Right of Way - USFS, DOT, etc.	3,000		
		085	Rents and Leases		25,800	
			UHF Site Lease - Little Buck Mtn.	2,500		
			UHF Site Lease - Aeneas Mtn.	2,500		
			UHF Site Lease - Goat Mtn.	600		
			UHF Site Lease - Omak Mtn.	2,500		
			Dark Fiber Lease - Brewster to Wells Dam	17,700		
		090	Materials and Supplies		50,000	
			General Materials and Supplies	50,000		
		091	Small Tools (under $1,000)		2,000	
		591	Capital - Material and Supplies		25,000	
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000		
			Miscellaneous	10,000		
		712	Capital - Equipment (Over $2,000)		650,000	
			UHF Radio System Overhaul	590,000		
			Miscellaneous Contingencies	60,000		

Div.	Dept.	Activity	Description	Budget Amount
			TOTAL EXPENDITURES AND CAPITAL OUTLAY	**70,766,000**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
OVERVIEW

HIGHLIGHTS

- → $14.7 million transfer from reserves, which is a $5.2 million decrease over the 2012 adopted budget.
- → Revenues, not including Grant Proceeds, cover operating expenses by $2.6 million.
- → Retail Electric Sales increased $1.4 million to $38.9 million.
- → Wholesale Electric Sales decreased $382,000 - The decrease in sales is due to lower estimated market pricing than was used when estimating 2012 wholesale sales.
- → Miscellaneous Income budget decreased by $452,000 - Accounting for BPA conservation reimbursement.
- → Grant Proceeds decreased $1.6 million to $3.8 million - Decrease due to the ARRA project not being finished in 2012.
- → Purchased Power - The largest operating expenditure in the budget increased $157,000 to $23.4 million.
- → Capital Outlays account for $17.4 million - see a summary of capital projects below.
- → Rate Stabilization Fund - The funding for the budget includes a $1.0 million transfer from the Rate Stabilization Fund.
- → Debt Service Coverage Ratio is estimated at 1.85 times annual debt service payments; bond covenants require 1.25 times.
- → Total TIER (times interest earned ratio) is estimated at 1.66, District's target is 1.5 times.

REVENUES of $49.7 million - Assumptions Used

- → **Retail Electric Sales:** Predicting a 1% load growth, no expected new large general service or industrial customers and previously approved rate adjustments of 3%.
- → **Wholesale Electric:** Sales based on a 3/4 to median water year and previous two years average market pricing,
- → **Wholesale Telecommunications:** Based on current revenue levels.
- → **Interest:** Return on investments of between .18%(LGIP) and .20%(CDs).
- → **Miscellaneous:** Previous twelve months revenue and Build America Bond reimbursement of $443,000.
- → **Rental Income:** Same as previous year with no growth.
- → **Construction Contributions:** Estimated using previous two years average.
- → **Grant Proceeds:** Anticipated reimbursements of $480,000 from BPA and $3.4 million from RUS.

EXPENDITURES $43.2 million - Assumptions Used

- → **Wages:** One less employee than in the 2012 adopted budget and overall average wage increase of 3.0%. The overall average wage increase includes current bargaining agreement step increases.
- → **Benefits:** Based on August 2011 thru July 2012 actual percentage of wages. Range of 35.2% through 54.1% (ave. 38.8%).
- → **Purchased Power:** Wells Project costs effective September 2012 and year two of BPA rates effective October 2011.
- → **Other Expenditures:** Other expenses are based on known 2013 costs. If costs are not specifically known, a 2% increase was estimated, except transportation 5% and postage 3%.

CAPITAL OUTLAY $17.4 million - Summary Listing

- → Methow Transmission Line and Substation $3.0 million.
- → ARRA Broadband Project $4.9 million.
- → Enloe Dam $3.1 million.
- → Operations Normal Replacements and Line Extensions of $1.4 million.
- → Wholesale Telecommunications Capital of $916,400, non-ARRA.
- → Upgrade/Expand UHF radio system $600,000.
- → Tonasket to Oroville Fiber Build $500,000.
- → Information Systems $445,000 (network, phone, access control and surveillance systems).
- → Covered Storage Okanogan and Sandflat Substations $400,000
- → Regulator and Switch Purchases $382,000.
- → Bucket Truck Replacement $275,000.
- → Warehouse Truck Replacement $275,000.
- → HVAC Replacements $226,000
- → Underground Replacements $200,000.
- → Backyard Machine $130,000
- → Cutout Replacement Program $120,000.
- → Other capital Items $554,300.

DEBT SERVICE $3.7 million

- → **Principal and Interest:** Per debt service schedules and ARRA estimated debt service.

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
BUDGET SUMMARY

Description	Electric	Wholesale Telecom	Total
REVENUE			
Sales - Retail	38,889,900		38,889,900
Sales - Wholesale	2,360,300	2,200,000	4,560,300
Interest	68,000		68,000
Miscellaneous	1,052,000		1,052,000
Rental Income	118,000		118,000
Construction Contribution	1,104,000		1,104,000
Grant Proceeds	480,000	3,388,000	3,868,000
Total Revenue	**44,072,200**	**5,588,000**	**49,660,200**
EXPENDITURES			
Wages	7,377,500	266,500	7,644,000
Benefits	2,831,700	106,300	2,938,000
Travel	141,500	12,500	154,000
Training, Tuition and Meeting Fees	90,700	20,000	110,700
Transportation	800,000	43,100	843,100
Insurance	312,400		312,400
Utilities	88,900		88,900
Postage, Printing and Stationery	150,800	300	151,100
Advertising	23,000		23,000
Conservation Expenditures	480,000		480,000
Misc. Contractual Services	1,974,400	89,400	2,063,800
Legal Services	319,500	10,000	329,500
Maintenance Contracts	239,100	98,900	338,000
Software Licenses and Support	624,400	54,500	678,900
Permits and Fees	13,500	77,000	90,500
Rents and Leases	86,900	185,400	272,300
Materials and Supplies	644,400	110,000	754,400
Small Tools (under $1,000)	47,300	1,000	48,300
Miscellaneous	72,500		72,500
Unforeseen Operating Contingency	100,000		100,000
Purchased Power	23,376,800		23,376,800
Taxes	2,360,200	10,200	2,370,400
Total Expenditures	42,155,500	1,085,100	43,240,600
CAPITAL OUTLAY			
Capital - Contractual Services	6,442,500	30,000	6,472,500
Capital - Materials and Supplies	2,208,000	5,686,400	7,894,400
Capital - Meter Purchases	90,000		90,000
Capital - Transformer Purchases	225,000		225,000
Capital - Tools and Equipment	9,500		9,500
Capital - Buildings	685,000		685,000
Capital - Equipment (Over $2,000)	1,171,100	88,000	1,259,100
Capital - Vehicles	634,000		634,000
Capital - Personal Computers	54,200		54,200
Unforeseen Capital Contingency	100,000		100,000
Total Capital Outlay	11,619,300	5,804,400	17,423,700
DEBT SERVICE			
Debt Service - Principal	1,411,600	305,400	1,717,000
Debt Service - Interest	1,624,200	347,700	1,971,900
Total Debt Service	3,035,800	653,100	3,688,900
Total Use of Resources	**56,810,600**	**7,542,600**	**64,353,200**
TRANSFER TO/(FROM) RESERVES	**(12,738,400)**	**(1,954,600)**	**(14,693,000)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
2012 ADOPTED BUDGET COMPARED TO 2013 ADOPTED BUDGET

	Electric System				Wholesale Telecommunications				Total			
REVENUE	Adopted 2012	Projected 2012	Adopted 2013	2012 Adopted/ 2013 Adopted	Adopted 2012	Projected 2012	Adopted 2013	2012 Adopted/ 2013 Adopted	Adopted 2012	Projected 2012	Adopted 2013	2012 Adopted/ 2013 Adopted
Sales - Retail	37,475,000	35,247,000	38,889,900	1,414,900			0	0	37,475,000	35,247,000	38,889,900	1,414,900
Sales - Wholesale	2,742,000	2,742,000	2,360,300	(381,700)	2,500,000	2,103,000	2,200,000	(300,000)	5,242,000	4,845,000	4,560,300	(681,700)
Interest	80,000	62,000	68,000	(12,000)			0	0	80,000	62,000	68,000	(12,000)
Miscellaneous	1,504,000	1,098,000	1,052,000	(452,000)			0	0	1,504,000	1,098,000	1,052,000	(452,000)
Rental Income	118,000	118,000	118,000	0			0	0	118,000	118,000	118,000	0
Construction Contribution	1,059,000	1,175,000	1,104,000	45,000			0	0	1,059,000	1,175,000	1,104,000	45,000
Grant Proceeds	460,000	472,000	480,000	20,000	4,961,000	1,619,000	3,388,000	(1,573,000)	5,421,000	2,091,000	3,868,000	(1,553,000)
Total Revenue	**43,438,000**	**40,914,000**	**44,072,200**	**634,200**	**7,461,000**	**3,722,000**	**5,588,000**	**(1,873,000)**	**50,899,000**	**44,636,000**	**49,660,200**	**(1,238,800)**
EXPENDITURES												
Wages	7,364,100	6,837,000	7,377,500	13,400	262,900	257,000	266,500	3,600	7,627,000	7,094,000	7,644,000	17,000
Benefits	2,626,200	2,520,000	2,831,700	205,500	90,200	106,000	106,300	16,100	2,716,400	2,626,000	2,938,000	221,600
Travel	158,300	105,000	141,500	(16,800)	12,500	6,000	12,500	0	170,800	111,000	154,000	(16,800)
Training, Tuition and Meeting Fees	116,300	72,000	90,700	(25,600)	12,500	13,000	20,000	7,500	128,800	85,000	110,700	(18,100)
Transportation	806,500	768,000	800,000	(6,500)	22,800	42,000	43,100	20,300	829,300	810,000	843,100	13,800
Insurance	308,000	307,000	312,400	4,400			0	0	308,000	307,000	312,400	4,400
Utilities	85,800	86,000	88,900	3,100			0	0	85,800	86,000	88,900	3,100
Postage, Printing and Stationery	193,000	152,000	150,800	(42,200)		1,000	300	300	193,000	153,000	151,100	(41,900)
Advertising	22,300	16,000	23,000	700		3,000	0	0	22,300	19,000	23,000	700
Conservation Expenditures	460,000	413,000	480,000	20,000			0	0	460,000	413,000	480,000	20,000
Misc. Contractual Services	2,205,400	1,990,000	1,974,400	(231,000)	8,400	125,000	89,400	81,000	2,213,800	2,115,000	2,063,800	(150,000)
Legal Services	309,100	227,000	319,500	10,400	10,000	17,000	10,000	0	319,100	244,000	329,500	10,400
Maintenance Contracts	138,400	146,000	239,100	100,700	47,500	88,000	98,900	51,400	185,900	234,000	338,000	152,100
Software Licenses and Support	429,500	253,000	624,400	194,900	15,700	23,000	54,500	38,800	445,200	276,000	678,900	233,700
Permits and Fees	60,500	9,000	13,500	(47,000)	100,000	127,000	77,000	(23,000)	160,500	136,000	90,500	(70,000)
Rents and Leases	66,700	47,000	86,900	20,200	213,300	169,000	185,400	(27,900)	280,000	216,000	272,300	(7,700)
Materials and Supplies	700,500	672,000	644,400	(56,100)	96,500	60,000	110,000	13,500	797,000	732,000	754,400	(42,600)
Small Tools (under $1,000)	42,300	11,000	47,300	5,000	1,000	1,000	1,000	0	43,300	12,000	48,300	5,000
Miscellaneous	100,300	53,000	72,500	(27,800)			0	0	100,300	53,000	72,500	(27,800)
Unforeseen Operating Contingency	100,000	19,000	100,000	0			0	0	100,000	19,000	100,000	0
Purchased Power	23,220,100	23,059,000	23,376,800	156,700			0	0	23,220,100	23,059,000	23,376,800	156,700
Taxes	2,286,800	2,174,000	2,360,200	73,400	11,900	11,900	10,200	(1,700)	2,298,700	2,185,900	2,370,400	71,700
Total Expenditures	41,800,100	39,936,000	42,155,500	355,400	905,200	1,049,900	1,085,100	179,900	42,705,300	40,985,900	43,240,600	535,300
CAPITAL OUTLAY												
Capital - Contractual Services	9,593,000	1,273,000	6,442,500	(3,150,500)	93,400	658,000	30,000	(63,400)	9,686,400	1,931,000	6,472,500	(3,213,900)
Capital - Materials and Supplies	4,024,000	1,419,000	2,208,000	(1,816,000)	9,027,400	3,670,000	5,686,400	(3,341,000)	13,051,400	5,089,000	7,894,400	(5,157,000)
Capital - Meter Purchases	90,000	0	90,000	0			0	0	90,000	0	90,000	0
Capital - Transformer Purchases	225,000	225,000	225,000	0			0	0	225,000	225,000	225,000	0
Capital - Tools and Equipment	12,000	12,000	9,500	(2,500)			0	0	12,000	12,000	9,500	(2,500)
Capital - Buildings	7,500	7,500	685,000	677,500			0	0	7,500	7,500	685,000	677,500
Capital - Equipment (Over $2,000)	1,041,000	153,300	1,171,100	130,100	10,000	303,000	88,000	78,000	1,051,000	456,300	1,259,100	208,100
Capital - Vehicles	315,300	(264,700)	634,000	318,700			0	0	315,300	(264,700)	634,000	318,700
Capital - Personal Computers	48,100	41,600	54,200	6,100			0	0	48,100	41,600	54,200	6,100
Unforeseen Capital Contingency	100,000	14,000	100,000	0			0	0	100,000	14,000	100,000	0
Total Capital Outlay	15,455,900	2,880,700	11,619,300	(3,836,600)	9,130,800	4,631,000	5,804,400	(3,326,400)	24,586,700	7,511,700	17,423,700	(7,163,000)
DEBT SERVICE												
Debt Service - Principal	1,387,000	1,387,000	1,411,600	24,600	168,000	168,000	305,400	137,400	1,555,000	1,555,000	1,717,000	162,000
Debt Service - Interest	1,685,300	1,685,300	1,624,200	(61,100)	233,700	233,700	347,700	114,000	1,919,000	1,919,000	1,971,900	52,900
Total Debt Service	3,072,300	3,072,300	3,035,800	(36,500)	401,700	401,700	653,100	251,400	3,474,000	3,474,000	3,688,900	214,900
Total Use of Resources	**60,328,300**	**45,889,000**	**56,810,600**	**(3,517,700)**	**10,437,700**	**6,082,600**	**7,542,600**	**(2,895,100)**	**70,766,000**	**51,971,600**	**64,353,200**	**(6,412,800)**
TRANSFER TO/(FROM) RESERVES	**(16,890,300)**	**(4,975,000)**	**(12,738,400)**	**4,151,900**	**(2,976,700)**	**(2,360,600)**	**(1,954,600)**	**1,022,100**	**(19,867,000)**	**(7,335,600)**	**(14,693,000)**	**5,174,000**

PUBLIC UTILITY DISTRICT NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
BUDGET COMPARISON 2007 THRU 2013 FINAL

	2007		2008		2009		2010		2011		2012		2013
REVENUE	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Projected	Final
Sales - Electric Retail	30,904,100	31,043,483	31,853,400	31,952,534	31,290,700	30,777,098	33,337,000	29,307,079	35,001,000	33,605,348	37,475,000	35,247,000	38,889,900
Sales - Electric Wholesale	9,110,500	12,120,917	8,737,000	11,263,826	7,489,500	4,198,884	4,937,000	5,801,903	5,490,000	6,741,526	2,742,000	2,742,000	2,360,300
Sales - Broadband Wholesale	710,400	855,469	850,000	1,030,980	1,168,200	1,767,217	1,900,000	1,944,345	2,000,000	1,995,657	2,500,000	2,103,000	2,200,000
Interest	1,676,200	1,919,000	1,738,500	1,697,562	1,246,000	964,500	262,000	214,509	207,000	113,944	80,000	62,000	68,000
Miscellaneous	797,900	802,336	1,250,000	727,466	746,700	1,056,550	531,000	916,913	749,000	1,841,914	1,504,000	1,098,000	1,052,000
Rental Income	123,000	117,646	118,000	117,068	118,000	116,995	118,000	117,098	118,000	117,098	118,000	118,000	118,000
Construction Contribution	1,325,600	1,951,581	1,600,000	1,795,823	1,600,000	884,844	542,000	996,025	820,000	974,691	1,059,000	1,175,000	1,104,000
Grant Proceeds											5,421,000	2,091,000	3,868,000
Total Revenue	**44,647,700**	**48,810,432**	**46,146,900**	**48,585,259**	**43,659,100**	**39,766,088**	**41,627,000**	**39,297,872**	**44,385,000**	**45,390,178**	**50,899,000**	**44,636,000**	**49,660,200**
EXPENDITURES													
Wages	5,931,000	5,611,848	6,675,300	5,929,192	7,177,800	6,311,358	7,482,500	6,842,404	7,696,800	6,675,420	7,627,000	7,094,000	7,644,000
Benefits	1,660,700	1,854,052	2,182,700	2,035,454	2,368,600	2,532,708	2,618,900	2,373,456	2,544,600	2,394,707	2,716,400	2,626,000	2,938,000
Travel	112,500	106,502	125,500	140,556	267,600	124,077	244,700	124,532	185,900	122,664	170,800	111,000	154,000
Training, Tuition and Meeting Fees	86,200	62,923	84,900	96,332	179,300	74,206	196,000	86,633	135,900	61,871	128,800	85,000	110,700
Transportation	210,800	610,114	627,300	687,840	695,400	783,135	757,000	924,761	903,500	835,496	829,300	810,000	843,100
Insurance	185,600	184,663	206,600	212,096	219,300	313,815	320,500	279,268	310,000	308,777	308,000	307,000	312,400
Utilities	66,700	66,087	65,900	69,183	73,100	75,014	75,600	87,580	97,200	82,874	85,800	86,000	88,900
Postage, Printing and Stationary	101,700	106,365	105,500	111,096	122,700	104,646	117,200	106,436	198,400	142,313	193,000	153,000	151,100
Advertising	43,900	33,755	29,800	14,858	28,500	29,848	31,500	21,817	37,700	26,321	22,300	19,000	23,000
Conservation Expenditures	221,600	232,619	274,700	286,121	203,700	340,016	276,000	430,665	372,800	294,811	460,000	413,000	480,000
Misc. Contractual Services	1,878,300	1,505,518	2,400,700	2,171,518	2,350,200	2,067,841	2,994,400	1,908,893	2,508,600	1,441,439	2,213,800	2,115,000	2,063,800
Legal Services	60,600	55,828	64,500	155,895	374,800	296,977	364,100	240,533	314,100	323,826	319,100	244,000	329,500
Maintenance Contracts	171,300	76,393	223,900	136,192	127,100	90,704	157,400	102,674	177,600	126,661	185,900	234,000	338,000
Software Licenses and Support	148,000	86,569	137,200	154,785	187,700	183,255	264,500	241,644	317,400	223,978	445,200	276,000	678,900
Permits and Fees	36,700	58,946	41,300	85,420	116,400	103,281	104,400	104,237	368,300	162,253	160,500	136,000	90,500
Rents and Leases	107,000	122,428	136,000	139,093	154,400	151,378	148,300	161,484	285,100	166,823	280,000	216,000	272,300
Materials and Supplies	500,200	603,415	550,000	882,014	720,400	773,077	932,000	840,196	930,400	592,470	797,000	732,000	754,400
Small Tools (under $1,000)	41,500	44,455	43,600	38,941	44,300	60,736	69,300	25,196	68,800	25,664	43,300	12,000	48,300
Miscellaneous	19,200	81,232	83,700	81,974	64,000	48,492	101,000	45,911	74,100	105,491	100,300	53,000	72,500
Unforeseen Operating Contingency											100,000	19,000	100,000
Purchased Power	23,454,700	24,579,372	24,243,700	24,686,109	21,213,700	21,822,349	24,158,000	23,895,600	25,373,000	24,060,574	23,220,100	23,059,000	23,376,800
Taxes	1,890,700	1,896,453	1,947,500	1,921,891	1,927,000	1,876,406	2,020,200	1,839,337	2,119,000	2,138,550	2,298,700	2,185,900	2,370,400
Total Expenditures	36,928,900	37,979,537	40,250,300	40,036,560	38,616,000	38,163,319	43,433,500	40,683,257	45,019,200	40,312,983	42,705,300	40,985,900	43,240,600
DEBT SERVICE													
Debt Service - Principal	775,000	777,883	810,000	812,118	835,000	837,916	870,000	873,334	1,190,000	1,183,749	1,555,000	1,555,000	1,717,000
Debt Service - Interest	780,600	826,410	753,300	798,800	722,600	767,367	684,100	992,487	2,241,100	2,068,361	1,919,000	1,919,000	1,971,900
Total Debt Service	1,555,600	1,604,293	1,563,300	1,610,918	1,557,600	1,605,283	1,554,100	1,865,821	3,431,100	3,252,110	3,474,000	3,474,000	3,688,900
AVAILABLE FOR CAPITAL OUTLAY	**6,163,200**	**9,226,602**	**4,333,300**	**6,937,781**	**3,485,500**	**(2,514)**	**(3,360,600)**	**(3,251,206)**	**(4,065,300)**	**1,825,085**	**4,719,700**	**176,100**	**2,730,700**
CAPITAL OUTLAY													
Capital - Contractual Services	4,075,100	2,036,715	3,986,700	2,042,651	10,158,000	1,761,846	11,208,000	1,759,767	10,500,000	2,279,483	9,686,400	1,931,000	6,472,500
Capital - Materials and Supplies	6,174,600	2,679,513	4,827,600	4,783,802	9,326,100	5,270,105	8,796,000	6,189,149	5,636,700	3,283,116	13,051,400	5,089,000	7,894,400
Capital - Meter Purchases	110,000	71,960	390,000	125,857	595,000	790,778	1,500,000	252,306	440,000	369,605	90,000	0	90,000
Capital - Transformer Purchases	2,750,000	2,481,491	1,200,000	1,153,037	1,166,000	521,218	500,000	365,288	500,000	408,995	225,000	225,000	225,000
Capital - Tools and Equipment	30,000	10,072	22,000	6,920	10,200	1,374	13,500	6,572	13,200	1,770	12,000	12,000	9,500
Capital - Buildings	665,000	637,053	778,600	240,876	6,984,500	3,932,356	3,094,000	4,274,502	42,000	40,475	7,500	7,500	685,000
Capital - Equipment (Over $2,000)	527,800	272,803	819,300	680,078	1,105,100	412,738	1,457,800	1,043,752	999,600	218,074	1,051,000	456,300	1,259,100
Capital - Vehicles	876,000	296,759	941,000	930,324	351,000	281,734	(175,000)	(219,097)	30,000	(186,718)	315,300	(264,700)	634,000
Capital - Personal Computers	53,600	25,072	78,500	56,993	58,600	39,551	70,600	59,792	57,300	40,751	48,100	41,600	54,200
Unforeseen Capital Contingencies	100,000	23,648	100,000	31,359	100,000	42,005	100,000	16,131	100,000	47,639	100,000	14,000	100,000
Total Capital Outlay	15,362,100	8,535,086	13,143,700	10,051,897	29,854,500	13,053,705	26,564,900	13,748,162	18,318,800	6,503,190	24,586,700	7,511,700	17,423,700
RESERVES/DEBT	**(9,198,900)**	**691,516**	**(8,810,400)**	**(3,114,116)**	**(26,369,000)**	**(13,056,219)**	**(29,925,500)**	**(16,999,368)**	**(22,384,100)**	**(4,678,105)**	**(19,867,000)**	**(7,335,600)**	**(14,693,000)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Engineering	Operations	Environmental	Customer Service	Conservation	General Administration	Information Systems	Commissioners	Wholesale Telecom	Internal Communications	Total
EXPENDITURES													
010 Wages	175,100	113,300	858,900	3,688,300	62,600	664,300	124,400	1,166,200	301,600	85,800	266,500	137,000	7,644,000
011 Benefits	70,200	44,300	353,000	1,298,300	25,400	310,900	59,100	465,300	111,300	46,400	106,300	47,500	2,938,000
020 Travel	19,000	12,500	10,000	17,500	4,500	4,000	3,000	40,000	10,000	16,000	12,500	5,000	154,000
021 Training, Tuition and Meeting Fees	7,000	3,000	5,000	30,000	3,500	2,500	2,000	19,700	10,000	3,000	20,000	5,000	110,700
030 Transportation	6,000	2,700	30,000	700,000	2,000	35,700	7,000	7,100	2,400		43,100	7,100	843,100
040 Insurance								312,400					312,400
050 Utilities				200				88,700					88,900
060 Postage, Printing and Stationery			1,000	3,000		137,600	3,000	5,900			300	300	151,100
070 Advertising			500	2,500			17,000	3,000					23,000
071 Conservation Expenditures							480,000						480,000
080 Misc. Contractual Services	32,000	367,500	133,500	678,600	6,500	42,700	18,600	585,500	34,500		89,400	75,000	2,063,800
081 Legal Services								319,500			10,000		329,500
082 Maintenance Contracts				144,500		500		14,600	58,500		98,900	21,000	338,000
083 Software Licenses and Support		195,000		2,200	1,000	4,700			410,200		54,500	11,300	678,900
084 Permits and Fees	2,500		1,000	4,000		300		2,700			77,000	3,000	90,500
085 Rents and Leases	8,000			1,000		5,200		9,800	37,100		185,400	25,800	272,300
090 Materials and Supplies	5,500	500	20,000	500,000	1,500	28,400	1,500	61,000	15,000	1,000	110,000	10,000	754,400
091 Small Tools (under $1,000)			5,000	15,000		3,000		2,300	20,000		1,000	2,000	48,300
092 Miscellaneous	500		500	10,000		34,500	200	26,500		300			72,500
099 Unforeseen Operating Contingency								100,000					100,000
120 Purchased Power		23,376,800											23,376,800
210 Taxes								2,360,200			10,200		2,370,400
Total Expenditures	325,800	24,115,600	1,418,400	7,095,100	107,000	1,274,300	715,800	5,590,400	1,010,600	152,500	1,085,100	350,000	43,240,600
CAPITAL OUTLAY													
581 Capital - Contractual Services	3,009,500			3,433,000							30,000		6,472,500
591 Capital - Materials and Supplies	40,000			2,143,000							5,686,400	25,000	7,894,400
592 Capital - Meter Purchases				90,000									90,000
593 Capital - Transformer Purchases				225,000									225,000
710 Capital - Tools and Equipment				7,500				2,000					9,500
711 Capital - Buildings				685,000									685,000
712 Capital - Equipment (Over $2,000)				76,400					444,700		88,000	650,000	1,259,100
713 Capital - Vehicles				634,000									634,000
714 Capital - Personal Computers									54,200				54,200
901 Unforeseen Capital Contingency								100,000					100,000
Total Capital Outlay	3,049,500	0	0	7,293,900	0	0	0	102,000	498,900	0	5,804,400	675,000	17,423,700
DEBT SERVICE													
810 Debt Service - Principal								1,411,600			305,400		1,717,000
811 Debt Service - Interest								1,624,200			347,700		1,971,900
Total Debt Service	0	0	0	0	0	0	0	3,035,800	0	0	653,100	0	3,688,900
Total Use of Resources	3,375,300	24,115,600	1,418,400	14,389,000	107,000	1,274,300	715,800	8,728,200	1,509,500	152,500	7,542,600	1,025,000	64,353,200

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**44,072,200**
	001	Sales - Retail	38,889,900	
	002	Sales - Wholesale	2,360,300	
	003	Interest	68,000	
	004	Miscellaneous	1,052,000	
	005	Rental Income	118,000	
	006	Construction Contributions	1,104,000	
	007	Grant Proceeds	480,000	
2		**Wholesale Telecom**		**5,588,000**
	002	Sales - Wholesale	2,200,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
	007	Grant Proceeds	3,388,000	
		TOTAL REVENUE		**49,660,200**

Div.	Dept.	Activity	Description			Budget Amount
1	10		**Generation**			**3,375,300**
		010	Wages		175,100	
		011	Benefits		70,200	
		020	Travel		19,000	
		021	Training, Tuition and Meeting Fees		7,000	
		030	Transportation		6,000	
		080	Misc. Contractual Service		32,000	
		084	Permits and Fees		2,500	
		085	Rent and Leases		8,000	
			Ophir Site Lease	8,000		
		090	Materials and Supplies		5,500	
		092	Miscellaneous		500	
		581	Capital - Contractual Services		3,009,500	
		591	Capital - Materials and Supplies		40,000	

Div.	Dept.	Activity	Description			Budget Amount
1	11		**Power Supply**			**24,115,600**
		010	Wages		113,300	
		011	Benefits		44,300	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		3,000	
		030	Transportation		2,700	
		080	Misc. Contractual Services		367,500	
			Douglas County PUD	351,500		
			Professional Services (compliance/scheduling)	5,000		
			Central Washington Power Authority	1,000		
			Slice Implementation Group	10,000		
		083	Software Licenses and Support		195,000	
			Slice Software Support Fee	195,000		
		090	Materials and Supplies		500	
		120	Purchased Power		23,376,800	
			BPA - Slice	7,973,300		
			BPA - Block	6,144,000		
			BPA - Transmission	2,353,900		
			Wells	4,142,800		
			Nine Canyon	2,762,800		

Div.	Dept.	Activity	Description			Budget Amount
1	20		**Engineering**			**1,418,400**
		010	Wages		858,900	
		011	Benefits		353,000	
		020	Travel		10,000	
		021	Training, Tuition and Meeting Fees		5,000	
		030	Transportation		30,000	
		060	Postage, Printing and Stationery		1,000	
		070	Advertising		500	
		080	Misc. Contractual Services		133,500	
			Janitorial Services (BR, TO, and OR)	8,500		
			WECC Requirement - Transmission Line Clearance	125,000		
		084	Permits and Fees		1,000	
			Miscellaneous	1,000		
		090	Materials and Supplies		20,000	
		091	Small Tools (under $1,000)		5,000	
		092	Miscellaneous		500	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2013 FINAL BUDGET - DECEMBER 18, 2012
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	21		**Operations**			**14,389,000**
		010	Wages		3,688,300	
		011	Benefits		1,298,300	
		020	Travel		17,500	
			Operations	17,500		
		021	Training, Tuition and Meeting Fees		30,000	
			Operations	30,000		
		030	Transportation		700,000	
		050	Utilities		200	
		060	Postage, Printing and Stationery		3,000	
		070	Advertising		2,500	
		080	Misc. Contractual Services		678,600	
			CDL Testing Program	4,000		
			Employee Dispatch	9,600		
			Pole Testing	100,000		
			Safety Training	39,000		
			Tree Trimming	510,000		
			Underground Locate Service	2,000		
			Weed Control	10,000		
			Miscellaneous	4,000		
		082	Maintenance Contracts		144,500	
			HVAC Maintenance	30,000		
			Landscape Maintenance	10,000		
			Snowplowing and Sweeping	15,000		
			Oroville Warehouse - Doors\Windows\Flashing	5,000		
			Oroville Office and Warehouse - Exterior Paint	11,500		
			Brewster Office - Exterior Repair and Paint	8,000		
			Warehouse/Truck Shop and Omak - Asphalt Repair	45,000		
			Battery Testing (NERC Compliance)	20,000		
		083	Software Licenses and Support		2,200	
			Electronic Material Safety Data Sheets	2,200		
		084	Permits and Fees		4,000	
			Right of Ways - USFS/Dept. of Int.	3,000		
			Miscellaneous	1,000		
		085	Rents and Leases		1,000	
			Pole Contacts	1,000		
		090	Materials and Supplies		500,000	
			General	497,500		
			Fire Resistant Clothing	2,500		
		091	Small Tools (under $1,000)		15,000	
			Brewster	2,600		
			Okanogan	8,000		
			Oroville	2,600		
			Mechanics Specialty Tool Replacement	1,800		
		092	Miscellaneous		10,000	
			Lineman Rodeo (Fees, Travel and Supplies)	9,600		
			Safety Meeting Refreshments	400		
		581	Capital - Contractual Services		3,433,000	
			Contract Labor	100,000		
			Engineering - Large System Projects	100,000		
			Tonasket to Oroville Fiber Construction	500,000		
			Underground Replacements	200,000		

Div.	Dept.	Activity	Description			Budget Amount
			Gold Creek Sub Construction	505,000		
			PT Line Construction	703,000		
			PT Mitigation/Roads	650,000		
			PT Permits, Tetra Tech, Training, etc.	175,000		
			PT ROW/Easements	500,000		
		591	Capital - Materials and Supplies		2,143,000	
			Normal Replacements and Extensions	1,100,000		
			OVS Battery Replancement	15,000		
			OKS Bus Diff Relay	19,000		
			OCB, Regulators, Switches, Cap Banks, Reclosers	382,000		
			SCADA Equipment	40,000		
			Cutout Replacement	120,000		
			Gold Creek Substation Materials	320,000		
			PT Transmission and Distribution Materials	147,000		
		592	Capital - Meter Purchases		90,000	
			Metering Special Projects	40,000		
			PME Meter Replacements	50,000		
		593	Capital - Transformer Purchases		225,000	
			Normal Additions/Replacements	225,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		7,500	
		711	Capital - Buildings		685,000	
			Headquarters - Emergency Generator Loadbank	8,000		
			Warehouse - HVAC Replacement	125,000		
			Vehicle Shop - HVAC Replacement	80,000		
			Omak - HVAC Replacement	21,000		
			Okanogan and Sandflat Subs - Cover Storage	400,000		
			Headquaters - Hardwater System	6,000		
			Warehouse - Lights	45,000		
		712	Capital - Equipment (Over $2,000)		76,400	
			Hydraulic Oil Filter Machine	11,000		
			Ironworker	20,000		
			Trimble Field Inspector Handheld (2)	8,400		
			Electric Shop - Lockers	3,000		
			Electric Shop - Conduit Bender	9,000		
			Vehicle Shop - Air Compressor	15,000		
			Phase ID Equipment	10,000		
		713	Capital - Vehicles		634,000	
			Bucket Truck - Replacement	275,000		
			Warehouse Truck - Replacement	275,000		
			Backhoe Trailer - Replacement	30,000		
			Service Trucks (2) - Replacements	90,000		
			Backyard Machine	130,000		
			Foreman Truck - Replacement	90,000		
			Pickup Truck - Replacement	25,000		
			Less: Transportation System Depreciation	(281,000)		

Div.	Dept.	Activity	Description			Budget Amount
1	22		**Environmental**			**107,000**
		010	Wages		62,600	
		011	Benefits		25,400	
		020	Travel		4,500	
		021	Training, Tuition and Meeting Fees		3,500	
		030	Transportation		2,000	
		080	Misc. Contractual Services		6,500	
			Miscellaneous	6,500		
		083	Software Licenses and Support		1,000	
		090	Materials and Supplies		1,500	

Div.	Dept.	Activity	Description			Budget Amount
1	30		**Customer Service**			**1,274,300**
		010	Wages		664,300	
		011	Benefits		310,900	
		020	Travel		4,000	
		021	Training, Tuition and Meeting Fees		2,500	
		030	Transportation		35,700	
		060	Postage, Printing and Stationery		137,600	
			Postage and Printing - NISC	108,800		
			Postage - PUD	19,200		
			Printing - Misc.	9,600		
		080	Misc. Contractual Services		42,700	
			CIS Programming	5,000		
			Collection Service - Credit Bureau	4,000		
			Credit Reporting Agency	3,200		
			Electronic Payments Fees	30,500		
		082	Maintenance Contracts		500	
		083	Software Licenses and Support		4,700	
			RemitPlus Check Scanning and Recognition Support	4,700		
		084	Permits and Fees		300	
			Miscellaneous Fees (Notaries, etc.)	300		
		085	Rents and Leases		5,200	
			Office Rent MVCC	4,900		
			Miscellaneous	300		
		090	Materials and Supplies		28,400	
			General	28,400		
		091	Small Tools (under $1,000)		3,000	
		092	Miscellaneous		34,500	
			Miscellaneous Expenses	600		
			Net Account Receivable Writeoffs	33,900		

Div.	Dept.	Activity	Description			Budget Amount
1	35		**Conservation/Consumer Information**			**715,800**
		010	Wages		124,400	
		011	Benefits		59,100	
		020	Travel		3,000	
		021	Training, Tuition and Meeting Fees		2,000	
		030	Transportation		7,000	
		060	Postage, Printing and Stationery		3,000	
			Miscellaneous	3,000		
		070	Advertising		17,000	
		071	Conservation Expenditures		480,000	
			District Conservation Programs	480,000		
		080	Misc. Contractual Services		18,600	
			Electric Education Programs	18,600		
		090	Materials and Supplies		1,500	
		092	Miscellaneous		200	

Div.	Dept.	Activity	Description			Budget Amount
1	40		**General Administration**			**8,728,200**
		010	Wages		1,166,200	
		011	Benefits		465,300	
		020	Travel		40,000	
			General	25,400		
			Accounting and Finance	7,700		
			Human Resource	3,900		
			Leadership	3,000		
		021	Training, Tuition and Meeting Fees		19,700	
			General	8,100		
			Accounting and Finance	5,000		
			Human Resource	1,600		
			Leadership	5,000		
		030	Transportation		7,100	
		040	Insurance (Property/Liability)		312,400	
		050	Utilities		88,700	
			Cell Phone Service	8,000		
			Electrical Service	4,200		
			Telephone Service	47,600		
			Water/Sewer/Garbage	28,900		
		060	Postage, Printing and Stationery		5,900	
		070	Advertising		3,000	
		080	Misc. Contractual Services		585,500	
			APPA Dues	13,900		
			Audit Costs	78,600		
			Banking Fees	53,900		
			Benefits Administration	4,200		
			Bond Admin Fee	1,900		
			Chamber Dues	700		
			CWPU/UIP Expenses	20,600		
			Economic Alliance	6,000		
			Financial Studies	150,000		
			Fire Alarm Monitoring	400		
			Foundation for Water and Energy	2,000		
			Janitorial Services (OK and OM)	56,500		
			Legislative Consultant	37,200		
			Misc. Services/Consulting	3,900		
			NW Public Power Assoc. Dues/NW Wage & Hour	26,100		
			PPC - Dues	25,900		
			PPC - NW River Partners	12,200		
			PPC - NW River Partners Additional	10,400		
			Standard and Poors	7,700		
			WA PUD Association Dues	73,400		
		081	Legal Services		319,500	
			General Counsel	244,500		
			Misc. Attorney Fees	75,000		
		082	Maintenance Contracts		14,600	
			Copier Maintenance	10,900		
			Elevator Maintenance	3,700		
		084	Permits and Fees		2,700	
			WA State Purchasing Coop	2,000		
			WA State L&I Right to Know	300		

Div.	Dept.	Activity	Description			Budget Amount
			Misc.	400		
		085	Rents and Leases		9,800	
			Copier Lease	9,400		
			P.O. Box Rent	400		
		090	Materials and Supplies		61,000	
		091	Small Tools (under $1,000)		2,300	
		092	Miscellaneous		26,500	
			Clothing for Identification	1,200		
			Deductibles/Damage Claims	4,000		
			Election Costs	0		
			Employee Day	3,400		
			Meeting Expenses	1,900		
			Misc. Expenses (Wellness, Interview and Moving Exp)	12,600		
			Service Awards and Costs	3,400		
		099	Unforeseen Operating Contingency		100,000	
		210	Taxes		2,360,200	
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000	
		810	Debt Service - Principal		1,411,600	
		811	Debt Service - Interest		1,624,200	
		901	Unforeseen Capital Contingency		100,000	

Div.	Dept.	Activity	Description			Budget Amount
1	41		**Information Systems**			**1,509,500**
		010	Wages		301,600	
		011	Benefits		111,300	
		020	Travel		10,000	
		021	Training, Tuition and Meeting Fees		10,000	
		030	Transportation		2,400	
		080	Misc. Contractual Services		34,500	
			Network Consulting	20,000		
			SharePoint Consulting	5,000		
			Webpage Consulting	5,000		
			Security System Monitoring	3,000		
			Phone Server Migration	1,500		
		082	Maintenance Contracts		58,500	
			Eaton Powerware - Datacenter UPS & Monitoring	0		
			Eaton Powerware - Omak Network UPS	8,000		
			Key Card System Maintenance	5,000		
			Liebert Units in Datacenter	13,000		
			NetApp SAN Hardware/Software Maintenance	25,000		
			SonicWall	2,500		
			Server Hardware Maintenance	5,000		
		083	Software Licenses and Support		410,200	
			Aclara - TWACS Support	18,000		
			Aclara - Migration to new servers	7,500		
			Aclara - Upgrade to new platform	10,000		
			Certs SSL	700		
			LocalTel Phone System Maintenance	13,500		
			Microsoft Software	29,900		
			NISC Custom Programming	5,000		
			NISC Maintenance	125,000		
			NISC MDMS Implementation	30,000		
			NISC MDMS Annual Fee	19,300		
			OCR for RICOH Scanner	40,000		
			Secure - Remote PC Management	3,000		
			Spam Filter	3,000		
			Symantec Software and Support	9,700		
			VMWare Software Support (IS)	5,000		
			AutoCad	2,000		
			ESRI	5,000		
			Futura	15,000		
			GeoNav	3,000		
			Acent GIS	1,200		
			Staker	19,000		
			Staker Reporting	10,000		
			TL-PRO Design Studio	5,000		
			Cummins Tool Software	700		
			Fastenal Tool Inventory	1,200		
			Max Force	3,000		
			OSI	17,000		
			Trimble Field Inspector	1,300		
			Zonar Vehicle Tracking	7,200		
		085	Rents and Leases		37,100	
			Okanogan Mailing Equipment	12,500		

Div.	Dept.	Activity	Description			Budget Amount
			Branch Office Mailing Equipment	3,000		
			Branch Office MFP	21,600		
		090	Materials and Supplies		15,000	
		091	Small Tools (under $1,000)		20,000	
		712	Capital - Equipment (Over $2,000)		444,700	
			Physical Server Environment - Hardware	32,500		
			Firewall	25,000		
			Mail Relay	5,000		
			Archive Solution	100,000		
			Network Switches	62,000		
			SIEM - Log Management	15,000		
			Printers	10,100		
			Phone System	10,100		
			Keycard Systems - Backend Server Hardware	10,000		
			Keycard Systems - Readers and Controllers	50,000		
			Video Systems - Backend Server Hardware	30,000		
			Video Surveillance Software	15,000		
			Video System Cameras - Subs, Yards and Fence Line	60,000		
			Video System Cameras - Branch Offices	10,000		
			Video Conferencing	10,000		
		714	Capital - Personal Computers		54,200	

Div.	Dept.	Activity	Description			Budget Amount
1	50		**Commissioners**			**152,500**
		010	Wages		85,800	
		011	Benefits		46,400	
		020	Travel	16,000	16,000	
		021	Training, Tuition and Meeting Fees	3,000	3,000	
		090	Materials and Supplies	1,000	1,000	
		092	Miscellaneous	300	300	

Div.	Dept.	Activity	Description			Budget Amount
2	60		**Wholesale Telecommunications**			**7,542,600**
		010	Wages		266,500	
		011	Benefits		106,300	
		020	Travel		12,500	
		021	Training, Tuition and Meeting Fees		20,000	
		030	Transportation		43,100	
		060	Postage, Printing and Stationery		300	
		080	Misc. Contractual Services		89,400	
			NoaNet Calea Services	8,400		
			Network Consulting	75,000		
			Installation of ADVA WDM Tonasket Sub	6,000		
		081	Legal Services		10,000	
		082	Maintenance Contracts		98,900	
			Cisco Smartnet	9,200		
			WWP Lightning Edge/Ciena Devices	67,200		
			ADVA Optical	16,000		
			RADcare (Optimux + IPMux)	4,500		
			Motorola Canopy Hardware/Software	2,000		
		083	Software Licenses and Support		54,500	
			NetZoom	1,400		
			Microsoft Software	8,300		
			Symantec Software and Support	14,000		
			VMWare	12,000		
			Solar Winds	8,300		
			MapInfo Professional	3,000		
			Server License and Software Upgrades	7,500		
		084	Permits and Fees		77,000	
			Upstream Internet Bandwidth	72,000		
			ARIN ASN & IP Address Allocation	5,000		
		085	Rents and Leases		185,400	
			DCPUD Lit Services Leases	3,300		
			DCPUD Dark Fiber Leases	30,000		
			DCPUD Co-location	5,600		
			Protect Path Ring	90,400		
			NoaNet Dark Fiber Lease	32,100		
			Wireless Site Lease	24,000		
		090	Materials and Supplies		110,000	
			HVAC Maintenance and Repair	15,000		
			Switch/Network HW Upgrades	10,000		
			Fiber Plant Maintenance - Wholesale	50,000		
			Battery Plant - Maintenance and Replacement	15,000		
			UPS/Rectifier - Maintenance and Replacement	15,000		
			Server Memory Upgrade	2,500		
			Equipment Calibration/Repair	2,500		
		091	Small Tools (under $1,000)		1,000	
		092	Miscellaneous		0	
		210	Taxes		10,200	
		581	Capital - Contractual Services		30,000	
			Site Engineering - Alternative Microwave Back Haul	30,000		
		591	Capital - Material and Supplies		5,686,400	
			Malott Sub Ethernet Node	10,000		
			TOSUB Comm Hut Entrance	10,000		

Div.	Dept.	Activity	Description			Budget Amount
			Fiber Buildout - OKPUD HQ to 3rd Street Node	16,000		
			Wifi Sites (8) - Omak/Okanogan	120,000		
			Fiber Buildout - OKPUD to Nichols and R. Canyon	169,000		
			Fiber Buildout - Johnson Creek to Greenacres	147,900		
			Alternative Microwave Back Haul	65,000		
			Network Hardware Replacements - End of Life	49,400		
			10G Optics	32,000		
			ADVA WDM for TOSUB	55,000		
			Fiber Distribution Builds	50,000		
			Ethernet Node	25,000		
			Wireless Tower Augmentation	33,600		
			Wireless Remote Subscriber Units	15,500		
			ARRA Broadband Project	4,888,000		
		712	Capital - Equipment (Over $2,000)		88,000	
			Tools	5,000		
			Test Equipment	75,000		
			Server Hardware Upgrades/Replacements	8,000		
		810	Debt Service - Principal		305,400	
			Loan - Electric	188,400		
			Operating Line - Electric	0		
			Loan - ARRA	117,000		
		811	Debt Service - Interest		347,700	
			Loan - Electric	90,000		
			Operating Line - Electric	160,700		
			Loan - ARRA	97,000		

Div.	Dept.	Activity	Description			Budget Amount
1	61		**Internal Communications**			**1,025,000**
		010	Wages		137,000	
		011	Benefits		47,500	
		020	Travel		5,000	
		021	Training, Tuition and Meeting Fees		5,000	
		030	Transportation		7,100	
		060	Postage, Printing and Stationery		300	
		080	Misc. Contractual Services		75,000	
			Radio System Coverage Analysis	75,000		
		082	Maintenance Contracts		21,000	
			Fire Alarm System	2,000		
			UHF Radio System	19,000		
		083	Software Licenses and Support		11,300	
			Cisco Smartnet	300		
			MapInfo Software Support	3,000		
			Fiber Mapping Software Support	8,000		
		084	Permits and Fees		3,000	
			Right of Way - USFS, DOT, etc.	3,000		
		085	Rents and Leases		25,800	
			UHF Site Lease - Little Buck Mtn.	2,500		
			UHF Site Lease - Aeneas Mtn.	2,500		
			UHF Site Lease - Goat Mtn.	600		
			UHF Site Lease - Omak Mtn.	2,500		
			Dark Fiber Lease - Brewster to Wells Dam	17,700		
		090	Materials and Supplies		10,000	
			General Materials and Supplies	10,000		
		091	Small Tools (under $1,000)		2,000	
		591	Capital - Material and Supplies		25,000	
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000		
			Miscellaneous	10,000		
		712	Capital - Equipment (Over $2,000)		650,000	
			UHF Radio System Overhaul	600,000		
			Miscellaneous Contingencies	50,000		

Div.	Dept.	Activity	Description	Budget Amount
			TOTAL EXPENDITURES AND CAPITAL OUTLAY	**64,353,200**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
OVERVIEW

HIGHLIGHTS

- → $14.2 million transfer from reserves, which is a $463,800 decrease over the 2013 adopted budget.
- → Revenues, not including Grant Proceeds, cover debt service and operating expenses by $3.6 million.
- → Retail Electric Sales increased $3.6 million to $42.5 million.
- → Wholesale Electric Sales increased $474,900 - The increase in sales is due to a higher estimated market pricing than was used when estimating 2013 Wholesale Sales.
- → Grant Proceeds decreased $3.4 million to $472,400 - Decrease due to the ARRA Project ending in 2013.
- → Purchased Power - The largest operating expenditure in the budget decreased $149,500 to $23.2 million.
- → Capital Outlays account for $17.8 million - see a summary of Capital Projects below.
- → Rate Stabilization Fund - The funding for the budget includes a $1.1 million transfer from the Rate Stabilization Fund.
- → Debt Service Coverage Ratio is estimated at 2.99 times annual debt service payments; bond covenants require 1.25 times.
- → Total TIER (times interest earned ratio) is estimated at 5.91; District's target is 1.5 times.

REVENUES of $50.2 million - Assumptions Used

- → **Retail Electric Sales:** Predicting a 0% load growth, 1 Mwa for new industrial customer and no rate adjustments in 2014.
- → **Wholesale Electric:** Sales based on a 3/4 to median water year, ten year average wind and previous three years' average market pricing.
- → **Wholesale Telecommunications:** Based on current revenue levels.
- → **Interest:** Return on investments of between .12%(LGIP) and .20%(CDs).
- → **Miscellaneous:** Previous twelve months revenue and Build America Bond reimbursement of $439,500.
- → **Rental Income:** Based on current revenue levels.
- → **Construction Contributions:** Estimated using previous two years' average.
- → **Grant Proceeds:** Anticipated reimbursements of $472,400 from BPA and no grant revenue from RUS relating to ARRA.

EXPENDITURES $42.8 million - Assumptions Used

- → **Wages:** Two less employees than in the 2013 adopted budget and overall average wage increase of 0.6%. The average wage increase only includes current bargaining agreement step increases and no general wage increase.
- → **Benefits:** Based on August 2012 thru July 2013 actual percentage of wages. Range of 39% through 50.5% (ave. 42.1%). Includes a 2% increase in employer PERS contributions rates effective July 2013.
- → **Purchased Power:** Wells Project costs effective September 2013 and BPA rates effective October 2013.
- → **Other Expenditures:** Other expenses are based on known 2014 costs. If costs are not specifically known, a 2% increase was estimated.

DEBT SERVICE $3.8 million

- → **Principal and Interest:** Per debt service schedules and ARRA estimated debt service.

CAPITAL OUTLAY $17.8 million - Summary Listing

- → Methow Transmission Line and Substation $9.4 million.
- → Enloe Dam $2.75 million.
- → Operations Normal Replacements and Line Extensions of $2.025 million.
- → Line Truck Replacement $375,000.
- → Warehouse Truck Replacement $375,000.
- → Regulator and Switch Purchases $320,000.
- → Information Systems $307,900 (network, phone, access control and surveillance systems).
- → Bucket Truck Replacement $300,000.
- → Wholesale Telecommunications Capital of $296,900.
- → Twisp Substation Modifications $250,000.
- → Covered Storage Okanogan or Sandflat Substations $200,000
- → Engineering - Large System Projects $150,000.
- → Cutout Replacement Program $125,000.
- → Pickup Truck Replacements (4) $120,000.
- → Other capital Items $825,000.

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
BUDGET SUMMARY

Description	Electric	Broadband	Total
REVENUE			
Sales - Retail	42,501,700		42,501,700
Sales - Wholesale	2,835,200	2,200,000	5,035,200
Interest	50,000		50,000
Miscellaneous	1,104,000		1,104,000
Rental Income	108,000		108,000
Construction Contribution	917,000		917,000
Grant Proceeds	472,400	0	472,400
Total Revenue	**47,988,300**	**2,200,000**	**50,188,300**
EXPENDITURES			
Wages	6,998,100	281,200	7,279,300
Benefits	2,920,400	125,400	3,045,800
Travel	115,900	10,000	125,900
Training, Tuition and Meeting Fees	69,900	12,000	81,900
Transportation	828,200	42,600	870,800
Insurance	319,600		319,600
Utilities	95,800		95,800
Postage, Printing and Stationery	149,400	300	149,700
Advertising	18,600		18,600
Conservation Expenditures	472,400		472,400
Misc. Contractual Services	1,791,600	133,400	1,925,000
Legal Services	300,000	10,000	310,000
Maintenance Contracts	164,700	147,100	311,800
Software Licenses and Support	705,500	38,400	743,900
Permits and Fees	16,500	71,500	88,000
Rents and Leases	80,900	138,900	219,800
Materials and Supplies	697,500	85,500	783,000
Small Tools (under $1,000)	24,000	1,000	25,000
Miscellaneous	65,000		65,000
Unforeseen Operating Contingency	100,000		100,000
Purchased Power	23,227,300		23,227,300
Taxes	2,570,000	11,000	2,581,000
Total Expenditures	**41,731,300**	**1,108,300**	**42,839,600**
DEBT SERVICE			
Debt Service - Principal	1,447,200	354,100	1,801,300
Debt Service - Interest	1,560,000	396,800	1,956,800
Total Debt Service	**3,007,200**	**750,900**	**3,758,100**
AVAILABLE FOR CAPITAL OUTLAY	**3,249,800**	**340,800**	**3,590,600**
CAPITAL OUTLAY			
Capital - Contractual Services	11,165,000		11,165,000
Capital - Materials and Supplies	3,675,000	266,900	3,941,900
Capital - Meter Purchases	70,000		70,000
Capital - Transformer Purchases	400,000		400,000
Capital - Tools and Equipment	4,500		4,500
Capital - Buildings	410,000		410,000
Capital - Equipment (Over $2,000)	441,900	30,000	471,900
Capital - Vehicles	1,219,000		1,219,000
Capital - Personal Computers	37,500		37,500
Unforeseen Capital Contingency	100,000		100,000
Total Capital Outlay	**17,522,900**	**296,900**	**17,819,800**
RESERVES/DEBT	**(14,273,100)**	**43,900**	**(14,229,200)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
2013 ADOPTED BUDGET COMPARED TO 2014 ADOPTED BUDGET

	Electric System				Broadband				Total			
REVENUE	Adopted 2013	Projected 2013	Adopted 2014	2013 Adopted/ 2014 Adopted	Adopted 2013	Projected 2013	Adopted 2014	2013 Adopted/ 2014 Adopted	Adopted 2013	Projected 2013	Adopted 2014	2013 Adopted/ 2014 Adopted
Sales - Retail	38,889,900	37,337,000	42,501,700	3,611,800			0	0	38,889,900	37,337,000	42,501,700	3,611,800
Sales - Wholesale	2,360,300	4,969,000	2,835,200	474,900	2,200,000	2,212,000	2,200,000	0	4,560,300	7,181,000	5,035,200	474,900
Interest	68,000	53,000	50,000	(18,000)			0	0	68,000	53,000	50,000	(18,000)
Miscellaneous	1,052,000	1,067,000	1,104,000	52,000			0	0	1,052,000	1,067,000	1,104,000	52,000
Rental Income	118,000	108,000	108,000	(10,000)			0	0	118,000	108,000	108,000	(10,000)
Construction Contribution	1,104,000	1,087,000	917,000	(187,000)			0	0	1,104,000	1,087,000	917,000	(187,000)
Grant Proceeds	480,000	480,000	472,400	(7,600)	3,388,000	3,388,000	0	(3,388,000)	3,868,000	3,868,000	472,400	(3,395,600)
Total Revenue	**44,072,200**	**45,101,000**	**47,988,300**	**3,916,100**	**5,588,000**	**5,600,000**	**2,200,000**	**(3,388,000)**	**49,660,200**	**50,701,000**	**50,188,300**	**528,100**
EXPENDITURES												
Wages	7,377,500	6,680,000	6,998,100	(379,400)	266,500	499,000	281,200	14,700	7,644,000	7,179,000	7,279,300	(364,700)
Benefits	2,831,700	2,698,000	2,920,400	88,700	106,300	222,000	125,400	19,100	2,938,000	2,920,000	3,045,800	107,800
Travel	141,500	78,000	115,900	(25,600)	12,500	7,000	10,000	(2,500)	154,000	85,000	125,900	(28,100)
Training, Tuition and Meeting Fees	90,700	34,000	69,900	(20,800)	20,000	10,000	12,000	(8,000)	110,700	44,000	81,900	(28,800)
Transportation	800,000	769,000	828,200	28,200	43,100	60,000	42,600	(500)	843,100	829,000	870,800	27,700
Insurance	312,400	286,000	319,600	7,200	0	0	0	0	312,400	286,000	319,600	7,200
Utilities	88,900	89,000	95,800	6,900	0	0	0	0	88,900	89,000	95,800	6,900
Postage, Printing and Stationery	150,800	123,000	149,400	(1,400)	300	1,000	300	0	151,100	124,000	149,700	(1,400)
Advertising	23,000	17,000	18,600	(4,400)	0	0	0	0	23,000	17,000	18,600	(4,400)
Conservation Expenditures	480,000	480,000	472,400	(7,600)	0	0	0	0	480,000	480,000	472,400	(7,600)
Misc. Contractual Services	1,974,400	1,475,000	1,791,600	(182,800)	89,400	25,000	133,400	44,000	2,063,800	1,500,000	1,925,000	(138,800)
Legal Services	319,500	244,000	300,000	(19,500)	10,000	7,000	10,000	0	329,500	251,000	310,000	(19,500)
Maintenance Contracts	239,100	169,000	164,700	(74,400)	98,900	54,000	147,100	48,200	338,000	223,000	311,800	(26,200)
Software Licenses and Support	624,400	454,000	705,500	81,100	54,500	38,000	38,400	(16,100)	678,900	492,000	743,900	65,000
Permits and Fees	13,500	4,000	16,500	3,000	77,000	57,000	71,500	(5,500)	90,500	61,000	88,000	(2,500)
Rents and Leases	86,900	77,000	80,900	(6,000)	185,400	211,000	138,900	(46,500)	272,300	288,000	219,800	(52,500)
Materials and Supplies	644,400	499,000	697,500	53,100	110,000	149,000	85,500	(24,500)	754,400	648,000	783,000	28,600
Small Tools (under $1,000)	47,300	6,000	24,000	(23,300)	1,000	1,000	1,000	0	48,300	7,000	25,000	(23,300)
Miscellaneous	72,500	37,000	65,000	(7,500)	0	0	0	0	72,500	37,000	65,000	(7,500)
Unforeseen Operating Contingency	100,000	150,000	100,000	0	0	0	0	0	100,000	150,000	100,000	0
Purchased Power	23,376,800	23,376,800	23,227,300	(149,500)	0	0	0	0	23,376,800	23,376,800	23,227,300	(149,500)
Taxes	2,360,200	2,312,000	2,570,000	209,800	10,200	11,000	11,000	800	2,370,400	2,323,000	2,581,000	210,600
Total Expenditures	**42,155,500**	**40,057,800**	**41,731,300**	**(424,200)**	**1,085,100**	**1,352,000**	**1,108,300**	**23,200**	**43,240,600**	**41,409,800**	**42,839,600**	**(401,000)**
DEBT SERVICE												
Debt Service - Principal	1,411,600	1,412,000	1,447,200	35,600	305,400	249,000	354,100	48,700	1,717,000	1,661,000	1,801,300	84,300
Debt Service - Interest	1,624,200	1,690,000	1,560,000	(64,200)	347,700	315,000	396,800	49,100	1,971,900	2,005,000	1,956,800	(15,100)
Total Debt Service	**3,035,800**	**3,102,000**	**3,007,200**	**(28,600)**	**653,100**	**564,000**	**750,900**	**97,800**	**3,688,900**	**3,666,000**	**3,758,100**	**69,200**
AVAILABLE FOR CAPITAL OUTLAY	**(1,119,100)**	**1,941,200**	**3,249,800**	**4,368,900**	**3,849,800**	**3,684,000**	**340,800**	**(3,509,000)**	**2,730,700**	**5,625,200**	**3,590,600**	**859,900**
CAPITAL OUTLAY												
Capital - Contractual Services	6,442,500	3,476,000	11,165,000	4,722,500	30,000	3,771,000	0	(30,000)	6,472,500	7,247,000	11,165,000	4,692,500
Capital - Materials and Supplies	2,208,000	1,349,000	3,675,000	1,467,000	5,686,400	419,000	266,900	(5,419,500)	7,894,400	1,768,000	3,941,900	(3,952,500)
Capital - Meter Purchases	90,000	24,000	70,000	(20,000)	0	0	0	0	90,000	24,000	70,000	(20,000)
Capital - Transformer Purchases	225,000	228,000	400,000	175,000	0	0	0	0	225,000	228,000	400,000	175,000
Capital - Tools and Equipment	9,500	9,500	4,500	(5,000)	0	0	0	0	9,500	9,500	4,500	(5,000)
Capital - Buildings	685,000	27,000	410,000	(275,000)	0	0	0	0	685,000	27,000	410,000	(275,000)
Capital - Equipment (Over $2,000)	1,171,100	271,100	441,900	(729,200)	88,000	32,000	30,000	(58,000)	1,259,100	303,100	471,900	(787,200)
Capital - Vehicles	634,000	(146,000)	1,219,000	585,000	0	0	0	0	634,000	(146,000)	1,219,000	585,000
Capital - Personal Computers	54,200	45,200	37,500	(16,700)	0	0	0	0	54,200	45,200	37,500	(16,700)
Unforeseen Capital Contingency	100,000	31,000	100,000	0	0	0	0	0	100,000	31,000	100,000	0
Total Capital Outlay	**11,619,300**	**5,314,800**	**17,522,900**	**5,903,600**	**5,804,400**	**4,222,000**	**296,900**	**(5,507,500)**	**17,423,700**	**9,536,800**	**17,819,800**	**396,100**
RESERVES/DEBT	**(12,738,400)**	**(3,373,600)**	**(14,273,100)**	**(1,534,700)**	**(1,954,600)**	**(538,000)**	**43,900**	**1,998,500**	**(14,693,000)**	**(3,911,600)**	**(14,229,200)**	**463,800**

PUBLIC UTILITY DISTRICT NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
BUDGET COMPARISON 2007 THRU 2014 ADOPTED

	2007		2008		2009		2010		2011		2012		2013		2014
REVENUE	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Projected	Adopted
Sales - Electric Retail	30,904,100	31,043,483	31,853,400	31,952,534	31,290,700	30,777,098	33,337,000	29,307,079	35,001,000	33,605,348	37,475,000	35,861,526	38,889,900	37,337,000	42,501,700
Sales - Electric Wholesale	9,110,500	12,120,917	8,737,000	11,263,826	7,489,500	4,198,884	4,937,000	5,801,903	5,490,000	6,741,526	2,742,000	3,531,677	2,360,300	4,969,000	2,835,200
Sales - Broadband Wholesale	710,400	855,469	850,000	1,030,980	1,168,200	1,767,217	1,900,000	1,944,345	2,000,000	1,995,657	2,500,000	2,117,105	2,200,000	2,212,000	2,200,000
Interest	1,676,200	1,919,000	1,738,500	1,697,562	1,246,000	964,500	262,000	214,509	207,000	113,944	80,000	74,313	68,000	53,000	50,000
Miscellaneous	797,900	802,336	1,250,000	727,466	746,700	1,056,550	531,000	916,913	749,000	1,841,914	1,504,000	1,342,999	1,052,000	1,067,000	1,104,000
Rental Income	123,000	117,646	118,000	117,068	118,000	116,995	118,000	117,098	118,000	117,098	118,000	117,098	118,000	108,000	108,000
Construction Contribution	1,325,600	1,951,581	1,600,000	1,795,823	1,600,000	884,844	542,000	996,025	820,000	974,691	1,059,000	991,816	1,104,000	1,087,000	917,000
Grant Proceeds											5,421,000	2,091,175	3,868,000	3,868,000	472,400
Total Revenue	**44,647,700**	**48,810,432**	**46,146,900**	**48,585,259**	**43,659,100**	**39,766,088**	**41,627,000**	**39,297,872**	**44,385,000**	**45,390,178**	**50,899,000**	**46,127,709**	**49,660,200**	**50,701,000**	**50,188,300**
EXPENDITURES															
Wages	5,931,000	5,611,848	6,675,300	5,929,192	7,177,800	6,311,358	7,482,500	6,842,404	7,696,800	6,675,420	7,627,000	7,076,500	7,644,000	7,179,000	7,279,300
Benefits	1,660,700	1,854,052	2,182,700	2,035,454	2,368,600	2,532,708	2,618,900	2,373,456	2,544,600	2,394,707	2,716,400	2,633,239	2,938,000	2,920,000	3,045,800
Travel	112,500	106,502	125,500	140,556	267,600	124,077	244,700	124,532	185,900	122,664	170,800	116,854	154,000	85,000	125,900
Training, Tuition and Meeting Fees	86,200	62,923	84,900	96,332	179,300	74,206	196,000	86,633	135,900	61,871	128,800	91,420	110,700	44,000	81,900
Transportation	210,800	610,114	627,300	687,840	695,400	783,135	757,000	924,761	903,500	835,496	829,300	825,034	843,100	829,000	870,800
Insurance	185,600	184,663	206,600	212,096	219,300	313,815	320,500	279,268	310,000	308,777	308,000	307,665	312,400	286,000	319,600
Utilities	66,700	66,087	65,900	69,183	73,100	75,014	75,600	87,580	97,200	82,874	85,800	91,668	88,900	89,000	95,800
Postage, Printing and Stationary	101,700	106,365	105,500	111,096	122,700	104,646	117,200	106,436	198,400	142,313	193,000	141,003	151,100	124,000	149,700
Advertising	43,900	33,755	29,800	14,858	28,500	29,848	31,500	21,817	37,700	26,321	22,300	18,742	23,000	17,000	18,600
Conservation Expenditures	221,600	232,619	274,700	286,121	203,700	340,016	276,000	430,665	372,800	294,811	460,000	428,365	480,000	480,000	472,400
Misc. Contractual Services	1,878,300	1,505,518	2,400,700	2,171,518	2,350,200	2,067,841	2,994,400	1,908,893	2,508,600	1,441,439	2,213,800	1,993,088	2,063,800	1,500,000	1,925,000
Legal Services	60,600	55,828	64,500	155,895	374,800	296,977	364,100	240,533	314,100	323,826	319,100	257,876	329,500	251,000	310,000
Maintenance Contracts	171,300	76,393	223,900	136,192	127,100	90,704	157,400	102,674	177,600	126,661	185,900	208,019	338,000	223,000	311,800
Software Licenses and Support	148,000	86,569	137,200	154,785	187,700	183,255	264,500	241,644	317,400	223,978	445,200	263,155	678,900	492,000	743,900
Permits and Fees	36,700	58,946	41,300	85,420	116,400	103,281	104,400	104,237	368,300	162,253	160,500	137,887	90,500	61,000	88,000
Rents and Leases	107,000	122,428	136,000	139,093	154,400	151,378	148,300	161,484	285,100	166,823	280,000	220,978	272,300	288,000	219,800
Materials and Supplies	500,200	603,415	550,000	882,014	720,400	773,077	932,000	840,196	930,400	592,470	797,000	743,578	754,400	648,000	783,000
Small Tools (under $1,000)	41,500	44,455	43,600	38,941	44,300	60,736	69,300	25,196	68,800	25,664	43,300	15,366	48,300	7,000	25,000
Miscellaneous	19,200	81,232	83,700	81,974	64,000	48,492	101,000	45,911	74,100	105,491	100,300	58,933	72,500	37,000	65,000
Unforeseen Operating Contingency											100,000	14,099	100,000	150,000	100,000
Purchased Power	23,454,700	24,579,372	24,243,700	24,686,109	21,213,700	21,822,349	24,158,000	23,895,600	25,373,000	24,060,574	23,220,100	22,284,244	23,376,800	23,376,800	23,227,300
Taxes	1,890,700	1,896,453	1,947,500	1,921,891	1,927,000	1,876,406	2,020,200	1,839,337	2,119,000	2,138,550	2,298,700	2,220,162	2,370,400	2,323,000	2,581,000
Total Expenditures	36,928,900	37,979,537	40,250,300	40,036,560	38,616,000	38,163,319	43,433,500	40,683,257	45,019,200	40,312,983	42,705,300	40,147,875	43,240,600	41,409,800	42,839,600
DEBT SERVICE															
Debt Service - Principal	775,000	777,883	810,000	812,118	835,000	837,916	870,000	873,334	1,190,000	1,183,749	1,555,000	1,574,421	1,717,000	1,661,000	1,801,300
Debt Service - Interest	780,600	826,410	753,300	798,800	722,600	767,367	684,100	992,487	2,241,100	2,068,361	1,919,000	2,018,950	1,971,900	2,005,000	1,956,800
Total Debt Service	1,555,600	1,604,293	1,563,300	1,610,918	1,557,600	1,605,283	1,554,100	1,865,821	3,431,100	3,252,110	3,474,000	3,593,371	3,688,900	3,666,000	3,758,100
AVAILABLE FOR CAPITAL OUTLAY	**6,163,200**	**9,226,602**	**4,333,300**	**6,937,781**	**3,485,500**	**(2,514)**	**(3,360,600)**	**(3,251,206)**	**(4,065,300)**	**1,825,085**	**4,719,700**	**2,386,463**	**2,730,700**	**5,625,200**	**3,590,600**
CAPITAL OUTLAY															
Capital - Contractual Services	4,075,100	2,036,715	3,986,700	2,042,651	10,158,000	1,761,846	11,208,000	1,759,767	10,500,000	2,279,483	9,686,400	2,350,626	6,472,500	7,247,000	11,165,000
Capital - Materials and Supplies	6,174,600	2,679,513	4,827,600	4,783,802	9,326,100	5,270,105	8,796,000	6,189,149	5,636,700	3,283,116	13,051,400	5,196,359	7,894,400	1,768,000	3,941,900
Capital - Meter Purchases	110,000	71,960	390,000	125,857	595,000	790,778	1,500,000	252,306	440,000	369,605	90,000	0	90,000	24,000	70,000
Capital - Transformer Purchases	2,750,000	2,481,491	1,200,000	1,153,037	1,166,000	521,218	500,000	365,288	500,000	408,995	225,000	216,729	225,000	228,000	400,000
Capital - Tools and Equipment	30,000	10,072	22,000	6,920	10,200	1,374	13,500	6,572	13,200	1,770	12,000	6,232	9,500	9,500	4,500
Capital - Buildings	665,000	637,053	778,600	240,876	6,984,500	3,932,356	3,094,000	4,274,502	42,000	40,475	7,500	1,969	685,000	27,000	410,000
Capital - Equipment (Over $2,000)	527,800	272,803	819,300	680,078	1,105,100	412,738	1,457,800	1,043,752	999,600	218,074	1,051,000	371,313	1,259,100	303,100	471,900
Capital - Vehicles	876,000	296,759	941,000	930,324	351,000	281,734	(175,000)	(219,097)	30,000	(186,718)	315,300	(310,574)	634,000	(146,000)	1,219,000
Capital - Personal Computers	53,600	25,072	78,500	56,993	58,600	39,551	70,600	59,792	57,300	40,751	48,100	30,680	54,200	45,200	37,500
Unforeseen Capital Contingencies	100,000	23,648	100,000	31,359	100,000	42,005	100,000	16,131	100,000	47,639	100,000	3,679	100,000	31,000	100,000
Total Capital Outlay	15,362,100	8,535,086	13,143,700	10,051,897	29,854,500	13,053,705	26,564,900	13,748,162	18,318,800	6,503,190	24,586,700	7,867,013	17,423,700	9,536,800	17,819,800
RESERVES/DEBT	**(9,198,900)**	**691,516**	**(8,810,400)**	**(3,114,116)**	**(26,369,000)**	**(13,056,219)**	**(29,925,500)**	**(16,999,368)**	**(22,384,100)**	**(4,678,105)**	**(19,867,000)**	**(5,480,550)**	**(14,693,000)**	**(3,911,600)**	**(14,229,200)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Const. Design	Eng.	Operations	Enviro.	Customer Service	Cons.	General Admin.	I.S.	BOC	Broadband	Internal Comm.	Total
EXPENDITURES														
010 Wages	172,300	114,400	560,000	161,500	3,527,900	62,100	657,200	63,900	1,136,200	296,700	108,600	281,200	137,300	7,279,300
011 Benefits	72,000	49,800	239,700	69,100	1,397,000	28,500	331,200	24,900	465,800	131,700	54,800	125,400	55,900	3,045,800
020 Travel	25,000	10,000	2,300	5,800	11,400	3,000	4,000	3,000	24,400	5,000	17,000	10,000	5,000	125,900
021 Training, Tuition and Meeting Fees	7,000	2,500	2,100	4,300	22,000	2,400	2,500	2,000	11,100	6,000	3,000	12,000	5,000	81,900
030 Transportation	6,200	1,500	22,700	11,400	731,600	500	38,900	6,400	2,600	1,500		42,600	4,900	870,800
040 Insurance									319,600					319,600
050 Utilities					200				95,600					95,800
060 Postage, Printing and Stationery		100		500	3,000		137,600	3,000	4,900			300	300	149,700
070 Advertising				300	1,000			17,000	300					18,600
071 Conservation Expenditures								472,400						472,400
080 Misc. Contractual Services	82,100	364,000			646,100	6,500	52,200	20,000	498,700	47,000		133,400	75,000	1,925,000
081 Legal Services									300,000			10,000		310,000
082 Maintenance Contracts					94,000		500		13,900	35,300		147,100	21,000	311,800
083 Software Licenses and Support	5,000	190,000	4,000			2,000	5,000			494,700		38,400	8,800	747,900
084 Permits and Fees	5,000			500	1,000		300		2,700			71,500	3,000	84,000
085 Rents and Leases	9,000				1,000		5,200		9,500	26,800		138,900	29,400	219,800
090 Materials and Supplies	5,500	200		15,000	582,000	5,000	26,000	2,200	40,600	10,000	1,000	85,500	10,000	783,000
091 Small Tools (under $1,000)			1,000		8,500		1,500		1,000	10,000		1,000	2,000	25,000
092 Miscellaneous				400	10,400		34,500	200	19,200		300			65,000
099 Unforeseen Operating Contingency									100,000					100,000
120 Purchased Power		23,227,300												23,227,300
210 Taxes									2,570,000			11,000		2,581,000
Total Expenditures	**389,100**	**23,959,800**	**831,800**	**268,800**	**7,037,100**	**110,000**	**1,296,600**	**615,000**	**5,616,100**	**1,064,700**	**184,700**	**1,108,300**	**357,600**	**42,839,600**
DEBT SERVICE														
810 Debt Service - Principal									1,447,200			354,100		1,801,300
811 Debt Service - Interest									1,560,000			396,800		1,956,800
Total Debt Service	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,007,200**	**0**	**0**	**750,900**	**0**	**3,758,100**
CAPITAL OUTLAY														
581 Capital - Contractual Services	2,585,000		8,030,000	150,000	400,000									11,165,000
591 Capital - Materials and Supplies	165,000		1,860,000	410,000	1,225,000							266,900	15,000	3,941,900
592 Capital - Meter Purchases					70,000									70,000
593 Capital - Transformer Purchases					400,000									400,000
710 Capital - Tools and Equipment					2,500				2,000					4,500
711 Capital - Buildings					410,000									410,000
712 Capital - Equipment (Over $2,000)					84,000					307,900		30,000	50,000	471,900
713 Capital - Vehicles					1,219,000									1,219,000
714 Capital - Personal Computers										37,500				37,500
901 Unforeseen Capital Contingency									100,000					100,000
Total Capital Outlay	**2,750,000**	**0**	**9,890,000**	**560,000**	**3,810,500**	**0**	**0**	**0**	**102,000**	**345,400**	**0**	**296,900**	**65,000**	**17,819,800**
Total Use of Resources	**3,139,100**	**23,959,800**	**10,721,800**	**828,800**	**10,847,600**	**110,000**	**1,296,600**	**615,000**	**8,725,300**	**1,410,100**	**184,700**	**2,156,100**	**422,600**	**64,417,500**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**47,988,300**
	001	Sales - Retail	42,501,700	
	002	Sales - Wholesale	2,835,200	
	003	Interest	50,000	
	004	Miscellaneous	1,104,000	
	005	Rental Income	108,000	
	006	Construction Contributions	917,000	
	007	Grant Proceeds	472,400	
2		**Broadband**		**2,200,000**
	002	Sales - Wholesale	2,200,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
	007	Grant Proceeds	0	
		TOTAL REVENUE		**50,188,300**

Div.	Dept.	Activity	Description			Budget Amount	
1	10		**Generation**			**3,139,100**	
		010	Wages		172,300		
		011	Benefits		72,000		
		020	Travel		25,000		
		021	Training, Tuition and Meeting Fees		7,000		
		030	Transportation		6,200		
		080	Misc. Contractual Service		82,100		
		083	Software Licenses and Support		5,000		
		084	Permits and Fees		5,000		
		085	Rent and Leases		9,000		
			Ophir Site Lease	9,000			
		090	Materials and Supplies		5,500		
		581	Capital - Contractual Services		2,585,000 *		**1**
		591	Capital - Materials and Supplies		165,000 *		**1**

* Expenditures will require Board authorization prior to General Manager's approval.

Div.	Dept.	Activity	Description			Budget Amount
1	11		**Power Supply**			**23,959,800**
		010	Wages		114,400	
		011	Benefits		49,800	
		020	Travel		10,000	
		021	Training, Tuition and Meeting Fees		2,500	
		030	Transportation		1,500	
		060	Postage, Printing and Stationery		100	
		080	Misc. Contractual Services		364,000	
			Douglas County PUD	350,000		
			Professional Services (compliance/scheduling)	3,000		
			Central Washington Power Authority	1,000		
			Slice Implementation Group	10,000		
		083	Software Licenses and Support		190,000	
			Slice Software Support Fee	190,000		
		090	Materials and Supplies		200	
		120	Purchased Power		23,227,300	
			BPA - Slice	7,937,400		
			BPA - Block	5,828,600		
			BPA - Transmission	2,672,900		
			Wells	4,025,600		
			Nine Canyon	2,762,800		

Div.	Dept.	Activity	Description			Budget Amount	
1	19		**Construction Design**			**10,721,800**	
		010	Wages		560,000		
		011	Benefits		239,700		
		020	Travel		2,300		
		021	Training, Tuition and Meeting Fees		2,100		
		030	Transportation		22,700		
		084	Permits and Fees		4,000		
			Miscellaneous	4,000			
		091	Small Tools (under $1,000)		1,000		
		581	Capital - Contractual Services		8,030,000		
			PT Line Construction	6,000,000 **			**1**
			PT Mitigation/Roads	650,000 **			**1**
			PT Permits	175,000 **			**1**
			PT ROW/Easements	500,000 **			**1**
			Gold Creek Substation	505,000 **			**1**
			LiDAR - Transmission Fixes	50,000 ***			**3**
			BPA Engineering Studies - Chicken Creek Substation	60,000 ***			**3**
			OKPUD Preliminary Study - Chicken Creek Substation	15,000 ***			**3**
			Okanogan-Brewster Transmission Rebuild	65,000 ***			**3**
			Misc. Property Survey	10,000 ***			**3**
		591	Capital - Materials and Supplies		1,860,000		
			PT Line - Transmission and Distribution Materials	1,250,000 **			**1**
			Gold Creek Substation	320,000 **			**1**
			Twisp Substation Modifications	250,000 ***			**3**
			Loup Transmission Line Re-Route into Twisp Substation	40,000 ***			**3**

** The District expects to spend $2,000,000 in 2014 and reserve the balance to complete the project.
*** Staff will get Board approval prior to incurring expenses for Priority 3 capital items and will provide an explanation of the funding source for the item.

Div.	Dept.	Activity	Description			Budget Amount	
1	20		**Engineering**			**828,800**	
		010	Wages		161,500		
		011	Benefits		69,100		
		020	Travel		5,800		
		021	Training, Tuition and Meeting Fees		4,300		
		030	Transportation		11,400		
		060	Postage, Printing and Stationery		500		
		070	Advertising		300		
		084	Permits and Fees		500		
			Miscellaneous	500			
		090	Materials and Supplies		15,000		
		092	Miscellaneous		400		
		581	Capital - Contractual Services		150,000		
			Engineering - Large System Projects	150,000 ***			**3**
		591	Capital - Materials and Supplies		410,000		
			Okanogan 115kv Bus Differential	10,000 ***			**3**
			SCADA	50,000 ***			**3**
			OCB, Regulators, Reclosers, etc.	320,000 ***			**3**
			Battery Replacements Identified by NERC Testing	30,000 ***			**3**

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Div.	Dept.	Activity	Description			Budget Amount	
1	21		**Operations**			**10,847,600**	
		010	Wages		3,527,900		
		011	Benefits		1,397,000		
		020	Travel		11,400		
		021	Training, Tuition and Meeting Fees		22,000		
		030	Transportation		731,600		
		050	Utilities		200		
		060	Postage, Printing and Stationery		3,000		
		070	Advertising		1,000		
		080	Misc. Contractual Services		646,100		
			CDL Testing Program	6,000			
			Employee Dispatch	9,600			
			Janitorial Services (BR, TO and OR)	8,500			
			Pole Testing	115,000			
			Safety Training	40,000			
			Tree Trimming	455,000			
			Underground Locate Service	3,000			
			Weed Control	9,000			
		082	Maintenance Contracts		94,000		
			HVAC Maintenance	32,000			
			Landscape Maintenance	9,000			
			Snowplowing and Sweeping	15,000			
			Omak Office - Asphalt Repair, Seal and Stripe	10,000			
			Okanogan Office - Asphalt, Seal and Stripe	20,000			
			Brewster Office - Exterior Repair and Paint	8,000			
		084	Permits and Fees		1,000		
			Miscellaneous	1,000			
		085	Rents and Leases		1,000		
			Pole Contacts	1,000			
		090	Materials and Supplies		582,000		
			General	550,000			
			Fire Resistant Clothing	24,500			
			Fire Resistant Raingear	7,500			
		091	Small Tools (under $1,000)		8,500		
			Brewster	1,500			
			Okanogan	3,500			
			Oroville	1,500			
			Vehicle Shop/Electric Shop	2,000			
		092	Miscellaneous		10,400		
			Lineman Rodeo (Fees, Travel and Supplies)	10,000			
			Safety Meeting Refreshments	400			
		581	Capital - Contractual Services		400,000		
			Contract Labor	100,000			**2**
			Underground Replacements	300,000			**2**
		591	Capital - Materials and Supplies		1,225,000		
			Normal Replacements and Extensions	1,100,000			**2**
			Cutout Replacement	125,000			**2**
		592	Capital - Meter Purchases		70,000		
			Metering Special Projects	30,000 ***			**3**
			PME Meter Replacements	40,000 ***			**3**
		593	Capital - Transformer Purchases		400,000		
			Normal Additions/Replacements	400,000			**2**

Div.	Dept.	Activity	Description		Budget Amount	
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,500 ***	3
		711	Capital - Buildings		410,000	
			Headquarters - Emergency Generator Loadbank	8,000 ***		3
			Okanogan or Sandflat Subs - Covered Storage	200,000 ***		3
			Headquarters - Hardwater System	9,000 ***		3
			Warehouse - HVAC Replacement	75,000 ***		3
			Warehouse - Storage Container	3,000 ***		3
			Warehouse - Lights	35,000 ***		3
			Vehicle Shop - HVAC Replacement	80,000		1
		712	Capital - Equipment (Over $2,000)		84,000	
			Electric Shop - Oil Filtration System	14,000		2
			Electric Shop - Portable Oil Test Set	12,000		2
			Electric Shop - Pipe Threading Machine	6,000 ***		3
			Electric Shop\Telecom - Air Compressor	12,000 ***		3
			Electric Shop\Telecom - Battery Storage\Charging	20,000 ***		3
			Vehicle Shop - Parts Washer	5,500		2
			Vehicle Shop - Iron Worker Attachments	14,500 ***		3
		713	Capital - Vehicles		1,219,000	
			Bucket Truck - Replacement	300,000		1
			Line Truck - Replacement	375,000 ***		3
			Warehouse Truck - Replacement	375,000 ***		3
			Backhoe Trailer - Replacement	35,000 ***		3
			Service Trucks (2) - Replacements	90,000 ***		3
			Cab\Chassis - Reuse and Remount Boom	80,000 ***		3
			Foreman Truck - Replacement	90,000 ***		3
			Pickup Truck - Replacements (4)	120,000 ***		3
			Large SUV	30,000 ***		3
			Less: Transportation System Depreciation	(276,000)		2

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Div.	Dept.	Activity	Description			Budget Amount
1	22		**Environmental**			**110,000**
		010	Wages		62,100	
		011	Benefits		28,500	
		020	Travel		3,000	
		021	Training, Tuition and Meeting Fees		2,400	
		030	Transportation		500	
		080	Misc. Contractual Services		6,500	
			Miscellaneous	6,500		
		083	Software Licenses and Support		2,000	
		090	Materials and Supplies		5,000	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2014 ADOPTED BUDGET - DECEMBER 10, 2013
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount
1	30		**Customer Service**			**1,296,600**
		010	Wages		657,200	
		011	Benefits		331,200	
		020	Travel		4,000	
		021	Training, Tuition and Meeting Fees		2,500	
		030	Transportation		38,900	
		060	Postage, Printing and Stationery		137,600	
			Postage and Printing - NISC	108,800		
			Postage - PUD	19,200		
			Printing - Misc.	9,600		
		080	Misc. Contractual Services		52,200	
			CIS Programming	5,000		
			Collection Service - Credit Bureau	4,000		
			Credit Reporting Agency	3,200		
			Electronic Payments Fees	40,000		
		082	Maintenance Contracts		500	
		083	Software Licenses and Support		5,000	
			RemitPlus Check Scanning and Recognition Support	5,000		
		084	Permits and Fees		300	
			Miscellaneous Fees (Notaries, etc.)	300		
		085	Rents and Leases		5,200	
			Office Rent MVCC	4,900		
			Miscellaneous	300		
		090	Materials and Supplies		26,000	
			General	26,000		
		091	Small Tools (under $1,000)		1,500	
		092	Miscellaneous		34,500	
			Miscellaneous Expenses	600		
			Net Account Receivable Writeoffs	33,900		

Div.	Dept.	Activity	Description			Budget Amount
1	35		**Conservation/Consumer Information**			**615,000**
		010	Wages		63,900	
		011	Benefits		24,900	
		020	Travel		3,000	
		021	Training, Tuition and Meeting Fees		2,000	
		030	Transportation		6,400	
		060	Postage, Printing and Stationery		3,000	
			Miscellaneous	3,000		
		070	Advertising		17,000	
		071	Conservation Expenditures		472,400	
			District Conservation Programs	472,400		
		080	Misc. Contractual Services		20,000	
			Electric Education Programs	20,000		
		090	Materials and Supplies		2,200	
		092	Miscellaneous		200	

Div.	Dept.	Activity	Description			Budget Amount
1	40		**General Administration**			**8,725,300**
		010	Wages		1,136,200	
		011	Benefits		465,800	
		020	Travel		24,400	
			General	13,600		
			Accounting and Finance	5,000		
			Human Resource	3,800		
			Leadership	2,000		
		021	Training, Tuition and Meeting Fees		11,100	
			General	2,500		
			Accounting and Finance	5,000		
			Human Resource	1,600		
			Leadership	2,000		
		030	Transportation		2,600	
		040	Insurance (Property/Liability)		319,600	
		050	Utilities		95,600	
			Cell Phone Service	8,600		
			Electrical Service	8,700		
			Telephone Service	48,100		
			Water/Sewer/Garbage	30,200		
		060	Postage, Printing and Stationery		4,900	
		070	Advertising		300	
		080	Misc. Contractual Services		498,700	
			APPA Dues	13,700		
			Audit Costs	74,400		
			Banking Fees	51,800		
			Benefits Administration	11,300		
			Bond Admin Fee	1,600		
			Chamber of Commerce Dues	800		
			CWPU/UIP Expenses	27,500		
			Economic Alliance	6,000		
			Financial Studies	50,000		
			Fire Alarm Monitoring	400		
			Foundation for Water and Energy	2,000		
			Janitorial Services (OK and OM)	49,500		
			Legislative Consultant	37,200		
			Misc. Services/Consulting	23,500		
			NW Public Power Assoc. Dues/NW Wage & Hour	28,600		
			PPC - Dues	27,400		
			PPC - NW River Partners	12,400		
			Standard and Poors	7,700		
			WA PUD Association Dues	72,900		
		081	Legal Services		300,000	
			General Counsel	225,000		
			Misc. Attorney Fees	75,000		
		082	Maintenance Contracts		13,900	
			Copier Maintenance - HQ Building	10,000		
			Elevator Maintenance	3,900		
		084	Permits and Fees		2,700	
			WA State Purchasing Coop	2,000		
			WA State L&I Right to Know	300		
			Misc.	400		

Div.	Dept.	Activity	Description			Budget Amount	
		085	Rents and Leases		9,500		
			Copier Lease	8,800			
			P.O. Box Rent	700			
		090	Materials and Supplies		40,600		
		091	Small Tools (under $1,000)		1,000		
		092	Miscellaneous		19,200		
			Clothing for Identification	1,200			
			Deductibles/Damage Claims	4,000			
			Election Costs	4,100			
			Employee Day	3,300			
			Meeting Expenses	1,800			
			Misc. Expenses (Wellness, Interview and Moving Exp)	3,600			
			Service Awards and Costs	1,200			
		099	Unforeseen Operating Contingency		100,000		
		210	Taxes		2,570,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000 ***		**3**
		810	Debt Service - Principal		1,447,200		
		811	Debt Service - Interest		1,560,000		
		901	Unforeseen Capital Contingency		100,000		**2**

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Div.	Dept.	Activity	Description			Budget Amount
1	41		**Information Systems**			**1,410,100**
		010	Wages		296,700	
		011	Benefits		131,700	
		020	Travel		5,000	
		021	Training, Tuition and Meeting Fees		6,000	
		030	Transportation		1,500	
		080	Misc. Contractual Services		47,000	
			Consulting	15,000		
			Security System Monitoring	3,000		
			Key Card System	2,000		
			Origin to WindmilMap Conversion	27,000		
		082	Maintenance Contracts		35,300	
			Branch Office Multi Function Printer	1,500		
			Datacenter Liebert Units	5,400		
			NetApp SAN Hardware/Software - Current	25,000		
			Server Hardware Maintenance	3,400		
		083	Software Licenses and Support		494,700	
			3rd Party Patch Management	4,500		
			Aclara - TWACS Support	18,000		
			Aclara - Upgrade to new iiDEAS	10,000		
			Certs SSL	1,500		
			LocalTel Phone System - Maintenance	13,500		
			Microsoft Software	20,200		
			NISC Custom Programming	5,000		
			NISC Maintenance	130,000		
			NISC MDMS Implementation	36,000		
			NISC MDMS Annual Fee	23,200		
			Domain Registrations	600		
			Programming Software	500		
			SonicWALL - ESA	2,200		
			Symantec Software and Support	14,700		
			VMWare Software Support (IS)	6,000		
			MS SQL Server	700		
			Milsoft - WindMilMap	27,000		
			AutoCad	2,500		
			ESRI	6,200		
			Futura	16,000		
			GeoNav	3,000		
			Itron Engineering Analysis	78,500		
			Itron Engineering Analysis - Maintenance	4,500		
			Itron Staker	20,000		
			Itron Staker - Reporting	10,000		
			TL-PRO Design Studio	5,000		
			OSI	19,500		
			Trimble Field Inspector	1,400		
			Allison Transmission Diagnostic Software	800		
			Mitchell Diagnostic Software	1,500		
			MSDS On Line	2,200		
			Cummins Tool Software	700		
			Fastenal Tool Inventory	1,200		
			Max Force	600		
			Zonar Vehicle Tracking	7,500		

Div.	Dept.	Activity	Description			Budget Amount	
		085	Rents and Leases		26,800		
			Okanogan Mailing Equipment	13,000			
			Branch Office Mailing Equipment	3,000			
			Branch Office MFP	10,800			
		090	Materials and Supplies		10,000		
		091	Small Tools (under $1,000)		10,000		
		712	Capital - Equipment (Over $2,000)		307,900		
			Virtual Environment	105,000			**2**
			HP Autoloader LTO5	5,500			**2**
			SQL Server - Operations	6,000 ***			**3**
			Trimble Field Inspection Unit - Operations	4,300 ***			**3**
			Network Switch	1,500			**2**
			SIEM - Log Management	15,000 ***			**3**
			Phone System	5,600 ***			**3**
			Keycard Systems - Readers and Controllers	50,000 ***			**3**
			Video Systems - Hardware	20,000 ***			**3**
			Video Surveillance Software/Licenses	15,000 ***			**3**
			Video System Cameras - Subs, Yards & Fence Lines	60,000 ***			**3**
			Video System Cameras - Branch Offices	10,000 ***			**3**
			Video Conferencing	10,000 ***			**3**
		714	Capital - Personal Computers		37,500		**2**

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Div.	Dept.	Activity	Description		Budget Amount
1	50		**Commissioners**		**184,700**
		010	Wages	108,600	
		011	Benefits	54,800	
		020	Travel	17,000	
		021	Training, Tuition and Meeting Fees	3,000	
		090	Materials and Supplies	1,000	
		092	Miscellaneous	300	

Div.	Dept.	Activity	Description			Budget Amount	
2	60		**Broadband**			**2,156,100**	
		010	Wages		281,200		
		011	Benefits		125,400		
		020	Travel		10,000		
		021	Training, Tuition and Meeting Fees		12,000		
		030	Transportation		42,600		
		060	Postage, Printing and Stationery		300		
		080	Misc. Contractual Services		133,400		
			NoaNet Calea Services	8,400			
			Network Consulting/Software Development	100,000			
			NRC 10G add/drop at Spokane USB	25,000			
		081	Legal Services		10,000		
		082	Maintenance Contracts		147,100		
			Motorola - New Access Points	54,700			
			Cambium Networks	4,600			
			Cisco SmartNet	10,200			
			WWP Lightning Edge/Ciena Devices	57,600			
			ADVA Optical	20,000			
		083	Software Licenses and Support		38,400		
			NetZoom	2,100			
			Microsoft Software	1,700			
			Symantec Software and Support	4,500			
			VMWare	4,000			
			Ciena	10,000			
			Solar Winds	8,100			
			MapInfo Professional	500			
			Server License and Software Upgrades	7,500			
		084	Permits and Fees		71,500		
			Upstream Internet Bandwidth	66,500			
			ARIN ASN & IP Address Allocation	5,000			
		085	Rents and Leases		138,900		
			DCPUD Dark Fiber Leases	29,200			
			Co-location	10,400			
			Protect Path Ring	75,300			
			Wireless Site Lease	24,000			
		090	Materials and Supplies		85,500		
			HVAC Maintenance and Repair	10,000			
			Switch/Network HW Upgrades	10,000			
			Fiber Plant Maintenance - Broadband	50,000			
			Battery Plant - Maintenance and Replacement	6,100			
			UPS/Rectifier - Maintenance and Replacement	7,100			
			Backup Tapes	500			
			Equipment Calibration	1,800			
		091	Small Tools (under $1,000)		1,000		
		210	Taxes		11,000		
		591	Capital - Materials and Supplies		266,900		
			WiFi Sites	75,000			**2**
			Fiber Build - Berney Ranch to SitnBull	18,500			**2**
			Fiber Build - SitnBull to Sackman's	5,900			**2**
			Fiber Build - Sackman's to Shady Pines	3,200			**2**
			Network Hardware Replacement - EOL	7,000			**2**
			Optics	17,300			**2**

Div.	Dept.	Activity	Description			Budget Amount	
			Fiber Distribution Builds	60,000			2
			Wireless Subscriber Units	80,000			2
		712	Capital - Equipment (Over $2,000)		30,000		
			Tools	5,000			2
			Test Equipment	25,000			2
		810	Debt Service - Principal		354,100		
			Loan - Electric	197,800			
			Operating Line - Electric	0			
			Loan - ARRA	156,300			
		811	Debt Service - Interest		396,800		
			Loan - Electric	80,500			
			Operating Line - Electric	186,600			
			Loan - ARRA	129,700			

Div.	Dept.	Activity	Description			Budget Amount	
1	61		**Internal Communications**			**422,600**	
		010	Wages		137,300		
		011	Benefits		55,900		
		020	Travel		5,000		
		021	Training, Tuition and Meeting Fees		5,000		
		030	Transportation		4,900		
		060	Postage, Printing and Stationery		300		
		080	Misc. Contractual Services		75,000		
			Radio System Coverage Analysis	75,000			
		082	Maintenance Contracts		21,000		
			Fire Alarm System	2,000			
			UHF Radio System	19,000			
		083	Software Licenses and Support		8,800		
			Cisco Smartnet	300			
			MapInfo Software Support	500			
			Fiber Mapping Software Support	8,000			
		084	Permits and Fees		3,000		
			Right of Way - USFS, DOT, etc.	3,000			
		085	Rents and Leases		29,400		
			UHF Site Lease - Little Buck Mtn.	2,500			
			UHF Site Lease - Aeneas Mtn.	2,500			
			UHF Site Lease - Goat Mtn.	600			
			UHF Site Lease - Omak Mtn.	2,500			
			UHF Site Lease - McClure Mtn.	1,200			
			UHF Site Lease - Tunk Mtn.	2,400			
			Dark Fiber Lease - Brewster to Wells Dam	17,700			
		090	Materials and Supplies		10,000		
			General Materials and Supplies	10,000			
		091	Small Tools (under $1,000)		2,000		
		591	Capital - Materials and Supplies		15,000		
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000			**2**
		712	Capital - Equipment (Over $2,000)		50,000		
			UHF Radio System Overhaul - Jackass Butte	50,000			**2**

Div.	Dept.	Activity	Description	Budget Amount
			TOTAL EXPENDITURES AND CAPITAL OUTLAY	**64,417,500**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
OVERVIEW

HIGHLIGHTS

- → $6.8 million transfer from reserves, which is a $7.4 million decrease over the 2014 adopted budget.
- → Revenues cover debt service and operating expenses by $11.9 million.
- → Retail Electric Sales increased $2.3 million to $44.9 million.
- → Wholesale Electric Sales increased $139,800 - The increase in sales is due to a higher estimated market pricing than was used when estimating 2014 Wholesale Sales.
- → Purchased Power - The largest operating expenditure in the budget increased $57,700 to $23.3 million.
- → Capital Outlays account for $18.8 million - see a summary of Capital Projects below.
- → Debt Service Coverage Ratio is estimated at 3.08 times annual debt service payments; bond covenants require 1.25 times.
- → Total TIER (times interest earned ratio) is estimated at 7.17; District's target is 1.5 times.

REVENUES of $59.8 million - Assumptions Used

- → **Retail Electric Sales:** Predicting a 1% load growth, no added large single load and a July 1st 2% rate increase.
- → **Wholesale Electric:** Sales based on a 3/4 to median water year, ten year average wind and previous two years' average market pricing.
- → **Wholesale Telecommunications:** Based on current revenue levels.
- → **Interest:** Return on investments of between .10%(LGIP) and .20%(CDs).
- → **Miscellaneous:** Previous twelve months revenue and Build America Bond reimbursement of $406,000.
- → **Rental Income:** Based on current revenue levels.
- → **Construction Contributions:** Estimated using previous two years' average.
- → **Grant Proceeds:** Anticipated reimbursements of $472,400 from BPA, $6.2 million for the Carlton Fire and $438,700 for the ARRA Project.

EXPENDITURES $44.1 million - Assumptions Used

- → **Wages:** Three more employees than in the 2014 adopted budget. The wages reflect a general wage increase of 2%.
- → **Benefits:** Based on August 2013 thru July 2014 actual percentage of wages. Range of 32.9% through 49.4% (ave. 40.8%).
- → **Purchased Power:** Wells Project costs effective September 2014 and BPA rates effective October 2014.
- → **Other Expenditures:** Other expenses are based on known 2015 costs. If costs are not specifically known, a 2% increase was estimated.

DEBT SERVICE $3.7 million

- → **Principal and Interest:** Per debt service schedules and ARRA estimated debt service.

CAPITAL OUTLAY $18.8 million - Summary Listing

- → Methow Transmission Line and Substation $9,930,000.
- → Carlton Fire Restoration $2,150,000.
- → Enloe Dam $1,764,000.
- → Normal Renewals and Replacements $4,230,000.
- → Priority 3 Capital Outlays $708,100.

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
BUDGET SUMMARY

Description	Electric	Broadband	Total
REVENUE			
Sales - Retail	44,867,000		44,867,000
Sales - Electric Wholesale	2,975,000		2,975,000
Sales - Broadband Wholesale		2,550,000	2,550,000
Interest	41,000		41,000
Miscellaneous	1,094,000		1,094,000
Rental Income	110,000		110,000
Construction Contribution	997,000		997,000
Grant Proceeds	6,720,400	438,700	7,159,100
Total Revenue	**56,804,400**	**2,988,700**	**59,793,100**
EXPENDITURES			
Wages	7,418,400	326,800	7,745,200
Benefits	2,955,200	146,400	3,101,600
Travel	141,500	15,000	156,500
Training, Tuition and Meeting Fees	95,500	15,000	110,500
Transportation	823,700	58,000	881,700
Insurance	336,500		336,500
Utilities	100,800		100,800
Postage, Printing and Stationery	152,100	300	152,400
Advertising	24,100		24,100
Conservation Expenditures	472,400		472,400
Misc. Contractual Services	2,327,800	229,200	2,557,000
Legal Services	281,100	10,000	291,100
Maintenance Contracts	233,300	157,500	390,800
Software Licenses and Support	574,800	63,000	637,800
Permits and Fees	16,600	69,800	86,400
Rents and Leases	89,800	68,400	158,200
Materials and Supplies	666,700	95,700	762,400
Small Tools (under $1,000)	36,800	1,000	37,800
Miscellaneous	66,600		66,600
Unforeseen Operating Contingency	100,000		100,000
Purchased Power	23,285,000		23,285,000
Taxes	2,677,000	13,000	2,690,000
Total Expenditures	**42,875,700**	**1,269,100**	**44,144,800**
DEBT SERVICE			
Debt Service - Principal	1,482,300	358,600	1,840,900
Debt Service - Interest	1,517,400	355,700	1,873,100
Total Debt Service	**2,999,700**	**714,300**	**3,714,000**
AVAILABLE FOR CAPITAL OUTLAY	**10,929,000**	**1,005,300**	**11,934,300**
CAPITAL OUTLAY			
Capital - Contractual Services	12,475,000		12,475,000
Capital - Materials and Supplies	4,198,000	342,100	4,540,100
Capital - Meter Purchases	119,000		119,000
Capital - Transformer Purchases	400,000		400,000
Capital - Tools and Equipment	6,500		6,500
Capital - Buildings	354,000		354,000
Capital - Equipment (Over $2,000)	435,700	101,100	536,800
Capital - Vehicles	224,000		224,000
Capital - Personal Computers	26,700		26,700
Unforeseen Capital Contingency	100,000		100,000
Total Capital Outlay	**18,338,900**	**443,200**	**18,782,100**
RESERVES/DEBT	**(7,409,900)**	**562,100**	**(6,847,800)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
2014 ADOPTED BUDGET COMPARED TO 2015 ADOPTED BUDGET

	Electric System				Broadband				Total			
REVENUE	Adopted 2014	Projected 2014	Adopted 2015	2014 Adopted/ 2015 Adopted	Adopted 2014	Projected 2014	Adopted 2015	2014 Adopted/ 2015 Adopted	Adopted 2014	Projected 2014	Adopted 2015	2014 Adopted/ 2015 Adopted
Sales - Retail	42,501,700	42,565,000	44,867,000	2,365,300	0	0	0	0	42,501,700	42,565,000	44,867,000	2,365,300
Sales - Electric Wholesale	2,835,200	4,343,000	2,975,000	139,800	0	0	0	0	2,835,200	4,343,000	2,975,000	139,800
Sales - Broadband Wholesale	0	0	0	0	2,200,000	2,525,000	2,550,000	350,000	2,200,000	2,525,000	2,550,000	350,000
Interest	50,000	38,000	41,000	(9,000)	0	0	0	0	50,000	38,000	41,000	(9,000)
Miscellaneous	1,104,000	1,071,000	1,094,000	(10,000)	0	17,000	0	0	1,104,000	1,088,000	1,094,000	(10,000)
Rental Income	108,000	109,000	110,000	2,000	0	0	0	0	108,000	109,000	110,000	2,000
Construction Contribution	917,000	1,293,000	997,000	80,000	0	0	0	0	917,000	1,293,000	997,000	80,000
Grant Proceeds	472,400	3,311,000	6,720,400	6,248,000	0	279,000	438,700	438,700	472,400	3,590,000	7,159,100	6,686,700
Total Revenue	**47,988,300**	**52,730,000**	**56,804,400**	**8,816,100**	**2,200,000**	**2,821,000**	**2,988,700**	**788,700**	**50,188,300**	**55,551,000**	**59,793,100**	**9,604,800**
EXPENDITURES												
Wages	6,998,100	7,435,000	7,418,400	420,300	281,200	472,000	326,800	45,600	7,279,300	7,907,000	7,745,200	465,900
Benefits	2,920,400	2,838,000	2,955,200	34,800	125,400	193,000	146,400	21,000	3,045,800	3,031,000	3,101,600	55,800
Travel	115,900	76,000	141,500	25,600	10,000	5,000	15,000	5,000	125,900	81,000	156,500	30,600
Training, Tuition and Meeting Fees	69,900	33,000	95,500	25,600	12,000	11,000	15,000	3,000	81,900	44,000	110,500	28,600
Transportation	828,200	997,000	823,700	(4,500)	42,600	51,000	58,000	15,400	870,800	1,048,000	881,700	10,900
Insurance	319,600	375,000	336,500	16,900	0	0	0	0	319,600	375,000	336,500	16,900
Utilities	95,800	95,000	100,800	5,000	0	0	0	0	95,800	95,000	100,800	5,000
Postage, Printing and Stationery	149,400	128,000	152,100	2,700	300	1,000	300	0	149,700	129,000	152,400	2,700
Advertising	18,600	23,000	24,100	5,500	0	0	0	0	18,600	23,000	24,100	5,500
Conservation Expenditures	472,400	472,000	472,400	0	0	0	0	0	472,400	472,000	472,400	0
Misc. Contractual Services	1,791,600	1,718,000	2,327,800	536,200	133,400	7,000	229,200	95,800	1,925,000	1,725,000	2,557,000	632,000
Legal Services	300,000	199,000	281,100	(18,900)	10,000	6,000	10,000	0	310,000	205,000	291,100	(18,900)
Maintenance Contracts	164,700	123,000	233,300	68,600	147,100	154,000	157,500	10,400	311,800	277,000	390,800	79,000
Software Licenses and Support	705,500	520,000	574,800	(130,700)	38,400	21,000	63,000	24,600	743,900	541,000	637,800	(106,100)
Permits and Fees	16,500	2,000	16,600	100	71,500	52,000	69,800	(1,700)	88,000	54,000	86,400	(1,600)
Rents and Leases	80,900	80,000	89,800	8,900	138,900	188,000	68,400	(70,500)	219,800	268,000	158,200	(61,600)
Materials and Supplies	697,500	505,000	666,700	(30,800)	85,500	72,000	95,700	10,200	783,000	577,000	762,400	(20,600)
Small Tools (under $1,000)	24,000	3,000	36,800	12,800	1,000	1,000	1,000	0	25,000	4,000	37,800	12,800
Miscellaneous	65,000	48,000	66,600	1,600	0	0	0	0	65,000	48,000	66,600	1,600
Unforeseen Operating Contingency	100,000	155,000	100,000	0	0	1,000	0	0	100,000	156,000	100,000	0
Purchased Power	23,227,300	24,201,000	23,285,000	57,700	0	0	0	0	23,227,300	24,201,000	23,285,000	57,700
Taxes	2,570,000	2,655,000	2,677,000	107,000	11,000	13,000	13,000	2,000	2,581,000	2,668,000	2,690,000	109,000
Total Expenditures	**41,731,300**	**42,681,000**	**42,875,700**	**1,144,400**	**1,108,300**	**1,248,000**	**1,269,100**	**160,800**	**42,839,600**	**43,929,000**	**44,144,800**	**1,305,200**
DEBT SERVICE												
Debt Service - Principal	1,447,200	1,367,000	1,482,300	35,100	354,100	286,000	358,600	4,500	1,801,300	1,653,000	1,840,900	39,600
Debt Service - Interest	1,560,000	1,490,000	1,517,400	(42,600)	396,800	331,000	355,700	(41,100)	1,956,800	1,821,000	1,873,100	(83,700)
Total Debt Service	**3,007,200**	**2,857,000**	**2,999,700**	**(7,500)**	**750,900**	**617,000**	**714,300**	**(36,600)**	**3,758,100**	**3,474,000**	**3,714,000**	**(44,100)**
AVAILABLE FOR CAPITAL OUTLAY	**3,249,800**	**7,192,000**	**10,929,000**	**7,679,200**	**340,800**	**956,000**	**1,005,300**	**664,500**	**3,590,600**	**8,148,000**	**11,934,300**	**8,343,700**
CAPITAL OUTLAY												
Capital - Contractual Services	11,165,000	617,000	12,475,000	1,310,000	0	53,000	0	0	11,165,000	670,000	12,475,000	1,310,000
Capital - Materials and Supplies	3,675,000	2,471,000	4,198,000	523,000	266,900	78,000	342,100	75,200	3,941,900	2,549,000	4,540,100	598,200
Capital - Meter Purchases	70,000	(8,000)	119,000	49,000	0	0	0	0	70,000	(8,000)	119,000	49,000
Capital - Transformer Purchases	400,000	400,000	400,000	0	0	0	0	0	400,000	400,000	400,000	0
Capital - Tools and Equipment	4,500	0	6,500	2,000	0	0	0	0	4,500	0	6,500	2,000
Capital - Buildings	410,000	101,000	354,000	(56,000)	0	0	0	0	410,000	101,000	354,000	(56,000)
Capital - Equipment (Over $2,000)	441,900	119,000	435,700	(6,200)	30,000	63,000	101,100	71,100	471,900	182,000	536,800	64,900
Capital - Vehicles	1,219,000	43,000	224,000	(995,000)	0	0	0	0	1,219,000	43,000	224,000	(995,000)
Capital - Personal Computers	37,500	38,000	26,700	(10,800)	0	0	0	0	37,500	38,000	26,700	(10,800)
Unforeseen Capital Contingency	100,000	4,882,000	100,000	0	0	1,739,000	0	0	100,000	6,621,000	100,000	0
Total Capital Outlay	**17,522,900**	**8,663,000**	**18,338,900**	**816,000**	**296,900**	**1,933,000**	**443,200**	**146,300**	**17,819,800**	**10,596,000**	**18,782,100**	**962,300**
RESERVES/DEBT	**(14,273,100)**	**(1,471,000)**	**(7,409,900)**	**6,863,200**	**43,900**	**(977,000)**	**562,100**	**518,200**	**(14,229,200)**	**(2,448,000)**	**(6,847,800)**	**7,381,400**

PUBLIC UTILITY DISTRICT NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
BUDGET COMPARISON 2008 ACTUALS THRU 2015 ADOPTED

	2008		2009		2010		2011		2012		2013		2014		2015
REVENUE	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actuals	Budget	Projected	Adopted
Sales - Electric Retail	31,853,400	31,952,534	31,290,700	30,777,098	33,337,000	29,307,079	35,001,000	33,605,348	37,475,000	35,861,526	38,889,900	40,124,923	42,501,700	42,565,000	44,867,000
Sales - Electric Wholesale	8,737,000	11,263,826	7,489,500	4,198,884	4,937,000	5,801,903	5,490,000	6,741,526	2,742,000	3,531,677	2,360,300	5,132,272	2,835,200	4,343,000	2,975,000
Sales - Broadband Wholesale	850,000	1,030,980	1,168,200	1,767,217	1,900,000	1,944,345	2,000,000	1,995,657	2,500,000	2,117,105	2,200,000	2,251,626	2,200,000	2,525,000	2,550,000
Interest	1,738,500	1,697,562	1,246,000	964,500	262,000	214,509	207,000	113,944	80,000	74,313	68,000	58,696	50,000	38,000	41,000
Miscellaneous	1,250,000	727,466	746,700	1,056,550	531,000	916,913	749,000	1,841,914	1,504,000	1,342,999	1,052,000	1,203,732	1,104,000	1,088,000	1,094,000
Rental Income	118,000	117,068	118,000	116,995	118,000	117,098	118,000	117,098	118,000	117,098	118,000	107,875	108,000	109,000	110,000
Construction Contribution	1,600,000	1,795,823	1,600,000	884,844	542,000	996,025	820,000	974,691	1,059,000	991,816	1,104,000	990,163	917,000	1,293,000	997,000
Grant Proceeds									5,421,000	2,091,175	3,868,000	2,914,452	472,400	3,590,000	7,159,100
Total Revenue	**46,146,900**	**48,585,259**	**43,659,100**	**39,766,088**	**41,627,000**	**39,297,872**	**44,385,000**	**45,390,178**	**50,899,000**	**46,127,709**	**49,660,200**	**52,783,739**	**50,188,300**	**55,551,000**	**59,793,100**
EXPENDITURES															
Wages	6,675,300	5,929,192	7,177,800	6,311,358	7,482,500	6,842,404	7,696,800	6,675,420	7,627,000	7,076,500	7,644,000	7,076,280	7,279,300	7,907,000	7,745,200
Benefits	2,182,700	2,035,454	2,368,600	2,532,708	2,618,900	2,373,456	2,544,600	2,394,707	2,716,400	2,633,239	2,938,000	2,895,392	3,045,800	3,031,000	3,101,600
Travel	125,500	140,556	267,600	124,077	244,700	124,532	185,900	122,664	170,800	116,854	154,000	84,407	125,900	81,000	156,500
Training, Tuition and Meeting Fees	84,900	96,332	179,300	74,206	196,000	86,633	135,900	61,871	128,800	91,420	110,700	48,022	81,900	44,000	110,500
Transportation	627,300	687,840	695,400	783,135	757,000	924,761	903,500	835,496	829,300	825,034	843,100	848,903	870,800	1,048,000	881,700
Insurance	206,600	212,096	219,300	313,815	320,500	279,268	310,000	308,777	308,000	307,665	312,400	285,789	319,600	375,000	336,500
Utilities	65,900	69,183	73,100	75,014	75,600	87,580	97,200	82,874	85,800	91,668	88,900	95,307	95,800	95,000	100,800
Postage, Printing and Stationary	105,500	111,096	122,700	104,646	117,200	106,436	198,400	142,313	193,000	141,003	151,100	139,314	149,700	129,000	152,400
Advertising	29,800	14,858	28,500	29,848	31,500	21,817	37,700	26,321	22,300	18,742	23,000	15,435	18,600	23,000	24,100
Conservation Expenditures	274,700	286,121	203,700	340,016	276,000	430,665	372,800	294,811	460,000	428,365	480,000	369,514	472,400	472,000	472,400
Misc. Contractual Services	2,400,700	2,171,518	2,350,200	2,067,841	2,994,400	1,908,893	2,508,600	1,441,439	2,213,800	1,993,088	2,063,800	1,514,903	1,925,000	1,725,000	2,557,000
Legal Services	64,500	155,895	374,800	296,977	364,100	240,533	314,100	323,826	319,100	257,876	329,500	266,784	310,000	205,000	291,100
Maintenance Contracts	223,900	136,192	127,100	90,704	157,400	102,674	177,600	126,661	185,900	208,019	338,000	282,513	311,800	277,000	390,800
Software Licenses and Support	137,200	154,785	187,700	183,255	264,500	241,644	317,400	223,978	445,200	263,155	678,900	468,830	743,900	541,000	637,800
Permits and Fees	41,300	85,420	116,400	103,281	104,400	104,237	368,300	162,253	160,500	137,887	90,500	61,760	88,000	54,000	86,400
Rents and Leases	136,000	139,093	154,400	151,378	148,300	161,484	285,100	166,823	280,000	220,978	272,300	281,988	219,800	268,000	158,200
Materials and Supplies	550,000	882,014	720,400	773,077	932,000	840,196	930,400	592,470	797,000	743,578	754,400	638,865	783,000	577,000	762,400
Small Tools (under $1,000)	43,600	38,941	44,300	60,736	69,300	25,196	68,800	25,664	43,300	15,366	48,300	6,591	25,000	4,000	37,800
Miscellaneous	83,700	81,974	64,000	48,492	101,000	45,911	74,100	105,491	100,300	58,933	72,500	53,676	65,000	48,000	66,600
Unforeseen Operating Contingency									100,000	14,099	100,000	147,210	100,000	156,000	100,000
Purchased Power	24,243,700	24,686,109	21,213,700	21,822,349	24,158,000	23,895,600	25,373,000	24,060,574	23,220,100	22,284,244	23,376,800	22,835,780	23,227,300	24,201,000	23,285,000
Taxes	1,947,500	1,921,891	1,927,000	1,876,406	2,020,200	1,839,337	2,119,000	2,138,550	2,298,700	2,220,162	2,370,400	2,413,881	2,581,000	2,668,000	2,690,000
Total Expenditures	40,250,300	40,036,560	38,616,000	38,163,319	43,433,500	40,683,257	45,019,200	40,312,983	42,705,300	40,147,875	43,240,600	40,831,144	42,839,600	43,929,000	44,144,800
DEBT SERVICE															
Debt Service - Principal	810,000	812,118	835,000	837,916	870,000	873,334	1,190,000	1,183,749	1,555,000	1,574,421	1,717,000	1,668,642	1,801,300	1,653,000	1,840,900
Debt Service - Interest	753,300	798,800	722,600	767,367	684,100	992,487	2,241,100	2,068,361	1,919,000	2,018,950	1,971,900	2,005,443	1,956,800	1,821,000	1,873,100
Total Debt Service	1,563,300	1,610,918	1,557,600	1,605,283	1,554,100	1,865,821	3,431,100	3,252,110	3,474,000	3,593,371	3,688,900	3,674,085	3,758,100	3,474,000	3,714,000
AVAILABLE FOR CAPITAL OUTLAY	**4,333,300**	**6,937,781**	**3,485,500**	**(2,514)**	**(3,360,600)**	**(3,251,206)**	**(4,065,300)**	**1,825,085**	**4,719,700**	**2,386,463**	**2,730,700**	**8,278,510**	**3,590,600**	**8,148,000**	**11,934,300**
CAPITAL OUTLAY															
Capital - Contractual Services	3,986,700	2,042,651	10,158,000	1,761,846	11,208,000	1,759,767	10,500,000	2,279,483	9,686,400	2,350,626	6,472,500	7,350,382	11,165,000	670,000	12,475,000
Capital - Materials and Supplies	4,827,600	4,783,802	9,326,100	5,270,105	8,796,000	6,189,149	5,636,700	3,283,116	13,051,400	5,196,359	7,894,400	1,930,443	3,941,900	2,549,000	4,540,100
Capital - Meter Purchases	390,000	125,857	595,000	790,778	1,500,000	252,306	440,000	369,605	90,000	0	90,000	19,620	70,000	(8,000)	119,000
Capital - Transformer Purchases	1,200,000	1,153,037	1,166,000	521,218	500,000	365,288	500,000	408,995	225,000	216,729	225,000	227,794	400,000	400,000	400,000
Capital - Tools and Equipment	22,000	6,920	10,200	1,374	13,500	6,572	13,200	1,770	12,000	6,232	9,500	0	4,500	0	6,500
Capital - Buildings	778,600	240,876	6,984,500	3,932,356	3,094,000	4,274,502	42,000	40,475	7,500	1,969	685,000	20,992	410,000	101,000	354,000
Capital - Equipment (Over $2,000)	819,300	680,078	1,105,100	412,738	1,457,800	1,043,752	999,600	218,074	1,051,000	371,313	1,259,100	218,107	471,900	182,000	536,800
Capital - Vehicles	941,000	930,324	351,000	281,734	(175,000)	(219,097)	30,000	(186,718)	315,300	(310,574)	634,000	(182,592)	1,219,000	43,000	224,000
Capital - Personal Computers	78,500	56,993	58,600	39,551	70,600	59,792	57,300	40,751	48,100	30,680	54,200	35,384	37,500	38,000	26,700
Unforeseen Capital Contingencies	100,000	31,359	100,000	42,005	100,000	16,131	100,000	47,639	100,000	3,679	100,000	45,883	100,000	6,621,000	100,000
Total Capital Outlay	13,143,700	10,051,897	29,854,500	13,053,705	26,564,900	13,748,162	18,318,800	6,503,190	24,586,700	7,867,013	17,423,700	9,666,013	17,819,800	10,596,000	18,782,100
RESERVES/DEBT	**(8,810,400)**	**(3,114,116)**	**(26,369,000)**	**(13,056,219)**	**(29,925,500)**	**(16,999,368)**	**(22,384,100)**	**(4,678,105)**	**(19,867,000)**	**(5,480,550)**	**(14,693,000)**	**(1,387,503)**	**(14,229,200)**	**(2,448,000)**	**(6,847,800)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Const. Design	Eng.	Operations	Enviro.	Customer Service	Cons.	General Admin.	I.S.	BOC	Broadband	Internal Comm.	Total
EXPENDITURES														
010 Wages	179,800	123,900	780,600	160,100	3,639,700	63,400	654,100	66,400	1,188,300	310,800	107,400	326,800	143,900	7,745,200
011 Benefits	88,800	53,400	309,100	64,500	1,346,700	20,900	319,900	27,500	482,400	139,200	46,700	146,400	56,100	3,101,600
020 Travel	25,000	7,500	6,000	10,000	27,000	6,000	4,500	3,000	26,800	5,000	15,700	15,000	5,000	156,500
021 Training, Tuition and Meeting Fees	7,000	7,500	9,000	15,000	20,000	3,000	2,500	2,000	15,100	6,000	3,400	15,000	5,000	110,500
030 Transportation	1,200	800	40,000	11,400	700,000	500	55,200	4,200	3,800	1,400		58,000	5,200	881,700
040 Insurance									336,500					336,500
050 Utilities					200				100,600					100,800
060 Postage, Printing and Stationery				500	1,500		142,500	3,000	4,300			300	300	152,400
070 Advertising				3,000	1,000			19,200	900					24,100
071 Conservation Expenditures								472,400						472,400
080 Misc. Contractual Services	79,100	388,600	80,000	100,000	1,079,000		56,000	20,000	425,600	49,500		229,200	50,000	2,557,000
081 Legal Services									281,100			10,000		291,100
082 Maintenance Contracts					142,200		500		12,000	56,600		157,500	22,000	390,800
083 Software Licenses and Support	5,000	184,600	4,000			1,500	5,200		11,100	358,600		63,000	8,800	641,800
084 Permits and Fees	5,000			500	1,000	100	300		2,700			69,800	3,000	82,400
085 Rents and Leases	9,800				1,000		5,200		10,300	26,800		68,400	36,700	158,200
090 Materials and Supplies	2,500	1,000	15,000	3,000	558,000	1,500	26,000	2,200	36,200	10,000	1,300	95,700	10,000	762,400
091 Small Tools (under $1,000)			2,000		20,000		1,500		1,300	10,000		1,000	2,000	37,800
092 Miscellaneous				400	10,400		34,500	200	20,700		400			66,600
099 Unforeseen Operating Contingency									100,000					100,000
120 Purchased Power		23,285,000												23,285,000
210 Taxes									2,677,000			13,000		2,690,000
Total Expenditures	**403,200**	**24,052,300**	**1,245,700**	**368,400**	**7,547,700**	**96,900**	**1,307,900**	**620,100**	**5,736,700**	**973,900**	**174,900**	**1,269,100**	**348,000**	**44,144,800**
DEBT SERVICE														
810 Debt Service - Principal									1,482,300			358,600		1,840,900
811 Debt Service - Interest									1,517,400			355,700		1,873,100
Total Debt Service	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,999,700**	**0**	**0**	**714,300**	**0**	**3,714,000**
CAPITAL OUTLAY														
581 Capital - Contractual Services	1,695,000		10,100,000	180,000	500,000									12,475,000
591 Capital - Materials and Supplies	39,000		2,100,000	419,000	1,625,000							342,100	15,000	4,540,100
592 Capital - Meter Purchases					119,000									119,000
593 Capital - Transformer Purchases					400,000									400,000
710 Capital - Tools and Equipment					4,500				2,000					6,500
711 Capital - Buildings					354,000									354,000
712 Capital - Equipment (Over $2,000)					104,000					281,700		101,100	50,000	536,800
713 Capital - Vehicles					224,000									224,000
714 Capital - Personal Computers										26,700				26,700
901 Unforeseen Capital Contingency									100,000					100,000
Total Capital Outlay	**1,734,000**	**0**	**12,200,000**	**599,000**	**3,330,500**	**0**	**0**	**0**	**102,000**	**308,400**	**0**	**443,200**	**65,000**	**18,782,100**
Total Use of Resources	**2,137,200**	**24,052,300**	**13,445,700**	**967,400**	**10,878,200**	**96,900**	**1,307,900**	**620,100**	**8,838,400**	**1,282,300**	**174,900**	**2,426,600**	**413,000**	**66,640,900**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**56,804,400**
	001	Sales - Retail	44,867,000	
	002	Sales - Wholesale	2,975,000	
	003	Interest	41,000	
	004	Miscellaneous	1,094,000	
	005	Rental Income	110,000	
	006	Construction Contributions	997,000	
	007	Grant Proceeds	6,720,400	
2		**Broadband**		**2,988,700**
	002	Sales - Wholesale	2,550,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
	007	Grant Proceeds	438,700	
		TOTAL REVENUE		**59,793,100**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	10		**Generation**			**2,137,200**	
		010	Wages		179,800		
		011	Benefits		88,800		
		020	Travel		25,000		
		021	Training, Tuition and Meeting Fees		7,000		
		030	Transportation		1,200		
		080	Misc. Contractual Service		79,100		
		083	Software Licenses and Support		5,000		
		084	Permits and Fees		5,000		
		085	Rent and Leases		9,800		
			Ophir Site Lease	9,800			
		090	Materials and Supplies		2,500		
		581	Capital - Contractual Services		1,695,000		**1**
		591	Capital - Materials and Supplies		39,000		**1**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	11		**Power Supply**			**24,052,300**	
		010	Wages		123,900		
		011	Benefits		53,400		
		020	Travel		7,500		
		021	Training, Tuition and Meeting Fees		7,500		
		030	Transportation		800		
		080	Misc. Contractual Services		388,600		
			Douglas County PUD	363,600			
			Professional Services (compliance/scheduling)	10,000			
			Central Washington Power Authority	5,000			
			Slice Implementation Group	10,000			
		083	Software Licenses and Support		184,600		
			Slice Software Support Fee	184,600			
		090	Materials and Supplies		1,000		
		120	Purchased Power		23,285,000		
			BPA - Slice	8,002,400			
			BPA - Block	5,495,600			
			BPA - Transmission	2,686,300			
			Wells	4,220,700			
			Nine Canyon	2,722,000			
			Other - Market Purchases	158,000			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	19		**Construction Design**			**13,445,700**	
		010	Wages		780,600		
		011	Benefits		309,100		
		020	Travel		6,000		
		021	Training, Tuition and Meeting Fees		9,000		
		030	Transportation		40,000		
		080	Misc. Contractual Services		80,000		
			BPA Engineering Studies - Chicken Creek Sub	60,000			
			OKPUD Preliminary Study - Chicken Creek Sub	20,000			
		084	Permits and Fees		4,000		
			Miscellaneous	4,000			
		090	Materials and Supplies		15,000		
		091	Small Tools (under $1,000)		2,000		
		581	Capital - Contractual Services		10,100,000		
			PT Line Construction	6,000,000			**1**
			PT Mitigation/Roads	650,000			**1**
			PT Permits	175,000			**1**
			PT ROW/Easements	500,000			**1**
			Gold Creek Substation	505,000			**1**
			LiDAR - Transmission Analysis/Fixes	50,000			**2**
			Okanogan-Brewster Transmission Rebuild	60,000			**2**
			Misc. Property Survey	10,000			**2**
			Carlton Fire Restoration - Transmission	1,200,000			**1**
			Carlton Fire Restoration - Distribution	950,000			**1**
		591	Capital - Materials and Supplies		2,100,000		
			PT Line - Transmission and Distribution Materials	1,250,000			**1**
			Gold Creek Substation	400,000			**1**
			Twisp Substation Modifications	400,000			**1**
			Loup Transmission Line Re-Route into Twisp Sub	50,000			**1**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	20		**Engineering**			**967,400**	
		010	Wages		160,100		
		011	Benefits		64,500		
		020	Travel		10,000		
		021	Training, Tuition and Meeting Fees		15,000		
		030	Transportation		11,400		
		060	Postage, Printing and Stationery		500		
		070	Advertising		3,000		
		080	Misc. Contractual Services		100,000		
			BPA Study - WECC De-Registration	50,000			
			Protective Relay/Instrument Transformer Testing	50,000			
		084	Permits and Fees		500		
			Miscellaneous	500			
		090	Materials and Supplies		3,000		
		092	Miscellaneous		400		
		581	Capital - Contractual Services		180,000		
			Engineering - Large System Projects	150,000			**2**
			Enloe Dam - PFMA (potential failure mode analysis)	30,000			**1**
		591	Capital - Materials and Supplies		419,000		
			Okanogan 115kv Bus Differential	17,000			**2**
			SCADA	52,000			**2**
			OCB, Regulators, Reclosers, etc.	320,000			**2**
			Battery Replacements Identified by NERC Testing	30,000			**2**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	21		**Operations**			**10,878,200**	
		010	Wages		3,639,700		
		011	Benefits		1,346,700		
		020	Travel		27,000		
		021	Training, Tuition and Meeting Fees		20,000		
		030	Transportation		700,000		
		050	Utilities		200		
		060	Postage, Printing and Stationery		1,500		
		070	Advertising		1,000		
		080	Misc. Contractual Services		1,079,000		
			CDL Testing Program	6,000			
			Employee Dispatch	120,000			
			Firealarm Testing and Monitoring	1,500			
			Janitorial Services (BR, TO and OR)	9,500			
			Janitorial Services (OK and OM)	50,000			
			Pole Testing	145,000			
			Safety Training	40,000			
			Tree Trimming	695,000			
			Underground Locate Service	3,000			
			Weed Control	9,000			
		082	Maintenance Contracts		142,200		
			Elevator Maintenance	4,200			
			HQ General Maintenance	40,000			
			HVAC Maintenance	35,000			
			Landscape Maintenance	10,000			
			Snowplowing and Sweeping	15,000			
			Omak Office - Asphalt Repair, Seal and Stripe	10,000			
			Okanogan Office - Asphalt, Seal and Stripe	20,000			
			Brewster Office - Exterior Repair and Paint	8,000			
		084	Permits and Fees		1,000		
			Miscellaneous	1,000			
		085	Rents and Leases		1,000		
			Pole Contacts	1,000			
		090	Materials and Supplies		558,000		
			General	500,000			
			Fall Protection	21,000			
			Fire Resistant Clothing	20,000			
			Fire Resistant Raingear	17,000			
		091	Small Tools (under $1,000)		20,000		
			Line	14,000			
			Telecom	2,000			
			Electric Shop	2,000			
			Vehicle Shop	2,000			
		092	Miscellaneous		10,400		
			Lineman Rodeo (Fees, Travel and Supplies)	10,000			
			Safety Meeting Refreshments	400			
		581	Capital - Contractual Services		500,000		
			Contract Labor	100,000			**2**
			Underground Replacements	400,000			**2**
		591	Capital - Materials and Supplies		1,625,000		
			Normal Replacements and Extensions	1,100,000			**2**
			Avian Protection	6,000			**2**
			Cutout Replacement	125,000			**2**
			TNS-2000: Rebuild Havillah Road Phase 1	106,000			**2**
			TNS-2000: Rebuild Havillah Road Phase 2	114,000			**3**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			WSS-3000: Rebuild Phase 1 from (3215-3300)	76,000			**3**
			MLS-1000: Rebuild towards Ophir Substation	62,000			**3**
			SFS-2000: Reconductor S. Fir; Ridge Dr./Radio Sta.	12,000			**3**
			BWS-5000: Replace UG Brewster Hghts. Subdivision	24,000			**2**
		592	Capital - Meter Purchases		119,000		
			Metering Special Projects	30,000			**2**
			PME Meter Replacements	40,000			**2**
			Meters w/ Internal Breakers	30,000			**2**
			K Switches	19,000			**2**
		593	Capital - Transformer Purchases		400,000		
			Normal Additions/Replacements	400,000			**2**
		710	Capital - Tools & Equipment ($1,000 to $2,000)		4,500		**2**
		711	Capital - Buildings		354,000		
			Headquarters - Emergency Generator Loadbank	8,000			**2**
			Headquarters - Hardwater System	10,000			**2**
			Headquarters - HVAC Digital Control Project	6,000			**2**
			Headquarters - HVAC Roof Mist System Installation	2,000			**2**
			Headquarters - Network Room Gas Fire System	25,000			**2**
			Okanogan or Sandflat Subs - Covered Storage	200,000			**3**
			Oroville - Storage Building, Cover Ceiling	5,000			**2**
			Warehouse - HVAC Replacement	75,000			**2**
			Warehouse - Storage Container	3,000			**2**
			Warehouse - Lighting	20,000			**2**
		712	Capital - Equipment (Over $2,000)		104,000		
			Electric Shop - Air Compressor	13,000			**2**
			Electric Shop - Battery Testing Equipment	10,000			**2**
			Electric Shop - Pipe Threading Machine	6,000			**2**
			Electric Shop\Telecom - Battery Storage\Charging	20,000			**2**
			Line - High Voltage Amp Meters	10,000			**2**
			Line - Boot Dryers	4,000			**2**
			Line - Servisavor (2)	10,000			**2**
			Operations - Water Tank, Pump, Hose (slip in)	10,000			**2**
			Telecom - OTDR	7,000			**2**
			Vehicle Shop - Iron Worker Attachments	14,000			**2**
		713	Capital - Vehicles		224,000		
			Fleet	500,000			**2**
			Less: Transportation System Depreciation	(276,000)			**2**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description		Budget Amount	Priority Ranking
1	22		**Environmental**		**96,900**	
		010	Wages	63,400		
		011	Benefits	20,900		
		020	Travel	6,000		
		021	Training, Tuition and Meeting Fees	3,000		
		030	Transportation	500		
		083	Software Licenses and Support	1,500		
		084	Permits and Fees	100		
		090	Materials and Supplies	1,500		

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	30		**Customer Service**			**1,307,900**	
		010	Wages		654,100		
		011	Benefits		319,900		
		020	Travel		4,500		
		021	Training, Tuition and Meeting Fees		2,500		
		030	Transportation		55,200		
		060	Postage, Printing and Stationery		142,500		
			Postage and Printing - NISC	112,100			
			Postage - PUD	19,800			
			Printing - Misc.	10,600			
		080	Misc. Contractual Services		56,000		
			CIS Programming	5,000			
			Collection Service - Credit Bureau	4,000			
			Credit Reporting Agency	3,200			
			Electronic Payments Fees	43,800			
		082	Maintenance Contracts		500		
		083	Software Licenses and Support		5,200		
			RemitPlus Check Scanning and Recognition Support	5,200			
		084	Permits and Fees		300		
			Miscellaneous Fees (Notaries, etc.)	300			
		085	Rents and Leases		5,200		
			Office Rent MVCC	4,900			
			Miscellaneous	300			
		090	Materials and Supplies		26,000		
			General	26,000			
		091	Small Tools (under $1,000)		1,500		
		092	Miscellaneous		34,500		
			Miscellaneous Expenses	600			
			Net Account Receivable Writeoffs	33,900			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	35		**Conservation/Consumer Information**			**620,100**	
		010	Wages		66,400		
		011	Benefits		27,500		
		020	Travel		3,000		
		021	Training, Tuition and Meeting Fees		2,000		
		030	Transportation		4,200		
		060	Postage, Printing and Stationery		3,000		
			Miscellaneous	3,000			
		070	Advertising		19,200		
		071	Conservation Expenditures		472,400		
			District Conservation Programs	472,400			
		080	Misc. Contractual Services		20,000		
			Electric Education Programs	20,000			
		090	Materials and Supplies		2,200		
		092	Miscellaneous		200		

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	40		**General Administration**			**8,838,400**	
		010	Wages		1,188,300		
		011	Benefits		482,400		
		020	Travel		26,800		
			General	12,700			
			Accounting and Finance	6,300			
			Human Resource	4,300			
			Leadership	3,500			
		021	Training, Tuition and Meeting Fees		15,100		
			General	2,900			
			Accounting and Finance	3,600			
			Human Resource	1,600			
			Educational Reimbursement	3,500			
			Leadership	3,500			
		030	Transportation		3,800		
		040	Insurance (Property/Liability)		336,500		
		050	Utilities		100,600		
			Cell Phone Service	8,400			
			Electrical Service	10,800			
			Telephone Service	49,900			
			Water/Sewer/Garbage	31,500			
		060	Postage, Printing and Stationery		4,300		
		070	Advertising		900		
		080	Misc. Contractual Services		425,600		
			APPA Dues	15,100			
			Audit Costs	81,500			
			Banking Fees	47,700			
			Benefits Administration	4,900			
			Bond Admin Fee	1,600			
			Chamber of Commerce Dues	800			
			CWPU/UIP Expenses	14,700			
			Economic Alliance	6,000			
			Financial Studies	50,000			
			Foundation for Water and Energy	2,000			
			Legislative Consultant	37,200			
			Misc. Services/Consulting	16,700			
			NW Public Power Assoc. Dues/NW Wage & Hour	27,600			
			PPC - Dues	26,800			
			PPC - NW River Partners	12,400			
			Standard and Poors	7,700			
			WA PUD Association Dues	72,900			
		081	Legal Services		281,100		
			General Counsel	206,100			
			Misc. Attorney Fees	75,000			
		082	Maintenance Contracts		12,000		
			Copier Maintenance - HQ Building	12,000			
		083	Software Licenses and Support		11,100		
			Performance Review Program (1/2 of cost is start up)	11,100			
		084	Permits and Fees		2,700		
			WA State Purchasing Coop	2,000			
			WA State L&I Right to Know	200			
			Misc.	500			
		085	Rents and Leases		10,300		
			Copier Lease	9,600			
			P.O. Box Rent	700			

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2015 ADOPTED BUDGET - DECEMBER 15, 2014
EXPENDITURE DETAIL

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
		090	Materials and Supplies		36,200		
		091	Small Tools (under $1,000)		1,300		
		092	Miscellaneous		20,700		
			Clothing for Identification	1,200			
			Deductibles/Damage Claims	4,000			
			Election Costs	0			
			Employee Day	3,300			
			Meeting Expenses	300			
			Misc. Expenses (Wellness, Interview and Moving Exp)	9,100			
			Service Awards and Costs	2,800			
		099	Unforeseen Operating Contingency		100,000		
		210	Taxes		2,677,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000		**2**
		713	Capital - Vehicles		0		
		810	Debt Service - Principal		1,482,300		
		811	Debt Service - Interest		1,517,400		
		901	Unforeseen Capital Contingency		100,000		**2**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	41		**Information Systems**			**1,282,300**	
		010	Wages		310,800		
		011	Benefits		139,200		
		020	Travel		5,000		
		021	Training, Tuition and Meeting Fees		6,000		
		030	Transportation		1,400		
		080	Misc. Contractual Services		49,500		
			Consulting	15,000			
			Security System Monitoring	3,000			
			Key Card System	2,500			
			Eaton Powerware	2,000			
			Origin to WindmilMap Conversion	27,000			
		082	Maintenance Contracts		56,600		
			Branch Office Multi Function Printer	1,500			
			Check Scanner - RemitPlus	1,200			
			Datacenter Liebert Units	5,400			
			Eaton Powerware - Datacenter UPS & Monitoring	34,500			
			Eaton Powerware - Omak Network UPS	14,000			
		083	Software Licenses and Support		358,600		
			Aclara - TWACS Support	18,000			
			Certs SSL	300			
			Cisco SmartNet	1,000			
			Genetec Maintenance	2,500			
			LANDesk	1,200			
			Microsoft Software	18,200			
			NISC Custom Programming	5,000			
			NISC eBill VM	4,500			
			NISC Maintenance	130,000			
			Domain Registrations	600			
			Programming Software	1,200			
			ShoreTel Phone System	16,200			
			SonicWALL - ESA	2,500			
			SonicWALL - NSA	2,200			
			Symantec Software and Support	10,100			
			VMWare Software Support (IS)	5,000			
			Eng/Ops - MS SQL Server	700			
			Eng/Ops - Milsoft WindMilMap	27,000			
			Eng/Ops - AutoCad	2,800			
			Eng/Ops - ESRI	6,000			
			Eng/Ops - Futura	17,500			
			Eng/Ops - GeoNav	3,500			
			Eng/Ops - Itron Staker Maintenance	25,000			
			Eng/Ops - Itron Staker Reporting	10,000			
			Eng/Ops - TL-PRO Design Studio	5,000			
			Eng/Ops - OSI	21,000			
			Eng/Ops - Trimble Field Inspector	1,600			
			Eng/Ops - Allison Transmission Diagnostic Software	800			
			Eng/Ops - Mitchell Diagnostic Software	2,500			
			Eng/Ops - MSDS On Line	2,200			
			Eng/Ops - Cummins Tool Software	700			
			Eng/Ops - Fastenal Tool Inventory	1,200			
			Eng/Ops - Max Force	600			
			Eng/Ops - Zonar Vehicle Tracking	12,000			
		085	Rents and Leases		26,800		
			Okanogan Mailing Equipment	13,000			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			Branch Office Mailing Equipment	3,000			
			Branch Office MFP	10,800			
		090	Materials and Supplies		10,000		
		091	Small Tools (under $1,000)		10,000		
		712	Capital - Equipment (Over $2,000)		281,700		
			Eaton Powerware - Omak Network Room	19,500			**2**
			Genetec System - Cameras (Branch office)	8,000			**2**
			Genetec System - Cameras (Subs, yards and fences)	60,000			**3**
			Genetec System - Readers and Controllers	50,000			**3**
			Genetec System - Video Surveillance Software	15,000			**3**
			Genetec System - Video Conferencing	10,000			**3**
			Mapping Server - Physical	6,000			**2**
			NISC - iVue Server	19,000			**2**
			NISC - eBill Server	5,000			**2**
			Eng/Ops - Tablet PC's	19,000			**2**
			Eng/Ops - Physical Server SQL Database	6,000			**2**
			Printers	6,500			**2**
			Phone System	8,600			**2**
			Virtual Environment	49,100			**2**
		714	Capital - Personal Computers		26,700		**2**

Div.	Dept.	Activity	Description		Budget Amount	Priority Ranking
1	50		**Commissioners**		**174,900**	
		010	Wages	107,400		
		011	Benefits	46,700		
		020	Travel	15,700		
		021	Training, Tuition and Meeting Fees	3,400		
		090	Materials and Supplies	1,300		
		092	Miscellaneous	400		

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
2	60		**Broadband**			**2,426,600**	
		010	Wages		326,800		
		011	Benefits		146,400		
		020	Travel		15,000		
		021	Training, Tuition and Meeting Fees		15,000		
		030	Transportation		58,000		
		060	Postage, Printing and Stationery		300		
		070	Advertising		0		
		080	Misc. Contractual Services		229,200		
			Network Consulting	100,000			
			NoaNet Calea Services	4,200			
			NRC 10G add/drop at Spokane USB	25,000			
			Software Development	100,000			
		081	Legal Services		10,000		
		082	Maintenance Contracts		157,500		
			ADVA Optical	25,000			
			Cambium Networks	4,600			
			Cisco	4,900			
			Motorola	57,400			
			NetApp	1,300			
			WWP Lightning Edge/Ciena Devices	64,300			
		083	Software Licenses and Support		63,000		
			Ciena	30,000			
			MapInfo Professional	3,000			
			Microsoft Software	1,800			
			NetZoom	2,100			
			Server License and Software Upgrades	7,500			
			Solar Winds	8,600			
			Symantec Software and Support	4,500			
			VMWare	5,500			
		084	Permits and Fees		69,800		
			ARIN ASN & IP Address Allocation	5,000			
			Upstream Internet Bandwidth	64,800			
		085	Rents and Leases		68,400		
			DCPUD Dark Fiber Leases	29,200			
			DCPUD Co-location	5,600			
			Wireless Site Lease	33,600			
		090	Materials and Supplies		95,700		
			Backup Tapes	500			
			Battery Plant - Maintenance and Replacement	16,300			
			Fiber Plant Maintenance - Broadband	50,000			
			HVAC Maintenance and Repair	10,000			
			Switch/Network HW Upgrades	10,000			
			UPS/Rectifier - Maintenance and Replacement	7,100			
			Equipment Calibration/Repair	1,800			
		091	Small Tools (under $1,000)		1,000		
		210	Taxes		13,000		
		591	Capital - Materials and Supplies		342,100		
			Node Rework	30,000			**2**
			WiFi Sites Omak/Okanogan	75,000			**3**
			Fiber Build - SitnBull to Sackman's	5,900			**3**
			Fiber Build - Sackman's to Shady Pines	3,200			**3**
			Fiber Distribution Builds	75,000			**2**
			Network Hardware Replacement - EOL	25,800			**2**
			Optics	42,200			**2**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			Wireless Subscriber Units	85,000			**2**
		712	Capital - Equipment (Over $2,000)		101,100		
			Door Controller	2,500			**2**
			NetApp Shelf	30,500			**2**
			Tools	5,000			**2**
			Test Equipment	25,000			**3**
			Virtual Server Environment	38,100			**2**
		810	Debt Service - Principal		358,600		
			Loan - Electric	207,700			
			Operating Line - Electric	0			
			Loan - ARRA	150,900			
		811	Debt Service - Interest		355,700		
			Loan - Electric	70,700			
			Operating Line - Electric	180,200			
			Loan - ARRA	104,800			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	61		**Internal Communications**			**413,000**	
		010	Wages		143,900		
		011	Benefits		56,100		
		020	Travel		5,000		
		021	Training, Tuition and Meeting Fees		5,000		
		030	Transportation		5,200		
		060	Postage, Printing and Stationery		300		
		080	Misc. Contractual Services		50,000		
			Radio System Coverage Analysis	50,000			
		082	Maintenance Contracts		22,000		
			Fire Alarm System	3,000			
			UHF Radio System	19,000			
		083	Software Licenses and Support		8,800		
			Cisco Smartnet	300			
			MapInfo Software Support	500			
			Fiber Mapping Software Support	8,000			
		084	Permits and Fees		3,000		
			Right of Way - USFS, DOT, etc.	3,000			
		085	Rents and Leases		36,700		
			UHF Site Lease - Little Buck Mtn.	2,500			
			UHF Site Lease - Aeneas Mtn.	2,500			
			UHF Site Lease - Goat Mtn.	600			
			UHF Site Lease - Omak Mtn.	2,500			
			UHF Site Lease - McClure Mtn.	2,400			
			UHF Site Lease - Tunk Mtn.	3,200			
			Dark Fiber Lease - Brewster to Wells Dam	23,000			
		090	Materials and Supplies		10,000		
			General Materials and Supplies	10,000			
		091	Small Tools (under $1,000)		2,000		
		591	Capital - Materials and Supplies		15,000		
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000			**2**
		712	Capital - Equipment (Over $2,000)		50,000		
			UHF Radio System Overhaul - Jackass Butte	50,000			**2**

Div.	Dept.	Activity	Description	Budget Amount	Priority Ranking
			TOTAL EXPENDITURES AND CAPITAL OUTLAY	**66,640,900**	

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2016 ADOPTED BUDGET - DECEMBER 7, 2015
OVERVIEW

HIGHLIGHTS

- → $11.9 million transfer from reserves, which is a $5.1 million increase over the 2015 adopted budget.
- → Revenues cover debt service and operating expenses by $5.5 million.
- → Retail Electric Sales increased $1.0 million to $45.9 million.
- → Wholesale Electric Sales decreased $1.0 million - The decrease in sales is due to a lower estimated market pricing than was used when estimating 2015 Wholesale Sales and lower sales volume.
- → Purchased Power - The largest operating expenditure in the budget increased $785,500 to $24.1 million.
- → Capital Outlays account for $18.3 million - see a summary of Capital Projects below.
- → Debt Service Coverage Ratio is estimated at 2.35 times annual debt service payments; bond covenants require 1.25 times.
- → Total TIER (times interest earned ratio) is estimated at 2.11; District's target is 1.5 times.

REVENUES of $57.9 million - Assumptions Used

- → **Retail Electric Sales:** Predicting a 1% load growth, 1% weather adjustment and no rate increase.
- → **Wholesale Electric:** Sales based on a 3/4 to median water year, ten year average wind and previous two years' average market pricing.
- → **Wholesale Telecommunications:** Based on current revenue levels.
- → **Interest:** Return on investments of between .13%(LGIP) and .20%(CDs).
- → **Miscellaneous:** Previous twelve months revenue and Build America Bond reimbursement of $406,000.
- → **Rental Income:** Based on current revenue levels.
- → **Construction Contributions:** Estimated using previous two years' average.
- → **Grant Proceeds:** Anticipated reimbursements of $486,900 from BPA, $829,800 for the Carlton Complex Fires and $3,359,000 for the Okanogan Complex Fires.

EXPENDITURES $47.8 million - Assumptions Used

- → **Wages:** Four more employees than in the 2015 adopted budget. The wages reflect a general wage increase of 2%.
- → **Benefits:** Based on August 2014 thru July 2015 actual percentage of wages. Range of 30.6% through 49.1% (ave. 41.2%).
- → **Purchased Power:** Wells Project costs effective September 2015 and BPA rates effective October 2015.
- → **Other Expenditures:** Other expenses are based on known 2016 costs. If costs are not specifically known, a 2% increase was estimated.

DEBT SERVICE $3.7 million

- → **Principal and Interest:** Per debt service schedules and ARRA estimated debt service.

CAPITAL OUTLAY $18.3 million - Summary Listing

- → Methow Transmission Line and Substation $11,025,000.
- → Enloe Dam $1,056,000.
- → Okanogan Fire Restoration $325,800.
- → Normal Renewals and Replacements $5,271,600.
- → Priority 3 Capital Outlays $656,000.

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2016 ADOPTED BUDGET - DECEMBER 7, 2015
BUDGET SUMMARY

Description	Electric	Broadband	Total
REVENUE			
Sales - Retail	45,909,000		45,909,000
Sales - Electric Wholesale	1,939,800		1,939,800
Sales - Broadband Wholesale		2,640,000	2,640,000
Interest	41,000		41,000
Miscellaneous	1,208,000		1,208,000
Rental Income	110,000		110,000
Construction Contribution	1,345,600		1,345,600
Grant Proceeds	4,675,700	0	4,675,700
Total Revenue	**55,229,100**	**2,640,000**	**57,869,100**
EXPENDITURES			
Wages	8,243,000	345,200	8,588,200
Benefits	3,339,100	156,700	3,495,800
Travel	134,800	15,000	149,800
Training, Tuition and Meeting Fees	98,800	15,000	113,800
Transportation	933,900	50,400	984,300
Insurance	337,600		337,600
Utilities	97,900		97,900
Postage, Printing and Stationery	152,700	300	153,000
Advertising	34,800		34,800
Conservation Expenditures	214,900		214,900
Misc. Contractual Services	3,966,400	104,200	4,070,600
Legal Services	283,800	10,000	293,800
Maintenance Contracts	193,000	112,700	305,700
Software Licenses and Support	557,900	72,300	630,200
Permits and Fees	14,900	80,600	95,500
Rents and Leases	91,100	73,200	164,300
Materials and Supplies	709,300	98,800	808,100
Small Tools (under $1,000)	34,000	1,000	35,000
Miscellaneous	64,500		64,500
Unforeseen Operating Contingency	250,000		250,000
Purchased Power	24,070,500		24,070,500
Taxes	2,793,000	13,000	2,806,000
Total Expenditures	**46,615,900**	**1,148,400**	**47,764,300**
DEBT SERVICE			
Debt Service - Principal	1,536,900	360,400	1,897,300
Debt Service - Interest	1,563,900	235,500	1,799,400
Total Debt Service	**3,100,800**	**595,900**	**3,696,700**
AVAILABLE FOR CAPITAL OUTLAY	**5,512,400**	**895,700**	**6,408,100**
CAPITAL OUTLAY			
Capital - Contractual Services	10,805,800		10,805,800
Capital - Materials and Supplies	5,006,000	375,000	5,381,000
Capital - Meter Purchases	95,000		95,000
Capital - Transformer Purchases	400,000		400,000
Capital - Tools and Equipment	5,000		5,000
Capital - Buildings	382,000		382,000
Capital - Equipment (Over $2,000)	564,500	161,000	725,500
Capital - Vehicles	260,000		260,000
Capital - Personal Computers	30,100		30,100
Unforeseen Capital Contingency	250,000		250,000
Total Capital Outlay	**17,798,400**	**536,000**	**18,334,400**
RESERVES/DEBT	**(12,286,000)**	**359,700**	**(11,926,300)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2016 ADOPTED BUDGET - DECEMBER 7, 2015
2015 ADOPTED BUDGET COMPARED TO 2016 ADOPTED BUDGET

	Electric System				Broadband				Total			
REVENUE	Adopted 2015	Projected 2015	Adopted 2016	2015 Adopted/ Adopted 2016	Adopted 2015	Projected 2015	Adopted 2016	2015 Adopted/ Adopted 2016	Adopted 2015	Projected 2015	Adopted 2016	2015 Adopted/ Adopted 2016
Sales - Retail	44,867,000	43,418,000	45,909,000	1,042,000	0	0	0	0	44,867,000	43,418,000	45,909,000	1,042,000
Sales - Electric Wholesale	2,975,000	2,768,000	1,939,800	(1,035,200)	0	0	0	0	2,975,000	2,768,000	1,939,800	(1,035,200)
Sales - Broadband Wholesale	0	0	0	0	2,550,000	2,624,000	2,640,000	90,000	2,550,000	2,624,000	2,640,000	90,000
Interest	41,000	40,000	41,000	0	0	0	0	0	41,000	40,000	41,000	0
Miscellaneous	1,094,000	1,230,000	1,208,000	114,000	0	4,000	0	0	1,094,000	1,234,000	1,208,000	114,000
Rental Income	110,000	110,000	110,000	0	0	0	0	0	110,000	110,000	110,000	0
Construction Contribution	997,000	1,707,000	1,345,600	348,600	0	0	0	0	997,000	1,707,000	1,345,600	348,600
Grant Proceeds	6,720,400	3,384,000	4,675,700	(2,044,700)	438,700	1,190,000	0	(438,700)	7,159,100	4,574,000	4,675,700	(2,483,400)
Total Revenue	**56,804,400**	**52,657,000**	**55,229,100**	**(1,575,300)**	**2,988,700**	**3,818,000**	**2,640,000**	**(348,700)**	**59,793,100**	**56,475,000**	**57,869,100**	**(1,924,000)**
EXPENDITURES												
Wages	7,418,400	7,449,000	8,243,000	824,600	326,800	447,000	345,200	18,400	7,745,200	7,896,000	8,588,200	843,000
Benefits	2,955,200	2,879,000	3,339,100	383,900	146,400	189,000	156,700	10,300	3,101,600	3,068,000	3,495,800	394,200
Travel	141,500	76,000	134,800	(6,700)	15,000	8,000	15,000	0	156,500	84,000	149,800	(6,700)
Training, Tuition and Meeting Fees	95,500	32,000	98,800	3,300	15,000	14,000	15,000	0	110,500	46,000	113,800	3,300
Transportation	823,700	1,026,000	933,900	110,200	58,000	49,000	50,400	(7,600)	881,700	1,075,000	984,300	102,600
Insurance	336,500	253,000	337,600	1,100	0	0	0	0	336,500	253,000	337,600	1,100
Utilities	100,800	98,000	97,900	(2,900)	0	0	0	0	100,800	98,000	97,900	(2,900)
Postage, Printing and Stationery	152,100	147,000	152,700	600	300	2,000	300	0	152,400	149,000	153,000	600
Advertising	24,100	32,000	34,800	10,700	0	2,000	0	0	24,100	34,000	34,800	10,700
Conservation Expenditures	472,400	454,000	214,900	(257,500)	0	0	0	0	472,400	454,000	214,900	(257,500)
Misc. Contractual Services	2,327,800	1,955,000	3,966,400	1,638,600	229,200	185,000	104,200	(125,000)	2,557,000	2,140,000	4,070,600	1,513,600
Legal Services	281,100	281,000	283,800	2,700	10,000	10,000	10,000	0	291,100	291,000	293,800	2,700
Maintenance Contracts	233,300	125,000	193,000	(40,300)	157,500	135,000	112,700	(44,800)	390,800	260,000	305,700	(85,100)
Software Licenses and Support	574,800	524,000	557,900	(16,900)	63,000	63,000	72,300	9,300	637,800	587,000	630,200	(7,600)
Permits and Fees	16,600	2,000	14,900	(1,700)	69,800	50,000	80,600	10,800	86,400	52,000	95,500	9,100
Rents and Leases	89,800	106,000	91,100	1,300	68,400	91,000	73,200	4,800	158,200	197,000	164,300	6,100
Materials and Supplies	666,700	596,000	709,300	42,600	95,700	96,000	98,800	3,100	762,400	692,000	808,100	45,700
Small Tools (under $1,000)	36,800	7,000	34,000	(2,800)	1,000	1,000	1,000	0	37,800	8,000	35,000	(2,800)
Miscellaneous	66,600	93,000	64,500	(2,100)	0	0	0	0	66,600	93,000	64,500	(2,100)
Unforeseen Operating Contingency	100,000	100,000	250,000	150,000	0	0	0	0	100,000	100,000	250,000	150,000
Purchased Power	23,285,000	24,539,000	24,070,500	785,500	0	0	0	0	23,285,000	24,539,000	24,070,500	785,500
Taxes	2,677,000	2,683,000	2,793,000	116,000	13,000	13,000	13,000	0	2,690,000	2,696,000	2,806,000	116,000
Total Expenditures	**42,875,700**	**43,457,000**	**46,615,900**	**3,740,200**	**1,269,100**	**1,355,000**	**1,148,400**	**(120,700)**	**44,144,800**	**44,812,000**	**47,764,300**	**3,619,500**
DEBT SERVICE												
Debt Service - Principal	1,482,300	1,482,000	1,536,900	54,600	358,600	340,000	360,400	1,800	1,840,900	1,822,000	1,897,300	56,400
Debt Service - Interest	1,517,400	1,648,000	1,563,900	46,500	355,700	285,000	235,500	(120,200)	1,873,100	1,933,000	1,799,400	(73,700)
Total Debt Service	**2,999,700**	**3,130,000**	**3,100,800**	**101,100**	**714,300**	**625,000**	**595,900**	**(118,400)**	**3,714,000**	**3,755,000**	**3,696,700**	**(17,300)**
AVAILABLE FOR CAPITAL OUTLAY	**10,929,000**	**6,070,000**	**5,512,400**	**(5,416,600)**	**1,005,300**	**1,838,000**	**895,700**	**(109,600)**	**11,934,300**	**7,908,000**	**6,408,100**	**(5,526,200)**
CAPITAL OUTLAY												
Capital - Contractual Services	12,475,000	2,047,000	10,805,800	(1,669,200)	0	1,000	0	0	12,475,000	2,048,000	10,805,800	(1,669,200)
Capital - Materials and Supplies	4,198,000	3,533,000	5,006,000	808,000	342,100	192,000	375,000	32,900	4,540,100	3,725,000	5,381,000	840,900
Capital - Meter Purchases	119,000	41,000	95,000	(24,000)	0	0	0	0	119,000	41,000	95,000	(24,000)
Capital - Transformer Purchases	400,000	366,000	400,000	0	0	0	0	0	400,000	366,000	400,000	0
Capital - Tools and Equipment	6,500	6,500	5,000	(1,500)	0	0	0	0	6,500	6,500	5,000	(1,500)
Capital - Buildings	354,000	150,000	382,000	28,000	0	0	0	0	354,000	150,000	382,000	28,000
Capital - Equipment (Over $2,000)	435,700	210,000	564,500	128,800	101,100	101,000	161,000	59,900	536,800	311,000	725,500	188,700
Capital - Vehicles	224,000	224,000	260,000	36,000	0	0	0	0	224,000	224,000	260,000	36,000
Capital - Personal Computers	26,700	27,000	30,100	3,400	0	0	0	0	26,700	27,000	30,100	3,400
Unforeseen Capital Contingency	100,000	1,360,000	250,000	150,000	0	14,000	0	0	100,000	1,374,000	250,000	150,000
Total Capital Outlay	**18,338,900**	**7,964,500**	**17,798,400**	**(540,500)**	**443,200**	**308,000**	**536,000**	**92,800**	**18,782,100**	**8,272,500**	**18,334,400**	**(447,700)**
RESERVES/DEBT	**(7,409,900)**	**(1,894,500)**	**(12,286,000)**	**(4,876,100)**	**562,100**	**1,530,000**	**359,700**	**(202,400)**	**(6,847,800)**	**(364,500)**	**(11,926,300)**	**(5,078,500)**

PUBLIC UTILITY DISTRICT NO. 1 OF OKANOGAN COUNTY
2016 ADOPTED BUDGET - DECEMBER 7, 2015
BUDGET COMPARISON 2008 ACTUALS THRU 2016 ADOPTED

	2008		2009		2010		2011		2012		2013		2014		2015		2016
REVENUE	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actuals	Budget	Actuals	Budget	Projected	Adopted
Sales - Electric Retail	31,853,400	31,952,534	31,290,700	30,777,098	33,337,000	29,307,079	35,001,000	33,605,348	37,475,000	35,861,526	38,889,900	40,124,923	42,501,700	43,214,804	44,867,000	43,418,000	45,909,000
Sales - Electric Wholesale	8,737,000	11,263,826	7,489,500	4,198,884	4,937,000	5,801,903	5,490,000	6,741,526	2,742,000	3,531,677	2,360,300	5,132,272	2,835,200	4,680,275	2,975,000	2,768,000	1,939,800
Sales - Broadband Wholesale	850,000	1,030,980	1,168,200	1,767,217	1,900,000	1,944,345	2,000,000	1,995,657	2,500,000	2,117,105	2,200,000	2,251,626	2,200,000	2,534,575	2,550,000	2,624,000	2,640,000
Interest	1,738,500	1,697,562	1,246,000	964,500	262,000	214,509	207,000	113,944	80,000	74,313	68,000	58,696	50,000	42,574	41,000	40,000	41,000
Miscellaneous	1,250,000	727,466	746,700	1,056,550	531,000	916,913	749,000	1,841,914	1,504,000	1,342,999	1,052,000	1,203,732	1,104,000	1,380,474	1,094,000	1,234,000	1,208,000
Rental Income	118,000	117,068	118,000	116,995	118,000	117,098	118,000	117,098	118,000	117,098	118,000	107,875	108,000	109,207	110,000	110,000	110,000
Construction Contribution	1,600,000	1,795,823	1,600,000	884,844	542,000	996,025	820,000	974,691	1,059,000	991,816	1,104,000	990,163	917,000	1,294,510	997,000	1,707,000	1,345,600
Grant Proceeds									5,421,000	2,091,175	3,868,000	2,914,452	472,400	3,622,043	7,159,100	4,574,000	4,675,700
Total Revenue	**46,146,900**	**48,585,259**	**43,659,100**	**39,766,088**	**41,627,000**	**39,297,872**	**44,385,000**	**45,390,178**	**50,899,000**	**46,127,709**	**49,660,200**	**52,783,739**	**50,188,300**	**56,878,462**	**59,793,100**	**56,475,000**	**57,869,100**
EXPENDITURES																	
Wages	6,675,300	5,929,192	7,177,800	6,311,358	7,482,500	6,842,404	7,696,800	6,675,420	7,627,000	7,076,500	7,644,000	7,076,280	7,279,300	7,932,730	7,745,200	7,896,000	8,588,200
Benefits	2,182,700	2,035,454	2,368,600	2,532,708	2,618,900	2,373,456	2,544,600	2,394,707	2,716,400	2,633,239	2,938,000	2,895,392	3,045,800	2,994,218	3,101,600	3,068,000	3,495,800
Travel	125,500	140,556	267,600	124,077	244,700	124,532	185,900	122,664	170,800	116,854	154,000	84,407	125,900	74,294	156,500	84,000	149,800
Training, Tuition and Meeting Fees	84,900	96,332	179,300	74,206	196,000	86,633	135,900	61,871	128,800	91,420	110,700	48,022	81,900	45,272	110,500	46,000	113,800
Transportation	627,300	687,840	695,400	783,135	757,000	924,761	903,500	835,496	829,300	825,034	843,100	848,903	870,800	887,259	881,700	1,075,000	984,300
Insurance	206,600	212,096	219,300	313,815	320,500	279,268	310,000	308,777	308,000	307,665	312,400	285,789	319,600	409,387	336,500	253,000	337,600
Utilities	65,900	69,183	73,100	75,014	75,600	87,580	97,200	82,874	85,800	91,668	88,900	95,307	95,800	98,982	100,800	98,000	97,900
Postage, Printing and Stationary	105,500	111,096	122,700	104,646	117,200	106,436	198,400	142,313	193,000	141,003	151,100	139,314	149,700	139,527	152,400	149,000	153,000
Advertising	29,800	14,858	28,500	29,848	31,500	21,817	37,700	26,321	22,300	18,742	23,000	15,435	18,600	22,941	24,100	34,000	34,800
Conservation Expenditures	274,700	286,121	203,700	340,016	276,000	430,665	372,800	294,811	460,000	428,365	480,000	369,514	472,400	257,358	472,400	454,000	214,900
Misc. Contractual Services	2,400,700	2,171,518	2,350,200	2,067,841	2,994,400	1,908,893	2,508,600	1,441,439	2,213,800	1,993,088	2,063,800	1,514,903	1,925,000	1,774,746	2,557,000	2,140,000	4,070,600
Legal Services	64,500	155,895	374,800	296,977	364,100	240,533	314,100	323,826	319,100	257,876	329,500	266,784	310,000	212,634	291,100	291,000	293,800
Maintenance Contracts	223,900	136,192	127,100	90,704	157,400	102,674	177,600	126,661	185,900	208,019	338,000	282,513	311,800	270,763	390,800	260,000	305,700
Software Licenses and Support	137,200	154,785	187,700	183,255	264,500	241,644	317,400	223,978	445,200	263,155	678,900	468,830	743,900	486,590	637,800	587,000	630,200
Permits and Fees	41,300	85,420	116,400	103,281	104,400	104,237	368,300	162,253	160,500	137,887	90,500	61,760	88,000	52,086	86,400	52,000	95,500
Rents and Leases	136,000	139,093	154,400	151,378	148,300	161,484	285,100	166,823	280,000	220,978	272,300	281,988	219,800	256,269	158,200	197,000	164,300
Materials and Supplies	550,000	882,014	720,400	773,077	932,000	840,196	930,400	592,470	797,000	743,578	754,400	638,865	783,000	716,146	762,400	692,000	808,100
Small Tools (under $1,000)	43,600	38,941	44,300	60,736	69,300	25,196	68,800	25,664	43,300	15,366	48,300	6,591	25,000	6,991	37,800	8,000	35,000
Miscellaneous	83,700	81,974	64,000	48,492	101,000	45,911	74,100	105,491	100,300	58,933	72,500	53,676	65,000	57,419	66,600	93,000	64,500
Unforeseen Operating Contingency									100,000	14,099	100,000	147,210	100,000	131,401	100,000	100,000	250,000
Purchased Power	24,243,700	24,686,109	21,213,700	21,822,349	24,158,000	23,895,600	25,373,000	24,060,574	23,220,100	22,284,244	23,376,800	22,835,780	23,227,300	24,062,379	23,285,000	24,539,000	24,070,500
Taxes	1,947,500	1,921,891	1,927,000	1,876,406	2,020,200	1,839,337	2,119,000	2,138,550	2,298,700	2,220,162	2,370,400	2,413,881	2,581,000	2,713,280	2,690,000	2,696,000	2,806,000
Total Expenditures	40,250,300	40,036,560	38,616,000	38,163,319	43,433,500	40,683,257	45,019,200	40,312,983	42,705,300	40,147,875	43,240,600	40,831,144	42,839,600	43,602,672	44,144,800	44,812,000	47,764,300
DEBT SERVICE																	
Debt Service - Principal	810,000	812,118	835,000	837,916	870,000	873,334	1,190,000	1,183,749	1,555,000	1,574,421	1,717,000	1,668,642	1,801,300	1,865,034	1,840,900	1,822,000	1,897,300
Debt Service - Interest	753,300	798,800	722,600	767,367	684,100	992,487	2,241,100	2,068,361	1,919,000	2,018,950	1,971,900	2,005,443	1,956,800	1,980,622	1,873,100	1,933,000	1,799,400
Total Debt Service	1,563,300	1,610,918	1,557,600	1,605,283	1,554,100	1,865,821	3,431,100	3,252,110	3,474,000	3,593,371	3,688,900	3,674,085	3,758,100	3,845,656	3,714,000	3,755,000	3,696,700
AVAILABLE FOR CAPITAL OUTLAY	**4,333,300**	**6,937,781**	**3,485,500**	**(2,514)**	**(3,360,600)**	**(3,251,206)**	**(4,065,300)**	**1,825,085**	**4,719,700**	**2,386,463**	**2,730,700**	**8,278,510**	**3,590,600**	**9,430,134**	**11,934,300**	**7,908,000**	**6,408,100**
CAPITAL OUTLAY																	
Capital - Contractual Services	3,986,700	2,042,651	10,158,000	1,761,846	11,208,000	1,759,767	10,500,000	2,279,483	9,686,400	2,350,626	6,472,500	7,350,382	11,165,000	869,847	12,475,000	2,048,000	10,805,800
Capital - Materials and Supplies	4,827,600	4,783,802	9,326,100	5,270,105	8,796,000	6,189,149	5,636,700	3,283,116	13,051,400	5,196,359	7,894,400	1,930,443	3,941,900	2,382,334	4,540,100	3,725,000	5,381,000
Capital - Meter Purchases	390,000	125,857	595,000	790,778	1,500,000	252,306	440,000	369,605	90,000	0	90,000	19,620	70,000	(7,752)	119,000	41,000	95,000
Capital - Transformer Purchases	1,200,000	1,153,037	1,166,000	521,218	500,000	365,288	500,000	408,995	225,000	216,729	225,000	227,794	400,000	235,676	400,000	366,000	400,000
Capital - Tools and Equipment	22,000	6,920	10,200	1,374	13,500	6,572	13,200	1,770	12,000	6,232	9,500	0	4,500	0	6,500	6,500	5,000
Capital - Buildings	778,600	240,876	6,984,500	3,932,356	3,094,000	4,274,502	42,000	40,475	7,500	1,969	685,000	20,992	410,000	83,767	354,000	150,000	382,000
Capital - Equipment (Over $2,000)	819,300	680,078	1,105,100	412,738	1,457,800	1,043,752	999,600	218,074	1,051,000	371,313	1,259,100	218,107	471,900	176,699	536,800	311,000	725,500
Capital - Vehicles	941,000	930,324	351,000	281,734	(175,000)	(219,097)	30,000	(186,718)	315,300	(310,574)	634,000	(182,592)	1,219,000	42,640	224,000	224,000	260,000
Capital - Personal Computers	78,500	56,993	58,600	39,551	70,600	59,792	57,300	40,751	48,100	30,680	54,200	35,384	37,500	22,464	26,700	27,000	30,100
Unforeseen Capital Contingencies	100,000	31,359	100,000	42,005	100,000	16,131	100,000	47,639	100,000	3,679	100,000	45,883	100,000	5,601,308	100,000	1,374,000	250,000
Total Capital Outlay	13,143,700	10,051,897	29,854,500	13,053,705	26,564,900	13,748,162	18,318,800	6,503,190	24,586,700	7,867,013	17,423,700	9,666,013	17,819,800	9,406,983	18,782,100	8,272,500	18,334,400
RESERVES/DEBT	**(8,810,400)**	**(3,114,116)**	**(26,369,000)**	**(13,056,219)**	**(29,925,500)**	**(16,999,368)**	**(22,384,100)**	**(4,678,105)**	**(19,867,000)**	**(5,480,550)**	**(14,693,000)**	**(1,387,503)**	**(14,229,200)**	**23,151**	**(6,847,800)**	**(364,500)**	**(11,926,300)**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2016 ADOPTED BUDGET - DECEMBER 7, 2015
EXPENDITURE SUMMARY BY DEPARTMENT

Description	Generation	Power Supply	Const. Design	Eng.	Operations	Enviro.	Customer Service	Cons.	General Admin.	I.S.	BOC	Broadband	Internal Comm.	Total
EXPENDITURES														
010 Wages	215,700	134,700	800,500	200,100	4,013,000	69,700	743,600	132,500	1,249,900	418,400	108,900	345,200	156,000	8,588,200
011 Benefits	89,500	59,800	352,200	64,800	1,537,000	21,300	365,100	44,500	507,500	192,500	44,500	156,700	60,400	3,495,800
020 Travel	7,500	10,000	6,000	8,000	33,000	7,000	4,500	3,500	20,200	10,000	20,100	15,000	5,000	149,800
021 Training, Tuition and Meeting Fees	2,500	7,500	9,000	10,000	22,000	4,000	2,500	2,500	17,300	13,500	3,000	15,000	5,000	113,800
030 Transportation	2,300	400	60,000	8,000	800,000	100	40,800	2,200	2,400	1,300		50,400	16,400	984,300
040 Insurance									337,600					337,600
050 Utilities					200				97,700					97,900
060 Postage, Printing and Stationery			100	300	1,500		145,000	500	5,000			300	300	153,000
070 Advertising			2,500	1,500	2,000		1,000	23,000	4,800					34,800
071 Conservation Expenditures								214,900						214,900
080 Misc. Contractual Services	29,100	414,500	45,000	1,363,000	1,252,200	1,500	57,500	292,000	458,600	28,000		104,200	25,000	4,070,600
081 Legal Services									283,800			10,000		293,800
082 Maintenance Contracts					150,200					19,300		112,700	23,500	305,700
083 Software Licenses and Support		190,600								358,500		72,300	8,800	630,200
084 Permits and Fees	7,500		2,000	500	1,000	100	300		500			80,600	3,000	95,500
085 Rents and Leases	9,800				1,500		5,300		800	38,300		73,200	35,400	164,300
090 Materials and Supplies	2,500	1,000	12,000	2,000	550,000	1,500	24,400	13,000	31,500	10,000	1,400	98,800	60,000	808,100
091 Small Tools (under $1,000)			2,000	2,000	16,000		1,000		1,000	10,000		1,000	2,000	35,000
092 Miscellaneous				400			34,100	200	27,900		1,900			64,500
099 Unforeseen Operating Contingency									250,000					250,000
120 Purchased Power		24,070,500												24,070,500
210 Taxes									2,793,000			13,000		2,806,000
Total Expenditures	**366,400**	**24,889,000**	**1,291,300**	**1,660,600**	**8,379,600**	**105,200**	**1,425,100**	**728,800**	**6,089,500**	**1,099,800**	**179,800**	**1,148,400**	**400,800**	**47,764,300**
DEBT SERVICE														
810 Debt Service - Principal									1,536,900			360,400		1,897,300
811 Debt Service - Interest									1,563,900			235,500		1,799,400
Total Debt Service	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,100,800**	**0**	**0**	**595,900**	**0**	**3,696,700**
CAPITAL OUTLAY														
581 Capital - Contractual Services	750,000		8,975,800	580,000	500,000									10,805,800
591 Capital - Materials and Supplies	6,000		2,700,000	375,000	1,900,000							375,000	25,000	5,381,000
592 Capital - Meter Purchases					95,000									95,000
593 Capital - Transformer Purchases					400,000									400,000
710 Capital - Tools and Equipment					3,000				2,000					5,000
711 Capital - Buildings					382,000									382,000
712 Capital - Equipment (Over $2,000)					137,500					362,000		161,000	65,000	725,500
713 Capital - Vehicles					260,000									260,000
714 Capital - Personal Computers										30,100				30,100
901 Unforeseen Capital Contingency									250,000					250,000
Total Capital Outlay	**756,000**	**0**	**11,675,800**	**955,000**	**3,677,500**	**0**	**0**	**0**	**252,000**	**392,100**	**0**	**536,000**	**90,000**	**18,334,400**
Total Use of Resources	**1,122,400**	**24,889,000**	**12,967,100**	**2,615,600**	**12,057,100**	**105,200**	**1,425,100**	**728,800**	**9,442,300**	**1,491,900**	**179,800**	**2,280,300**	**490,800**	**69,795,400**

PUBLIC UTILITY DIST. NO. 1 OF OKANOGAN COUNTY
2016 ADOPTED BUDGET - DECEMBER 7, 2015
REVENUE DETAIL

Div.	Activity	Description		Budget Amount
1		**Electric**		**55,229,100**
	001	Sales - Retail	45,909,000	
	002	Sales - Wholesale	1,939,800	
	003	Interest	41,000	
	004	Miscellaneous	1,208,000	
	005	Rental Income	110,000	
	006	Construction Contributions	1,345,600	
	007	Grant Proceeds	4,675,700	
2		**Broadband**		**2,640,000**
	002	Sales - Wholesale	2,640,000	
	004	Miscellaneous	0	
	006	Construction Contributions	0	
	007	Grant Proceeds	0	
		TOTAL REVENUE		**57,869,100**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	10		**Generation**			**1,122,400**	
		010	Wages		215,700		
		011	Benefits		89,500		
		020	Travel		7,500		
		021	Training, Tuition and Meeting Fees		2,500		
		030	Transportation		2,300		
		080	Misc. Contractual Service		29,100		
		084	Permits and Fees		7,500		
		085	Rent and Leases		9,800		
			Ophir Site Lease	9,800			
		090	Materials and Supplies		2,500		
		581	Capital - Contractual Services		750,000		**1**
		591	Capital - Materials and Supplies		6,000		**1**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	11		**Power Supply**			**24,889,000**	
		010	Wages		134,700		
		011	Benefits		59,800		
		020	Travel		10,000		
		021	Training, Tuition and Meeting Fees		7,500		
		030	Transportation		400		
		080	Misc. Contractual Services		414,500		
			Douglas County PUD	354,500			
			Professional Services (compliance/scheduling)	15,000			
			Central Washington Power Authority	5,000			
			Slice Implementation Group	10,000			
			WECC/NERC Assessment	30,000			
		083	Software Licenses and Support		190,600		
			Slice Software Support Fee	190,600			
		090	Materials and Supplies		1,000		
		120	Purchased Power		24,070,500		
			BPA - Slice	8,391,300			
			BPA - Block	5,463,400			
			BPA - Transmission	2,633,400			
			Wells	4,176,100			
			Nine Canyon	2,722,000			
			Other - Market Purchases	684,300			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	19		**Construction Design**			**12,967,100**	
		010	Wages		800,500		
		011	Benefits		352,200		
		020	Travel		6,000		
		021	Training, Tuition and Meeting Fees		9,000		
		030	Transportation		60,000		
		060	Postage, Printing and Stationery		100		
		070	Advertising		2,500		
		080	Misc. Contractual Services		45,000		
			Foster Crk 115KV Tower Inspection	45,000			
		084	Permits and Fees		2,000		
			Miscellaneous	2,000			
		090	Materials and Supplies		12,000		
		091	Small Tools (under $1,000)		2,000		
		581	Capital - Contractual Services		8,975,800		
			PT Line Construction	7,325,000			**1**
			WASDOT Clear Zone Analysis	175,000			**2**
			Gold Creek Substation	1,000,000			**1**
			LiDAR - Transmission Analysis/Fixes	50,000			**2**
			Preliminary Studies	90,000			**2**
			Misc. Property Survey	10,000			**2**
			Okanogan Fire Restoration - Distribution & Fiber	255,600			**1**
			Okanogan Fire Restoration - Loup Trans. & Fiber	70,200			**1**
			Carlton Fire Restoration - Distribution	0			**1**
		591	Capital - Materials and Supplies		2,700,000		
			PT Line - Transmission and Distribution Materials	1,250,000			**1**
			Gold Creek Substation	1,000,000			**1**
			Twisp Substation Modifications	400,000			**1**
			Loup Transmission Line Re-Route into Twisp Sub	50,000			**1**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	20		**Engineering**			**2,615,600**	
		010	Wages		200,100		
		011	Benefits		64,800		
		020	Travel		8,000		
		021	Training, Tuition and Meeting Fees		10,000		
		030	Transportation		8,000		
		060	Postage, Printing and Stationery		300		
		070	Advertising		1,500		
		080	Misc. Contractual Services		1,363,000		
			BPA Study - WECC De-Registration	50,000			
			Contract Engineering	100,000			
			Enloe Dam Dewatering	1,000,000			
			Enloe Dam Inspection	38,000			
			SPCC Plan Updates	65,000			
			Substation Equipment Testing	50,000			
			Wells Dam - O&M Contract Development	60,000			
		084	Permits and Fees		500		
			Miscellaneous	500			
		090	Materials and Supplies		2,000		
		091	Small Tools (under $1,000)		2,000		
		092	Miscellaneous		400		
		581	Capital - Contractual Services		580,000		
			Engineering - Large System Projects	180,000			**2**
			Enloe Dam - On Call Engineering Support	300,000			**1**
			Wells Dam - System Impact Studies	100,000			**2**
		591	Capital - Materials and Supplies		375,000		
			Brewster 115kv Bus Differential	25,000			**2**
			OCB, Regulators, Reclosers, etc.	300,000			**2**
			SCADA	50,000			**2**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	21		**Operations**			**12,057,100**	
		010	Wages		4,013,000		
		011	Benefits		1,537,000		
		020	Travel		33,000		
		021	Training, Tuition and Meeting Fees		22,000		
		030	Transportation		800,000		
		050	Utilities		200		
		060	Postage, Printing and Stationery		1,500		
		070	Advertising		2,000		
		080	Misc. Contractual Services		1,252,200		
			CDL Testing Program	6,500			
			Employee Dispatch	120,000			
			Firealarm Testing and Monitoring	1,700			
			Janitorial Services (All Offices)	66,000			
			Non-PCB Waste Disposal	8,000			
			Pole Testing	230,000			
			Safety Training	40,000			
			Transmission Pole Fire Retardent	65,000			
			Tree Trimming	700,000			
			Underground Locate Service	3,000			
			Weed Control	12,000			
		082	Maintenance Contracts		150,200		
			Elevator Maintenance	4,200			
			HQ General Maintenance	40,000			
			HVAC Maintenance	38,000			
			Landscape Maintenance	10,000			
			Snowplowing and Sweeping	15,000			
			Okanogan Sub - Asphalt Repair/Driveway Approach	35,000			
			Brewster Office - Exterior Repair and Paint	8,000			
		084	Permits and Fees		1,000		
			Miscellaneous	1,000			
		085	Rents and Leases		1,500		
			Pole Contacts	1,500			
		090	Materials and Supplies		550,000		
			General	530,000			
			Fire Resistant Clothing	20,000			
		091	Small Tools (under $1,000)		16,000		
			Line	10,000			
			Telecommunications	2,000			
			Electric Shop	2,000			
			Vehicle Shop	2,000			
		581	Capital - Contractual Services		500,000		
			Contract Labor	100,000			**2**
			Underground Replacements	400,000			**2**
		591	Capital - Materials and Supplies		1,900,000		
			Normal Replacements and Extensions	1,375,000			**2**
			Avian Protection	6,000			**2**
			Cutout Replacement	125,000			**2**
			TNS-2000: Rebuild Havillah Road Phase 1	106,000			**2**
			TNS-2000: Rebuild Havillah Road Phase 2	114,000			**3**
			WSS-3000: Rebuild Phase 1 from (3215-3300)	76,000			**3**
			MLS-1000: Rebuild towards Ophir Substation	62,000			**3**
			SFS-2000: Reconductor S. Fir; Ridge Dr./Radio Sta.	12,000			**3**
			BWS-5000: Replace UG Brewster Hghts. Subdivision	24,000			**2**
		592	Capital - Meter Purchases		95,000		

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			Metering Special Projects	30,000			**2**
			PME Meter Replacements	20,000			**2**
			Meters w/ Internal Breakers	45,000			**2**
		593	Capital - Transformer Purchases		400,000		
			Normal Additions/Replacements	400,000			**2**
		710	Capital - Tools & Equipment ($1,000 to $2,000)		3,000		**2**
		711	Capital - Buildings		382,000		
			Brewster Warehouse - Enclose	30,000			**2**
			District Offices - Physical Security	104,000			**2**
			Headquarters - Emergency Generator Loadbank	8,000			**2**
			Headquarters - HVAC Digital Control Project	15,000			**2**
			Headquarters - Network Room Gas Fire System	25,000			**2**
			Okanogan or Sandflat Subs - Covered Storage	200,000			**3**
		712	Capital - Equipment (Over $2,000)		137,500		
			Electric Shop - Recloser Tester	22,000			**2**
			Electric Shop\Telecom - Battery Storage\Charging	20,000			**2**
			Operations - PPE\Tool Vending Machines	27,500			**2**
			Operations - Water Tank, Pump, Hose (slip in)	15,000			**2**
			Vehicle Shop - Plasma Cutter	16,500			**2**
			Vehicle Shop - Diagnostic Code Scanner	10,500			**2**
			Vehicle Shop - Vehicle Lifts	26,000			**2**
		713	Capital - Vehicles		260,000		
			Fleet	500,000			**2**
			Fleet - 2017 Commitment: Line Vehicles (2) $700,000				**2**
			Less: Transportation System Depreciation	(240,000)			**2**

Div.	Dept.	Activity	Description		Budget Amount	Priority Ranking
1	22		**Environmental**		**105,200**	
		010	Wages	69,700		
		011	Benefits	21,300		
		020	Travel	7,000		
		021	Training, Tuition and Meeting Fees	4,000		
		030	Transportation	100		
		080	Misc. Contractual Services	1,500		
		084	Permits and Fees	100		
		090	Materials and Supplies	1,500		

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	30		**Customer Service**			**1,425,100**	
		010	Wages		743,600		
		011	Benefits		365,100		
		020	Travel		4,500		
		021	Training, Tuition and Meeting Fees		2,500		
		030	Transportation		40,800		
		060	Postage, Printing and Stationery		145,000		
			Postage and Printing - NISC	115,000			
			Postage - PUD	25,000			
			Printing - Misc.	5,000			
		070	Advertising		1,000		
		080	Misc. Contractual Services		57,500		
			CIS Programming	500			
			Collection Service - Credit Bureau	3,000			
			Credit Reporting Agency	3,000			
			Electronic Payments Fees	51,000			
		084	Permits and Fees		300		
			Miscellaneous Fees (Notaries, etc.)	300			
		085	Rents and Leases		5,300		
			Office Rent MVCC	5,000			
			Miscellaneous	300			
		090	Materials and Supplies		24,400		
			General	24,400			
		091	Small Tools (under $1,000)		1,000		
		092	Miscellaneous		34,100		
			Miscellaneous Expenses	200			
			Net Account Receivable Writeoffs	33,900			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	35		**Conservation/Consumer Information**			**728,800**	
		010	Wages		132,500		
		011	Benefits		44,500		
		020	Travel		3,500		
		021	Training, Tuition and Meeting Fees		2,500		
		030	Transportation		2,200		
		060	Postage, Printing and Stationery		500		
			Miscellaneous	500			
		070	Advertising		23,000		
		071	Conservation Expenditures		214,900		
			District Conservation Programs	214,900			
		080	Misc. Contractual Services		292,000		
			Conservation Contracts	272,000			
			Electric Education Programs	20,000			
		090	Materials and Supplies		13,000		
		092	Miscellaneous		200		

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Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	40		**General Administration**			**9,442,300**	
		010	Wages		1,249,900		
		011	Benefits		507,500		
		020	Travel		20,200		
			General	8,200			
			Accounting and Finance	4,700			
			Human Resource	3,800			
			Leadership	3,500			
		021	Training, Tuition and Meeting Fees		17,300		
			General	3,400			
			Accounting and Finance	6,600			
			Human Resource	1,600			
			Educational Reimbursement	2,200			
			Leadership	3,500			
		030	Transportation		2,400		
		040	Insurance (Property/Liability)		337,600		
		050	Utilities		97,700		
			Cell Phone Service	8,400			
			Electrical Service	10,100			
			Telephone Service	47,700			
			Water/Sewer/Garbage	31,500			
		060	Postage, Printing and Stationery		5,000		
		070	Advertising		4,800		
		080	Misc. Contractual Services		458,600		
			APPA Dues	16,600			
			Audit Costs	88,100			
			Banking Fees	45,500			
			Benefits Administration	10,500			
			Bond Admin Fee	600			
			Chamber of Commerce Dues	800			
			CWPU/UIP Expenses	12,700			
			Economic Alliance	6,000			
			Financial Studies	50,000			
			Foundation for Water and Energy	2,000			
			Human Resources Consulting Services	31,100			
			Legislative Consultant	42,000			
			Misc. Services/Consulting	10,000			
			NW Public Power Assoc. Dues/NW Wage & Hour	28,000			
			PPC - Dues	21,900			
			PPC - NW River Partners	12,400			
			Standard and Poors	7,500			
			WA PUD Association Dues	72,900			
		081	Legal Services		283,800		
			General Counsel	208,800			
			Misc. Attorney Fees	75,000			
		084	Permits and Fees		500		
			WA State L&I Right to Know	200			
			Misc.	300			
		085	Rents and Leases		800		
			P.O. Box Rent	800			
		090	Materials and Supplies		31,500		
		091	Small Tools (under $1,000)		1,000		
		092	Miscellaneous		27,900		
			Clothing for Identification	1,200			
			Deductibles/Damage Claims	4,000			

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Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			Election Costs	6,500			
			Employee Day	3,300			
			Meeting Expenses	300			
			Misc. Expenses (Wellness, Interview & Moving Exp)	11,700			
			Service Awards and Costs	900			
		099	Unforeseen Operating Contingency		250,000		
		210	Taxes		2,793,000		
		710	Capital - Tools & Equipment ($1,000 to $2,000)		2,000		**2**
		810	Debt Service - Principal		1,536,900		
		811	Debt Service - Interest		1,563,900		
		901	Unforeseen Capital Contingency		250,000		**2**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	41		**Information Systems**			**1,491,900**	
		010	Wages		418,400		
		011	Benefits		192,500		
		020	Travel		10,000		
		021	Training, Tuition and Meeting Fees		13,500		
		030	Transportation		1,300		
		080	Misc. Contractual Services		28,000		
			Consulting	15,000			
			Key Card System	2,500			
			Security System Monitoring	3,000			
			Sharepoint Migration/Configuration	7,500			
		082	Maintenance Contracts		19,300		
			Branch Office Multi Function Printer	1,500			
			Okanogan Office Multi Function Printer	12,000			
			Check Scanner - RemitPlus	300			
			Datacenter Liebert Units	5,500			
		083	Software Licenses and Support		358,500		
			Aclara - TWACS Support	18,000			
			Brocade Tech Support	1,000			
			Certs SSL	2,100			
			Genetec Maintenance	3,000			
			Kayako Helpdesk Maintenance	300			
			LANDesk Patch Management	1,200			
			Microsoft Software	35,300			
			NISC Custom Programming	5,000			
			NISC Maintenance	130,000			
			NISC SmartHub - One Time	5,000			
			NISC SmartHub - Maintenance	5,000			
			Domain Registrations	600			
			Programming Software	1,200			
			ShoreTel Phone System	16,200			
			SonicWALL - ESA	3,500			
			SonicWALL - NSA	2,500			
			Symantec Software and Support	10,800			
			VMWare Software Support (IS)	5,000			
			Eng/Ops - Symantec for SCADA Servers	800			
			Eng/Ops - AutoCad	3,000			
			Eng/Ops - ESRI	6,000			
			Eng/Ops - Futura	17,500			
			Eng/Ops - GeoNav	3,500			
			Eng/Ops - Itron Staker Maintenance	25,000			
			Eng/Ops - Itron Staker Reporting	10,000			
			Eng/Ops - Mapsight	3,000			
			Eng/Ops - OSI	21,300			
			Eng/Ops - Trimble Field Inspector	1,600			
			Eng/Ops - Allison Transmission Diagnostic Software	800			
			Eng/Ops - Mitchell Diagnostic Software	3,000			
			Eng/Ops - MSDS On Line	2,700			
			Eng/Ops - Cummins Tool Software	700			
			Eng/Ops - Fastenal Tool Inventory	1,200			
			Eng/Ops - Max Force	700			
			Eng/Ops - Zonar Vehicle Tracking	12,000			
		085	Rents and Leases		38,300		
			Okanogan Mailing Equipment	13,000			
			Branch Office Mailing Equipment	3,000			

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			Branch Office MFP	10,300			
			Okanogan Office MFP	12,000			
		090	Materials and Supplies		10,000		
		091	Small Tools (under $1,000)		10,000		
		712	Capital - Equipment (Over $2,000)		362,000		
			KVM Switch for Datacenter	2,300			**2**
			PowerVault External Tape Drive	2,500			**2**
			Eaton Powerware - Okanogan Datacenter	30,000			**2**
			Genetec System - Cameras (Subs, yards and fences)	60,000			**3**
			Genetec System - Readers and Controllers	40,000			**3**
			Genetec System - Video Surveillance Software	10,000			**3**
			Genetec System - Video Conferencing	10,000			**3**
			NISC RemitPlus Server	2,500			**2**
			Eng/Ops - OSI SCADA Servers and Workstations	127,600			**2**
			Eng/Ops - Tablet PC's	20,000			**2**
			Eng/Ops - Physical Server SQL Database	6,000			**2**
			Printers	5,000			**2**
			Phone System	6,600			**2**
			Virtual Environment	39,500			**2**
		714	Capital - Personal Computers		30,100		**2**

Div.	Dept.	Activity	Description		Budget Amount	Priority Ranking
1	50		**Commissioners**		**179,800**	
		010	Wages	108,900		
		011	Benefits	44,500		
		020	Travel	20,100		
		021	Training, Tuition and Meeting Fees	3,000		
		090	Materials and Supplies	1,400		
		092	Miscellaneous	1,900		

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
2	60		**Broadband**			**2,280,300**	
		010	Wages		345,200		
		011	Benefits		156,700		
		020	Travel		15,000		
		021	Training, Tuition and Meeting Fees		15,000		
		030	Transportation		50,400		
		060	Postage, Printing and Stationery		300		
		080	Misc. Contractual Services		104,200		
			Network Consulting	50,000			
			NoaNet Calea Services	4,200			
			Software Development	50,000			
		081	Legal Services		10,000		
		082	Maintenance Contracts		112,700		
			ADVA Optical	30,000			
			Cambium Networks	4,600			
			Cisco	2,100			
			Juniper support	6,000			
			Motorola	3,500			
			WWP Lightning Edge/Ciena Devices	66,500			
		083	Software Licenses and Support		72,300		
			Ciena	30,000			
			Kayako Helpdesk	300			
			Microsoft Software	5,300			
			NetZoom	2,100			
			Server License and Software Upgrades	7,500			
			Solar Winds	15,100			
			Symantec Software and Support	4,600			
			Telerik	1,900			
			VMWare	5,500			
		084	Permits and Fees		80,600		
			ARIN ASN & IP Address Allocation	5,000			
			Upstream Internet Bandwidth	75,600			
		085	Rents and Leases		73,200		
			DCPUD Dark Fiber Leases	29,200			
			DCPUD Co-location	5,600			
			USEI Co-location	4,800			
			Wireless Site Lease	33,600			
		090	Materials and Supplies		98,800		
			Backup Tapes	500			
			Battery Plant - Maintenance and Replacement	16,300			
			Equipment Calibration/Repair	2,300			
			Fiber Plant Maintenance - Broadband	50,000			
			HVAC Maintenance and Repair	10,000			
			Switch/Network HW Upgrades	10,000			
			UPS/Rectifier - Maintenance and Replacement	7,100			
			10G NICs for ESX Hosts	2,600			
		091	Small Tools (under $1,000)		1,000		
		210	Taxes		13,000		
		591	Capital - Materials and Supplies		375,000		
			Fiber Build - Berney' to P18275	34,800			**3**
			Fiber Build - SitnBull to P18275	2,200			**3**
			Fiber Distribution Builds	100,000			**2**
			Legacy Wireless Site Upgrades	55,000			**2**
			Network Hardware Replacement - EOL	25,800			**2**
			Node Rework	30,000			**2**

Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
			Optics	42,200			**2**
			Wireless Subscriber Units	85,000			**2**
		712	Capital - Equipment (Over $2,000)		161,000		
			NetApp Shelf	51,000			**2**
			Stand Alone Server for IDS/IPS Services	12,000			**2**
			Switch Replacement Cisco 3750s	13,000			**2**
			Tools	5,000			**2**
			Test Equipment	35,000			**3**
			Virtual Environment	45,000			**2**
		810	Debt Service - Principal		360,400		
			Loan - Electric	218,100			
			Operating Line - Electric	0			
			Loan - ARRA	142,300			
		811	Debt Service - Interest		235,500		
			Loan - Electric	60,300			
			Operating Line - Electric	78,300			
			Loan - ARRA	96,900			

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Div.	Dept.	Activity	Description			Budget Amount	Priority Ranking
1	61		**Internal Communications**			**490,800**	
		010	Wages		156,000		
		011	Benefits		60,400		
		020	Travel		5,000		
		021	Training, Tuition and Meeting Fees		5,000		
		030	Transportation		16,400		
		060	Postage, Printing and Stationery		300		
		080	Misc. Contractual Services		25,000		
			Radio System Coverage Analysis	25,000			
		082	Maintenance Contracts		23,500		
			Fire Alarm System	3,500			
			UHF Radio System	20,000			
		083	Software Licenses and Support		8,800		
			Cisco Smartnet	300			
			MapInfo Software Support	500			
			Fiber Mapping Software Support	8,000			
		084	Permits and Fees		3,000		
			Right of Way - USFS, DOT, etc.	3,000			
		085	Rents and Leases		35,400		
			UHF Site Lease - Little Buck Mtn.	2,500			
			UHF Site Lease - Aeneas Mtn.	2,800			
			UHF Site Lease - Goat Mtn.	600			
			UHF Site Lease - Omak Mtn.	3,900			
			UHF Site Lease - McClure Mtn.	1,300			
			UHF Site Lease - Tunk Mtn.	1,300			
			Dark Fiber Lease - Brewster to Wells Dam	23,000			
		090	Materials and Supplies		60,000		
			Fiber Plant Maintenance - Internal and Backbone	50,000			
			General Materials and Supplies	10,000			
		091	Small Tools (under $1,000)		2,000		
		591	Capital - Materials and Supplies		25,000		
			Fiber Rework - 1st and 2nd Avenue Okanogan	15,000			**2**
			Misc.	10,000			**2**
		712	Capital - Equipment (Over $2,000)		65,000		
			UHF Radio System Overhaul - Jackass Butte	65,000			**2**

Div.	Dept.	Activity	Description	Budget Amount	Priority Ranking
			TOTAL EXPENDITURES AND CAPITAL OUTLAY	**69,795,400**	