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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

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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)."

Major Findings:

- 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.

[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

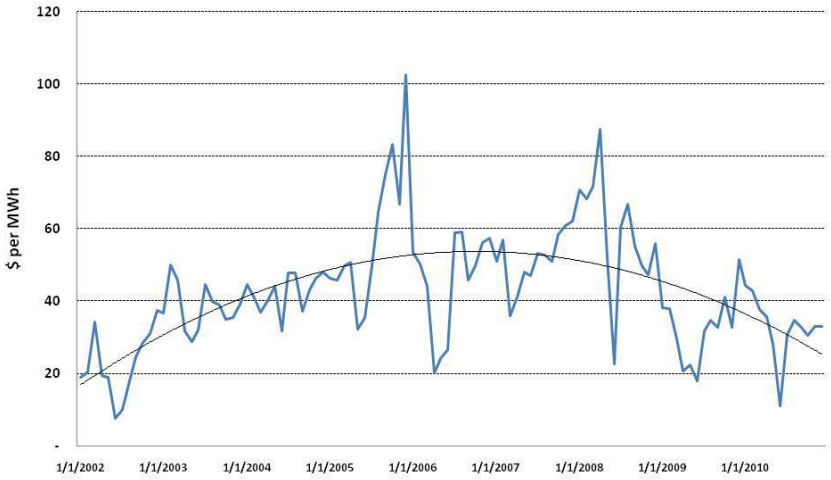
The Applicant made their price forecast of $66 per MWh in the overheated time just before the United States entered the second biggest recession in history. This section details why the Applicant's forecast has already failed and why a much better number to use for open market sales prices, or avoided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

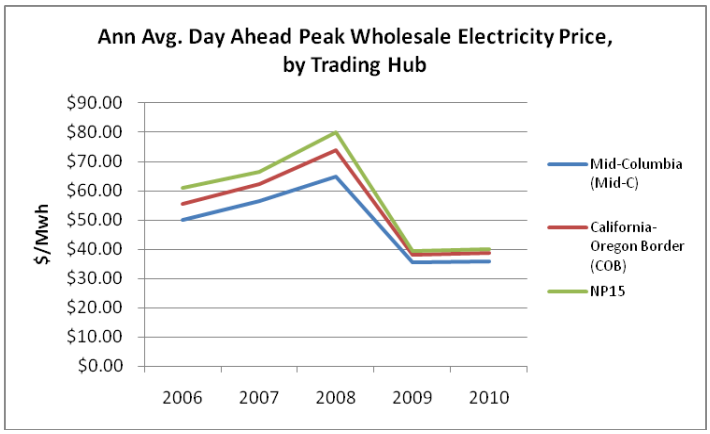
The following Graph 2 presents the data in Table 3 in a visual format to emphasize the manner in which all the major west and northwest open market electricity prices move in near lockstep, with NP15 always higher than Mid-C by a range of $3.63 to $15.14 per MWh.

[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.

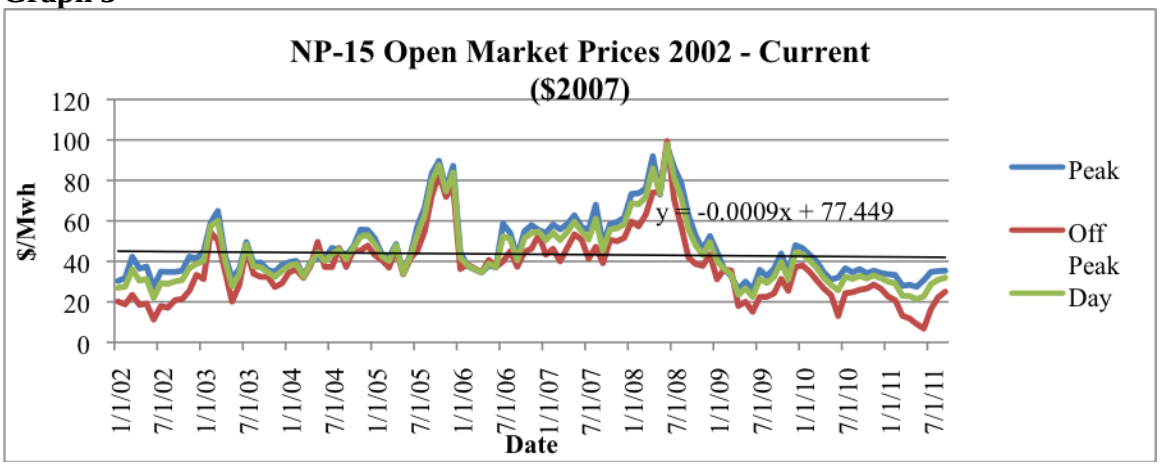
[18] Herbert Stein (August 27, 1916 – September 8, 1999) was a senior fellow at the American Enterprise Institute and was on the board of contributors of The Wall Street Journal. He was chairman of the Council of Economic Advisers under President Nixon and President Ford. From 1974 until 1984, he was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

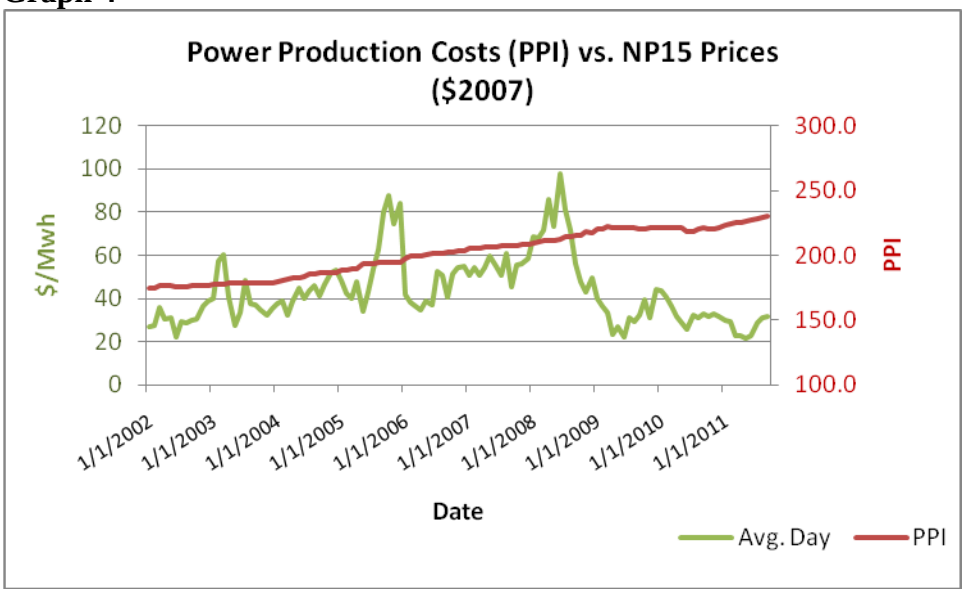
[23] Bureau of Economic Analysis, http://www.bea.gov/iTable/,Table 1.1.3., Real Gross Domestic Product, Quantity Indexes,[Index numbers, 2005=100] Seasonally adjusted,

[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.

[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

[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.

[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.

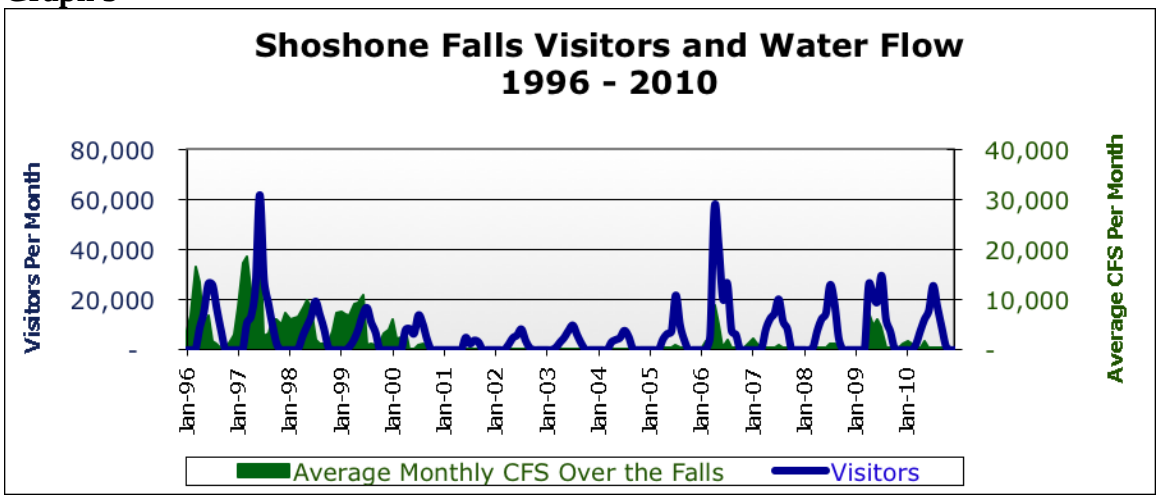
The general problem with waterfalls is the same as with all public goods: it is very difficult to determine who benefits and how extensively from the asset. As a result it is difficult to measure the value of the assets with any degree of accuracy. Fortunately, Shoshone Falls in Southern Idaho is a major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

Transferability of Results to Similkameen Falls

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.

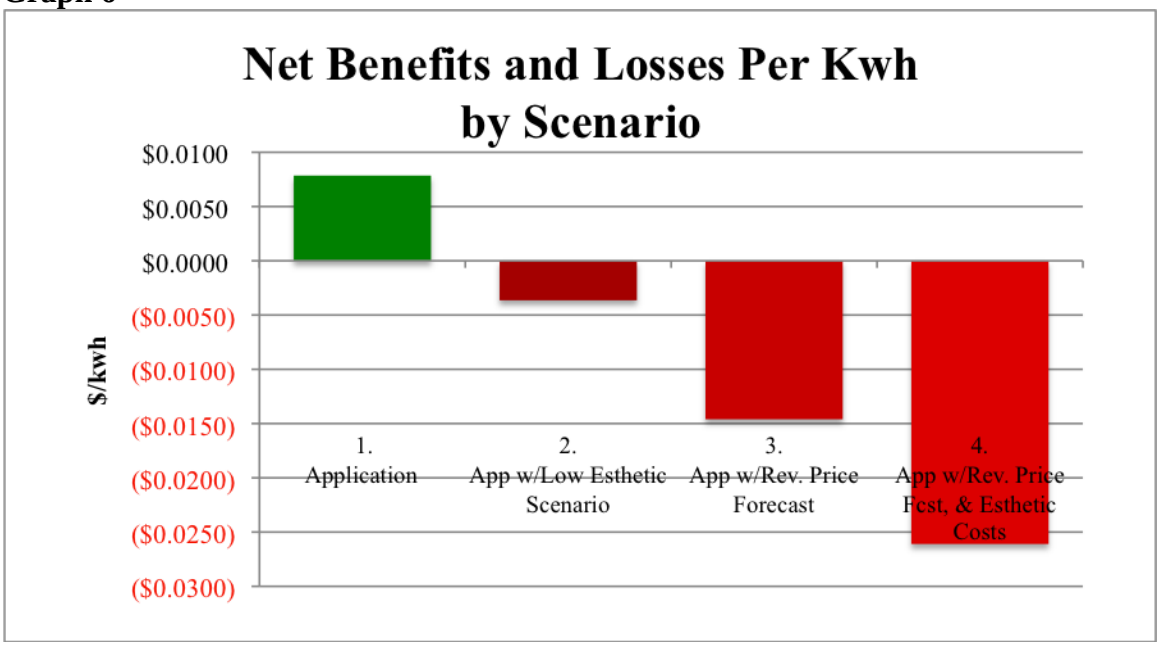
Table 7
Enloe Hydroelectric Project Estimated Annual Costs (2007 $)
(Original Cost Est., With the Addition of Esthetic Costs)

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

[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 Sold	$2,350.00 94		$2,500.00 100		$2,950.00 118		$2,575.00 103		$3,250.00 130
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 Sold	$2,625.00		$6,450.00		$8,275.00		$8,600.00		$9,825.00
	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**