Appendix E

May 30, 2014 Wanapum Hydroelectric Project Qualifying Upgrade Report

Avista Corporation

Introduction

This appendix provides details about the calculation of qualifying renewable energy output from incremental hydroelectric upgrades on the Company's share of the Priest Rapids Project.

Under certain circumstances, incremental electricity produced as a result of efficiency improvements completed after March 31, 1999 may qualify as an eligible renewable resource for purposes of compliance with Washington's Energy Independence Act, RCW 19.285.030(10)(b). Three methodologies may be used to calculate the amount of incremental hydro electricity associated with efficiency improvements. All of the acceptable methodologies consider the state of the hydroelectric project in question without the incremental improvements, then with the incremental improvements, and the resulting difference between the generation before and after the incremental improvements constitutes the amount of generation applicable to the Company's goals under the Energy Independence Act.

The accepted methodologies under Docket UE-110523 include:

1. "Annual calculation using hydroelectric model and actual inflows or generation;"
2. "One-time calculation of renewable electricity percentage using an historical period of inflow or generation;" or
3. "One-time calculation of renewable electricity using an historical period of inflow or generation."

Avista is utilizing the third method using historical inflows from 1978 through 1990. This method entails the use of historical inflow or generation based on a minimum of five years or up to the available inflow record of generation. Grant County PUD used this method for their Energy Independence Act filing.

Wanapum Fish Bypass

As part of the “meaning priority”, “surplus product”, and “surplus conversion” purchase from Grant County PUD, Avista receives all environmental attributes from the Priest Rapids Project, specifically the Wanapum Fish Bypass (see the attached letter from Grant PUD). To be consistent with the measurement of the incremental output of other qualifying hydroelectric upgrades for the Washington Energy Independence Act, included in Table 1 is the amount of incremental energy (MWh) from the hydro upgrade for each year from 1978 through 1990. Table 2 illustrates the quantity of qualifying incremental energy for the compliance periods 2012-2014. The supporting documentation for Table 1 is in the confidential work papers for this filing.

Table 1: Annual Incremental Energy (2013 qualifying year)

ear	MWh	aMW	Avista Share (%)	Avista aMW	Avista MWh
1978	636,912	72.71	3.93%	2.9	25,031
1979	542,431	61.92	3.93%	2.4	21,318
1980	556,316	63.51	3.93%	2.5	21,863
1981	640,905	73.16	3.93%	2.9	25,188
1982	367,366	41.94	3.93%	1.6	14,437
1983	669,846	76.47	3.93%	3.0	26,325
1984	479,623	54.75	3.93%	2.2	18,849
1985	552,878	63.11	3.93%	2.5	21,728
1986	558,930	63.8	3.93%	2.5	21,966
1987	513,807	58.65	3.93%	2.3	20,193
1988	524,156	59.84	3.93%	2.4	20,599
1989	544,703	62.18	3.93%	2.4	21,407
1990	665,327	75.95	3.93%	3.0	26,147
Average	**439,004**	**50.1**	**3.93%**	**2.5**	**21,927**

Table 2: Avista's share of qualifying MWh for 2012-2014

	2012	2013	2014
Avista Share	3.98%	3.93%	3.77%
Total (MWh)	22,206	21,927	21,146

The incremental energy is a result of an added fish bypass system, this new system lowers the required amount of flow spill during spring and summer months. Prior to the bypass system upgrade, 43 percent of the flow was spilled between April 21st and June 30th and 49 percent of the flow between July 1st and August 18th each year. With the new fish bypass system, the spill requirement is reduced to 22 percent of flow between April 21st and August 18th of each year.

Since this upgrade does not change the generation or turbine configuration, a simple H/K factor (measurement of energy per unit of flow) analysis is used to quantify the incremental energy from the fish bypass system on a monthly basis. The analysis maintains all license constraints, such as generation capacity limits and spill requirements.

Attachments

The following attachments to this document provide detailed information submitted to and received from the I-937 Technical Working Group concerning the Wanapum Hydroelectric development, as well as the letter from the Grant County Public Utility District concerning Avista's share of the qualified renewable energy generated at the Wanapum facility. Copies of the relevant contracts are included in the Company's confidential work papers.

Attachment A – Letter to the I-937 Technical Working Group
Attachment B – Response from the I-937 Technical Working Group
Attachment C – Grant County PUD Priest Rapids Project Purchased Attributes
Attachment D – Grand County PUD Calculation of Incremental Energy

Appendix E – Wanapum Hydroelectric Project Upgrade Report

Attachment A

Letter to the I-937 Technical Working Group

May 25, 2011

Rogers Weed
Washington State Department of Commerce
1011 Plum Street SE
PO Box 42525
Olympia, WA 98504-2525

Re: RCW 19.285 Compliance Requirements

Dear Mr. Weed:

Public Utility District No. 1 of Chelan County (Chelan PUD) and Public Utility District No. 2. of Grant County (Grant PUD) are currently evaluating and implementing key provisions of the Energy Independence Act of 2006 (RCW 19.285 or "the Act"). We have made preliminary determinations in accordance with rules promulgated by the Department of Commerce[1] in 2008 and would appreciate your guidance and confirmation concerning the potential eligibility of certain resources under the law.

Chelan and Grant PUDs recognize that the final authority for determining whether consumer-owned utilities have complied with RCW 19.285 rests with the Washington State Auditor[2]. The first audit of our compliance with the law's Renewable Portfolio Standard (RPS) requirement does not occur until after 2012 and after we must be in compliance. We believe it is not in the best interests of our customer-owners to defer decisions regarding our ability to comply with the law until the audit. Compliance with RCW 19.285 requires a significant investment of human and financial resources prior to deadlines contained in the Act, and therefore requires us to take action now. If certainty regarding past and future actions is not provided, unwarranted costs may be imposed on our customer-owners due to the potential that improvements made or to be made are determined to be non-compliant after the fact. We believe that Commerce could assist in providing some level of certainty. Chelan PUD and Grant PUD have or will be investing hundreds of millions of dollars for improvements to its hydroelectric facilities. As we prepare to document our compliance, we need additional assurance about the eligibility of certain hydropower improvements.

[1] The Department of Commerce was recognized as the Department of Community, Trade and Economic Development at the time of the rulemaking.
[2] RCW 19.285.060(1)(7). The Auditor is responsible for auditing compliance, and the attorney general is responsible for enforcement.

We believe you understand this issue well and have taken some steps to prepare for inquiries from utilities. The recently-updated State energy strategy[3] includes a potential "initiative" to offer some mechanism for pre-certification of eligible renewable resources to avoid the uncertainty inherent in the law. However, such mechanism does not exist and thus our only option is to turn directly to Commerce for the required certainty regarding the definitions and improvements made or to be made.

Under the Act, the Department of Commerce was required to adopt rules pertaining to the law. As authors of the rulemaking, we believe your department is uniquely positioned to offer informed advice as Chelan PUD and Grant PUD evaluate their ability to document compliance with the RPS.

Qualified Incremental Hydropower Efficiency Improvements

Chelan and Grant PUDs' questions center on the definitions of "incremental hydropower" and "qualified incremental hydropower efficiency improvements" under RCW 19.285.030(10)(b) and WAC 194-37-040(21), excerpted here:

> Statute:
> (10)(b) Incremental electricity produced as a result of efficiency improvements completed after March 30, 1999, to hydroelectric generation projects owned by qualifying utility … where the additional generation in either case does not result in new water diversions or impoundments.
>
> Rule:
> (21) "Qualified incremental hydropower efficiency improvements" means the installation or modification of equipment and structures, or operating protocols that increase the amount of electricity generated from the same amount of water. These may include rewinding of existing generators, replacing turbines with more efficient units and changing control systems to optimize electricity generation, and improvements to hydraulic conveyance systems that decrease head loss. They do not include additions to capacity by increasing pondage or elevation head, or diverting additional water into the project.

Specifically, Chelan PUD and Grant PUD seek clarification and confirmation regarding hydropower improvements that constitute "qualified incremental hydropower efficiency improvements." Examples of these improvements are provided in Appendices A (Chelan PUD) and B (Grant PUD). As described in the statute and regulations, "qualified incremental hydropower efficiency improvements" include the "installation or modification of equipment and structures" or "operating protocols" that increase the amount of electricity generated from the same amount of water. The WAC definition proceeds to illuminate that language by providing qualifying examples which "may" qualify. This list of examples is not exclusionary. Other types of hydropower efficiency improvements may qualify, should they increase the amount of energy

[3] Energy Strategy Update and 2011 Biennial Energy Report with Indicators, December 2010. pgs. 13-14 .

generated from the same amount of water and otherwise meet the definition of incremental hydropower in the law itself. Appendices A and B to this letter list incremental hydropower improvements Chelan PUD and Grant PUD have installed or plans to install to meet compliance requirements. In order to provide certainty and to ensure that customer dollars spent effectively, we are requesting that Commerce confirm that the listed improvements qualify under the statute and regulations.

To accurately determine the amount of their incremental hydropower, Chelan and Grant PUD believes it is first necessary to normalize water flows. As you know, water flows past any hydropower project can vary considerably from year to year. Indeed, the Commerce rules reflect this challenge since they include a minimum 10-year average baseline against which incremental gains must be measured.[4] Chelan PUD and Grant PUD will normalize their flows per this methodology.

Normalizing the water flows means we cannot simply measure actual increased (or decreased) generation in any one year against the baseline to determine what amount of renewable resource we have produced. Instead, it requires us to model output, taking into consideration the full "basket" of incremental hydropower types contemplated by the Act and its rules, and optimizing the output to develop a generation figure. We believe this approach is technically sound and can provide clear documentation while bundling the full range of "equipment" and structural" "modifications" and "operating protocols" contained in the law.

We seek your guidance and input on our approach. We have begun working with other stakeholders and the Auditor's Office about this approach as well. However, we continue to believe the unique technical expertise within your Department can assist us in reaching a resolution that provides additional certainty. Please do not hesitate to contact us with questions or requests for additional information.

Sincerely,

John Janney
General Manager
Chelan County PUD

Tim Culbertson
General Manager
Grant County PUD

Cc: Daniel Malarkey, Deputy Director, Department of Commerce
Tony Usibelli, Assistant Director, Energy Policy Division, Department of Commerce
Howard Schwartz, Energy Policy Analyst, Department of Commerce

[4] WAC 194-37-040(3).

Appendix A

1) *Replacement and rehabilitation of turbines, generators and transformers*

In 2006, the PUD completed a major upgrade of the 11-unit Rocky Reach Hydroelectric Project powerhouse. The upgrade began in 1995. Since the qualifying date of March 31, 1999 under RCW 19.285, Chelan PUD replaced five turbines and ten generators, along with replacements and upgrades of two transformers that resulted in efficiency increases. Optimization software was also installed on all units to improve generator and turbine configuration and loading, resulting in an even greater efficiency increase. The modernization program has resulted in improved and increased efficiency of the hydro plant. The end result is more power generation. In addition, the new turbine runners are "fish friendly." Due to the fact that many of these incremental efficiency gains were achieved prior to passage of the Act, documentation of the incremental hydropower efficiency improvements will need to be based on best available data. Documentation will be provided in the form of engineering studies, bid documents, model test reports, performance test reports, current meter tests, and other documentation. It is clear that the Act recognizes projects undertaken for reasons other than compliance with the Act must be considered given the look back to March 31, 1999 for qualifying projects.

2) *Structural improvement: juvenile fish bypass system*

A key component to protecting fish at the Rocky Reach Hydroelectric Project is the $112-million juvenile fish bypass system, which was approved by FERC in 2002 and completed in time for the juvenile fish spring migration in 2003. Again, it is clear that the Act recognizes that projects undertaken for reasons other than compliance with the Act must be considered given the look back to March 31, 1999 for qualifying projects.

Spilling water was not a satisfactory method for moving juvenile fish past the dam, since the deep river channel fish follow enters the powerhouse side of the dam rather than the spillgate side. The juvenile fish bypass system was constructed in response to endangered species concerns and the upcoming FERC relicensing process (which was subsequently completed in 2009). The one-of-a-kind fish passage system was tailored to the shape of the river flow and uses the tendency of the downstream migrating fish to congregate in a corner of the forebay near the entrance to the first two generating units. A system of underwater pumps creates a 6,000 cfs “river-within-a-river” that attracts juvenile fish while having minimal impact on power generation. A large surface collector guides fish through a dewatering process that leaves only 260 cfs to accompany them on a 4,600- foot journey around the dam via an 8-foot diameter pipe. The fish are returned to the river downstream in fast currents to help avoid attacks from predatory fish and birds. The same body of water (the river) is used and there is no additional diversion or impoundment. The system allows available river flows to be used for power generation rather than released as spill (e.g. more energy with the same amount of water passing the project). It also has an excellent record of fish survival.

Chelan PUD recognizes that an important factor in documenting structural efficiency improvements such as the juvenile fish bypass system is the establishment of baseline conditions. Chelan PUD intends to document baseline conditions by evaluating "pre-improvement"

conditions. Without the juvenile fish bypass system, for example, Chelan PUD was facing a potential regulatory requirement to maximize the use of spill (up to 40% of the daily average flow for up to 99% of the juvenile migration season for each salmonid species). The structural improvements preempted the need for imposition of this requirement as a mandatory condition or prescription in the new federal operating license issued for the Project in 2009. Moreover, it enabled Chelan PUD to more effectively pass juvenile fish around the dam and ensure compliance with Washington State total dissolved gas standards. Chelan PUD intends to document, as qualifying incremental hydropower, the generation preserved by spilling less than the 40% recommended in NOAA Fisheries' final environmental impact statement for the Rocky Reach Hydroelectric Project.[5]

3) *Structural improvement: track rack installation*

Trashracks are attached to the upstream pier nose structure of generating unit intakes to prevent large debris from entering the water passage and damaging the turbine or generator housing. At the Rock Island Hydroelectric Project, Chelan PUD has replaced trash racks to reduce head loss. For example, an increase of 1 foot in head has resulted in an increase in generation of 6.2Mwh. Chelan PUD has also initiated operational changes (i.e. more frequent cleaning of trash racks) to increase generation. Chelan PUD intends to document these increases using average water data.

[5] Anadromous Fish Agreements and Habitat Conservation Plans. Final environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects. Alternative 2, S.5.2.4, Rocky Reach Hydroelectric Project, p. S-19. Volume I FEIS, December 2002.

Appendix B

1) *Replacement and rehabilitation of turbines, generators and transformers*

In 2004, the Grant PUD began a major upgrade of the 10-unit Wanapum Hydroelectric Development powerhouse. At Wanapum, each of the 10 turbines will be replaced with new, advanced design turbines and all 10 generators will be replaced with higher capacity, more efficient generators to utilize the increased output of the new turbines. Since the qualifying date of March 31, 1999 under RCW 19.285, Grant PUD's entire replacement program of 10 turbines and 10 generators, along with replacements and upgrades of hydro facility stepup transformers, result in efficiency increases. The modernization program has resulted in improved and increased efficiency of the hydro plant resulting in more electricity generation. In addition, the new turbine runners allow Grant PUD to use its new turbines to help satisfy fish passage requirements. Documentation of the incremental hydropower efficiency improvements will need to be based on before and after improvements and engineering modeling results. Documentation will be provided in the form of engineering studies, model test reports, performance test reports, and other documentation. Following the completion of the upgrade work at Wanapum it is expected that a turbine and generator replacement project will be undertaken at the Priest Rapids Hydroelectric Development.

2) *Structural improvement: juvenile fish bypass system*

A key component of enhancing fish passage at the Wanapum Development is the fish bypass system. Construction began in the summer of 2005 and was completed in April 2008 for the juvenile fish spring migration. Prior to the completion of the fish bypass, Grant PUD was spilling up to 43% of river flow in the spring and 49% (these are maximum values, actual spill was lower because of TDG limitations) in the summer for fish passage which was not an efficient means for moving juvenile fish past the dam while generating electricity with a given amount of water. The juvenile fish bypass system was constructed as a more efficient means for moving juvenile fish past the dam and to allow more flow to go through the turbines to generate electricity. The same body of water (the river) is used and there is no additional diversion or impoundment. The system allows available river flows to be used for power generation rather than released as spill (e.g. more energy with the same amount of water passing the project). It also has an excellent record of fish survival. Grant PUD is currently installing a similar juvenile fish bypass at the Priest Rapids Hydroelectric Development.

Grant PUD recognizes the importance of documenting how structural efficiency improvements, such as the juvenile fish bypass system, increase the amount of electricity generated with the same amount of water. Therefore, Grant PUD has established baseline conditions by documenting "pre-improvement" conditions. Without the juvenile fish bypass system, for example, Grant PUD was facing a requirement to spill in the spring time up to 43% of the daily average flow or the total dissolved gas (TDG) limits, whichever is less. This structural improvement reduced the need for this spill requirement and it enabled Grant PUD to more effectively pass juvenile fish around the dam under compliance with Washington State total dissolved gas standards. Grant PUD will document the generation increase as a result of generating electricity with water that previously was required spill.

Appendix E – Wanapum Hydroelectric Project Qualifying Upgrade Report

Attachment B

Response from the I-937 Technical Working Group

Department of Commerce
Innovation is in our nature.

WASHINGTON UTC UTILITIES AND TRANSPORTATION COMMISSION

June 30, 2011

I-937 Technical Working Group
Analytic Guidance: Chelan PUD & Grant PUD qualified incremental hydropower efficiency improvements

John Janney
Chelan County PUD
327 N Wenatchee Ave.
Wenatchee, WA 98801

Tim Culbertson
Grant County PUD
P.O. Box 878
Ephrata, WA 98823

Mr. Janney and Mr. Culbertson:

On May 25, 2011, Chelan and Grant county public utility districts submitted a joint letter to Commerce requesting comment regarding compliance with RCW 19.285 and qualified incremental hydropower efficiency improvements. Earlier this year, Commerce, Washington Utilities and Transportation Commission staff and State Auditor staff convened the interagency I-937 Technical Working Group, comprised of staff representing Commerce and the UTC. On June 3, 2011, members of the TWG met to review your request.

Background
Your letter states, "In order to provide certainty and to ensure that customer dollars spent effectively, we are requesting that Commerce confirm that the listed improvements qualify under the statute and regulations."

Relevant definitions per RCW 19.285.030
(10) "Eligible Renewable Resource" means:
(b) Incremental electricity produced as a result of efficiency improvements completed after March 31, 1999, to hydroelectric generation projects owned by a qualifying utility and located in the Pacific Northwest or to hydroelectric generation in irrigation pipes and canals located in the Pacific Northwest, where the additional generation in either case does not result in new water diversions or impoundments.

Relevant definitions per WAC 194.37.040
(13) "Eligible renewable resource" means:
(b) Incremental electricity produced as a result of efficiency improvements completed after March 31, 1999, to a hydroelectric generation project owned by one or more qualifying utilities (see definition of qualifying utility in chapter 19.285 RCW) and located in the Pacific Northwest or to hydroelectric generation in irrigation pipes and canals located in the Pacific Northwest,

where the additional electricity generated in either case is not a result of new water diversions or impoundments.

(15) "Incremental hydropower" means the incremental amount of kilowatt-hours of electricity generated from a base or constant amount of water.

(21) "Qualified incremental hydropower efficiency improvements" means the installation or modification of equipment and structures, or operating protocols that increase the amount of electricity generated from the same amount of water. These may include rewinding of existing generators, replacing turbines with more efficient units and changing control systems to optimize electricity generation, and improvements to hydraulic conveyance systems that decrease head loss. They do not include additions to capacity by increasing pondage or elevation head, or diverting additional water into the project.

194-37-130 Documentation of Incremental Hydropower

(1) Utilities may count toward their annual renewable resource targets incremental power acquired from qualified incremental hydropower efficiency improvements made at the following facilities since 1999:
   (a) Hydropower facilities in the Pacific Northwest owned by a qualifying utility where the new generation does not result in new water diversions or impoundments.
   (b) Hydroelectric generation facilities in irrigation pipes and canals located in the Pacific Northwest, where the additional generation does not result in new water diversions or impoundments.

(2) The utility shall calculate renewable resource power from incremental hydropower as the increase in annual megawatt-hours of generation attributable to the qualified incremental hydropower efficiency improvements under average water generation.

(3) The increase in annual megawatt-hours of generation attributable to the qualified incremental hydropower efficiency improvements shall be documented by engineering studies or with before and after generation data. The documentation shall clearly explain:
   (a) Where the facility is located;
   (b) When the improvements were made;
   (c) How the amount of generation in "average water generation" was calculated;
   (d) What other factors may have caused an increase in electricity production and how the amount "attributable to the qualified improvements" was extracted from the total increase;
   (e) How and why the "qualified improvements" increased hydropower production; and
   (f) How the utility came to acquire the incremental output associated with the qualified improvements.

TWG Analysis and Response

The TWG offers analytic guidance to provide more clarity on issues related to I-937; however, the guidance does not represent pre-qualification under I-937, nor does it represent a legal opinion. This guidance contains staff opinions based solely on facts presented in your letter and assumes those facts to be true and correct. Agency staff reserve the right to change their opinion should additional information come to their attention. These views are solely those of the agency staff and cannot be considered to be

binding in any formal proceeding on this matter. It is incumbent on the stakeholder using this process to make their case to the State Auditor or UTC, as appropriate.

Based on analysis of information you provided, the TWG found:

Chelan County PUD (Appendix A)

Replacement and rehabilitation of turbines, generators and transformers: These modifications are qualified as incremental hydropower efficiency improvements, but consider the following:

- Completion date is the point at which you can begin counting energy savings generated from the qualified improvements.
- Referring to the documentation requirements from 194-37-130 (3)(d) above, you need to be ready to document attribution of the qualified improvements. Remember that you must subtract other factors—not directly related to the qualified improvements, such as water year conditions —that may have caused an increase in electricity production.

Juvenile fish bypass system: This is a qualified incremental hydropower efficiency improvement based on the following:

- As described, the fish bypass is an efficiency improvement that does not result in new water diversions or impoundments. The amount of water used by the facility does not change. The fraction of existing water that is used for fish migration is reduced and made available for power generation.
- Re-allocating water resources from one use within the project to another is not a new diversion. We assume the "project" is defined as the historic footprint of the dam site across the river and therefore diversion does not occur inside that project envelope. The rerouting of water within the project envelope is an operational change not a new diversion of water.

Trash rack installation: This is a qualified incremental hydropower efficiency improvement; however, consider the following:

- Refer to WAC 194.37.040 (21). You need to document why the trash rack structural improvement minimizes head loss and make a clear case for the efficiency improvement. It is not clear to the TWG that increasing the frequency of trash rack cleaning is an efficiency improvement. A solid case would need to be made that this goes beyond good standard practice. Engineering studies and reports would be useful in making your case for the before and after structural improvements resulting in energy efficiency.

Grant County PUD (Appendix B)

Replacement and rehabilitation of turbines, generators and transformers: Same as Chelan County above. These modifications are qualified as incremental hydropower efficiency improvements, but consider the following:

- Completion date is the point at which you can begin counting energy savings generated from the qualified improvements.
- Referring to the documentation requirements from 194-37-130 (3)(d) above, you need to be ready to document attribution of the qualified improvements. Remember that you must subtract

other factors—not directly related to the qualified improvements, such as water year conditions —that may have caused an increase in electricity production.

Juvenile fish bypass system: Same as Chelan County above. This is a qualified incremental hydropower efficiency improvement based on the following:

- As described, the fish bypass is an efficiency improvement that does not result in new water diversions or impoundments. The amount of water used by the facility does not change. The fraction of existing water that is used for fish migration is reduced and made available for power generation.
- Re-allocating water resources from one use within the project to another is not a new diversion. We assume the "project" is defined as the historic footprint of the dam site across the river and therefore diversion does not occur inside that project envelope. The rerouting of water within the project envelope is an operational change not a new diversion of water.

If you have questions, please contact Meg O'Leary at meg.oleary@commerce.wa.gov or (360) 725-3121.

Thank you,

Tony Usibelli, Director, State Energy Office
WASHINGTON STATE DEPARTMENT OF COMMERCE

Mike Parvinen, Energy Assistant Director
WASHINGTON UTILITIES & TRANSPORTATION COMMISSION

Appendix E – Wanapum Hydroelectric Project Upgrade Report

Attachment C

Grant County PUD Priest Rapids Project Purchased Attributes

Grant County
PUBLIC UTILITY DISTRICT
Excellence in Service and Leadership

April 16, 2012

Dick Storro, Vice President Energy Resources
Avista Corp.
1411 E. Mission
Spokane, WA 99220

Subject: Priest Rapids Project Purchased Attributes

Dear Mr. Storro,

You have requested a letter which indicates that Avista, through their purchase power agreements with Public Utility District No. 2 of Grant County (GCPUD), receives a percentage of the Washington Energy Independence Act qualified incremental hydroelectric generation efficiency improvements produced at the Priest Rapids Project (PRP), which includes the Priest Rapids and Wanapum dams. The qualified incremental hydroelectric generation at Wanapum includes the juvenile fish bypass system completed in 2003.

Avista and GCPUD have entered into three separate power sales contracts relating to the output of the PRP. These contracts include the Priest Rapids Project Product Sales Contract, Contract for Meaningful Priority Sale of Priest Rapids Project Output and the Additional Products Sales Agreement. The Product Sales and Additional Products contracts were later amended through Amendment No. 2 to the Priest Rapids Project Product Sales Contract and Termination of Additional Product Sales Agreement.

The significance of the termination of the Additional Products agreement is that it provided the right to purchase an additional amount of Surplus Product (i.e., Additional Surplus Product). The Surplus Product is an amount of Priest Rapids Project Output (see definition below)

> *"Priest Rapids Project Output" shall mean the amount of capacity, energy (both firm and non-firm), pondage, reactive power, ancillary services and <u>any other product</u> from the Priest Rapids Development from November 1, 2005 to November 1, 2009 and from the Priest Rapids Project from November 1, 2009 through the term of this contract under the operating conditions which exist during the term, including periods when the Priest Rapids Project may be wholly or partially inoperable for any reason, after correction for encroachment, Canadian Entitlement, station service and project use, and depletions required by the FERC License or other regulatory requirements.* (Underline added)

The Meaningful Priority contract has a similar definition of Priest Rapids Project Output, but since it is only a one year contact the definition does not include provisions needed in the long term agreements (see definition below).

> *"Priest Rapids Project Output" or "PRPO" shall mean: i) the amount of capacity, energy (both firm and non-firm), pondage, reactive power, ancillary services and any other product produced by the Priest Rapids Project, after correction of encroachment, Canadian entitlement, station and project use, and depletions required by the FERC License or other regulatory requirements.* (underline added)

GCPUD regards any incremental hydroelectric energy produced by PRP to be included in *any other product* and, therefore, Avista is entitled to its percentage of the qualified incremental hydroelectric energy produced at Wanapum Dam, one of the two dams in the Priest Rapids Project.

The amount of Priest Rapids Project Output Avista receives for 2012 includes 0.22% Surplus Product, 0.46% Additional Surplus Product and 3.30% Meaningful Priority for a total of 3.98%.

Should you have any questions please do not hesitate to contact me via phone (509-754-5002) or email (Kknitte@gcpud.org).

Sincerely,

Keith Knitter
Manager of Resource Planning

Appendix E – Wanapum Hydroelectric Project Qualifying Upgrade Report

Attachment D

Grant County PUD Calculation of Incremental Energy

						Before WFUFB						After WFUFB									
Year	Month	Days	Monthly Average Flow cfs	Monthly Average Flow kcfs	Maximum Power-house Flow	Spill Percent	Spill kcfs	Turbine Flow kcfs	H/K	Net Generation MWa	Net Generation MWH	Spill kcfs	Turbine Flow kcfs	H/K	Net Generation MWa	Net Generation MWH	Incremental Generation MWH	Annual Incremental Generation MWa	13 year Average Incremental Generation	Year	Annual MWh
1978	4	10	148132	148.13	143.47	43%	63.7	84.4	5.62	474.3	113,822	22	126.1	5.62	708.5	170,031	56,209			78	
	5	31	135346	135.35	142.89	43%	58.2	77.1	5.65	436.1	324,447	22	113.3	5.65	640.7	476,683	152,236				
	6	30	157865	157.87	143.90	46%	65.0	92.9	5.59	519.1	373,735	22	135.9	5.59	759.4	546,788	173,053				
	7	31	158180	158.18	143.92	49%	65.0	93.2	5.59	520.8	387,441	22	136.2	5.59	761.1	566,235	178,794				
	8	18	108079	108.08	141.66	49%	53.0	55.1	5.73	315.8	136,418	22	86.1	5.73	493.1	213,039	76,620	72.71			636912
1979	4	10	74119	74.12	140.14	43%	31.9	42.2	5.82	246.1	59,053	22	52.1	5.82	303.5	72,851	13,798			79	
	5	31	134152	134.15	142.84	43%	57.7	76.5	5.66	432.5	321,775	22	112.2	5.66	634.3	471,941	150,166				
	6	30	154408	154.41	143.75	46%	65.0	89.4	5.60	500.6	360,445	22	132.4	5.60	741.4	533,798	173,353				
	7	31	113434	113.43	141.90	49%	55.6	57.9	5.71	330.6	245,938	22	91.4	5.71	522.5	388,705	142,767				
	8	18	96008	96.01	141.12	49%	47.0	49.0	5.76	282.2	121,897	22	74.0	5.76	426.5	184,245	62,348	61.92			542431
1980	4	10	122808	122.81	142.33	43%	52.8	70.0	5.69	398.1	95,555	22	100.8	5.69	573.4	137,609	42,054			80	
	5	31	161807	161.81	144.08	43%	65.0	96.8	5.58	540.0	401,791	22	139.8	5.58	779.9	580,260	178,469				
	6	30	171899	171.90	144.54	46%	65.0	106.9	5.55	593.3	427,190	27	144.5	5.55	802.2	577,593	150,403				
	7	31	104998	105.00	141.52	49%	51.4	53.5	5.74	307.2	228,589	22	83.0	5.74	476.2	354,300	125,711				
	8	18	93767	93.77	141.02	49%	45.9	47.8	5.77	275.9	119,182	22	71.8	5.77	414.0	178,861	59,679	63.51			556316
1981	4	10	107996	108.00	141.66	43%	46.4	61.6	5.73	352.7	84,643	22	86.0	5.73	492.7	118,245	33,603			81	
	5	31	171465	171.47	144.52	43%	65.0	106.5	5.55	591.0	439,734	27	144.5	5.55	802.3	596,896	157,162				
	6	30	155384	155.38	143.79	46%	65.0	90.4	5.60	505.8	364,202	22	133.4	5.60	746.5	537,471	173,268				
	7	31	167591	167.59	144.34	49%	65.0	102.6	5.56	570.6	424,561	23	144.3	5.56	802.9	597,341	172,780				
	8	18	152878	152.88	143.68	49%	65.0	87.9	5.60	492.4	212,730	22	130.9	5.60	733.4	316,821	104,091	73.16			640905
1982	4	10	114029	114.03	141.93	43%	49.0	65.0	5.71	371.3	89,107	22	92.0	5.71	525.7	126,168	37,060			82	
	5	31	152815	152.82	143.68	43%	65.0	87.8	5.60	492.1	366,115	22	130.8	5.60	733.1	545,389	179,274				
	6	30	216898	216.90	146.56	46%	65.0	146.6	5.42	795.0	572,390	70	146.6	5.42	795.0	572,390	-				
	7	31	199419	199.42	145.77	49%	65.0	134.4	5.47	735.7	547,365	54	145.8	5.47	797.9	593,603	46,238				
	8	18	139374	139.37	143.07	49%	65.0	74.4	5.64	419.6	181,254	22	117.4	5.64	662.1	286,048	104,794	41.94			367366
1983	4	10	138899	138.90	143.05	43%	59.7	79.2	5.64	446.7	107,218	22	116.9	5.64	659.6	158,309	51,091			83	
	5	31	157933	157.93	143.91	43%	65.0	92.9	5.59	519.4	386,462	22	135.9	5.59	759.8	565,278	178,816				
	6	30	143491	143.49	143.26	46%	65.0	78.5	5.63	441.9	318,161	22	121.5	5.63	684.0	492,461	174,299				
	7	31	170578	170.58	144.48	49%	65.0	105.6	5.55	586.4	436,265	26	144.5	5.55	802.4	596,998	160,733				
	8	18	137198	137.20	142.97	49%	65.0	72.2	5.65	407.7	176,141	22	115.2	5.65	650.6	281,048	104,907	76.47			669846
1984	4	10	131844	131.84	142.73	43%	56.7	75.2	5.66	425.5	102,129	22	109.8	5.66	622.0	149,276	47,147			84	
	5	31	113634	113.63	141.91	43%	48.9	64.8	5.71	370.1	275,329	22	91.6	5.71	523.5	389,517	114,187				
	6	30	193199	193.20	145.49	46%	65.0	128.2	5.49	703.9	506,804	48	145.5	5.49	798.9	575,176	68,372				
	7	31	132328	132.33	142.75	49%	64.8	67.5	5.66	382.1	284,246	22	110.3	5.66	624.6	464,684	180,438				
	8	18	102021	102.02	141.39	49%	50.0	52.0	5.75	299.0	129,153	22	80.0	5.75	459.8	198,632	69,479	54.75			479623
1985	4	10	132168	132.17	142.75	43%	56.8	75.3	5.66	426.5	102,364	22	110.2	5.66	623.7	149,693	47,329			85	
	5	31	120890	120.89	142.24	43%	52.0	68.9	5.69	392.3	291,869	22	98.9	5.69	563.0	418,866	126,997				
	6	30	161629	161.63	144.07	46%	65.0	96.6	5.58	539.1	388,150	22	139.6	5.58	779.0	560,877	172,727				
	7	31	117423	117.42	142.08	49%	57.5	59.9	5.70	341.5	254,089	22	95.4	5.70	544.2	404,870	150,781				
	8	18	89887	89.89	140.84	49%	44.0	45.8	5.78	265.0	114,465	22	67.9	5.78	392.4	169,509	55,044	63.11			552878
1986	4	10	141963	141.96	143.19	43%	61.0	80.9	5.63	455.9	109,417	22	120.0	5.63	675.9	162,212	52,795			86	
	5	31	104572	104.57	141.51	43%	45.0	59.6	5.74	342.1	254,498	22	82.6	5.74	473.9	352,555	98,057				
	6	30	153782	153.78	143.72	46%	65.0	88.8	5.60	497.3	358,034	22	131.8	5.60	738.1	531,441	173,407				
	7	31	124411	124.41	142.40	49%	61.0	63.4	5.68	360.6	268,286	22	102.4	5.68	582.0	433,028	164,742				

						Before WFUFB						After WFUFB									
Year	Month	Days	Monthly Average Flow cfs	Monthly Average Flow kcfs	Maximum Power-house Flow	Spill Percent	Spill kcfs	Turbine Flow kcfs	H/K	Net Generation MWa	Net Generation MWH	Spill kcfs	Turbine Flow kcfs	H/K	Net Generation MWa	Net Generation MWH	Incremental Generation MWH	Annual Incremental Generation MWa	13 year Average Incremental Generation	Year	Annual MWh
	8	18	102402	102.40	141.41	49%	50.2	52.2	5.74	300.0	129,611	22	80.4	5.74	461.9	199,541	69,929	63.80			558930
1987	4	10	90178	90.18	140.86	43%	38.8	51.4	5.78	297.1	71,293	22	68.2	5.78	394.0	94,561	23,269			87	
	5	31	156461	156.46	143.84	43%	65.0	91.5	5.59	511.6	380,621	22	134.5	5.59	752.1	559,569	178,948				
	6	30	179255	179.26	144.87	46%	65.0	114.3	5.53	631.8	454,892	34	144.9	5.53	801.1	576,768	121,876				
	7	31	112240	112.24	141.85	49%	55.0	57.2	5.72	327.3	243,492	22	90.2	5.72	515.9	383,853	140,362				
	8	18	85144	85.14	140.63	49%	41.7	43.4	5.79	251.6	108,674	22	63.1	5.79	365.8	158,028	49,354	58.65			513807
1988	4	10	75976	75.98	140.22	43%	32.7	43.3	5.82	252.0	60,478	22	54.0	5.82	314.1	75,378	14,900			88	
	5	31	106624	106.62	141.60	43%	45.8	60.8	5.73	348.4	259,232	22	84.6	5.73	485.2	360,954	101,722				
	6	30	133671	133.67	142.82	46%	61.5	72.2	5.66	408.4	294,018	22	111.7	5.66	631.8	454,866	160,848				
	7	31	127035	127.04	142.52	49%	62.2	64.8	5.68	367.7	273,591	22	105.0	5.68	596.2	443,549	169,959				
	8	18	108169	108.17	141.67	49%	53.0	55.2	5.73	316.0	136,526	22	86.2	5.73	493.6	213,253	76,726	59.84			524156
1989	4	10	120837	120.84	142.24	43%	52.0	68.9	5.69	392.1	94,112	22	98.8	5.69	562.7	135,049	40,937			89	
	5	31	124202	124.20	142.39	43%	53.4	70.8	5.68	402.4	299,377	22	102.2	5.68	580.9	432,189	132,812				
	6	30	161205	161.21	144.05	46%	65.0	96.2	5.58	536.8	386,529	22	139.2	5.58	776.8	559,293	172,764				
	7	31	112258	112.26	141.85	49%	55.0	57.3	5.72	327.3	243,528	22	90.3	5.72	516.0	383,926	140,398				
	8	18	92186	92.19	140.95	49%	45.2	47.0	5.77	271.4	117,261	22	70.2	5.77	405.2	175,053	57,792	62.18			544703
1990	4	10	160183	160.18	144.01	43%	65.0	95.2	5.58	531.4	127,540	22	138.2	5.58	771.5	185,157	57,617			90	
	5	31	152558	152.56	143.67	43%	65.0	87.6	5.60	490.7	365,091	22	130.6	5.60	731.7	544,388	179,297				
	6	30	163155	163.16	144.14	46%	65.0	98.2	5.57	547.2	393,978	22	141.2	5.57	786.9	566,572	172,595				
	7	31	169879	169.88	144.44	49%	65.0	104.9	5.56	582.7	433,530	25	144.4	5.56	802.5	597,079	163,549				
	8	18	121484	121.48	142.27	49%	59.5	62.0	5.69	352.6	152,334	22	99.5	5.69	566.2	244,602	92,268	75.95			665327
	4																39,831	0.07			557938
	5																148,319	0.27			
	6																145,151	0.26			
	7																149,019	0.27			
	8																75,618	0.14			

	Monthly Flow -cfs											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	82311	70975	80623	148132	135346	157865	158180	108079	100645	94787	88436	80385
1979	79258	63142	94112	74119	134152	154408	113434	96008	69167	74074	92134	76882
1980	104915	70464	90858	122808	161807	171899	104998	93767	64856	75162	89182	130431
1981	194877	150807	88440	107996	171465	155384	167591	152878	77779	83610	91316	106246
1982	148649	157990	122646	114029	152815	216898	199419	139374	96944	91515	84254	108291
1983	151502	133582	123273	138899	157933	143491	170578	137198	79206	75381	112861	93433
1984	148138	99511	102833	131844	113634	193199	132328	102021	64901	78201	78673	83748
1985	111770	69673	60941	132168	120890	161629	117423	89887	60906	64833	88353	100178
1986	122991	113806	133778	141963	104572	153782	124411	102402	60069	67256	80283	88097
1987	93545	61960	82803	90178	156461	179255	112240	85144	68717	76740	94573	81528
1988	67139	67531	66906	75976	106624	133671	127035	108169	73006	80030	88153	89285
1989	85870	71850	56701	120837	124202	161205	112258	92186	67367	73804	92395	124549
1990	178046	128677	89370	160183	152558	163155	169879	121484	69592	79502	125867	126463