BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-01______

DIRECT TESTIMONY OF CLINT KALICH
REPRESENTING AVISTA CORPORATION

I. INTRODUCTION

Q. Please state your name, the name of your employer, and your business address.

A. My name is Clint Kalich. I am employed by Avista Corporation at 1411 East Mission Avenue, Spokane, Washington.

Q. In what capacity are you employed?

A. I am the Manager of Power Supply Analysis working in the Energy Resources Department of Avista Utilities.

Q. Please state your educational background and professional experience.

A. I graduated from Central Washington University in 1991 with a Bachelor of Science Degree in Business Economics. Shortly after graduation I accepted an analyst position with Economic and Engineering Services, Inc. (now EES Consulting, Inc.), a leading northwest management-consulting firm located in Bellevue, Washington. Working primarily for municipalities, public utility districts, and cooperatives in the area of electric utility management, my specific areas of focus were economic analyses around new resource development, rate case proceedings in front of the Bonneville Power Administration, integrated (least-cost) resource planning, and demand-side management program development. In late 1995 I left Economic and Engineering Services, Inc. to join Tacoma Power in Tacoma, Washington. First as a Utilities Economist, then as a Senior Utilities Economist, and finally promoted to the position of Power Analyst with the municipality, I provided key analytical and policy support in the areas of resource development, procurement, and optimization, hydroelectric operations and re-licensing, unbundled power supply rate-making, contract negotiations, and system operations. I helped develop, and ultimately managed, Tacoma Power's industrial market access program serving one-quarter of the company's retail load. In mid-2000 I joined Avista Utilities as a Senior Power Resource Analyst. Early in 2001 I was promoted to my current capacity. I assist the company in the areas of resource analyses, dispatch modeling, resource procurement, and rate case proceedings. Much of my career has involved resource dispatch modeling of the nature described in this testimony.

Q. What is the scope of your testimony in this proceeding?

A. My testimony will describe the Company's new Hourly Prosym Model, including key inputs, assumptions, and results. A table of contents for my testimony is as follows:

Q. Are you sponsoring exhibits in this proceeding?

A. Yes. I am sponsoring one exhibit marked as Exhibit No. ___ (CGK-1). All information contained in the exhibit was prepared under my supervision and direction.

II. EXECUTIVE SUMMARY

Q. Please provide an overview of your direct testimony.

A. My testimony will describe the new hourly dispatch model developed by the Company, and its advantages in determining normalized costs relative to the monthly model used in previous filings before this Commission. I will explain the Company's experience using the new model and how it dispatches resources, including hydroelectric projects.

I will explain how model dispatch is performed against weather-adjusted 2000 retail loads. To permit an hourly dispatch, the monthly loads are shaped using the Company's hourly recording of loads on its system in 2000.

Key drivers of the dispatch decisions are the market prices assumed for natural gas and electricity. I will describe how market price forecasts were developed for the proforma period, and how the wholesale market prices are shaped hourly based on a study by R.W. Beck. I will explain that five price scenarios were used to account for varying water years of the study.

Proforma fuel costs, project generation, and market purchases and sales expenses and revenues were averaged over the full hydroelectric record to derive an average value for inclusion in the proforma power supply expense.

The Commission has ordered the Company to quantify a normalized capacity value in this case. I will explain that the new hourly dispatch model accounts for capacity costs as it dispatches resources. I will show how the Company is able to identify approximately $714,000 of capacity costs associated with carrying reserves by running a model scenario without reserves, and comparing that result to the model run inclusive of reserves.

Finally, I will explain how the model dispatches resources in a manner that maximizes benefits to customers. The model's goal specifically is to minimize overall system operating costs. Thermal resources are dispatched only when the wholesale marketplace exceeds their variable costs. Hydroelectric generation is used to reduce loads during peak hours when prices are the highest, and the on- and off-peak hydroelectric generation levels compare well with the 5-year average split of actual hydroelectric generation. All surplus sales revenues are credited directly to reduce the normalized power supply expense.

III. THE PROSYM HOURLY DISPATCH MODEL

Q. Please provide an explanation of what the new dispatch model is and how it compares to the Company's previous tool.

A. Throughout the remainder of my testimony I will refer to the new dispatch model used in this proceeding as the "Prosym Hourly Dispatch Model," or more simply, the "Prosym Model." Where references to the monthly dispatch model used by the Company in previous proceedings are made, I will us the name "Monthly Dispatch Model."

The Prosym Hourly Dispatch Model is a computer software program and data set, which simulate the Company's resource portfolio and its operations. Operating the Prosym Model over the full hydroelectric record allows for the normalization of power supply revenues and expenses that are dependent on hydrology and market prices. However, this explanation must be broadened to encompass the Prosym Model's many facets.

Q. Please describe these facets.

A. The facets can be explained best in the following order: 1) a history of the Prosym Model; 2) the Company's experience with the Prosym Model; 3) the mechanics of the Prosym Model; and, 4) an explanation of the Prosym Model's enhancements relative to the Company's previous Monthly Dispatch Model. The first two facets will be described later in this section. The last two are explained in Sections IV and V of my testimony.

Q. Please provide a history of the Prosym Model?

A. The Prosym™ market simulation engine which serves as the basis for the Company's Prosym Model has been in existence since the mid-1980's. According to Henwood Energy Services, the software's developer, Prosym™ is the world's leading hourly simulation modeling tool. It presently is used by more than 120 companies on five continents. Prosym™ has a market penetration of eighty percent in deregulated markets worldwide. Additional information on Prosym™ is included as pages 1 and 2 of Exhibit ___ (CGK-1).

Q. What is the Company's experience using the Prosym Model?

A. The Company first purchased Prosym™ in 1994 to evaluate relicensing alternatives for the Clark Fork River projects. Based on this experience, the Company purchased a Prosym™ license in the summer of 1999 for resource planning purposes and began modeling its loads and obligations within it. One of the first official analyses performed by the Company using Prosym™ was a determination of hydro dispatch flexibility on the Clark Fork River System. The results of that analysis were filed with the Commission in 2000.

On or about July 12, 2000 the Company filed its *Update to the 1997 Integrated Resource Plan* (2000 IRP). Many analyses contained within that document were derived from or based on Prosym Model runs. Although the 2000 IRP contained forecast data through 2009, the document provided a detailed discussion of the Company's load and resource balance in the year 2004 based on results generated by the Prosym Model. The results of that study were attached to the 2000 IRP as Appendix E. The studies completed for the 2000 IRP were performed in much the same manner as studies for this rate case proceeding. The full hydrological record was run against forecasted 2004 loads to determine net system requirements. The critical water year result was highlighted.

More recently the Company evaluated responses to its 2000 Request for Proposals using the Prosym Model. The Model provided a uniform means to evaluate responses with differing terms and operational flexibility. The results from the Prosym Model were key to defining the true economic impacts that customers might see were the Company to pursue each bid.

The Company continues to use Prosym™ in various studies where dispatch flexibility is crucial in determining the value of resources and contracts.

Q. What efforts has the Company made to familiarize Commission Staff with the new Prosym Model?

A. At approximately the same time the Company purchased Prosym™ for its own use, it purchased an additional license to allow WUTC Staff to run the model. In September 1999 the Company met with Commission Staff and delivered the software. Since that time, the Company has continued to pay those license fees necessary to enable the Commission Staff to use Prosym™, and have technical support from Henwood Energy Services, Inc.

In addition to software and technical support, the Company has provided various data sets representing the Company's loads and resources that are necessary to operate Prosym™. In addition to the data sets that initially were delivered to the Commission, new sets were provided with each relevant analysis presented. For example Commission Staff, on various occasions during the 2000 RFP process, was provided the latest Prosym Model data sets describing how the Company modeled the responses.

Prior to this rate filing, and in anticipation of this rate case, the Company hired Henwood Energy Services, Inc. to run a customized one-week training session at Avista's offices. The goal was two-fold: enhance the Company's understanding of Prosym™, and provide an opportunity for Commission Staff in both Washington and Idaho to become more familiar with the tool. Three staff members from the Washington Commission attended the training session. Additionally, and just prior to this filing, the Company met with Commission Staff and shared drafts of the data files that are being used to support this case.

Q. Why did the Company choose to make the Prosym software license available to Commission Staff and provide training?

A. Analyzing today's energy marketplace is a complex business. We believe that better decisions, both inside and outside of this proceeding, will be made on behalf of our customers where the Commission Staff and the Company can openly discuss the methods and tools being used in resource planning efforts and dispatch decisions. Because the Prosym Model has become such an important component of the Company's planning studies, it is in our interest to enhance the understanding of its capabilities.

IV. KEY ADVANTAGES OF PROSYM™ HOURLY DISPATCH MODEL OVER PREVIOUS MODEL

Q. Before we begin, will you please provide a concise summary of the key advantages of the new Prosym Model over the old Monthly Dispatch Model?

A. Yes. Conceptually, the Prosym Model is quite similar to the Monthly Dispatch Model. However, by considering resource dispatch on an hourly basis, the Prosym Model is able much more accurately estimate system operations. The following is a short list of the more significant advantages of the Prosym Model.

1) Hydroelectric Dispatch – the Prosym Model uses hydroelectric projects to "peak shave" loads as in actual operations. A majority this generation is shifted to the on-peak hours where its value to customers is the highest.

2) Reserves Modeling – the Prosym Model is able to model reserves for spinning, non-spinning, and load following. The Monthly Dispatch Model was not able to quantify reserve costs.

3) On- versus Off-Peak Pricing – because the Prosym Model makes hourly dispatch decisions, hourly prices may be used to drive these choices. Thermal resources can be dispatched only when their variable costs are lower than equivalent purchases from the marketplace. Hydroelectric generation no longer is valued against the average monthly price, but against market prices that reflect true supply and demand conditions (i.e., prices are higher during the day than the night, and during the summer when compared to the spring runoff period). The ability to consider hourly pricing probably is the greatest enhancement of the Prosym Model relative to its predecessor.

4) Thermal Project Physical Constraints – the Company's various thermal plants each have their own characteristics. For example, some plants can "ramp up" to meet

loads instantaneously, while others require a period of many hours. Once most plants come on-line, they must remain up for a number of hours.

Q. Why is the Company proposing the use of the Prosym Hourly Dispatch Model in this proceeding?

A. In 1999 the Company recognized that traditional monthly analysis no longer was going to be adequate for making resource and planning decisions. As explained above, Prosym was identified as an alternative to consider intra-month dispatch of its resources. Over the past two years the Company has endeavored to develop the Hourly Prosym Dispatch Model into a viable tool capable of being used in proceedings such as this.

In addition, the Commission, in its Third Supplemental Order, in Docket No. UE-991606, required the Company to use hourly dispatch modeling in its next general rate case.

The Prosym Model operates the Company's resource portfolio to meet retail load on the more granular basis of one hour. The Prosym Model reviews loads and resources in every hour and appropriately balances the system at all times, not just on an average monthly basis. These decisions allow the Prosym Model to accurately reflect the true flexibility inherent in the Company's resource portfolio to the benefit of customers. For example, between January 1997 and October 2001, the Company's hydroelectric projects (including its Mid-Columbia contracts) generated approximately 68 percent of their actual total energy output during on-peak hours. On-peak hours represent approximately 57 percent of the calendar year. On average the Company was able to shift generation from the lower-valued off-peak periods to the on-peak periods, benefiting its customers. As I will explain later in this testimony, the Prosym Model operates the

Company's hydroelectric system such that 66.4% of the energy is shaped into the on-peak hours, which is representative of actual results.

Q. Does the Prosym Model more accurately reflect forced outages and scheduled maintenance relative to its predecessor?

A. Yes it does. The Prosym Model randomly removes the project from the Company's generation portfolio at a rate that equals the forced outage value applied to the resource. Prosym enables the resource availability rate to be addressed in each hour, not just on a monthly average basis. Maintenance also is scheduled to occur when it is actually planned.

Q. Are there other advantages of the new Prosym Model?

A. Yes. The Prosym Model includes a number of routines that allow it to more accurately "operate" the Company's portfolio of resources relative to the Monthly Dispatch Model. The first of these enhancements is that the Prosym Model calculates, based on minimizing system costs, when projects operate. Based on the criteria specified in the Prosym Model, each resource is dispatched in the appropriate way. For example the Prosym Model, as with actual operations, dispatches hydroelectric resources to serve peak load requirements and flatten the retail load shape. Certain contracts are "must run" in that they cannot be displaced for economic or other reasons. Thermal resources are specified for "economic" dispatch, and run only when their operating costs are lower than the wholesale energy market price.

A second enhancement of the new Prosym Model is its ability to better represent the specifics of portfolio resources. For example, a combustion turbine might be able to generate fifty megawatts; however, actual operations will not allow the unit to cycle on an hour-to-hour basis. By specifying a "minimum up" period, the Prosym Model is able to dispatch resources more in-line with actual operations. A number of Company resources have minimum up limitations. Colstrip has a minimum up requirement of 72 hours to reflect the nature of its operations. The Rathdrum and Northeast units must remain on for at least eight hours. The new Coyote Springs project is modeled with a 16-hour minimum up period.

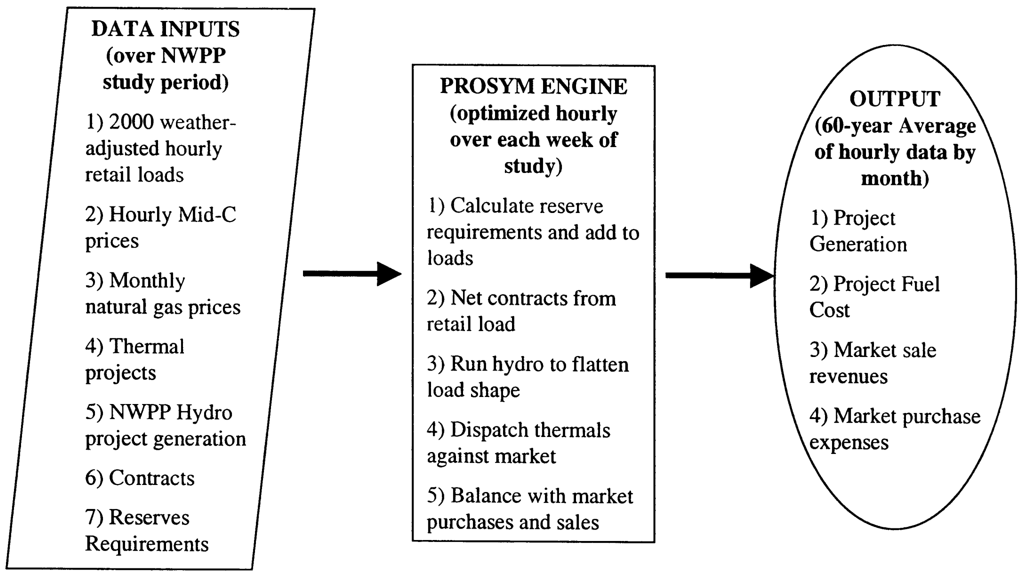
Finally, within the Prosym Model, resources and contract obligations may be linked together. For example, the Company serves a portion of the pumping load at the Colstrip projects. When Colstrip is off-line for forced or planned maintenance there is no pumping load. By linking the pumping load contracts to Colstrip operations, the Company can better represent actual pumping loads.

V. PROSYM HOURLY DISPATCH MODEL MECHANICS & INPUTS

Q. In previous filings before this Commission, the Company provided a schematic that illustrated the operation of the Monthly Dispatch Model. Has the Company updated this schematic to reflect how the new Prosym Model operates?

A. Yes. Page 3 of Exhibit No. __ (CGK-1) includes a schematic that illustrates the operation of the new Prosym Model. A simplified schematic is shown below to illustrate how the model operates.

Avista Corporation
Schematic Illustrating Dispatch Model Operation



Q. Please briefly describe the schematic described in your exhibit.

A. The Prosym Model chronologically works its way through three "nested loops," as represented in the schematic. The first loop ensures that the model considers the water years of record. The Prosym Model then loops through the 52 weeks in each water year. Finally, the last loop forces the Prosym Model to balance loads and resources during the 168 hours of each week.

Q. Please continue.

A. Focusing now on the weekly 168-hour nested loop, the model balances loads and resources for each individual hour. This loop is what is represented in the simplified schematic above. The Prosym Model first calculates reserve obligations in each hour and increases retail load obligations by an equivalent amount. It then nets contract obligations (purchases and sales) against the Company's reserves-adjusted retail load during the hour.

Second, the Prosym Model dispatches hydroelectric projects to flatten the overall load shape while still meeting minimum flow requirements. This step utilizes the flexibility of the hydroelectric system to meet peak load requirements.

Next, the Prosym Model considers the marketplace for natural gas and electricity and determines which thermal resources will operate during the hour. Finally, any load not served is met with purchases from the wholesale marketplace; generation in excess of load requirements is sold into the wholesale marketplace.

For each hour a number of data points are exported from the Prosym Model. The more important values exported for use in developing proforma power supply costs are generation by resource, energy purchased and sold into the wholesale marketplace, the costs and revenues from marketplace purchases and sales, and the cost of consumed fuels.

Q. How were retail loads determined for the proforma year?

A. Proforma retail loads equal hourly weather-adjusted 2000 net retail loads, adjusted to reflect 50 MW of self-generation by the Potlatch Corporation load at its Lewiston, Idaho facility, which is explained by Mr. Johnson. The weather adjustments are the same as those used by Witness Hirschkorn in his revenue normalization. The same hourly retail loads are used for each hydroelectric year.

Q. How does the Company model its PURPA and other small resources?

A. The Company cannot control or closely predict generation levels from its small generation suppliers. These suppliers' output levels are driven not by the Company's need for resources, but by their own unique set of characteristics. Historically, the Company has used 5-

year monthly averages to represent proforma year generation. The Company has used the same method in this filing, using the 1995-1999 five-year average.

Q. Are all contracts and resources optimally dispatched within the Prosym Model?

A. Yes they are. However, because the Prosym Model is limited to looking forward one week at a time, the Company's energy sale and exchange contract with PacifiCorp must first go through an initial optimization outside of the Model. Once the contract is optimized, the results of the optimization are reflected in the Prosym Model.

Q. Please describe specifically the optionality requiring this contract to be considered outside of the Prosym Model.

A. The first PacifiCorp obligation, a capacity exchange contract, allows PacifiCorp to purchase 27,500 megawatt-hours of electricity between June 16 and September 15 of each year at a maximum hourly rate of 50 megawatts. In return, Avista can request the return of an equal quantity of energy and capacity between the period December 1 and the end of February. Whats*Best!*®, a linear-programming add-in to Microsoft Excel, optimizes the dispatch value for PacifiCorp during the June 16 through September 15 period. For the return period, Whats*Best!*® determines the hours that represent the greatest value for Avista customers.

The second portion of the PacifiCorp contract is a sale for 150 megawatts during June through September. The contract provides that PacifiCorp must schedule an average monthly quantity of between fifteen average megawatts and 105 average megawatts, with an average over the entire June through September period of 37.5 megawatts. The price of energy is tied to the cost of generation at the Rathdrum plant. Whats*Best!*® is used to optimize the value of contract purchases made by PacifiCorp during the period. Purchases by PacifiCorp are modeled to occur primarily during third quarter on-peak hours, when the value is greatest from that company's perspective.

Q. Please provide additional details related to the Whats*Best!*® program and its use in this proceeding.

A. In the words of its developer, Whats*Best!*® is "a highly developed solver capable of performing linear and non-linear optimization upon the most difficult problems." Lindo Systems, Inc. first brought linear programming software to the personal computer in 1979. The spreadsheet add-in was released in 1984 for Excel's predecessor, VisiCalc. The tool has been under continuous development since that time.

Before optimization, the spreadsheet models were developed to consider the on- and off-peak periods for each calendar day of the proforma year. This level of modeling detail provided the accuracy required to correctly describe each of the contracts under discussion. Once the basic model was developed, Whats*Best!*® was called on to determine optimal dispatch. After Whats*Best!*® performed its optimizing function, the results were exported to the Prosym Model. The Prosym Model then "dispatched" the contracts as specified by the Whats*Best!*® solution.

VI. ASSUMED MARKET PRICES FOR NATURAL GAS AND ELECTRICITY

Q. How has the Company represented market prices for natural gas and electricity during the pro forma period?

A. The Company's monthly forward curves for electricity and natural gas were obtained on October 18, 2001 for the rate period November 2002 through October 2003 and used to represent market prices. As shown on page 4 of Exhibit __ (CGK-1), during the proforma period, natural gas prices in the Base Case vary between $3.263 per dekatherm in November 2002 to a high of $3.593 per dekatherm in January 2003. For Base Case electricity, the Company splits monthly prices between heavy load-hours (HLH) and light load-hours (LLH). HLH occur between the hours of 6:00 a.m. and 10:00 p.m., Monday through Saturday. All other hours, including all day Sunday, are defined as LLH. On average, forward market prices equal $33.9 per MWh. Prices in the HLH range between $28.34 and $47.56 per MWh. In the LLH, prices range from $19.71 to $41.29 per MWh.

Q. Prosym™ dispatches resources on an hourly basis. Did the Company use hourly electricity prices for its Prosym Model?

A. Yes. In late 2000 the Company purchased a 25-year hourly price forecast from R.W. Beck. Although wholesale market prices since that forecast was made have changed, the Company believes the hourly shape of the forecast still is reasonable. To shape the Base Case, R.W. Beck hourly forecasted prices during the November 2002 through October 2003 period were used. The R.W. Beck hourly prices in each month were calculated as a percentage of that month's price. These percentages then were applied to the Base Case monthly wholesale price forecast to develop hourly Base Case prices. An hourly price duration curve chart for the Base Case can be found on page 5 of Exhibit __ (CGK-1). The middle line in the chart represents the Base Case price duration curve. The chart also includes four additional price scenarios that will be described below. In ascending order, the chart includes price duration curves for the Low Case, Intermediate-Low Case, Base Case, Intermediate-High Case, and High Case.

Q. Did the Company use hourly natural gas prices in the Prosym Model?

A. No. Natural gas prices are kept constant during each month.

Q. Were prices varied over the hydroelectric period of record, as was done in previous dispatch modeling performed by the Company in previous proceedings before this Commission?

A. Yes. The Company's old Monthly Dispatch Model included six market price levels assigned to "bands" of regional surplus energy. The Company believes that this method of accounting for hydroelectric variability remains valid for the Prosym Model. Four additional price forecasts were developed to associate with varying hydroelectric conditions.

Q. How were the additional market price forecasts developed?

A. The implied heat rate[1] in the Base Case between the average flat electricity price and average natural gas price over the test period is approximately 10,000 British thermal units per kilowatt-hour (Btu/kWh). The four additional price forecasts are described below, along with the Base Case.

	NYMEX Gas		Average Implied Heat Rate	Annual Average Electricity Price
Forecast Case	**% of Base Case**	**Annual Average Price $/dth**	**(Btu/kWh)**	**($/MWh)**
High	130	4.409	13,000	57.29
Intermediate-High	115	3.901	11,500	44.83
Base	100	3.392	10,000	33.90
Intermediate-Low	85	2.883	8,500	24.49
Low	70	2.374	7,000	16.61

As the table demonstrates, natural gas prices are increased to 115 and 130 percent relative to the Base Case in the Intermediate-High and High cases, respectively. The Intermediate-Low and Low cases have gas prices equal to 85 and 70 percent of Base Case levels, respectively. The

[1] "Implied Heat Rate" identifies the marginal turbine that is supported by the markets for natural gas and electricity. The calculation of implied heat rate is performed by dividing the wholesale electricity price by the natural gas price and multiplying by 1000. For example, where the wholesale electricity price is $30

implied heat rates also are varied by 1,500 Btu/kWh for each case. The Intermediate-High and High cases have implied heat rates equal to 11,500 and 13,000 Btu/kWh, respectively. The Intermediate-Low and Low cases have implied heat rates equal to 8,500 and 7,000, respectively. For consistency, an equal increase in the implied heat rate was applied to the higher cases. Applying the implied heat rates to each case's NYMEX gas price provides monthly HLH and LLH wholesale market prices. Hourly prices then are calculated in the same manner as for the Base Case. Page 4 of Exhibit ___ (CKG-1) contains more detail on the prices contained in each case.

Q. How were each of these price forecasts assigned to the various water years of record?

A. The Company performed a probabilistic analysis on the annual generation levels relative to the other years in the Northwest Power Pool Coordinating Group (NWPP) Study. Section VII below provides a more detailed description of the NWPP study. Those years where the combined generation for the Clark Fork, Spokane River, and Mid-Columbia projects was within one-half of a standard deviation of the NWPP study average were assigned the Base Case price forecast. Those years where generation levels fell below one-half standard deviation, but above one and one-half standard deviations below the average were assigned the Intermediate-High Case. Years with flows below one and one-half standard deviations from the average were assigned the High Case price forecast. Where flows in any given year were more than one-half standard deviation above the average, but also less than one and one-half standard deviations

per MWh and the price of natural gas is $3.00 per dekatherm, the marginal operating unit would have a heat rate of 10,000 British thermal units per kilowatt-hour (Btu/kWh).

above the average, the Intermediate-Low Case was used. The years where flows were more than one and one-half standard deviation from the average were assigned the Low Case price forecast.

Q. Based on the probabilistic analysis described above, how many water years were assigned to each price forecast?

A. The following table shows how many water years were assigned to each price forecast.

Price Forecast	Water Years
Low	6
Intermediate-Low	8
Base	23
Intermediate-High	20
High	2

VII. HYDROELECTRIC PROJECT MODELING IN PROSYM MODEL

Q. How does the Prosym Model address the flexible nature of the Company's hydroelectric resources?

A. One of the more unique features of the Prosym Model is its effective dispatch of hydroelectric and thermal resources and contracts. The Prosym Model uses hydroelectric resources essentially to "peak shave" retail loads while still meeting their environmental and other contractual obligations (e.g., minimum flow requirements).

Q. Do the peak shaving capabilities of the Prosym Model approximate actual operations of the Company's hydroelectric resources?

A. Yes. The end result of this peak shaving is very similar to how the Company operates its hydroelectric resources. For example, during the proforma year the Prosym Model generated an average of 66 percent of hydroelectric generation into the on-peak hours. For the period January 1997 through October 2001, actual on-peak generation was 67.9 percent, as shown on page 2 of Exhibit __ (CGK-2).

Q. What source is used for the Company's hydroelectric generation for the study period?

A. The source for all water year data is the 2000-01 NWPP Headwater Benefits Study. Each year the NWPP runs a hydro regulation model that simulates the operation of northwest reservoirs, including Canadian projects, based on the loads to be served and the available hydroelectric and thermal resources in the northwest region. The NWPP receives data submittals each year from members of the NWPP. Most investor-owned and public utilities in the northwest are members of the NWPP. The data submittals generally include each utility's forecast of retail loads, wholesale contract rights and obligations, and available thermal and hydroelectric generation capability. The NWPP runs its hydro regulation model based on these data. The model simulates the operation of northwest reservoirs, including those located in Canada, over the 60 water years between 1928 and 1988.

The results are used to determine the benefits to downstream and upstream parties from large upstream storage reservoirs. The study results include the amount of energy that could be produced at all northwest hydroelectric projects during each month under each of these water year conditions. The study models what the output would be from the Company's hydroelectric projects (including Company contract rights for Mid-Columbia project generation) under the current rules for reservoir operations for each annual streamflow condition. The Prosym Model utilizes the continuous period of calendar years beginning in 1929 and ending in 1987. The key outputs used in the Prosym Model are each water year's monthly generation values for the Company's resources and Mid-Columbia contractual projects.

VIII. RESULTS OF PROSYM HOURLY DISPATCH MODEL RUN

Q. What are the results of the Prosym Model for the Company's resource portfolio, including short-term market transactions?

A. The proforma operation of the Company's resource portfolio is summarized in pages 3 and 4 of Exhibit __ (CGK-2). The pages provide monthly on- and off-peak generation levels and purchase quantities for the various resources, contract obligations and rights, and short-term market transactions. A brief summary of the generation results is presented in the table below, including the percentage of each resource type's generation during the on- and off-peak periods.

Resource	Total	On-Peak[2]		Off-Peak	
	(aMW)	(aMW)	(%)	(aMW)	(%)
Hydro	551.8	641.0	66.4	432.9	33.6
Thermal	324.3	341.5	60.2	301.3	39.8
Contracts	173.9	74.7	24.6	306.2	75.4
Market Purchases	42.2	65.3	88.4	11.5	11.6
Market Sales	(133.9)	(64.6)	27.6	(226.2)	72.4
Total	**958.3**	**1,057.9**	**63.1**	**825.7**	**36.9**

Q. What level of short-term sales and purchases are generated by the Prosym Model.

A. Over the proforma period, the Company is in a net surplus position. However, surplus sales into, as well as deficit purchases from, the wholesale marketplace are made in all

[2] Approximately 57 percent of a given year's hours are on-peak.

months of the proforma. For the year, the Prosym Model identified a level of sales equal to 133.9 average megawatts. Purchases offset this value by 42.2 average megawatts. The net position of the Company during the proforma year is 91.7 average megawatts surplus.

Q. Why does the Prosym Model choose to have simultaneous purchases and sales from the wholesale marketplace?

A. When reviewing the monthly summaries generated by the Prosym Model, it becomes apparent that during any given month both purchases and sales are being made. However, in any given hour there are only sales *or* purchases. Purchases and sales are made on a regular basis with the month and within the day to balance the Company's resources with its loads.

Q. How are the results of the Prosym Model included in the proforma rate study?

A. Key outputs from the Prosym Model are short-term market purchase expense, short-term market sales revenue, fuel costs necessary to operate Company-owned thermal projects, and thermal generation. These quantities are averaged on a monthly basis over the study period and presented to Witness Johnson who includes these results in his determination of proforma power supply costs. The results of the Prosym Model are included as page 1 of Exhibit ___ (CGK-2.

IX. NORMALIZED VALUE FOR CAPACITY PURCHASES

Q. In the Commission's Third Supplemental Order, in Docket No. UE-991606, it required the Company to address a normalized value for capacity purchases. Does the Prosym Model generate a normalized value for capacity purchases?

A. Yes. The Prosym Model purchases power on an hourly basis as necessary to model two costs incurred by the Company when providing electric service for its customers—on-peak versus off-peak price differentials and reserve costs.

Q. Please explain the on-peak versus off-peak price differential concept.

A. Accounting for on- versus off-peak prices is essential in estimating the proforma power supply expense incurred by the Company. This value was impossible to model using the old Monthly Dispatch Model. All loads, obligations, purchase contracts, and resources were averaged into a single monthly value, with no recognition of when deliveries occurred. For example and as explained earlier, just over 63 percent of retail loads are met during on-peak hours of the year. This compares to 57 percent of the hours in a year being on peak. The Prosym Model correctly accounts for this cost because it relies upon hourly electricity market prices to determine power supply expenses.

Q. Please explain how reserves increase the proforma power supply expense.

A. The Company must in every hour meet spinning and non-spinning as well as load following reserve requirements as a member of the Western Systems Coordinating Council. As a participant in the Pacific Northwest Coordination Agreement, the Company carries spinning and non-spinning reserves equal to 5 percent of all on-line hydroelectric and 7 percent of all on-line thermal resource capacity. Fifty percent of the obligation is for spinning and 50 percent is for non-spinning reserves.

The Company also must meet instantaneous load fluctuations. Historically, the Company has planned for 20 megawatts of load following capability to meet this requirement.

Spinning, non-spinning, and load following reserves can reduce the Company's capability in any given hour to generate firm energy. The Prosym Model tracks the position of Company loads and resources and ensures that all reserve obligations are met. Where the Company does not have enough capacity to meet its obligations in a given hour, purchases are made from the wholesale marketplace to free up generating capacity. The cost of this re-dispatch is reflected in the total power supply costs identified by the Prosym Model.

Q. Has the Company identified the capacity costs included in the proforma power supply expense?

A. Yes. Although the total capacity cost is not an explicit output of the Prosym Model, reserve costs can be calculated by removing the reserve obligations from the Prosym Model. The Company has run this scenario and identified a net annual cost of reserves equal to $714,110.

X. MAXIMIZING DISPATCH VALUE FOR CUSTOMERS

Q. Does the Prosym Model maximize the dispatch value of Company resources to the benefit of customers?

A. Yes. The Prosym Model is designed expressly to minimize overall portfolio costs; or, where resource capabilities exceed loads, maximize revenues. When one reviews the hourly dispatch decisions of the Prosym Model, it is clear that, for example, thermal plants operate only when their costs are lower than the wholesale market price. Hydroelectric generation is used to peak shave retail loads, thereby reducing customer exposure to the high-cost on-peak wholesale market purchases.

Q. On a net basis, the Company is selling electricity into the wholesale marketplace during the proforma period. How are the revenues from these sales applied in the calculation of the Company's total power supply expense?

A. Revenues from all power sales are credited in full against power supply expenses.

Q. Hourly modeling, while bringing a new level of sophistication and accuracy to dispatch, complicates oversight. Has the Company found other means to explain clearly that its resources are being operated to the exclusive benefit of customers?

A. Yes. An excellent method to confirm that the Company's resources are being operated to benefit customers is by viewing how resources are dispatched over the study period. Pages 5 and 6 of Exhibit ___ (CGK-2) contain two samples from the 3,068 weekly graphs necessary to describe the entire proforma study period. The first, taken from week 24 of 1932, is from the month of June and represents system operations during a high-flow hydroelectric period. The second, taken from week 34 of the same year, explains system operations during a low-flow hydroelectric period in August. The graphics detail how the Prosym Model met system loads on an hourly basis. To simplify matters, resources were broken into the categories of hydro, thermals, and contracts. The dashed line represents retail loads. Where resources exceed the dashed line in a given hour, one can infer that short-term market sales were necessary to balance loads and resources in that hour. In hours where resources fall short of retail loads, short-term market purchases were necessary. Note how the Company's hydroelectric projects are operated most heavily during the peak period(s) of the day, thereby lowering overall power supply expenses.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-01________

EXHIBIT NO. ___ (CGK-1)

WITNESS: CLINT KALICH, AVISTA CORPORATION

PROSYM™

Market Simulation Engine

Energy enterPrise software

Business Solutions
for **Energy Supply Chain** Management

- RETAIL DATA MANAGEMENT
- LOAD FORECAST
- PRICE FORECAST
- GENERATION EVALUATION
- GENERATION OPERATIONS
- WHOLESALE TRADING
- RISK ANALYSIS
- PORTFOLIO OPTIMIZATION
- ENERGY SCHEDULING
- ENERGY SETTLEMENTS

Electric markets worldwide are rapidly transforming from regulated industries to environments characterized by aggressive competition and customer choice. Wholesale energy is now sold, traded, and purchased as an unbundled commodity. Forecasting market-clearing prices, acquiring and scheduling supply resources in response to these prices, and developing a fundamental in-depth understanding of the market dynamics, are mission-critical tasks for any entity actively involved in the wholesale energy market.

Henwood Energy Services, Inc. (Henwood) has developed a suite of Business Solutions for energy supply chain management. **Henwood's PROSYM™** product provides Price Forecasting, Generation Evaluation, Generation Operations, Risk Analysis, and Portfolio Optimization functions.

Product Description

PROSYM performs a detailed fundamental simulation of the electric wholesale market on an hour-to-hour basis. Electric production is modeled at the generation unit level while system loads and transmission constraints are modeled on an hourly basis. **PROSYM** computes market clearing prices and generation production for user-defined transmission zone(s).

PROSYM reflects the specific market rules for any region that is being modeled – whether it is the United Kingdom, Australia, Singapore, Alberta, California, or anywhere else in the world. As a result of its extensive ability to incorporate specific regional rules, **PROSYM** has up to an 80 percent market share in deregulated markets worldwide.

Benefits

PROSYM is a defensible and proven market modeling system, and the leading hourly simulation solution in the world for electric-wholesale markets. **PROSYM** is currently being used by more than 120 companies on five continents.

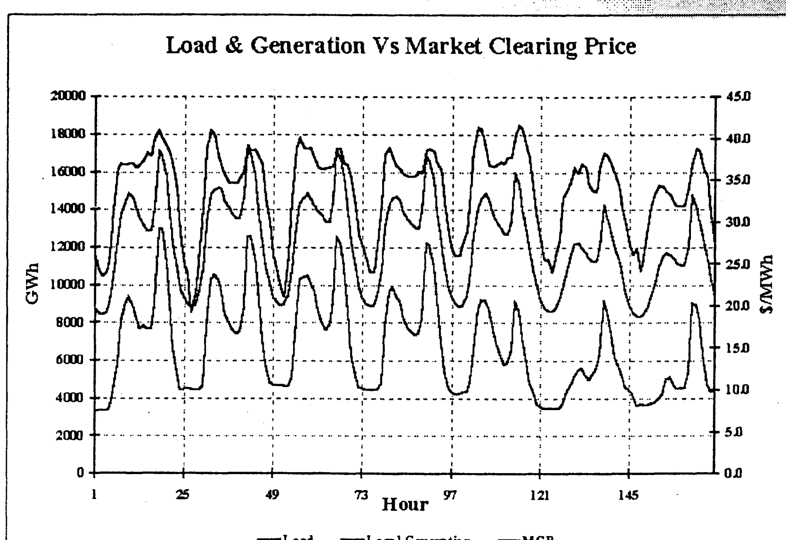
PROSYM's robust flexibility allows the user to model scenarios ranging from the specific design details of a generation unit to assessing the impacts of market restructuring legislation.

PROSYM provides a more defensible market simulation result than any of its competing products. For the past 15 years, the model has been proven in the most exacting forums such as utility rate filings, litigation hearings, and bond financings.

PROSYM can be used in a stand-alone mode, or can be further expanded with any combination of 10 modules that have been specifically designed by Henwood staff to solve complex or unique business issues.

Product Features

The extensive capabilities of **PROSYM** cause it to be the analytical tool of choice for understanding wholesale markets worldwide. These features include:



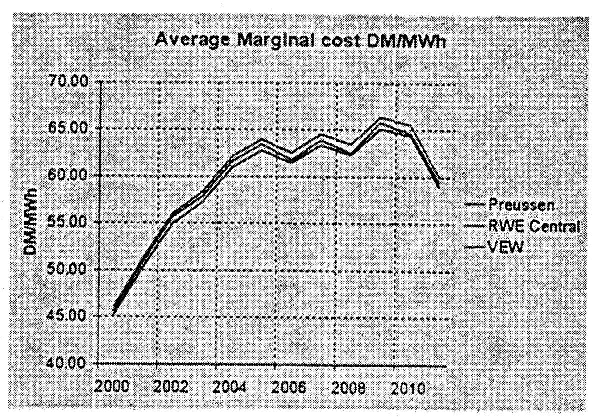
- Detailed market simulations from one day to twenty years
- Advanced hourly commitment and dispatch optimization
- Cost, bid, emission, or price-based dispatching capability
- Direct modeling of stochastic drivers and their correlations: forced outages, energy market and reserve market prices, emission prices, fuel prices, hydro energy and load
- Generating asset profit maximization in competitive markets
- Zonal market-clearing prices and congestion charges computed on an hourly basis
- Bid-based market simulations based on region-specific pool rules
- Zonal constraints such as minimum generation and multiple operating reserve criteria are enforced
- Detailed representation of performance, cost, and constraint characteristics of physical and financial supply resources
- Direct modeling of significant chronological constraints such as ramp rates and minimum up and down times
- Fuel contract and pipeline constraint optimization
- Direct modeling of start-up costs and fuel burn as a function of off-time

Business Applications

PROSYM performs detailed simulations of energy markets worldwide. It is used for forecasting wholesale electric prices, evaluating generation assets, energy transactions, and short-term unit commitment and dispatch decisions.

PROSYM, in tandem with its supplemental modules, provides regional simulation capabilities unparalleled in the industry. These applications are critical if a company is:

- Evaluating its competitive position and identifying attractive market opportunities
- Considering the acquisition or divestiture of an electric generation asset and need to determine the value of the asset under competitive market conditions
- Financing a major electric generation investment in a competitive power market
- Performing stranded cost recovery evaluation
- Developing forward-price curves or generation operating budgets
- Forecasting energy, capacity and ancillary service prices
- Performing transaction evaluation, and transmission congestion analysis
- Evaluating regional emission impacts of generating facility additions



Ener
enter
Prise
software

Market Analytics
- MarketPlace™
- MARKETSYM™

Risk Analysis
- RiskReporter™
- RISKSYM™
- Theo™

Generation Operations
- PROSYM™
- OPSYM™
- MAINSYM™

Wholesale Operations
- TradeManager™
- WebScheduler™

Retail Operations
- RACM™

Henwood Consulting

Henwood's Consulting Services:
- Strategic Planning
- Power Market Analysis
- Power Business Solutions
- Retail Business Solutions

Henwood eBusiness

Henwood's eBusiness Applications:
- MarketWatch
- GenReporter
- NextGen
- Hydro Forecasts

Henwood

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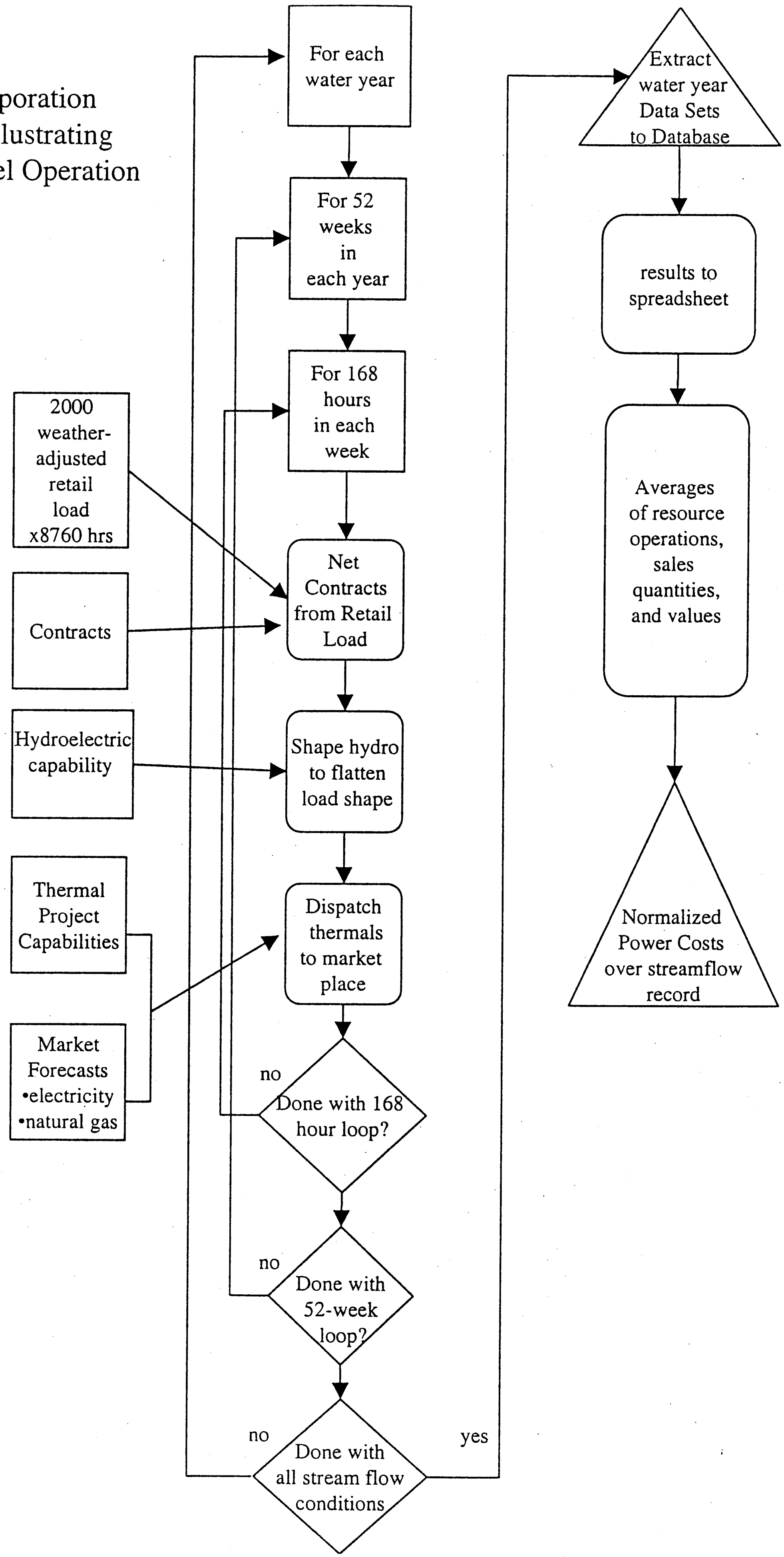
041901

Avista Corporation Schematic Illustrating Dispatch Model Operation

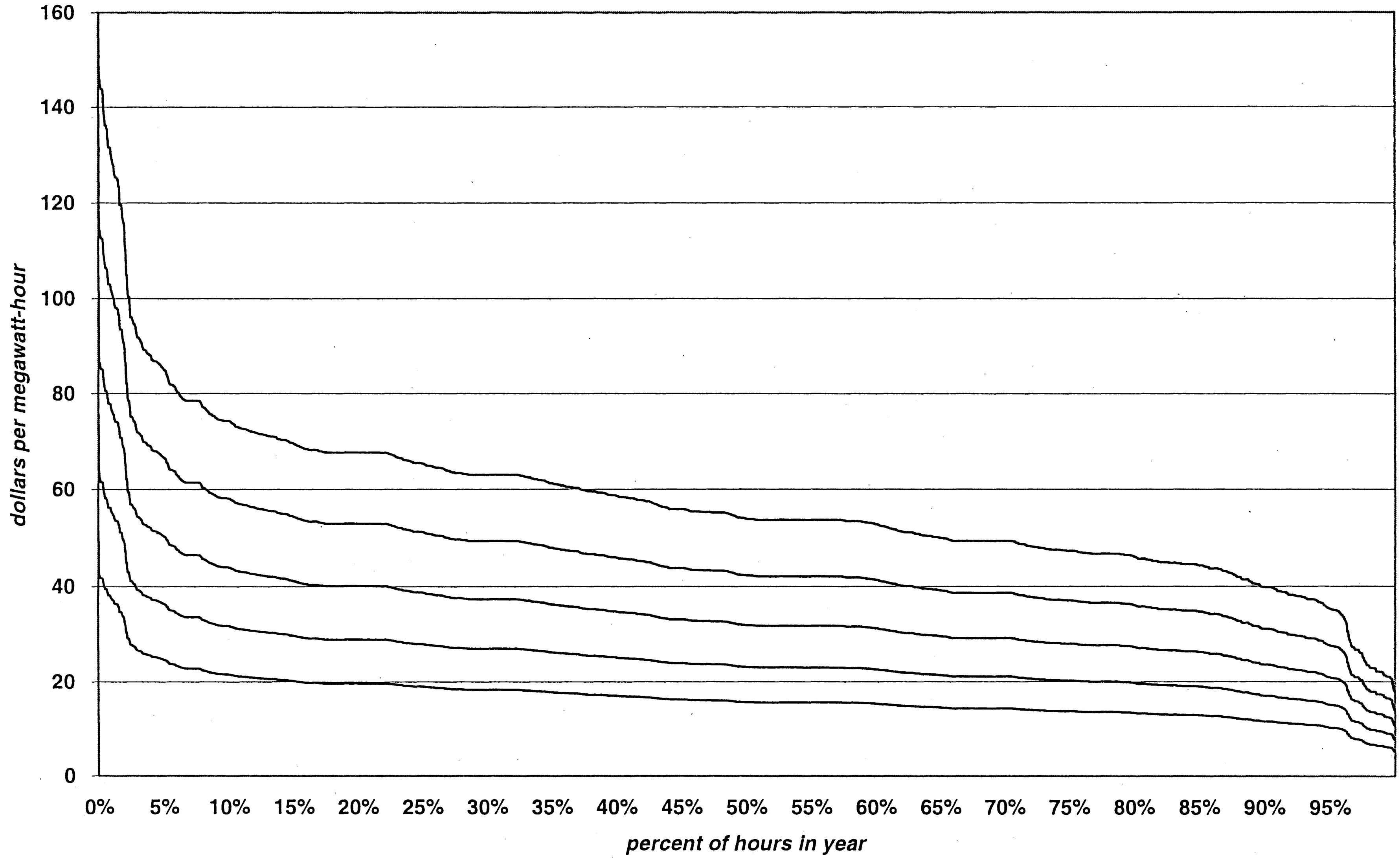


Market Prices Summary

Source: 10/18/2001 Forward Curves

	Month	Base Case				Low Case				Intermediate-Low Case				Intermediate-High Case				High Case			
		HLH	LLH	Flat	NYMEX	HLH	LLH	Flat	NYMEX	HLH	LLH	Flat	NYMEX	HLH	LLH	Flat	NYMEX	HLH	LLH	Flat	NYMEX
		($/MWh)	($/MWh)	($/MWh)	($/dth)	($/MWh)	($/MWh)	($/MWh)	($/dth)	($/MWh)	($/MWh)	($/MWh)	($/dth)	($/MWh)	($/MWh)	($/MWh)	($/dth)	($/MWh)	($/MWh)	($/MWh)	($/dth)
11	Nov-02	35.75	27.81	32.40	3.263	17.52	13.63	15.88	2.284	25.83	20.09	23.41	2.774	47.28	36.78	42.85	3.752	60.42	47.00	54.75	4.242
12	Dec-02	35.28	28.30	32.20	3.475	17.29	13.87	15.78	2.432	25.49	20.45	23.27	2.954	46.66	37.43	42.59	3.996	59.62	47.83	54.42	4.517
1	Jan-03	39.12	32.98	36.55	3.593	19.17	16.16	17.91	2.515	28.26	23.83	26.40	3.054	51.73	43.62	48.33	4.132	66.11	55.74	61.76	4.671
2	Feb-03	37.03	32.70	35.18	3.503	18.14	16.02	17.24	2.452	26.75	23.63	25.41	2.978	48.97	43.25	46.52	4.028	62.58	55.27	59.45	4.554
3	Mar-03	33.20	30.10	31.83	3.405	16.27	14.75	15.60	2.383	23.99	21.74	23.00	2.894	43.91	39.80	42.10	3.916	56.11	50.86	53.80	4.427
4	Apr-03	28.34	24.40	26.68	3.286	13.89	11.95	13.07	2.300	20.48	17.63	19.27	2.793	37.48	32.26	35.28	3.779	47.90	41.23	45.08	4.272
5	May-03	28.96	19.71	25.08	3.301	14.19	9.66	12.29	2.311	20.92	14.24	18.12	2.806	38.30	26.07	33.17	3.796	48.94	33.31	42.39	4.291
6	Jun-03	31.83	24.03	28.36	3.331	15.60	11.77	13.90	2.332	23.00	17.36	20.49	2.831	42.09	31.78	37.51	3.831	53.79	40.61	47.93	4.330
7	Jul-03	42.84	32.90	38.68	3.358	20.99	16.12	18.95	2.351	30.96	23.77	27.94	2.854	56.66	43.51	51.15	3.862	72.41	55.61	65.36	4.365
8	Aug-03	47.56	41.29	44.93	3.390	23.30	20.23	22.01	2.373	34.36	29.83	32.46	2.881	62.89	54.61	59.42	3.898	80.37	69.78	75.93	4.407
9	Sep-03	45.36	34.88	40.70	3.391	22.23	17.09	19.94	2.374	32.77	25.20	29.41	2.882	59.99	46.13	53.83	3.900	76.66	58.95	68.79	4.408
10	Oct-03	37.95	28.79	34.11	3.406	18.59	14.11	16.71	2.384	27.42	20.80	24.64	2.895	50.18	38.08	45.11	3.917	64.13	48.66	57.64	4.428
	Average	36.95	29.82	33.90	3.392	18.11	14.61	16.61	2.374	26.70	21.55	24.49	2.883	48.87	39.44	44.83	3.901	62.45	50.40	57.29	4.409

Price Forecast Duration Curves



11-19-2001 Final Price Forecast Duration Curves.xls

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-01________

EXHIBIT NO. ___ (CGK-2)

Proforma Power Supply Run Results

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ANNUAL	(aMW)	Line No.
GENERATION (GWh)															
Boulder Park	7	6	4	1	2	3	9	9	10	6	5	4	66	7.6	1
Colstrip	148	127	148	143	70	126	143	149	144	148	144	147	1,638	186.9	2
Coyote Springs	82	70	77	48	19	36	72	75	76	71	71	69	766	87.5	3
Kettle Falls	19	18	11	7	2	8	20	21	21	17	11	17	173	19.7	4
Kettle Falls CT	2	2	1	1	0	1	2	2	2	1	1	1	15	1.7	5
Northeast	1	0	0	0	0	2	4	9	6	1	1	0	25	2.8	6
Rathdrum	12	12	2	0	1	13	28	35	34	11	8	3	158	18.0	7
TOTAL GENERATION													**2,841**	**324.3**	8
FUEL USE (MMBtu)															
Boulder Park	63	55	38	10	16	26	78	85	91	57	49	36	603		9
Colstrip	1,566	1,351	1,570	1,521	745	1,334	1,517	1,576	1,525	1,573	1,522	1,558	17,359		10
Coyote Springs	591	502	548	344	132	261	523	543	549	514	509	494	5,510		11
Kettle Falls	248	235	143	88	30	109	270	275	277	217	144	227	2,262		12
Kettle Falls CT	16	14	8	4	1	5	17	19	20	12	9	9	133		13
Northeast	19	1	1	0	0	25	54	118	83	13	9	1	324		14
Rathdrum	139	141	19	0	13	152	340	417	406	132	91	34	1,885		15
TOTAL FUEL USE													**28,076**		16
FUEL COST ($000)															
Boulder Park	252	216	153	42	66	95	280	304	323	212	177	141	2,262		17
Colstrip	1,065	919	1,068	1,034	507	907	1,032	1,072	1,037	1,070	1,035	1,060	11,804		18
Coyote Springs	2,153	1,795	1,901	1,203	475	917	1,776	1,860	1,871	1,795	1,699	1,768	19,213		19
Kettle Falls	424	401	245	151	51	187	462	471	474	371	246	387	3,869		20
Kettle Falls CT	62	53	33	18	6	18	62	70	73	46	33	35	508		21
Northeast	87	3	6	0	0	100	215	410	316	57	36	5	1,236		22
Rathdrum	614	606	83	0	56	551	1,271	1,485	1,488	554	371	153	7,232		23
TOTAL FUEL COST													**46,124**		24
MARKET (GWh)															
Market Purch	16	7	25	35	19	9	20	66	46	54	40	33	370	42.3	25
Market Sale	(94)	(102)	(86)	(66)	(123)	(207)	(194)	(62)	(59)	(39)	(54)	(86)	(1,172)	(133.8)	26
NET MARKET													**(802)**	**(91.5)**	27
MARKET ($000)															
Market Purch	710	317	953	1,129	580	246	896	2,835	1,718	1,853	1,295	1,032	13,563		28
Market Sale	(3,121)	(3,311)	(2,455)	(1,543)	(2,406)	(5,710)	(6,771)	(2,859)	(2,313)	(1,230)	(1,674)	(2,676)	(36,067)		29
NET MARKET													**(22,504)**		30
												NET POWER SUPPLY COST ($000)	**23,620**		31

5-Year Hydroelectric History at Avista Projects

	Heavy Load-Hour Hydroelectric Generation *					
Month	1997	1998	1999	2000	2001	Average
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Jan	67.8%	67.6%	65.5%	65.2%	74.8%	68.2%
Feb	70.3%	68.2%	68.6%	67.0%	71.9%	69.2%
Mar	66.2%	67.7%	70.2%	67.4%	71.4%	68.6%
Apr	63.4%	75.2%	70.3%	62.5%	65.1%	67.3%
May	56.0%	60.8%	57.8%	60.8%	65.2%	60.1%
Jun	55.8%	61.5%	58.0%	63.1%	72.7%	62.2%
Jul	62.0%	65.8%	62.1%	67.2%	64.9%	64.4%
Aug	73.8%	74.6%	70.6%	72.6%	71.5%	72.6%
Sep	71.6%	75.7%	68.3%	68.1%	65.5%	69.8%
Oct	75.9%	77.8%	69.4%	70.4%	69.4%	72.6%
Nov	73.8%	75.6%	69.6%	69.3%		72.1%
Dec	70.5%	67.2%	68.4%	66.4%		68.1%
Total						67.9%

* includes owned Spokane and Clark Fork projects and Mid-C projects

11-19-2001 Hydro History HLH Split.xls cgk

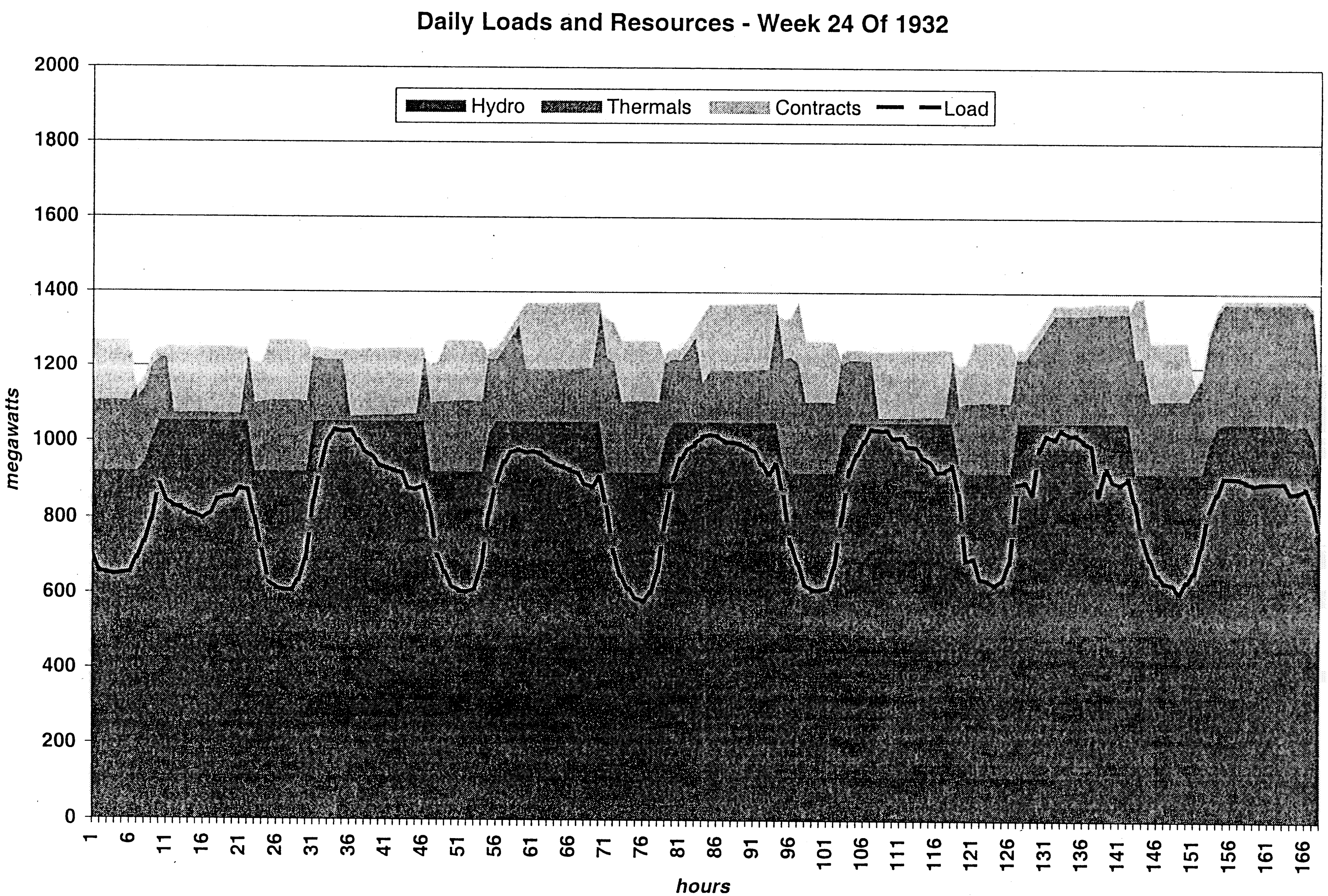
AVISTA UTILITIES

Generation (in GWh) by Month and Time of Day

	ANNUAL		January		February		March		April		May		June		July		August		September		October		November		December	
	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH
Black Crk	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	0	0	0	0	0	0	0	0
BPA EntSuppl	4	(4)	1	(1)	1	(1)	1	(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	(1)	1	(1)
Can EntReturn	(46)	0	(3)	0	(2)	0	(3)	0	(4)	0	(5)	0	(5)	0	(5)	0	(5)	0	(5)	0	(5)	0	(3)	0	(3)	0
CSPE EntReturn	(3)	0	(1)	0	(1)	0	(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(1)	0	(1)	0
CSPE Purchase	12	1	3	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0
NicholsPump Sale	(30)	(22)	(3)	(2)	(2)	(2)	(3)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(3)	(2)	(2)	(2)	(3)	(2)	(2)	(2)	(2)	(2)
PacCorp ExchObl	(28)	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)	0	(19)	0	(9)	0	0	0	0	0	0	0
PacCorp ExchRet	28	0	19	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PacCorp Sale	(110)	0	0	0	0	0	0	0	0	0	0	0	(11)	0	(11)	0	(65)	0	(23)	0	0	0	0	0	0	0
PGE CapReturn	0	420	0	36	0	32	0	36	0	34	0	36	0	35	0	36	0	36	0	34	0	36	0	35	0	35
PGE CapSale	(391)	(29)	(35)	(3)	(30)	(2)	(33)	(2)	(32)	(2)	(35)	(3)	(32)	(2)	(33)	(2)	(35)	(3)	(30)	(2)	(35)	(3)	(33)	(2)	(31)	(2)
Puget Sale	(27)	(7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(14)	(3)	(14)	(3)
SmPow Purchase	19	14	1	1	1	1	2	1	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1
TransAlta	715	535	83	59	72	56	82	59	0	0	0	0	0	0	82	60	82	59	76	61	82	60	79	58	78	63
Upriver Firm	45	33	5	4	5	4	6	4	5	4	4	3	5	4	3	2	1	1	1	1	2	2	3	2	4	3
WNP3Purch P	182	204	38	42	34	38	19	20	18	21	0	0	0	0	0	0	0	0	0	0	0	0	37	40	36	43
TOTAL CONTRACTS	**374**	**1,149**	**109**	**136**	**89**	**126**	**73**	**116**	**(14)**	**56**	**(35)**	**36**	**(43)**	**36**	**35**	**94**	**(36)**	**96**	**9**	**93**	**43**	**94**	**70**	**128**	**73**	**137**
% of Total	**24.6%**	**75.4%**																								
Clark Fork Hy	2,040	822	140	46	130	45	135	40	189	70	282	165	286	179	192	101	184	41	83	21	99	20	148	39	172	56
Mid Columbia	521	369	62	44	48	34	45	31	34	25	40	28	47	34	43	30	45	31	36	25	37	26	36	25	48	37
Spokane River	649	434	57	39	58	43	68	49	63	51	69	50	64	45	46	29	33	12	36	18	46	24	48	29	61	45
TOTAL HYDRO	**3,210**	**1,624**	**259**	**130**	**236**	**121**	**247**	**119**	**287**	**145**	**391**	**242**	**397**	**257**	**281**	**160**	**262**	**84**	**154**	**63**	**182**	**70**	**232**	**93**	**281**	**138**
% of Total	**66.4%**	**33.6%**																								
Market Purch	327	43	14	2	6	1	23	2	29	6	18	1	9	0	18	2	60	6	40	6	47	7	36	5	27	6
Market Sale	(324)	(849)	(28)	(66)	(33)	(69)	(20)	(67)	(25)	(41)	(31)	(92)	(67)	(140)	(70)	(124)	(3)	(59)	(6)	(53)	(6)	(33)	(11)	(43)	(24)	(62)
TOTAL MARKET	**4**	**(806)**	**(14)**	**(64)**	**(27)**	**(67)**	**4**	**(65)**	**4**	**(35)**	**(13)**	**(91)**	**(58)**	**(140)**	**(51)**	**(123)**	**58**	**(53)**	**34**	**(47)**	**41**	**(25)**	**24**	**(39)**	**3**	**(56)**
% of Total	**-0.5%**	**100.5%**																								
Boulder Park	48	19	5	2	4	2	3	1	1	0	1	0	2	1	6	3	6	3	7	3	5	1	4	1	3	1
Colstrip	937	700	86	62	72	55	85	63	79	65	42	28	77	49	78	65	87	61	80	63	85	63	83	60	82	65
Coyote Springs	483	283	52	31	43	27	47	29	32	16	15	4	24	13	42	30	46	29	45	31	47	25	47	24	44	25
Kettle Falls	101	72	12	7	10	8	6	5	4	3	1	1	5	3	11	9	13	9	12	9	10	7	6	5	10	8
Kettle Falls CT	11	5	1	0	1	0	1	0	0	0	0	0	0	0	1	1	1	1	2	1	1	0	1	0	1	0
Northeast	18	7	1	0	0	0	0	0	0	0	0	0	1	0	3	1	6	4	5	1	1	0	0	0	0	0
Rathdrum	113	44	9	3	9	3	2	0	0	0	1	0	9	4	20	9	23	12	25	9	9	2	6	2	2	1
TOTAL THERMALS	**1,710**	**1,131**	**165**	**106**	**140**	**95**	**144**	**99**	**116**	**84**	**60**	**34**	**119**	**70**	**162**	**117**	**182**	**118**	**176**	**118**	**158**	**98**	**147**	**93**	**142**	**99**
% of Total	**60.2%**	**39.8%**																								
TOTAL RESOURCES	**5,299**	**3,098**	**519**	**308**	**438**	**275**	**468**	**269**	**393**	**251**	**403**	**221**	**414**	**223**	**426**	**249**	**466**	**245**	**373**	**227**	**424**	**237**	**474**	**276**	**499**	**318**
% of Total	**63.1%**	**36.9%**																								

AVISTA UTILITIES
Generation (aMW) by Month and Time of Day

	ANNUAL		January		February		March		April		May		June		July		August		September		October		November		December	
	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH
Black Crk	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BPA EntSuppl	0.8	(1.1)	2.0	(2.6)	2.0	(2.6)	2.0	(2.6)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	(2.6)	2.0	(2.6)
Can EntReturn	(9.1)	0.0	(6.2)	0.0	(6.1)	0.0	(6.2)	0.0	(10.9)	0.0	(11.2)	0.0	(11.3)	0.0	(11.2)	0.0	(11.6)	0.0	(11.3)	0.0	(10.8)	0.0	(6.2)	0.0	(6.4)	0.0
CSPE EntReturn	(0.7)	0.0	(1.6)	0.0	(1.6)	0.0	(1.6)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(1.6)	0.0	(1.6)	0.0
CSPE Purchase	2.5	0.3	5.8	1.2	5.7	1.1	6.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.3	5.7	0.4
NicholsPump Sale	(5.9)	(5.9)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.9)	(6.0)	(5.3)	(5.5)	(5.9)	(5.9)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(6.0)	(5.9)	(6.0)
PacCorp ExchObl	(5.5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.5)	0.0	(43.1)	0.0	(22.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PacCorp ExchRet	5.5	0.0	43.1	0.0	23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PacCorp Sale	(21.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(26.0)	0.0	(26.8)	0.0	(150.0)	0.0	(57.6)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PGE CapReturn	0.0	112.0	0.0	114.9	0.0	112.0	0.0	114.9	0.0	107.3	0.0	114.9	0.0	114.0	0.0	108.3	0.0	114.9	0.0	107.3	0.0	114.9	0.0	114.0	0.0	107.8
PGE CapSale	(78.1)	(7.8)	(79.9)	(8.3)	(78.1)	(7.8)	(76.4)	(8.0)	(78.8)	(7.4)	(79.9)	(8.3)	(75.7)	(7.8)	(79.3)	(7.6)	(79.9)	(8.3)	(75.0)	(7.1)	(79.9)	(8.3)	(79.3)	(8.2)	(74.3)	(7.1)
Puget Sale	(5.5)	(1.7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(33.0)	(10.3)	(32.7)	(10.4)
SmPow Purchase	3.7	3.7	3.1	3.1	3.8	3.8	4.7	4.7	5.2	5.2	4.9	4.9	4.8	4.8	4.1	4.1	3.1	3.1	2.4	2.4	2.4	2.4	3.1	3.1	3.3	3.3
TransAlta	142.7	142.5	191.6	187.9	187.9	193.2	189.6	190.7	0.0	0.0	0.0	0.0	0.0	0.0	196.7	181.7	190.0	190.1	189.0	191.3	188.9	191.7	189.2	191.1	187.7	191.5
Upriver Firm	8.9	8.9	12.2	12.2	12.8	12.8	13.4	13.4	11.8	11.8	10.4	10.4	11.7	11.7	6.8	6.8	2.6	2.6	3.5	3.5	5.4	5.4	6.6	6.6	10.0	10.1
WNP3Purch P	36.3	54.4	88.4	133.1	88.3	132.4	43.9	64.3	44.0	65.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.4	132.9	87.3	131.8
TOTAL CONTRACTS	74.7	306.2	252.6	435.6	232.2	438.9	169.4	371.7	(34.6)	176.0	(81.1)	116.4	(102.4)	116.8	83.7	287.3	(83.9)	307.4	23.0	291.4	100.0	300.1	169.5	420.9	175.1	418.9
Clark Fork Hy	407.4	219.0	323.6	148.6	339.6	155.3	312.5	128.4	473.5	218.1	652.9	528.3	687.8	588.1	461.4	307.0	425.3	130.3	207.1	65.4	228.3	65.5	355.3	126.9	414.2	169.6
Mid Columbia	104.1	98.4	144.6	142.3	124.1	116.4	103.6	97.9	85.3	78.1	93.3	89.5	112.6	110.2	103.5	92.8	104.4	99.8	88.9	77.6	86.1	82.7	87.3	83.7	114.8	112.1
Spokane River	129.6	115.6	131.9	125.2	150.8	148.3	156.6	155.9	158.5	157.9	159.4	159.3	153.0	147.7	110.0	88.9	77.5	39.9	89.5	55.1	107.0	77.1	116.3	96.4	146.9	138.5
TOTAL HYDRO	641.0	432.9	600.0	416.1	614.5	420.0	572.8	382.1	717.3	454.1	905.6	777.1	953.4	846.0	674.8	488.8	607.2	270.0	385.5	198.2	421.5	225.3	558.9	307.0	675.8	420.2
Market Purch	65.3	11.5	31.8	8.0	15.1	4.7	54.2	5.3	73.0	19.0	41.5	2.5	20.5	1.4	44.2	4.6	139.8	18.5	99.8	17.7	108.7	23.6	85.8	14.8	65.4	16.9
Market Sale	(64.6)	(226.2)	(63.7)	(212.7)	(85.6)	(238.4)	(46.1)	(213.4)	(61.9)	(129.1)	(72.6)	(294.5)	(160.9)	(461.6)	(167.1)	(378.5)	(6.4)	(189.3)	(15.7)	(165.4)	(14.0)	(104.7)	(27.0)	(141.5)	(58.5)	(188.2)
TOTAL MARKET	0.7	(214.7)	(31.9)	(204.7)	(70.6)	(233.6)	8.2	(208.1)	11.1	(110.1)	(31.1)	(292.0)	(140.4)	(460.2)	(122.9)	(373.9)	133.4	(170.8)	84.0	(147.7)	94.8	(81.1)	58.8	(126.7)	6.9	(171.3)
Boulder Park	9.5	5.0	11.9	5.8	11.2	6.1	7.0	3.7	1.9	1.0	3.3	1.1	4.7	3.0	13.6	9.0	14.7	9.7	17.2	9.9	11.6	4.0	9.8	4.2	7.1	2.9
Colstrip	187.1	186.7	197.9	199.6	188.4	191.3	196.6	202.5	197.0	202.1	97.5	90.3	184.5	161.6	187.9	198.1	202.4	196.2	201.0	198.3	197.9	201.6	199.7	198.9	197.6	197.6
Coyote Springs	96.4	75.6	119.6	97.9	110.8	94.6	109.7	93.7	79.1	51.4	33.7	12.8	56.8	41.7	101.9	91.6	107.0	93.0	112.6	96.1	108.3	79.0	112.0	79.3	106.3	75.3
Kettle Falls	20.2	19.1	26.7	23.9	27.0	26.2	14.8	14.8	9.9	8.5	3.3	2.7	12.8	9.6	27.6	27.3	29.0	27.5	30.4	28.4	22.5	22.3	15.4	15.2	23.5	23.0
Kettle Falls CT	2.1	1.2	3.0	1.6	2.8	1.6	1.4	1.0	1.0	0.3	0.3	0.1	0.9	0.5	3.1	2.0	3.5	2.3	3.9	2.4	2.4	1.0	1.8	0.8	1.7	0.8
Northeast	3.5	1.9	2.6	0.9	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	3.5	1.6	7.0	3.7	12.9	11.3	12.6	4.2	2.0	0.4	1.1	0.7	0.2	0.1
Rathdrum	22.6	11.8	19.8	9.8	23.5	9.6	3.6	0.1	0.0	0.0	1.9	0.9	21.7	12.2	47.7	26.3	52.9	38.6	62.0	28.6	21.5	5.8	13.6	6.4	4.9	2.5
TOTAL THERMALS	341.5	301.3	381.5	339.6	363.8	329.4	333.4	315.9	289.0	263.4	139.9	107.9	284.9	230.3	388.8	358.1	422.3	378.5	439.7	367.8	366.2	314.1	353.4	305.4	341.2	302.3



Daily Loads and Resources - Week 24 Of 1932
Hydro
Thermals
Contracts
Load
megawatts
2000
1800
1600
1400
1200
1000
800
600
400
200
0
hours
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
76
81
86
91
96
101
106
111
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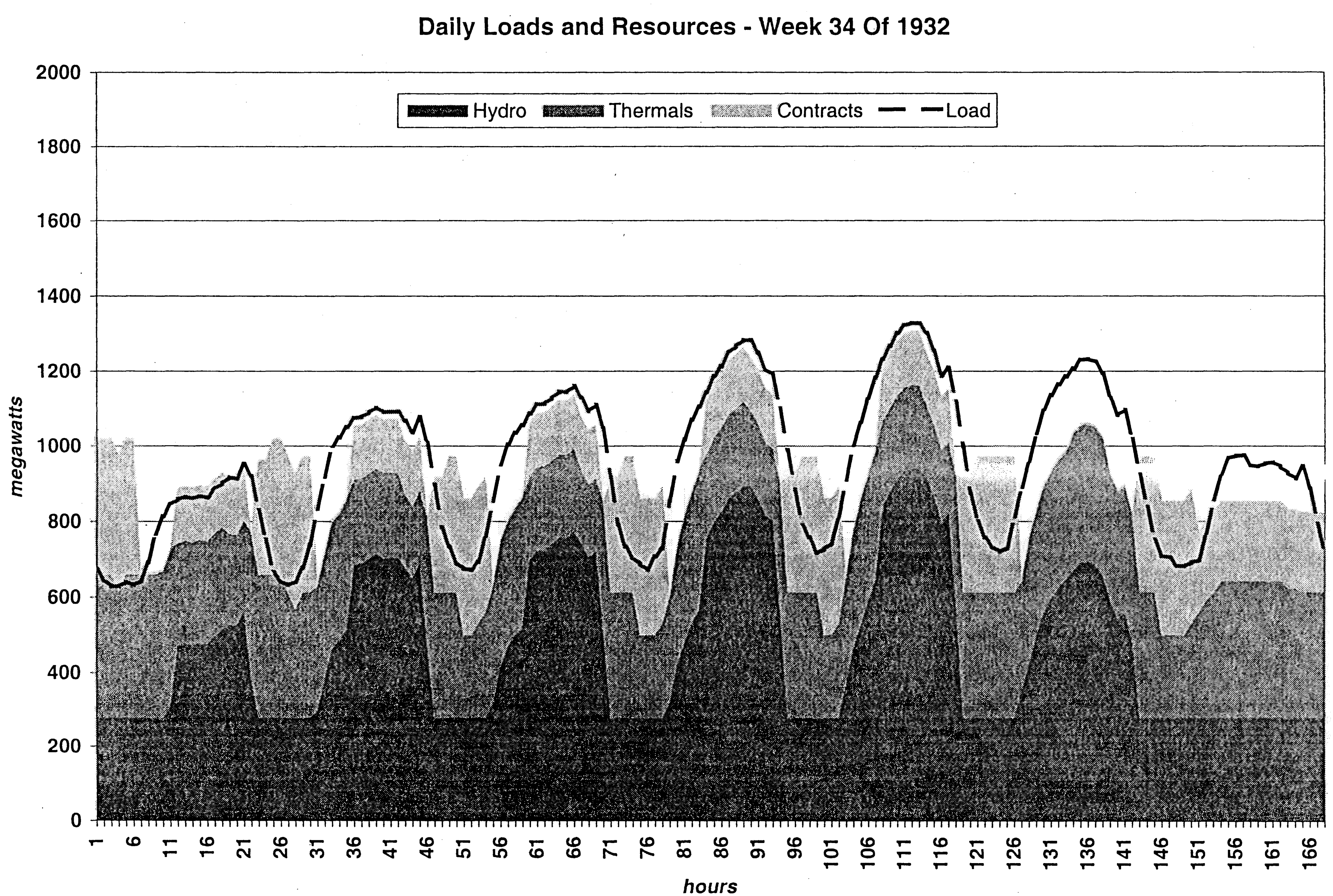
146
151
156
161
166


Daily Loads and Resources - Week 34 Of 1932
Hydro
Thermals
Contracts
Load
megawatts
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
76
81
86
91
96
101
106
111
116
121
126
131
136
141
146
151
156
161
166
hours