

memorandum

Bonneville Power Administration

DATE: November 14, 2003

REPLY TO
ATTN OF: PGPL-5

SUBJECT: 2002 White Book

to: Interested parties

This document is Bonneville Power Administration's (BPA) latest projected Pacific Northwest Loads and Resources summary, commonly called the "White Book". The 2002 White Book is a snapshot of the Federal system conditions as of June 30, 2003, with the exception of BPA's direct service industrial (DSI) power sales contract (PSC) obligations, which were updated September 9, 2003. This analysis incorporates BPA's estimates of Pacific Northwest (PNW) regional retail loads, contract obligations, contract purchases, and resource capabilities. These estimates are provided by BPA and PNW Federal agency, public agency, cooperative, U.S. Bureau of Reclamation (USBR), and investor-owned utility (IOU) customers through their annual Pacific Northwest Utilities Conference Committee (PNUCC) data submittals for 2002 as well as direct submittals to BPA. BPA compiled these projections to present the PNW regional and Federal system load and resource capabilities for the 10-year study horizon, operating years (OY) 2004 through 2013. This information is used as input into BPA's long-range resource planning process.

BPA is publishing the White Book to plan for adequate, efficient, and reliable long-term load service for both the Federal system and the region. BPA has included different load obligation scenarios for the Federal system and the PNW. This 2002 White Book updates the 2001 Pacific Northwest Loads and Resources Study.

Federal Firm Sales and Load Obligations

Federal system sales and load obligations are comprised of BPA's PSC obligations to PNW Federal agency, public agency, cooperative, USBR, IOU, and DSI customers and other BPA firm contractual obligations.

BPA Power Sales Obligations: BPA signed either 5- or 10-year PSCs with its customers that began October 1, 2001. The following is a description of the power deliveries to these specific customer classes for these contracts.

- Federal agency, public agency, cooperative, and USBR customers signed either 5- or 10-year PSCs. Some of the public agencies and cooperatives signed up for the 10-year Slice of the System Product. BPA's PSC obligations with these customers end September 30, 2011; however, this study assumes the public agency, USBR, and cooperative customers' net requirements will be met by BPA throughout the study horizon. For OY 2007 through 2011, BPA's PSC obligations include approximately 800 aMW of service that currently are not signed. In actual operation, BPA's obligations to the full-service customers may be higher or lower than those shown in this analysis;
- The IOU's signed 10-year contracts settling the Residential Purchase and Sales Agreement (RPSA). As a result of negotiations in 2001, IOU power deliveries under the RPSA settlement reflect reduced power deliveries in exchange for financial considerations through

September 30, 2006. The net RPSA settlement power deliveries are 258 aMW during this time period. The RPSA settlement allows BPA the option to provide its IOU customer's financial benefits and/or power deliveries of up to 2,200 aMW for the period October 1, 2006, through September 30, 2011. This study assumes that BPA will exercise its option to pass to the IOU customers RPSA settlement in the form of financial benefits and no power will be delivered for the period October 1, 2006, through September 30, 2011. This is a significant change from the 2000 and 2001 Studies that showed BPA annually delivering its IOU customers RPSA settlement of 2,200 aMW in power deliveries during this time period. BPA's potential exposure to load obligation impacts from the IOU RPSA settlement could range anywhere from 0 to 2,200 aMW during this time period; and

- BPA's DSI customers signed 5-year contracts beginning October 1, 2001, through September 30, 2006. Due to economic conditions, the actual DSI loads may be lower than those depicted in this study. After September 30, 2006, Federal service to the DSIs is not assumed because the DSIs do not have signed contracts in place for service. This assumption does not represent a decision by BPA on firm DSI PSCs post-September 30, 2006.

Table 1, shows BPA's Federal agency, public agency, cooperative, USBR, IOU and DSI load obligations under their 2001 PSCs.

Table 1
2002 White Book
BPA Power Sales Contract Load Obligations
Annual Energy in Average Megawatts

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
USBR	148	148	148	148	148	148	148	148	148	148
Federal Agency	117	118	118	119	120	120	121	121	122	122
Public Agency <u>1/</u>	6,490	6,556	6,622	7,013	7,167	7,198	7,279	7,302	7,420	7,465
DSI <u>2/</u>	640	762	768	128	0	0	0	0	0	0
IOU										
Power Deliveries <u>3/</u>	382	382	382	67	0	0	0	0	0	0
Power Purchase Programs <u>4/</u>	-124	-124	-124	-21	0	0	0	0	0	0
Net IOU Power Deliveries <u>5/</u>	258	258	258	46	0	0	0	0	0	0

1/ This includes BPA's public agency and cooperative PSC obligations that include full service, partial service, block, slice block, and slice resource contracts. BPA's obligations are reduced for load reduction agreements.

2/ BPA's DSI customers signed 5-year contracts beginning October 1, 2001, extending through September 30, 2006, and reflect buy-backs as of September 9, 2003. After September 30, 2006, Federal service to the DSIs is not assumed because the DSIs do not have signed contracts in place for service. This assumption does not represent a decision by BPA on post-September 30, 2006 firm DSI power sales.

3/ BPA's IOU RPSA settlement power deliveries were reduced through September 30, 2006. Beginning October 1, 2006 through September 30, 2011, this analysis assumes that BPA will pass the RPSA settlement in the form of financial benefits and no power will be delivered. This is a change from the 2000 and 2001 Studies that showed BPA delivering to the IOU customers RPSA settlement of 2,200 aMW annually in power deliveries during this time period.

4/ In addition to the IOU RPSA settlement, some of the IOUs reduced their obligations through power purchase programs. Under these programs, BPA purchased power back from some of the IOUs through September 30, 2006. These contracts are shown as BPA purchases in Intraregional Transfers and reduce BPA's actual IOU power deliveries.

5/ BPA's net IOU power deliveries, under the RPSA settlement and BPA power purchase programs, is 258 aMW through September 30, 2006:

Federal System Resources

BPA is the designated marketer of the hydroelectric resources of the Federal system, which includes 31 dams owned and operated by the USBR and the U.S. Army Corps of Engineers. BPA also markets the generation from the hydroelectric projects owned by the City of Idaho Falls and Lewis County Public Utility District. In addition, BPA markets the thermal generation from the Columbia Generating Station nuclear plant, operated by Energy Northwest, Inc., and the output from renewable power plants, primarily wind turbines, under power purchase contracts with BPA. This analysis reflects a new hydroregulation study that incorporates measures from the National Oceanographic and Atmospheric Administration Fisheries Biological Opinions dated December 2000, (2000 FCRPS BO) for the Snake River and Columbia River projects.

Hydro Improvements: BPA has budgeted \$1.2 billion over the next 10- to 12-years for maintaining and improving the reliability of the Federal hydroelectric system. These improvements increase and preserve Federal hydro generation by:

- Replacing turbine runners to preserve and increase generation and to make the turbine operations more fish friendly;
- Providing increased reliability by decreasing forced and planned outages; and
- Implementing hydro optimization and operational planning tools to increase generation

Under critical water conditions, it is estimated that the combination of these hydroelectric improvements will annually preserve and create up to 305 aMW by OY 2016, of which 76 aMW are associated with preserving the existing level of Federal hydro system generation capability from degradation. The balance of 229 aMW is considered to be potential additional Federal hydroelectric generation. The contribution of these hydroelectric improvements under average water conditions is estimated to be up to 1,013 aMW by OY 2016, of which about 712 aMW are associated with preserving the existing level of Federal hydro system generation capability. The balance of 301 aMW is considered to be potential additional Federal hydro generation. The total amount and timing of annual generation actually realized over the next 10- to 12-years will be dependent on the timely completion of the scheduled installations, the success of the optimization changes, and hydrologic conditions. The estimated increases in generation are associated with the current level of fishery operations. If future fishery operations decrease the flexibility of the hydro system operations and/or increase the amount of spill, the annual megawatt contribution of the hydro improvements realized will most likely be lower.

The 2002 White Book assumes increases in Federal hydroelectric generation of up to 211 aMW due to reliability increases, turbine runner replacements, and hydro optimization under critical water conditions by OY 2013. As changes occur in the hydro improvements programs, further analyses will be performed to quantitatively assess impacts to hydroelectric generation and those impacts will be reflected in future studies.

Federal System Annual Energy Surplus/Deficit

Table 2 is a summary of the Federal system annual energy loads and resources as shown in the 2002 White Book, page 55, under the Federal System Base Case Assumptions detailed on page 13, utilizing normal weather conditions and the 1937 critical water conditions. The Federal system is expected to be energy surplus in OY 2004 and have energy deficits of less than -100 aMW in OY 2005 through 2008. In OY 2009 through 2013, the Federal energy deficits climb from approximately -240 aMW to almost -465 aMW due to growth in BPA's public customers' loads, and the expiration of interregional purchases and import contracts. BPA will most likely meet these deficits using a combination of methods described below in Federal Resource Adequacy.

Table 2
2002 White Book
Federal System Energy Surplus/Deficit
Under 1937 Critical Water Conditions
Annual Energy in Average Megawatts

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Obligations	9,523	9,425	9,460	8,632	8,546	8,572	8,651	8,676	8,627	8,661
Resources	9,646	9,411	9,376	8,546	8,450	8,333	8,468	8,355	8,319	8,197
Surplus/Deficit	123	-14	-84	-86	-96	-239	-183	-321	-308	-464

Variability of Federal System Annual Energy Surplus/Deficit

This analysis presents the Federal system annual energy surplus/deficit projections under different levels of IOU power deliveries and DSI PSC obligations over the study horizon. There are four scenarios bound possible outcomes of the Federal system surplus/deficit under 1937-critical water conditions and normal weather conditions. See Variability of Federal Firm Annual Energy Surplus/Deficit Projections, page 26 of the document.

Federal System Resource Adequacy

The Federal system energy and capacity load resource projections use the Federal System Base Case Assumptions presented on page 13 and are considered conservative. This analysis assumes Federal system hydroelectric generation under 1937-critical water conditions, Federal non-hydroelectric resources operating at expected generation levels, and Federal contract obligations and purchases delivered at maximum contract levels. In addition, this analysis includes Federal power purchases or new resources that were acquired as of June 30, 2003. The Federal system load resource deficits may be reduced or met by any combination of the following:

- Better than critical water conditions, which increases water flow and water storage thereby increasing the output of the Federal hydroelectric system;
- Power purchases from new merchant plants operating or under construction in the PNW;
- Power purchases from merchant plants operating outside the PNW region;
- Purchase of off-system storage and exchange agreements that allow for seasonal shaping of Federal hydropower with other PNW entities or other regions; and
- BPA's DSI obligations may be lower than their full contracted amounts through September 30, 2006, due to contract termination, closures, and/or economic conditions.

PNW Region Total Retail Load Forecast

For this study, a total retail load forecast for each PNW entity was estimated separately and then grouped into the following customer categories: Federal agency, public agency, cooperative, USBR, IOU, and DSI. The total retail load forecasts for the Federal agencies, public agencies, cooperatives, and USBR were developed by BPA's East and West Hubs using linear trend methods based on individual customers' historical annual energy consumption and their 2001 Power Sales Contracts' Exhibit C submittals. Similarly, the forecasts for the IOUs were developed from data submitted in their PNUCC submittals or load forecasts sent directly to BPA. DSI total retail load estimates are based on their current PSCs with BPA. All total retail load forecasts were finalized on June 30, 2003, with the exception of the DSI loads, which were updated September 9, 2003.

2002 White Book and the Council Regional Total Retail Load Comparison: Table 3 shows the comparison of the non-DSI regional total retail loads for the 2002 White Book and the Northwest Power and Conservation Council (Council) for OY 2004 through 2013. The Council's load forecast, for this comparison, was based on their Revised Draft Forecast of Electricity Demand for the Fifth Power Plan (2003). To provide consistency between the load forecasts for comparison purposes, the DSI load components were removed from both forecasts. The comparison of the non-DSI load forecasts shows that the White Book projections are slightly higher in all years with the differences ranging from 0.5 percent (94 aMW) up to the maximum difference of 3.2 percent (730 aMW) in OY 2013. The average difference over the 10-years of the study is 1.8 percent.

Table 3

**Non-DSI PNW Regional Firm Load Comparison
2002 White Book and the Council Revised Draft Fifth Power Plan
Annual Energy in Average Megawatts**

Operating Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2002 White Book	19,657	20,022	20,345	20,740	21,132	21,536	21,870	22,208	22,551	22,975
Council Reg. Plan	19,459	19,928	20,238	20,497	20,759	21,033	21,331	21,632	21,941	22,245
Difference (aMW)	198	94	107	243	373	503	539	576	610	730
Difference (%)	1.0%	0.5%	0.5%	1.2%	1.8%	2.3%	2.5%	2.6%	2.7%	3.2%

Treatment of PNW Regional Independent Power Producer Resources

Of the expected 4,000 peak MW (annually 3,300 aMW) of new generation presented in the 2001 Study, all but approximately 1,776 peak MW (annually 1,496 aMW) of new generating resources have started operating in the PNW. These remaining regional resources are expected to be in operation by OY 2005. Currently, the output of all new projects is assumed to be connected to and delivered into the PNW region's transmission system and therefore are shown as regional resources. With the exception of new resources purchased by BPA, the majority of the output of these resources is not dedicated to meet PNW regional loads under provisions of the Northwest Power Act, § 5(b)(1)(b).

Additional copies of this document can be obtained from BPA's Public Information Center, 1-800-622-4520. The 2002 Pacific Northwest Loads and Resources Study Technical Appendix, which presents the aggregation of the loads and resources for each major Pacific Northwest generating utility, is only available electronically. Both the Technical Appendix and this summary document will be available electronically on BPA's external web site at: <http://www.bpa.gov/power/whitebook2002>.

Questions or additional comments may be directed to Tim Misley (503) 230-3942.

Sincerely,

/s/ **Gregory K. Delwiche**

Gregory K. Delwiche
Vice President, Generation Supply

Attachment

cc:
Official File – PGP (RP-03-14-11)