

2003 Safety-Net Cost Recovery Adjustment Clause Final Proposal

Final Study

Chapter 2 – Loads and Resources

SN-03-FS-BPA-01

June 2003



1 **CHAPTER 2: LOADS AND RESOURCES**

2
3 **2.1 Introduction**

4 The Loads and Resources chapter represents the compilation of the load, sales, contract, and
5 resource data necessary for developing BPA wholesale power rates. The results of this study are
6 used to: (1) provide base data to determine resource costs for the Revenue Recovery Study, *see*
7 chapter 3; (2) provide regional sales and hydro data for use in the Secondary Revenue Forecast,
8 *see* chapter 4; (3) provide base data to derive billing determinants in the Revenue Forecast, *see*
9 chapter 5; and (4) provide load and resource data for use in calculating risk in the Risk Analysis,
10 *see* chapter 6.

11
12 This chapter provides a synopsis of BPA’s loads and resources analyses. Specific components of
13 the analyses are not addressed in detail. Instead, an overview illustrates how each component is
14 completed, how components relate to each other, and how each component fits into the rate
15 development process. Methods, details, and results supporting this study are contained in the
16 documentation for SN-03 Study, SN-03-FS-BPA-02, chapter 2.

17
18 **2.2 Methods**

19 **2.2.1 Overview.** This study includes major interrelated Federal system components: (1) a
20 Federal system load and sales forecast that includes BPA’s power sales contracts and other BPA
21 contract obligations; (2) Federal system resources that include BPA’s Federal system generating
22 resources and other BPA contract purchases; (3) the Federal loads and resources balance that
23 relates Federal loads and sales to the Federal generating resources and contract purchases; and
24 (4) regional hydro resources.

1 This chapter provides projected firm loads and resources of the BPA system for the Fiscal Year¹
2 (FY) 2003 through 2006 rate period.

3
4 **2.2.1.1 Federal System Load and Sales Forecast.** The Federal system load and sales forecast
5 is the forecast of firm energy load that BPA expects to serve during the FY 2003-2006 period
6 under firm requirements power sale contracts. The Federal system load and sales forecast is
7 composed of customer group sales forecasts for public body and cooperative utilities and Federal
8 agencies (Public Agencies), direct service industrial customers (DSI), investor-owned utilities
9 (IOU), and other BPA power sales contract obligations. These obligations are forecasted
10 monthly over the period for the generation system peak (GSP) in megawatts, energy in average
11 megawatts, heavy load hour energy in megawatt-hours (HLH), and light load hour energy in
12 megawatt-hours (LLH). This forecast is provided to the Risk Analysis, chapter 6.

13
14 **2.2.1.2 Other BPA Contract Obligations.** BPA's other contract obligations are comprised of
15 contracts not defined under BPA's firm requirements power sale contracts. These obligations
16 include contract sales to utilities, marketers, and power commitments under international treaty.
17 These contract obligations are estimated for monthly energy in average megawatts, HLH, and
18 LLH. The contract data are provided to the Risk Analysis, chapter 6.

19
20 **2.2.1.3 Federal System Generating Resources.** BPA markets power from generating
21 resources that include Federal and non-Federal hydro projects, other contracted generating
22 projects, and other BPA hydro-related contracts. The combination of these generating resources
23 represents most of the Federal system's available firm output. BPA's current projection of the
24 output of these generating resources is incorporated in this chapter. The Federal hydro
25 generation is estimated in monthly energy in average megawatts only. Other non-hydro Federal

¹ Fiscal Year (FY) is a 12-month period October through September. For example, FY 2003 is October 1, 2002, through September 30, 2003.

1 generation is projected in monthly energy in average megawatts, HLH, and LLH. These data are
2 provided to the Risk Analysis, chapter 6.

3
4 **2.2.1.4 Other BPA Contract Purchases.** BPA's other resources are comprised of contract
5 purchases and exchanges, return energy associated with BPA's capacity contracts, and return and
6 exchange energy associated with capacity-for-energy exchanges. These contract purchases are
7 estimated in monthly energy in average megawatts, HLH, and LLH. The data are provided to
8 the Risk Analysis, chapter 6.

9
10 **2.2.1.5 Federal Loads and Resources Balance.** The Federal loads and resources balance
11 completes BPA's loads and resource picture. It compares monthly the Federal system load and
12 sales forecast under BPA's power sales contracts and contract obligations to the Federal system
13 generating resources and BPA's contract purchases, under 1937 water conditions, for
14 FY 2003-2006. The Federal loads and resources projections are presented by month for each
15 fiscal year. The result of the loads and resources balance yields BPA's estimated Federal system
16 monthly firm energy surplus or deficit, in monthly average megawatts. The data are provided to
17 the Risk Analysis, chapter 6.

18
19 **2.2.1.6 Regional Hydro Generation.** The regional hydro used in the Secondary Revenue
20 Forecast, chapter 4, includes all regional hydro: regulated hydro, independent hydro, and
21 non-utility generators (NUG) hydro. This larger set of regional hydro generation for the
22 50 water years of record (August 1928 through July 1978) is compiled for FY 2003-2006. The
23 regional hydro is estimated monthly for energy in average megawatts. The data are provided for
24 use as input to the Secondary Revenue Forecast, chapter 4.

1 **2.2.2 Federal System Load and Sales Forecast**

2 **2.2.2.1 Overview.** The Federal System Load and Sales Forecast includes BPA’s forecasted
3 sales to regional public agencies, IOUs, and DSIs, and contractual obligations outside the Pacific
4 Northwest region (exports) and contractual obligations within the Pacific Northwest region
5 (intra-regional transfers). The Federal system load and sales obligations are provided to the
6 Risk Analysis Study, chapter 6. The Federal system loads, sales, contracts, and generation
7 estimates used in BPA’s 2003 SN CRAC final proposal are detailed in the documentation for
8 SN-03 Study, SN-03-FS-BPA-02, chapter 2. Summaries of public agencies, IOU, and DSI
9 projected sales are presented in the appendix of this chapter.

10
11 Policies and procedures guiding BPA’s firm energy sales in the FY 2002-2006 rate period are
12 presented in BPA’s Power Subscription Strategy Administrator’s Record of Decision
13 (Subscription Strategy) published December 1998. The Subscription Strategy provides the basis
14 for the public agencies, IOU, and DSI firm energy sales forecasts presented in this loads and
15 resources chapter.

16
17 **2.2.2.2 Public Agencies Sales Forecast.** The public agencies monthly energy sales forecast
18 for those utilities that purchased Full or Partial Service products is based on the sum of the
19 utility-specific sales forecasts routinely produced by BPA analysts. The utility-specific forecasts
20 are produced using linear trend models based on historical annual energy totals. The annual
21 projections are spread to monthly figures using historical relationships. These forecasts
22 comprise projections of monthly energy and peak. The energy figures are pro-rated into HLH
23 and LLH segments. For those utilities purchasing Slice and Block products, the forecast is the
24 contracted amount and is split into appropriate HLH and LLH segments. Slice is a requirements
25 power product that provides a fixed percentage of the energy generated by the FCRPS to a
26 number of public preference customers. The Slice product differs from traditional requirements

1 products in that the power sold through Slice is shaped to BPA's generation output of the FCRPS
2 rather than the purchaser's load. The impact of the Slice product is addressed in the Risk
3 Analysis, chapter 6.

4
5 The monthly sales forecasts for energy and demand for the Full Service, Partial Service,
6 Slice/Block, and Block customer groups are presented in the appendix to this chapter, Tables 2-1
7 through 2-4. A description of the data, method, and projections of the public agencies sales
8 forecast is shown in the documentation for SN-03 Study, SN-03-FS-BPA-02, chapter 2.

9
10 **2.2.2.3 Investor-Owned Utilities Sales Forecast.** The six IOUs in the region are: Avista
11 Utilities Corporation, Idaho Power Company, NorthWestern Energy (formerly Montana Power
12 Company), PacifiCorp, Portland General Electric Company, and Puget Sound Energy.

13
14 In this chapter, BPA forecasts power sales to IOUs under the Residential Load (RL) rate and PF
15 Exchange Subscription rate to be 382 aMW per year for FY 2003-2006. This is based on signed
16 contracts with the six regional IOUs. The sales are in equal hourly amounts over the contract
17 period. *See* appendix, Tables 2-5 through 2-8. Of the 382 aMW in sales, BPA bought back
18 124 aMW each year for FY 2003-2006.

19
20 Some of the IOUs have agreed not to place additional net requirements service, in excess of
21 requirements loads served under section 5(b) Subscription sales, on BPA at the New Resources
22 (NR-02) rate except in accordance with the terms of the Subscription sales agreement. BPA will
23 meet the net requirements service of IOUs without sales contracts at the NR-02 rate. BPA's
24 forecast does not contain any NR sales subject to the SN CRAC at this time.

1 **2.2.2.4 Direct Service Industry Sales Forecast.** For purposes of this chapter, DSI sales are
2 forecasted to be 35 aMW, 31 aMW, 81 aMW, and 138 aMW for FY 2003-2006, respectively. In
3 BPA's May 2000 Final Loads and Resources Study, WP-02-FS-BPA-01, BPA forecasted
4 1,440 MW/hour would be sold to the DSIs. The current DSI sales forecast is much lower for
5 several reasons: (1) BPA purchased back some power from the DSIs (all load reductions for the
6 DSIs end on September 30, 2003); (2) the forecasted continued downturn in aluminum prices
7 combined with the level of BPA power prices will likely cause some DSIs to exercise their
8 contractual right to curtail purchases; (3) one DSI has rejected its power sales contract (291 MW)
9 in bankruptcy; and (4) BPA terminated one DSI power sales contract (280 MW).

10
11 The remaining DSIs' Industrial Firm Power (IP) contract total is 864 MW/hour for FY 2004 and
12 FY 2005, and 871 MW/hour during FY 2006. BPA is forecasting that DSIs will curtail the
13 majority of this contract total because aluminum prices are not expected to recover and the IP-02
14 rate, adjusted for CRACs, is expected to be too high for most DSI aluminum smelters to operate
15 economically during the remainder of the rate period. Non-aluminum DSIs are forecast to
16 purchase their full contract total, while the most efficient aluminum smelters may purchase a
17 portion of their contract total, and the least efficient smelters are likely to curtail all of their
18 contract total.

19
20 The DSI sales forecast for the IP Targeted Adjustment Charge (IPTAC) rate classes is shown in
21 the appendix, Tables 2-9 through 2-12.

22
23 **2.2.2.5 Other BPA Contract Obligations.** BPA provides Federal power to customers under a
24 variety of contract arrangements not included in the Public Agency, IOU, and DSI power sales
25 contracts forecasts. The contracts are categorized as: (1) power sales; (2) power or energy
26 exchange contracts; (3) capacity sales or capacity-for-energy exchange contracts; (4) power

1 payments for services; and (5) power commitments under international treaty. These
2 arrangements are collectively called “other contract obligations” and can have different rate
3 structures. These obligations are obtained from individual contracts and are estimated monthly
4 for energy in average megawatts, HLH and LLH. These data are provided to the Risk Analysis,
5 chapter 6.

6
7 All firm contract obligations are assumed served by Federal system firm resources regardless of
8 weather, water, or economic conditions. The Federal system contract obligations are
9 summarized monthly for the Federal system for energy in average megawatts, in the
10 documentation for SN-03 Study, SN-03-FS-BPA-02, chapter 2, (Federal System). Monthly
11 detailed energy in average megawatts, HLH, and LLH are shown in the documentation for
12 SN-03 Study, SN-03-FS-BPA-02, chapter 2, Table A-2 (Exports) and Table A-16
13 (Intra-Regional Transfers) for the rate period; and Table A-13 (CSPE Purchase) and Table A-14
14 (Supplemental and Entitlement Capacity) contractual obligations expire March 31, 2003. These
15 data are provided to the Risk Analysis, chapter 6.

17 **2.2.3 Federal System Resource Forecast**

18 **2.2.3.1 Overview.** Federal system resources consist of both hydro and contracted resources.
19 The Federal system hydro resource estimates are derived from a hydro-regulation study that
20 estimates their generation under 50 water conditions using the operating provisions of the Pacific
21 Northwest Coordination Agreement (PNCA) while meeting power and non-power requirements
22 for each hydroelectric project and the system as a whole. The seasonal shape and magnitude of
23 the Federal system hydro generation depends on availability and coordination of regional
24 resources to meet regional loads. This study uses resource generation estimates and contract
25 resource information to determine the composition of Federal system resources.

1 A major feature of these hydro-regulation studies are the operations described by the National
2 Marine Fisheries Service (National Oceanographic & Atmospheric Administration (NOAA)
3 Fisheries) and the U.S. Fish and Wildlife Service (USFWS) in their Biological Opinion (BiOp)
4 published December 21, 2000, and operations described in the Northwest Power Planning
5 Council's Fish and Wildlife Program. Each specifies hydroelectric project operations to provide
6 for such elements as seasonal flow augmentation, minimum flow levels for fish, spill for juvenile
7 fish passage, reservoir drawdown limitations, and turbine operation efficiency requirements.

8
9 **2.2.3.2 Federal System Generation and Contract Resources.** Federal resources from which
10 BPA markets power currently consist of federally owned hydro, non-federally owned resources
11 (hydro, thermal, and wind projects), exchange energy associated with BPA's existing
12 capacity-for-energy exchanges, power purchases, and other BPA hydro-related contracts.

13
14 **2.2.3.2.1 Hydro-Regulation Study.** Hydro plant operating characteristics are necessary to
15 determine the expected energy production from a specific project, given specific operating
16 conditions. These are physical characteristics that establish the limits within which each project
17 must be operated. These project-specific data were taken from PNCA data submittals made by
18 the regional utilities and government agencies involved in operating hydro projects.

19
20 Hydro plant operating requirements are inputs to the hydro-regulation simulator (HydroSim)
21 used to simulate the coordinated operation of the hydro system. As taken from PNCA data
22 submittals, these operating requirements include, but are not limited to, storage content limits
23 determined by rule curves, maximum project draft rates determined by each project, and flow
24 and spill objectives determined by the 2000 BiOp. Deviations from the PNCA data submittals
25 occur in the FY 2003 analysis when specific operating decisions have been made in order to
26 implement the 2000 BiOp. Data submittals made in 2003 had not yet been completed and are

1 not reflected in this study. This study does not contain any 2003 PNCA updates because they
2 were not available at the time of this study.

3
4 For the purpose of this SN CRAC final proposal, BPA made a hydro-regulation study for each
5 year, FY 2003-2006. Sets of variables are used to characterize hydro-regulation studies. These
6 variables include streamflows, firm loads, firm resources, markets for secondary energy, and
7 project-by-project operating requirements, which all affect the amount and timing of energy
8 available from the hydro system. In each year of the hydro-regulation study, these variables
9 were changed as necessary to reflect current knowledge of each operating parameter.

10
11 Modified streamflows are used to estimate power generation under historical streamflow
12 conditions. The Actual Energy Regulation (AER) and Operational Hydro regulation studies
13 were developed with the use of the 1990 level modified streamflows. Modified streamflows are
14 the historic streamflow adjusted to a common level of development by correcting for the effects
15 of irrigation and consumptive diversion demand, return flow, and changes in contents of
16 upstream reservoirs and lakes. These modified streamflows were developed by the A.G. Crook
17 Company, under contract with BPA, for the Columbia River Water Management Group's
18 Depletions Task Force.¹ Irrigation depletions are included for the 1990 level of development.

19
20 These modified streamflows are adjusted to include estimates of irrigation pumping at
21 Grand Coulee, as projected, for the rate period. This irrigation pumping provides water to the
22 Columbia Basin Project. The Bureau of Reclamation (Reclamation) provided the pumping
23 schedule in its 2000 PNCA preliminary data submittal. Adjustments are also made to include the
24 return flows downstream of Grand Coulee resulting from this updated pumping schedule. Due to
25 projected below-normal runoff for the FY 2003 water year, the 50-year modified flow set was

¹ The process by which the modified streamflows were created by the A. G. Crook Company is beyond the scope of this document. For further information on this process, please refer to documents published by the Columbia River Water Management Group.

1 weighted to reflect the latest projections for the 2003 April through September runoff. The latest
2 Northwest River Forecast Center volume forecast, the May “Final” of 82.2 million acre-feet
3 (maf), was used to base the weightings at the time of this analysis. The result was a weighted
4 50-year set of years with a weighted mean of 83.3 maf for April through September. In addition
5 to having a weighted mean of 83.3 maf, the set was also truncated above 101 maf and below
6 68 maf (all years above 101 maf and below 68 maf were weighted zero) to reflect the less than
7 one percent probability of occurring outside this range. The resulting set of years with weights
8 greater than zero contained a subset of 22 years out of the original 50-year set. For
9 FY 2004-2006, all 50 water years, equally weighted, were used.

10
11 There are two modes for hydro-regulation studies: refill and continuous. Both are used to
12 estimate the energy production of the hydro system. However, each mode is different in how it
13 treats initial reservoir conditions. Continuous hydro studies operate from one water year to
14 another, using the previous water year’s final reservoir elevations as the initial reservoir
15 elevations for the next water year. Refill studies operate each water year independent of all other
16 water years, using the same initial reservoir elevations for each water year. Continuous studies
17 are typically used when there is little or no information on initial reservoir elevations such as
18 when considering operations for a future year.

19
20 Since this year’s initial conditions are known, a refill study was used for the FY 2003 analysis.
21 For the FY 2004-2006 studies, each was run in the continuous mode. A significant difference
22 was noted in the Columbia River Treaty reservoirs’ storage levels when comparing the end of the
23 FY 2003 study with the storage levels those reservoirs started at in the FY 2004 study. In order
24 to transition smoothly from the FY 2003 study to the FY 2004 study, an energy adjustment was
25 made to the Federal system energy production in the FY 2004 study results. A table of these
26

1 energy adjustments may be found in the documentation for SN-03 Study, SN-03-FS-BPA-02,
2 chapter 2.

3
4 There are other differences between the study done for FY 2003 and those done for
5 FY 2004-2006. Since BPA is already operating within the FY 2003 year, more is known about
6 the range of possible streamflows that need to be considered and their effects on such things as
7 flood control draft requirements and fish operations requirements that vary with the amount of
8 spring runoff expected. Also, ongoing spring operations, such as bypass spill and flows for
9 steelhead, are modeled consistent with current operations. Non-Treaty storage operation was
10 modeled in the hydro-regulation studies in a manner that makes the most economic use in
11 September. The 2000 BiOp calls for Non-Treaty Storage to be operated to provide flow
12 augmentation water by storing in May and June and releasing in July through August, and is
13 modeled to the extent allowable by the current flow shaping agreement with Canada.

14
15 The 50-year hydro study monthly reservoir operations were run through the Hourly Operating
16 and Scheduling Simulator (HOSS) model to estimate the monthly ratios of HLH hydro
17 generation. The operational hydro study results and HOSS HLH hydro generation ratios are
18 input into the Risk Analysis, *see* chapter 6, which determines the Federal system monthly HLH
19 and LLH surpluses and deficits. HLH and LLH energy surpluses and deficits estimated in
20 RiskMod include transmission losses of 2.82 percent, which are applied to all hydro and nuclear
21 generation. The surplus energy is estimated in the Risk Analysis, *see* chapter 6, to project
22 surplus power sales revenues and power purchase expenses.

23
24 **2.2.3.2.2 Hydro Generation.** The hydro-regulation study provides the basis for the hydro
25 system operation and generation for the Federal system on the Federal Columbia River Power
26 System for the 50 water years of record (August 1928 through July 1978). The Federal system

1 hydro resources, though marketed by BPA, are owned and operated by Reclamation and the U.S.
2 Army Corps of Engineers (Corps). BPA also markets power purchased from hydro projects
3 owned by the City of Idaho Falls (Idaho Falls bulb turbine), Lewis County Public Utility District
4 (Cowlitz Falls), and Mission Valley (Big Creek). BPA's contract to purchase from Energy
5 Northwest's (ENW) Packwood hydroelectric project expired September 30, 2002. This study
6 includes hydro improvements anticipated from hydro optimization, turbine runner replacement,
7 and reliability increases through BPA's capital improvements programs at Federal regulated and
8 independent hydro projects. These hydro improvements are estimated by hydro project and
9 included in that project's generation. Generation increases are expected to yield as much as
10 75.8 aMW by FY 2006 under 1937 water conditions. Federal hydro resources include these
11 hydro improvements are summarized in the documentation for SN-03 Study, SN-03-FS-BPA-02,
12 chapter 2, Federal System (Regulated Hydro) and (Independent Hydro). Detailed Federal hydro
13 resource data are included in the documentation for SN-03 Study, SN-03-FS-BPA-02, chapter 2,
14 Tables A-3 (Regulated Hydro Projects) and A-4 (Hydro Independents).

15
16 **2.2.3.2.3 Other Federal Generation.** Additional Federal system resources include ENW's
17 Columbia Generating Station (CGS, formerly WNP-2) nuclear plant and other contract
18 resources. The projected output of the CGS includes facility improvements and a change in the
19 refueling cycle to once every two years. *See* documentation for SN-03 Study,
20 SN-03-FS-BPA-02, chapter 2, Table A-10 (Large Thermal). BPA also has contracted, or is
21 negotiating, for the output of several other generation projects. These projects include small
22 hydro (Elwah and Glines Hydro through July 31, 2005, Clearwater, Dworshak Small
23 Hydropower), wind (shares of Foote Creek 1, 2, and 4 Wind Projects; Stateline Wind project,
24 Condon Wind Project, and Klondike Phase 1 Wind Project), geothermal (100 percent of
25 Fourmile Hill Geothermal Project), and a small amount of solar resources. *See* documentation
26 for SN-03 Study, SN-03-FS-BPA-02, chapter 2, Table A-23 (Non-Utility Generation). In

1 addition, BPA has contracted for the output of the James River Wauna cogeneration project. *See*
2 documentation for SN-03 Study, SN-03-FS-BPA-02, chapter 2, Table A-8 (Renewables).

3
4 **2.2.3.2.4 Other BPA Contract Purchases.** BPA purchases power from sellers under a variety
5 of contractual arrangements to meet Federal load obligations. The contracts are categorized as:
6 (1) power purchases; (2) power or energy exchange purchase; (3) capacity sales or
7 capacity-for-energy exchange contracts; and (4) power purchased under international treaty.
8 These arrangements are collectively called “other contract purchases.” The monthly energy in
9 average megawatts, HLH, and LLH is established in the individual contracts. These data are
10 provided to the Risk Analysis, *see* chapter 6.

11
12 All firm contract purchases are assumed to be received by the Federal system as firm resources
13 regardless of weather, water, or economic conditions. The Federal system contract purchases are
14 summarized for the Federal system energy in the documentation for SN-03 Study,
15 SN-03-FS-BPA-02, chapter 2, Federal System, and detailed for monthly energy in average
16 megawatts, HLH, and LLH in the documentation for SN-03 Study, SN-03-FS-BPA-02,
17 chapter 2, Table A-5 (Imports) and A-16 (Intra-Regional Transfers) for the rate period.

18 19 **2.2.4 Federal Loads and Resources Balance**

20 **2.2.4.1 Overview.** The Federal loads and resources balance compiles BPA’s loads and
21 resources. It compares the monthly energy amounts from Federal system loads, sales, and
22 contract obligations, to the Federal generating resources and contract purchases.

23
24 **2.2.4.2 Federal Energy Loads and Resources Balance.** The result of the Federal firm energy
25 loads and resources balance presents the firm energy surplus or deficit, under 1937 water
26 conditions, for FY 2003-2006 and is shown in the documentation for SN-03 Study,

1 SN-03-FS-BPA-02, chapter 2, Federal System. The data estimates for the non-regulated and
2 independent hydro varying components are the basis for the Risk Analysis, *see* chapter 6.

3 4 **2.2.5 Regional Hydro Resources**

5 **2.2.5.1 Overview.** The regional hydro generation for 50 water conditions (1929 through 1978)
6 is compiled for FY 2003-2006.

7
8 **2.2.5.2 Regional 50 Water Year Hydro Generation.** Using the hydro-regulation study
9 developed for this rate case analysis, BPA estimates all the regional hydro generation energy by
10 month for each of the 50 water years of record. The set of regional hydro resources necessary
11 for the Secondary Revenue Forecast includes regional regulated and independent hydro projects,
12 plus NUG hydro projects produced by Independent Power Producers. The summary of the 50
13 water year regional hydro for FY 2004-2006 is shown in the documentation for SN-03 Study,
14 SN-03-FS-BPA-02, chapter 2.

15
16 **2.2.6 Estimation of Purchase MW Eligible for 4(h)(10)(C) Credit.** In order to estimate
17 4(h)(10)(C) credits, it was necessary to estimate the quantity of replacement power necessary due
18 to changes in fish operations for each year of the rate period. These amounts are shown in
19 Table 2-13 (the same amounts were used for 2004 through 2006). To do this estimation, two
20 hydroregulation studies were necessary. The first study, termed the “With Fish” study, modeled
21 how the river would be operated given current requirements for fish mitigation and enhancement.
22 This operation was modeled under 50 possible runoff forecasts, indicating that the 4(h)(10)(C)
23 credits vary dramatically based on Pacific Northwest streamflows. The second study modeled
24 what river operations would be like if no changes had been made for the benefit of fish, called
25 the “Without Fish” study. This study also used 50 possible streamflow scenarios. BPA receives
26

1 a 4(h)(10)(C) credit for any power purchases it must make in order to implement the “With Fish”
2 alternative as compared to the “Without Fish” alternative.

3
4 To determine power purchases for fish, it was necessary to look at BPA's surplus/deficit situation
5 under each of these hydro studies. One fundamental principal is that 4(h)(10)(C) credits be
6 unaffected by BPA marketing decisions. For example, the decision on the part of BPA to
7 augment the Federal system in order to serve more load beginning in FY 2002 has no effect on
8 the estimation of 4(h)(10)(C) credits. In order that BPA's surplus/deficit situation not be a
9 function of BPA marketing decisions, it was assumed that the appropriate BPA load to use in the
10 4(h)(10)(C) calculation was the load that could have been served with certainty under “Without
11 Fish” conditions in the worst water year (1937 water conditions). This is also known as the Firm
12 Energy Load Carrying Capability (FELCC) of the hydro system. FELCC is an estimate of the
13 generation that is guaranteed to be available from the Federal hydro system under the worst
14 water conditions prior to changes in operations for fish. Therefore, it is also the amount of firm
15 load that BPA would have been entitled to sell. Changes in this entitlement are the appropriate
16 measurement of operational costs that should be available for 4(h)(10)(C) credit.

17 Therefore, BPA's surplus/deficit situation using FELCC as load and 50 different streamflow
18 scenarios given the “Without Fish” hydro study was compared to the surplus/deficit situation
19 using FELCC as load and 50 different streamflow scenarios given the “With Fish” hydro study.

20 This is done for each monthly period. There are six possible scenarios in each period:

- 21 1. “Without Fish” study is deficit and “With Fish” study is more deficit: Leads to
22 more purchases in the “With Fish” study.
- 23 2. “Without Fish” study is deficit and “With Fish” study is less deficit: Leads to
24 fewer purchases in the “With Fish” study.
- 25 3. “Without Fish” study is surplus and “With Fish” study is more surplus: Leads to
26 more revenues in the “With Fish” study.

- 1 4. “Without Fish” study is surplus and “With Fish” study is less surplus: Leads to
- 2 fewer revenues in the “With Fish” study.
- 3 5. “Without Fish” study is surplus and “With Fish” study is deficit: Leads to fewer
- 4 revenues and more purchases in the “With Fish” study.
- 5 6. “Without Fish” study is deficit and “With Fish” study is surplus: Leads to fewer
- 6 purchases and more revenues in the “With Fish” study.
- 7

8 All situations that lead to a change in purchases (1, 2, 5, and 6) are summed across the monthly
9 periods. The resulting change in purchases is the amount eligible for 4(h)(10)(C) credit. These
10 are the results shown in Table 2-13.

APPENDIX
SALES FORECASTS

| | | Table 2-1 | | | | | | | | | | | | | |
|---------------------------|-----|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|--|
| | | 2003 Safety Net CRAC BPA Public Agencies Sales Forecast | | | | | | | | | | | | | |
| | | 2002-2003 Fiscal Year | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg | |
| Full - HLH | MWh | 587,543 | 660,923 | 764,163 | 785,088 | 659,019 | 644,621 | 594,855 | 579,672 | 555,584 | 587,323 | 595,732 | 560,074 | 7,574,596 | |
| Full - LLH | MWh | 346,413 | 404,466 | 470,812 | 480,165 | 411,169 | 405,012 | 369,520 | 349,918 | 340,210 | 344,839 | 350,174 | 324,297 | 4,596,995 | |
| Full - Demand | MW | 1,813 | 1,999 | 2,169 | 2,412 | 2,078 | 1,958 | 1,772 | 1,451 | 1,307 | 1,423 | 1,459 | 1,486 | | |
| Partial - HLH | MWh | 366,041 | 364,033 | 401,101 | 423,631 | 378,013 | 371,390 | 369,421 | 350,826 | 334,633 | 346,926 | 359,249 | 347,265 | 4,412,530 | |
| Partial - LLH | MWh | 257,809 | 270,176 | 292,118 | 308,927 | 273,328 | 277,266 | 263,821 | 255,229 | 239,529 | 233,223 | 248,675 | 237,725 | 3,157,826 | |
| Partial - Demand | MW | 948 | 999 | 1,078 | 1,106 | 1,060 | 1,024 | 965 | 875 | 815 | 810 | 863 | 869 | | |
| Block - HLH | MWh | 265,950 | 364,557 | 453,290 | 445,511 | 399,980 | 414,458 | 484,777 | 483,785 | 425,500 | 331,913 | 317,181 | 298,959 | 4,685,861 | |
| Block - LLH | MWh | 155,204 | 208,092 | 252,850 | 263,106 | 234,602 | 238,549 | 300,873 | 304,288 | 275,097 | 195,694 | 185,341 | 152,575 | 2,766,269 | |
| Block - Demand | MW | 618 | 879 | 1,091 | 1,034 | 1,044 | 999 | 1,167 | 1,121 | 1,065 | 769 | 764 | 719 | | |
| Slice Block - HLH | MWh | 389,050 | 413,694 | 468,141 | 497,069 | 429,729 | 419,526 | 347,961 | 285,790 | 268,488 | 319,918 | 337,134 | 365,416 | 4,541,916 | |
| Slice Block - LLH | MWh | 281,450 | 301,986 | 369,603 | 358,531 | 322,239 | 331,270 | 253,123 | 205,994 | 215,352 | 230,642 | 261,802 | 271,336 | 3,403,328 | |
| Slice Block - Demand | MW | 900 | 994 | 1,126 | 1,150 | 1,119 | 1,009 | 836 | 661 | 672 | 740 | 811 | 878 | | |
| Pre-Subscription - HLH | MWh | 372,117 | 406,769 | 479,391 | 483,606 | 417,730 | 412,053 | 378,816 | 401,223 | 395,552 | 433,004 | 406,989 | 352,737 | 4,939,986 | |
| Pre-Subscription - LLH | MWh | 234,874 | 261,313 | 314,211 | 312,093 | 274,079 | 280,614 | 242,301 | 261,009 | 269,586 | 280,825 | 269,013 | 220,562 | 3,220,481 | |
| Pre-Subscription - Demand | MW | 974 | 1,065 | 1,174 | 1,301 | 1,162 | 1,070 | 971 | 1,021 | 939 | 1,020 | 956 | 797 | | |
| Total Energy | aMW | 4,371 | 5,078 | 5,733 | 5,857 | 5,655 | 5,100 | 5,015 | 4,674 | 4,610 | 4,441 | 4,478 | 4,349 | 4,943 | |
| Total Peak | MW | 5,253 | 5,936 | 6,639 | 7,003 | 6,462 | 6,059 | 5,711 | 5,129 | 4,797 | 4,761 | 4,852 | 4,749 | | |

| | | Table 2-2 | | | | | | | | | | | | | |
|---------------------------|-----|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|--|
| | | 2003 Safety Net CRAC BPA Public Agencies Sales Forecast | | | | | | | | | | | | | |
| | | 2003-2004 Fiscal Year | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg | |
| Full - HLH | MWh | 632,085 | 702,845 | 817,094 | 836,365 | 710,957 | 690,669 | 634,467 | 617,494 | 597,223 | 632,745 | 642,099 | 605,691 | 8,119,736 | |
| Full - LLH | MWh | 372,875 | 435,001 | 497,502 | 511,335 | 448,527 | 428,649 | 394,134 | 377,554 | 362,094 | 371,527 | 378,625 | 351,895 | 4,929,718 | |
| Full - Demand | MW | 1,945 | 2,140 | 2,318 | 2,566 | 2,221 | 2,088 | 1,895 | 1,568 | 1,422 | 1,552 | 1,592 | 1,625 | | |
| Partial - HLH | MWh | 396,335 | 395,040 | 427,259 | 446,963 | 407,813 | 392,950 | 387,541 | 369,253 | 350,826 | 363,745 | 376,902 | 365,388 | 4,680,015 | |
| Partial - LLH | MWh | 274,511 | 286,853 | 309,843 | 323,201 | 293,515 | 291,285 | 277,382 | 268,081 | 252,344 | 246,109 | 261,622 | 250,955 | 3,335,701 | |
| Partial - Demand | MW | 1,001 | 1,051 | 1,128 | 1,147 | 1,132 | 1,065 | 1,003 | 910 | 851 | 849 | 905 | 913 | | |
| Block - HLH | MWh | 284,846 | 388,371 | 489,050 | 479,095 | 435,981 | 444,474 | 401,993 | 450,809 | 354,764 | 348,329 | 338,621 | 313,695 | 4,730,028 | |
| Block - LLH | MWh | 170,228 | 230,524 | 276,850 | 292,746 | 266,306 | 256,917 | 238,152 | 291,384 | 201,849 | 207,862 | 194,869 | 162,975 | 2,790,660 | |
| Block - Demand | MW | 662 | 957 | 1,153 | 1,112 | 1,137 | 1,046 | 968 | 1,069 | 864 | 807 | 806 | 765 | | |
| Slice Block - HLH | MWh | 403,488 | 414,000 | 504,576 | 514,512 | 444,672 | 452,736 | 363,168 | 292,448 | 297,024 | 335,664 | 351,936 | 379,392 | 4,753,616 | |
| Slice Block - LLH | MWh | 292,342 | 325,040 | 371,712 | 371,592 | 347,736 | 333,376 | 264,519 | 225,656 | 221,648 | 242,424 | 273,040 | 281,840 | 3,550,925 | |
| Slice Block - Demand | MW | 934 | 1,035 | 1,168 | 1,191 | 1,158 | 1,048 | 873 | 703 | 714 | 777 | 846 | 912 | | |
| Pre-Subscription - HLH | MWh | 378,020 | 408,899 | 492,475 | 491,534 | 424,350 | 423,361 | 384,846 | 403,425 | 406,637 | 440,232 | 413,990 | 358,317 | 5,026,086 | |
| Pre-Subscription - LLH | MWh | 238,516 | 270,045 | 314,479 | 317,160 | 285,378 | 280,312 | 246,069 | 269,306 | 269,608 | 285,368 | 273,425 | 223,925 | 3,273,591 | |
| Pre-Subscription - Demand | MW | 988 | 1,080 | 1,191 | 1,320 | 1,179 | 1,085 | 985 | 1,035 | 952 | 1,034 | 969 | 808 | | |
| Total Energy | aMW | 4,622 | 5,356 | 6,050 | 6,162 | 6,049 | 5,369 | 4,996 | 4,792 | 4,603 | 4,669 | 4,711 | 4,575 | 5,159 | |
| Total Peak | MW | 5,530 | 6,264 | 6,959 | 7,335 | 6,826 | 6,332 | 5,724 | 5,285 | 4,802 | 5,020 | 5,118 | 5,023 | | |

| | | Table 2-3 | | | | | | | | | | | | | |
|---------------------------|-----|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|--|
| | | 2003 Safety Net CRAC BPA Public Agencies Sales Forecast | | | | | | | | | | | | | |
| | | 2004-2005 Fiscal Year | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg | |
| Full - HLH | MWh | 641,744 | 719,006 | 831,913 | 845,304 | 721,226 | 701,050 | 643,993 | 626,311 | 605,621 | 639,212 | 653,757 | 614,770 | 8,243,906 | |
| Full - LLH | MWh | 383,400 | 439,860 | 506,730 | 522,679 | 450,208 | 434,994 | 399,970 | 382,852 | 367,115 | 379,145 | 381,509 | 357,100 | 5,005,561 | |
| Full - Demand | MW | 1,983 | 2,180 | 2,360 | 2,604 | 2,255 | 2,119 | 1,924 | 1,591 | 1,443 | 1,575 | 1,616 | 1,649 | | |
| Partial - HLH | MWh | 395,294 | 392,413 | 426,245 | 448,003 | 398,781 | 391,573 | 386,017 | 367,176 | 348,834 | 362,392 | 374,684 | 363,828 | 4,655,240 | |
| Partial - LLH | MWh | 272,439 | 285,823 | 308,488 | 321,700 | 287,294 | 289,799 | 275,752 | 266,186 | 250,375 | 243,966 | 260,057 | 249,303 | 3,311,183 | |
| Partial - Demand | MW | 997 | 1,049 | 1,127 | 1,146 | 1,108 | 1,063 | 999 | 905 | 846 | 844 | 901 | 909 | | |
| Block - HLH | MWh | 285,710 | 393,571 | 492,506 | 481,527 | 432,909 | 448,794 | 405,737 | 454,553 | 358,092 | 348,201 | 344,429 | 317,023 | 4,763,052 | |
| Block - LLH | MWh | 173,918 | 230,284 | 279,034 | 298,210 | 261,386 | 259,413 | 240,576 | 293,680 | 203,977 | 213,622 | 194,757 | 165,103 | 2,813,958 | |
| Block - Demand | MW | 679 | 948 | 1,161 | 1,142 | 1,129 | 1,056 | 977 | 1,078 | 872 | 829 | 799 | 773 | | |
| Slice Block - HLH | MWh | 388,544 | 430,560 | 504,576 | 495,456 | 444,672 | 452,736 | 363,168 | 292,448 | 297,024 | 323,232 | 360,288 | 374,400 | 4,727,104 | |
| Slice Block - LLH | MWh | 301,862 | 314,640 | 371,712 | 383,464 | 333,504 | 333,376 | 264,519 | 225,656 | 221,648 | 250,488 | 260,208 | 278,192 | 3,539,269 | |
| Slice Block - Demand | MW | 934 | 1,035 | 1,168 | 1,191 | 1,158 | 1,048 | 873 | 703 | 714 | 777 | 834 | 900 | | |
| Pre-Subscription - HLH | MWh | 379,392 | 420,110 | 500,548 | 494,397 | 431,319 | 429,921 | 390,780 | 409,786 | 413,238 | 442,934 | 425,175 | 363,760 | 5,101,360 | |
| Pre-Subscription - LLH | MWh | 246,301 | 269,697 | 319,518 | 327,092 | 282,811 | 284,566 | 249,751 | 273,299 | 273,798 | 294,056 | 273,461 | 227,154 | 3,321,504 | |
| Pre-Subscription - Demand | MW | 1,003 | 1,096 | 1,210 | 1,341 | 1,196 | 1,100 | 999 | 1,050 | 965 | 1,048 | 983 | 819 | | |
| Total Energy | aMW | 4,656 | 5,411 | 6,104 | 6,207 | 6,018 | 5,412 | 5,035 | 4,828 | 4,639 | 4,701 | 4,742 | 4,598 | 5,192 | |
| Total Peak | MW | 5,596 | 6,309 | 7,026 | 7,423 | 6,846 | 6,387 | 5,773 | 5,327 | 4,839 | 5,074 | 5,133 | 5,051 | | |

| | | Table 2-4 | | | | | | | | | | | | | |
|---------------------------|-----|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|--|
| | | 2003 Safety Net CRAC BPA Public Agencies Sales Forecast | | | | | | | | | | | | | |
| | | 2005-2006 Fiscal Year | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg | |
| Full - HLH | MWh | 653,207 | 731,597 | 846,307 | 863,304 | 736,931 | 716,813 | 655,732 | 643,326 | 619,191 | 653,483 | 668,409 | 629,117 | 8,417,417 | |
| Full - LLH | MWh | 390,455 | 447,706 | 515,598 | 533,817 | 459,987 | 444,783 | 412,117 | 388,862 | 375,440 | 387,836 | 390,298 | 365,670 | 5,112,567 | |
| Full - Demand | MW | 2,019 | 2,218 | 2,400 | 2,657 | 2,302 | 2,164 | 1,966 | 1,627 | 1,477 | 1,611 | 1,653 | 1,686 | | |
| Partial - HLH | MWh | 399,796 | 396,948 | 431,617 | 453,686 | 403,820 | 396,135 | 391,862 | 370,496 | 352,986 | 366,725 | 378,545 | 367,599 | 4,710,214 | |
| Partial - LLH | MWh | 275,364 | 288,815 | 311,982 | 325,399 | 290,604 | 292,857 | 278,629 | 269,110 | 253,120 | 246,736 | 262,589 | 251,739 | 3,346,944 | |
| Partial - Demand | MW | 1,009 | 1,061 | 1,141 | 1,160 | 1,122 | 1,075 | 1,011 | 915 | 855 | 854 | 910 | 919 | | |
| Block - HLH | MWh | 289,454 | 397,731 | 497,258 | 486,519 | 437,133 | 453,114 | 406,457 | 462,185 | 361,420 | 351,529 | 347,885 | 320,767 | 4,811,452 | |
| Block - LLH | MWh | 176,550 | 233,020 | 282,154 | 301,162 | 264,266 | 262,221 | 246,300 | 292,432 | 206,105 | 215,918 | 196,941 | 166,927 | 2,843,994 | |
| Block - Demand | MW | 688 | 958 | 1,172 | 1,154 | 1,140 | 1,066 | 1,005 | 1,071 | 880 | 837 | 807 | 782 | | |
| Slice Block - HLH | MWh | 385,216 | 426,400 | 498,960 | 489,632 | 439,680 | 447,984 | 345,200 | 299,376 | 292,864 | 319,904 | 360,288 | 374,400 | 4,679,904 | |
| Slice Block - LLH | MWh | 299,230 | 311,600 | 367,656 | 378,872 | 329,760 | 329,944 | 269,729 | 216,216 | 218,608 | 247,864 | 260,208 | 278,192 | 3,507,879 | |
| Slice Block - Demand | MW | 926 | 1,025 | 1,155 | 1,177 | 1,145 | 1,037 | 863 | 693 | 704 | 769 | 834 | 900 | | |
| Pre-Subscription - HLH | MWh | 385,169 | 426,784 | 508,682 | 502,342 | 438,144 | 436,537 | 372,268 | 399,706 | 399,081 | 430,184 | 410,609 | 349,346 | 5,058,850 | |
| Pre-Subscription - LLH | MWh | 249,858 | 273,869 | 324,596 | 332,157 | 287,183 | 288,856 | 241,918 | 256,702 | 262,814 | 281,387 | 262,240 | 214,476 | 3,276,058 | |
| Pre-Subscription - Demand | MW | 1,017 | 1,112 | 1,228 | 1,361 | 1,213 | 1,116 | 963 | 1,014 | 928 | 1,013 | 947 | 781 | | |
| Total Energy | aMW | 4,704 | 5,465 | 6,162 | 6,273 | 6,083 | 5,469 | 5,035 | 4,837 | 4,641 | 4,706 | 4,755 | 4,609 | 5,224 | |
| Total Peak | MW | 5,658 | 6,375 | 7,097 | 7,508 | 6,922 | 6,459 | 5,808 | 5,320 | 4,844 | 5,084 | 5,150 | 5,067 | | |

| Table 2-5 | | | | | | | | | | | | | | |
|--|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
| 2003 Safety Net CRAC BPA Investor-Owned Utility Sales Forecast | | | | | | | | | | | | | | |
| 2002-2003 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 165,024 | 158,912 | 158,912 | 165,024 | 146,688 | 158,912 | 158,912 | 165,024 | 152,800 | 165,024 | 158,912 | 158,912 | 159,421 |
| LLH | MWh | 119,566 | 116,128 | 125,296 | 119,184 | 110,016 | 125,296 | 115,746 | 119,184 | 122,240 | 119,184 | 125,296 | 116,128 | 119,439 |
| Demand | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Energy | aMW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Peak | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |

| Table 2-6 | | | | | | | | | | | | | | |
|--|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
| 2003 Safety Net CRAC BPA Investor-Owned Utility Sales Forecast | | | | | | | | | | | | | | |
| 2003-2004 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 165,024 | 152,800 | 165,024 | 165,024 | 146,688 | 165,024 | 158,912 | 158,912 | 158,912 | 165,024 | 158,912 | 158,912 | 159,931 |
| LLH | MWh | 119,566 | 122,240 | 119,184 | 119,184 | 119,184 | 119,184 | 115,746 | 125,296 | 116,128 | 119,184 | 125,296 | 116,128 | 119,693 |
| Demand | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Energy | aMW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Peak | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |

| Table 2-7 | | | | | | | | | | | | | | |
|--|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
| 2003 Safety Net CRAC BPA Investor-Owned Utility Sales Forecast | | | | | | | | | | | | | | |
| 2004-2005 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 158,912 | 158,912 | 165,024 | 158,912 | 146,688 | 165,024 | 158,912 | 158,912 | 158,912 | 158,912 | 165,024 | 158,912 | 159,421 |
| LLH | MWh | 125,678 | 116,128 | 119,184 | 125,296 | 110,016 | 119,184 | 115,746 | 125,296 | 116,128 | 125,296 | 119,184 | 116,128 | 119,439 |
| Demand | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Energy | aMW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Peak | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |

| Table 2-8 | | | | | | | | | | | | | | |
|--|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
| 2003 Safety Net CRAC BPA Investor-Owned Utility Sales Forecast | | | | | | | | | | | | | | |
| 2005-2006 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 158,912 | 158,912 | 165,024 | 158,912 | 146,688 | 165,024 | 152,800 | 165,024 | 158,912 | 158,912 | 165,024 | 158,912 | 159,421 |
| LLH | MWh | 125,678 | 116,128 | 119,184 | 125,296 | 110,016 | 119,184 | 121,858 | 119,184 | 116,128 | 125,296 | 119,184 | 116,128 | 119,439 |
| Demand | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Energy | aMW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |
| Total Peak | MW | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 | 382 |

| Table 2-9 | | | | | | | | | | | | | | |
|---|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| 2003 Safety Net CRAC BPA Direct Service Industry Sales Forecast | | | | | | | | | | | | | | |
| 2002-2003 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 15,120 | 14,560 | 14,560 | 15,120 | 13,440 | 14,560 | 14,560 | 15,120 | 14,000 | 15,120 | 14,560 | 14,560 | 14,607 |
| LLH | MWh | 10,955 | 10,640 | 11,480 | 10,920 | 10,080 | 11,480 | 10,605 | 10,920 | 11,200 | 10,920 | 11,480 | 10,640 | 10,943 |
| Demand | MW | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Total Energy | aMW | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Total Peak | MW | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |

| Table 2-10 | | | | | | | | | | | | | | |
|---|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| 2003 Safety Net CRAC BPA Direct Service Industry Sales Forecast | | | | | | | | | | | | | | |
| 2003-2004 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 13,392 | 12,400 | 13,392 | 13,392 | 11,904 | 13,392 | 12,896 | 12,896 | 12,896 | 13,392 | 12,896 | 12,896 | 12,979 |
| LLH | MWh | 9,703 | 9,920 | 9,672 | 9,672 | 9,672 | 9,672 | 9,393 | 10,168 | 9,424 | 9,672 | 10,168 | 9,424 | 9,713 |
| Demand | MW | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Total Energy | aMW | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| Total Peak | MW | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |

| Table 2-11 | | | | | | | | | | | | | | |
|---|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| 2003 Safety Net CRAC BPA Direct Service Industry Sales Forecast | | | | | | | | | | | | | | |
| 2004-2005 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 33,696 | 33,696 | 34,992 | 33,696 | 31,104 | 34,992 | 33,696 | 33,696 | 33,696 | 33,696 | 34,992 | 33,696 | 33,804 |
| LLH | MWh | 26,649 | 24,624 | 25,272 | 26,568 | 23,328 | 25,272 | 24,543 | 26,568 | 24,624 | 26,568 | 25,272 | 24,624 | 25,326 |
| Demand | MW | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 |
| Total Energy | aMW | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 |
| Total Peak | MW | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 |

| Table 2-12 | | | | | | | | | | | | | | |
|---|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| 2003 Safety Net CRAC BPA Direct Service Industry Sales Forecast | | | | | | | | | | | | | | |
| 2005-2006 Fiscal Year | | | | | | | | | | | | | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | 12Mon Avg |
| HLH | MWh | 57,408 | 57,408 | 59,616 | 57,408 | 52,992 | 59,616 | 55,200 | 59,616 | 57,408 | 57,408 | 59,616 | 57,408 | 57,592 |
| LLH | MWh | 45,402 | 41,952 | 43,056 | 45,264 | 39,744 | 43,056 | 44,022 | 43,056 | 41,952 | 45,264 | 43,056 | 41,952 | 43,148 |
| Demand | MW | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 |
| Total Energy | aMW | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 |
| Total Peak | MW | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 |