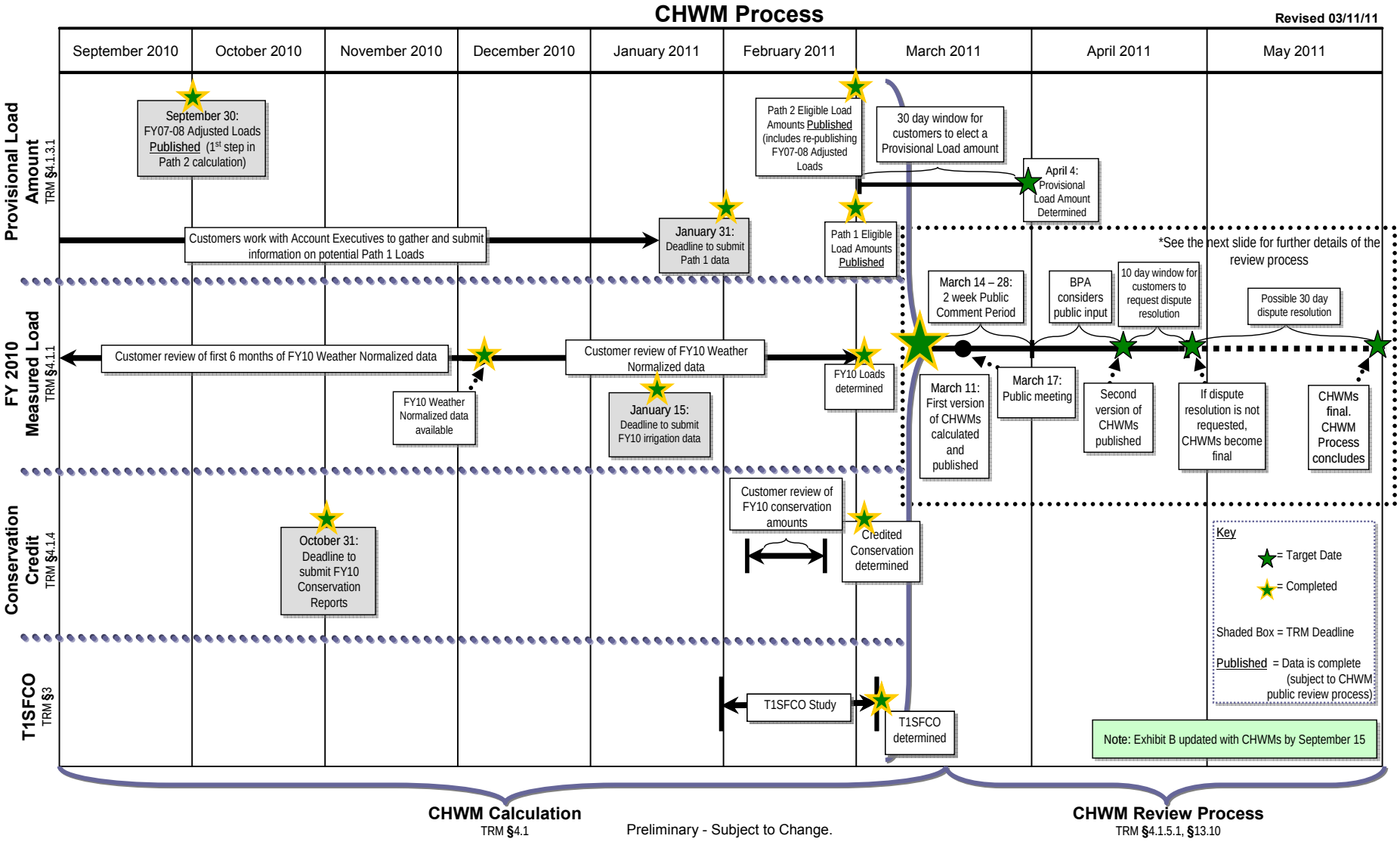
CHWM Public Meeting

CHWM Calculations

March 17, 2011

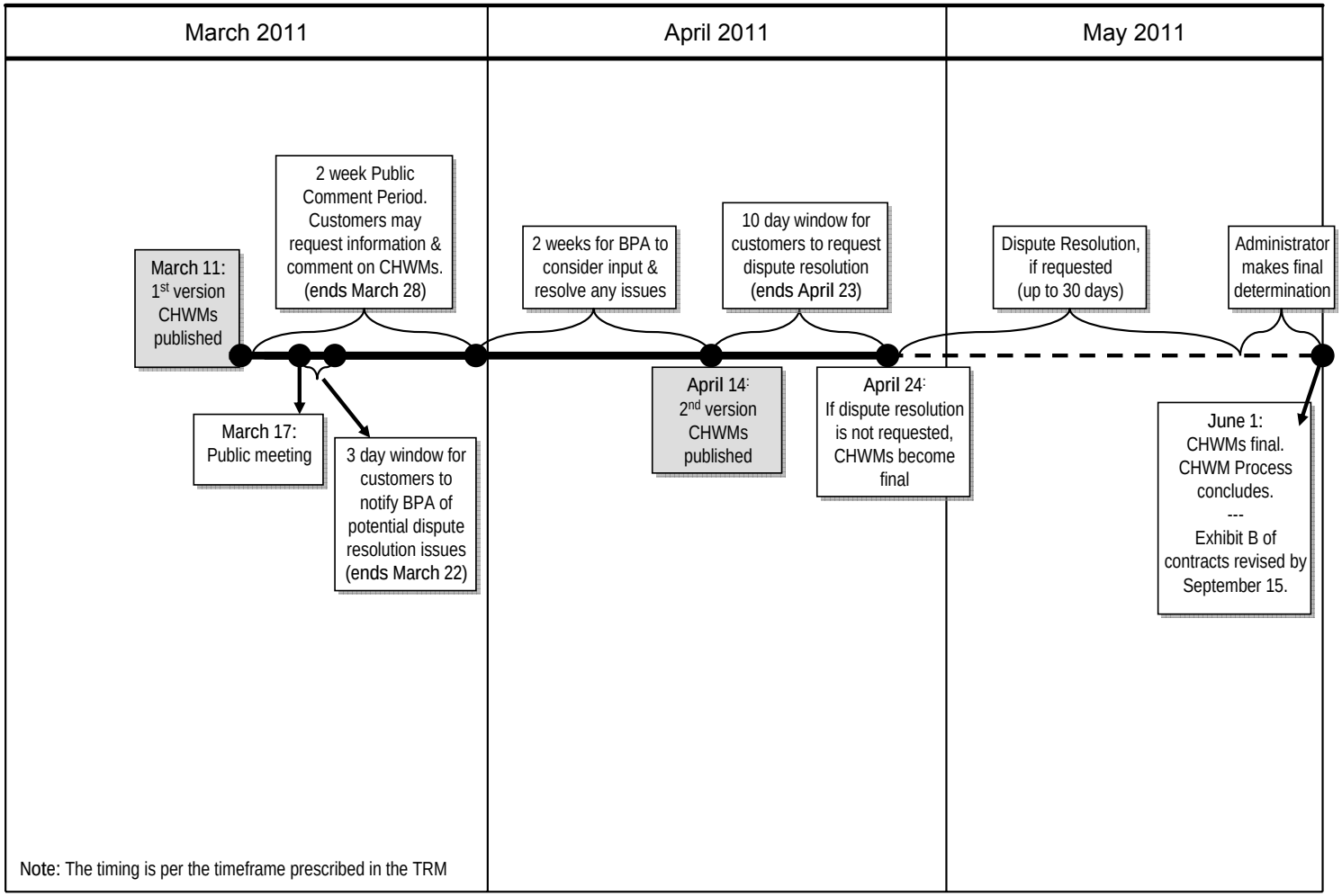
Overview

- CHWM Public Review Process
- Weather Normalization, FY 2010 Load Data, and Path 2 Provisional Load Data
- Tier 1 System Firm Critical Output (T1SFCO)
- Path 1 Provisional Loads
- Additional CHWM Amounts
  - New Publics
  - Increased CHWM for New Tribal Load Growth and DOE-Richland
- Conservation Adjustment


CHWM Process
Revised 03/11/11
September 2010
October 2010
November 2010
December 2010
January 2011
February 2011
March 2011
April 2011
May 2011
Provisional Load Amount
TRM §4.1.3.1
FY 2010 Measured Load
TRM §4.1.1
Conservation Credit
TRM §4.1.4
T1SFCO
TRM §3
September 30: FY07-08 Adjusted Loads Published (1st step in Path 2 calculation)
Path 2 Eligible Load Amounts Published (includes re-publishing FY07-08 Adjusted Loads
30 day window for customers to elect a Provisional Load amount
April 4: Provisional Load Amount Determined
Customers work with Account Executives to gather and submit information on potential Path 1 Loads
January 31: Deadline to submit Path 1 data
Path 1 Eligible Load Amounts Published
*See the next slide for further details of the review process
March 14 – 28: 2 week Public Comment Period
BPA considers public input
10 day window for customers to request dispute resolution
Possible 30 day dispute resolution
Customer review of first 6 months of FY10 Weather Normalized data
FY10 Weather Normalized data available
Customer review of FY10 Weather Normalized data
January 15: Deadline to submit FY10 irrigation data
FY10 Loads determined
March 11: First version of CHWMs calculated and published
March 17: Public meeting
Second version of CHWMs published
If dispute resolution is not requested, CHWMs become final
CHWMs final. CHWM Process concludes
Customer review of FY10 conservation amounts
Credited Conservation determined
October 31: Deadline to submit FY10 Conservation Reports
T1SFCO Study
T1SFCO determined
Key
= Target Date
= Completed
Shaded Box = TRM Deadline
Published = Data is complete (subject to CHWM public review process)
Note: Exhibit B updated with CHWMs by September 15
CHWM Calculation
TRM §4.1
Preliminary - Subject to Change.
CHWM Review Process
TRM §4.1.5.1, §13.10

CHWM Review Process

Revised 03/11/11



Preliminary - Subject to Change.

Weather Normalization, FY 2010 Load Data, and Path 2 Provisional Load Data

Purpose of This Work

- Tiered Rates Methodology required that weather normalized loads be used in the calculation of the Contract High Water Mark.
- Provisional adjustments required that the average of weather normalized 2007 and 2008 be the foundation for Path 2 Adjustments.
- This work was done according to steps established during workshops from June-September 2009 as set forth in the Tiered Rates Methodology process.

Objectives to Achieve

- Benefit must match cost
- Methods must be sufficiently accurate
- Consistent method must be used across all customers
- No Bias between groups
- Method must be transparent
- Method must be available to all parties
- Must be repeatable with same results
- Must be simple, logical, and easy to implement
- Should try for agreement between parties

Where We Have Come From

- TRM established a methodology to weather normalize loads. Allowed for a series of workshops to discuss specifics with customers.
- Kick-off workshop held in June 2009 and additional workshops were held during August and September 2009 with interested parties, all customers notified of kick-off workshop.
- Steps that BPA would follow when doing the weather normalization were established with customers in workshops.

Normalization General Steps

1. Gather and review 5 years of historical daily loads and average temperature. *(Jan-Mar 2010)*

2. Gather necessary monthly and annual irrigation data from customers. *(Dec 2009-Mar 2010)*

3. Delivery data for customer review. *(Feb-Apr 2010)*

4. Model the load temperature relationship for each customer separately. *(Apr-May 2010)*

5. Calculate 2007 & 2008 adjusted values. *(Apr-May 2010)*

Normalization General Steps

6. Gather and review FY 2010 historical daily loads and average temperature. *(Mar-Oct 2010)*

7. Gather necessary monthly and annual irrigation data from customers. *(Jan 2011)*

8. Calculate adjusted values. *(Apr-May 2010)*

9. Delivery data for customer review. *(Jan-Feb 2011)*

Temperature Data

- Actual hourly data is obtain via a satellite feed from NOAA to BPA for the weather stations.
- Hourly reads are the temperature at a set time during the hour (i.e. approximately 5 minutes past the hour).
- Will not likely match with the NOAA reported daily maximum or minimum temperature:
  - Max and Min are likely within an hour.
- Arithmetic average of hourly points are used when sufficient observations are available.

Temperature Data

- Normal based on the 1970-2004 temperature data from calculations performed by ITRON.
- Valid weather stations required: automated reads, hourly detail, and sufficient history to produce normal.

Making the Process Transparent

- To meet the objectives of the process all data and results are stored in a very large Excel file by customer:
  - All files start formatted similarly like
    - WN_(customer identifier).xls
  - Spread sheet can seem quite complicated but, not really, when you understand the layout.
  - Currently at the start of the process, numbers are not final and still subject to change.

- Trying to meet the following objectives:
  - Use a software that is available to customers (SAS & Excel).
  - Store the data and results for future reference work.
  - Model and normalize data within the same application.
  - Provide clear application of the steps and results within the tool.

Questions?

Tier 1 System Firm Critical Output

HYDSIM Assumptions: Updates Since the BP-12 Initial Proposal

- Canadian Operation
  - Canadian operations were updated.
  - In the Initial Proposal HYDSIM studies the 2010 Canadian operations planning assumptions came from the most recent DOP study available at the time.
  - BPA updated 2012 Canadian operations planning assumptions because changes in the Canadian load shape for 2012 and 2013 changed the timing for release of water from Canadian storage projects.
  - The Canadian projects are so high up in the hydro system that relatively small flow changes have a significant effect on our generation. Just a 10-kcfs change from the Canadian projects can be worth about 600 aMW to our federal generation.

HYDSIM Assumptions: Updates Since the BP-12 Initial Proposal

- Reserve Assumptions
  - Balancing reserves are based on the Initial Proposal assumptions
    - Balancing Reserves at 99.5% with Self Supply
  - Operating Contingency Reserves were updated from the Initial Proposal
    - Operating Contingency Reserves at 7% for thermal and 5% for non-thermal resources
      - less 66 aMW Firm Contingent Tagging
      - less 33.4 aMW contracted to DSIs

HYDSIM Assumptions: Updates Since the BP-12 Initial Proposal

- Availability Factors
  - Availability factors tell HYDSIM how much of the full project generating capability is available for use each period of the study by factoring in outages and reserve requirements.
  - Initial proposal studies assumed average actual outages from FY01 through FY09 for all projects, with one additional 805-MW unit outage at Grand Coulee starting March 2013 and two additional 88-MW unit outages at Chief Joseph throughout the rate period.
  - The CHWM Process hydro studies include updated outage assumptions for Grand Coulee because the Initial Proposal did not assume enough outages.

HYDSIM Assumptions: Updates Since the BP-12 Initial Proposal

- Availability Factors (continued)
  - The CHWM Process hydro studies for Grand Coulee were updated to assume average actual outages from FY09 through FY10 with one additional 805-MW unit out of service. This update was made to reflect the high levels of outages that are currently occurring and are expected to continue within the rate period.
  - The outage assumptions for all the other projects are still the same as the Initial Proposal.
- Loads
  - HYDSIM uses the Residual Hydro Load for the region. Total Retail Loads were updated in LARIS Studies 74 and 75. LARIS Study 68 and 69 were used in the Initial Proposal studies.
  - The Total Retail Loads in FY12 and FY13 are ~500 aMW lower than in the Initial Proposal and the non-hydro resources have not changed significantly. As a result, the updated Residual Hydro Loads in HYDSIM are ~500aMW lower than in the Initial Proposal.

Resulting Estimated Differences in FY12 & FY13 HYDSIM Federal Regulated Hydro Generation 1937 Critical Water Conditions (aMW)

	Regulated Federal Hydro Generation From HYDSIM	FY Annual Average
1937 Critial water Conditions		
1.	CHWM Process (Study 75)	***6,517***
2.	BP-12 Initial Rate Case (Study 72)	***6,358***
3.	**Difference CHWM less WP-12 Initial Proposal**	***159***

Post-HYDSIM Adjustments in LaRIS

- LaRIS uses regulated Federal hydro generation from HYDSIM, and adds:
  - Hydro Independents
    - BPA checks hydro generation forecasts with observed generation at various modeled hydro projects.
    - The Initial Proposal included Bonneville Fishway generation at 21 aMW as a specific line item in the Hydro Independents. However the checking process revealed a double-counting of generation between the Bonneville dam and the Bonneville Fishway.
    - To avoid this double-counting, the Bonneville Fishway generation was set to 0 for CHWM Process.
  - Chief Joseph Encroachments

Federal System Tier 1 System Firm Critical Output

Table 3.1: Federal System Hydro Generation (Study 75)

Energy in aMW

1.	Regulated Hydro	2012	2013	Average
2.	Albeni Falls	26.6	26.6	26.6
3.	Bonneville Hydro	416.4	416.0	416.2
4.	Chief Joseph Hydro	1,111.9	1,112.0	1,112.0
5.	Dworshak Hydro	147.8	148.1	148.0
6.	Grand Coulee Hydro	1,936.1	1,936.6	1,936.4
7.	Hungry Horse	89.4	89.4	89.4
8.	Ice Harbor Hydro	166.1	166.2	166.1
9.	John Day Hydro	816.2	816.1	816.2
10.	Libby	176.9	177.2	177.1
11.	Little Goose Hydro	190.3	190.5	190.4
12.	Lower Granite Hydro	188.4	188.5	188.5
13.	Lower Monumental Hydro	188.4	188.6	188.5
14.	Mc Nary Hydro	498.4	495.8	497.1
15.	The Dalles Hydro	612.0	611.7	611.8

Federal System Tier 1 System Firm Critical Output

Table 3.1: Federal System Hydro Generation (Study 75) (Continued)

Energy in aMW

16.	Independent Hydro	2012	2013	Average
17.	Anderson Ranch	14.6	14.7	14.7
18.	Big Cliff	10.2	10.3	10.3
19.	Black Canyon	8.1	8.1	8.1
20.	Boise River Diversion	1.3	1.3	1.3
21.	Bonneville Fishway **(Already Included in Bonneville H/K)**	0.0	0.0	0.0
22.	Chandler	8.6	8.6	8.6
23.	Cougar	16.5	16.6	16.6
24.	Cowlitz Falls	26.2	26.2	26.2
25.	Detroit	41.9	41.9	41.9
26.	Dexter	9.2	9.2	9.2
27.	Foster	12.5	12.5	12.5
28.	Green Peter	27.5	27.6	27.6
29.	Green Springs - USBR	5.8	5.8	5.8
30.	Hills Creek	18.0	18.0	18.0
31.	Idaho Falls - City Plant	4.5	4.5	4.5
32.	Idaho Falls - Lower Plant	4.7	4.7	4.7
33.	Idaho Falls - Upper Plant	4.8	4.8	4.8
34.	Lookout Point	36.3	36.4	36.4
35.	Lost Creek	28.6	28.7	28.6
36.	Minidoka	16.4	16.4	16.4
37.	Palisades	74.1	74.2	74.2
38.	Roza	7.9	7.9	7.9
39.	***Total Federal System Hydro Generation***	***6,942.9***	***6,941.9***	***6,942.4***

Federal System Tier 1 System Firm Critical Output

Table 3.2: Designated Non-Federally Owned Resources (Study 75)

Energy in aMW

1.	Project	2012	2013	Average
2.	Ashland Solar Project	0.0	0.0	0.0
3.	Columbia Generating Station	1,030.0	877.6	953.8
4.	Condon Wind Project	10.4	10.5	10.4
5.	Dworshak/Clearwater Small Hydropower	2.6	2.6	2.6
6.	Elwha Hydro **(Generation off-line beginning 6/1/2011)**	0.0	0.0	0.0
7.	Foote Creek 1	5.1	5.1	5.1
8.	Foote Creek 2	0.6	0.6	0.6
9.	Foote Creek 4	5.6	5.6	5.6
10.	Fourmile Hill Geothermal **(Not included)**	0.0	0.0	0.0
11.	Georgia-Pacific Paper (Wauna)	19.2	19.2	19.2
12.	Glines Canyon Hydro **(Generation off-line beginning 6/1/2011)**	0.0	0.0	0.0
13.	Klondike I	7.6	7.7	7.6
14.	Stateline Wind Project	21.9	21.9	21.9
15.	White Bluffs Solar	0.0	0.0	0.0
16.	***Total Designated Non-Federally Owned Resources***	***1,103.1***	***950.7***	***1,026.9***

Federal System Tier 1 System Firm Critical Output

Table 3.3: Designated BPA Contract Purchases (Study 75)

Energy in aMW

1.	Contract Purchases	Contract #	2012	2013	Average
2.	Priest Rapids CER for Canada	97PB-10099	30.0	29.4	29.7
3.	Rock Island #1 CER for Canada	97PB-10102	11.3	11.1	11.2
4.	Rock Island #2 CER for Canada	97PB-10102	7.2	7.0	7.1
5.	Rock Reach CER for Canada	97PB-10103	38.5	37.7	38.1
6.	Wanapum CER for Canada	97PB-10100	29.0	28.5	28.8
7.	Wells CER for Canada	97PB-10101	24.6	24.1	24.4
8.	BCHP to BPA PwrS	99PB-22685	1.0	1.0	1.0
9.	PASA to BPA Pk Repl	94BP-93658	1.1	1.1	1.1
10.	PASA to BPA S/N/X	94BP-93658	0.4	0.4	0.4
11.	PASA to BPA Xchg Nrg	94BP-93658	1.9	1.9	1.9
12.	PPL to BPA So Idaho	89BP-92524	160.2	159.9	160.0
13.	RVSD to BPA Pk Repl	94BP-93958	4.8	4.9	4.9
14.	RVSD to BPA Seas Xchg	94BP-93958	4.3	4.3	4.3
15.	RVSD to BPA Xchg Nrg	94BP-93958	7.3	7.3	7.3
16.	SPP to BPA Harney Wells	88BP-92436	60.0	60.0	60.0
17.	PPL to BPA SNX (Spring Return)	94BP-94332	0.0	0.0	0.0
18.	PPL to BPA SPX (Summer Return)	94BP-94332	5.7	5.7	5.7
19.	***Total Designated BPA Contract Purchases***		***387.3***	***384.6***	***385.9***

Federal System Tier 1 System Firm Critical Output

Table 3.4: Designated BPA System Obligations (Study 75)

Energy in aMW

1.	System Obligations	Contract #	2012	2013	Average
2.	BPA to BRCJ Chief Joseph	14-03-17506; 14-03-49151	135.2	135.5	135.4
3.	BPA to BRCB Columbia Basin Project	Ibp-4512; 14-03-001-12160	8.1	8.2	8.1
4.	BPA to BRCR Crooked River Project	14-03-73152	1.1	1.1	1.1
5.	BPA to BROP Owyhee Project	EW-78-Y-83-00019	3.4	3.4	3.4
6.	BPA to BRRP Rathdrum Prairie Project	14-03-49151	0.7	0.7	0.7
7.	BPA to BRSID Southern Idaho Projects	EW-78-Y-83-00019	19.5	19.6	19.5
8.	BPA to BRSIN Spokane Indian Development	14-03-49151	0.3	0.3	0.3
9.	BPA to BRSV Spokane Valley	14-03-63656	0.7	0.7	0.7
10.	BPA to BRTD The Dallas Reclamation Project	14-03-32210	2.0	2.0	2.0
11.	BPA to BRTV Tualatin Project	14-03-49151	0.6	0.6	0.6
12.	BPA to BRUB Umatilla Basin Project	10GS-75345 (draft)	0.0	0.0	0.0
13.	BPA to BRYK Yakima Project	DE-MS79-88BP92591	1.7	1.7	1.7
14.	BPA To BCHA Can Ent	99EO-40003	522.3	504.7	513.5
15.	BPA to BHEC 2012PSC	97PB-10051	5.2	5.2	5.2
16.	BPA to PASA C/N/X	94BP-93658	1.1	1.1	1.1
17.	BPA to PASA S/N/X	94BP-93658	0.4	0.4	0.4
18.	BPA to RVSD C/N/X	94BP-93958	4.8	4.9	4.9
19.	BPA to RVSD Seas Xchg	94BP-93958	4.3	4.3	4.3
20.	Federal Intertie Losses **(Calculated: 3.0% of Intertie Sales in Table 3.4 lines 16-19)**	*-Calculated-*	0.3	0.3	0.3
21.	BPA to SPP Pwr S	88BP-92436	60.0	60.0	60.0

Federal System Tier 1 System Firm Critical Output

Table 3.4: Designated BPA System Obligations (Study 75) (Continued)

Energy in aMW

	System Obligations (Continued)	Contract #	2012	2013	Average
22.	BPA to AVWP WP3 S	85BP-92186	41.7	41.6	41.6
23.	BPA to PPL SNX (Spring Delivery)	94BP-94332	0.0	0.0	0.0
24.	BPA to PPL SPX (Summer Delivery)	94BP-94332	5.7	5.7	5.7
25.	BPA to PPL SoID	89BP-92524	160.2	159.9	160.0
26.	BPA to PSE WP3 S	85BP-92185	41.7	41.6	41.6
27.	BPAp to BPAT **(Ditmer/Substation Service)**	09PB-12128	9.1	9.1	9.1
28.	Federal Power Trans. Losses **(Calculated: 2.82% of totals in Tables 3.1, 3.2, & 3.3)**	*-Calculated-*	237.8	233.4	235.6
29.	Transmission Returns (Slice) **(27.027%*1.9%* sum of Tables 3.1, 3.2, & 3.3 less sum of Table 3.4 lines 1-28)**	*-Calculated-*	-36.8	-36.1	-36.4
30.	***Total Designated System Obligations***		***1,231.2***	***1,209.9***	***1,220.5***

Federal System Tier 1 System Firm Critical Output

Federal Tier 1 System Firm Critical Output (Study 75)

Energy in aMW

1.	T1SFCO Projections (Study 75) Energy in aMW	2012	2013	Average
2.	Total Federal System Hydro Generation (Table 3.1)	*6,943*	*6,942*	*6,942*
3.	Total Designated Non-Federally Owned Resources (Table 3.2)	*1,103*	*951*	*1,027*
4.	Total Designated BPA Contract Purchases (Table 3.3)	*387*	*385*	*386*
5.	Total Designated System Obligations (Table 3.4)	*(1,231)*	*(1,210)*	*(1,221)*
6.	**Federal Tier 1 System Firm Critical Output**	*7,202*	*7,067*	*7,135*

Study75-T1SFCO CalculationD03172011.xls

Federal System Tier 1 System Firm Critical Output

Federal Tier 1 System Firm Critical Output Difference

Study 75 – Study 69 (September 10, 2010 Workshop)

Energy in aMW

Study 75 - Study 69 Energy in aMW	Study 75	Study 69	Difference
1. Table 3.1: Total Federal System Hydro Generation	**6,942**	**6,804**	**138**
a) HYDSIM Regulated Hydro Generation			*159*
b) Remove double-counting of Bonneville Fishway			*(21)*
2. Table 3.2: Total Designated Non-Federally Owned Resources	**1,027**	**1,029**	**(2)**
a) Remove Glines Canyon & Elwha Hydro (Beginning 6/1/2011)			*(2)*
3. Table 3.3: Total Designated BPA Contract Purchases	**386**	**386**	**(0)**
4. Table 3.4: Total Designated System Obligations	**(1,221)**	**(1,221)**	**0**
a) USBR Obligations (Study 75 obligations are lower)			*4*
b) Federal Power Transmission Losses (Losses are a Function of Resources. Study 75 is higher due to increased T1CFCO resources)			*(4)*
5. Difference Federal Tier 1 System Firm Critical Output	**7,135**	**6,998**	**137**

Path 1 Provisional Loads

Path 1 Provisional Loads

- Path 1(a): loss of one or more loads due to a discrete event. No customers submitted data for such a load loss.

- Path 1(b): loss of a single consumer load due to any event, including the economy.
  - Provides an adjustment to a utility's CHWM when there is:
    - A decrease in a single *consumer* load that resulted in the smaller of 5 aMW or a 10% decrease in the customer's FY 2010 measured load

Path 1(b) Eligibility Parameters

- The TRM does not specify how to determine eligibility and gives BPA the discretion as to what the provisional load amount should be

- BPA determined that a consumer load is eligible for a Path 1(b) amount based on:
  - The FY 2010 load compared to either:
    - The average of the FY 2007-2009 load, or
    - The highest of any continuous 12 month load in FY 2007-2009

Path 1(b) Provisional Amount

- The TRM states that if the load is eligible, the amount will be:
  - The difference between the FY 2007-2009 average load and FY 2010 load
- BPA has discretion to increase the amount up to an amount that is:
  - The difference between the FY 2020 load and the highest of any continuous 12 month load in FY 2007-2009
  - BPA granted an upward adjustment where the highest of any continuous 12 month load in FY 2007-2009 is consistent with the highest of any continuous 24 month load in FY2004-2009

Additional CHWM Amounts

CHWM for New Publics

- CHWM for Jefferson PUD

$$\textbf{Jefferson PUD's } TRL_{2013} \textbf{ (less non-federal resources, NLSLs)} \times \frac{\sum \textbf{existing customers' } CHWMs_{2013}}{\sum \textbf{existing customers' } TRL_{2013} \textbf{ (less existing resources, NLSLs)}}$$

Jefferson PUD's FY 2013 forecast TRL includes 3.236 aMW for the Port Townsend Paper OCC load that Jefferson PUD intends to serve.

Increased CHWM for Tribes and DOE-Richland

- Increased CHWM for New Tribal Load Growth
  - TRM §4.1.6.3.1 allows tribes to increase their CHWM amounts for load growth or load they annex (subject to certain aMW limitations)
  - Yakama and Umqua both receive additional CHWM amounts for load growth through FY 2013 that is in excess of their initial CHWM

- Increased CHWM for DOE-Richland
  - Exhibit B of DOE-Richland's RD contract provides additional CHWM amounts for increases in its load due to defense activities

Conservation Adjustment

Conservation Adjustment

- Conservation Adjustment process is detailed in Attachment D of the TRM.
- Conservation achievements from FY 2007 – FY 2010 give utilities credit toward their HWM calculation.
- Utility-funded conservation was credited toward the HWM at 100%; BPA-funded conservation was credited at 75%.

Conservation Adjustment (cont.)

- Conservation must be cost-effective and reducing load in FY 2010.
- Utility-funded conservation must be verified in the same way as BPA-funded conservation.
- Each utility was consulted on an annual basis about their number prior to release.