NorthWestern® Energy

March 8, 2013

Ms. Kate Whitney
Utility Division
Montana Public Service Commission
1701 Prospect Avenue
PO Box 2022601
Helena, Montana 59620-2601

Re: Docket No. D2012.5.49 Electric Tracker
PSC Set 5 Data Requests (PSC-034-PSC-091)

Dear Ms. Whitney:

Enclosed for filing is a copy of NorthWestern Energy's response to PSC Set 5 Data Requests. These Data Responses have been mailed to the service list in this docket. They will be hand delivered to the PSC and MCC today. They will also be efiled with the PSC.

Should you have questions please contact Joe Schwartzenberger at (406) 497-3362.

Sincerely,

Nedra Chase

Nedra Chase
Administrative Assistant

Enclosures

CERTIFICATE OF SERVICE

I hereby certify that a copy of NorthWestern Energy's response to PSC Set 5 Data Requests (PSC-034-PSC-091) in Docket D2012.5.49 Electric Tracker has been served by mailing a copy thereof by first class mail, postage prepaid to the service list in this Docket. They will be hand delivered to the PSC and MCC this date. They will also be efiled with the PSC.

Date: March 8, 2013

Nedra Chase

Nedra Chase
Administrative Assistant
Regulatory Affairs

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D2012.5.49

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NorthWestern Energy
Docket D2012.5.49
Electric Tracker

Montana Public Service Commission (PSC)
Set 5 (034-091)

Data Requests received February 22, 2013

PSC-034

Regarding: DSM Impacts on Electricity Supply Costs
Witness: Fine, part a / Bennett, parts b, c & d

a. Please provide estimates of annual total electricity supply portfolio costs with and without planned non-USB DSM acquisition over NWE's planning horizon. Please explain how the estimate is calculated and provide supporting work papers.

b. Please provide estimates of annual residential electricity supply service rates with and without planned non-USB DSM acquisition over NWE's planning horizon, and with and without lost revenue.

c. Please provide estimates of average residential electric bills with and without planned non-USB DSM acquisition over NWE's planning horizon.

d. Please provide separate estimates of average residential electric bills for participants and non-participants with planned non-USB DSM acquisition over NWE's planning horizon, including lost revenue.

RESPONSE:

a. The contribution of USB-funded energy savings to total DSM acquired has steadily declined since 2004-2005 (see table below). It is not known with any reasonable degree of certainty what the USB contribution to the DSM total will be in the future. Most of the DSM that is acquired now comes from non-USB funding (energy supply).

DSM Reported Savings (aMW)*				
	USB	DSM	Total	USB % of Total
2004-05	2.04	0.22	2.26	90.3%
2005-06	1.33	2.08	3.41	39.0%
2006-07	0.36	3.04	3.40	10.6%
2007-08	0.82	4.55	5.37	15.3%
2008-09	1.11	5.58	6.69	16.6%
2009-10	0.96	7.37	8.33	11.5%
2010-11	0.57	8.63	9.20	6.2%
2011-12	0.39	7.30	7.69	5.1%
Totals	7.58	38.77	46.35	16.4%

* Values from Thomas Direct Testimony; D2012.5.49; Table 1; page WMT-4

PSC-034 cont'd

NWE estimated annual total supply portfolio costs using the 2011 Electric Resource Procurement Plan. The cost with and without DSM is summarized in the following table. The estimated electric portfolio cost with all DSM included is $10,184,995,900. The estimated electric portfolio cost without DSM is $10,790,972,266. DSM reduces the 2011-2035 electric portfolio cost by an estimated $605,976,366 over the planning period of the 2011 Resource Procurement Plan.

2011 Resource Procurement Plan			
Impact of DSM on Base Portfolio 11 (no new resources)			
Item	Item Description	20-Year Total	Source
a	Cost of Portfolio 11, Including DSM	$10,184,995,900	2011 RPP Volume 2, Chapter 3, Page 18
b	DSM Acquisition Forecast (MWh)	11,253,043	2011 RPP Volume 2, Chapter 3, Page 9
c	NWE Avoided Cost	$53.85	DOCKET NO. D2012.1.3, John Bushnell Testimony, Exhibit_(JBB-02), page 1 of 9, 2012-2031 levelization
d = b x c	Value of DSM in 20-Year Base Portfolio	$605,976,366	
e = a + d	Cost of Portfolio 11, Excluding DSM	$10,790,972,266	
f = d / a	Portfolio Cost Increase Without DSM	5.9%	

b. NorthWestern has not made these estimates. Any estimates would likely not be meaningful due to the number of assumptions and forecasts that would have to be incorporated to estimate the 20 years worth of detailed projections for rates based on 20 years of annual trackers. These assumptions at a minimum would include: multiple market price inputs, market price risks, estimates of replacement power purchase agreements, estimates of future rate allocations, estimates of future customer class allocations, estimated annual re-projection of loads, estimates of timing of DSM resets, estimates of authorized DSM expenditures for each annual tracker filing, estimated government rules and regulations, and estimated future changes to technology.

c. See the response to part b, above.

d. See the response to part b, above.

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PSC-035

Regarding: DSM Impacts on Gas Supply Costs
Witness: Thomas

a. Please provide estimates of annual total natural gas supply portfolio costs with and without planned non-USB DSM acquisition over NWE's planning horizon. Please explain how the estimate is calculated and provide supporting work papers.

b. Please provide estimates of residential natural gas supply service rates with and without planned non-USB DSM acquisition over NWE's planning horizon, and with and without lost revenue.

c. Please provide estimates of average residential natural gas bills with and without planned non-USB DSM acquisition over NWE's planning horizon.

d. Please provide separate estimates of average residential natural gas bills for participants and non-participants with planned non-USB DSM acquisition over NWE's planning horizon, including lost revenue.

RESPONSE:

a. NorthWestern has objected to this on the basis of relevance. Please see the objection filed March 8.

b. Please see the response to part a, above.

c. Please see the response to part a, above.

d. Please see the response to part a, above.

PSC-036

Regarding: Impacts of USB DSM Programs
Witness: Thomas

a. Does NWE fund electric USB DSM programs in excess of statutory requirements? If so, please repeat the analyses requested in PSC-034 by including USB DSM programs in excess of statutory requirements with the non-USB DSM programs.

b. Does NWE fund natural gas USB DSM programs in excess of statutory requirements? If so, please repeat the analyses requested in PSC-035 by including USB DSM programs in excess of statutory requirements with the non-USB DSM programs.

RESPONSE:

a. No. NorthWestern Energy's Electric Universal System Benefits Charge (USBC) tariffs went into effect January 1, 1999. As required in law, the tariffs were established to collect nearly $8.6M (2.4% of 1995 revenues) in a weather-normal year based upon 1998 electric loads. The table below shows that the USBC revenues are based upon electrical usage (kilowatt hours or kWh) and lists the USBC tariff rates by customer class.

General Description	**Tariffed Customer Class**	**Rate/kWh**
Residential	Residential	$0.001334
Commercial/Small Industrial	GS-1 & GS-2 under 1000 KW	$0.001143
Large Customer per USB	GS-1 & GS-2 over 1000 KW	$0.000900
Irrigation	Irrigation	$0.001144
Lighting	Lighting	$0.003404

An average NorthWestern Energy residential customer using 750 kilowatt hours (kWh)/month pays about $1 each month for electric USBC. The Large Customer USB rate of $0.0009 per kWh was set by the Montana Legislature.

b. NorthWestern has objected to this on the basis of relevance. Please see the objection filed March 8.

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Montana Public Service Commission (PSC)
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PSC-037

Regarding: DSM Impacts on Shareholders
Witness: Rausch/Thomas

a. Are there impacts to shareholders, direct or indirect, related to NWE's electric DSM programs? If so, please describe and quantify those impacts.

b. Are there impacts to shareholders, direct or indirect, related to NWE's natural gas DSM programs? If so, please describe and quantify those impacts.

c. If ratepayers did not underwrite the costs of electric DSM programs, is it likely that shareholders would be willing to underwrite the programs assuming that lost revenue recovery mechanisms were maintained?

d. If ratepayers did not underwrite the costs of natural gas DSM programs, is it likely that shareholders would be willing to underwrite the programs assuming that lost revenue recovery mechanisms were maintained?

RESPONSE:

a. Assuming that NWE recovers the costs and lost revenues associated with the electric DSM programs, there are no direct impacts, positive or negative, on shareholders. To the extent recovery of any portion of the program costs or associated lost revenues is disallowed, NWE's net income is lower than it would be otherwise and shareholders are impacted negatively. NWE does not believe the electric DSM programs indirectly impact shareholders one way or the other. Refer also to the response to Data Request PSC-038a.

b. NorthWestern has objected to this on the basis of relevance. Please see the objection filed March 8.

c. Shareholders would not and should not be willing to fund the costs of electric DSM programs assuming the lost revenue recovery mechanism were maintained, because benefits resulting from the DSM programs accrue to customers rather than shareholders. NWE's electric DSM programs reduce the amount of electricity supply required by its customers at a cost that is less than the cost of purchasing the same amount of electricity supply. The difference represents the benefit enjoyed by customers.

d. NorthWestern has objected to this on the basis of relevance. Please see the objection filed March 8.

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PSC-038

Regarding: DSM Impacts on Creditors
Witness: Rausch/Thomas

a. Please describe and quantify any direct or indirect impacts on NWE's creditors of NWE's electric DSM programs.

b. Please describe and quantify any direct or indirect impacts on NWE's creditors of NWE's natural gas DSM programs.

RESPONSE:

a. Assuming that NWE recovers the costs and lost revenues associated with the electric DSM programs, there are no impacts, positive or negative, on creditors. To the extent recovery of any portion of the program costs or associated lost revenues is disallowed, NWE's net income and cash flows would be lower than otherwise and creditors will perceive increased risk. All else equal, increased risk would result in higher cost of debt, which would ultimately translate to higher costs for customers. Refer also to the response to Data Request PSC-037a.

b. NorthWestern has objected to this on the basis of relevance. Please see the objection filed March 8.

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PSC-039

Regarding: Third Party Vendor Impacts
Witness: Thomas

Describe and quantify any impacts on third-party DSM services vendors under contract to NWE if NWE terminated its electric and/or natural gas non-USB DSM programs.

RESPONSE:

NorthWestern has objected to this data request to the extent that it relates to natural gas on the basis of relevance. Please see the objection filed March 8. Without waiving that objection, NorthWestern responds as follows:

Fluid Marketing Strategies (Fluid) under contract with NWE implements the CFL manufacturer buy-down delivery mechanism as one of the six CFL delivery mechanisms associated with the DSM-funded E+ Residential Lighting Program. Fluid negotiates the CFL buy-down with manufacturers, develops relationships with retailers to display the bought-down CFLs, provides point-of-purchase display information at retailer facilities, tracks bought-down CFLs sold in NWE's service area, and reports to NWE. The annual contract amount is currently not-to-exceed $650,000 which includes CFL rebates and Fluid labor. It is estimated Fluid assigns approximately 0.5 full time equivalent (FTE) employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

Portland Energy Conservation, Inc. (PECI) under contract with NWE provides marketing, identification and development of E+ Business Partners, E+ Commercial Lighting, E+ Commercial Electric Rebate, and E+ Commercial Gas Rebate program projects with customers to support NWE commercial/industrial DSM energy conservation programs. The annual contract amount is currently not-to-exceed $250,000. It is estimated PECI provides approximately 1.40 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

KEMA Services, Inc. (KEMA) under contract with NWE provides full-time marketing outreach professionals to inform customers, contractors, vendors, engineering firms, architectural firms, etc. of NWE's commercial/industrial electric/natural gas energy conservation programs in Montana. The outreach team provides training, referrals of potential projects to the engineering firms under contract to assist customers to identify and develop projects for submittal to NWE, and face-to-face promotion of the commercial/industrial programs. The annual contract amount is currently not-to-exceed $750,000. KEMA provides 4.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

PSC-039 cont'd

Energy Resource Management, Inc. (ERM) under contract with NWE provides marketing, identification and development of E+ Business Partners, E+ Commercial Lighting, E+ Commercial Electric Rebate, and E+ Commercial Gas Rebate program projects with customers to support NWE commercial/industrial DSM energy conservation programs. The annual contract amount is currently not-to-exceed $500,000. ERM provides approximately 1.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

CTA Architects Engineers (CTA) under contract with NWE provides marketing, identification and development of E+ Business Partners, E+ Commercial Lighting, E+ Commercial Electric Rebate, and E+ Commercial Gas Rebate program projects with customers to support NWE commercial/industrial DSM energy conservation programs. The annual contract amount is currently not-to-exceed $375,000. CTA provides approximately 4.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

The National Center for Appropriate Technology (NCAT) under contract with NWE provides marketing, identification and development of E+ Business Partners, E+ Commercial Lighting, E+ Commercial Electric Rebate, and E+ Commercial Gas Rebate program projects with customers to support NWE commercial/industrial DSM energy conservation programs. The annual contract amount is currently not-to-exceed $1,750,000. NCAT provides approximately 15.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

KEMA under contract with NWE provides implementation services for the E+ Commercial Lighting Rebate Program and the E+ Residential Lighting Program. KEMA promotes the programs, provides marketing and customer education, installs CFLs associated with on-site residential and commercial audits, processes and pays qualifying customer project rebates, conducts completed project inspections, and maintains the program databases. The annual contract amount is currently not-to-exceed $3,500,000 and includes the customer rebates. KEMA provides approximately 4.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

McKinstry Essention (McKinstry) under contract with NWE provides marketing, identification and development of E+ Business Partners, E+ Commercial Lighting, E+ Commercial Electric Rebate, and E+ Commercial Gas Rebate program projects with customers to support NWE commercial/industrial DSM energy conservation programs. The annual contract amount is currently not-to-exceed $250,000. McKinstry provides approximately 2.0 FTE employees to

PSC-039 cont'd

this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

KEMA under contract with NWE provides implementation services for the E+ Commercial and Residential, New and Existing, Electric Rebate Programs. KEMA promotes the programs, provides marketing and customer education, pays qualifying customer project rebates, conducts completed project inspections, and maintains the program databases. The annual contract amount is currently not-to-exceed $1,750,000 and includes the customer rebates. KEMA provides approximately 3.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

Green Motors Practices Group (GMPG) under contract with NWE provides marketing, promotion, and training for electric motor rewinds. GMPG trains motor rewind shops, establishes testing procedures with motor rewind shops, and qualifies rewound motors for incentives through the E+ Commercial Existing Electric Rebate Program. The annual contract amount is currently not-to-exceed $12,500. GMPG provides approximately 0.125 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

KEMA under contract with NWE provides implementation services for the E+ Commercial and Residential, New and Existing, Natural Gas Rebate Programs. KEMA promotes the programs, provides marketing and customer education, pays qualifying customer project rebates, conducts completed project inspections, and maintains the program databases. The annual contract amount is currently not-to-exceed $2,000,000. KEMA provides approximately 3.0 FTE employees to this effort. If the electric non-USB DSM programs were terminated, this contract would be cancelled.

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PSC-040

Regarding: DSM Good Will
Witness: Thomas

a. Do NWE's electric and natural gas non-USB DSM programs create any positive image "good will" value for NWE? If so, please describe and quantify it.

b. Should the estimated "good will" value be deducted from the cost of DSM programs recovered in retail rates? Please explain why or why not.

RESPONSE:

NorthWestern has objected to this data request to the extent that it relates to natural gas on the basis of relevance. Please see the objection filed March 8. Without waiving that objection, NorthWestern responds as follows:

a. NorthWestern interprets the term "good will" in this question to mean favorable reaction or opinion from its customers or the general public, and not to mean goodwill in the accounting sense of an intangible balance sheet asset. NorthWestern occasionally receives comments expressing appreciation for its efforts to assist its customers with saving energy and managing their energy use and costs. NorthWestern cannot quantify or measure this with any degree of accuracy and therefore is unable to attach any tangible value to it.

b. No. See the response to part a, above.

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Set 5 (034-091)

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PSC-041

Regarding: NWE E+ Green Renewable Attributes Program
Witness: Thomas

How many customers volunteer for the NWE E+ Green Renewable Attributes Program?

RESPONSE:

320 customers were enrolled in E+ Green at the end of 2012.

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Montana Public Service Commission (PSC)
Set 5 (034-091)

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PSC-042

Regarding: DSM Program Unit Costs
Witness: Thomas

a. Please provide the unit cost ($/MWh) of all electric DSM programs during the 2011-2012 tracker period, preferably in a table with all other tracker years as provided to staff in the past (*See* page 6 of the Additional Issues Testimony of Bill Thomas in Docket D2009.9.129 on July 8, 2010).

b. Please provide the unit cost ($/Dkt) of all natural gas DSM programs for each tracker year since July 2007.

RESPONSE:

a. The table from page 6 of the Additional Issues Testimony of Bill Thomas in Docket No. D2009.9.129 on July 8, 2010 has been updated to present the requested information for electric DSM. Refer to the following table:

Period	DSM Cost (Program Administrator Perspective)
	Electric ($/MWH)
2006-07	$ 8.80
2007-08	$ 8.68
2008-09	$ 10.56
2009-10	$ 11.12
2010-11	$ 8.79
2011-12	$ 12.86

PSC-042 cont'd

b. NorthWestern has objected to this on the basis of relevance. Please see the objection filed March 8.

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PSC-043

Regarding: Selection of SBW
Witness: Thomas

a. Please provide the RFP used to select SBW, Inc.

b. How many bids were submitted in relation to the RFP?

c. Regarding p. 3, lines 18-19 of your supplemental testimony, please list all bidders that responded to NWE's 2011 RFP and highlight the two finalists.

d. How were respondents to the RFP scored and evaluated?

e. Who made the decision to select SBW over the other finalist?

RESPONSE:

a. See Attachment in the folder labeled "PSC-043" on the attached CD. Because this document is voluminous, hard copies were provided to the Commission and the MCC only.

b. The RFP was requested by and provided to 15 potential bidders, of which eight provided bids.

c. Navigant
Tetra Tech
Gil Peach and Associates
SBW Consulting - finalist
ADM Associates - finalist
Opinion Dynamics
Applied Energy Group
Dynamic Energy Group

d. The criteria used in ranking bids were included in the RFP. They are:

- The bidder's demonstrated ability to perform work outlined in the RFP document (20%)
- Demonstrated understanding of DSM technologies and NWE Customers (15%)

PSC-043 cont'd

- The ability to deliver work in a timely manner (15%)
- A clear explanation of the logic behind the proposed approach (15%)
- Demonstrated experience completing similar successful projects (15%)
- The cost of the work to be performed as specified in the proposal (10%)
- The bidder's demonstrated ability (through examples) to provide clear written reports (5%)
- References (5%)

e. NWE DSM staff considered input from Lands Energy Consulting Inc. (the RFP administrator) on the two finalists. Following the presentations from the two finalists in Butte, Montana at a meeting of the Electric Technical Advisory Committee, staff presented their recommendation to select SBW, Inc. to management. NorthWestern executive management, including the Energy Supply Board, approved that recommendation.

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PSC-044

Regarding: SBW Report and ETAC Input
Witness: Thomas

a. Please provide an estimate of the final cost of the SBW Report, including regulatory expenses such as having SBW personnel appear as witnesses in various Commission proceedings.

b. Regarding your testimony on p. 3, lines 21-24, please list the ETAC member organizations present during the finalist presentations in October 2011.

c. Did ETAC provide feedback as the review process was ongoing and, if so, what was the substance of that feedback?

d. Regarding your testimony on p. 4, lines 1-2, please provide copies of any written comments submitted by ETAC members.

RESPONSE:

a. The SBW Programs Evaluation Study contract amount is not-to-exceed $2,272,988.

The contract base not-to-exceed amount of $2,154,491 includes:

- Development of a DSM Evaluation Plan
- Project Management
- Program Process Evaluation
- Program Impact Evaluation
- Program Economic Analysis
- Final Report
- Three in-person trips to Montana with appropriate staff
- 40 hours of senior analyst time for data request responses

The contract contingency not-to-exceed amount of $118,497 includes regulatory support and data request responses.

b. The Conference Call Summary of the NorthWestern Energy Electricity Technical Advisory Committee (ETAC) (dated December 7, 2011) lists representatives of the following organizations in attendance:

PSC-044 cont'd

Montana Public Service Commission (MPSC)
Montana Department of Environmental Quality (DEQ)
Northwest Power and Conservation Council (NPCC)
Natural Resources Defense Council
District XI Human Resource Council
Northwest Energy Coalition
Montana Energy Information Center (MEIC)
NorthWestern Energy (NWE)
Lands Energy
Consensus Associates

c. ETAC as an entity does not provide feedback. The following information related to this question was excerpted from the Conference Call Summary of the NorthWestern Energy ETAC (dated December 7, 2011) and is the only input NorthWestern received from ETAC on this matter:

Agenda

- DSM Evaluation Contractor Selection
- Comments on the Draft 2011 Electric Resource Procurement Plan

DSM Evaluation Contractor Selection

Bill Thomas reported that NWE selected SBW Consulting Inc. (SBW) to conduct the process, impact, and economic evaluation of its electricity and natural gas DSM programs for the years 2007-2011. After the selection, NWE shared with SBW additional details about the company's twenty-eight DSM programs not provided in the evaluation request-for-proposal (RFP) and asked for a revised budget. NWE also expanded the project scope of work to include a study of the actual hours of use of lighting, an activity not contemplated in the RFP. SBW's original RFP response included a budget of $1.7 million. Its revised budget totaled $2.7 million. NWE then negotiated with SBW a budget amount of $2.3 million.

The $2.3 million is 3.8% of NWE's total annual DSM expenditures, which is in the range of 3-7% of total expenditures commonly expended for evaluations of utility DSM programs. The cost of the last evaluation of NWE DSM programs conducted by Nexant was $600 thousand, which at that time was 4.7% of NWE annual DSM expenditures. When Nexant conducted its evaluation, NWE had fewer DSM programs, fourteen rather than twenty-eight and the evaluation addressed fewer years.

PSC-044 cont'd

Mr. Thomas asked for ETAC member questions and comments and specifically whether members saw any show stoppers in awarding the contract for the $2.3 million amount.

Question - Does the cost of DSM used in deriving the 3.8% figure include natural gas and Universal System Benefit (USB) program expenditures?
Answer - Yes.

Question - Do you have a sense of whether the budget provided by the other RFP finalist would also have increased given the additional information about NWE's DSM programs and the expanded scope of work?
Answer - We expect that the other finalist, ADM Associates Inc., would also have requested an increased budget. SBW's budget estimate was very transparent, setting out both the hourly rate of its personnel and the hours they would work on the project. The increased numbers of programs required a larger sample size to maintain the 90% confidence interval and 10% margin of error standard desired by NWE.

Question - Would the results of the lighting study be useful to light-emitting diode (LED) lighting programs?
Answer - Yes. We are asking SBW to assess the number of hours lights are used, information that should be useful regardless of the type of lighting.

Comment - If NWE has done its due diligence and is comfortable with the SBW budget proposal, then I have no problem with the SBW budget amount.

Comment - Would NWE expect to spend on the same order if it were considering resources other than DSM?
Answer - Yes.

ETAC Advice - ETAC members provide advice only as a individuals, not as a group. No ETAC member participating in this call expressed concern about the $2.3 million budget for SBW's evaluation of NWE's DSM programs.

d. See the response to part c, above.

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PSC-045

Regarding: Impact Evaluation, File Review Process
Witness: Thomas

a. Please explain the process by which NWE determined which specific program files would be provided to SBW for the file review component of the impact evaluation.

b. Please discuss the extent to which SBW could request to review additional program files or request alternative program files.

RESPONSE:

a. NWE did not determine which specific program files would be provided to SBW Consulting Inc. (SBW) for the file review component of the impact evaluation. NWE provided SBW with a list of completed projects for all the programs during the evaluation period of July 1, 2007 through December 31, 2011. SBW randomly selected a statistically significant sample of completed projects from each program during the evaluation period and requested those detailed project files from NWE. The project files were transmitted to SBW for the file review component of the impact evaluation.

b. NWE provided SBW detailed project files for all completed projects that were requested by SBW. SBW made initial and follow-up requests for file documentation based on its research needs. Whatever file information SBW requested, NorthWestern promptly provided.

PSC-046

Regarding: DSM Program Evaluation
Witness: Baker

a. In your role as a Principle for SBW Consulting, Inc. to the extent you are aware of any trade associations or other organizations for firms that perform DSM program evaluations, please identify them.

b. Is SBW Consulting, Inc. a member of any of the associations or organizations identified in response to part "a.?"

c. Your testimony on p. 2, line 22, through p. 3, line 2, indicates that you performed evaluation studies for private utilities, publicly-owned utilities, non-profit public agencies and public utility commissions. To what extent do any of the associations or organizations identified in response to part establish standard practices and/or guidelines designed to ensure that DSM program evaluation firms perform objective, methodologically sound evaluations.

d. To what extent are the evaluation reports by DSM program evaluation firms audited by any of the associations or organizations identified in response to part "a.?"

e. To the extent SBW Consulting, Inc. maintains any internal quality control process designed to ensure that its evaluations are objective and methodologically sound regardless of the client type, please describe them.

RESPONSE:

a. American Association of Energy Service Professionals, American Council for Energy Efficient Economy, Efficiency Valuation Organization, International Energy Program Evaluation Conference, Northwest Energy Efficiency Council, Regional Technical Forum, California Energy Efficiency Industry Council

b. Northwest Energy Efficiency Council and California Energy Efficiency Industry Council

c. The Efficiency Valuation Organization maintains IPMVP, which is a guideline for conducting site specific measurement and verification of energy savings. It is primarily intended for use by energy service companies in establishing performance contracts with individual clients, but it provides some guidance in conducting independent program impact evaluation. The Regional Technical Form provides extensive guidance on methods of independently estimating energy efficiency savings and conducting program

PSC-046 cont'd

impact evaluation. SBW has been under contract to this organization for the last three years assisting in the development of these Guidelines.

d. I do not believe that auditing is conducted by any of these organizations.

e. SBW relies primarily on a peer review process at all levels of our work. Three members of our staff have extensive experience with program impact evaluation research design. We review and comment on each other's designs in order to maintain high quality standards. This same approach applies in implementing these designs. Experienced members of our engineering team review all the work products prepared by other members of our team.

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Set 5 (034-091)

Data Requests received February 22, 2013

PSC-047

Regarding: Delivery of SBW Report
Witness: Baker

SBW delivered the final Program Evaluation to NWE on Jan. 9, 2013, after missing at least two prior deadlines. Please explain the cause of each delay in completing the final Program Evaluation and submitting it to NWE.

RESPONSE:

SBW's deadline for submitting the initial draft of our report was 10/4/2012. We were two weeks late in missing this deadline because we began our field data collection more than a month later than expected. This delay was due to the unexpected complexities encountered in assembling program tracking data and preparing the lists from which we drew samples for telephone surveys and site visit samples. In addition, we encountered more difficulty than expected in completing the telephone surveys, which had to be completed before we could finish our on-site visits. The draft report that we submitted two weeks late was further delayed when we discovered that additional work was needed to correctly allocate NWE program costs to USB and DSM categories and to estimate incremental participants costs.

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PSC-048

Regarding: NWE Review of SBW Drafts
Witnesses: Thomas, Baker

a. Please explain when NWE first received a draft, whether partial or complete, of the SBW report.

b. On how many occasions did SBW transmit part of the report to NWE for its review?

RESPONSE:

a. NWE first received a partial draft on October 15, 2012 for review.

b. **Thomas response:** Six. The dates were:

10/15/12
11/30/12
12/19/12
01/02/13
01/07/13
01/29/13

Baker response: On the following dates: 10/15/2012, 11/30/2012, 12/19/2012, 1/4/2013 SBW transmitted all or a portion of the report for NWE review. In addition, in the months preceding these dates SBW transmitted draft descriptions of each NWE program for review. These descriptions assisted SBW in understanding in detail how each program operated. These descriptions were ultimately incorporated into the report. There are 24 program descriptions; some of them went through multiple rounds of drafts and comments.

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PSC-049

Regarding: Changes to Drafts of Report
Witness: Baker

a. What changes were made to the report between the time it existed in draft form, whether partial or complete, and when it was final?

b. Did any change occur between draft(s) of the report and the final report to the reported energy savings, the net savings adjustment rate, or benefit/cost ratios presented on p. iii of the report and, if so, please identify and explain the change(s).

RESPONSE:

a. Numerous changes were made to report text to clarify and correct our descriptions of the programs, our methodology, and our findings. We also made numerous revisions to our data processing routines to correct errors and to improve estimation procedures. These resulted in many changes to report exhibits. Changes can be identified by using Microsoft Word to perform a comparison of the versions of the report files provided to NWE.

b. Numerous changes were made that affected all the impact results as a result of numerous revisions to our data processing routines to correct errors and to improve estimation procedures.

PSC-050

Regarding: Independence of Program Evaluator
Witness: Thomas

a. Please identify and describe any mistakes, errors, or flawed assumptions made by SBW in the course of its work for NWE.

b. Please provide any comments NWE made to SBW related to any draft of the Program Evaluation.

c. Please identify any numbers, assumptions, or conclusions in the Program Evaluation that changed as a result of communications between NWE and SBW and provide the original number, assumption or conclusion.

d. Please identify and describe any disagreements that arose between NWE and SBW during the course of SBW's work and describe how each disagreement was resolved.

e. Please provide copies of all correspondence between representatives of NWE and SBW related to methodology, assumptions, inputs, wording or conclusions in the Program Evaluation.

RESPONSE:

a. In an effort of this size, complexity, and magnitude there will be mistakes and errors. NWE conducted a thorough review of each portion of SBW's work, paying particular attention to understanding and duplicating SBW's numbers presented in the report and workbooks. For every instance where NWE could not duplicate SBW's numbers, NWE asked SBW to re-examine their calculation for correctness. SBW would correct the calculation if it was in error or instruct NWE on the error in NWE's calculation. A record of individual mistakes or errors, by SBW or NWE, was not tallied or recorded.

Examples include disagreement about which weather location (e.g., Kalispell vs. Helena) was most representative of NorthWestern's system average, calculation errors in spreadsheets resulting from incorrect formula expressions, incorrect or incomplete written program descriptions, missing tables, charts and figures in early drafts, tables not populated with data, incorrect labeling, or duplicate text (likely resulting from copy/paste operations when consolidating material from multiple authors).

PSC-050 cont'd

b. NorthWestern has objected to this under the Work Product Doctrine. Please see the objection filed March 8.

c. In NWE's effort to understand and master the ability to duplicate SBW's numbers presented in the report, some numbers changed as errors and mistakes were identified. A record of individual mistakes or errors was not recorded.

d. Whenever NWE questioned a number, calculation, or presented information that conflicted with information in the report, SBW would consider the information and provide their professional judgment to resolve the issue. The final decision for the work product was SBW's as an independent program evaluator. An example may be the use of Kalispell historical weather data used by SBW to analyze weather dependent measure unit energy savings (UES) values (insulation is a measure example). NWE has historically used Helena historical weather data as an average for the electric and natural gas service area in Montana. SBW chose to use Kalispell historical weather data in their evaluation of weather dependent measures. NWE brought the discrepancy to SBW's attention. SBW considered the information and decided to proceed with the use of Kalispell data.

e. NorthWestern has objected to this under the Work Product Doctrine. Please see the objection filed March 8.

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PSC-051

Regarding: Independence of Program Evaluator
Witness: Baker

a. Please identify and describe any changes that NWE requested to the methodology, assumptions, inputs, wording or conclusions in the Program Evaluation.

b. Please provide copies of drafts of any portion of the Program Evaluation that SBW sent to NWE.

c. Please identify and describe any disagreements that arose between NWE and SBW during the course of SBW's work, and how each disagreement was resolved.

d. Please provide copies of all correspondence between representatives of NWE and SBW related to methodology, assumptions, inputs, wording or conclusions in the Program Evaluation.

RESPONSE:

a. NWE did not request any changes to the overall evaluation methodology described in the evaluation plan. They did, however, provide many technical and editorial comments on our work after it was completed. In some cases, we considered them and decided to make changes to our methodology, assumptions, inputs, wording or conclusions. In other cases, we provided a response to the comment, but made no changes.

b. NorthWestern has objected to this under the Work Product Doctrine. Please see the objection filed March 8.

c. NWE provided many technical and editorial comments on our work. In some cases, we considered them and decided to make changes to our methodology, analysis or documentation. In other cases, we provided a response to the comment, but made no changes. This process is consistent with our standard practices in performing independent program impact evaluation for utilities. We believe that it is a required part of conducting high quality evaluation research.

d. NorthWestern has objected to this under the Work Product Doctrine. Please see the objection filed March 8.

PSC-052

Regarding: SBW Report
Witnesses: Thomas

a. Regarding Mr. Thomas's testimony on p. 8, line 15, through p. 9, line 15, please explain the reasons for applying a single adjustment factor of .89 for both residential and commercial programs, rather than separate adjustment factors for these two classes.

b. Please identify and provide the source documents that support the avoided costs shown in the tab named "AvoidedLostDiscount" in the Excel spreadsheet provided in response to data request PSC-033. For example, if the avoided electricity costs are based on prior NWE electricity supply resource procurement plans or Commission orders setting PURPA avoided cost rates, please identify the procurement plan or Commission order.

c. Regarding Mr. Thomas's testimony on p. 11, line 16, through p. 12, line 11, please discuss whether NWE intends to have completed its consideration of the results of the SBW Report in time to include information in the Company's 2013 Electric Supply Resource Procurement Plan on any plans for DSM program changes, such as program cancelations, program modifications, program consolidation, incentive level changes, and measure eliminations.

RESPONSE:

a. Net adjusted energy savings are used for lost revenue calculations. The composite factor of 0.89 was available from SBW's results at the time that supplemental testimony in this docket was due. NorthWestern notes that this value of 0.89 is an energy savings Realization Rate based on the difference between NorthWestern's reported gross energy savings and its net adjusted energy savings. This value of 0.89 represents the difference between NorthWestern's reported gross energy savings and SBW's estimate of net energy savings for the study period. It serves the same purpose that the Adjustment Factor used in NorthWestern's lost revenue calculation spreadsheet workbooks (Exhibit__(WMT-3)), i.e., reduces gross reported energy savings to net adjusted energy savings which are then used with applicable transmission and distribution rates in the final lost revenue calculations.

Additional analysis is required to resolve the energy savings for the previous tracker periods into residential and commercial components and develop Net-to-Gross factors for residential and commercial programs. Time constraints have not permitted completion of such analysis. Resolving the adjustment factor into residential and commercial component values would be an appropriate refinement for the calculation of lost

PSC-052 cont'd

revenues. Final reconciliation of lost revenues and future calculations of lost revenues should include separate factors for residential and commercial.

b. The source documents below are provided in the folder labeled "PSC-052" on the CD attached to PSC-043. This data has been provided by NorthWestern Supply. Refer to the Tab Levelized Avoided Cost in each of the attached spreadsheet workbooks.

- Resource Value Spreadsheet 2006.xls
- Resource Value Spreadsheet 2007.xls
- Resource Value Spreadsheet 2008 20080101.xls
- Resource Value Spreadsheet 2009 20090102 Rev 1.xls
- Resource Value Spreadsheet 2010 Shell (2).xls
- Resource Value Spreadsheet 2011 FINAL 20101227.xls

c. Yes. This process has already begun. All DSM programs are under review and changes will be made to incorporate the results of the SBW Report in time to include information in the Company's 2013 Electric Supply Resource Procurement Plan. See also the responses to Data Requests PSC-060 and PSC-065.

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PSC-053

Regarding: E+ Residential Lighting Program
Witnesses: Thomas

a. For each measure offered through the several delivery mechanisms that constitute the E+ Residential Lighting program, and for evaluation years 2007 and 2011, please provide NWE's calculations of the net present value of energy savings, including supporting work papers, based on pre-SBW Report assumptions for avoided costs, total measure costs, measure savings and measure lives (i.e., a TRC perspective).

b. Please provide recalculations, including supporting work papers, of the net present value of energy savings provided in part "a." using SBW's recommended measure savings and measure lives.

c. For each measure offered through the several delivery mechanisms that constitute the E+ Residential Lighting program, and for evaluation years 2007 and 2011, please provide the dollar value of the incentive offered to participating customers.

d. Table 463 on p. 577 of the Impact and Process Evaluation report shows that the E+ Residential Lighting portfolio had RIM benefit/cost ratios of 0.85 in 2007 and 1.65 in 2011. Please discuss any program factors that contributed to the change in cost-effectiveness from this perspective (e.g., changes to avoided costs, incentives, primary delivery mechanisms, etc.).

RESPONSE:

a. For the 2007 Residential Lighting Program, NorthWestern was in the early stages of development of its energy supply DSM program. This program was introduced in 2005 and at that time was modeled after other utility lighting rebate programs. The first analysis of this program was performed by Nexant in 2007. The relevant portion of Nexant's analysis is in the file named *Section 4 Home Lighting of Nexant Program Evaluation 2006-2007* and is provided in the folder named "PSC-053" on the CD attached to PSC-043. NorthWestern used this analysis to move forward with changes and improvements to its Residential Lighting Program. Initial calculations to establish rebate levels for the program during this time period are provided in the file named Change a Light chart 20070124.xls, also in the "PSC-053" folder on the CD.

For the 2011 Residential Lighting Program, NorthWestern had developed greater capability to evaluate various DSM measures, including lighting. The calculations of the net present value of energy savings, based on pre-SBW Report assumptions for avoided costs, total measure costs, measure savings and measure lives (i.e., a TRC perspective)

PSC-053 cont'd

including supporting work papers are provided in file 2010-11 Residential Measures List Rev 2 FINAL 20100714.xls in the "PSC-053" folder on the CD. Refer specifically to Tab Calculations, lines 135-341 for the computations and values for lighting.

b. NorthWestern has not performed this analysis.

c. Refer to 2007 Home Lighting Rebate Brochure and the 2011 Home Lighting Rebate Brochure in the "PSC-053" folder on the CD.

d. The RIM economic test is a benefit/cost ratio that compares the present value of saved energy at the utility's avoided cost (numerator) to the sum of lost revenue + program administration & marketing + incentives paid (denominator). The generalized formula is:

Ratepayer Impact Measure (RIM) Test

$$B_{RIM} \sum_{t=1}^{N} \frac{UAC_t}{(1+d)^{t-1}}$$

$$C_{RIM} \sum_{t=1}^{N} \frac{RL_t + PRC_t + INC_t}{(1+d)^{t-1}}$$

where:

UAC = Utility avoided costs in year t
RL_t = Revenue loss from reduced sales in year t
PRC_t = Program administration and marketing costs in year t
INC_t = Incentive costs, e.g., rebates or rate incentives in year t
d = Discount rate
t = The number of periods over which future values are discounted

In the 2007 period the utility electric avoided cost (20-year levelized) was $46.31/MWH.

In the 2011 period the avoided cost had risen to $70.12/MWH.

This increase in avoided costs (numerator in the formula) is the reason the E+ Residential Lighting program cost-effectiveness (RIM ratio) increased over that period, as shown in the Table 463 on p. 577 of the Impact and Process Evaluation.

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PSC-054

Regarding: Administrative Costs and Federal Standards
Witness: Thomas

a. Please explain, in general, the process by which program-specific administrative costs are determined using the E+ Residential Lighting program as an example.

b. For evaluation years 2007 and 2011 please provide a breakdown of the DSM program administration costs NWE attributed to the E+ Residential Lighting program.

c. Please provide an update on NWE's understanding of the status of federal lighting standards and NWE's current plan regarding for phasing out its CFL incentive programs.

RESPONSE:

a. The process by which program-specific administrative costs are based is determined by many factors including history and experience, the previous year's program participation, results and spending, existing and new contracts with outside vendors, federal/state regulations and code changes, and professional judgment.

b. In response to Data Request PSC-033, NorthWestern provided electronic copies of two spreadsheet workbooks from SBW, Inc. (Impact Result Tables - Tracker FINAL 01-29-13 and Impact Result Tables - Calendar FINAL 01-29-13). Marketing and administrative costs for the E+ Residential Lighting program for 2007 and 2011 are presented in the file Impact Result Tables - Calendar FINAL 01-29-13, Tab EResidentialLighting in cells I68 and M72.

c. The federal regulations relating to CFLs and other lighting technologies are being phased in over a three-year period that began January 1, 2012. These new regulations apply to manufacturing of lighting products, not retail sale of them. There is remaining shelf stock of lighting products (e.g., incandescent bulbs) that is being sold and installed by consumers for perhaps a year or more following the effective dates of the new regulations for each respective lighting product. Energy savings opportunities remain during this interim period while retailers' lighting shelf stock clears. If consumers can be persuaded through NorthWestern's E+ Lighting Rebate programs to purchase CFLs or other lighting technologies during this stock clearing period instead of purchasing the lesser efficient bulbs that will eventually be eliminated by the new regulations, then low-cost DSM resources are acquired – the same as in the past through operation of the E+ Lighting Rebate programs. NorthWestern is now estimating that this period will occur for one year following each of the steps of effective dates of the new regulations over the 2012-

PSC-054 cont'd

2014 period. As a result, NorthWestern is not rebating the 100-watt bulbs in 2013. NorthWestern will monitor this transition and make a decision on when the appropriate time has arrived to eliminate various wattage and lumen-rated CFLs and other lighting technologies that are now included in its programs and discontinue rebating those measures and reporting energy savings from them.

In December 2007, the federal government enacted the Energy Independence and Security Act (EISA) of 2007, which contains maximum wattage requirements for all general service incandescent lamps producing from 310–2600 lumens of light. However, these regulations never became law, as another section of the 2007 EISA bill overwrites them, and thus, current law, as specified in the U.S. Code, "does not relate to maximum wattage requirements."

The efficiency standards start with 100-watt bulbs and end with 40-watt bulbs. The timeline for these standards was to start in January 2012, but on December 16, 2011, the U.S. House passed the final 2012 budget legislation, which effectively delayed the implementation until October 2012.

Light bulbs outside of this range are exempt from the restrictions. Also exempt are several classes of specialty lights, including appliance lamps, rough service bulbs, 3-way, colored lamps, stage lighting, and plant lights.

The U.S. Environmental Protection Agency's Energy Star program in March 2008 established rules for labeling lamps that meet a set of standards for efficiency, starting time, life expectancy, color, and consistency of performance. The intent of the program is to reduce consumer concerns about efficient light bulbs due to variable quality of products. Those CFLs with a recent Energy Star certification start in less than one second and do not flicker. Energy Star Light Bulbs for Consumers is a resource for finding and comparing Energy Star-qualified lamps.

By 2020, a second tier of restrictions will become effective, which requires all general-purpose bulbs to produce at least 45 lumens per watt (similar to current CFLs). Exemptions from the Act include reflector flood, 3-way, candelabra, colored, and other specialty bulbs.

In 2011, Rep. Joe Barton of Texas and 14 other Republicans joined to introduce the Better Use of Light Bulbs Act or BULB Act (H.R. 91), which would have repealed Subtitle B of Title III of the Energy Independence and Security Act of 2007. Barton was opposed to regulation, while Rep. Michael Burgess pointed to jobs purportedly lost to

PSC-054 cont'd

China and voiced a fear of mercury problems resulting from CFL use. On July 12, 2011, H.R. 2417 failed to pass by the required two-thirds majority in the U.S. House. In December 2011 the U.S. halted the government phase-out of 100-watt incandescent bulbs. In October 2012, conventional 100-watt bulbs were no longer made, but a company in Summerville, South Carolina began making a bulb in Mullins, South Carolina that followed the rules but was intended for businesses, harder to break with "non-hazardous materials" inside.

The 75-watt bulb was phased out in January 2013. The 60-watt and the 40-watt bulbs are anticipated to be phased out in 2014.

All CFLs incented through NWE's residential and/or commercial lighting programs starting in 2013 will assume that a 75-watt or smaller wattage incandescent lamp was the replaced light. This methodology assumes there are no more incandescent lamps with wattages greater than 75 watts being replaced with CFLs through any of NWE's lighting programs regardless of the CFL wattage. Starting in 2014 it is anticipated all CFLs incented through NWE's residential and/or commercial lighting programs will assume that a 40-watt or smaller wattage incandescent lamp was the replaced light. Starting in 2015 it is anticipated CFL incentives will discontinue. NWE will continue to stay abreast of federal legislation associated with this topic.

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PSC-055

Regarding: Compound Incentives
Witness: Thomas

Please explain whether there are instances of compound incentives within the E+ Residential Lighting Program. For example, is it possible for a customer to receive an in-store coupon for CFLs and to use the coupon to obtain a discount on CFLs that have been marked down through the up-stream buy down program? If so, please provide any estimate NWE has of the percentage of program savings attributable to compound incentives.

RESPONSE:

It is possible that compound incentives occur within the E+ Residential Lighting Program as the variety of CFL products available in some stores includes a mix of upstream buydown products and other CFL products. The upstream buydown program applies to specific specialty CFL products such as globes, floodlamps, and larger lumen output products. The majority of stores participating in the coupon program are smaller retailers while the participating retailers in the manufacturer buydown program are typically the big box stores and chains. Not all retailers participate in both programs. For instance, Costco only participates in the buydown program.

Communicating to the customer/retailer which product is eligible under which mechanism is nearly impossible. The buydown products are the specialty products with a higher upfront cost to the consumer (even after the upstream buydown) than the many other more common CFL products.

NorthWestern is not aware of any feasible way to find out how often this occurs and has no estimate of the percentage of savings attributable to compound incentives.

This situation points out one of the challenges associated with operating large-scale DSM programs where individual measures (and associated energy savings) are incrementally small. CFL lamps, as an example, must be installed by the tens of thousands to produce meaningful amounts of aggregate energy savings. The cost to monitor and measure each individual lamp operating schedule and resulting energy savings production (e.g., sub-metering every CFL that is placed and then collecting that data) would very likely exceed the value of the DSM resource produced. This would then defeat the otherwise achievable objective of mass measure DSM programs, which is to acquire cost-effective energy savings. And, the evaluation results demonstrate that – despite some possibility of compound incentives – the E+ Residential Lighting Program has been cost-effective.

PSC-056

Regarding: SBW Spreadsheet Calculations
Witnesses: Thomas

Please refer to the tab named "AvoidedLostDiscount" in the Excel spreadsheet provided in response to data request PSC-033. Please explain why the lost revenue rate in column E is zero for the savings years after 2013.

RESPONSE:

This assumption reflects NorthWestern's best estimate (at the time) of when transmission and distribution rates would be changed as a result of a general rate case. When transmission and distribution rates are changed, DSM lost revenues are reset to a zero starting point and begin to accumulate again (assuming DSM program activity continues into the future). It is not known beyond that time whether lost revenue recovery will continue, so as a conservative assumption, NorthWestern directed SBW to set the lost revenue rate in column E to zero for the savings years after 2013.

PSC-057

Regarding: DSM Program Evaluation, E+ Residential Lighting
Witness: Baker

a. Chapter 18 of SBW's Impact and Process Evaluation report, p. 566, states, with respect to the measure-specific, engineering calculations NWE used to estimate savings, "For measures where the NWE method was not adequate, we recalculatedenergy (kWh) and demand (kW) savings using the more reliable techniques." Please provide several specific, representative examples of instances in which SBW found NWE's measure-specific engineering calculations inadequate and explain why the technique SBW used was an improvement.

b. Chapter 18 of SBW's Impact and Process Evaluation report, p. 567, states, with respect to SBW's estimation of annual residential CFL operating hours in earlier program years, "Since the NWE programs started much later than programs in the other regions, we estimated NWE hours of use for 2006-07 as the value estimated by the linear regression trend line for 2004." However, Figure 147 on p. 568, which shows the linear regression trend line, appears to show a value greater than 3 for 2004. The evaluation hours per day for 2006 shown in Table 458 of 2.7 appears to match the linear regression trend line for 2006. Please clarify SBW's intent with respect to which year of the linear regression trend line was the basis for the 2006-07 residential CFL operating hours and whether that intent is reflected in the results for the E+ Residential Lighting Program impact evaluation.

c. Chapter 18 of SBW's Impact and Process Evaluation report, p. 569, states, with respect to estimating the proportion of upstream CFL buy-down bulbs purchased and installed by non-residential customers, "We could not directly determine the disposition of each buy-down bulb. Therefore, we obtained information on the sector split from the telephone survey of trade allies (CFL Buy-Down Retailers)." Page 573 explains that eight retailers were surveyed. Please discuss to what extent the results from this telephone survey represent a reliable estimate of the sector split.

RESPONSE:

a. The quote from Chapter 18 that you reference was a general statement of methodology that we applied to many of the programs. If we found a case where the NWE method was not adequate, we used a more reliable technique. For the Residential Lighting program we did not find a case where the NWE method was inadequate.

PSC-057 cont'd

b. The vertical axis (Daily Hours) on this graph is poorly labeled. The values were somehow rounded to the nearest integer. The vertical axis should be labeled: 0.5, 1.0, 1.5, 2.0, 2.5, 3.0… The 2004 value appears to be between 3 and 3, (with incorrect labeling), but is actually between 2.5 and 3.0 (with correct labeling).

c. We believe that the retailers interviewed are in a good position to estimate this parameter, as it is part of their core job responsibilities to be aware of the types of customers that are buying products from their stores. Methods such as in-store intercepts, where random samples of customers would be interviewed might improve the reliability of the estimate, but such methods are much more expensive and were not anticipated by the agreed upon research plan for this study.

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PSC-058

Regarding: Residential CFL Operating Hours Study
Witnesses: Baker, McRae

a. Chapter 27 of SBW's Impact and Process Evaluation report, p. 782, states, with respect to metering sampled CFLs, that surveyors "reminded customers to avoid disturbing loggers, but otherwise use their lights as they normally would." Is there any reason to expect that customers who know their lighting use is being monitored will change their behavior, notwithstanding the surveyors' recommendation?

b. Please clarify whether the loggers recorded the time of day lights were operated and whether the data collected together with data from other studies produced a daily lighting load profile, or whether just the number of operating hours per day was recorded regardless of the time of day.

c. Chapter 27 of SBW's Impact and Process Evaluation report, p. 796, shows CFL hours of use by room type and program/component in Table 636. According to the table the average hours of use logged for CFLs delivered through the upstream buy-down, weighted by room type, is 0.9 hours per day, about one-half of the 1.7 hours per day average for all CFL program components. Given the sample data on the hours of use by program component, why didn't SBW use program component-specific hours of use to adjust reported savings in the impact evaluation of the E+ Residential Lighting program.

d. Based on Table 635 it appears that buy-down CFLs represent, at most, 25% of total sampled CFLs (if the "Not Applicable" and "Unknown" program components are counted with the buy-down component). Table 461, on p. 574-5 of the report, shows that upstream buy-down CFLs account for the majority (66%) of total net kWh savings. Does the high percentage of total net savings from upstream buy-down CFLs correspond to a high percentage of total installed residential CFLs through the buy-down program component? If so, to what extent might the relatively smaller proportion of buy-down CFLs in the hours of use study, combined with their lower-than-average hours of use, result in an over-estimate of kWh savings from buy-down CFLs in the impact evaluation?

e. Chapter 27 of SBW's Impact and Process Evaluation report, p. 800, with respect to early year installation patterns, states, "Our study examined the state of residential CFLs in 2012." Does this statement mean that the study was able to isolate residential CFLs that were installed in 2012? Is so, please describe how surveyors were able to distinguish those CFLs within a residence that were installed in 2012 from those that could have been installed in an earlier year.

PSC-058 cont'd

RESPONSE:

a. In our estimation, it is highly unlikely that the presence of loggers significantly affected occupant behavior at the metered residences. In many cases, we installed our loggers out of sight, i.e., inside an enclosed light fixture, or placed in a small case on the floor next to the electrical receptacle. Consequently, we strongly suspect that occupants quickly acclimated and engaged in their normal patterns of behavior soon after the loggers were installed.

b. The loggers we used for this study recorded exact times when the metered lamp turned on and off, permitting us to develop daily lighting profiles. Our understanding is that the similar lighting studies that we referenced in our work also used such time-of-use lighting loggers.

c. The sample of 220 metered CFLs only included 10 identified upstream buy-down CFLs. Consequently, the statistical precision around the mean of 0.9 hours for the latter is quite poor, and the estimate would not be reliable enough to apply to such a critical number. The data in this table were provided for illustrative purposes only.

d. It is unclear where the figure of 25% of sampled CFLs installed via buy-down comes from. Excluding not applicable (n=35) and unknown (n=10) CFLs from the sample (n=220), leaves 175 CFLs, of which 10 (6% of 175) were through buy-down. This small percentage in our sample is to be expected, since the number of homes participating in NWE CFL program is much smaller than the number of homes in the NWE service territory that purchased bought-down CFLs. This, coupled with the sampling discussion in the previous response (c), means that it is tenuous at best to conclude from these data that buy-down CFL kWh are overestimated.

e. This statement did not mean that we could establish the installation year with any certainty, only the self-evident fact that because the metering took place in 2012, it provides insights into 2012 CFL usage.

PSC-059

Regarding: Residential CFL Operating Hours Study
Witnesses: Baker, McRae

a. With regard to Table 638 in Chapter 27 of the report, p. 800, please explain what the population numbers represent.

b. With regard to Table 638 in Chapter 27 of the report, p. 800, please illustrate how the weighted mean figures for "Res DI CFL" and "Res Owner CFL" were calculated.

RESPONSE:

a. The population numbers cited in this table correspond to those in preceding Table 626. This table, and the accompanying Section 27.1.1, describes the evaluation sample design in more detail.

b. The method(s) by which we calculated the weighted means in this table are laid out in Section 27.1.6.2. We implemented these complex calculations in a Res CFL Extrapolation Excel workbook, which we subsequently provided to NWE to review. This workbook is available as part of report Volume II delivered to NWE on 12-19-2012.

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PSC-060

Regarding: E+ Audit Home or Business Program
Witness: Thomas

On page 49 of the SBW report, the Audit program component is described as the gateway for most NWE residential energy efficiency programs. Does NWE periodically evaluate alternatives to the Audit program as gateway strategies for its efficiency programs?

RESPONSE:

Yes. NorthWestern DSM staff work closely together on a day-to-day basis to administer the programs, monitor activity and performance of implementation contractors, respond to customer inquiries, and discuss ways to improve levels of customer participation in its DSM programs. Each January following completion of the Resource Procurement Plan (either electric or natural gas in alternating years), NorthWestern DSM staff meet to review program strategies, update budgets, adjust incentive levels and make other course corrections as necessary and appropriate for the forthcoming program calendar year.

There are many strategies and techniques employed to stimulate and maintain customer awareness and interest in these programs. One of those strategies, described by SBW as use of the Audit Program as a gateway, is promotion of the many DSM programs to customers at the time NorthWestern's representatives are on site conducting a home energy audit and have the customer's attention on the subject of energy efficiency. This is not the only method used to do this. Other mechanisms that can also be considered gateways include Fall Weatherization Events, trade shows, conferences, extensive distribution literature, and media advertising. These are all used to market energy efficiency programs to NorthWestern's customers.

The Audit program has been successfully used as a tool for marketing other energy efficiency programs to customers. NorthWestern seeks to continually supplement, rather than supplant, this mechanism in its ongoing effort to build customer participation and cumulative DSM resource acquisition.

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PSC-061

Regarding: E+ Audit Home or Business Program
Witnesses: Baker, DeBolt, McRae

a. Are audit programs commonly used as efficiency programs by other utilities?

b. Are audit programs commonly used as gateway programs for other efficiency programs?

RESPONSE:

a. Yes. Program operated by NYSERDA constitutes a prime example.

b. Yes. Program operated by the Energy Trust of Oregon constitutes a prime example.

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PSC-062

Regarding: E+ Irrigation Program
Witnesses: Baker, DeBolt, McRae

Why are the TRC and SC test scores for this program significantly lower than the PAC and RIM test scores?

RESPONSE:

The TRC test score is significantly lower than the PAC test score because TRC costs are much greater than PAC costs since TRC costs are program costs and incremental participant costs while PAC costs program costs and incentives paid which are a small fraction of the incremental participant costs for E+ Irrigation. The RIM costs comprise the PAC costs and lost revenues, but the lost revenues are only a small portion of the total RIM costs; therefore, the RIM costs are significantly less than the TRC costs, resulting in the TRC test score being significantly less than the RIM test score. SC costs are 110% of TRC costs and therefore still significantly more than PAC and RIM costs.

PSC-063

Regarding: Free-Rider and Spillover Adjustments
Witnesses: Baker, DeBolt, McRae

On page 876, the report states that "a number of evaluators believe that the total savings owing to spillover are equal to, and perhaps in excess of, free ridership savings." Please identify the evaluators referred to and reference the publications or contexts in which their beliefs were expressed.

RESPONSE:

We identify below some of the evaluators that believe long-term spillover effects commonly equal or exceed free ridership effects for well designed and implemented programs that operate over many years. These evaluators believe it appropriate for regulators and program administrators to use for the net-to-gross ratio an ex ante, deemed value of 1.0 (that is, a value determined in advance of program implementation, so an after-implementation estimated value is not used to determine whether the portfolio met its goals). These evaluators believe that asymmetric information exists between long-term spillover effects and free ridership effects (that is, less information exists about spillover than about free ridership), with spillover effects being much more difficult (both technically difficult and expensive) to estimate than free ridership effects and needing an evaluation design focusing on spillover.

Some evaluators believe the appropriate research agenda around these issues is one that dedicates the resources needed to estimate spillover; other evaluators believe the appropriate research agenda is one that dedicates the resources needed to understand market conditions. There is overlap between these positions, as both the supply and demand sides of the market need to be deeply investigated.

The research agenda to estimate spillover, however, requires both a baseline and a post condition (to determine change in the market) and requires determining attribution (to what extent did the program drive any change). The agenda to understand market conditions (which is the position Research Into Action endorses) (1) does not require an initial baseline as it is assessing whether the market is currently transformed (regardless of its prior condition), (2) does not require an assessment of attribution (see the evaluation report sections 31.4.2 and 31.4.4 (volume 1) and our response to PSC-073, below, for our assessment of the inability of the self-report method to assess attribution), and (3) does not divert attention from the important endeavor of better understanding the market with the goal of continually improving our program designs.

PSC-063 cont'd

(To be clear, both research agendas can include an objective of "better understand the market" if the research budgets suffice; however, we conduct our research through surveys and interviews with market actors (supply and demand) and market actors have limited time they are willing to devote to our research. Research Into Action is of the opinion that we best use this limited time (as well as limited ratepayer evaluation funding) trying to understand the market, not trying to chase the red herring of program attribution.)

A short list of evaluators that believe long-term spillover effects commonly equal or exceed free ridership effects for well designed and implemented programs that operate over many years:

- Dr. M. Sami Khawaja, Senior Vice President at The Cadmus Group, the largest energy program evaluation firm in the world
- Dr. Hossein Haeri, Executive Director at The Cadmus Group
- Dr. Ben Bronfman, Executive Director at The Cadmus Group
- These evaluators have gone on record with this opinion in the *Public Utilities Fortnightly* March 2012 article, "The Trouble with Freeriders"; in *Assessment of Energy and Capacity Savings Potential in Iowa,* February 28, 2012; and many other publications
- Nicholas Hall, Owner TecMarket Works, the country's first full-time evaluation professional focused on energy programs (at DOE, 1978) and the most published energy program evaluator in the world
- Mr. Hall has gone on record with this opinion in testimony filed with the Michigan Public Service Commission, Case No. U-1738 (December 17, 2012), testimony before many regulatory commissions, and numerous published articles
- William Saxonis, New York State Department of Public Service
- Mr. Saxonis has gone on record with this opinion in "Free Ridership and Spillover: A Regulatory Dilemma," Proceedings, *International Energy Program Evaluation Conference,* August 2007
- Rafael Friedman, Pacific Gas & Electric Co.
- Mr. Friedman has gone on record with this opinion in "Maximizing Societal Uptake of Energy Efficiency in the New Millennium: Time for Net-to-Gross to Get Out of The Way?" Proceedings, *International Energy Program Evaluation Conference,* August 2007
- Dr. Jane S. Peters, President of Research Into Action. Dr. Marion Brown, formerly the director of evaluation for Southern California Edison, serves as technical reviewer of Research Into Actions evaluation of DOE's Better Buildings Neighborhood Program, in which context she wrote: "This [work] exemplifies why RIA is one of the premier process evaluation firms." [Note that while the evaluation was a product of Research Into Action, Dr. Marjorie McRae wrote the net-to-gross critique in section 31, and thus Dr. Peters constitutes an evaluator that shares Dr. McRae's views]

PSC-063 cont'd

- Dr. Peters has gone on record with this opinion in "Freeridership Measurement is Out of Sync with Program Logic… or, We've Got the Structure Built, but What's Its Foundation?" Proceedings, *ACEEE Summer Study,* August 2008
- Dr. Marion Brown, former Manager Measurement and Evaluation, Southern California Edison [McRae has ascertained this in communication on February 28, 2013, yet neglected to ask Dr. Brown for citations to published work stating this opinion]

PSC-064

Regarding: Free-Rider and Spillover Adjustments
Witnesses: Baker, DeBolt, McRae

a. On page 876, the report discusses a 2012 review of the net-to-gross practices of 31 regulatory jurisdictions, finding that "42% had no NTG requirement." Did the review identify or analyze the actual practices, i.e., the calculation and use of free-ridership, spillover, and NTG ratios, that program administrators in jurisdictions without NTG requirements may have had in place? Please explain.

b. Did the reviews discussed on pages 876-878 of the report include findings about how program administrators within jurisdictions with NTG requirements may have adopted NTG practices that exceeded jurisdictional requirements? If so, please explain.

RESPONSE:

a. On page 876, McRae apologizes for omitting the citation for the statement "A 2012 review..." This is a study described by Haeri and Khawaja in their cited work; they did not provide a citation to the review itself. McRae posed this question to Haeri, who replied: "No [the review did not identify or analyze the actual practices]. The findings of that study are in line with the results of a recent survey of 45 jurisdictions by ACEEE (A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs) that about 50% of the jurisdictions use net savings for reporting purposes."

b. According to Hairi, commenting on the 2012 study (referred to on page 876): "No, this issue was not investigated." Regarding the NMR Group and the Ernest Orlando Lawrence Berkeley National Laboratory research cited on page 878, they describe many variants in NTG practices. It is difficult to characterize NTG practices that might exceed jurisdictional requirements, as different utilities and different evaluators working for a given utility differ in their definitions (both verbal and applied – that is, how the term is actually estimated) of the NTG components, and the utilities and jurisdictions differ in the uses to which they put the NTG term (such as prospective/retrospective, policy/program design/evaluation, etc). Further, the NMR Group study, as well as the Hairi and Khawaja study, described the difficulty in finding, for many jurisdictions, a clear statement of the jurisdictional requirements. Thus, it is not possible to make "apples to apples" comparisons in NTG practices, which precludes a characterization of such practices as have exceeded jurisdictional requirements.

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PSC-065

Regarding: Free-Rider and Spillover Adjustments
Witness: Thomas

Would NWE support net savings and lost revenue adjustments calculated using the free-rider and spillover rates provided in PSC-033? If not, please explain.

RESPONSE:

No. A DSM Evaluation is an expensive, time-consuming, and resource intensive process. Care is taken to retain a qualified and independent firm using a blind, competitive bidding process. Review is sought at every step in the process, from the initial RFP to final selection.

The primary purpose of an independent third party evaluation is to get an objective review of NorthWestern's efforts and accomplishments in energy efficiency. This work also provides findings and recommendations for improvements NorthWestern might make to its DSM programs. To the fullest extent possible, it is incumbent upon NorthWestern to accommodate and/or incorporate these findings and recommendations into its ongoing program design and operation.

NorthWestern DSM staff wants to know what aspects of the DSM effort are being performed correctly and in accordance with accepted and best practices in the utility industry – including but not limited to estimation methodologies, documentation and record keeping, program techniques, economic analysis, and much more – as well as areas needing correction or holding opportunity for further improvement. There would be little point in going through this effort and process if NorthWestern were not prepared to carefully consider and act upon the results. NorthWestern did this with the previous DSM evaluation work performed by Nexant in 2007 and believes its DSM programs are stronger as a result.

SBW specifically rejected free-rider and spillover rates for all the reasons enumerated and documented in its findings (refer to Exhibit__(MHB-1a and MHB-1b, specifically in Chapter 34). This is one of SBW's primary and most important findings, and NorthWestern accepts this conclusion.

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PSC-066

Regarding: LRAM Adjustment
Witness: Thomas

Should interest apply to the amount over-collected through the LRAM since 2006 represented in Exhibit WMT-5?

RESPONSE:

Yes. Consistent with past practice, interest should be applied to both over- and under-collected balances.

PSC-067

Regarding: Cost-effectiveness Test Scores
Witnesses: DeBolt, McRae

a. For the E+ Commercial New Electric Rebate program, the cumulative PAC and RIM values are 1.27 and 1.11, respectively, while the TRC and SC values are 2.07 and 2.28. Please explain why the TRC and SC values for this rebate program are greater than the PAC and RIM values.

b. For the electric portion of the DEQ Appliance program, the PAC and RIM values are significantly higher (8.38 and 2.54, respectively) than the TRC and SC values (0.33 and 0.36). Why, for this rebate program, are the TRC and SC values significantly lower than the PAC and RIM values?

c. Are there reasons, in addition to those provided in response to the preceding two questions, why the TRC and SC values are measurably higher than PAC and RIM values for the E+ Commercial New Electric Rebate program while the opposite appears to be the case for the DEQ Appliance program, i.e., significantly lower TRC and SC values than PAC and RIM values?

RESPONSE:

a. The PAC test score is lower than the TRC and SC test scores because PAC costs are much greater than TRC and SC costs since the incremental participant costs provided by NWE are significantly less than the incentives paid costs provided by NWE for the E+ Irrigation program. The RIM test score is lower than the TRC test score because PAC costs are incorporated in the RIM costs plus the lost revenues making the RIM costs even larger than the TRC costs.

b. For the DEQ Appliance program, incentives paid were not broken out from program costs because NWE does not pay incentives directly to the participants so no incentives paid were added separately in the PAC and RIM costs. However, incremental participant costs were reported and incorporated into the TRC and SC costs. Therefore, the PAC and RIM costs are significantly less than the TRC and SC costs, resulting in the PAC and RIM tests being significantly higher than the TRC and SC tests.

c. No.

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PSC-068

Regarding: NEEA Incremental Participant Costs
Witnesses: DeBolt, McRae

In Table 648, "Portfolio Cost-Effectiveness Summary for All Calendar Years" (p. 826), values for all test calculations are provided for NWE's programs, including NEEA. However, an endnote of the table states that "NEEA Initiatives costs do not include Incremental Participant costs because none were provided." (p. 831) If incremental participant costs for NEEA were not available, please describe the validity, accuracy, and range of estimated range of error in cost-effectiveness test calculations that include values for incremental participant costs, such as TRC and SC tests, in your representation of those particular test values for NEEA.

RESPONSE:

The absence of incremental participant costs imposes substantial uncertainty on the TRC and SC test results for NEEA. The estimation of those costs was explicitly outside the scope of our research design, so we have no means by which to estimate the size of this error.

PSC-069

Regarding: DSM and USB Cost Allocation
Witness: Thomas

a. During the SBW evaluation period, 2006-2011, some programs, such as E+ New Homes, E+ Commercial Existing Electric Rebate, and E+ Electric Motor/RewindRebate, drew funding support from both NWE's DSM and USB budgets. Please explain the NWE's methodology in allocating costs to the DSM and USB budgets when both budgets are utilized to underwrite a particular program.

b. Did the reviews discussed on pages 876-878 of the report, which analyzed the NTG requirements of regulatory jurisdictions, include findings about how NTG practices may have been developed and used by program administrators in jurisdictions that had no NTG requirements? If so, please explain the findings.

c. Did the reviews include findings about how program administrators within jurisdictions with NTG requirements may have adopted NTG practices that exceeded jurisdictional requirements? If so, please explain the findings.

RESPONSE:

a. DSM funds are used to support program costs associated with rebates and administration of measures identified in the electric potential assessments that meet the TRC cost-effectiveness tests. In the programs referenced above, USB funds are used to support:

- Rebates for qualifying measures to small Choice customers who pay the electric USB charge but are not eligible to self-direct USB funds (as are large Choice customers) nor are they eligible for DSM rebates that are funded through electric supply rates; or
- Market transformation activities, separate of rebates, which foster high efficiency building practices in residential new construction and the adoption of energy efficient motor management practices.

DSM funds were used for qualifying electric rebates for new construction for 2006 through 2008 as identified by the 2003 KEMA Electric Potential Assessment study. As a result of the 2009 Electric Potential Assessment study conducted by Nexant/CADMUS, the DSM funded E+ Residential New Construction Electric Rebate Program was created. Prior to that time, USB Market Transformation funds supported the E+ New Homes Program to foster better-than-code residential new construction through contractor

PSC-069 cont'd

training, Energy Star verifier training, Northwest Energy Star Homes standards, marketing, and advertising.

Please refer to Chapter 15 of the January 29, 2013 Impact and Process Evaluation of NorthWestern Energy 2007-2011 Demand Side Management Programs conducted by SBW Consulting. In 2013, the E+ New Homes Program does not utilize DSM funds, but Market Transformation funds will continue to be used to foster high efficiency in new residential construction.

Electric USB funds have provided qualifying rebates to small electric Choice customers for the E+ Commercial Existing Electric Rebate Program, E+ Commercial Lighting Rebate Program, and the E+ Motor/Rewind Rebates. Small electric Choice customers pay the USB charge and receive their electricity through NWE's electrical distribution and transmission system, but purchase their electric supply from an alternative supplier. Large USB Choice customers are not eligible for either DSM or USB-funded rebates as they can self-direct their USB dollars and do not pay electric supply rates that fund the DSM programs.

The Motor Management Training, separate of the rebate program, is a USB-funded market transformation effort to foster electric energy efficiency through motor management and green motor practices.

b. See the response to Data Request PSC-064b.

c. See the response to Data Request PSC-064b.

PSC-070

Regarding: Program Type Selection
Witness: Thomas

a. In the latter years of the SBW evaluation period, NWE appears to have increased emphasis on rebate measures (with the exception of the discontinuation of the new motor rebate measure in 2011). Please explain NWE's general approach to the rebate methodology for efficiency and how that approach may have evolved in recent years.

b. Has NWE's level of usage of program types other than rebates, such as energy audits, professional training, *et al.*, changed on a utility-wide scale in recent years? If so, please summarize reasons for change.

RESPONSE:

a. In the early years of the SBW evaluation period, information about rebate measures (incremental costs, savings, effective useful lives, etc.) was not readily available. In 2009, Nexant/Cadmus completed the Assessment of Energy Efficiency Potentials which detailed electric measures that NWE could use to further develop prescriptive electric rebate programs, which is why additional electric rebate offerings were introduced in the latter years of the evaluation period. Customers prefer prescriptive rebate programs for energy-efficient measures they install. The extensive project analysis that goes along with a custom incentive was and remains burdensome to both the project evaluator and customer. Evaluating the measures associated with the custom programs was time consuming and expensive. Prescriptive rebate programs create less of a barrier to the customer compared to custom incentive programs. Removing barriers typically increases customer willingness and participation.

b. Yes, the level of use of non-rebate activities has varied. Non-rebate activities are primarily supported through USB funds. Over the years availability of funds to support the USB activities has varied primarily due to pressures from the low income activities. Final Order No. 6679e in Docket No. D2005.6.106 allowed for electric USB funds to be used to cover the natural gas low income bill discount shortfall. These Electric USB funds would have otherwise supported the USB categories of Local Conservation, Market Transformation, Renewable Generation, and Research and Development. Order No. 6679e increased the natural gas USB funding and reinstated funding levels for the non-Low Income purposes. This allowed for increased funding of training, education, energy audits/appraisals, and for new market transformation initiatives. It also allowed for increased funding of small-scale renewable generation and research and development.

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PSC-071

Regarding: Internal Review Protocols
Witness: Thomas

Please describe any established procedure or protocols that NWE has for internal review of efficiency programs and determinations of whether particular programs should be discontinued, altered, or established.

RESPONSE:

See the responses to Data Requests PSC-060 and PSC-065.

PSC-072

Regarding: Transformed Markets
Witness: McRae

a. How does one know when a market has been transformed?

b. Should forward-looking predictions be made about when a market will be transformed (e.g., the expectation that the market for residential lighting would be transformed in 2016 because of consumer adoption or government regulation) and make decisions about cost-effectiveness accordingly?

c. In your view, is NWE funding programs in any "transformed markets" as discussed on ln 3, p. 5 of your testimony?

RESPONSE:

a. The only definitive way is to measure the prevalence of the desired market characteristics (such as proportion of heat pumps installed in residence in a year with an efficiency of XX or higher) prior to terminating the program and then several times thereafter (such as one year and three post-program) and confirm that share of energy-efficient units has not fallen (or not fallen much). Because consumer self-reports have been discredited in this type of research, accurate measurement of prevalence can be obtained only from comprehensive manufacturer/distributor sales data (which is typically difficult or even not possible to obtain), or from on-site surveys of a representative random sample conducted by trained staff (which are expensive). Self-reported contractor data are not definitive, but might provide an acceptable proxy measure of the prevalence, especially if augmented periodically (say, every five years) by information from on-site surveys.

b. Such forward-looking predictions could be useful in planning. However, one would want to establish metrics (such as proportion of shoppers on a given day in three locations observed buying the item) by which one can ascertain the extent to which the predictions are materializing. Regarding using predictions to "make decisions about cost-effectiveness," in our view it seems cost-effectiveness decisions should be based on facts, to the extent the facts can be ascertained, rather than on predictions.

c. No, it is our view that NWE is not funding programs in any "transformed markets."

PSC-073

Regarding: Behavioral Psychology
Witnesses: Baker, McRae

a. What behavioral psychology considerations were taken into effect for the propensity of survey respondents to answer written surveys untruthfully, in a manner that makes the self-responding party seem, for example, less energy inefficient or otherwise more conscious about reaping energy efficiency savings?

b. Do you believe a self-report method to survey responses can bias a survey and, if so, how did you mitigate that concern?

c. Were any considerations made about how the installation of a light meter would affect consumers' propensity to turn on and off the light on which a meter was installed (e.g., turning off the light more frequently than they otherwise would were they not being monitored)?

RESPONSE:

a. See response to item b.

b. Yes, we believe the self-report method to survey responses can bias a survey through multiple conscious and unconscious mechanisms. And, as we explain below, we did not mitigate the bias from the unconscious mechanisms because it is not possible to do so.

Much of the energy efficiency literature has discussed the conscious mechanisms (by conscious, in this case, we mean that the contact could be aware that the "true" answer differs from the answer given), such as social desirability bias (the phenomenon of wanting to appear as conforming to social norms). This phenomenon was first identified by social scientists obtaining self-reported information from populations about which independent information was available. For example, researchers asked contacts to self-report their alcohol consumption while monitoring their alcohol purchases. Survey researchers have identified techniques to reduce social desirability bias – techniques that were developed and tested in situations where independent information was available by which the researchers could gauge bias.

In the last twenty years, the findings of cognitive scientists are overturning our confidence in self-reports broadly speaking (including self-reported telephone data, yet also including the gamut of self-reports of our experiences, including eye-witness reports). These scientists are identifying unconscious mechanisms that bias self-reports

PSC-073 cont'd

and which, being integral to how the brain produces "mind," cannot be corrected for through research methods.

Cognitive scientists have proven that each of our sensory perceptions, such as vision and hearing, are not direct, faithful reproductions of the external event, such as a video camera might record. Instead, the mind's image of each perceived stimuli (a sight, a sound) is generated from complex, unconscious processes of filtering, valuing, selective attending, interpolating, extrapolating, and interpreting to generate what we consciously recognize as an image or scene, a set of sounds, etc. All perception depends on all past perception for its meaning; perception is a fluid, constructive act that we are unaware of and that it took laboratory experiments to uncover and explore. Similarly, while memory is experienced as replying a set videotape, it has instead been proven to be the outcome of a constructive act of assembling bits and pieces of emotion and past sensory inputs, acted on by filtering, valuing, selective attending, interpolating, extrapolating, and interpreting. It has been proven that a given memory alters each time it is recalled to mind.

These are cognitive interpretive processes that cannot be "corrected for," because without which what we recognize as sight, hearing, and memory would not exist. So it is with the processes we discuss in the evaluation report section 31.4.2 (volume 1), including loss aversion, attribution bias, cognitive dissonance, choice-induced preference change, and type 1 and type 2 memory errors. These phenomena are present in our profession's estimates of self-reported free ridership and they cannot be corrected for, as they are cognitive processes inherent in cognitive functioning.

These findings from cognitive science are revolutionary in their implications. The criminal justice researchers have now determined that eye-witness accounts have poor validity; until the independent, indisputable evidence provided by DNA testing became available, researchers had no way to gauge the validity of eye-witness accounts and mistakenly assessed validity based on the "character" of the eye-witness. Over 100 people on death row have to date been found not guilty of their crimes, often determined from a DNA analysis conducted long after their sentencing.

The question for policy makers is whether it makes sense to "kill" an energy efficiency program on the basis of self-reported free ridership levels, and whether to penalize utilities based on their portfolio performance net of self-reported free ridership levels. We do not believe such policy decisions should rest on these data.

PSC-073 cont'd

c. No. We know of no instructions we can give to study participants that will reduce their awareness of being studied or induce their unobserved behaviors.

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PSC-074

Regarding: Random Sampling
Witnesses: Baker, McRae

a. What attempts were made to ensure that the samples of program participants and nonparticipants were random samples?

b. How important is it to have randomness in sampling for EM&V activity

RESPONSE:

a. We random-ordered all samples prior to telephoning and called through the list in the resulting random order for all studies, including both program participants and non-participants. As participation in our telephone survey (as well as virtually all research conducted in this country) is voluntary, the final sample is self-selected – the contact has chosen to participate. We followed best practices in the field to encourage survey participation. The extent of such self-selection bias in energy efficiency research has not been extensively studied; the few studies we've seen over the years do not suggest substantial bias in studies obtaining process feedback such as satisfaction.

b. In any research that seeks to extrapolate from a sample to a population, randomness in sampling is very important.

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PSC-075

Regarding: Staff-to-Budget Ratio
Witness: Baker, McRae

On p. iv of the SBW report you state that NWE's DSM program has "an extremely low staff to budget ratio, as compared with program administrators around the country." What is the basis for that statement?

RESPONSE:

a. **As we wrote on pages 841-842 of the evaluation (volume 1):**

NWE designs and implements its DSM and USB program portfolios with staff in the efficiency department, corporate communications department, print shop, and community relations offices. All of these staff also have responsibilities other than the DSM and USB programs. Staff estimate these activities account for six full-time-equivalent (FTE) positions. NWE's efficiency portfolio is also supported by a primary program implementation contractor, E+ Program Contractors, and a few program-specific implementation contractors.

NWE's staffing ratio is approximately 0.40 staff per million dollars of efficiency portfolio, an extremely low ratio compared with 39 efficiency program administrators around the country. (Goldman, et al. 2010) Similarly to NWE, these program administrators also use implementation contractors, so the use of such contractors does not account for differences between NWE and the average administrator. The research collected data on, among other things, administrators' total efficiency budgets; total in-house staff (FTE); proportions of total efficiency budget allocated to incentives, implementation contractors, and marketing; total budget by sector (residential, non-residential); and so on. Table 1 summarizes our findings on staffing ratio, defined as total in-house staff (FTE) divided by total efficiency budget in millions of dollars.

Table 1: Program Administrator Staff (FTE) per Million Dollars of Efficiency Budget

	Staff per Million Dollars of Budget	Description of Program Administrator
Minimum	0.27	A public utilities commission implementing a non-residential portfolio through primary implementation contractor
Maximum	18	A natural gas utility in the same state as the administrator with the minimum ratio
Mean	2.48	All surveyed 39 administrators

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PSC-076

Regarding: DEQ Appliance program
Witness: Thomas

Funding for this program was eventually depleted on a first come, first served basis. Do you not believe that the funding would have been depleted, even absent NWE advertising promoting the program through advertising?

RESPONSE:

NorthWestern has no way to form a belief about this. NorthWestern is continually encouraged to coordinate and find ways to partner with state government on energy efficiency programs and activities and did so with this program.

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PSC-077

Regarding: Demand Savings
Witness: Baker

You write on p. 14 of the SBW Report that "We computed demand savings by dividing the evaluation kWh values by 8,760, the number of hours in a year." Given that the import of demand is frequently whether or not it coincides with peak demand, did the study give consideration to program impacts specifically on peak demand hours, or did it focus, as the statement above implies, merely on aggregate demand?

RESPONSE:

Our scope of work defined demand as described on page 14. Our scope did not include an assessment of peak demand.

PSC-078

Regarding: Dispatch of Basin Creek
Witness: Markovich

a. Of all the megawatt-hours of production generated by Basin Creek in the tracker year, what percentage of them reflect an hourly schedule, versus the percentage of megawatt-hours that reflect a sub-hourly schedule?

b. If wind is projected to deliver for one-half of an hourly schedule, does the scheduler have the option of dispatching Basin Creek?

c. On how many occasions during the tracker year was Basin dispatched to assist an intermittent resource to meet its schedule?

d. Please provide a copy of any agreement that NWE's supply function has ever entered into with NWE's transmission function related to the dispatch of Basin Creek.

RESPONSE:

a. One hundred percent of them reflect an hourly schedule.

b. Wind forecasts are for hourly increments only.

c. None. That assistance is provided by the Dave Gates Generating Station.

d. See Attachments 1 through 4.

Memorandum of Understanding

The electric Default Supply function of NorthWestern Corporation has a 135 MW wind contract known as Judith Gap. This wind contract has substantial variability in its output that causes the scheduled energy from the facility to sometimes vary materially from the actual output. In order to help integrate this wind facility, Default Supply grants limited permission to NorthWestern Energy's electric transmission function to utilize its interest in the Basin Creek natural gas fired generator to perform operational functions in accordance with the following guidelines.

Due to variability of the Judith Gap wind resource, the intention of this arrangement is for NWDS to self provide this Basin resource in order to integrate the Judith Gap wind resource into the portfolio of NWDS and the NWMT control area.

Interest in Basin Creek Output:	NWE Default Supply (NWDS)
Limited Operational Authority:	NWE Electric Transmission group (NWMT)
Term:	Beginning August 23, 2006, and extending month to month, unless canceled by either party with 30 days written notice.
Cost:	Since this service is entirely for the benefit of Default Supply, no invoices will be rendered to NWMT. However, at the end of each month NWMT will provide a schedule of all changes made under this MOU so NWDS can adequately reflect these costs in its monthly electric tracker filings with the MPSC. The form of such information to be supplied will be agreed upon by NWMT and NWDS.

Service:

Regulation Down:

- No more than two times per 24 hour period (midnight to midnight), when the Basin Creek facility is operating, NWMT shall be allowed to reduce any or all of the nine separate operating units to zero, so long as no engine remains operating at less than full capacity.
- NWMT will make every attempt to decrease the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The decrease in generation can only begin after the start of the scheduling hour and must cease at the end of the scheduling hour.
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

Regulation Up:

- No more than two times per 24 hour period (midnight to midnight), if the Basin Creek facility is not operating, or it is operating at less than full capacity, NWMT shall be allowed to increase the plant output, so long as no engine operates at less than full capacity.
- NWMT will make every attempt to increase the units equally so that no single generator runs more or less than any others.

- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The increase in generation can only begin after the start of the scheduling hour and must cease at the end of the scheduling hour.
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

This MOU has been put in place solely to help integrate the Judith Gap wind resource in the Default Supply portfolio and in no way is it intended to provide any other type of service. NWDS has elected to self-provide wind firming resources and this MOU helps accomplish that. This service is entirely for the benefit of Default Supply and in no way should it be used for anything but Default Supply service. NWDS does not and will not provide this service to anyone or for anything but Default Supply activities.

Name (NWDS)

Director, Market Operations
Title

8/23/06
Date

Name (NWMT)

Director, Transmission Marketing & Business Planning
Title

8/23/06
Date

Amended Memorandum of Understanding

The electric Default Supply function of NorthWestern Corporation has a 135 MW wind contract known as Judith Gap. This wind contract has substantial variability in its output that causes the scheduled energy from the facility to sometimes vary materially from the actual output. In order to help integrate this wind facility, Default Supply grants limited permission to NorthWestern Energy's electric transmission function to utilize its interest in the Basin Creek natural gas fired generator to perform operational functions in accordance with the following guidelines.

Due to variability of the Judith Gap wind resource, the intention of this arrangement is for NWDS to self provide this Basin resource in order to integrate the Judith Gap wind resource into the portfolio of NWDS and the NWMT control area.

Interest in Basin Creek Output:	NWE Default Supply (NWDS)
Limited Operational Authority:	NWE Electric Transmission group (NWMT)
Term:	This Amended MOU is effective December 14,, 2006, and will extend month to month, unless canceled by either party with 30 days written notice.
Cost:	Since this service is entirely for the benefit of Default Supply, no invoices will be rendered to NWMT. However, at the end of each month NWMT will provide a schedule of all changes made under this MOU so NWDS can adequately reflect these costs in its monthly electric tracker filings with the MPSC. The form of such information to be supplied will be agreed upon by NWMT and NWDS.

Service:

Regulation Down:

- No more than four times per 24 hour period (midnight to midnight), when the Basin Creek facility is operating, NWMT shall be allowed to reduce any or all of the nine separate operating units to zero, so long as no engine remains operating at less than full capacity.
- NWMT will make every attempt to decrease the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The decrease in generation can only begin after the start of the current scheduling hour and must cease at the end of the next scheduling hour (i.e., a maximum of 2 hours operation per Regulation Down event).
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

Regulation Up:

- No more than four times per 24 hour period (midnight to midnight), if the Basin Creek facility is not operating, or it is operating at less than full capacity, NWMT shall be allowed to increase the plant output, so long as no engine operates at less than full capacity.
- NWMT will make every attempt to increase the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The increase in generation can only begin after the start of the current scheduling hour and must cease at the end of the next scheduling hour (i.e., a maximum of 2 hours operation per Regulation Up event).
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

This Amended MOU supersedes and replaces the original MOU dated August 23, 2006. This Amended MOU has been put in place solely to help integrate the Judith Gap wind resource in the Default Supply portfolio and in no way is it intended to provide any other type of service. NWDS has elected to self-provide wind firming resources and this MOU helps accomplish that. This service is entirely for the benefit of Default Supply and in no way should it be used for anything but Default Supply service. NWDS does not and will not provide this service to anyone or for anything but Default Supply activities.

Name (NWDS)

Director, Energy Supply
Title

12/12/06
Date

Name (NWMT)

Director - Transmission Marketing & Business Planning
Title

12/14/06
Date

Second Amended Memorandum of Understanding

The electric Default Supply function of NorthWestern Corporation has a 135 MW wind contract known as Judith Gap. This wind contract has substantial variability in its output that causes the scheduled energy from the facility to sometimes vary materially from the actual output. In order to help integrate this wind facility, Default Supply grants limited permission to NorthWestern Energy's electric transmission function to utilize its interest in the Basin Creek natural gas fired generator to perform operational functions in accordance with the following guidelines.

Due to variability of the Judith Gap wind resource, the intention of this arrangement is for NWDS to self provide this Basin resource in order to integrate the Judith Gap wind resource into the portfolio of NWDS and the NWMT control area.

Interest in Basin Creek Output:	NWE Default Supply (NWDS)
Limited Operational Authority:	NWE Electric Transmission group (NWMT)
Term:	This Amended MOU is effective April 2, 2007, and will extend month to month, unless canceled by either party with 30 days written notice.
Cost:	Since this service is entirely for the benefit of Default Supply, no invoices will be rendered to NWMT. However, at the end of each month NWMT will provide a schedule of all changes made under this MOU so NWDS can adequately reflect these costs in its monthly electric tracker filings with the MPSC. The form of such information to be supplied will be agreed upon by NWMT and NWDS.

Service:

Regulation Down:

- During the period April 2, 2007 through June 30, 2007: No more than eight (8) times per 24 hour period (midnight to midnight), when the Basin Creek facility is operating, NWMT shall be allowed to reduce any or all of the nine separate operating units to zero, so long as no engine remains operating at less than full capacity.

- Beginning July 1, 2007: No more than four (4) times per 24 hour period (midnight to midnight), when the Basin Creek facility is operating, NWMT shall be allowed to reduce any or all of the nine separate operating units to zero, so long as no engine remains operating at less than full capacity.

- NWMT will make every attempt to decrease the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The decrease in generation can only begin after the start of the current scheduling hour and must cease at the end of the next scheduling hour (i.e., a maximum of 2 hours operation per Regulation Down event).

- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

Regulation Up:

- During the period April 2, 2007 through June 30, 2007: No more than eight (8) times per 24 hour period (midnight to midnight), if the Basin Creek facility is not operating, or it is operating at less than full capacity, NWMT shall be allowed to increase the plant output, so long as no engine operates at less than full capacity.
- Beginning July 1, 2007: No more than four (4) times per 24 hour period (midnight to midnight), if the Basin Creek facility is not operating, or it is operating at less than full capacity, NWMT shall be allowed to increase the plant output, so long as no engine operates at less than full capacity.
- NWMT will make every attempt to increase the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The increase in generation can only begin after the start of the current scheduling hour and must cease at the end of the next scheduling hour (i.e., a maximum of 2 hours operation per Regulation Up event).
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

This Amended MOU supersedes and replaces the original MOU dated August 23, 2006. This Amended MOU has been put in place solely to help integrate the Judith Gap wind resource in the Default Supply portfolio and in no way is it intended to provide any other type of service. NWDS has elected to self-provide wind firming resources and this MOU helps accomplish that. This service is entirely for the benefit of Default Supply and in no way should it be used for anything but Default Supply service. NWDS does not and will not provide this service to anyone or for anything but Default Supply activities.

Kevin Munsch
Name (NWDS)

Director
Title

4/12/07
Date

Name (NWMT)

Director - Transmission Marketing & Business Planning
Title

4/10/07
Date

Third Amended Memorandum of Understanding

The electric Default Supply function of NorthWestern Corporation has a 135 MW wind contract known as Judith Gap. This wind contract has substantial variability in its output that causes the scheduled energy from the facility to sometimes vary materially from the actual output. In order to help integrate this wind facility, Default Supply grants limited permission to NorthWestern Energy's electric transmission function to utilize its interest in the Basin Creek natural gas fired generator to perform operational functions in accordance with the following guidelines.

Due to variability of the Judith Gap wind resource, the intention of this arrangement is for NWDS to self provide this Basin resource in order to integrate the Judith Gap wind resource into the portfolio of NWDS and the NWMT control area.

Interest in Basin Creek Output:	NWE Default Supply (NWDS)
Limited Operational Authority:	NWE Electric Transmission group (NWMT)
Term:	This Amended MOU is effective May 16, 2007, and will extend month to month, unless canceled by either party with 30 days written notice.
Cost:	Since this service is entirely for the benefit of Default Supply, no invoices will be rendered to NWMT. However, at the end of each month NWMT will provide a schedule of all changes made under this MOU so NWDS can adequately reflect these costs in its monthly electric tracker filings with the MPSC. The form of such information to be supplied will be agreed upon by NWMT and NWDS.

Service:

Regulation Down:

- During the period May 16, 2007 through June 30, 2007: No more than ten (10) times per 24 hour period (midnight to midnight), when the Basin Creek facility is operating, NWMT shall be allowed to reduce any or all of the nine separate operating units to zero, so long as no engine remains operating at less than full capacity.

- Beginning July 1, 2007: No more than four (4) times per 24 hour period (midnight to midnight), when the Basin Creek facility is operating, NWMT shall be allowed to reduce any or all of the nine separate operating units to zero, so long as no engine remains operating at less than full capacity.

- NWMT will make every attempt to decrease the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The decrease in generation can only begin after the start of the current scheduling hour and must cease at the end of the next scheduling hour (i.e., a maximum of 2 hours operation per Regulation Down event).

- If during the hour that the Basin Creek Facility has been deceased, the NWMT Transmission Operator determines the project needs to be dispatched up in order to integrate Judith Gap wind generation, NWMT may take that action within such hour. The dispatch-up under this situation will count toward the total allowed generation increase occurrences in a 24 hour period.
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

Regulation Up:

- During the period April 2, 2007 through June 30, 2007: No more than ten (10) times per 24 hour period (midnight to midnight), if the Basin Creek facility is not operating, or it is operating at less than full capacity, NWMT shall be allowed to increase the plant output, so long as no engine operates at less than full capacity.
- Beginning July 1, 2007: No more than four (4) times per 24 hour period (midnight to midnight), if the Basin Creek facility is not operating, or it is operating at less than full capacity, NWMT shall be allowed to increase the plant output, so long as no engine operates at less than full capacity.
- NWMT will make every attempt to increase the units equally so that no single generator runs more or less than any others.
- The NWDS resource schedules to NWMT will not change as they will be made whole by the movement of the Basin Creek facility.
- The increase in generation can only begin after the start of the current scheduling hour and must cease at the end of the next scheduling hour (i.e., a maximum of 2 hours operation per Regulation Up event).
- If during the hour that the Basin Creek Facility has been increased, the NWMT Transmission Operator determines the project needs to be dispatched down in order to integrate Judith Gap wind generation, NWMT may take that action within such hour. The dispatch-down under this situation will count toward the total allowed generation decease occurrences in a 24 hour period.
- Changes made in this manner will not adversely affect either the generator or load imbalance calculations for gas and electric activities.

This Third Amended MOU supersedes and replaces the original MOU dated August 23, 2006 and its Amendments. This Amended MOU has been put in place solely to help integrate the Judith Gap wind resource in the Default Supply portfolio and in no way is it intended to provide any other type of service. NWDS has elected to self-provide wind firming resources and this MOU helps accomplish that. This service is entirely for the benefit of Default Supply and in no way should it be used for anything but Default Supply service. NWDS does not and will not provide this service to anyone or for anything but Default Supply activities.

Name (NWDS)

Director, Energy Supply
Title

5/25/07
Date

Name (NWMT)

Director, Transmission Planning & Business Planning
Title

5/16/07
Date

PSC-079

Regarding: Comparison of Operational Characteristics
Witnesses: Markovich, parts a & d / Johnston, parts b, c & e

a. What are the respective heat rates of Basin Creek and David Gates Generating Station?

b. If Basin Creek provided a ramping service to increase the scheduling accuracy of intermittent generators, could it be compensated for providing that service pursuant to a FERC tariff such as Schedule 10?

c. If Basin Creek provided a service to the transmission operator to ramp within the hour to diminish an energy imbalance, could it be compensated for providing that service pursuant to a FERC tariff such as Schedule 4 or Schedule 9?

d. Following delivery of a signal to Basin Creek to dispatch, how long does it take, using manual dispatch, for Basin to ramp up? Please answer using increments of generation delivered, as appropriate.

e. Could Basin Creek supplant the David Gates Generating Station (DGGS) for ramps that occur over a larger scope of time (i.e., every 15 or 30 minutes) than the moment to moment variations that DGGS is optimally designed to address?

RESPONSE:

a. The Basin Creek heat rate is 8,900 – 9,000 High Heating Value (HHV). The average heat rate for DGGS in 2011 was 10,762 HHV and in 2012 it was 11,977 HHV.

b. NWE does not have a Schedule 10 filed with FERC and NWE cannot recover the costs of ramping of Basin Creek under Schedule 4 or 9 of the FERC Tariff as they are currently written. NWE Transmission does not have access to Basin Creek generation for these purposes and as such has not considered or reviewed whether a change to these schedules would be appropriate. In theory, if these services could be provided by Basin Creek, NWE would need to make filings under its OATT to request recovery of certain costs of Basin Creek. There is no assurance that FERC would grant such request. See also the response to part e, below.

c. See the response to part b, above.

d. A single engine at Basin Creek can go from 0 MW to full output (approximately 5.8 MW) in nine minutes.

PSC-079 cont'd

e. No, Basin Creek is not designed to provide regulation services and the plant is not connected to Automatic Generation Control. If manual operation of Basin Creek were to be used to supplement or supplant DGGS, bringing the plant on line then taking it off again is not only hard on equipment, but could lower the NWE CPS2 performance in some cases.

PSC-080

Regarding: Energy from Non-Dispatchable Resources
Witness: Markovich

a. For the 2011-2012 tracker period, please identify each non-dispatchable resource providing electric supply to NWE's market operations group, including resources available through power purchase agreements, take-and-pay contracts and hedging contracts whose deliveries cannot be avoided without incurring the same cost that would otherwise be paid under the agreement or contract, as well as resources that are owned by or contracted to NWE but whose energy production is not within NWE's control. For each resource, list the contracted heavy load hour and light load hour energy and capacity amounts and, to the extent applicable, any monthly variations.

b. For the 2011-2012 tracker period, please identify the hours and the number of hours during which the supply resulting from non-dispatchable resources in (a) was greater than scheduled retail loads.

c. For those hours in which the phenomenon described in (b) occurred, please provide the scheduled load, and a list of the non-dispatchable resources delivering energy, including for each the amount of delivered energy in that hour.

d. For those hours in which the phenomenon described in (b) occurred, please state whether Colstrip Unit 4 delivered energy, and if so, the amount of energy. To the extent the reciprocal sharing agreement with Colstrip Unit 3 resulted in energy deliveries from that unit, include those deliveries in the response to this question.

RESPONSE:

a. See the file in the folder labeled "PSC-080" on the CD attached to PSC-043, specifically under the "webTrader Data" tab.

b. See the "Summary" tab of the file provided in response to part a, above.

c. See the "Hourly" tab of the file provided in response to part a, above

d. See the "Hourly" tab of the file provided in response to part a, above.

NorthWestern Energy
Docket D2012.5.49
Electric Tracker

Montana Public Service Commission (PSC)
Set 5 (034-091)

Data Requests received February 22, 2013

PSC-081

Regarding: Wind Ramps
Witness: Bennett

a. Does NWE possess 15-minute data or 30-minute data relating to the production of energy from the wind energy assets it either owns or has contracts with?

b. If so, provide that data for the period from June 2011 through the most recent date for which data are available, both for each wind project separately and for the aggregate fleet of projects. Please provide this information in electronic format (i.e., a Microsoft Excel file).

c. Please identify the largest net ramp in energy resulting from wind generation since June 2011.

RESPONSE:

a. Yes, for all except Musselshell and Musselshell Two, which began operating in December 2012. The capability to extract this data from these facilities is still under development.

b. Please see the folder labeled "PSC-081" on the CD attached to PSC-043 for the public version of the 15-minute wind data. The file contains information for wind contracts and wind assets under the supply portfolio. Gordon Butte Wind, LLC has informed NorthWestern that it considers this wind data to be confidential and a trade secret. Gordon Butte has further informed NorthWestern that it intends to file a petition to intervene and a motion for a protective order in this docket. NorthWestern is not providing this data for Gordon Butte until the Commission issues a decision on the motion for a protective order nor has it included Gordon Butte production in the aggregate totals.

c. NorthWestern evaluated the total of all wind meter data available from Load Research and applied the change of the total sum of all projects to be the net ramp. The largest positive change of 118 MW occurred on January 26, 2013 between 20:15 and 20:30 hours MST. The largest negative change of -113 MW occurred on July 13, 2011 between 17:15 and 17:30 hours MST.

NorthWestern Energy
Docket D2012.5.49
Electric Tracker

Montana Public Service Commission (PSC)
Set 5 (034-091)

Data Requests received February 22, 2013

PSC-082

Regarding: Wind Scheduling Floor and Cap
Witness: Markovich

a. How were the floor and cap described in your testimony, p. 7, devised?

b. What was the total installed wind capacity when the floor of 20 MW and cap of 90 MW were in effect?

RESPONSE:

a. They were devised based on experience in forecasting wind output from the Judith Gap facility beginning in 2005.

b. The total installed wind capacity was approximately 135 MW.

PSC-083

Regarding: Load Ramps
Witness: Markovich, part a / Johnston, part b

a. Does NWE's supply function experience considerable ramps in loads during certain hours? If so, please identify them.

b. Does NWE's balancing authority experience considerable ramps in loads during certain hours? If so, please identify them.

RESPONSE:

a. Yes. The pattern of ramps is demonstrated in the attached sheet which shows forecasted hourly supply loads for four different dates during 2012–2013. These dates generally represent the four seasons. Please note that this attachment is in Pacific Prevailing Time (PPT), the time zone that NWE Energy Supply uses for electric scheduling and transacting purposes.

b. Yes, the load ramps occur between 0700 and 0900 MST and between 1700 and 1900 MST on weekdays and between 0700 to 1000 and 1700 to 1900 on weekends. There are some variations in these hours based on variations in weather and time of year.

Sample Loads

	Hr 1	Hr 2	Hr 3	Hr 4	Hr 5	Hr 6	Hr 7	Hr 8	Hr 9	Hr 10	Hr 11	Hr 12	Hr 13	Hr 14	Hr 15	Hr 16	Hr 17	Hr 18	Hr 19	Hr 20	Hr 21	Hr 22	Hr 23	Hr 24
1/4/2013	633	625	633	641	686	824	937	925	922	910	894	879	864	854	854	903	961	975	952	923	865	779	702	653
4/2/2012	509	501	500	509	557	670	762	775	775	773	766	757	749	742	738	746	753	770	779	784	749	662	574	529
8/2/2012	571	551	544	546	579	659	771	831	880	936	939	938	931	931	927	929	912	883	851	847	849	782	670	608
10/2/2012	460	452	448	457	499	636	767	749	730	733	736	735	731	733	741	759	773	786	803	780	725	636	531	490

PSC-084

Regarding: Assessing Intra-Hour Adjustments
Witness: Markovich

a. What kind of real-time information would NWE need to assess whether an intra-hour schedule adjustment make economic sense for its supply function?

b. What if any opportunity costs would NWE consider in assessing whether intra-hour schedule adjustments make economic sense for its supply function?

RESPONSE:

a. NWE Energy Supply would need to know its instantaneous load information, instantaneous supply output, what the imbalance price will be for that hour, and what the intra-hour market price will be.

b. Economics, including permit limitations and the effect of additional starts and stops on generating resources, would be the primary considerations.

NorthWestern Energy
Docket D2012.5.49
Electric Tracker

Montana Public Service Commission (PSC)
Set 5 (034-091)

Data Requests received February 22, 2013

PSC-085

Regarding: Supply Function Imbalances
Witness: Markovich

Please explain whether and why it is more cost-effective to incur hourly imbalance charges than to increase scheduling accuracy by utilizing AGC or manually dispatching resources like Basin Creek.

RESPONSE:

As mentioned in my supplemental testimony, NWE Energy Supply does not have the information on a real time basis to determine whether its loads and resources are out of balance. That process is managed in real time by the NWE Transmission function, and it is done for the control area as a whole, not based on individual loads and resources. As can be seen from Exhibit__(FVB-1 Rev) 11-12, imbalance energy is one of the least expensive sources of supply for customers.

NorthWestern Energy
Docket D2012.5.49
Electric Tracker

Montana Public Service Commission (PSC)
Set 5 (034-091)

Data Requests received February 22, 2013

PSC-086

Regarding: Imbalances of Various Transmission Customers
Witness: Johnston

a. Please provide the imbalance experienced by NWE's supply function for each hour during the 2011-2012 tracker year.

b. Please provide the hourly (or, where applicable, the monthly) imbalance of other customers, both generators and loads, during the tracker year.

c. Please provide the total amount of imbalance costs paid by the NWE Balancing Authority for each hour during the 2011-2012 tracker year.

d. Please provide the total amount of imbalance costs paid by each transmission customer for each hour (or, where applicable, by the month) during the 2011-2012 tracker year.

e. Do certain loads or certain generators routinely have greater imbalances than others, and if so, what in your view accounts for the differences?

RESPONSE:

a. See the file, PSC-086a_NWESupplyImbalance.xlsx, in the folder labeled "PSC-086" on the CD attached to PSC-043. It contains hourly imbalance values for NWE supply for July 2011 through June 2012. Positive kWh values indicate that the energy provided was greater than the actual load including losses. Negative values indicate that the energy provided was less than the load including losses.

b. The file, PSC-086b_TransCustImbalance.xlsx, also in the "PSC-086" folder on the CD, contains hourly imbalance values for the 25 transmission customers served under NWE's FERC Schedule 4 and the three generators served under NWE's FERC Schedule 9 for July 2011 through June 2012. Positive kWh values indicate that the energy provided was greater than the actual load including losses. Negative values indicate that the energy provided was less than the load including losses.

c. See the file, PSC-086c Hourly Imbalance_07.11-06.12.xlsx, also in the "PSC-086" on the CD. The values in this spreadsheet represent the hourly imbalance dollar amount totals from July 2011 through June 2012. A positive number represents an imbalance sale and a negative number represents an imbalance purchase. NWE's transmission pays a fixed charge for the imbalance service of $20,000 per month. The fixed charge is not included in the hourly amounts in the spreadsheet.

PSC-086 cont'd

d. The file, PSC-086d_TransCustImbalanceCost.xlsx, also in the "PSC-086" folder on the CD, contains hourly imbalance costs for the 25 transmission customers and three generators for July 2011 through June 2012. The second tab in this spreadsheet contains the hourly imbalance costs for the NWE Supply function. Note that a positive dollar amount indicates that the customer owes the NWE Transmission function. A negative dollar amount indicates that NWE Transmission function owes the customer. The dollar amounts are calculated per FERC Schedule 4 (Schedule 9 for generators) and include penalties charged and returned when applicable.

e. Imbalances for customers vary over hours, days, and months. It is difficult to identify long-term imbalance trends for customers. Some items that may impact imbalance are the load variability (flat industrial process, weather sensitive load, etc.), load size, a customer's energy supply agreements, energy prices, forecasting methods, data availability, and other items.

PSC-087

Regarding: Imbalance Costs Charged to NWE
Witnesses: Bennett, parts a & c / Johnston, parts b & d

a. How are the administrative charges that are described on page 8 of Exhibit FVB-1 calculated?

b. If any administrative charges are based on a FERC tariff, provide the tariff, with the relevant portion highlighted.

c. How frequently and under what tariff does NWE's supply function pay for hourly imbalance?

d. How frequently and under what tariffs does NWE's transmission function collect payments for providing balancing and load following services to the balancing authority?

RESPONSE:

a. Based on the other parts to the question, this response assumes that the question is referring to the imbalance values discussed on the top of page 8 of Mr. Bennett's direct testimony since his Exhibit__FVB-1 doesn't have eight pages. Also note that due to a typographical error, the line references to Exhibit__FVB-1 on the top of the testimony page 8 are off by one line. The references to lines 100 to 102 and lines 49 to 50 of Exhibit__FVB-1 in this response are correct.

Line 49 of Exhibit__FVB-1 is an initial estimate of the imbalance energy (MWH) for the NWE supply function for the indicated month. Positive imbalance energy indicates that less energy was provided to serve supply group customers than the actual load for the customers. The final imbalance calculation is not available until two months after the indicated month when final load numbers are available. Line 50 is the true-up for two months prior between the final imbalance calculation and the initial imbalance estimate. Line 100 of Exhibit__FVB-1 is initial estimate of the dollar amount that the NWE supply function owes the transmission function for imbalance energy (from line 49) for the indicated month. Line 101 is the dollar true-up for two months prior between the final NWE supply function imbalance calculation and the initial imbalance estimate. Line 102 is the difference between the imbalance-related in and out dollar flows from Schedule 4 customer payments/receipts and for BA imbalance services. Values in line 102 contain current and prior month information.

PSC-087 cont'd

b. NWE interprets "administrative charges" in this question to mean "imbalance costs." The NWE tariff is located at the following link:

http://www.oatioasis.com/NWMT/NWMTdocs/NWMT_FERC_Transmission_Tariff.pdf

The relative information is Schedule 4, located on page 96 of 406.

c. The NWE Supply function pays for hourly imbalance on a monthly basis calculated using the NWE Tariff Schedule 4.

d. NWE's Transmission function collects payments monthly for providing energy imbalance service on an hourly basis in accordance with Schedule 4 of the OATT and monthly for providing Regulation and Frequency Response according to Schedule 3 of the OATT.

PSC-088

Regarding: Feasibility of Intra-Hourly Scheduling
Witness: Markovich

Could NWE's supply function schedule both its generation and load on an intra-hourly basis to diminish imbalance and improve the accuracy of scheduling, without requiring the participation of a counterparty load or generator? If so, please provide any analysis NWE has performed of the economic benefits and benefits of doing so.

RESPONSE:

It could be physically done, but without any counterparties to enter into transactions with in the intra-hour market, the exercise would not provide any additional economic value.

PSC-089

Regarding: Functionality of I-TAP
Witness: Markovich

a. Does I-TAP provide an electronic platform through which transactions can actually be executed (i.e., a trading hub), or does it merely provide information to facilitate bilateral transactions in the traditional sense?

b. What precisely are NWE and other utilities doing to increase participation in an intra-hour market as suggested on page 3 of your testimony?

c. Further describe the "technical hurdles with WebExchange" you allude to on page 4 of your testimony.

d. Has NWE posted load or generator data on I-TAP in an attempt to find counterparties for any potential intra-hour schedules that it could submit?

e. What percentage, if any, of hourly transactions involved use of the I-TAP during the 2011-2012 tracker year?

RESPONSE:

a. I-TAP provides a platform by which transactions can be executed.

b. The I-TAP efforts are currently focused on software enhancements including scheduling improvements and the integration of transacting, transmission, and tagging.

c. The technical hurdles refer to the integration of transacting, transmission procurement, tagging, and scheduling.

d. Currently, only offers to sell energy or bids to buy energy (volume and price) can be posted on I-TAP.

e. NWE entered into two transactions using I-TAP during the 2011-2012 tracking period. See also the response to Data Request MCC-055.

PSC-090

Regarding: Sub-Hourly Market Participation
Witness: Markovich

a. PacifiCorp has announced that it will be a market participant in CAISO's real-time energy market (i.e., an energy imbalance market). The companies' memorandum of understanding appears to allow others the potential opportunity to join this market. How will NWE evaluate this opportunity?

b. Does NWE intend to participate in this new market? If so, to what extent and how?

c. Does NWE agree that utilizing the I-TAP "bulletin board" for hourly transactions could enable, encourage or result in greater use of I-TAP for sub-hourly transactions?

d. Please describe the basis of your statement on page 4 of your testimony that "benefits associated with intra-hour scheduling are not great enough to move market participants into the intra-hour timeframe."

RESPONSE:

a. The memorandum of understanding was announced on February 12, 2013, and it is not scheduled to go into effect until October 2014. NWE will monitor the proceedings and determine what, if any, opportunities it might provide. The geographical separation between CAISO (and the six BAs of PacifiCorp directly interconnected to CAISO) and the NWE BA may limit the available opportunities.

b. See the response to part a, above.

c. NWE is not aware of a "bulletin board" feature of I-TAP.

d. The economics are not there to encourage and foster participation in that market.

NorthWestern Energy
Docket D2012.5.49
Electric Tracker

Montana Public Service Commission (PSC)
Set 5 (034-091)

Data Requests received February 22, 2013

PSC-091

Regarding: CPS2 Scores
Witness: Johnston

Please provide the NWE Balancing Authority Area's CPS2 values for each month of the last three years, using the following formula:

$$CPS\,2 = \left[1 - \frac{\text{Violations}_{\text{month}}}{(\text{Total Periods}_{\text{month}} - \text{Unavailable Periods}_{\text{month}})}\right] * 100$$

RESPONSE:

See attached.

CPS 2 Values

	2013	2012	2011	2010
January	92.93%	95.05%	92.16%	95.02%
February		95.73%	92.55%	96.11%
March		95.61%	93.90%	94.98%
April		95.21%	93.61%	94.58%
May		94.76%	94.93%	93.57%
June		91.68%	93.08%	92.96%
July		91.82%	91.01%	92.38%
August		93.35%	92.81%	92.60%
September		96.02%	95.02%	93.49%
October		93.80%	94.24%	93.95%
November		92.06%	91.37%	93.98%
December		93.56%	94.49%	93.29%