

H DSM Verification

- 1) Was the DSM Verification analysis performed, as required by the pilot Mechanism? By whom, and when?

The independent verification of Avista’s Washington and Idaho natural gas DSM acquisition was completed by Research Into Action and their partner for this project, Nexant. The reports are included in this report. The exhibit number and completion date for each report are shown below.

Table H1 Annual DSM Savings Verification Report Summary		
Year	Exhibit	Completion Date
2006	H-1	August 20, 2007
2007	H-2	July 11, 2008
2008	H-3	February 28, 2009

- 2) What was the cost of the DSM verification analysis, for each year (2006, 2007 and 2008)?

The costs for the DSM verification analysis are shown in the chart below. These costs are direct vendor costs and do not include internal costs.

Table H2 DSM Savings Verification Costs			
Accounting Period	Vendor Number	Vendor Name	Cost
2006 Total	24265	RESEARCH INTO ACTION INC	\$54,291
2007 Total	24265	RESEARCH INTO ACTION INC	\$66,107
2008 Total	24265	RESEARCH INTO ACTION INC	\$17,015 ⁹⁶

The 2008 cost data is incomplete as all invoices had not been received when this report was published. Avista completed internal accounting adjustments to limit the charge against the DSM tariff rider to \$35,000 annually as directed in Docket UG-060518, Order 4, Page 8 Settlement Agreement.⁹⁷

⁹⁶ Reflects costs incurred as of 3/20/09 and does not reflect the total 2008 costs.

⁹⁷ See Exhibit H-4 Avista’s response to Data Request 8, Question 3 and Data Request 10, Question 10.

3 a) For each year, what were the verification analysis results?

The 2006, 2007 and 2008 DSM savings verification result summaries are below.⁹⁸

Table H3-A Summary of Avista's 2006 DSM Verification Report (Washington only)					
Project	Therms contained within verification sample	Therms in related WA population	Therms independently verified	% of claimed therms verified	Adjusted therm claim
Residential projects					
High Efficiency Furnaces	1,728	61,920	1,728	100.0%	61,920
Windows	1,080	66,135	884	81.9%	54,133
Other Res Sampled	2,463	39,650	3,684	149.6%	59,306
Limited Income					
Air Infiltration	2,052	14,270	1,709	83.3%	11,885
Insulation	4,485	52,723	3,815	85.1%	44,847
Other LI Sampled	1,022	3,968	591	57.8%	2,295
Large Non-Res site-specific					
Spokane Athletic Club	110,558	110,558	37,608	34.0%	37,608
Spokane Public School-Dist 81	71,731	71,731	71,731	100.0%	71,731
Spokane Public Facilities District	54,332	54,332	15,477	28.5%	15,477
East Valley School District 361	29,651	29,651	21,134	71.3%	21,134
Huntwood Industries	20,228	20,228	21,056	104.1%	21,056
Other non-res site-specific	30,238	210,878	30,149	99.7%	210,256
Pre-rinse sprayers	7,920	88,941	7,920	100.0%	88,941
Rooftop Program	4,215	65,850	0	0.0%	0
	0	890,835	0		700,588
Original Avista estimate of savings		890,835			
	(190,247)	Adjustment in claimed therm savings			
	700,588	Revised claim			

⁹⁸ From Avista's DSM Verification Data Submission.

Table H3-B Summary of Avista's 2006 DSM Verification Report (Idaho only)					
Project	Therms contained within verification sample	Therms in related WA population	Therms independently verified	% of claimed therms verified	Adjusted therm claim
Residential projects					
High Efficiency Furnaces	1,728	144,642	1,728	100.0%	144,642
Windows	1,080	21,387	884	81.9%	17,506
Other Res Sampled	2,463	48,621	3,684	149.6%	72,724
Limited Income					
Air Infiltration	2,052	1,195	1,709	83.3%	995
Insulation	4,485	3,489	3,815	85.1%	2,968
Other LI Sampled	1,022	4,612	591	57.8%	2,667
Large Non-Res site-specific					
Triple Play	27,193	27,193	21,754	80.0%	21,754
Kootenai Medical Center	19,095	19,096	0	0.0%	0
Other non-res site-specific					
Pre-rinse sprayers	7,920	2,751	7,920	100.0%	2,751
Rooftop Program	4,215	665	0	0.0%	0
	0	313,818	0		306,055
Original Avista estimate of savings		313,818			
	(7,763)	Adjustment in claimed therm savings			
	306,055	Revised claim			

Table H3-C Summary of Avista's 2007 DSM Verification Report (Washington only)					
Project	Therms contained within verification sample	Therms in related WA population	Therms independently verified	% of claimed therms verified	Adjusted therm claim
Residential projects					
High Efficiency Furnaces	782	85,556	686	87.7%	75,053
Windows	3,244	105,260	2,924	90.1%	94,877
Other Res Sampled	4,388	57,153	3,880	88.4%	50,536
Limited Income					
Air Infiltration	1,341	11,931	1,277	95.2%	11,362
Insulation	2,567	53,944	1,994	77.7%	41,903
Windows/Doors	1,395	2,882	1,738	124.6%	3,591
Furnaces/Water heaters	1,430	1,957	1,238	86.6%	1,694
Large Non-Res site-specific					
Odessa Memorial Hospital	39,297	39,297	43,728	111.3%	43,728
Saranac Building	36,059	36,059	50,775	140.8%	50,775
Spokane Valley Mall	31,723	31,723	80,915	255.1%	80,915
Spokane Public Facilities District	49,553	49,553	10,243	20.7%	10,243
SYTECH	25,884	25,884	26,251	101.4%	26,251
Other non-res site-specific					
Pre-rinse sprayers	220	24,376	220	100.0%	24,376
Rooftop Program	15,088	94,377	4,468	0	27,948
	0	1,119,836	0		1,167,670
Original Avista estimate of savings		1,119,836			
	47,834	Adjustment in claimed therm savings			
	1,167,670	Revised claim			

Table H3-D Summary of Avista's 2007 DSM Verification Report (Idaho only)					
Project	Therms contained within verification sample	Therms in related WA population	Therms independently verified	% of claimed therms verified	Adjusted therm claim
Residential projects					
High Efficiency Furnaces	782	44,627	686	87.7%	39,148
Windows	3,244	28,018	2,924	90.1%	25,254
Other Res Sampled	4,388	18,668	3,880	88.4%	16,507
Limited Income					
Air Infiltration	1,341	1,715	1,277	95.2%	1,633
Insulation	2,567	2,710	1,994	77.7%	2,105
Windows/Doors	1,395	4,167	1,738	124.6%	5,192
Furnaces/Water heaters	1,430	2,036	1,238	86.6%	1,763
Large Non-Res site-specific	0	0	0		
Other non-res site-specific	40,682	116,383	50,817	124.9%	145,377
Pre-rinse sprayers	220	21,120	220	100.0%	21,120
Rooftop Program	15,088	74,453	4,468	29.6%	22,048
	0	313,897	0		280,147
Original Avista estimate of savings		313,897			
	(33,750)				Adjustment in claimed therm savings
	280,147				Revised claim

Table H3-E Summary of Avista's 2008 DSM Verification Report (Washington only)					
Project	Therms contained within verification sample	Therms in related WA population	Therms independently verified	% of claimed therms verified	Adjusted therm claim
Residential projects					
High Efficiency Furnaces	615	208,434	615	100.0%	208,434
Insulation	6,281	133,253	7,213	114.8%	153,026
Windows	4,238	156,219	4,327	102.1%	159,500
Other Res Sampled	308	25,852	308	100.0%	25,852
Limited Income					
Air Infiltration	1,341	17,705	1,277	95.2%	16,860
Insulation	2,567	70,597	1,994	77.7%	54,838
Windows/Doors	1,395	5,941	1,738	124.6%	7,402
Furnaces/Waterheaters	1,430	3,608	1,238	86.6%	3,124
Large Non-Res site-specific					
Avista Corp	19,647	19,647	17,238	87.7%	17,238
Mead School District 354	14,703	14,703	14,171	96.4%	14,171
Mountain Gear	14,305	14,305	14,305	100.0%	14,305
Other non-res site-specific	39,593	463,600	31,810	80.3%	372,468
Nonres prescriptive programs	8,917	20,899	4,660	52.3%	10,922
	115,340	1,154,763	100,894		1,058,139
	1,154,763	Avista estimate of savings			
	1,058,139	Revised claim			

Table H3-F Summary of Avista's 2008 DSM Verification Report (Idaho only)					
Project	Therms contained within verification sample	Therms in related WA population	Therms independently verified	% of claimed therms verified	Adjusted therm claim
Residential projects					
High Efficiency Furnaces	615	86,310	615	100.0%	86,310
Insulation	6,281	34,124	7,213	114.8%	39,187
Windows	4,238	43,054	4,327	102.1%	43,958
Other Res Sampled	308	13,256	308	100.0%	13,256
Limited Income					
Air Infiltration	1,391	2,197	840	60.4%	1,327
Insulation	2,732	3,718	2,079	76.1%	2,829
Windows/Doors	1,843	5,203	1,717	93.2%	4,847
Furnaces/Waterheaters	1,469	784	1,432	97.5%	764
Large Non-Res site-specific					
<i>Intermountain Community</i>					
<i>Bancorp</i>	25,771	25,771	24,033	93.3%	24,033
<i>Kellogg School District 391</i>	23,894	23,894	8,550	35.8%	8,550
<i>Avista Corp</i>	18,679	18,679	18,682	100.0%	18,682
<i>City of Post Falls</i>	18,315	18,315	12,659	69.1%	12,659
<i>Kellogg School District 391</i>	14,303	14,303	26,003	181.8%	26,003
Other non-res site-specific	141,244	439,124	132,291	93.7%	411,289
Non-res prescriptive programs	3,318	4,158	2,124	64.0%	2,662
	264,401	732,890	242,873		696,357
	732,890	Avista estimate of savings			
	696,357	Revised claim			

The summary chart from Question C-10 is repeated below for convenience:

Table H-3 WA/ID DSM Savings (therms) versus Goals			
	2006	2007	2008
IRP DSM Savings Goal	1,062,000	1,062,000	1,425,070
Verified DSM Savings	1,052,390	1,455,678	1,821,298
% of Goal	99.1%	137.1%	127.8%

There are minor differences between Avista's WA/ID summary charts, Avista's jurisdictional summary charts above and this report's summary charts; however, these differences do not impact the Mechanism. Some minor differences are explained in Exhibit C-1 resulting from the current need to combine Triple-E report data, C/I completed savings data and summary data from the independent verification audit prepared by Avista. Avista's jurisdictional DSM verification audit summaries totalize each measure separately while the combined WA/ID summary charts fail to use a weighted average for the adjustment.

b) Were Avista's assumed savings levels increased or decreased?

Avista's assumed savings levels were increased and decreased for individual components of the portfolio ranging from complete disqualification of a site specific project and the rooftop maintenance program in 2006 to allowing 255% of the assumed savings on a site specific project in 2007. In general, prescriptive measures were verified at 75% to 125% of Avista's assumed savings levels. In 2006 and 2008, the net impact was a reduction of the savings levels while the 2007 net impact was an increase in assumed savings as a result of the verification process.

4) a) Were there any changes in the methodologies used in the independent verification of DSM savings that would have changed the overall audit results during the 2006-2008 time period?

After reviewing the 2006 audit results, the auditor adjusted the target precision level of the analysis. In the 2007 DSM Savings Verification Report, the auditor stated:

The primary consideration that informed our sampling approach was that each sample should have sufficient statistical power to produce estimates of audit measurements with good precision and confidence levels over the three-year course of the evaluation. In the report of the 2006 audit, we indicated a goal of achieving $\pm 5\%$ and 95% confidence. These levels were based on the assumption of a very low rate of documentation error. However, based on the results of the 2006 audit, achieving these highly stringent precision/confidence levels would require significantly larger samples. Since these levels go beyond industry standards (typically $\pm 10\%$ precision and 90% confidence) and were not mandated by WUTC, we have relaxed them slightly to $\pm 10\%$ precision and 95% confidence.⁹⁹

Changing the precision level from 5% to 10% decreases the likelihood that a second sampling audit would produce the same results; however, missing, inaccurate and unsubstantiated documentation would have required a high sampling rate to obtain a higher level of precision.

In 2006, "New Windows" was in "Other Measures" and "Replacement Windows" was a separate category. Starting in 2007, "New Windows" and "Replacement Windows" were combined in the "Windows" category. After 2006, insulation was removed from "Other Measures" and given its own [category]. Therefore, direct comparison of Insulation, Windows, Replacement Windows and Other Measures categories from 2006 to other years is not possible. Because New Windows and Insulation were both high volume, consistent measures, removing them from Other Measures will improve the results of the Other Measures sampling analysis in 2007 and 2008.¹⁰⁰

⁹⁹ See Exhibit H-2 Avista 2007 DSM Savings Verification Report, Page 9

¹⁰⁰ See Exhibit H-2 Avista 2007 DSM Savings Verification Report, Pages 12 and 13.

The high reliability of the “High Efficiency Furnace” results in 2006 motivated the auditor to minimize the sample size for this measure starting in 2007.¹⁰¹ This should not impact the results of the report.

b) What was the resulting impact, if any, on the deferral amount subject to recovery?

The audited 2006 DSM savings was 1,052,390 therms, which was 99.1% of the IRP targeted savings of 1,062,000; therefore, the level of recoverable lost margin was subsequently reduced to 80% in lieu of 90%, resulting in a reduction in the decoupling deferral of \$38,209¹⁰². The DSM audit results used in the Mechanism’s DSM test¹⁰³ had no further impact on the recovered lost margin in 2007 and 2008.

5) a) Based upon the Evaluator’s review of the DSM Verification Final Reports, did the Evaluator become aware of any problems or potential inaccuracies within any of the DSM Verification (audit) analyses that were performed, and if so, what is the nature and potential importance of each problem or potential inaccuracy, and would each problem or potential inaccuracy have had any significant impact on the verified results?

For each annual DSM report, the auditor validated or adjusted savings measures through sampling. The sampling methodology concept presented in each of the reports appears sound with the following caveats: 1) no significant review was performed on the stratification methodology; 2) the confidence interval and other detailed calculations were not checked; 3) the differences between the independent consultants’ preferred engineering values and Avista’s engineering values were not explored in any significant detail.

Despite re-evaluation to increase sample size and relax the precision level, the audit only met the auditor’s precision goal for residential DSM. Documentation issues with the CAP agencies on Limited Income DSM projects and engineering assumption differences on non-residential DSM projects resulted in higher than expected discrepancies.¹⁰⁴ This means the reliability of the audit is lower than desired by the auditor; however, it is doubtful that additional work to increase the precision level would impact the Mechanism.

The verified effect reported in the audit is not “measured” energy savings. The auditor verified the engineering estimates and the corresponding assumptions and documentation but did not perform any post-installation measurement or analysis. A non-typical example of where this approach is lacking is the pre-rinse sprayer program. In 2006, the auditor accepted Avista’s stipulated savings of 176 therms per unit.¹⁰⁵ After Avista identified the uncertainty of the claimed savings with this measure, Avista completed measurement and verification (M&V) on the measure, the auditor accepted the new stipulated savings of 44 therms per unit and noted the savings may be conservative.¹⁰⁶ This represents a difference representing approximately 6% of the total 2006 DSM savings and approximately 9% of the total 2007 DSM savings.

¹⁰¹ See Exhibit H-2 Avista 2007 DSM Savings Verification Report, Page 13.

¹⁰² See Exhibit D-2 UG-071863.

¹⁰³ See Exhibit 2 Docket 060518 Order 04, Pages 4-5

¹⁰⁴ See Exhibit H-3 2006-2008 Avista DSM Savings Verification Report

¹⁰⁵ See Exhibit H-1 Avista 2006 DSM Savings Verification Report, Page V

¹⁰⁶ See Exhibit H-2 Avista 2007 DSM Savings Verification Report, Page VIII & Page 68

The largest DSM projects were individually evaluated and most were modeled using building simulation software. During these individual project evaluations, when missing or inappropriate data was identified, the associated savings were often disallowed if a resolution was not available. This resulted in large variations between Avista’s estimated savings and the auditor’s. Approximately 10% of the 2006 DSM targeted savings were disqualified because of lack of information. Further investigation and follow-up on these measures could have produced a conclusion and potentially partial savings instead of disqualifying entire measures, resulting in Avista possibly meeting their 2006 IRP DSM savings goal. In 2007, over 5% of the annual targeted savings was added to Avista’s estimated DSM savings because of differences in assumptions; however, this would not have impacted the level of estimated lost margin eligible for recovery as Avista cleared the target by 36%. A large reduction in 2008 did not impact the Mechanism because Avista exceeded the target by 36% after adjustment.

The DSM savings verification reports looked at individual measures and did not include a summary of claimed and verified savings by jurisdiction. The Avista provided summaries provided for the Mechanism DSM test and the Avista provided jurisdictional summaries did not match; however, the differences were small and did not impact the Mechanism results.

Additionally, Avista inserted verification results into their DSM database after the verification reports were received. This produced a “moving target” effect while performing the Mechanism evaluation. Titus’ verified savings calculations and Avista’s verified savings differ as follows:

Table H-4 DSM Verified WA/ID Savings (therms) versus Goals			
	2006	2007	2008
IRP DSM Savings Goal	1,062,000	1,062,000	1,425,070
Avista Verified DSM Savings	1,052,390	1,455,678	1,821,298
% of Goal	99.1%	137.1%	127.8%
Titus Verified DSM Savings	1,060,467	1,445,130	1,752,330
% of Goal	99.9%	136.1%	123.0%

These differences did not materially impact the Mechanism.

b) In that regard, please identify any judgmental assumptions, allocations or methodologies that materially impacted the conclusions that were reached?

Avista missed the 2006 DSM savings goal by 0.9% using the results of an audit with a statistical confidence level exceeding $\pm 10\%$ and significant disqualification of savings because of documentation errors and differences in assumptions. It seems likely to Titus that Avista would have met the 2006 DSM savings goal with additional investigation into the disqualified measures.

Although the potential difference in the pre-rinse sprayer program is large, adjusting either the 2006 or 2007 stipulated savings would not impact the decoupling deferrals.

Verification Options

The vast majority of the DSM savings verification audit consisted of reviewing paperwork, recalculating savings and performing extensive statistical analysis. Although this approach is not necessarily wrong, alternate approaches to consider include:

- Incorporating verification of estimated savings into the large site specific project process to increase the likelihood that the estimated DSM savings will be realized. Options to accomplish this include:
 - Certified savings estimates from independent Professional Engineers (PE) or Certified Energy Managers (CEM) could be used to provide verified savings for incentive calculations and program management.
 - Usage audits performed pre and/or post installation or weather-normalized bill audits could increase the confidence that the estimated savings are being realized.
 - Pre and/or post installation energy consumption measurement or on-site operational review of procedures, equipment and/or control algorithms may be justified on projects with large incentives.

The following statement in Appendix A of Avista's 2006 Triple-E Report provides a potential baseline for expansion of M&V requirements:

Projects with an incentive amount of \$50,000 or more, with uncertain savings and where post-completion tracking can provide improved project commissioning and evaluation are subject to a performance contract. Typically the performance period is one year after the project has completed a commissioning period. Revisions to non-performance contracts occasionally occur after post-verification also occasionally occur as a result of improved information based upon measurement, evaluation, project commissioning or account follow-up activities. Revisions may be increase or decrease any of the project characteristics.

- Minimizing audit requirements on prescriptive savings measures. Options to accomplish this include:
 - Determine prescriptive savings in advance. The DSM auditor disagreed with some of the claimed prescriptive savings after the year was over. This discussion could take place before the year begins.
 - Create a “no-tolerance” documentation policy by requiring all documentation to be complete, accurate and properly entered into the database before paying any incentive to reduce verification requirements.
 - Perform post installation monitoring by reviewing the weather-normalized usage of prescriptive program participant's pre and post installation.¹⁰⁷

¹⁰⁷ Titus proposed a proprietary analysis of DSM participant usage during the RFP process and a non-proprietary analysis after being chosen as the Mechanism evaluator. These proposals were rejected by Avista in a non-consensus decision because the Evaluation Plan did not include an additional DSM savings audit. See Exhibit 10 Communication Log.

- Physically check random projects and installers to verify the measures were actually installed.

The DSM Savings Verification Reports lack a summary of the audited savings and their impact on the Mechanism. The reports include calculations and a paperwork audit of numerous samples and projects but a summary of the findings was not provided. For 2006-2008, Avista provided a summary for Titus' review.¹⁰⁸ Titus feels the DSM Savings Verification auditor should be responsible for summarizing and providing the verified savings in a format suitable for use in the Mechanism.

¹⁰⁸ Avista's response to Data Request 4, Question 1 and Data Request 10, Question 9.