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BEFORE THE ARIZONA CORPORATION COMMISSION

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7  
8 IN THE MATTER OF THE APPLICATION OF  
9 SOUTHWEST GAS CORPORATION FOR  
10 THE ESTABLISHMENT OF JUST AND  
11 REASONABLE RATES AND CHARGES  
12 DESIGNED TO REALIZE A REASONABLE  
13 RATE OF RETURN ON THE FAIR VALUE  
14 OF ITS PROPERTIES THROUGHOUT  
15 ARIZONA

Docket No. G-01551A-10-0458

Arizona Corporation Commission

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RUCO'S NOTICE OF FILING DIRECT TESTIMONY

15 The Residential Utility Consumer Office ("RUCO") hereby provides notice of filing  
16 the Direct Rate Design Testimony of Dr. Ben Johnson in the above-referenced matter.

18 RESPECTFULLY SUBMITTED this 24<sup>th</sup> day of June, 2011.

Daniel W. Pozefsky  
Chief Counsel

1 AN ORIGINAL AND THIRTEEN COPIES  
2 of the foregoing filed this 24<sup>th</sup> day  
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**SOUTHWEST GAS CORPORATION**

**DOCKET NO. G-01551A-10-0458**

**DIRECT RATE DESIGN TESTIMONY**

**OF**

**DR. BEN JOHNSON**

**ON BEHALF OF**

**THE**

**RESIDENTIAL UTILITY CONSUMER OFFICE**

**JUNE 24, 2011**

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TESTIMONY  
OF BEN JOHNSON, PH.D.  
On Behalf of  
The Residential Utility Consumer Office  
Before the  
Arizona Corporation Commission  
Docket No. G-01551A-10-0458

**Introduction**

**Q. Would you please state your name and address?**

A. Ben Johnson, 3854-2 Killlearn Court, Tallahassee, Florida.

**Q. What is your present occupation?**

A. I am a consulting economist and president of Ben Johnson Associates, Inc.®, an economic research firm specializing in public utility regulation.

**Q. Have you prepared an appendix that describes your qualifications in regulatory and utility economics?**

A. Yes. Appendix A, attached to my testimony, will serve this purpose.

1    **Q.    Are you the same Ben Johnson that filed revenue requirements testimony on June 10,**  
2           **2011?**

3    A.    Yes, I am.  
4

5    **Q.    Have you prepared any schedules to be filed with your testimony?**

6    A.    Yes, Schedules BJ-8 through BJ-10, which are attached to my testimony, were prepared under  
7           my supervision.  
8

9    **Q.    What is the nature of this testimony?**

10   A.    Our firm has been retained by the Residential Utility Consumer Office ("RUCO") to assist with  
11           RUCO's evaluation of Southwest Gas Corporation's (SWG's) application for a rate increase.  
12           The purpose of this testimony is to present RUCO's rate design recommendations.  
13

14   **Q.    How is your rate design testimony organized?**

15   A.    Following this introduction, my testimony has six sections. In the first section, I briefly discuss  
16           the background of the rate design phase of the proceeding. In the second section, I summarize  
17           SWG's cost of service methodology and rate design proposals. In the third section, I discuss  
18           revenue decoupling and SWG's proposed "Energy Efficiency Enabling Proposal." In the fourth  
19           section, I discuss fully allocated class cost of service study, with a particular focus on the issue  
20           of whether it is appropriate to allocate fixed costs on a per-customer basis. In the fifth section, I  
21           discuss the Company's proposed revenue distribution and offer some suggestions for an  
22           alternative approach. In the sixth section, I critique the Company's proposed residential rates,  
23           and recommend some changes to the Company's rate design.  
24  
25

1    **Q. Can you please briefly summarize your conclusions and recommendations?**

2    A. Yes. I recommend the Commission reject the Company's decoupling proposal, because it will  
3    result in an unjustified increase in future cash flows from customers to stockholders, by  
4    guaranteeing the recovery of revenues lost when customers conserve energy while allowing the  
5    Company to continue to retain the benefit of revenue and cash flow increases when the number  
6    of customers increases, regardless of whether or not system costs increase. This change in  
7    future cash flows swamps any purported benefits, but I also disagree with the validity of many  
8    of these claimed benefits, for reasons I set forth in my testimony. If the Commission wants to  
9    continue to investigate the decoupling concept, I recommend the focus be narrowed to the  
10   weather component, where there is a greater chance for the benefits to outweigh the problems.

11           Turning to SWG's cost of service study, I disagree with the Company's approach to  
12   allocating its fixed and sunk costs. The Company advocates allocating these costs based on the  
13   number of customers in each class. This places an inordinate share of the system costs onto the  
14   residential class. The fixed costs in question are incurred for the purpose of distributing gas to  
15   customers; rather than allocating them based on the number of customers, I recommend  
16   allocating them based on gas usage. More specifically, I recommend using a "average and  
17   peaks" method, giving 50% weight to peak demand, and giving 50% weight to the annual  
18   volume of gas distributed to each class (rather than the number of customers).

19           Similarly, I disagree with the Company's contention that its fixed costs should be  
20   recovered through the fixed monthly customer charge. This is not consistent with sound  
21   economic pricing principles, and it is inconsistent with important policy objectives related to  
22   economic efficiency, energy conservation, and inter-customer equity.

23           I recommend the Commission consider implementing a seasonal rate structure, to be  
24   more consistent with cost causation principles, better encourage energy efficiency, and help  
25   improve inter-customer equity. To ameliorate the resulting increase in month-to-month bill

1 volatility, the Commission could introduce a bill smoothing option, in which customers could  
2 opt to pay the gas company a relatively fixed amount each month, based on one-twelfth their  
3 anticipated annual gas usage, plus small account-specific true-ups as necessary over the course  
4 of the year to ensure that each customer pays the same total amount over the course of the year,  
5 regardless of whether or not they select this billing option.

6 Finally, I disagree with the Company's proposal to expand its low income discount to  
7 include very high volumes of gas usage. This proposal would increase the total amount other  
8 customers are paying to help low income customers, and it would exacerbate the problem of  
9 sending weak energy-conservation signals to low income customers.

10  
11 **I. Background**

12  
13 **Q. Can you briefly discuss SWG's most recent rate case?**

14 A. Yes. On August 31, 2007, SWG filed an application requesting an increase in rates. SWG  
15 requested a revenue increase of \$57,546,205. [Decision 70665, p. 5] Staff and RUCO  
16 recommended revenue increases of \$28,239,870 and \$32,046,846, respectively. [Id.] The  
17 Commission determined that the Company was entitled to a revenue increase of \$33,533,844, or  
18 8.4% over adjusted test year revenues.<sup>1</sup> [Id.] The Commission did not directly address the  
19 Company's class cost of service studies, but did reach conclusions regarding SWG's major rate  
20 design proposals.

21 First, the Commission rejected SWG's proposed decoupling mechanisms, deciding  
22 instead to further investigate decoupling through a generic docket. [Id., p. 41] Second, the  
23 Commission rejected SWG's proposed volumetric rate design ("VRD"), which would result in  
24 smaller users paying a greater percentage of non-gas costs and a smaller percentage of gas costs

---

1 The Commission determined SWG's adjusted test year revenues to be \$399,234,678. [Id., p. 21]

1 than under traditional rate design, larger users paying a smaller percentage of nongas costs and a  
2 greater percentage of gas costs. [Id, pp. 43-44] The Commission concluded that the VRD is  
3 "simply an alternative method of enabling the Company to collect more of its margin costs  
4 through a shifting of risk from the Company to ratepayers." [Id., p. 44] Third, the Commission  
5 rejected SWG's proposal to adopt an increase in the residential single-family basic monthly  
6 charge from the current \$9.70 to \$12.80, and its parallel proposal to increase the basic monthly  
7 charge for other customer classes. [Id., p. 44-46] Instead, the Commission accepted Staff's  
8 proposal, which included a smaller increase in the residential monthly customer charge to  
9 \$10.70 and elimination of the declining block rate structure. [Id., p. 46]

10  
11  
12 **II. SWG's Cost of Service and Rate Design Proposals**

13  
14 **Q. Can you briefly summarize SWG's proposals in this phase of the proceeding, beginning**  
15 **with its cost of service study?**

16 A. Yes. The underlying foundation for SWG's proposed rate design and revenue distribution was a  
17 class cost of service study (CCOSS). The CCOSS was developed using a three-step process in  
18 which test year accounting costs were first functionalized, by grouping costs with similar  
19 purposes or functions. The functionalized costs were then classified into capacity-related,  
20 volume-related or customer-related costs. Finally, the functionalized and classified costs were  
21 allocated to specific service classes using various allocation factors. [Congdon Direct, p. 3]

22  
23 **Q. Can you explain the "functionalization", "classification" and "allocation" steps in a little**  
24 **more detail?**

25 A. Yes. In the natural gas industry, the major functions are production, storage, transmission and  
26 distribution. SWG explains: "Southwest Gas' functionalization follows the FERC uniform

1 system of accounts. Southwest Gas has no production, storage or transmission facilities in its  
2 Arizona service areas". [Id.] Under this schema, its only other costs – administrative and  
3 corporate overhead costs – are not interpreted as a separate function, but are dealt with at a later  
4 stage in the cost allocation process.

5 Having concluded that essentially all of its costs were supporting the distribution  
6 function, the Company then "classified" certain of its costs as capacity-related, presumably on  
7 the theory that these costs are primarily a function of the level of peak demand on the system.  
8 Other costs were classified as volume-related, based on the reasoning that they are directly  
9 affected by the overall volume of gas usage by customers. Other costs that were classified as  
10 being customer-related, on the basis that these were costs of "simply providing customers with  
11 access to Southwest Gas' system, including the related meter reading and billing expenses".

12 [Id.]

13 The final step, "allocation," involves applying percentage factors to spread the costs to  
14 particular customer classes and rate schedules. The Company explains this was accomplished  
15 through the development of:

16 allocation factors that appropriately quantify each customer class' relative  
17 contribution to Southwest Gas' cost of providing service. Capacity or  
18 demand-related allocations are based on relative customer class demands.  
19 Commodity allocations are based on relative customer class annual  
20 natural gas consumption. Customer allocations are related to the number  
21 of customers in each class weighted to recognize cost variations in  
22 providing service, such as meter and service cost and billing expenses.  
23 [Id., pp. 3-4]  
24

25 **Q. Can you now summarize SWG's rate design methodology?**

26 A. Company witness Gieseking addresses the major aspects of SWG's proposed rate design. These  
27 aspects include: the Company's decoupling proposal, which it calls its Energy Efficiency  
28 Enabling Provision; its residential rate design methodology; and, its general service rate design

1 methodology.

2

3 **Q. What is the Energy Efficiency Enabling Provision?**

4 A. The Company's proposed energy efficiency enabling provision (EEP) is a revenue per customer  
5 decoupling mechanism "that is designed to eliminate the link between sales and revenues that  
6 currently exists with traditional rate designs ..." [Giesecking Direct, p. 2] The result of such a  
7 provision, according to the Company, would be to disassociate SWG's financial performance  
8 from the amount of gas it delivers to its customers. [Id.]

9 [T]he Company is proposing the EEP to better align utility and customer  
10 interests so Southwest Gas will be able to sharpen its focus on customer  
11 efficiencies and the development of strategies to achieve the gas energy  
12 efficiency standards established by the Commission. [Id.]

13

14 SWG has requested implementation of the EEP in part to mitigate current and expected declines  
15 in consumption per customer. [Cattanach Direct, p. 10] The EEP would only apply to the  
16 residential, and small, medium and large general service customer classes. [Giesecking Direct, p.  
17 7] It would not apply to: Transportation Eligible General Service and Street Lighting; Small  
18 Essential Agricultural, Airconditioning, Water Pumping, Electric Generation and Gas Service  
19 for Compression; or, Special Contract customers. [Id., pp. 7-8] I discuss SWG's proposed EEP  
20 in greater detail in the next section of my testimony.

21

22 **Q. Can you now summarize the reasoning which underlies SWG's residential rate design  
23 proposal?**

24 A. Yes. With regard to residential rate design, Mr. Giesecking explains:

25 Southwest Gas considered the following objectives in designing the  
26 residential rates proposed in this application: 1) the fair and equitable  
27 recovery of costs; 2) rates that work well in tandem with the EEP; 3)  
28 customer acceptance and understandability; and 4) the effect of the rate

1 design on the promotion of the Company's energy efficiency and  
2 conservation efforts. [Giesecking Direct, p. 8]  
3

4 SWG claims: "Almost 100% of Southwest Gas' cost of providing service is fixed and  
5 does not increase or decrease when customer consumption changes". [Id., p. 9] If these costs are  
6 recovered through variable charges, the Company contends it "will not recover the full cost of  
7 providing service from low use customers, and will recover more from high use customers than  
8 it cost to provide them service". [Id.]

9 By this line of reasoning, SWG could argue for virtually eliminating its per-therm  
10 charges (aside from passing through the cost of purchased gas), and in favor of charging nearly  
11 all customers roughly the same amount per month – regardless of whether they only use gas for  
12 cooking, whether they also use it for water heating, or whether they also use it for heating.  
13 Similarly, based upon this reasoning that all-costs-are fixed and its corollary that fixed costs  
14 should be recovered on a per-customer basis, the Company could try to charge the same price  
15 per month to supply gas to a small studio apartment in a high rise building in the city as it  
16 charges to supply gas to a six bedroom home on a two acre lot in the suburbs. In fact, the same  
17 logic could even be used to charge roughly the same amount for heating the small apartment as  
18 it charges for heating a large grocery store, or even a 10-story office building – if the grocery  
19 store or office building is served by a single meter, so the entire building is counted as one  
20 customer, while the apartment is metered separately, so it is counted as a single customer as  
21 well.

22 Of course, in this proceeding, SWG is not taking its approach all the way to its logical  
23 conclusion. In fact, it is not proposing to increase its basic monthly service charge, nor is it  
24 proposing to reduce its per-therm charges toward zero. But this is apparently a concession on  
25 the Company's part, related in part to its desire to have its revenue decoupling proposal adopted.  
26 Mr. Giesecking explains:

1 Without the revenue stability provided by the EEP, Southwest Gas  
2 deemed it necessary to seek recovery of a portion of its customer and  
3 demand-classified revenue requirement deficiency in the monthly basic  
4 service charge (BSC). In this proceeding, because of the revenue stability  
5 provided by the EEP, Southwest Gas is proposing to recover the entire  
6 revenue deficiency in variable charges... [Id., p. 7]  
7

8 The basic service charges are unchanged and the entire residential  
9 revenue deficiency is recovered in the variable charge, which will  
10 facilitate providing customers an incentive to be more energy efficient.  
11 [Id., p. 10]  
12

13 Southwest Gas is proposing to retain the monthly basic service charge  
14 and single commodity charge of its current rate design, and simply adjust  
15 the commodity rates to recover the proposed residential revenue  
16 requirement. [Id.]  
17  
18

19 **Q. Are there some changes included in SWG's residential rate design proposal?**

20 A. Yes. For instance, SWG is proposing a change to its residential low income discount. The  
21 current discount only applies to the first 150 therms of monthly consumption. SWG proposes to  
22 expand the discount to apply it to all low-income residential consumption during the winter  
23 months of November through April. [Id., p. 11]

24 Also, SWG proposes to tie the summer season residential air conditioning rate under  
25 Schedule No. G-15 (Special Residential Gas Service for Air Conditioning) to the air-  
26 conditioning rate provided under Schedule No. G-40 (Air Conditioning Gas Service).  
27 Apparently there are only a "very small number" of customers taking this service, so SWG has  
28 very little cost data associated with it. "Therefore the distribution rate calculated for Schedule  
29 G-40 is being utilized as a proxy for the cost of providing this service to residential customers  
30 with installed natural gas cooling equipment". [Id., p. 12]  
31  
32

1 **Q. Can you briefly summarize key aspects of SWG's general service rate design proposal?**

2 A. Yes. SWG proposes to modify its Large General Service schedule "in order to better align the  
3 recovery of margin with the costs of providing service..." [Id.] Currently, this schedule applies  
4 to customers that use between 7,201 and 180,000 therms per year. [Id.] SWG proposes to split  
5 the Large General Service class into two separate classes, with applying to customers that use  
6 more 7,200 and up to 50,000 therms per year, and the other applying to customers that use more  
7 than 50,000 and up to 180,000 therms per year. [Id.] SWG asserts that such a split is justified by  
8 its cost of service study. [Id.]

9

10 **III. Revenue Decoupling**

11

12 **Q. Let's turn to the next section of your testimony. Can you describe SWG's decoupling**  
13 **proposal in a little more detail?**

14 A. Certainly. SWG explains that its proposed EEP is comprised of two components; a "weather-  
15 related" component and an "annual true-up" component. [Giesecking Direct, p. 3] Both  
16 components involve the money the Company receives from customers for the recovery of costs  
17 other than the cost of purchased gas – what can be described as the Company's "operating  
18 margin" or its "non-gas revenues."

19 Under the weather component, during each winter billing cycle actual weather will be  
20 compared to the average weather used in setting rates, and customer bills will be adjusted  
21 accordingly. [Id.]

22 The weather-related component will be provided through an adjustment  
23 to winter bills when actual weather during the billing cycle differs from  
24 the average weather used in the calculation of rates. In the event of an  
25 extreme cold weather event, customers will receive an immediate real-  
26 time benefit as there will be a downward adjustment to their bill. [Id.]

27

1           The annual true-up component will compare actual non-gas revenues to authorized non-  
2           gas revenues, resulting in adjustments to rates, and thus to the following year's revenues, as  
3           necessary to move revenues toward the authorized level. Authorized revenue in this context is  
4           defined as the Commission-authorized monthly revenue per customer multiplied by the total  
5           number of customers billed for service during the month. [Id.] In effect, if this proposal is  
6           accepted the Company will be allowed to recover the revenue requirement per-customer that is  
7           approved in this case, multiplied times the number of customers served in future years. This  
8           has two very significant effects: First, it shields the Company from the potential loss of  
9           revenues that occurs when customers buy more efficient appliances or adjust their thermostats –  
10          and reduction in revenues attributable to conservation is canceled out (after a lag) through an  
11          upward adjustment in the rate per therm, in order to maintain a constant level of revenue per-  
12          customer. Second, it allows the Company to increase its revenues to the extent more customers  
13          join its system. In a sense, this is a heads-we-win, tails-we-win system, since it stops the  
14          erosion of revenues which occurs when usage per customer decreases, while assuring  
15          continuation of the offsetting growth in revenues which occurs as the number of customers  
16          grows.

17           Under the Company's proposal, a deferral account will accumulate each month, and a  
18          true-up will be computed once a year, on a per-therm basis, by dividing the accumulated  
19          deferred account balance by the previous 12 months sales volume. [Id.] The adjusted rate is  
20          effective for the subsequent 12 months.

21  
22          **Q. Can you briefly summarize the benefits to stockholders of SWG's decoupling proposal?**

23          A. The Company points to two primary benefits. First, the Company estimates that absent  
24          adoption of the EEP, the Commission's energy efficiency goals will shift recovery of  
25          approximately \$2.4 million of non-gas costs from customers to shareholders. The Company's

1 EEP would eliminate this alleged phenomena, to the benefit of its shareholders (due to higher  
2 payments from customers than would otherwise occur absent adoption of the decoupling  
3 proposal). [SWG response to RUCO DR 2-11] Second, decoupling will benefit shareholders  
4 by reducing year-to-year volatility in non-gas revenue attributable to weather fluctuations. [Id.]  
5

6 **Q. Does the Commission's recent Decoupling Policy Statement require the approval of some**  
7 **form of decoupling in this case?**

8 A. That is not my understanding. The order adopting the Policy Statement authorizes utilities to  
9 file decoupling proposals in their next rate case. [Id., p. 32] However, neither the order nor the  
10 Statement seem to require the Commission to approve such proposals. Rather, the Statement  
11 sets forth the Commission's preferences regarding the structure of any decoupling program, and  
12 providing some guidelines for utilities' to use in developing their decoupling proposals.

13 While the Commission has acknowledged a concern with financial disincentives, it has  
14 not committed to using decoupling, nor has it slammed the door shut on discussion of problems  
15 that might arise if decoupling were approved. In fact, the Commission specifically reserves the  
16 option to "consider alternative methods for addressing utility financial disincentives". [Id., p.  
17 30]

18  
19 **Q. Did the Company propose a decoupling mechanism in its prior rate case?**

20 A. Yes. The Company proposed revenue decoupling in Docket No. G-01551A-07-0504. In that  
21 docket, SWG claimed that its ongoing revenue instability was due primarily to two factors:  
22 declining usage per residential customer; and, variations in margin due to weather. [See,  
23 Decision 70665, p. 35] The Company proposed two decoupling mechanisms: one to recover  
24 the non-gas portion of customer bills based on weather-adjusted volumes (WNAP); and another  
25 to recover or refund differences between actual and weather-adjusted non-gas revenues

1 (RDAP). [Id., pp. 34-35] The Commission rejected the proposal.

2 We are not persuaded that the decoupling mechanisms proposed by  
3 Southwest Gas in this proceeding should be adopted. Both Staff and  
4 RUCO have raised valid concerns regarding the Company's proposals,  
5 and we believe that consideration of revenue decoupling through the  
6 pending generic docket is the appropriate method of addressing those  
7 issues. As indicated in the Company's last rate case, "[decoupling  
8 mechanisms] should be fully explored as part of a broader investigation  
9 of usage volatility and margin recovery." [Id., pp. 40-41]

10  
11 The Commission was particularly concerned that decoupling could "provide a disincentive to  
12 customers to undertake conservation efforts, because they would be required to pay for gas they  
13 did not use". [Id., p. 41] The Commission was also troubled by "providing the Company with  
14 what is effectively a guaranteed method of recovering authorized revenues", and by "shifting a  
15 significant portion of the Company's risk to ratepayers". [Id.] Rather than approve the  
16 decoupling proposal, the Commission opted instead to pursue the issue in a generic docket.  
17 [Id.]

18  
19 **Q. Can you briefly summarize the major problems you see with SWG's decoupling proposal?**

20 **A.** First, the Company's decoupling proposal weakens the incentive customers, builders and  
21 developers currently have to be more energy efficient, by sending the message to customers that  
22 reduced usage will lead to higher rates, so the more they conserve the more they will pay per  
23 therm. Second, SWG's decoupling proposal may lead to a decreased incentive for SWG to  
24 contain costs, the opportunity for over-earnings and excessive rates will be increased, and there  
25 will be a loss of regulatory oversight which, when combined with the reduced incentive to  
26 minimize costs, could ultimately lead to higher costs and higher rates (over and above the  
27 increase in rates that will result from the decoupling mechanism itself).

28  
29 **Q. I'd like to discuss each of these points with you in detail. But first, do you agree with the**

1           **core premise that customers will benefit from decoupling through lower gas bills, resulting**  
2           **from "enhanced conservation and energy efficiency efforts"?**

3    A.    No – because I do not agree that revenue decoupling will achieve the intended purpose of  
4           increasing conservation or energy efficiency.

5           As a theoretical matter, perhaps the Company has a disincentive to promote energy  
6           efficiency, and it has an incentive to try to encourage customers to use energy in a profligate  
7           manner. However, I have not seen any evidence that the Company has responded to these  
8           incentives. For instance, I haven't heard about any advertising programs to discourage  
9           customers from installing more insulation, or encourage them to delay the purchase of new,  
10          energy efficient appliances. Absent any evidence that the Company is acting on these  
11          incentives (or disincentives) or any evidence the incentives are causing real (not imagined)  
12          problems, I question the wisdom of embarking on such a massive restructuring of the existing  
13          regulatory regime. Even if the Company responds in small ways to these disincentives, or it  
14          doesn't try hard enough to encourage its customers to use energy more efficiently, I am not  
15          convinced that these disincentives are significant, or need to be changed.

16          To the contrary, I think the most important incentives are not those faced by the  
17          Company's management, but the ones faced by the Company's customers, as well as real estate  
18          developers and builders in its service area. These are the people who are actually making the  
19          key decisions concerning what type and amount of insulation to install in new buildings, what  
20          appliances to replace, what appliances to install, what type of energy to use, and so forth. And,  
21          the Company's decoupling proposal does nothing to improve upon or strengthen the incentives  
22          facing those individuals – the customers, builders and developers. In fact, the decoupling  
23          proposal could very likely have the unintended consequence of weakening the incentives and  
24          price signals that are sent to these key decision makers – an adverse change that could swamp  
25          any benefits that might arise from changing the incentives facing the Company.

1    **Q. Can you please elaborate on how decoupling could weaken the incentives for customers to**  
2    **be more energy efficient?**

3    A. For customers as a whole, the decoupling program will reduce the benefits obtained from more  
4    energy efficient decisions – with rates automatically increasing as per-customer usage declines,  
5    customers as a group will not get the same short term benefit they currently receive as a reward  
6    fro increased energy efficiency. After the next annual true up, the per unit cost of gas will  
7    increase under decoupling – so that the harder customers work at their conservation efforts, the  
8    higher rates will increase during the annual true up. In effect, much of the economic gains  
9    currently being achieved through conservation will automatically be shifted from the customers  
10   back to the utility on an annual basis. Needless to say, for customers as a whole, this suggests  
11   that decoupling reduces the economic incentive to conserve.

12           Of course, a specific customer who reduces their energy usage will still receive an  
13   immediate benefit from a lower bill – but other customers will be burdened with higher bills,  
14   after the annual true up takes place. Given this disconnect between the individual and the  
15   group, it could be argued that the cost / benefit ratio for individual customers will not be greatly  
16   worsened by decoupling. But, what if the distinctions between immediate and eventual effects,  
17   and the distinctions between individual and group effects are not clearly and adequately  
18   communicated through the media? Even if the media do a good job trying to explain  
19   decoupling, what if these subtle distinctions are lost on the average consumer, who has plenty of  
20   other things to think about? What if customers, builders and developers simply hear that the  
21   Commission has adopted a revenue decoupling system, and (correctly) understand that to mean  
22   that the way utility rates have been fundamentally changed in ways that ensure that reduced  
23   energy usage will automatically result in higher rates after a one year lag?

24           Many customers may not study the issue in enough detail to realize exactly how the  
25   decoupling program works, but they will have the vague understanding that under the new

1 system, as usage does down rates go up. If so, they may react to this change by deciding it isn't  
2 worth the bother to make costly investments for the sake of conservation. Why invest in more  
3 costly insulation or more efficient appliances, if reductions in usage lead to higher rates down  
4 the road? When trying to decide whether to purchase a new appliance, or to put off that costly  
5 purchase for a few more years, they may vaguely remember reading something about  
6 decoupling, and think that the gas savings from a more efficient appliance will eventually be  
7 taken away (which is true, in the aggregate), so they may think – why waste money on the more  
8 energy efficient option? If this is their reaction, their vague understanding of decoupling could  
9 tip the scales away from making the purchase, or cause them to pay more attention to other  
10 features, or a lower price point, which in turn may lead them to select a different, less efficient  
11 appliance.

12 Under these circumstances, it strikes me as very unwise to simply assume that the  
13 Company will suddenly change its behavior in ways that significantly increase the rate at which  
14 per customer usage declines, or to simply assume that customers will be oblivious to the  
15 change. To the contrary, it seems at least as likely that decoupling will lead to less  
16 conservation, not more conservation, by sending the message to customers that reduced usage  
17 will lead to higher rates, so the more they conserve the more they will pay per therm.

18 Its important to realize that the Company only plays an indirect role in conservation  
19 decisions. Even if changes in the incentive structure were to change management's behavior  
20 (and I've seen no evidence that it will), management necessarily plays a secondary role in all of  
21 this. Publicity concerning the decoupling program, and any resulting adverse change in  
22 customer attitudes toward energy conservation could far outweigh any potential impact from  
23 improving management's attitude. On balance, there is every reason to worry that the actual  
24 impact of decoupling will be to slow the rate at which customers, builders and developers adopt  
25 more energy efficient technologies, and take other actions to conserve energy.

1 **Q. Didn't the Commission imply in its Decoupling Policy Statement that decoupling can lead**  
2 **to a reduction in infrastructure investment?**

3 A. The Commission stated:

4 Historically, Arizona has experienced high population growth and  
5 corresponding increases in demand for energy which has required  
6 significant investments in distribution, transmission and generation  
7 facilities and led to increased utility infrastructure and operational  
8 expenses. While growth is anticipated to continue in the future, expanded  
9 demand side efforts, such as energy efficiency and demand response, can  
10 moderate rate pressures otherwise experienced from growth and reduce  
11 customer utility bills. Expansion of demand side management  
12 programs ... limits unnecessary load growth. [ACC Policy Statement  
13 Regarding Utility Disincentives to Energy Efficiency and Decoupled  
14 Rate Structures, p. 1]

15  
16 However, it is important to keep in mind that SWG is a gas distribution company. It's  
17 infrastructure investment will continue to primarily be driven by decisions by local  
18 governments (installing or authorizing new roads) and real estate developers (expanding into  
19 the desert) which lead to the physical expansion of the distribution system. Decisions by  
20 builders (whether to install gas or electric appliances) and customers (whether or not to use  
21 natural gas as a source of energy) will have at most a secondary or tertiary impact on the  
22 Company's infrastructure investment – unlike electric utilities, where energy conservation by  
23 existing customers can result in the deferral or avoidance of the need to build costly new  
24 generating plants and transmission lines.

25  
26 **Q. The focus of the Company's concern seems to be the loss in revenues that results from**  
27 **reduced usage per customer. Does the Company explain what has caused this long term**  
28 **trend?**

29 A. Yes. According to SWG, the decline in residential use per customer has been primarily caused  
30 by efficiency improvements in homes and appliances. [Cattanach Direct, p. 9] Newly  
31 constructed homes tend to be better insulated, and designed for greater energy efficiency; along

1 with a long term trend toward more efficient gas appliances for new and existing customers, this  
2 has led to a continuing trend toward declining residential usage. [Id., pp. 9-10]

3  
4 **Q. Does the Company expect this trend to continue?**

5 A. Yes. SWG anticipates a continued decline in consumption per customer, due to "the continued  
6 emphasis on energy conservation to reduce energy expenditures and greenhouse gas emissions".  
7 [Id., p. 10]

8  
9 **Q. What is your view of these trends?**

10 A. Over the past several decades, as customers have built more efficient, better insulated homes,  
11 they have been rewarded with lower utility bills. Customers have responded to higher global  
12 energy costs by adjusting their thermostats, replacing appliances with newer, more energy-  
13 efficient equipment, and installing more insulation (or moving into a new home that is better  
14 insulated); in each case they are rewarded with lower monthly bills.

15 The financial rewards customers receive from increasing their energy efficiency is a part  
16 of the normal market process; this is one of the prime drivers of the downtrend in usage.  
17 Customers are rewarded when they purchase less of a virtually any product or service.  
18 Admittedly, this normal market phenomena may seem unattractive to the Company – because it  
19 places downward pressure on the Company's earnings per share. However, from a public policy  
20 perspective, this downward pressure is a good thing. It pressures management to try to offset  
21 the impact of this trend by constantly looking for ways to cut costs and increase operational  
22 efficiency. If it can keep pace with the increases in efficiency and reductions in cost that are  
23 being achieved by its customers, it can sustain its earnings and postpone or avoid the need for  
24 rate cases.

25 While the pressures may be uncomfortable, they have not been excessive or extreme,

1 nor are these pressures contrary to what we often observe in unregulated markets. When  
2 customers find ways to reduce their use of a particular product or service, providers in that  
3 industry are pressured to cut costs or increase efficiency, and if they fail to successfully respond  
4 to these pressures they risk losing market share, a decline in profits or, in the worst case they  
5 will be driven out of business as the number of industry participants shrink.

6 There is another important point which needs to be kept in mind: the downward trend in  
7 per-customer gas usage is largely outside the Company's control. The incentive structure facing  
8 the Company's management is unlikely to have much impact on this trend, regardless of  
9 whether or not decoupling is adopted. The trend has been driven by price sensitivity in  
10 response to upward trends in worldwide energy prices, as well as by federal mandates intended  
11 to encourage conservation and reduce reliance on foreign oil. Even if the decoupling proposal  
12 were rejected and the Company were to respond by encouraging customers to leave their  
13 windows open during cold winter nights, I doubt it would have any impact on the trend.

14  
15 **Q. Does the Company benefit from any offsetting trends?**

16 A. Yes. SWG has experienced an upward trend in the number of customers it serves. The  
17 following table shows the average annual number of residential customers from 1998 through  
18 2010 (excluding low-income customers). As shown, the number of residential customers was  
19 rapidly increasing in each and every year until 2008, when the real estate bubble popped.  
20 Cumulatively, the average number of residential customers increased 39.2% over this time  
21 period.

Year	Average Customers	Percent Change	Cumulative Change
1998	613,012		
1999	640,776	4.5%	4.5%
2000	673,567	5.1%	9.6%
2001	699,857	3.9%	13.5%
2002	720,061	2.9%	16.4%
2003	744,408	3.4%	19.8%
2004	785,673	5.5%	25.4%
2005	825,650	5.1%	30.4%
2006	864,201	4.7%	35.1%
2007	891,515	3.2%	38.3%
2008	897,585	0.7%	39.0%
2009	897,265	0.0%	38.9%
2010	899,808	0.3%	39.2%

1 Source: SWG response to Staff DR 3-25

2 While no one can know for sure whether, or when, this long trend will resume, the  
3 fundamentals haven't changed. People have long shown a desire to move to the Sun Belt, and  
4 there is every reason to anticipate the baby boom generation will follow suit. Significantly, this  
5 important cohort will be entering the prime retirement age brackets over the next decade or so.  
6 For instance, those borne in 1946 are turning 65 this year, and those borne in 1960 will be  
7 turning 67 in 2027.

8

9 **Q. Do you have any data that shows the extent to which the increase in the number of**  
10 **customers using gas has offset the decrease in per customer usage?**

11 A. Yes. The following table shows the same average annual customer counts as the table above,  
12 the average annual usage for those customers on a per-customer basis, the total annual usage  
13 (average customers multiplied by average usage), the annual change in total usage, and the  
14 cumulative change in total usage. As shown, changes in annual total residential usage have  
15 fluctuated, ranging from a 14.4% increase in 2004 to an 11.5% decrease in 2009. Cumulatively,  
16 total residential usage (excluding low income customers) has increased nearly 5% from 1998 to

1           2010 – despite the impact of the recession and the recent slowing of migration into the state.

2

Year	Average Customers	Average Usage	Total Usage	Percent Change	Cumulative Change
1998	613,012	442.8	271,441,714		
1999	640,776	381.6	244,520,122	-9.9%	-9.9%
2000	673,567	379.8	255,820,747	4.6%	-5.3%
2001	699,857	382.5	267,695,303	4.6%	-0.7%
2002	720,061	353.0	254,181,533	-5.0%	-5.7%
2003	744,408	330.8	246,250,166	-3.1%	-8.8%
2004	785,673	358.7	281,820,905	14.4%	5.6%
2005	825,650	320.7	264,785,955	-6.0%	-0.4%
2006	864,201	309.2	267,210,949	0.9%	0.5%
2007	891,515	321.6	286,711,224	7.3%	7.8%
2008	897,585	319.4	286,688,649	0.0%	7.8%
2009	897,265	282.7	253,656,816	-11.5%	-3.7%
2010	899,808	306.1	275,431,229	8.6%	4.8%

4

5   **Q. Is customer growth significant?**

6   A. Yes. Even without a rebound in the economy or a resumption of population growth, the  
 7   Company could benefit from customer growth over the next decade, since there a very  
 8   significant number of unserved potential customers in SWG's Arizona service territory. For  
 9   example, the U.S. Census Bureau estimates that as of 2009 there were 1,589,242 housing units  
 10   in Maricopa County (Phoenix), and 428,564 housing units in Pima County (Tucson).  
 11   Comparing the total number of households to the total number of residential customers, it is  
 12   readily apparent that some households are not using natural gas, and thus SWG could benefit  
 13   from a shift in customer preferences toward natural gas as an energy source.

14           As well, SWG's Arizona service territory contains numerous unoccupied houses –  
 15   including homes that were built during the real estate bubble, which currently stand empty, but  
 16   will undoubtedly be purchased and occupied at some point in the future, after the economy  
 17   strengthens and prices stabilize.

18           And, of course, the underlying appeal of Tucson and Phoenix remain unchanged – the

1 beautiful scenery, warm weather, lively culture, moderate taxes, and other fundamentals which  
2 have contributed to inward migration are all factors that remain intact. In fact, as noted a  
3 moment ago, the underlying demographics of the baby boom generation suggests the  
4 Company's Arizona service territory could experience another substantial wave of population  
5 growth once the baby boom generation reaches retirement age – a wave that could continue for  
6 the next decade or more.

7  
8 **Q. Do you agree with the claim that customers will benefit from capping SWG's revenue per**  
9 **customer to a specific dollar amount authorized by the Commission?**

10 A. No. It's hard to see how switching from a regulatory system in which rates are capped to one in  
11 which revenues per customers are capped can be seen as a benefit to customers – particularly in  
12 the context of a gradual, long term trend toward reduced usage per customer – a trend that has  
13 directly benefited customers, and indirectly benefited them by creating pressure on management  
14 to increase efficiency and cut costs in an effort to ameliorate the impact of that trend, and avoid  
15 the need to file rate cases. over the years.

16 It isn't completely clear to me exactly what SWG is arguing with regard to capping  
17 revenues per customer. But, perhaps it is arguing that decoupling will provide less of an  
18 opportunity to over-earn (since the Company frames this issue in terms of limiting revenues per  
19 customer to a specific dollar amount). If so, it is being disingenuous at best. SWG will still be  
20 able to earn more than its authorized rate of return between rate cases, and in fact the  
21 opportunity to over-earn between rate cases will actually increase, because the trajectory of cash  
22 flows will shift in its favor. Rates per therm will automatically be increased once a year, in  
23 response to reductions in usage per customer, without having to wait to consider the impact of  
24 that reduction in the context of a full rate case, where other factors, including technological  
25 improvements, productivity improvements, and growth in the number of customers, would also

1 be taken into consideration. By automatically increasing rates in an expedited proceeding,  
2 based upon a narrow consideration of just one aspect of the overall picture (declining usage per  
3 customer), the opportunity for over-earnings and excessive rates will actually be increased,  
4 rather than decreased.

5  
6 **Q. Do you agree that customers will benefit through a decrease in rate case frequency?**

7 A. No. It is true that decoupling may lead to fewer rate cases, but this isn't necessarily a benefit.  
8 At a minimum, the savings in reduced rate case expense must be weighed against the loss of  
9 regulatory oversight and the weakened incentive for management to minimize costs between  
10 rate cases. Under decoupling, the trajectory in cash flows over time will clearly be more  
11 favorable from managements perspective – it will be easier to maintain or boost earnings per  
12 share without necessarily having to struggle to minimize costs and increase efficiency, because  
13 rates will be automatically increased once a year to offset the decline in per-customer usage,  
14 and revenues will continue to increase as customers growth occurs. In fact, if growth in the  
15 number of customers resumes its historic pace, and technological progress and industry-wide  
16 and economy-wide productivity improvements continue as they have historically, management  
17 may find that it can keep earnings robust between rate cases without having to work very hard  
18 to contain costs. If anything, its main concern may be to ensure that earnings do not grow so  
19 rapidly as to trigger the unwanted scrutiny of an over-earnings rate review.

21 **Q. Do you agree that customers will benefit from decoupling because SWG will have a  
22 stronger incentive to cut costs?**

23 A. No. Whenever management cuts costs, the immediate beneficiaries are stockholders.  
24 Customers eventually share in the benefit, but only after a lag, when a rate case occurs. To the  
25 extent decoupling automatically increases per-unit rates between rate cases, and extends the

1 period between rate cases, there will be less pressure on management to cut costs as I explained  
2 earlier. But, to the extent cost cutting does occur, the benefits will be retained by stockholders  
3 for a longer period of time (assuming a longer lag between rate cases). In fact, management's  
4 main concern may shift away from the need to occasionally request a rate increase to the need  
5 to avoid the unwanted scrutiny of an over-earnings rate review.

6 If rate cases are less frequent, because rates are automatically increased by the  
7 decoupling mechanism, there will be fewer opportunities for customers to share in the benefits  
8 of any cost reductions and efficiency gains achieved by management – so it's hard to see how  
9 any alleged incentive for management to cut costs could translate into much benefit for  
10 customers.

11  
12 **Q. What about the potential for a reduction in capital costs?**

13 A. If decoupling reduces the volatility of the Company's revenues and income, and this translates  
14 into lower business risks, lower equity costs, and lower interest rates paid by SWG when it  
15 raises debt capital, and those risk and cost reductions are eventually reflected in rates, customers  
16 may eventually benefit. This possibility was highlighted in the Commission's decoupling  
17 Policy Statement, which states:

18 The review of the initial three-year period following adoption of revenue  
19 per customer decoupling should include analysis and discussion of  
20 possible adjustments to cost of capital to recognize any modified risk at  
21 the utilities, as well as benchmarking and comparisons to other utilities  
22 operating with revenue per customer decoupling. [ACC Policy Statement  
23 Regarding Utility Disincentives to Energy Efficiency and Decoupled  
24 Rate Structures, p. 2]

25  
26 However, it will be difficult to measure the change in risk, and any estimate will be  
27 controversial and subject to the criticism that it is too speculative. Even if the data strongly  
28 supports a finding that equity costs have declined, I doubt the Company will concede the point,

1 and the issue will undoubtedly be controversial. Therefore, I am not optimistic that customers  
2 will fully share in the benefits of any reduction in risk, or in the cost of debt and equity, if the  
3 decoupling proposal is accepted.

4 In any event, whatever benefit might occur with regard to the cost of capital, the benefits  
5 could be more than offset if decoupling leads to an increase in the size of the Company's rate  
6 base – due to a phenomena known as the AJ effect. It's important to realize that decoupling will  
7 not eliminate management's incentive to take actions which cause the Company to grow, and to  
8 invest in ways that allow it to expand its rate base – incentives that are particularly strong if the  
9 authorized rate of return is greater than the Company's true cost of capital. If, for example, a  
10 utility is allowed to earn 9.0% percent on new investments, but it can raise capital at a cost of  
11 8.25% percent, it can increase shareholder wealth (and justify higher management salaries and  
12 bonuses) by increasing its capital investment and rate base as much as feasible. The reason is  
13 simple – every thousand dollars of additional investment will cost \$82.50 per year, but that  
14 same investment will earn \$90.00 per year.

15  
16 **Q. Can you briefly elaborate on this problem?**

17 A. Yes. Rate-regulated utilities are not guaranteed they will earn the allowed return, but they are  
18 legally entitled to the *opportunity* to earn the approved fair rate of return, which must be  
19 sufficient to at least cover their cost of capital. In practice, the allowed rate of return will  
20 almost always exceed the actual cost of capital because setting the rate of return below the cost  
21 of capital would be contrary to various legal standards, and because a regime in which rates of  
22 return are less than the cost of capital would ultimately be unsustainable in practical terms –  
23 because utilities would encounter difficulty in raising capital, which would jeopardize their  
24 ability to provide safe and reliable service to the public. Under decoupling, SWG will continue  
25 to have an incentive to expand its operations and to invest in new plant. Decoupling will not

1 eliminate management's desire to grow the size of its operation, or to invest in new facilities, in  
2 order to increase the size of the rate base. To the extent the trajectory of future cash flows is  
3 improved and the frequency of rate cases is diminished, the incentive for over-investment, and  
4 ultimately higher rates may be a problem which grows, rather than diminishes, as a result of  
5 decoupling.

6  
7 **Q. What do you recommend the Commission do regarding SWG's decoupling proposal?**

8 A. I recommend the Commission reject the proposal for the reasons I have just given. I recognize  
9 that the Commission has expressed an interest in decoupling, and that the issues surrounding  
10 decoupling are not unique to SWG, or even to Arizona. However, I see no pressing need to  
11 adopt any form of decoupling at this time; instead, the Commission could continue to  
12 investigate the issues in other pending rate proceedings, and if necessary it could even use  
13 explore the issues further in another generic proceeding.

14 If the Commission still wants to consider some form of decoupling, despite all of the  
15 concerns I have raised, I recommend it focus on weather decoupling, and scrutinize the proposal  
16 very carefully to ensure that it does not increase the risk of SWG over-earning. The same  
17 weather fluctuations which lead to significant variations in SWG's earnings can also lead to  
18 drastic swings in customer bills from month to month and year to year. During unusually cold  
19 winter months, both customer bills and the Company's earnings will be unusually high. The  
20 weather adjustment component of the decoupling proposal will have the salutary effect of  
21 reducing rates immediately after unusually cold weather, effectively rebating the excess  
22 payments back to customers, smoothing out the Company's earnings as well as the revenue  
23 burden of the average customer.

24 In this regard, I agree with the Commission's conclusion that weather decoupling can  
25 benefit both utilities and customers by "enhanc[ing] utility and customer billing stability".

1 [ACC Policy Statement Regarding Utility Disincentives to Energy Efficiency and Decoupled  
2 Rate Structures, p. 29] Both customer's and stockholders would benefit from the changes  
3 wrought by the weather decoupling proposal – the reduction in weather related billing volatility  
4 will make earnings more stable and predictable for stockholders, and it will make it easier for  
5 customer to budget for their gas consumption – a benefit that will be particularly significant for  
6 those of modest means who are living on a fixed income.

7  
8 **IV. Fully Allocated Embedded Costs**

9  
10 **Q. Let's turn to the next section of your testimony. Can you provide a brief description of**  
11 **fully allocated embedded cost studies, and explain what they measure?**

12 A. Certainly. Fully allocated cost of service studies divide total test-year revenues, rate base, and  
13 operating expenses among the various customer classes to estimate the rate of return earned  
14 from each class. Many of these costs are either joint or common costs not directly attributable  
15 to any one customer class; therefore, they must be allocated by a formula. This opens the door  
16 to subjective judgments, and the results of the study tend to depend heavily on the particular  
17 allocation formulas chosen by the analyst.

18 Because they are based upon embedded costs, these studies do not report direct cause-  
19 and-effect relationships between the consumption decisions of the class members and the costs  
20 incurred by the utility. Thus a "cost" is not necessarily the actual expense that a particular  
21 group of customers imposes on the system. Nevertheless, cost of service studies have long been  
22 used by this Commission and other regulators as a tool that can assist with the process of  
23 developing electric and gas rates. As long as their limitations are recognized, and reasonable  
24 allocation formulas are employed, fully allocated cost studies can help the Commission in  
25 determining an appropriate distribution of the revenue requirement amongst the various

1 customer classes.

2

3 **Q. Can the judgment and arbitrariness be eliminated, if the analyst is completely unbiased**  
4 **and if sufficient effort is applied to the task?**

5 A. No. Embedded cost allocation studies are simply a technique for evaluating the relative  
6 fractions of the total revenue requirement that can reasonably be recovered from each class. At  
7 best, these studies provide a yardstick for judging whether or not each customer class is paying  
8 an appropriate share of the joint and common costs. The real question is whether the yardstick  
9 is reasonably straight and true, or whether it is bent to favor particular classes at the expense of  
10 others.

11 The problem lies neither with the people performing the studies nor with the amount of  
12 effort and resources devoted to the analysis. Rather, it is inherent in the very concept of  
13 allocating embedded costs. To a large degree, these costs are the result of external factors (e.g.  
14 the configuration of roads within the Company's service territory) as well as management and  
15 engineering decisions which reflect many different considerations. These external factors,  
16 management decisions, and engineering judgments are completely outside the control of  
17 individual customers or customer classes, and the costs that are influenced by these factors,  
18 decisions and judgments cannot be unambiguously traced to individual customers or customer  
19 classes. To the extent the Commission wants to pursue the goal of insuring that each customer  
20 class pays the costs that it causes, it simply isn't possible to achieve this goal by allocating  
21 historical accounting costs.

22 Even when the actions of particular customer classes do influence the costs in question,  
23 the linkage is largely indirect, and is obscured by the passage of time. For instance, various  
24 customer decisions have influenced the management decisions and engineering judgments that  
25 determined the distribution system investments and related operating costs that were incurred

1 during the test year. However, these customer influences are almost entirely traceable to actions  
2 (and anticipated actions) by customers that occurred years ago, when the distribution lines  
3 serving today's customers were originally planned and constructed.

4 In truth, the cause and effect links between today's customers (or the customers present  
5 during the test year) and costs incurred during the test year are inherently impossible to measure  
6 using the techniques that are available for developing an embedded cost of service study. All of  
7 the various alternative allocation formulas rely upon statistics relating to the test year, and none  
8 of them can possibly reflect with exactness the historic relationships of cause and effect that  
9 explain the embedded accounting costs reflected in the test year data.

10 For these and other reasons, there is no "perfect" formula for allocating most, if not all,  
11 of the costs incurred by SWG, particularly the cost of distribution mains. Some cost allocation  
12 experts will sometimes imply their approach is the "true" answer, and that any significantly  
13 different approach is a heresy not to be condoned. I disagree with that viewpoint. There is a  
14 substantial body of economic literature which convincingly demonstrates that there is no  
15 "correct" method for allocating joint and common costs, and any attempt to locate the perfect  
16 method will ultimately prove fruitless.

17 Aside from the long lags that typically occur between when costs are planned,  
18 contracted, and incurred and when those costs are recovered through rates, there is another  
19 fundamental problem. Most of the Company's embedded costs are not caused by the actions of  
20 particular customers or customer classes; rather they are incurred by management based upon  
21 an evaluation of the needs of the system as a whole. Thus it isn't feasible, or meaningful, to rely  
22 entirely on an evaluation of causal relationships in deciding on the most reasonable allocation  
23 method.

24 Consider, for example, a hypothetical investment in distribution mains for which 20% of  
25 the cost can be directly and meaningfully traced to decisions by customers concerning whether

1 to use natural gas or electricity for heating, and the specific appliances and insulation they  
2 choose to install in their homes and places of business. The remaining 80% of this hypothetical  
3 investment is entirely attributable to factors like the geography of the Company's service  
4 territory, and the arrangement of roads and streets that have been constructed by local  
5 government over the course of decades. Under these circumstances, it would not necessarily be  
6 reasonable to allocate 100% of the investment solely on the basis of any specific statistics  
7 related to customer classes, when such a small fraction of the total costs is logically and directly  
8 traceable to customer decisions. Furthermore, given time lags involved and the impossibility of  
9 identifying and measuring causative factors precisely, even the small fraction of the cost which  
10 is attributable to customer decisions might be misinterpreted and traced to the wrong classes.

11 The requirement in a fully allocated cost-of-service study that all costs be allocated,  
12 regardless of how ambiguous the causal relationship with the service in question, produces  
13 results that are defined by the particular allocation methodology selected, rather than by  
14 established economic costing principles. Thus, any number of widely different estimates of  
15 "cost" could be produced for a given service category, merely by changing the allocation  
16 procedure. One study might show a particular customer category earning an above-average rate  
17 of return, while another study of the same company might show a negative return for that same  
18 category. The allocation scheme is pivotal. These allocation decisions are highly judgmental and  
19 (not surprisingly) controversial in regulatory proceedings where fully allocated studies are  
20 introduced--particularly where the joint costs are a very substantial fraction of the firms total  
21 costs.

22  
23 **Q. Can you describe the allocation approach used by SWG?**

24 A. SWG allocates distribution mains and other "fixed" costs based on a 50/50 weighting of peak  
25 demand and the number of customers. SWG explains:

1           The distribution system of Southwest Gas is designed and constructed to  
2           serve customers' peak demands. The CCOSS should reflect the  
3           underlying factors driving costs on the Company's system, which in the  
4           case of distribution mains is serving customers and their collective peak  
5           load requirements. Commodity-related requirements are by nature fully  
6           accommodated by the Company's peak demand planning criteria and, in  
7           effect, become a byproduct of the planning criteria.  
8

9           A commodity-based allocation of distribution mains does not reflect that  
10          sizing the distribution system to meet peak day demand provides the  
11          capacity needed to meet customers' annual throughput. Arizona  
12          Commission Decision No. 64172, issued in Southwest Gas Docket No.  
13          G-01551A-00-0309 ET AL., supported Arizona Commission Staff's  
14          methodology of allocating half the cost of distribution mains on number  
15          of customers and half on demand, as Southwest has proposed in this case.  
16          [SWG response to Staff DR 3-37]  
17  
18

19   **Q. How does SWG develop the demand portion of its allocation methodology?**

20   A. In SWG's view, peak usage is the main factor used by the engineers when making system  
21   design decisions, such as the diameter of the pipes. However, they don't have hourly or even  
22   daily peak demand data to use for the allocation process, so they are substituting January gas  
23   volume data, which is effectively serving as a proxy for peak demand. When asked to provide  
24   historical peak daily usage statistics, SWG responded:

25                   Southwest Gas does not have individual customer or customer class peak  
26                   day demands. Southwest Gas uses each class' coincident peak month  
27                   throughput to allocate costs in the class cost of service study. [SWG  
28                   response to Staff DR 19-4]  
29

30                   Similarly,  
31

32                   Southwest Gas does not have daily demand data by customer class and  
33                   performs its demand analyses and allocations using monthly demand  
34                   data. [SWG response to Staff DR 19-5]  
35  
36

37                   For most customer classes, SWG uses monthly data for January, presumably on the theory that  
38                   January was the coldest month of the test year, and the main reason demand varies over time is

1 the impact of weather fluctuations. By focusing on class usage in relative percentage terms  
2 during the month with the coldest weather and largest volume of gas distributed, the Company  
3 is arriving at relatively percentages that roughly parallel the results they would obtain if they  
4 had class-specific demand data during the system peak hour.

5  
6 **Q. Do you agree with SWG's cost allocation approach?**

7 A. No. I disagree with the Company's way of viewing the costs in question, as well as the specific  
8 allocation methodology it has adopted. The fundamental problem is that so many of the costs  
9 are what economists would describe as "fixed" costs – they do not change much from day to  
10 day or even from year to year. Over the long run these costs do vary to some degree with  
11 respect to anticipated levels of peak demand, but this variation is not nearly as significant from  
12 an economic perspective as the Company suggests it is from an engineering perspective. And,  
13 the problem is even more severe with respect to the Company's rationale for using customers  
14 statistics to allocate much of the costs.

15 It is true, in one sense, that a distribution system is designed and constructed to serve  
16 customers' peak demands – but it is even more fundamentally true that a distribution system  
17 involves fixed costs that are incurred for the purpose of distributing gas to customers. Unless  
18 the total anticipated volume of gas is large enough, and the service of distributing that gas to  
19 customers is valuable enough, customers will not connect to the gas system even if it is built,  
20 and they will instead rely on other alternatives, like propane and electricity. While peak  
21 demand may be the focus of the engineering design phase, at a more fundamental level it is  
22 clear that management's investment decisions are not primarily driven by peak demands, but  
23 rather by the anticipated economic value of the system over its entire life cycle – something  
24 which is primarily a function of the anticipated volume of gas that will be distributed by the  
25 system. The anticipated volume of gas sold is ultimately what is important (which in turn

1 depends on the attractiveness of this energy source compared to others), rather than the number  
2 of customers or the hourly pattern of usage (peak volumes).

3 Of course, a portion of the system costs does vary as a function of the peak demand, and  
4 this variation is the focus of much of the engineering planning process. As a result, it is fair to  
5 say that the incremental cost of installing larger pipes rather than smaller ones is a function of  
6 peak demand. And, another small portion of the costs will vary as a function of the number of  
7 customer locations (but not the number of customers, per se). For instance, the incremental cost  
8 of installing service lines to connect each customer location to the nearest distribution main is a  
9 function of the number of buildings connected to the system. However, strictly speaking, even  
10 the cost of service lines doesn't necessarily vary directly with the number of customers. Rather,  
11 the cost of service lines is primarily a function of the configuration of buildings – how many  
12 buildings are served, and how far back the building is located, relative to the distribution main  
13 that passes by the property.

14 A single service line can connect a single large apartment building, a quadraplex, or a  
15 individual house to the distribution system. The size of the respective service lines to serve  
16 these buildings might vary, but if the costs do vary, the variation will primarily be a function of  
17 the anticipated peak demand and overall volume of gas (a larger pipe will be installed if it is  
18 anticipated that a lot of gas will be used by the customer or customers served by the line).  
19 However, neither the design of the service line, nor its cost is purely a function of the number of  
20 customers. This can easily be seen by thinking about two simple hypothetical examples.  
21 Consider a 4,000 square foot Quadraplex and a 4,000 square foot single family home. If the  
22 anticipated consumption is the same for both buildings, the cost of the service line might be  
23 identical – yet one building could contain as many as four customers, while the other would  
24 have no more than one customer.

25 The central role of gas consumption, and the relative insignificance of the number of

1 customers can be even more dramatically illustrated by considering a hypothetical building  
2 containing 30 apartments. The decision to install a service line to the building, and the size of  
3 the service line, will depend upon decisions made by the original owner or developer of the  
4 building – whether he anticipates the occupants will be using electricity for all of their energy  
5 needs, or will be using gas for some of their requirements. Suppose he decides to use electricity  
6 for everything except water heating; in that case, the developer or owner will still need to  
7 decide whether to install a centralized system that provides hot water circulating throughout the  
8 building, or install a separate water heater in each apartment, and whether to use solar, natural  
9 gas or propane to heat the water. All of these decisions will be driven by anticipations  
10 concerning energy usage over the life cycle of the investment decisions – including his  
11 perceptions concerning convenience, cost effectiveness, and other factors relating to the relative  
12 merits of each energy choice.

13 What is striking about this hypothetical example is not only that the cost of serving the  
14 building is largely a function of decisions made based on an evaluation of the merits of natural  
15 gas relative to alternative energy sources, but also that the costs are almost entirely independent  
16 of the number of customers in the building. Aside from the cost of metering and billing, there is  
17 very little difference in the costs the Company will incur to provide gas service to an apartment  
18 building where the landlord purchases gas for the entire building through a single customer  
19 account, or the same building using the same amount of gas, where each apartment is connected  
20 to an individual meter.

21 In evaluating the relative merits of different approaches, I believe it is important for the  
22 Commission to give adequate recognition to the basic product being sold by SWG: gas energy.  
23 Any allocation method that slights the importance of the most fundamental measure of the  
24 Company's output (therms of gas) should be viewed with skepticism. Where there is no clear  
25 cause-and-effect relationship between customer actions and costs, therm sales provides a

1 reasonable basis for allocation, because they closely reflect the benefits received by each class  
2 from the investments and expenses in question. From an economic standpoint it is clear that  
3 utilities does not build a distribution system merely to meet peak demand. Rather, these  
4 investments are made in anticipation of distributing gas – unless gas is viewed favorably  
5 relative to other energy sources (there is strong enough demand for gas), customers will not  
6 connect to the system, and ultimately the system itself would not exist.

7  
8 **Q. You mentioned most of the costs being allocated would be described by economists as**  
9 **fixed costs. Can you please explain more concerning how economists view the costs that**  
10 **are relevant to this discussion?**

11 A. Yes. Common costs are incurred when production processes yield two or more outputs. They  
12 are often common to the entire output of the firm but can be common to just some of the  
13 outputs produced by the firm. An increase in production of any one good will tend to increase  
14 the level of common costs; however, the increase will not necessarily be proportional. The costs  
15 of producing several products within a single firm may be less than the sum of the analogous  
16 costs that would be incurred if each of the products were produced separately.

17 A joint cost is a specific type of common cost--one incurred when production processes  
18 yield two or more outputs in fixed proportions. A classic example arises in the joint production  
19 of leather and beef. Although cattle feed is a necessary input for the production of both gloves  
20 and hamburgers, there is no economically meaningful way to separate out the feed costs that are  
21 required to produce each. If the quantity of leather and beef is reduced, there will be a savings  
22 in the amount of cattle feeding costs, but it is impossible to say how much of this change in cost  
23 results from the change in the quantity of leather and how much from the change in the quantity  
24 of beef.

25 An allocated cost is a joint or common cost that has been divided among the firm's

1 different customers or products, in accordance with a particular formula or the judgments of a  
2 cost analyst. Economic theory demonstrates that there is no inherently correct method of  
3 allocating joint costs among the various joint products. Purchasers of each of the joint products  
4 will bear some share of the joint costs, in relative proportions that are determined by the relative  
5 strength of demand in the various markets, rather than by some arbitrary allocation formula.

6 Fixed costs are simply those elements of the firm's total cost which do not increase as  
7 the volume of output increases. The difference between fixed costs and sunk costs is that the  
8 former can be reduced or eliminated if the firm is willing to exit the market entirely (e.g., by  
9 converting its equipment over to another purpose). In contrast, sunk costs cannot be avoided or  
10 changed even by discontinuing production entirely; thus, they are considered irrelevant for most  
11 economic decisions. A simple example of a fixed cost is the cost of owning a factory building;  
12 as long as the building is in use as a factory, its costs are unavoidable (and they do not vary with  
13 the volume of output produced by the factory). However, if the firm discontinues production,  
14 and sells the building to someone who converts it to another use, it will avoid the costs of  
15 ownership. Hence, the cost is fixed, but it is not sunk because the building can be readily  
16 converted to another purpose.

17 A simple example of a sunk cost is the cost of writing a novel. Once this cost is incurred,  
18 it cannot be avoided, reduced, or eliminated, regardless of whether or not the novel is published,  
19 or how many copies are sold. Stated another way, sunk costs are irretrievable once the decision  
20 to incur them is implemented. From that time forward, they are completely irrelevant to any  
21 pricing, production, or other economic decisions that must be made.

22  
23 **Q. How do these concepts relate to the issues in this proceeding?**

24 A. In attempting to analyze prices relative to costs, joint costs create considerable difficulty and  
25 controversy. The classic solution favored in regulatory proceedings is to allocate a reasonable

1 share of the joint costs to each of the joint products. Unfortunately, as economic theory  
2 demonstrates, there is no unequivocally correct way to allocate these costs among the various  
3 services.

4 The costs of installing and operating a gas distribution system are almost entirely  
5 common costs – as should be apparent from the fact that numerous customers are all served  
6 using a common system – and it is difficult to disentangle the cost of serving one customer from  
7 the cost of serving another customer. Looking more closely at the definition of common costs  
8 given earlier, it is apparent that if the volume of gas distributed to any single customer  
9 increases, to the extent this increases the overall cost of building and operating the system, the  
10 increase in costs will will not necessarily be proportional. To the contrary, the costs of providing  
11 gas service to multiple customers (or customer classes) within a single firm will tend to be  
12 substantially less than the sum of the analogous costs that would be incurred if each customer  
13 (or customer class) were served separately. In other words, gas distribution system enjoy  
14 economies of scale and scope.

15 Because of the pervasive impact of economies of scale and scope, there is no  
16 unambiguous "cost causative" method available for allocating the fixed costs of the distribution  
17 system. The most that can be hoped for is an allocation method that produces reasonable and  
18 equitable results.

19 In the gas industry, the cost of installing pipes is a sunk cost: once the pipe is in place,  
20 no future decision will alter those installation costs, or allow them to be not incurred. If the  
21 company is able to salvage some of the material involved, the salvageable portion of the pipe  
22 cost would be considered a fixed cost, but not sunk. However, the labor needed to engineer and  
23 install the facilities is irretrievable. Therefore, once the labor costs of installation have been  
24 incurred, they are irrelevant to future decisions about the appropriate price level for the service  
25 or services that utilize the pipe.

1           In the calculation of marginal or incremental cost, fixed and sunk costs are canceled out  
2           in the computations. This is one of the most distinctive attributes of the economist's concept of  
3           marginal cost, setting this concept apart from more conventional notions of average or total  
4           cost. The reason for this distinctive treatment is straightforward: since fixed and sunk costs do  
5           not change with the volume of output, they have no direct impact on the level of marginal cost,  
6           which is the change in total cost associated with a change in output.

7  
8   **Q. Can you relate this discussion of joint and common costs to the issue of whether the**  
9   **Commission should allocate SWG's fixed costs giving 50% weight to peak demand and**  
10 **50% weight to the number of customers?**

11 **A.** Yes. I don't disagree with the portion of SWG's cost allocation approach which allocates 50%  
12 of the system costs on the basis of peak demand. There are additional costs incurred in order to  
13 install a larger main that is capable of handling more gas during peak hours. The design and  
14 cost of the system is influenced by anticipated future peak usage of each main, and thus it is  
15 reasonable to give some weight to peak demand statistics. However, I strongly disagree with the  
16 decision to give 50% weight to the number of customers, and the failure to give any weight  
17 whatsoever to gas usage – which is the factor that largely controls the decision to build or  
18 expand the system in the first place.

19           In other words, anticipated peak demand influences the size of the pipes, which  
20 increases the cost of the pipes (albeit less than proportionally to the increase in demand).  
21 Hence, I don't object to allocating 50% of the costs on the basis of peak usage data. However,  
22 However, a distribution system has many of the characteristics of a "joint" cost in the classic  
23 sense. To a large extent, system costs are a function of the number of miles of streets served,  
24 and not a function of the level of peak demand or the number of customers who are, or will be,  
25 connected to the system. For instance, the cost of opening a trench and installing a pipe of even

1 minimum size is substantial – and this minimum system cost closely fits the classic definition of  
2 a “joint” cost, since it doesn't vary with output, but rather with the number of miles of pipe that  
3 needs to be installed.

4 In competitive markets, to the extent common costs vary with output, they are recovered  
5 in the same manner as direct costs--they directly affect the marginal cost of producing each  
6 service, and thus directly influence prices. (In competitive markets, prices tend to equilibrate  
7 towards marginal cost). Joint costs, on the other hand, have no impact on marginal cost, and  
8 thus do not directly determine prices in competitive markets.

9 In competitive markets, joint costs are never recovered entirely from consumers of one  
10 of the joint products, to the exclusion of the others; rather, the costs are shared by both groups  
11 of consumers, with the respective proportions depending upon the relative strength of demand.  
12 The stronger the demand, the greater the share of joint costs that will be borne by the respective  
13 product, service, or customer group.

14

15 **Q. You've explained why you disagree with the Company's proposed method of allocating**  
16 **fixed or sunk system costs. Can you now briefly explain the approach you recommend**  
17 **using instead?**

18 A. Yes. I recommend using the "average and peaks" allocation method. More specifically, I  
19 recommend giving 50% weight to peak demand, like the Company, but instead of giving the  
20 remaining 50% weight to the number of customers, I recommend using total annual gas volume,  
21 instead. My recommended approach recognizes that the primary purpose of the system is to  
22 provide energy used by its customers, and thus it gives considerable weight to energy usage  
23 (total gas usage). However, my approach also recognizes that it is less costly to serve  
24 customers who use energy more uniformly throughout the year. Thus, for example, it is less  
25 costly to provide gas to heat water for a home or office than it is to provide gas to heat the home

1 or office itself (due to wide variations in temperatures over the course of the year). Logically,  
2 both total gas usage and peak demand should be considered during the allocation process, and  
3 this is what I recommend doing. To the extent a cost allocation method is supposed to reflect  
4 the factors which "cause" costs, it makes sense to give some consideration to coincident peak  
5 data, as well as the total volume of gas used during the course of the test year.

6

7 **Q. Have you developed any estimates of the impact of following your recommendation?**

8 A. Yes, I have. For illustrative purposes, I developed an alternative set of cost of service results  
9 giving 50% weight to peak demand and 50% weight to gas usage. For ease of development and  
10 comparison, these calculations are based on the Company's revenue requirement filing, and thus  
11 the calculated returns are substantially lower than would be computed if I had started with  
12 RUCO's revenue requirement calculations.

13 As shown on Schedule BJ-8, relative to the Company's study, the major residential  
14 classes and the small general service class show higher returns, and the medium and large  
15 General Service classes show lower returns, as shown in the following table (which summarizes  
16 key results from Schedule BJ-8):

17

	Company	RUCO
Single-Family Residential	2.32%	4.84%
Multi-Family Residential	1.50%	7.30%
Small General	10.98%	17.30%
Medium General	8.16%	4.51%
Large-1 General	17.33%	6.41%

19 My recommended allocation method generates rates of return of 4.84% and 7.30% for  
20 the single-family and multi-family residential classes, respectively. These compare to returns of

1           2.32% and 4.84% for these two classes under the Company's approach.

2           My proposed allocation methodology results in an overall rate of return of 17.30%,  
3           4.51% and 6.41% for the Small, Medium and Large-1 General Service classes, respectively.  
4           These compare to returns of 10.98%, 8.16% and 17.33%, respectively, for these classes under  
5           the Company's approach.

6

7 **V. Revenue Distribution**

8

9 **Q. Let's turn to the fourth section of your testimony. What factors do you think should be**  
10 **considered in developing the interclass revenue distribution?**

11 A. I recommend giving some consideration to the cost of service results. However, as a policy  
12 matter, I think it is important to note that other factors can also be important in developing a fair  
13 and reasonable revenue distribution, including historical rate relationships, ability to pay,  
14 relative risk, and demand or market conditions (including the extent of competition that might  
15 exist).

16           It is sometimes argued that the revenue burden should be distributed among the classes  
17 based entirely upon the results of a particular class cost-of-service study, at least as a goal. This  
18 argument has grown in popularity as "cost-based" ratemaking has come into vogue. However, I  
19 fundamentally disagree with this philosophy, particularly when it is tied to a single embedded  
20 cost allocation study. Valid cost-of-service studies can provide a useful starting point in  
21 developing the overall revenue distribution; but even if the cost study itself isn't controversial,  
22 the ultimate determination of rate spread should be tempered by consideration of other factors,  
23 such as the ones I just enumerated.

24           Any proposal to move away from the existing rate relationships should be implemented  
25 gradually. This is particularly important in a case like the present one, where there is relatively

1 little information available to evaluate how the various allocation methods react to changing  
2 weather and economic conditions, and thus little is known about how the various class returns  
3 react to changing conditions in the future. While I strongly believe the approach I am  
4 recommending is superior to the one proposed by the Company, I recognize that the latter  
5 approach was recommended by the Staff and accepted by the Commission in the prior case. I  
6 would hope the Commission will be persuaded by the merits of the alternative approach I have  
7 recommended – but even if the Commission accepts this change in methodology, I believe the  
8 resulting shift in the revenue distribution should be introduced gradually.

9 I also believe that the revenue distribution should not be designed merely to track the  
10 results of a particular cost-of-service study, regardless of how well founded that study may be.  
11 Instead, thought should be given from the outset to the potential hardships imposed on  
12 particular classes, historical relationships among the classes, and other elements of interclass  
13 equity. Moreover, the Commission should recognize that efforts to achieve uniform class rates  
14 of return are mostly fruitless. Even if a consistent COS methodology is employed from case to  
15 case, fluctuations in weather, economic conditions, and other variables can easily produce  
16 absolute fluctuations in the class rates of return of 1%-4% or even more, defeating such any  
17 attempt at perfect uniformity. If an above-average increase is imposed in one case (because a  
18 class appears to earning less than the average return), a below-average increase may appear  
19 appropriate for that same class in the next case, simply because of minor fluctuations in  
20 economic conditions or usage patterns – even if the underlying methodology is not changing.  
21 Of course, where changes in the costing methodology are involved, the class returns can  
22 fluctuate by even wider margins, due simply to differences in allocation techniques.

23 Given the inherent instability and subjectivity of the various allocations, the goal of  
24 absolute uniformity in class rates of return can probably never be achieved. Such an effort is an  
25 attempt to hit a moving target, and that very effort can potentially conflict with important policy

1 objectives, like rate continuity, gradualism and stability.

2

3 **Q. How has the Company proposed to distribute its proposed revenue increase among the**  
4 **various customer classes?**

5 A. The Company is proposing different percentage increases for the various customer classes. It  
6 developed a methodology which moves the individual customer classes toward a uniform rate  
7 of return, but it ameliorated the impact and simplified the resulting percentage increases in  
8 various ways. SWG explains:

9 Some rate classes show a rate-of-return below the system average,  
10 sometimes referred to as under performing, and some classes show a rate-  
11 of-return above the system average, sometimes referred to as over  
12 performing. Southwest Gas' methodology takes this rate-of-return  
13 difference into consideration by distributing more of the requested rate  
14 relief to underperforming classes and limiting the distribution to classes  
15 that are over performing. The purpose of this methodology is to move  
16 customer class' rate-of-return towards the system average rate-of-return.  
17 [SWG response to RUCO DR 10-1]

18

19 More specifically, SWG performed the following steps: 1) Customer classes whose rate-of-  
20 return was greater than 3 times the proposed system average rate-of-return were excluded from  
21 the deficiency distribution; 2) Customer classes whose rate-of-return was less than the system  
22 average rate-of-return received a deficiency distribution of up to 1.25 times the system average  
23 margin increase, but no more than an amount necessary to bring the class rate-of-return to the  
24 system average; and, 3) The remaining deficiency after step 2 was distributed to customer  
25 classes on an equal percent of margin. [Id.]

26 While the Company's approach was rather convoluted, the final result was about the  
27 same as if they simply decided to exempt some customers from any increase, decided to  
28 increase the rates paid by a few classes by approximately 23.3%, and decided to increase the  
29 remaining classes by about a third as much – 7.47%.

1           The variations in the proposed increases reflect the Company's intent to move towards  
2           greater uniformity of rates of return pursuant to its cost-of-service study. For instance, under  
3           the Company's allocation methodology the Residential classes are supposedly earning about  
4           half the system average rate of return, while the General Service class is supposedly earning far  
5           more than the system average. This discrepancy in the allocated cost results explains why the  
6           Company is proposing to increase Residential rates by roughly three times the amount it is  
7           proposing to increase General Service rates, as can be seen in the following table:

8

Class	Return Present Rates	Return Proposed Rates	Margin Change
Residential Gas Service	2.33%	5.77%	23.29%
General Gas Service	12.16%	13.74%	7.47%
Air Conditioning Gas Service	16.08%	17.93%	7.47%
Street Lighting Gas Service	1.78%	4.12%	23.34%
Compression on Customer's Premises	12.71%	14.26%	7.47%
Electric Generation Gas Service	8.87%	10.15%	7.47%
Small Essential Agriculture User Gas Service	10.36%	11.75%	7.47%
Natural Gas Engine Gas Service	23.95%	23.84%	0.00%
Total Sales	4.47%	5.77%	17.81%

Source: Schedules G-1, G-2, H-1

10   **Q. What is your reaction to SWG's proposed revenue distribution?**

11   A. I disagree with the Company's proposed revenue distribution both because some of the  
12   proposed increases are too extreme and because it is based upon cost allocation results which  
13   are fundamentally unsound. For example, residential rates would be subjected to an overall  
14   increase of 23.29%, and Single Family Low Income customers would see a 29.21% increase in  
15   their rates. [Schedule H-1, Sheet 2] I disagree with both of these proposals, because the  
16   percentage increases are much too extreme, and because they are based on a fundamentally

1           invalid premise: that the Residential class is not currently paying its fair share of the revenue  
2           burden.

3                     With a more appropriate allocation approach, in which a small apartment is not asked to  
4           share the same share of the burden as a large house, a hotel, a grocery store or an office  
5           building, a very different conclusion is reached. The Residential classes are shown to generate  
6           returns which are close to, or a bit higher than, the system average return during the test year.

7                     Of course, the specific returns earned by each class depend in large part on the  
8           assumptions and allocation techniques used in a specific cost-of-service study. Different  
9           conclusions are reached when a different allocation study is used as a benchmark for evaluating  
10          the rate relationships.

11

12   **Q. Have you developed an alternative revenue distribution approach which you are**  
13   **recommending for the Commission to consider?**

14   A. Yes. I have developed an alternative methodology which gives considerable weight to historic  
15   rate relationships, while also giving substantial consideration to my recommended class cost of  
16   service results.

17                     Specifically, starting with the results of my cost of service study, I looked at the classes  
18   with rates of return significantly above or below the system average. In order to avoid inter-  
19   class inequities, and in recognition of the fact that cost allocation studies are not perfectly  
20   precise, I believe that none of the classes should receive percentage rate increases that differ  
21   dramatically from the overall system average. Instead, I recommend increasing the rates paid by  
22   these classes by slightly more, or less, than the system average (as appropriate), thereby moving  
23   the class returns toward the average, without making futile attempt to move toward complete  
24   uniformity of returns.

25                     My specific recommendations are as follows: First, the following rate schedules have

1 returns that are substantially lower than the system average of 4.47%: Gas Service for Air  
2 Conditioning (-0.88%), Large 2 - General (1.46%), Transportation Eligible (0.81%), Street  
3 Lighting (2.35%), Compression on Customer Premises (1.12%), Electric Generation Gas  
4 Service (-1.48%), Small Essential Agricultural (1.75%), and Natural Gas Engine Service  
5 (2.21%). Since these classes are generating below-average returns, I recommend increasing  
6 their rates by a moderately higher percentage than the overall system average increase.

7 Second, the following rate schedules have returns that are substantially higher than the  
8 system average of 4.47%: Multi-Family Residential (7.30%), Master Metered Mobile Home  
9 Park (6.68%), Small General (17.30%), and Large 1 - General (6.41%). Since these customers  
10 are generating above-average returns, I recommend increasing their rates by somewhat less than  
11 the overall system average increase.

12 Third, the following rate schedules have returns that are relatively similar to the system  
13 average of 4.47%: Single Family Residential (4.84%) and Medium General (4.51%). Since  
14 they are currently earning returns that are fairly close to the system average, no deviation from  
15 the system average is necessary or appropriate.

16 For convenience, my specific recommendations are summarized in greater detail in the  
17 last column of Schedule BJ-9. For comparison purposes, all of these calculations are based on  
18 the Company's requested revenue requirement. The actual rate changes that I recommend be  
19 applied to each class could be substantially less, of course, since it will depend on the overall  
20 revenue requirement which is ultimately approved by the Commission.

21  
22 **VI. Residential Rate Design and Miscellaneous Tariff Issues**

23  
24 **Q. Let's turn to the last section of your testimony. What other rate design issues do you wish**  
25 **to discuss?**

1 A. I would like to discuss fixed costs and customer charges, discuss the possibility of seasonal  
2 rates, and comment on SWG's proposed rates for low income customers.

3  
4 **Q. Let's discuss fixed costs and customer charges. What does SWG say about these issues?**

5 A. As I mentioned earlier, the Company states that one of the primary objectives of its residential  
6 rate design was "the fair and equitable recovery of costs." SWG contends that almost 100% of  
7 its non-gas costs are fixed, and that it is unfair or inequitable to recover these fixed costs  
8 through variable charges. It contends that recovering fixed costs through variable charges leads  
9 to under-recovery from low use customers and over-recovery from high use customers.

10 Although SWG is not proposing dramatic changes to its current rate design, the  
11 argument its is making would justify drastically increasing the fixed monthly rate, and greatly  
12 reducing or eliminating its existing per-therm (variable) rates. Although the reasoning is a bit  
13 ambiguous, the Company seems to be implying that its proposal to leave the monthly charge  
14 unchanged in this case is tied to its request for approval of its EEP. "[B]ecause of the revenue  
15 stability provided by the EEP, Southwest Gas is proposing to recover the entire revenue  
16 deficiency in variable charges..." [Giesecking Direct, p. 7] SWG further explains:

17 The cost of service rate design principle, that economic efficiency is  
18 maximized when the fixed and variable costs of service are recovered  
19 through associated fixed and variable charges, supports the retention of at  
20 least the current level monthly basic service charge, if not an increased  
21 monthly fixed charge. However, in consideration of other rate design  
22 goals, Southwest Gas is not proposing an increase in the monthly basic  
23 service charge at this time. Please also refer to the attached Excel file.  
24 [SWG response to Staff DR 3-47]

25  
26  
27 **Q. Does SWG quantify the exact amount of costs that it considers fixed?**

28 A. In response to data requests seeking clarify or support the "almost 100%" figure, SWG referred  
29 to Schedule G-4.

1           The Company's class cost of service study shows that \$7,442,314 out of  
2           \$1,456,517,468, or 0.5%, of total rate base is associated with commodity-  
3           related functions (Line 34 of Schedule G-3, sheets 1-14). In addition the  
4           study shows that only \$2,023,257 out of \$136,804,420, or 1.5%, of the  
5           Total O&M expense is associated with commodity-related functions  
6           (Line 55 of Schedule G-4). [SWG response to Staff DR 13-5]  
7

8           Essentially, the Company is arguing that its distribution system is fixed once it is installed – not  
9           varying with the volume of gas that moves through the system. Needless to say, I don't  
10          necessarily disagree with that conclusion – I made a similar point earlier in my testimony in  
11          arguing that the great majority of the costs of a natural gas distribution system are either fixed  
12          or sunk, once the investment is made. And, even during the planning phase, before investments  
13          are made, a large fraction of the costs are determined by the configuration of the road network  
14          and the positioning of buildings relative to that network.  
15

16   **Q. Do you agree with SWG's argument that fixed costs should be recovered on a flat**  
17   **monthly-per customer basis, or its corollary, that only costs that are strictly variable**  
18   **should be recovered through the price of gas-- in other words, all customers should pay**  
19   **about the same amount per month regardless of how much gas they use?**

20   A. No. In fact, I would argue quite the opposite – that many of the customer charges are already  
21   higher than necessary or appropriate. Not only are further increases not warranted at this time,  
22   it would be preferable to shift away from flat per-month charges toward higher rates per unit of  
23   gas used.

24          When customer charges are set at reasonable levels, they are an acceptable rate-design  
25   tool for recovering a portion of a regulated utility's costs. However, the Company's current  
26   customer charges are already far higher than the marginal cost of connecting an additional  
27   customer to the system. These charges are not justified by marginal cost considerations, but  
28   rather they are an attempt to recover “fixed” costs on a “fixed” per-month, per-customer basis. I

1 strongly disagree with this approach because it is not a sound application of economic pricing  
2 principles, and it is inconsistent with important policy objectives related to economic efficiency,  
3 energy conservation, and inter-customer equity.

4 There are several problems with high customer charges. First, and most obviously,  
5 holding all else constant, higher customer charges tend to encourage gas consumption and  
6 discourage energy conservation, while lower customer charges will discourage energy usage  
7 and encourage greater energy efficiency.

8 Second, higher customer changes place a heavy burden on low use customers, for whom  
9 this is a major element of their gas bill. This rate design unduly burdens customers who do not  
10 own a large number of gas appliances, those who set the thermostat at a low level during the  
11 winter, those who rely on electricity to heat their home, and those who, for whatever reason, use  
12 the Company's system only to a minimal extent. It is not logical, equitable, or efficient to  
13 demand that a low use customers pay as much per month as high use customers. The illogic of  
14 the Company's position would have been self-evident if they had taken their reasoning to its  
15 logical extreme, and argued that a customer living in a small studio apartment in a densely  
16 populated urban area, should pay the exact same amount per month for use of the distribution  
17 system as someone living in a 6,000 square foot home in the suburbs. The illogic is even more  
18 obvious if one realizes that if the Company's reasoning were fully accepted and implemented,  
19 the monthly price would be the same regardless of whether the customer only uses gas for  
20 cooking and water heating, or whether they also use the gas for heating. In fact, by this  
21 reasoning, a residential customer might end up paying the same price per month as a hotel, an  
22 office building, or a retailer.

23 Third, the Company's customer charges are not based upon sound economic costing and  
24 pricing principles. Instead, they are based upon an inherently arbitrary embedded cost  
25 allocation approach, which happens to allocate substantial portions of the Company's

1 distribution investment and operating expenses on the basis of the number of customers in each  
2 class, regardless of whether or not these items directly vary in response to decisions by  
3 customers to join or leave the system. Even if the Commission were to disagree with the  
4 reasoning I set forth earlier in my testimony, and to conclude that there is no better way to  
5 assign some of these costs than on the basis of the number of customers, that doesn't mean the  
6 resulting allocated numbers are a valid justification for determining what portion of the revenue  
7 requirement should be recovered through a fixed monthly charge, and what portion should be  
8 recovered through the volumetric rates. Allocation techniques that are deemed acceptable for  
9 one purpose are not necessarily appropriate or acceptable for another purpose.

10  
11 **Q. Can you elaborate on your first point?**

12 A. Yes. Customer charges have a negative effect similar to that of declining block rates, in which  
13 rates drop as the level of usage increases. In general, such rate structures make small-volume  
14 users pay a higher average rate per therm than large-volume users and tend to present customers  
15 with a relatively low marginal per-therm rate for increased usage. This has several undesirable  
16 effects: it imposes excessive rates on low-volume users, including those who are most  
17 successful in limiting their energy usage, and it tends to discourage energy conservation. A  
18 relatively high customer charge works in much the same way. It translates into relatively low  
19 therm rates; as a result, it sends price signals that make it seem less costly to consume additional  
20 energy, providing relatively little reward for those customers who buy more efficient  
21 appliances, install additional insulation, adjust the thermostat to lower levels in the winter, or  
22 take other steps to reduce their gas consumption.

23 The following example in the table below illustrates this point. The costs are based on  
24 the Company's proposed single-family residential rates, which include a \$10.70 customer  
25 charge and a commodity charge of \$1.44649 per therm.

1

	5	20	50	100
	Therms	Therms	Therms	Therms
Customer Charge	\$10.70	\$10.70	\$10.70	\$10.70
Commodity Charge	7.23	28.93	72.32	144.65
Total	\$17.93	\$39.63	\$83.02	\$155.35
Total per Therm	\$3.586	\$1.981	\$1.660	\$1.553
		0.45		0.57

Source: Schedule H-4, Sheet 1

2

As shown, a customer using 5 therms during a given month would incur a total bill of \$17.93 under the proposed rates. Thus, he would pay an average of about \$3.59 per therm. In comparison, a customer who uses 20 therms would pay an average price of approximately \$1.98 per therm, or roughly 45% less than the rate per therm paid by the smaller customer. Similarly, the customer using 50 therms will pay approximately 54% less per them than the customer using 5 therms in a given month. Finally, the customer using 100 therms will pay approximately 57% less per them than the customer using 5 therms in a given month.

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**Q. Have you analyzed the methods by which the Company allocates costs to the customer charge?**

17

18

**A.** Yes. The great majority of the costs that are used to support this rate element are not actually variable or marginal costs that are directly attributable to decisions by customers to join or leave

19

1 the system. Rather, they are fixed or sunk costs that are largely determined by the configuration  
2 of roads and buildings in the Company's service area. In my view, a customer charge makes the  
3 most sense when it is used to collect the variable costs of metering, billing, and collecting the  
4 monthly bill. Other so called "customer costs" can and should be recovered through volumetric  
5 rates.

6  
7 **Q. Can you please elaborate on the costs that you believe are appropriately recovered**  
8 **through a fixed monthly fee?**

9 A. I believe that the most meaningful definition of customer costs for pricing purposes is a narrow  
10 one. Preferably, a customer charge should only include those costs which are closely related to  
11 the number of customers served each month, so that the customer charge would be closely tied  
12 to the actual cost savings realized when a customer joins or leaves the system. This approach is  
13 economically sound, it avoids the imposition of excessive burdens on low-volume customers,  
14 and it tends to encourage energy conservation.

15 This recommendation entails a relatively narrow definition of customers costs.  
16 Specifically, I believe that only accounts 901-903 and possibly 586, 905, and 907-910 should be  
17 included in the calculation of the fixed monthly rate element (customer charge). This closely  
18 matches the costs which are directly related to a customer's decision to join or leave the system  
19 and which therefore are most appropriate to recover through a fixed monthly fee which is  
20 incurred when a customer joins the system, and which can only be avoided if the customer  
21 leaves the system.

22  
23 **Q. Have you analyzed the company's customer costs, based on your preferred definition?**

24 A. Yes. Schedule 10 of my exhibit presents an analysis of those costs that I believe can properly be  
25 recovered through the customer charge. Schedule 10 shows that SWG's customer accounts

1 expenses (accounts 901-903) totaled \$30,593,032 for the year ending June 30, 2010. Dividing  
2 the total monthly costs by the adjusted test year number of bills reveals that the expense per  
3 customer is \$2.61 per month.

4 This figure is a reasonable estimate of the Company's variable direct cost per customer,  
5 per month--the cost which is most directly related to the number of customers present on the  
6 system during any particular month. I am not suggesting that the customer charge be  
7 immediately reduced from \$10.70 to less than \$3.00 per month – but this analysis of the  
8 relevant costs suggests that some movement in that direction would be appropriate in this case.

9  
10 **Q. To the extent they are not recovered through a fixed monthly fee, how should the**  
11 **company's joint and common costs be recouped?**

12 **A.** In my opinion, the fixed costs of the system are most appropriately recovered in the same way  
13 that most unregulated businesses recover these sorts of overhead costs--through customer  
14 payments for value received. Most competitive firms do not charge monthly dues for the right  
15 to be a customer. Instead, by far the most common practice is to build their overhead costs into  
16 the prices of the goods and services they sell.

17 For instance, a retailer typically recovers overhead costs from his retail mark-up, not  
18 from a flat monthly fee charged customers for simply shopping in his store, or a per-visit fee for  
19 walking through the door. Similarly, customers generally do not pay a fixed monthly fee for the  
20 right to buy a car when they need one. All of the auto manufacturers' and auto dealers' overhead  
21 costs are recovered in the price of the cars actually sold to customers. Even book and music  
22 clubs recover their overhead costs through actual sales transactions – despite the fact that these  
23 firms incur additional costs with every additional customer who joins or stays on their system.  
24 The fixed costs of maintaining customer accounting records and sending monthly mailings to  
25 each customer are normally recovered strictly on the basis of the books, and music that is

1           actually purchased – rather than a flat fee imposed on customers regardless of how little or how  
2           much benefit they gain from the service.

3           Let me hasten to add that there are exceptions – situations where competitive firms  
4           impose fixed monthly or annual charges regardless of actual purchases. For instance, some  
5           credit card companies use this pricing method for some of their card offerings. But, such  
6           charges are relatively rare in unregulated markets, even for firms with relatively high levels of  
7           fixed costs in comparison to their variable costs. For instance, airports and airlines both have  
8           substantial fixed costs unrelated to the number of customers who fly. Even though it might be  
9           feasible, they do not assess a flat fee to every person who enters the airport in order to recover  
10          those costs. Nor do airports or airlines charge a fixed fee for the right to fly, regardless of  
11          whether or not a person chooses to fly during a particular month. Instead, these fixed overhead  
12          costs are recovered as and when tickets are sold.

13          In all of these examples, customers who buy more pay a higher portion of the firm's total  
14          overhead costs than the customers who buy less, but they also receive a proportionately greater  
15          benefit. No one complains that this practice is unfair or unreasonable. Applying the same logic  
16          to the pricing policies of gas and electric utilities, it is reasonable to recover most overhead  
17          costs through the rates charged for the use of gas and electricity. This pricing method imposes  
18          overhead costs on customers in proportion to their actual consumption of energy, which I  
19          believe is wholly appropriate and consistent with standard practice in most competitive markets.

20          From my perspective as an economist, the reason customer charges or equivalent fees  
21          typically do not survive in competitive markets is clear: customers find them objectionable,  
22          because they are not directly associated with the benefits they receive when the service is  
23          actually rendered. Unlike regulated utilities, none of the other entities just discussed (retail  
24          stores, gas stations, book clubs, and airlines) have sufficient monopoly power to impose this  
25          non-intuitive and potentially inequitable form of pricing on their customers. Hence, in most

1 unregulated markets normal market forces lead firms to recover their overhead costs in the price  
2 of the goods and services actually consumed--even though the underlying costs do not vary  
3 directly with sales volume and even though some of the costs in question may vary with the  
4 number of customers.

5  
6 **Q. Even if the Commission were to again adopt the cost allocation method proposed by the**  
7 **Company, which allocates numerous investment-related costs in proportion to the number**  
8 **of customers in each class, do you nevertheless oppose recovery of those costs through**  
9 **monthly customer charges?**

10 A. Yes. Neither economics nor public policy requires that gas rates be tied directly to the results of  
11 fully allocated cost-of-service studies. Such studies are at best a tool which can assist regulators  
12 in evaluating the appropriate distribution of revenues among customer classes. Even if  
13 someone believes it is logical to allocate the same share of certain costs to a hotel as would be  
14 allocated to a residence, merely because they are fixed or sunk costs, that allocation should not  
15 determine or control the final pricing decisions. Other factors can and should be considered.  
16 Two long-recognized policy goals are particularly pertinent to this issue: the promotion of inter-  
17 customer equity and the encouragement of energy conservation. The former objective implies  
18 that small consumers should pay less than large customers, considering differences in their  
19 ability to pay, as well as differences in the aggregate value they receive from using the system.  
20 Few would argue that a single family residence should be taxed the same amount as a hotel; by  
21 the same reasoning, they should not be asked to pay the same amount toward the fixed costs of  
22 the natural gas system they both use.

23 Likewise, high fixed monthly rates do not promote the longstanding goal of energy  
24 conservation. Strictly speaking, conservation will be encouraged by setting a relatively high  
25 price per therm – even if that means setting a customer charge which is below what someone

1 believes is the actual level of customer costs.

2

3 **Q. What did the Commission conclude regarding customer charges in SWG's prior rate**  
4 **case?**

5 A. In the prior rate case, SWG proposed raising various customer charges as an alternative to its  
6 decoupling proposal. [See, Decision 70665, p. 44] Other parties expressed a preference for an  
7 increase customer charge in lieu of decoupling, or as a way of ameliorating the impact of  
8 eliminating declining block rates. The Commission agreed to increase the customer charge, but  
9 not as drastically as proposed by SWG. [Id., p. 46]

10 The Company's proposed 32-percent increase in the residential customer  
11 charge would diminish the ability of many customers to control their gas  
12 bills by engaging in conservation and would undermine the gradualism  
13 concept in setting rates. As we stated in the Company's last rate case,  
14 "[w]e agree with all parties that movement closer to cost-based rates is in  
15 principle a laudable goal. However, that goal must be balanced with  
16 consideration of the principles of gradualism, fairness, and  
17 encouragement of conservation." (Decision No. 68487 at 38.) [Decision  
18 No. 70665, p. 47]  
19

20 **Q. What do you recommend the Commission do regarding customer charges in this**  
21 **proceeding?**

22 A. I recommend the Commission recognize that, contrary to the impression given in the prior case,  
23 fixed costs do not need to be recovered through a fixed monthly fee in order to be consistent  
24 with sound pricing principles. To the contrary, there are valid reasons to recover most fixed  
25 costs through volumetric charges – including the fact that an analogous pricing pattern is  
26 observed in most unregulated markets.

27 Going one step further, I recommend that the Commission consider modestly lowering  
28 SWG's customer charges for all of the reasons I mentioned above. This outcome would be a  
29 further step in the direction established in the previous case when declining block rates were

1 eliminated. It would serve the same purpose as the Company's revenue decoupling proposal,  
2 (encouraging encourage energy conservation), but without the deleterious effects of that  
3 proposal, which I explained earlier in my testimony.  
4

5 **Q. Let's discuss a few other aspects of the Company's rate design, beginning with seasonality.**

6 **Are SWG's rates the same throughout the year?**

7 A. Yes. Aside from the purchased gas recovery rates, all of the Company's rates are constant  
8 throughout the year. Customers pay the same monthly charge and the same rate per therm  
9 during the summer as during the winter, completely ignoring seasonal cost variations. The  
10 existing rate design ignores the fact it is more costly to deliver gas during the peak winter  
11 months than it is during the summer months, when the system is relatively little used. The  
12 incremental cost of going from a small pipe to a large pipe is largely attributable to the  
13 additional usage which occurs during winter months, when heating demand is strongest. Since  
14 extra costs are incurred to accommodate the higher level of demand which occurs during the  
15 peak winter months, it would not be unreasonable to vary rates, so that somewhat higher rates  
16 are charged during the winter.  
17

18 **Q. Is it practical to introduce an element of seasonality into the Company's rate structure?**

19 A. Yes. In fact, unlike real-time pricing and other complex innovations that this Commission has  
20 recently authorized on a pilot basis, seasonal rates would be relatively simple, predictable and  
21 easy for customers to understand. It can be as simple as charging higher rates per therm during  
22 winter months, and lower rates during the remaining months of the year.  
23

24 **Q. Aside from greater consistency with the manner in which costs are incurred, are there**  
25 **other pros and cons to introducing seasonality into the Company's rate structure?**

1 A. Yes. On the positive side of the ledger, seasonal rates could have the salutary effect of further  
2 encouraging energy efficiency, and improving inter-customer equity. The goal of encouraging  
3 energy conservation would potentially be enhanced by strengthening the connection customers  
4 see between increases in their gas usage during the winter and the higher monthly bills they  
5 receive from the Company. This would reinforce the message that consumption matters, and  
6 that actions they take to reduce their gas consumption can potentially save them money.

7 On the negative side of the ledger, seasonal rates would not be popular with some  
8 customers. Customers' bills already increase during the winter as a result of greater gas usage,  
9 and there would undoubtedly be some customers who would be displeased to see any further  
10 increase in the volatility of their winter bill amounts. This could be a significant problem if  
11 nothing is done to ameliorate the volatility, and particularly if the changeover to seasonal rates  
12 were not explained well.

13

14 **Q. Is there anything that could be done to achieve the potential benefits of seasonal rates,**  
15 **without adversely affecting customers who are living on a fixed monthly budget?**

16 A. Yes. In addition to introducing a degree of seasonality to the rate design, the Commission could  
17 also introduce a bill smoothing option, in which customers could opt to pay the gas company a  
18 fixed amount each month, based on one-twelfth their anticipated annual gas usage. Under this  
19 optional program, they would clearly see on their bill the cost of gas used that month, the  
20 amount extra they are paying into their account during the summer (as an advance on future  
21 use), or the amount they are drawing down from their account during the winter months  
22 (thereby recouping amounts previously paid into their account during the summer months).

23 Done correctly, a bill smoothing option would provide customers with the best of both  
24 worlds – monthly bill stability and strong price signals that emphasize how much more it costs  
25 to use large amounts of gas (in the winter) compared to what it costs to use just a little gas

1 (during the summer). These strong price signals would encourage customers to think more  
2 deeply about the option of upgrading their appliances, installing a more efficient heating  
3 system, or adding more insulation to their home or business. And, they would provide  
4 customers who are living on a relatively fixed salary or retirement income with the added  
5 convenience of more easily budgeting for their gas usage.

6

7 **Q. Can you now explain the Company's low income proposal?**

8 A. Yes. As I mentioned earlier, SWG proposes to increase the low income discount by applying it  
9 to all low-income residential consumption during the winter months of November through  
10 April. [Id., p. 11] The current discount is 20%, and applies to the first 150 therms per month  
11 during the winter season. The Company is proposing to provide a 20% discount on all winter  
12 season use. [SWG response to Staff DR 25-1]

13

14 **Q. Do you agree with this aspect of the Company's rate design proposals?**

15 A. No. Adequate justification has not been provided for increasing the discount above the first 150  
16 therms. There are at least two problems with this proposal. First, it increases the total amount  
17 other customers are paying to help low income customers. While this discount program is  
18 serves a useful public purpose, it is not cost-free. While it's natural to visualize only upper  
19 income customers paying for this support, the reality is that middle and working class  
20 customers are also paying for this program. In this regard, it is important to realize that the  
21 current economic difficulties, including severe dislocations in the housing market have  
22 placed many different types of customers, including many members of the middle class, in a  
23 position of unexpected economic distress. It is not at all clear that someone who is  
24 undergoing genuine hardship during these difficult economic times should subsidize the  
25 cost of someone who uses unusually large amounts of gas, merely because the latter

1 customer happens to have an income level falling below the cut-off, whereas they happen to  
2 have income above the cut-off.

3 And, it's important to remember that any definition of "low income" customers is  
4 somewhat arbitrary. It is unavoidably the case that some customers who are just above the  
5 income cut-off are effectively subsidizing those with very similar incomes, who happen to be  
6 just below the cut-off. Anything that is done to expand the magnitude of the low income  
7 discount program will have a tendency to exacerbate this problem.

8 Second, increasing the application of the discount to include even very high levels of  
9 winter usage exacerbates the problem of sending weak energy-conservation signals to low  
10 income customers.

11

12 **Q. Do you have any other concerns with the structure of the low income discount program?**

13 A. Yes. As explained by SWG, the commodity discount is allocated to all non-discounted  
14 residential customers – and only to those customers. [SWG response to Staff DR 3-48] To  
15 the extent SWG offers discounts to low-income customers, I fail to see the logic of insisting  
16 that the cost of that program be borne entirely by the residential customer class.

17

18 **Q. What do you recommend the Commission do regarding SWG's low-income discount?**

19 A. I recommend not expanding the scope of the discount; it should continue to be limited to the  
20 first 150 therms per month. Second, I recommend the Commission require all customer  
21 classes to contribute equitably toward the cost of this program, rather than continuing to  
22 impose the full cost only on residential customers who do not qualify for the discount.

23

24

1     **Q.   Does this conclude your rate design testimony pre-filed on June 24, 2011?**

2     **A.   Yes, it does.**

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Appendix A  
**Qualifications**

***Present Occupation***

**Q. What is your present occupation?**

A. I am a consulting economist and President of Ben Johnson Associates, Inc.®, a firm of economic and analytic consultants specializing in the area of public utility regulation.

***Educational Background***

**Q. What is your educational background?**

A. I graduated with honors from the University of South Florida with a Bachelor of Arts degree in Economics in March 1974. I earned a Master of Science degree in Economics at Florida State University in September 1977. The title of my Master's Thesis is a "A Critique of Economic Theory as Applied to the Regulated Firm." Finally, I graduated from Florida State University in April 1982 with the Ph.D. degree in Economics. The title of my doctoral dissertation is "Executive Compensation, Size, Profit, and Cost in the Electric Utility Industry."

***Clients***

**Q. What types of clients employ your firm?**

A. Much of our work is performed on behalf of public agencies at every level of government involved in utility regulation. These agencies include state regulatory

1 commissions, public counsels, attorneys general, and local governments, among others.  
2 We are also employed by various private organizations and firms, both regulated and  
3 unregulated. The diversity of our clientele is illustrated below.

4

5 Regulatory Commissions

6

- 7 Alabama Public Service Commission—Public Staff for Utility Consumer Protection  
8 Alaska Public Utilities Commission  
9 Arizona Corporation Commission  
10 Arkansas Public Service Commission  
11 Connecticut Department of Public Utility Control  
12 District of Columbia Public Service Commission  
13 Idaho Public Utilities Commission  
14 Idaho State Tax Commission  
15 Iowa Department of Revenue and Finance  
16 Kansas State Corporation Commission  
17 Maine Public Utilities Commission  
18 Minnesota Department of Public Service  
19 Missouri Public Service Commission  
20 National Association of State Utility Consumer Advocates  
21 Nevada Public Service Commission  
22 New Hampshire Public Utilities Commission  
23 North Carolina Utilities Commission—Public Staff  
24 Oklahoma Corporation Commission  
25 Ontario Ministry of Culture and Communications  
26 Staff of the Delaware Public Service Commission  
27 Staff of the Georgia Public Service Commission  
28 Texas Public Utilities Commission  
29 Virginia State Corporation Commission  
30 Washington Utilities and Transportation Commission

- 1 West Virginia Public Service Commission—Division of Consumer Advocate
- 2 Wisconsin Public Service Commission
- 3 Wyoming Public Service Commission

4 Public Counsels

- 5
- 6 Arizona Residential Utility Consumers Office
- 7 Colorado Office of Consumer Counsel
- 8 Colorado Office of Consumer Services
- 9 Connecticut Consumer Counsel
- 10 District of Columbia Office of People's Counsel
- 11 Florida Public Counsel
- 12 Georgia Consumers' Utility Counsel
- 13 Hawaii Division of Consumer Advocacy
- 14 Illinois Small Business Utility Advocate Office
- 15 Indiana Office of the Utility Consumer Counselor
- 16 Iowa Consumer Advocate
- 17 Maryland Office of People's Counsel
- 18 Minnesota Office of Consumer Services
- 19 Missouri Public Counsel
- 20 New Hampshire Consumer Counsel
- 21 Ohio Consumer Counsel
- 22 Pennsylvania Office of Consumer Advocate
- 23 Utah Department of Business Regulation—Committee of Consumer Services

24

25 Attorneys General

- 26
- 27 Arkansas Attorney General
- 28 Florida Attorney General—Antitrust Division
- 29 Idaho Attorney General
- 30 Kentucky Attorney General
- 31 Michigan Attorney General

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Appendix A, Direct Testimony of Ben Johnson, Ph.D.  
On Behalf of Residential Utility Consumer Office  
Docket No. 01345A-08-0172

- 1 Minnesota Attorney General
- 2 Nevada Attorney General's Office of Advocate for Customers of Public Utilities
- 3 South Carolina Attorney General
- 4 Utah Attorney General
- 5 Virginia Attorney General
- 6 Washington Attorney General

7

8 Local Governments

9

- 10 City of Austin, TX
- 11 City of Corpus Christi, TX
- 12 City of Dallas, TX
- 13 City of El Paso, TX
- 14 City of Galveston, TX
- 15 City of Norfolk, VA
- 16 City of Phoenix, AZ
- 17 City of Richmond, VA
- 18 City of San Antonio, TX
- 19 City of Tucson, AZ
- 20 County of Augusta, VA
- 21 County of Henrico, VA
- 22 County of York, VA
- 23 Town of Ashland, VA
- 24
- 25 Town of Blacksburg, VA
- 26 Town of Pecos City, TX

27

1     Other Government Agencies

2

- 3             Canada—Department of Communications  
4             Hillsborough County Property Appraiser  
5             Provincial Governments of Canada  
6             Sarasota County Property Appraiser  
7             State of Florida—Department of General Services  
8             United States Department of Justice—Antitrust Division  
9             Utah State Tax Commission

10

11     Regulated Firms

12

- 13             Alabama Power Company  
14             Americall LDC, Inc.  
15             BC Rail  
16             CommuniGroup  
17             Florida Association of Concerned Telephone Companies, Inc.  
18             LDDS Communications, Inc.  
19             Louisiana/Mississippi Resellers Association  
20             Madison County Telephone Company  
21             Montana Power Company  
22             Mountain View Telephone Company  
23             Nevada Power Company  
24             Network I, Inc.  
25             North Carolina Long Distance Association  
26             Northern Lights Public Utility  
27             Otter Tail Power Company  
28             Pan-Alberta Gas, Ltd.  
29             Resort Village Utility, Inc.  
30             South Carolina Long Distance Association

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Appendix A, Direct Testimony of Ben Johnson, Ph.D.  
On Behalf of Residential Utility Consumer Office  
Docket No. 01345A-08-0172

- 1 Stanton Telephone
- 2 Teleconnect Company
- 3 Tennessee Resellers' Association
- 4 Westel Telecommunications
- 5 Yelcot Telephone Company, Inc.

6

7 Other Private Organizations

8

- 9 Arizona Center for Law in the Public Interest
- 10 Black United Fund of New Jersey
- 11 Casco Bank and Trust
- 12 Coalition of Boise Water Customers
- 13 Colorado Energy Advocacy Office
- 14 East Maine Medical Center
- 15 Georgia Legal Services Program
- 16 Harris Corporation
- 17 Helca Mining Company
- 18 Idaho Small Timber Companies
- 19 Independent Energy Producers of Idaho
- 20 Interstate Securities Corporation
- 21 J.R. Simplot Company
- 22 Merrill Trust Company
- 23 MICRON Semiconductor, Inc.
- 24 Native American Rights Fund
- 25 PenBay Memorial Hospital
- 26 Rosebud Enterprises, Inc.
- 27 Skokomish Indian Tribe
- 28 State Farm Insurance Company
- 29 Twin Falls Canal Company
- 30 World Center for Birds of Prey

31

1 ***Prior Experience***

2

3 **Q. Before becoming a consultant, what was your employment experience?**

4 A. From August 1975 to September 1977, I held the position of Senior Utility Analyst  
5 with Office of Public Counsel in Florida. From September 1974 until August 1975, I  
6 held the position of Economic Analyst with the same office. Prior to that time, I was  
7 employed by the law firm of Holland and Knight as a corporate legal assistant.

8

9 **Q. In how many formal utility regulatory proceedings have you been involved?**

10 A. As a result of my experience with the Florida Public Counsel and my work as a  
11 consulting economist, I have been actively involved in approximately 400 different  
12 formal regulatory proceedings concerning electric, telephone, natural gas, railroad, and  
13 water and sewer utilities.

14

15 **Q. Have you done any independent research and analysis in the field of regulatory  
16 economics?**

17 A. Yes, I have undertaken extensive research and analysis of various aspects of utility  
18 regulation. Many of the resulting reports were prepared for the internal use of the  
19 Florida Public Counsel. Others were prepared for use by the staff of the Florida  
20 Legislature and for submission to the Arizona Corporation Commission, the Florida  
21 Public Service Commission, the Canadian Department of Communications, and the  
22 Provincial Governments of Canada, among others. In addition, as I already mentioned,  
23 my Master's thesis concerned the theory of the regulated firm.

24

1 **Q. Have you testified previously as an expert witness in the area of public utility**  
2 **regulation?**

3 A. Yes. I have provided expert testimony on more than 250 occasions in proceedings  
4 before state courts, federal courts, and regulatory commissions throughout the United  
5 States and in Canada. I have presented or have pending expert testimony before 35  
6 state commissions, the Interstate Commerce Commission, the Federal Communications  
7 Commission, the District of Columbia Public Service Commission, the Alberta, Canada  
8 Public Utilities Board, and the Ontario Ministry of Culture and Communication.

9

10 **Q. What types of companies have you analyzed?**

11 A. My work has involved more than 425 different telephone companies, covering the  
12 entire spectrum from AT&T Communications to Stanton Telephone, and more than 55  
13 different electric utilities ranging in size from Texas Utilities Company to Savannah  
14 Electric and Power Company. I have also analyzed more than 30 other regulated firms,  
15 including water, sewer, natural gas, and railroad companies.

16

17 *Teaching and Publications*

18

19 **Q. Have you ever lectured on the subject of regulatory economics?**

20 A. Yes, I have lectured to undergraduate classes in economics at Florida State University  
21 on various subjects related to public utility regulation and economic theory. I have also  
22 addressed conferences and seminars sponsored by such institutions as the National  
23 Association of Regulatory Utility Commissioners (NARUC), the Marquette University  
24 College of Business Administration, the Utah Division of Public Utilities and the  
25 University of Utah, the Competitive Telecommunications Association (COMPTEL), the

1 International Association of Assessing Officers (IAAO), the Michigan State University  
2 Institute of Public Utilities, the National Association of State Utility Consumer  
3 Advocates (NASUCA), the Rural Electrification Administration (REA), North Carolina  
4 State University, and the National Society of Rate of Return Analysts.

5

6 **Q. Have you published any articles concerning public utility regulation?**

7 **A.** Yes, I have authored or co-authored the following articles and comments:

8

9 "Attrition: A Problem for Public Utilities—Comment." *Public Utilities Fortnightly*,  
10 March 2, 1978, pp. 32-33.

11

12 "The Attrition Problem: Underlying Causes and Regulatory Solutions." *Public Utilities*  
13 *Fortnightly*, March 2, 1978, pp. 17-20.

14

15 "The Dilemma in Mixing Competition with Regulation." *Public Utilities Fortnightly*,  
16 February 15, 1979, pp. 15-19.

17

18 "Cost Allocations: Limits, Problems, and Alternatives." *Public Utilities Fortnightly*,  
19 December 4, 1980, pp. 33-36.

20

21 "AT&T is Wrong." *The New York Times*, February 13, 1982, p. 19.

22

23 "Deregulation and Divestiture in a Changing Telecommunications Industry," with  
24 Sharon D. Thomas. *Public Utilities Fortnightly*, October 14, 1982, pp. 17-22.

25

- 1           “Is the Debt-Equity Spread Always Positive?” *Public Utilities Fortnightly*,  
2           November 25, 1982, pp. 7-8.
- 3
- 4           “Working Capital: An Evaluation of Alternative Approaches.” *Electric Rate-Making*,  
5           December 1982/January 1983, pp. 36-39.
- 6
- 7           “The Staggers Rail Act of 1980: Deregulation Gone Awry,” with Sharon D. Thomas.  
8           *West Virginia Law Review*, Coal Issue 1983, pp. 725-738.
- 9
- 10          “Bypassing the FCC: An Alternative Approach to Access Charges.” *Public Utilities*  
11          *Fortnightly*, March 7, 1985, pp. 18-23.
- 12
- 13          “On the Results of the Telephone Network's Demise—Comment,” with Sharon D.  
14          Thomas. *Public Utilities Fortnightly*, May 1, 1986, pp. 6-7.
- 15
- 16          “Universal Local Access Service Tariffs: An Alternative Approach to Access  
17          Charges.” In *Public Utility Regulation in an Environment of Change*, edited by  
18          Patrick C. Mann and Harry M. Trebing, pp. 63-75. Proceedings of the Institute of  
19          Public Utilities Seventeenth Annual Conference. East Lansing, Michigan: Michigan  
20          State University Public Utilities Institute, 1987.
- 21
- 22          With E. Ray Canterbery. Review of *The Economics of Telecommunications: Theory*  
23          *and Policy* by John T. Wenders. *Southern Economic Journal* 54.2 (October 1987).
- 24

1            “The Marginal Costs of Subscriber Loops,” A Paper Published in the Proceedings of  
2            the Symposia on Marginal Cost Techniques for Telephone Services. The National  
3            Regulatory Research Institute, July 15-19, 1990 and August 12-16, 1990.

4

5            With E. Ray Canterbery and Don Reading. “Cost Savings from Nuclear Regulatory  
6            Reform: An Econometric Model.” *Southern Economic Journal*, January 1996.

7

8            ***Professional Memberships***

9

10          **Q.    Do you belong to any professional societies?**

11          A.    Yes. I am a member of the American Economic Association.

12

**SOUTHWEST GAS CORPORATION**  
**DOCKET NO. G-01551A-10-0458**  
**TABLE OF CONTENTS TO BJ SCHEDULES**

**SCHEDULE #**

BJ - 8	ALLOCATION METHODOLOGY COMPARISON
BJ - 9	RECOMMENDED REVENUE DISTRIBUTION
BJ - 10	ALTERNATIVE CUSTOMER CHARGE CALCULATIONS

SOUTHWEST GAS CORPORATION  
 ADJUSTED TEST YEAR ENDED JUNE 30, 2010  
 ALLOCATION METHODOLOGY COMPARISON  
 50/50 PEAK AND CUSTOMERS VS. 50/50 PEAK AND GAS USAGE  
 RATES OF RETURN AT PRESENT RATES

DOCKET NO. G-01551A-10-0458  
 SCHEDULE BJ-8

LINE NO.	Customer Class	Peak and Customers ROR	Peak and Usage ROR
1	Single Family Residential	2.32%	4.84%
2	Multi Family Residential	1.50%	7.30%
3	MMMHP	15.66%	6.68%
4	Small General	10.98%	17.30%
5	Medium General	8.16%	4.51%
6	Large-1 General	17.33%	6.41%
7	Large-2 General	7.64%	1.46%
8	Transportation Eligible	12.37%	0.81%
9	Air Conditioning	16.08%	-0.88%
10	Street Lighting	1.78%	2.35%
11	Compression on Customer's Premises	12.71%	1.12%
12	Electric Generation	8.87%	-1.48%
13	Small Essential Agricultural	10.36%	1.75%
14	Natural Gas Engines	23.95%	2.21%
15	<b>Total</b>	<b>4.47%</b>	<b>4.47%</b>

**SOUTHWEST GAS CORPORATION  
 ADJUSTED TEST YEAR ENDED JUNE 30, 2010  
 RECOMMENDED REVENUE DISTRIBUTION  
 ASSUMING PROPOSED REVENUE REQUIREMENT**

**DOCKET NO. G-01551A-10-0458  
 SCHEDULE BJ-9**

LINE NO.	Customer Class	Current Margin	Recommended Increase Percent	Recommended Increase Dollars	Recommended Margin
1	Single-Family Residential Gas Service	\$260,896,069	7.10%	\$18,531,597	\$279,427,666
2	Multi-Family Residential Gas Service	\$6,914,441	4.26%	\$294,682	\$7,209,123
3	Single-Family Low Income Residential Gas Service	\$8,921,577	7.10%	\$633,705	\$9,555,282
4	Multi-Family Low Income Residential Gas Service	\$676,150	4.26%	\$28,816	\$704,966
5	Special Residential Gas Service for Air Conditioning	\$58,822	14.21%	\$8,356	\$67,178
6	Master Metered Mobile Home Park Gas Service	\$863,947	4.26%	\$36,820	\$900,767
<u>General Gas Service</u>					
7	Small	\$7,908,814	4.26%	\$337,061	\$8,245,875
8	Medium	\$22,579,171	7.10%	\$1,603,811	\$24,182,982
9	Large-1	\$43,845,416	4.26%	\$1,868,619	\$45,714,035
10	Large-2	\$11,254,459	14.21%	\$1,598,821	\$12,853,280
11	Transportation Eligible	\$21,689,599	14.21%	\$3,081,249	\$24,770,848
12	Optional Gas Service	\$4,024,536	4.26%	\$171,519	\$4,196,055
13	Air Conditioning Gas Service	\$82,169	14.21%	\$11,673	\$93,842
14	Street Lighting Gas Service	\$53,386	14.21%	\$7,584	\$60,970
<u>Compression on Customer's Premises</u>					
15	Residential	\$17,094	14.21%	\$2,428	\$19,522
16	Small	\$24,227	14.21%	\$3,442	\$27,669
17	Large	\$818,366	14.21%	\$116,258	\$934,624
18	Electric Generation Gas Service	\$2,982,640	14.21%	\$423,717	\$3,406,357
19	Small Essential Agriculture User Gas Service	\$727,284	14.21%	\$103,319	\$830,603
20	Natural Gas Engine Gas Service	\$1,713,984	14.21%	\$243,491	\$1,957,475
21	Total Sales and Full Margin Transportation	\$396,052,151		\$29,106,969	\$425,159,120
22	Special Contract Service	\$2,763,591	4.26%	\$117,780	\$2,881,371
23	Other Operating Revenue	\$12,096,356	0.00%	\$-	\$12,096,356
24	Total Arizona Revenue	\$410,912,098		\$29,224,749	\$440,136,847
25	Total Margin Requirement			\$29,224,749	
26	Over/(Under) Requirement			\$ (0)	

SOUTHWEST GAS CORPORATION  
ADJUSTED TEST YEAR ENDED JUNE 30, 2010  
ALTERNATIVE CUSTOMER CHARGE CALCULATIONS

DOCKET NO. G-01551A-10-0458  
SCHEDULE BJ-10

<u>LINE NO.</u>		<u>Amount</u>
	CUSTOMER ACCOUNTS EXPENSES	
1	901-Supervision	\$2,543,953
2	902-Meter Reading Expense	1,964,231
3	903-Cust Records & Coll Exp	26,084,848
4	Customer Costs	\$30,593,032
5	Test Year Adjusted Number of Bills	\$11,738,902
6	Customer Charge (Line 10/Line 11)	\$2.61