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July 15, 2013

***VIA ELECTRONIC FILING AND FIRST CLASS MAIL***

Public Utility Commission of Oregon  
550 Capitol Street, NE, Suite 215  
Post Office Box 2148  
Salem, Oregon 97308-2148

Attention: Filing Center

Re: UM 1654 – Investigation of Interstate Storage and Optimization Sharing

Northwest Natural Gas Company, dba NW Natural (“NW Natural” or “Company”), files herewith its Direct Testimony in the above-captioned docket. Enclosed are an original and five copies.

A copy of this filing has been served on all parties to this proceeding as included on the enclosed Certificate of Service.

Please call me if you have questions.

Sincerely,

*/s/ Mark R. Thompson*

Mark R. Thompson  
Manager, Rates & Regulatory Affairs

Enclosure

cc: Service List



**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing DIRECT TESTIMONY OF NW NATURAL, upon all parties of record in the UM 1654 proceeding by electronic mail.

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DATED at Portland, Oregon, this 15th day of July 2013.

/s/ Kelley C. Miller  
Kelley C. Miller  
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NW NATURAL

BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON

**UM 1654**

**NW Natural**

**Direct Testimony of Keith White**

July 15, 2013

**EXHIBIT 100 – DIRECT TESTIMONY – INTERSTATE STORAGE AND OPTIMIZATION**

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1 I. INTRODUCTION AND SUMMARY  
2

3 **Q. Please state your name and position with Northwest Natural Gas Company (“NW  
4 Natural” or “the Company”).**

5 A. My name is Keith White. I am Vice President of Business Development and Energy  
6 Supply, and the Company’s Chief Strategic Officer.

7 **Q. Please summarize your educational background and business experience.**

8 A. I joined NW Natural in 1996 and I have served in my current position since 2007. Prior to  
9 joining NW Natural, I was employed for 20 years at Portland General Electric. I have an  
10 undergraduate degree in Business from Oregon State University.

11 **Q. What is the purpose of this docket?**

12 A. The Public Utility Commission of Oregon (“Commission” or “OPUC”) opened this docket  
13 in accordance with the Commission-approved stipulation filed in the Company’s last  
14 general rate case. In that case, UG 221, several of the parties questioned the sharing  
15 arrangements applied to the Company’s Mist storage services (“Storage Services”) and  
16 to resource optimization activities (“Optimization Activities”) under the Company’s  
17 Schedule 185 and Schedule 186. Rather than litigating the issues in UG 221, the parties  
18 reached a settlement that extended the current sharing arrangement for another year  
19 and called for a separate docket to evaluate the Schedule 185 and 186 sharing  
20 arrangements with a decision to be issued in the docket by the end of 2013.

21 **Q. What is the purpose of your testimony?**

22 A. The purpose of my testimony is to describe the activities that are conducted under  
23 Schedules 185 and 186, and the market and other conditions that gave rise to their

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1 development. I will also discuss the sharing arrangement prescribed in those schedules,  
2 and will provide and justify NW Natural's recommendation that the Commission affirm  
3 the current sharing arrangements in both Schedule 185 and 186. Randy Friedman, who  
4 is also providing testimony on behalf of the Company in this docket, will provide more  
5 detailed explanations of the Company's Storage Services and Optimization Activities.

6 **Q. Please summarize your testimony.**

7 A. NW Natural first became involved in the activities conducted under Schedule 185 and  
8 186 as a means to expand and optimize utility resources beyond what would otherwise  
9 occur in the normal course of business. Initially, the Company invested shareholder  
10 dollars to expand the then existing Mist storage capacity, as a means of creating value  
11 for its investors while at the same time benefiting utility customers through sharing and  
12 the ability to recall pre-built capacity on an as-needed basis and at depreciated cost.  
13 The Company next developed its optimization activities – through contracting with third-  
14 party wholesale traders - in order to create further value from resources in its gas supply  
15 portfolio.

16 The sharing arrangements for the revenues flowing from NW Natural's Storage  
17 Services and Optimization Activities were agreed to by Staff and the Company as fairly  
18 compensating NW Natural's shareholders and customers for their respective  
19 contributions. In particular, the sharing for NW Natural's Mist Storage Services - which  
20 is set at 20% customers/80% Company - is intended to recognize the fact that the  
21 incremental investment to provide these services was provided by shareholders, while  
22 providing customers with benefits to reflect the shared use of certain rate-based  
23 investments. The sharing for the Optimization Activities - which is set at 67%

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1 customers/33% Company on resources in customer rates and 20% customers/80%  
2 Company on resources not in customer rates - is intended to compensate the Company  
3 for the increased complexity and risks these more speculative activities impose on  
4 shareholders, while at the same time recognizing the fact that most of the resources  
5 relied upon are paid for in customer rates.

6 Customers have benefitted significantly from NW Natural's Storage Services and  
7 Optimization Activities. First, since 2000, customers have received a total of \$80 million  
8 in credits under Schedules 185 and 186. In addition, customers have received a very  
9 substantial benefit provided by the ability to recall the portions of the expanded Mist  
10 storage in increments as needed, and at a depreciated book cost. ***And importantly,***  
11 ***customers have received all of these benefits with no additional cost or risk.***

12 The Company believes the current sharing arrangements are fair to all parties  
13 and should be continued. Customers have benefitted while at the same time the sharing  
14 has provided the Company with sufficient incentive to take on the complexity and risks  
15 associated with this discretionary activity. Moreover, the Company's research suggests  
16 that the sharing percentages are consistent with comparable arrangements adopted for  
17 other LDCs. For these reasons, the Company requests that the Commission make no  
18 changes to the existing sharing under Schedules 185 and 186.

19 **II. NW NATURAL'S MIST STORAGE AND PIPELINE OPTIMIZATION ACTIVITIES**

20 **A. NW Natural's Development of Storage Services and Optimization Activities**

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1 **Q. Please explain the circumstances under which the Company first became**  
2 **engaged in the Storage Services and Optimization Activities that are the subject of**  
3 **Schedules 185 and 186.**

4 A. As historical context, I would like to first note that Mist storage was originally developed  
5 from within the utility and was initially fully dedicated to serving core utility customers  
6 (our utility customers who purchase firm sales service). Mist storage utilizes depleted  
7 gas reservoirs located near Mist, Oregon. The original utility storage and related  
8 pipeline development went into service in 1989. The Company completed subsequent  
9 Mist expansions for utility customers in 1991, 1997 and 1999. All of these expansions  
10 were for the sole purpose of serving core customers, and accordingly, the capital costs  
11 of these pre-2000 expansions were included in utility rate base.

12 In the late 1990's, the Company began to perceive that there was a potential  
13 business opportunity to develop additional Mist storage for the purpose of serving the  
14 broader Pacific Northwest regional market. We talked with prospective regional  
15 wholesale customers as well as companies in the storage business in other parts of  
16 North America. This early exploration supported our view that a need existed in the  
17 market for which the Company could compete to serve on a non-utility basis.

18 In considering how to proceed, the Company identified two fundamentally  
19 different options. It could either 1) develop an entirely new set of storage facilities  
20 outside of the utility through a subsidiary under full FERC jurisdiction; or 2) develop  
21 incremental capacity from within the utility, with FERC review limited to the interstate  
22 storage services being provided. After discussions with OPUC staff, the Company  
23 decided to pursue the second course of action. By taking the incremental investment  
24 approach, NW Natural was able to leverage sunk costs and avoid construction of

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1 unnecessarily duplicative facilities. The Company's view was that the new potential non-  
2 utility revenues could be used to not only cover its incremental investment and operating  
3 costs, but also could be partially shared with core utility customers to help offset some of  
4 the sunk costs already imbedded in their rates. Moreover, core utility customers would  
5 benefit from the Company's early development of additional Mist storage capacity by  
6 having the ability to recall the storage capacity in the future at a depreciated cost, when  
7 it is needed to serve them.

8 To realize this plan, the Company first reached agreement on how the new non-  
9 utility margin revenues would be shared with core utility customers with the OPUC staff  
10 and other parties. It then sought and was granted regulatory authority from the Federal  
11 Energy Regulatory Commission ("FERC") under Part 284.224 of the Federal Code to  
12 utilize new, non-rate base assets to provide storage services in interstate commerce  
13 (also referred to as "interstate storage service"). With these regulatory approvals in  
14 place, the Company then invested shareholder dollars to add capacity at Mist in 2001,  
15 with subsequent shareholder investments for additional expansions in 2004, 2005 and  
16 2007. To date, these non-rate base investments have totaled over \$65 million (original  
17 investments before depreciation and any recall by the utility).<sup>1</sup> More recently, Rate  
18 Schedule 80 was approved by the Commission to provide Mist storage services to  
19 customers that desire to receive such service wholly within the state of Oregon (also  
20 referred to as "intrastate storage service").

21 **Q. How did the Company become involved in Optimization Activities?**

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<sup>1</sup> To date seven reservoirs have been developed for storage use with total working gas of 16 billion cubic feet (Bcf), of which only 10 Bcf needs to be reserved for core utility requirements.

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1 From discussions with other companies already in the storage business, the Company  
2 learned that “optimization” was important to the storage business activity in order to  
3 maximize storage value. Thus, in order to take full advantage of its existing and planned  
4 investments the Company decided to optimize its storage capacity through wholesale  
5 trading.<sup>2</sup> In the early years, these Optimization Activities included the sale and trading of  
6 excess gas, existing Mist storage, and excess capacity on upstream pipeline contracts  
7 on the Northwest Pipeline (“NWP”) and other upstream pipeline systems. Later, as  
8 opportunities arose, we added new wholesale trading activities such as the exchange of  
9 gas commodity contract purchases at different trading locations (“portfolio” optimization),  
10 the use of off-system underground storage contracts at Jackson Prairie and in Alberta,  
11 and the extraction of natural gas liquids (“NGLs” or just “liquids”).

12 **Q. Did the Company have the in-house expertise necessary to successfully**  
13 **undertake these Optimization Activities?**

14 A. No, we did not. As a Local Distribution Company (“LDC”), our focus and expertise was  
15 and still is dedicated to acquiring gas and meeting the more direct needs of our  
16 customers. While these typical gas utility activities require very significant knowledge  
17 and skill, they are qualitatively different from the much more complicated and speculative  
18 Optimization Activities which will be discussed in more detail in Mr. Friedman’s  
19 testimony. For this reason, the Company decided to contract with a third-party  
20 wholesale natural gas trading company to partner with on these new Optimization  
21 Activities. The specific third-party entity used by the Company has changed over the

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<sup>2</sup> At this point in time the Company established a separate business segment for SEC reporting to conduct the Storage Services and Optimization activities—in recognition of the fact that they are different in nature from the typical activities undertaken by the utility.

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1 years, but is currently Tenaska Marketing Ventures. The Company has found it  
2 important to work with a national marketing/trading company because they have the  
3 capability and expertise required to maximize the value of these Optimization Activities,  
4 as well as the regulatory understanding to avoid potential pitfalls. However it is  
5 important to note that prior to making resources available to the third-party, the  
6 Company first optimizes what it can by itself and passes any savings to customers  
7 through the normal PGA sharing mechanism. Beginning in 2010 the Company has  
8 effectuated the third party optimization agreement through an Asset Management  
9 Agreement (“AMA”) structure, an arrangement that some other natural gas LDCs have  
10 similarly begun to employ.

11 **B. The Development of the Current Sharing Arrangements**

12 **Q. How did the Commission determine the allocation of profits from the Storage**  
13 **Services and Optimization Activities?**

14 A. NW Natural met with Staff and the customer groups and presented several alternative  
15 sharing arrangements. After discussion, the parties agreed to the sharing allocations  
16 reflected in Schedules 185 and 186, and upon Staff’s recommendation they were  
17 approved by the Commission.

18 **Q. What sharing arrangement was agreed to for the expanded interstate and**  
19 **intrastate storage service at Mist, which is provided using primarily shareholder-**  
20 **funded assets?**

21 The parties agreed that the sharing should be set on a 20/80 basis, with 20 percent of  
22 net margin shared with customers, and 80 percent retained by the Company. The  
23 parties agreed that these sharing percentages were reasonable to compensate

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1 customers for the use of certain assets that were in rate base in order to accomplish  
2 what was otherwise an entirely shareholder funded endeavor. The Company was  
3 pleased with the opportunity to expand its non-utility business, and Staff and  
4 stakeholders were pleased with an arrangement that allowed them to benefit without  
5 incurring cost or risk.

6 **Q. What sharing was agreed to for the Optimization Activities using resources that**  
7 **are included in customer rates?**

8 A. Initially, the parties agreed to the same 20/80 sharing for Optimization Activities as those  
9 applicable to Storage Services. This was because when the Company first began this  
10 activity in 2000 it expected any margin from its Optimization Activities to be small and to  
11 come primarily from Mist storage. However, after the first year of experience, the  
12 Company discovered that the opportunity for optimization of other resources was greater  
13 than expected. This fact highlighted an important issue for the Company; unlike the  
14 interstate and intrastate Mist storage services, which were funded with shareholder  
15 dollars, the majority of the Company's Optimization Activities leverage resources that are  
16 included in customer rates. In light of this fact, the Company felt that it was  
17 inappropriate for shareholders to retain the majority of income from Optimization  
18 Activities. Consequently, NW Natural approached Commission Staff and the consumer  
19 groups about amending the sharing agreement to increase customers' share for  
20 optimization of resources in customer rates from 20% (20/80) to 67% (67/33). This  
21 adjustment was intended to significantly increase the benefits to customers while  
22 maintaining an appropriate and necessary incentive for NW Natural to continue these  
23 optimization activities and seek new opportunities, and thus ensure that the "win/win"  
24 sharing arrangement remained fair and durable over time.

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1           In addressing the increase, the Company specifically requested that customers  
2 receive 67% because, at that time, that allocation matched the weighted average cost of  
3 gas (“WACOG”) sharing percentage adopted for the Purchased Gas Adjustment  
4 arrangement (“PGA”) for its internal normal utility optimization of gas supply resources.  
5 Matching the 67% WACOG sharing was important because the Optimization Activities  
6 were at their infancy, and the Company felt by using the PGA sharing percentage, it  
7 could eliminate any concerns of potential gamesmanship regarding classification of  
8 activities as Optimization Activities versus normal utility gas supply WACOG savings.  
9 The Company also felt that the 33% retention by shareholders still provided a sufficient  
10 incentive. Today, it is well established which activities fall within each category  
11 (Optimization Activities vs. normal WACOG savings), primarily because the Optimization  
12 Activities are conducted under the AMA; nevertheless, the increase of the customer  
13 sharing up to 67% has remained in place as a significant customer benefit.

14 **Q. Please describe how these sharing arrangements are reflected in the Company’s**  
15 **tariff schedules.**

16 A. The two relevant tariff schedules are Schedule 185 and Schedule 186. Schedule 185,  
17 which I will address first, is titled “Special Annual Interstate and Intrastate Storage and  
18 Transportation Credit,” and applies to the Company’s firm sales service customers  
19 whose rates include costs related to the Mist Storage facility. Under Schedule 185,  
20 customers receive a credit for the Oregon share of net margins received by the  
21 Company for (a) interstate storage and related transportation services provided under  
22 FERC jurisdiction; (b) intrastate storage activities and related transportation services  
23 under Rate Schedule 80; and (c) optimization of total Mist storage capacity (core and  
24 non-utility allocated in accordance with the schedule).

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1 **Q. How are these revenues allocated under Schedule 185?**

2 A. Schedule 185 provides that NW Natural will share with eligible customers the net margin  
3 received from non-utility interstate and intrastate storage services on a 20/80 basis, with  
4 20 percent to be credited to customers, and 80 percent to be retained by NW Natural. In  
5 addition, Schedule 185 provides that NW Natural will also share with eligible customers  
6 the net margin that is attributable to optimization of Mist storage capacity (i.e.,  
7 deliverability). Net margins from Mist storage optimization are shared (a) 20/80 for the  
8 proportion of non-utility Mist capacity not included in the rates and, (b) 67/33 for the  
9 proportion of core Mist capacity that is included in the rates, with 67 percent being  
10 credited to customers and 33 percent being retained by NW Natural.

11 **Q. Please describe Schedule 186.**

12 A. Schedule 186, which is titled "Special Annual Core Pipeline Capacity Optimization  
13 Credit," applies to firm and interruptible sales service customers whose rates include  
14 costs related to upstream pipeline capacity. The purpose of Schedule 186 is to credit  
15 eligible customers with the Oregon share of net margins received by NW Natural for the  
16 optimization of core customer pipeline capacity, which includes all off-system pipeline  
17 capacity, commodity, liquids extraction, and storage capacity. Schedule 186 does not  
18 apply to optimization of those portions of Mist storage that is included in customer rates.

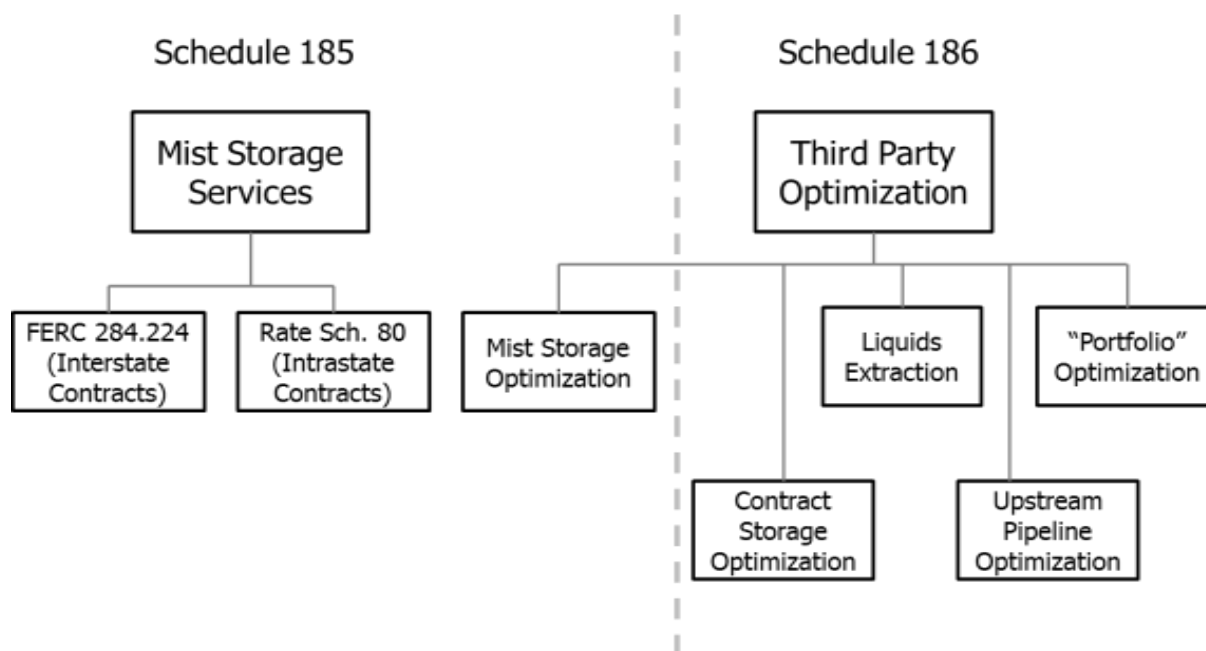
19 **Q. How are revenues allocated under Schedule 186?**

20 A. Schedule 186 provides that NW Natural will share with eligible customers the net margin  
21 attributable to this third party optimization for the entire portfolio of upstream capacity  
22 contracts. Specifically, under Schedule 186 the Company will share net revenues with  
23 its firm and interruptible sales customers on a 67/33 basis, with 67 percent to be credited  
24 to customers 33 percent to be retained by NW Natural.

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- 1 **Q. Can you summarize the activities that are governed by Schedules 185 and 186?**  
2 A. Yes. The following figure depicts how the various activities relate to Schedule 185 and  
3 Schedule 186:  
4

### Schedule 185 and 186 Activities



- 5  
6 The above figure shows that Mist storage is the source for all of the Schedule 185  
7 credits while the other gas resources in the Company's portfolio (supply, pipeline and  
8 storage contracts) are the source for the Schedule 186 credits.

- 9 **Q. Are the sharing percentages reflected in current Schedules 185 and 186 the same**  
10 **sharing percentages initially approved by the Commission?**

- 11 A. Yes.  
12 ///

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1 and ten years. Consequently, in most years there is a roll-over of capacity that needs to  
2 be re-contracted at whatever the new prevailing market price is at the time.<sup>3</sup>

3 Because the Company has always been required to discount its FERC cost-  
4 based rate to meet market prices, the difficulty is not in *whether* the capacity can be  
5 sold, but rather *at what price*. This fact, which significantly affects the profitability of this  
6 business activity, is illustrated in my Exhibit NWN/101, White/1 CONFIDENTIAL, which  
7 is taken from the 2011 Interstate Storage report filed with the Commission. As shown, in  
8 2011, the Company had capacity that it was forced to re-contract at a significant  
9 discount. My Exhibit NWN/102, White/1 CONFIDENTIAL shows how steep this discount  
10 had to be relative to the average price of its prior year contracts.

11 Further compounding these risks is the fact that the intrinsic and extrinsic trading  
12 values related to gas storage have declined dramatically over the last few years. This  
13 precipitous drop in storage values is due to the shale gas supply that has swept  
14 throughout the country. This abundant supply has not only lowered gas commodity  
15 prices, but, more importantly to storage values, has also depressed market volatility. In  
16 addition, the national recession has slowed economic growth and, with the possible  
17 exception of electric generation fuel switching, forestalled any hope for a tightening in  
18 the supply/demand balance over the next few years. As a result, new storage

---

<sup>3</sup> Staggered and short-term contract durations are an essential component to the Company's ability to "recall" Mist capacity when needed for core customer load growth. Even if longer-term contracts at a particular point in time could yield better rates, the Company needs to forego some of that opportunity in order to preserve the recall option. Accordingly, some amount of rate discounting is unavoidable.

1 development has slowed drastically and re-contracting risk on existing projects has  
2 increased.

3 In addition to these current and ongoing risks, Mist Storage Service had historical  
4 risks associated with the development of the storage reservoirs. These risks included  
5 permitting delays and variations in construction costs.

6 **Q. How has NW Natural managed risks associated with Optimization?**

7 A. The Company has managed these risks by balancing a willingness to engage in  
8 innovative transactions with a commitment to do so only when the transactions present  
9 reasonable and manageable risks. As I discussed above, NW Natural has chosen to  
10 manage the trading risks inherent in this activity by using an AMA structure with a third  
11 party gas marketer. This arrangement has also broadened the opportunities available to  
12 the Company.

13 Specifically, with respect to FERC compliance risks, the Company maintains a  
14 number of governance and oversight mechanisms, coupled with annual training to  
15 reinforce what forms of transaction structures are acceptable.

16 **III. BENEFITS TO CUSTOMERS AND SHAREHOLDERS UNDER CURRENT**  
17 **SHARING ARRANGEMENTS**

18  
19 **Q. What have been the results for shareholders and customers under the Schedule**  
20 **185 and Schedule 186 sharing arrangements?**

21 A. In Northwest Natural's view, the sharing arrangements have worked well and as  
22 intended. For Storage Services covered by Schedule 185, the sharing arrangement was  
23 intended to provide a sufficient profit opportunity to justify the Company's at-risk,

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1 discretionary, investment of over \$65 million to expand the Mist facilities. While returns  
2 have varied from year-to-year depending on market conditions, so far it has been a good  
3 investment for shareholders. In addition, customers have received 20 percent of the net  
4 pre-tax income from investments and activities funded exclusively by shareholders and  
5 customers have been able to recall this pre-built Mist capacity when needed at a  
6 depreciated value, sized in the amounts needed, and without any of the risks typically  
7 associated with storage development.

8 For Optimization under Schedule 185 and Schedule 186, the sharing  
9 arrangement was intended to provide a sufficient profit opportunity to justify the  
10 Company taking on the more speculative Optimization Activities and their associated  
11 incremental costs and risks. The majority of margin is derived from optimizing resource  
12 contracts, which are not included in rate base. Because the costs of these contracts are  
13 passed through to customers and do not earn a return, sharing is necessary to incent  
14 shareholders to take on the added risks associated with the discretionary Optimization  
15 Activities. Under the existing sharing arrangement, Customers receive the majority of  
16 the optimization margin without any exposure to additional risk or incremental costs, and  
17 the Company is incented to continue these activities.

18 **Q. Specifically, how have customers benefitted?**

19 A. Customers have received a cumulative \$80 million in credits since 2000.

20 For Mist Storage Services, there is an additional and significant customer benefit  
21 because the Company has been and will continue to be able to recall Mist storage to  
22 meet customers' actual demand needs in smaller capacity increments as the need  
23 arises. By recalling smaller portions of storage that the Company has pre-built,  
24 customers avoid paying for excess capacity that is not needed. In addition, because the

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1 expanded storage has already been constructed, customers are not exposed to the  
2 permitting and development costs and risks. And once the storage resource is recalled  
3 for customer use, the resource goes into rates at depreciated book cost, not the actual  
4 costs to construct.

5 **Q. Has Staff recognized these benefits in the past?**

6 A. Yes. When the Commission approved Schedule 185, Staff's public meeting  
7 memorandum stated that Schedule 185's sharing arrangement "reasonably  
8 compensated customers for costs incurred for the use of utility facilities for non-regulated  
9 activities."<sup>4</sup> Staff also identified several customer benefits, including:

10  
11 At the time the storage asset is added to rate base, it is at  
12 a depreciated cost, subject to Commission review and  
13 approval. Therefore, core customers are charged less for  
14 the asset than they otherwise would be.

15  
16 \* \* \*

17 Core customers get the benefit of greater future storage  
18 resource certainty. The reservoirs at Mist that have been  
19 produced out, but are not yet used for storage, suffer from  
20 water encroachment, which reduces such reservoirs'  
21 available working gas inventory capability. Earlier storage  
22 development of such reservoirs will help mitigate  
23 degradation of these reservoirs' potential capacity.

24  
25 \* \* \*

26 If there is no net margin for a year, core customers do not  
27 have a negative credit, but instead have a zero adjustment  
28 to rates; NW Natural's shareholders would realize no gain  
29 or take a loss. Even though the core customers do not  
30 directly benefit by way of the credit if there is no net margin  
31 to share, these customers still benefit because of the other  
32 benefits discussed above. If the net margin is positive,  
33 core customers are credited 20 percent of the net margin  
34 before income taxes.<sup>5</sup>

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<sup>4</sup> Staff Memorandum dated April 18, 2000 from April 25, 2000 public meeting.

<sup>5</sup> *Id.*

1           **IV.     REASONABLENESS OF CURRENT SHARING PERCENTAGES**

2   **Q.     Do you believe that the overall sharing arrangements for Mist Storage Services**  
3       **and Optimization Activities - *together as a package* - are reasonable?**

4   A.     Yes. Overall, and together, the sharing arrangements are reasonable.

5   **Q.     Specifically with regard to Storage Services, do you believe that the current**  
6       **sharing arrangement is reasonable?**

7   A.     The sharing percentages themselves are reasonable; however, customers receive  
8       significantly more benefit from the Storage Services than their share of the operating  
9       margins alone. In addition to the revenue sharing benefit customers have received  
10      significant benefits from having flexible Mist recall. This arrangement has allowed them  
11      the unique opportunity of paying for storage only in small increments, as it is needed,  
12      and at a depreciated price. Consequently, looking at the arrangement in hindsight, one  
13      could conclude that the 20 percent customer sharing on Mist Storage Services - together  
14      with the benefits of recall - may actually over-compensate customers for the value they  
15      have provided.

16   **Q.     Is the Company requesting a change to the sharing arrangement related to**  
17       **Storage Services?**

18   A.     No. The current sharing arrangement was in place when the shareholders invested over  
19      \$65 million and the Company expectations were that these terms would remain in place.  
20      A deal is a deal, and the Company feels it is appropriate to continue the arrangement  
21      that was negotiated. However, if the Commission were inclined to revisit the sharing  
22      arrangements on Optimization Activities, the Company believes that it would also need  
23      to consider whether the Company percentage for Storage Services should be adjusted

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1 to recognize the benefit to customers associated with flexible recall - which we believe is  
2 undervalued in the current sharing percentage.

3 **Q. Do you believe that the 67/33 sharing arrangement related to Optimization**  
4 **Activities of resources included in customer rates is balanced and reasonable?**

5 A. Yes. From the Company's perspective the current sharing structure provides sufficient  
6 incentive for the Company's shareholders to assume the complexity and risks  
7 associated with these activities while at the same time the sharing provides that the  
8 majority of the benefit goes back to customers.

9 In addition, the majority of net revenues generated by the Company's  
10 Optimization Activities derive from the optimization of resource contracts on which the  
11 Company does not earn a return. Therefore, a results-based incentive structure, such  
12 as the current sharing arrangement, is the only way for the Company to justify to its  
13 shareholders that the discretionary risks and costs that the Optimization Activities entail  
14 are worthwhile. Indeed, the only Optimization Activity related to a resource that is  
15 included in the Company's rate base is the Mist storage optimization, and only a portion  
16 of that investment is in utility rate base, with the remainder associated with  
17 interstate/intrastate capacity that is not included in rate base.

18 **Q. Are there any reference points in Commission precedent that support the**  
19 **Company's view that the current sharing percentages are appropriate?**

20 A. Yes, there are two available reference points:

- 21 • **The PGA:** Under the PGA, the Company has the option of either selecting 80/20  
22 or 90/10 sharing. This sharing is designed to serve two purposes: 1) risk  
23 mitigation for Company shareholders for market price volatility and 2) as an

1 incentive to encourage the Company to secure the lowest prices for customers  
2 consistent with its obligation to provide safe and reliable service.

- 3 • **Pipeline capacity release:** Under Schedule P, there is an 80/20 sharing of  
4 savings (20% retained by the Company). This sharing is intended to serve as an  
5 incentive for the Company to release on a short-term seasonal basis capacity  
6 that is not required to meet customer load requirements. The Company has  
7 found that, in general, little value can be realized from releasing this capacity  
8 during periods not needed to serve core utility customers. Instead, NW Natural  
9 has found it can realize more value through its AMA optimization agreement  
10 through more sophisticated transaction structuring.

11 **Q. What do you conclude from these two Commission precedents?**

12 A. That the sharing percentage available to shareholders should, at a minimum, be at least  
13 20% (80/20). In other words, 80/20 sharing sets the lower end of the reasonable range  
14 for sharing. Further, sharing above 20% to shareholders can be justified because the  
15 Company's Optimization Activities go beyond normal expectations of what a gas LDC  
16 can perform within its normal gas supply activities.

17 **Q. Are there any additional relevant reference points that could be considered?**

18 A. Yes. In assessing reasonableness, the incentives available to gas-only LDCs for similar  
19 forms of optimization provide additional reference points. Gas-only LDCs are similarly  
20 situated to NW Natural in that they are strictly engaged in gas distribution activities and  
21 are not part of a larger integrated energy company.

22 **Q. Has the Company attempted to review the incentives available to other gas LDC**  
23 **companies for similar activities?**

19 – DIRECT TESTIMONY OF KEITH WHITE

1 A. Yes, although it is difficult to decipher from publically-available sources the true breadth  
2 of activities that these companies are engaged in that happen to fall under their various  
3 gas supply regulatory mechanisms. There is also a diversity of sharing structures that  
4 vary from state to state. A summary of the sharing structures identified through this  
5 research is included with my testimony as Exhibit 103, White/1.

6 **Q. What observations do you make based upon the regulatory treatment applied to**  
7 **other gas LDCs' similar activities?**

8 A. While it is hard to draw firm conclusions, several relevant observations can be made.  
9 First, there appears to be recognition that meaningful incentives are appropriate. All  
10 LDCs engaged in similar optimization and AMA activities appear to be allowed a  
11 significant revenue sharing mechanism. There are two prevalent sharing structures  
12 evident in these instances – either 75/25 sharing (75% to customers) or a progressive  
13 block sharing structure with the tail, or peak, block being 50/50.  
14 A second observation is that only a minority of the gas LDCs included in the sample  
15 clearly have AMA optimization arrangements in place. The majority appear to only have  
16 a more limited scope of PGA type activities. These would be equivalent to what the  
17 Company has in Oregon for its more traditional gas supply WACOG optimization and  
18 Schedule P pipeline capacity release, wherein it may receive up to 80/20 sharing (20%  
19 to shareholders).

20 **Q. In UG 221 CUB analogized the Company's Optimization Activities to the activities**  
21 **of an electric utility, which is expected to sell in the market generation that is not**  
22 **currently needed for customer load. How do you respond to this analogy?**

23 A. There are two reasons why the analogy is a weak one. First, gas and electric utilities  
24 are not similarly situated with respect to rate base resources. Electric utilities are

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1 vertically integrated and own their own generation, or production. Thus, the majority of  
2 an electric utility's return is earned on rate-based power generation. Gas utilities on the  
3 other hand are not vertically integrated and, generally, do not own their own production.  
4 In general, the gas industry is segregated between producers, pipelines, and LDC  
5 segments and not vertically integrated as with electric.

6 Second, in the Pacific Northwest, historically much of the power generation came  
7 from hydro power. The region has historically used critical water planning to serve its  
8 customer demand requirements. Consequently, in most years it had excess power from  
9 generation plants whose fixed costs were fully recovered in customer rates. The growth  
10 of electric transmission interties with the Southwest U.S. since the early 1970s to take  
11 advantage of seasonal load diversities further accentuated the scope and reach of these  
12 power marketing activities. This provided an economic rationale for Pacific Northwest  
13 electric utilities to develop and grow their wholesale marketing and trading activities in  
14 order to offset the generation resources' fixed costs - they needed to become sellers as  
15 well as buyers of power. In contrast, NW Natural has been and continues to be almost  
16 exclusively a buyer of natural gas. It does not have gas production that it needs to  
17 market.

## 18 V. SUMMARY

19 **Q. Please summarize NW Natural's proposal for this docket.**

20 A. NW Natural recommends that no changes be made to the Schedule 185 and  
21 Schedule 186 sharing arrangements. These arrangements have worked well for both  
22 customers and shareholders. By maintaining the current sharing percentages, and the

21 – DIRECT TESTIMONY OF KEITH WHITE

1 incentives provided by those percentages, the Company can continue to create value for  
2 customers while sheltering customers from added risks and costs.

3 While the Company does not recommend any changes to the sharing  
4 arrangements in Schedule 185 and Schedule 186, the Company is not opposed to  
5 clarifying the language in either or both of those schedules if that is determined to be  
6 necessary to eliminate any confusion between the different types of activities.

7 The Company also supports informal workshops every 2-3 years to allow the  
8 Company to update the Commission and stakeholders regarding the Mist Storage  
9 Services and the Company's Optimization Activities. These regular workshops would  
10 keep parties informed in a way that the Company's annual reports by themselves may  
11 not.

12 **Q. Does this conclude your testimony?**

13 A. Yes.

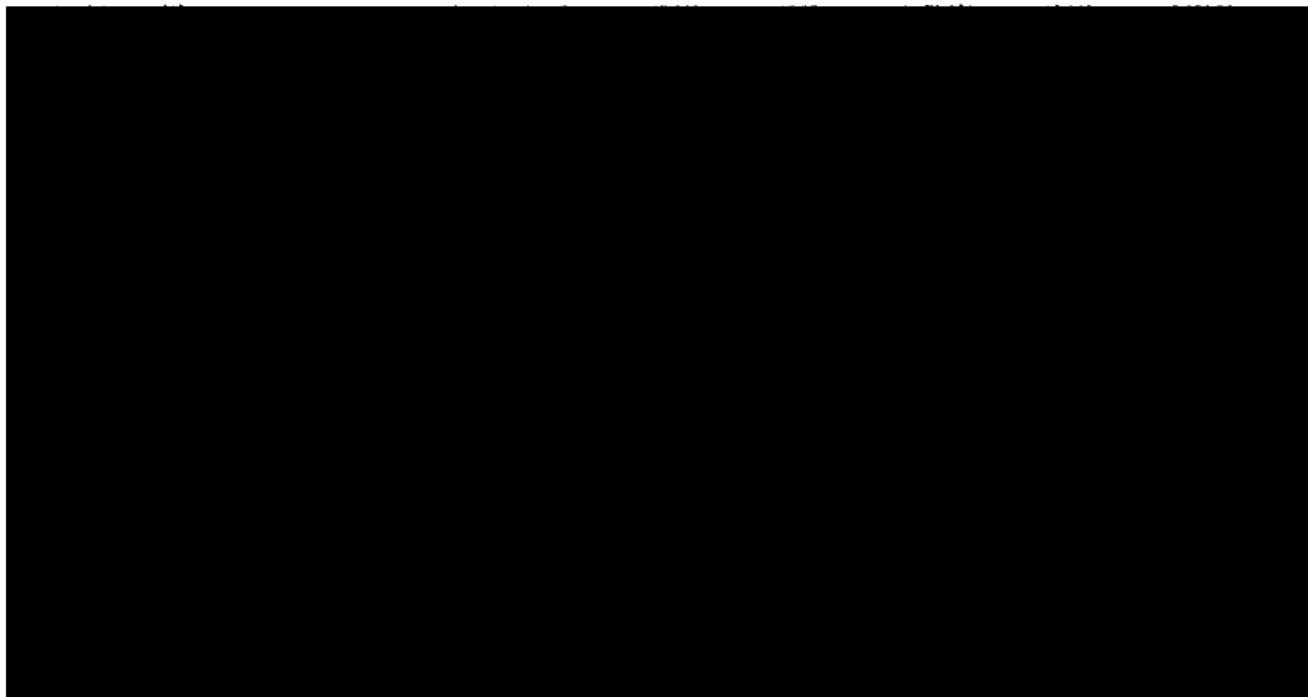
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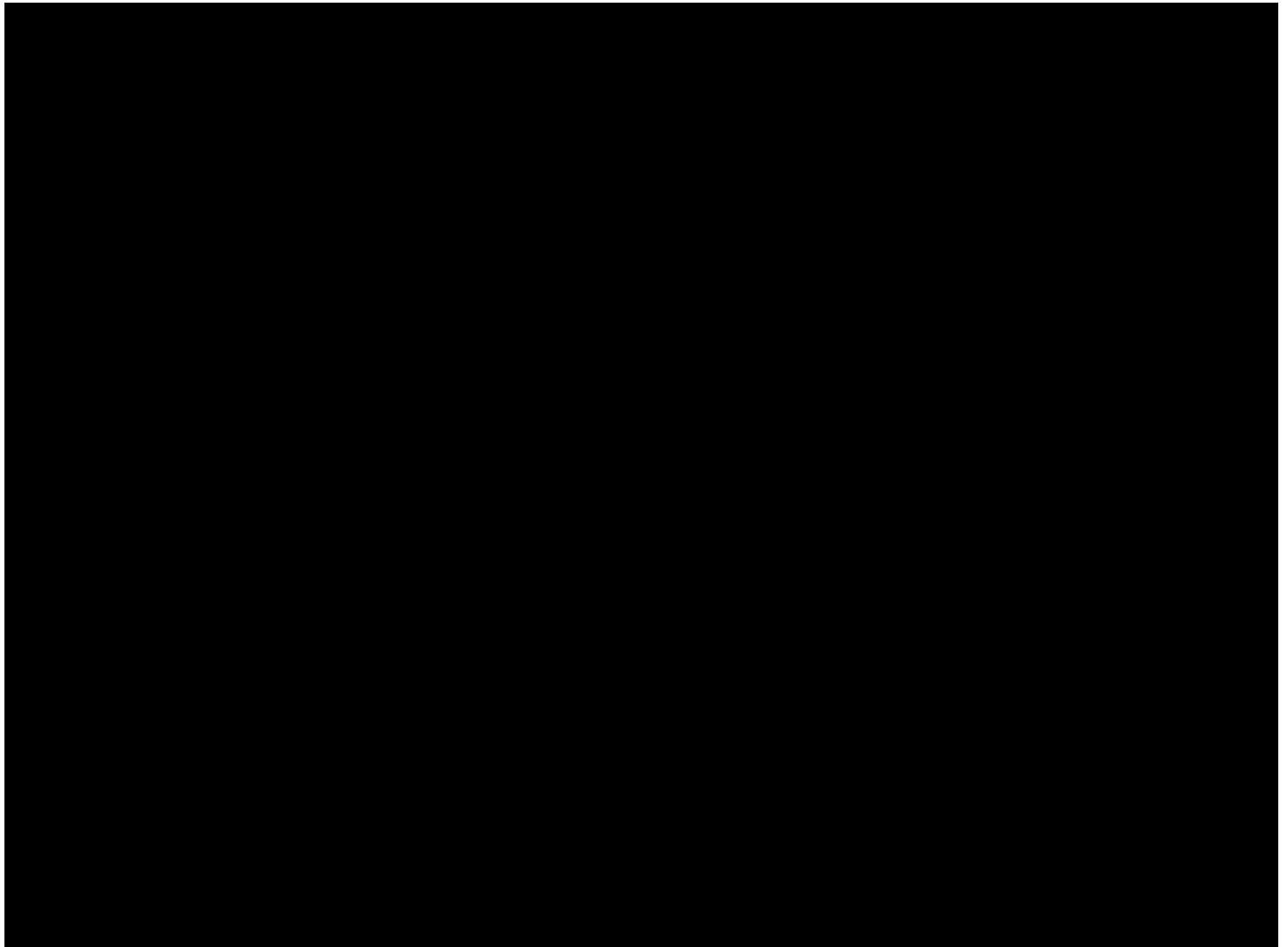
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**Table 1**  
**Interstate Storage - Storage Services**  
**Firm Sale Agreements and Net Revenues**  
**December 2011**

<u>Contract Period</u>	<u>Reservation Volume (MMBtu/d)</u>	<u>Monthly Price</u>	<u>Capacity Volume (MMBtu)</u>	<u>Monthly Capacity Price</u>	<u>Revenue 2011</u>
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**Comparison of New 2011 Contract Prices to Historic Pre-2011 Contracts  
in effect during 2011**



Source: Table 1 from NW Natural's 2011 Annual Report of Interstate and Intrastate Gas Storage and Optimization Activities.

\* FortisBC - D is a multi-year contract with a primary term going through May 31, 2014. It is not a new contract.

The contract period is shown as Jun 11- May 12 in Table 1 because there is a one year reduction in contract volume.

**SUMMARY OF OPTIMIZATION SHARING ARRANGMENTS  
AMONG GAS DISTRIBUTION PEER GROUP<sup>1</sup>**

The utilities listed below represent gas LDCs within NW Natural's peer group. The Company searched for asset management agreements and optimization activities like those in which NW Natural participates. Their sharing arrangements are shown in the table below.

<b>Utility and Jurisdiction<sup>2</sup></b>	<b>Optimization Sharing Arrangement (Customers/Shareholders)</b>
AGL Resources (Georgia)	60/40
AGL Resources (New Jersey)	Block sharing mechanism with the peak block at 50/50 (average of 70/30)
National Fuel (Pennsylvania)	75/25
Piedmont Natural Gas (North Carolina)	75/25
UGI Penn Natural Gas (Pennsylvania)	75/25
Washington Gas Light (Maryland)	Block sharing mechanism with the tail block at 50/50
Washington Gas Light (Virginia)	Block sharing mechanism with the tail block at 50/50

Other utilities within the Proxy Statement peer group have sharing arrangements on cost-saving activities that appear to be more similar to those included in the Company's PGA sharing mechanism. These include:

- Atmos Energy (Texas, Mississippi, Kansas, Tennessee, Louisiana)
- AGL Resources (Illinois, Virginia)
- National Fuel (New York)
- Laclede Gas (Missouri)
- South Jersey Gas (New Jersey)
- Southwest Gas (Nevada, Arizona)

In addition, the Proxy Statement peer group includes several vertically integrated gas companies with pipeline affiliates. They do not appear to be engaged in optimization activities within their gas LDC subsidiaries. These include:

- NiSource
- Oneok
- Questar
- Spectra

<sup>1</sup> The Gas Distribution Peer Group as listed in the Company's May 15, 2013 Proxy Statement to Shareholders (page 38) was used as the basis for identifying which utilities to review and include in this comparative reference research.

<sup>2</sup> For those utilities that operate in multiple jurisdictions, the Company looked specifically for any sharing arrangements in jurisdictions that represent a significant portion of regulated operations (defined as states with more than 200,000 customers).

BEFORE THE  
PUBLIC UTILITY COMMISSION OF OREGON

**UM 1654**

**NW Natural**

**Direct Testimony of Randolph S. Friedman**

July 15, 2013

**EXHIBIT 200 – DIRECT TESTIMONY – INTERSTATE STORAGE AND OPTIMIZATION**

**Table of Contents**

I.	Introduction and Summary .....	1
II.	Gas Supply Department Function at NW Natural .....	1
III.	Detail on Mist Storage Services .....	2
IV.	Detail on Optimization Activities .....	6

1 **I. INTRODUCTION AND SUMMARY**

2 **Q. Please state your name and position with Northwest Natural Gas Company (“NW**  
3 **Natural” or “the Company”).**

4 A. My name is Randolph S. (Randy) Friedman. I am Director, Gas Supply for NW Natural.

5 **Q. Please summarize your educational background and business experience.**

6 A. I joined NW Natural in March 1989 as Gas Contracts Administrator. In September 1992  
7 I was promoted to the position of Manager, Gas Acquisition and Pipeline Relations.  
8 Effective June 1994, I became the Manager of Gas Supply. My title was changed to  
9 Director, Gas Supply, in 2005. Prior to joining NW Natural, I was employed for seven  
10 years at Southern California Edison Company, where my duties included load and fuel  
11 price forecasting, generation and transmission project evaluation, and natural gas  
12 procurement. I hold a Bachelor of Science degree in Mechanical and Nuclear  
13 Engineering for the University of California, Berkeley. I also hold a Master of Science  
14 degree in Management from Purdue University.

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to describe in some detail the natural gas transactions  
17 that generate the customer credits under Schedule 185 and Schedule 186.

18 **II. GAS SUPPLY DEPARTMENT FUNCTION AT NW NATURAL**

19 **Q. Please describe the duties and responsibilities of your current position as**  
20 **Director of Gas Supply at NW Natural.**

21 A. I direct the activities of the Gas Supply department, whose primary purpose is to  
22 purchase the Company's gas supplies to meet sales service customer requirements in a  
23 reliable and cost-effective manner. The department transacts physical supply purchases  
24 as well as financial derivative contracts (financial hedging). NW Natural spends over

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1 \$300 million each year on gas purchases and interstate pipeline capacity and related  
2 contracts.

3 The Gas Supply department also coordinates all gas flows on NW Natural's  
4 system. This includes the flow of gas to non-residential customers who choose to  
5 purchase and transport their own gas supplies, as well as the third parties holding  
6 interstate and intrastate storage service agreements at the Company's Mist underground  
7 storage facility.

8 My own particular responsibilities include development of gas supply strategies,  
9 negotiation of contracts, overseeing the implementation of the Company's gas reserves  
10 acquisition agreement, optimization of NW Natural's gas resource portfolio, and  
11 involvement in special projects that are typically cross-departmental in nature.

12 **III. DETAIL ON MIST STORAGE SERVICES**

13 **Q. Please describe the nature of the Company's Mist storage services that are**  
14 **subject to Rate Schedule 185?**

15 A. Rate Schedule 185 relates to storage services at Mist ("Storage Services") that the  
16 Company provides to interstate and intrastate markets at negotiated market prices,  
17 subject to a FERC-mandated maximum rate cap.

18 **Q. Please describe the Company's interstate Storage Service?**

19 A. NW Natural's interstate Storage Service includes the injection, withdrawal, and  
20 underground storage of customer-owned gas at Mist, as well as the transportation of  
21 customer-owned gas to and from Mist storage using NW Natural's high pressure pipeline  
22 system. Customer-owned gas is delivered to a point at which NW Natural is directly  
23 interconnected to an upstream interstate pipeline and then injected into Mist storage. At  
24 present, NW Natural is connected to two interstate pipelines—Northwest Pipeline (NWP)

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1 and the small Kelso Beaver Pipeline (KBP). There are two points of connection in use  
2 for interstate storage service -- the NWP gate station at Molalla and the NWP gate  
3 station at Deer Island. Those points also serve as delivery points when an interstate  
4 customer wishes to withdraw its gas from storage. Once customer-owned gas is  
5 withdrawn from storage and delivered to the NWP system, the interstate customer is  
6 responsible for the future movement of the gas.

7 Interstate Storage Services are subject to a general tariff and an operating  
8 statement filed with and approved by FERC, with updated filings made on a periodic  
9 basis. The operating provisions generally follow the same gas day, scheduling cycles  
10 and other parameters that mesh with the operations of the upstream interstate pipeline  
11 system.

12 The marketing of interstate storage services was handled initially within NW  
13 Natural as a non-utility business activity, but was transferred to NW Natural Gas Storage  
14 LLC when that affiliate was created in 2009 in conjunction with the Company's  
15 development of a separate gas storage facility in California (Gill Ranch). Rates and  
16 contract volumes for interstate Storage Services are negotiated for contracts of varying  
17 durations.

18 **Q. What services are included in the intrastate Storage Service?**

19 A. Intrastate Storage Service, which is provided under the Company's Oregon Tariff, Rate  
20 Schedule 80, is similar in all respects to interstate Storage Service except for one  
21 distinction: The withdrawn gas does not move on the NWP system, but instead stays  
22 within NW Natural's Oregon service territory. The gas withdrawn from Mist storage is  
23 subsequently moved to industrial customer location(s) in accordance with the tariffed  
24 Oregon Rate Schedule under which the customer receives transportation service on the

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1 Company's distribution system. In essence, the withdrawn gas moves to the Molalla or  
2 Deer Island gate station but is not scheduled as a delivery to NWP, hence the customer  
3 avoids incurring the additional transportation charges that NWP would assess if the gas  
4 withdrawn from storage were actually scheduled onto the NWP system. As such, from  
5 Molalla or Deer Island, the gas looks like any other delivery of customer-owned gas onto  
6 NWN's system. For this reason, the scope of Rate Schedule 80 is limited to large non-  
7 residential customers who are physically able to access gas that is received into NW  
8 Natural's system at either the Molalla or Deer Island gate stations. Rate Schedule 80 is  
9 a small component of the Company's Storage Service revenues.

10 **Q. Mr. White has testified that one of the benefits of the Mist expansion is the ability**  
11 **to recall capacity for core utility customer use when needed. Can you explain how**  
12 **such recall works?**

13 A. Yes. One of our goals in expanding storage at Mist was to provide our core sales  
14 service customers with the ability to incrementally add storage capacity only when  
15 needed, and in the amounts needed, through capacity recall. To allow for such  
16 economic recall, we have negotiated interstate and intrastate storage contracts for terms  
17 of varying durations. The Company's Integrated Resource Plan ("IRP") analysis  
18 considers these contract expiration dates as the Company determines whether more  
19 Mist capacity should be "recalled" to meet growing core sales service customer  
20 requirements. Expiring capacity that is not recalled can then be re-contracted. Almost  
21 all Mist storage service agreements are contracted on a firm basis because firm  
22 contracts yield the highest value, but interruptible contract variations are possible and do  
23 occur.

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1 **Q. Are recall decisions reversible or dependent on the market value of Storage**  
2 **Services?**

3 A. No. Once the capacity is recalled to serve core sales service customers, current  
4 regulatory treatment does not allow for a subsequent reversal that would return such  
5 capacity for contracting through Storage Services. Hence, recall decisions are  
6 evaluated every year, approval is required by a team of Company executives, and the  
7 recall quantities are made in the smallest possible increments needed to satisfy core  
8 customer load projections for the subsequent planning year as determined through the  
9 IRP analysis<sup>1</sup>. Making these decisions one year in advance of need allows time for the  
10 effective remarketing of any expiring Storage Services contracts whose capacity is not  
11 needed for recall.

12 **Q. How much of the expanded Mist capacity has been recalled for core utility**  
13 **customers to date?**

14 A. From 2004 through 2012, the Company has recalled storage capacity on five separate  
15 occasions, in amounts totaling 65,000 Dth/day of peak day deliverability. The portion of  
16 Mist now reserved for core customers totals 275,000 Dth/day out of the current total Mist  
17 peak day deliverability of 520,000 Dth/day.

18 **Q. What level of involvement does the utility in general, and the Gas Supply**  
19 **department in particular, provide for the interstate and intrastate Storage**  
20 **Services?**

21 A. In the field, the same utility personnel who run the utility storage operations at Mist  
22 provide the same support for non-utility Storage Services; for example, 24 hour a day,

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<sup>1</sup> Recall decisions are rounded to the closest 5,000 Dth/day for administrative convenience.

1 seven day a week monitoring of system status, operation of compressors, wellheads and  
2 related equipment, maintenance activities, call-ins after hours and on weekends/holidays  
3 in the event of outages or other problems, and so forth.

4 In the office, the main role of utility personnel is for the daily (including after-  
5 hours, weekends and holidays) scheduling of gas to meet the needs of Storage Service  
6 customers, which is done in coordination with the utility's usage of Mist gas supplies.  
7 The incremental cost associated with work performed by utility personnel for Mist  
8 Storage Services is allocated to the Gas Storage business segment.

9 **III. DETAIL ON OPTIMIZATION ACTIVITIES**

10 **Q. Please describe in more detail the Company's Optimization Activities?**

11 A. Optimization Activities fall into five general categories: (1) Mist Storage Optimization; (2)  
12 Liquids Extraction; (3) Commodity Contract ("Portfolio") Optimization; (4) Pipeline  
13 Capacity Optimization; and (5) Off-System Storage Optimization. All Optimization  
14 Activities seek to create additional value for customers and shareholders by engaging in  
15 more speculative transactions for the resources that are not being fully utilized by sales  
16 service customers.

17 Q. Mr. White has explained that the Company has engaged a third-party to provide  
18 optimization services through an Asset Management Agreement ("AMA"). Can you  
19 describe how NW Natural works with the third-party to perform the Optimization  
20 Activities?

21 A. Gas Supply is responsible for negotiating the terms of the AMA arrangement and  
22 developing strategies with our optimization partner to maximize value while maintaining  
23 reliability standards for core utility and Storage Service customers. At least one  
24 individual in Gas Supply is involved virtually every day in consultations with our

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1 optimization partner to review current positions, assess available resources, and  
2 determine new opportunities for optimization. Higher values, though, generally are  
3 obtained through strategies that can take many months to unfold, heightening the need  
4 for a close working relationship with our optimization partner so that we can adapt as  
5 needed to changing market conditions and customer requirements. Examples of such  
6 strategies and transactions are described in my testimony below.

7 The largest involvement outside the Gas Supply department comes from the legal and  
8 Mid Office (financial risk management) groups because they analyze each type of  
9 optimization transaction for regulatory compliance and financial impact. With their  
10 approval, individual transactions then can be pursued by the Front Office, i.e., certain  
11 authorized individuals within the Gas Supply department

12 The costs of this utility involvement are not borne by customers, but instead are  
13 allocated to the separate non-utility Gas Storage business segment in which the costs  
14 and revenues of Storage Services and Optimization Activities are recorded.

15 **Q. Why does the Company have gas resources that are not fully utilized by core**  
16 **customers at all times?**

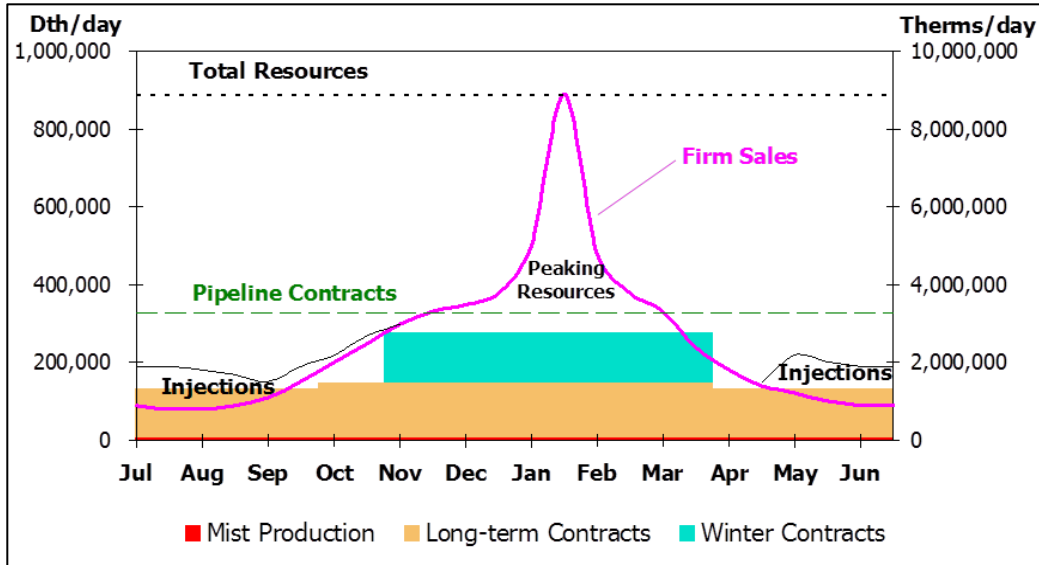
17 A. As an LDC, NW Natural is obligated to ensure reliable service to its firm sales service  
18 customers under all foreseeable weather conditions—including peak cold weather  
19 conditions. As modeled in the IRP the Company plans its resource portfolio around  
20 “design” weather conditions. Design weather includes criteria for temperatures over the  
21 entire heating season and, perhaps most importantly, the peak cold day. The resulting  
22 load pattern is highly seasonal as shown below.

23 ///

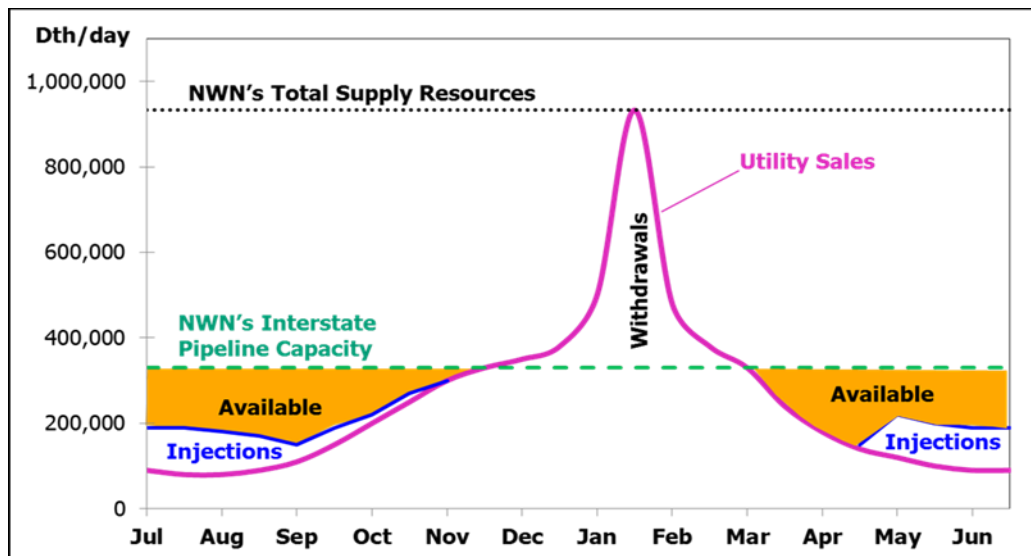
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The Company uses the IRP process to assemble the most cost-effective gas resource portfolio to serve this pattern of customer load requirements. A combination of pipeline and peaking (primarily storage) resources is the most efficient mix. However, pipelines by their nature are in place every day whether used or not, and so are available for optimization as shown below.



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1           In addition, the projected load requirements are themselves based on an extreme  
2 cold weather design, meaning that they are not expected to occur in an average year.  
3 This difference between design and average year weather conditions creates the  
4 potential for under-utilized resources making more resources available for potential  
5 optimization, particularly with storage resources as discussed below.

6 **Q. Please describe Mist Storage Optimization.**

7 A. All Mist storage capacity is reserved either for core firm sales service or  
8 interstate/intrastate service customers (the service described above). However, when  
9 Mist is not fully utilized by either or both of these groups, the Company has the  
10 opportunity to generate additional revenues through optimization. The optimization  
11 opportunity is primarily a function of gas injection or withdrawal rates, which in turn have  
12 some relationship to the total amount of working gas in Mist storage on any given day.  
13 Injection and withdrawal rates are inversely correlated, i.e., the more gas that is being  
14 injected for customers, the more optimization capability exists to do withdrawals, and  
15 vice versa.

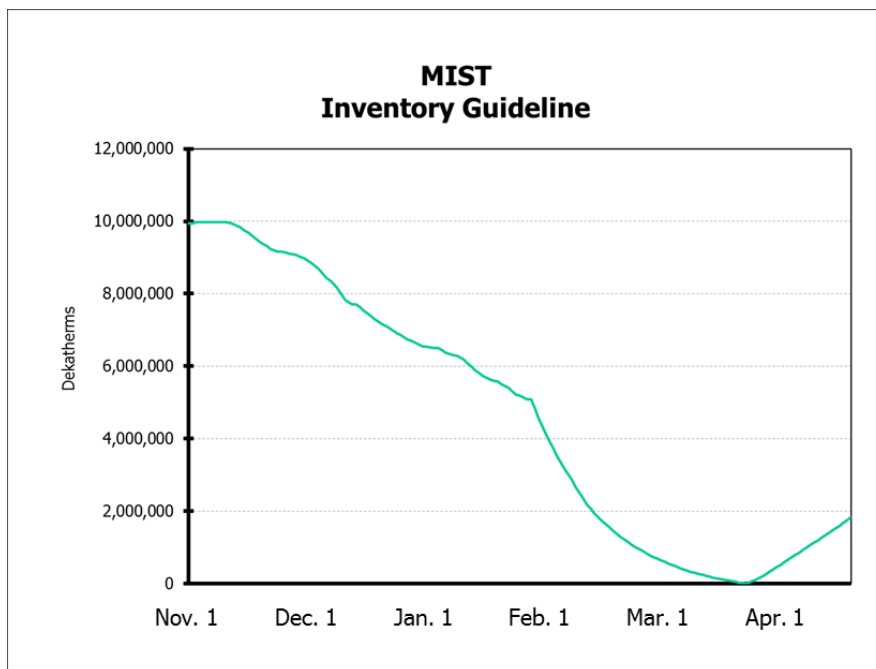
16           As previously mentioned, NW Natural's IRP analysis is based on "design"  
17 weather conditions. Because cold weather can and has occurred late in the heating  
18 season, the Company's analysis (using the SENDOUT<sup>®</sup> model as described in the IRP  
19 process) indicates that maximum deliverability should be maintained into early February.  
20 But, because most winters are not extremely cold, this practice typically results in  
21 inventory not being fully withdrawn from Mist. One output from the SENDOUT<sup>®</sup> analysis  
22 is a guideline for how to dispatch (or hold back on dispatching) gas out of each storage  
23 resource in order to maintain reliable service. An example of such a guideline is shown  
24 in the table below.

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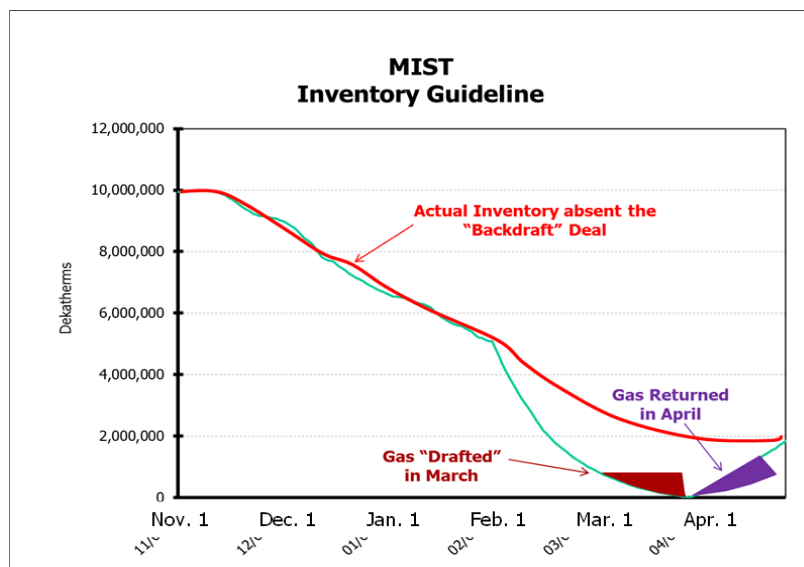
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From the chart above, note that storage inventory needs to be maintained at a fairly high level into early February, but then can drop quickly once the design peak day condition has passed. By mid-February most of the winter has passed, so it is not unusual to have significant quantities of gas left in storage in a normal winter weather season.

The gas still in inventory after the cold weather has passed represents an opportunity to serve additional load, but usually that load is not to be found on the utility system. Looking for transactional opportunities outside the utility system entails additional risks, as described below, and requires a larger trading “footprint” than NW Natural has in place for meeting base utility service, but these opportunities are well-suited to a company whose strength is based on wholesale natural gas trading capabilities.

1 An example of a wholesale transaction is the “backdraft” arrangement pictured  
2 below. The green line again represents the Company’s guideline for inventory levels at  
3 Mist in order to ensure reliable service to its utility customers.



13 The “backdraft” in this picture is the act of withdrawing gas (“drafting”) after the February  
14 peak condition has passed by for use by an off-system market while gas prices are still  
15 relatively high. The gas is returned back to the Company at a later time and potentially  
16 at a different location when prices are lower and there is more flexibility on the upstream  
17 pipeline system. From a utility customer perspective, nothing has changed because the  
18 gas is returned to inventory at the same price that it left. However, the sale of the gas (in  
19 March in this example) and its purchase at a lower price (in April in this example)  
20 generates revenue that would not otherwise have been obtained from this asset.

21 This simple example is potentially just a sliver of the entire storage optimization  
22 transaction. The price spreads between months are not static but widen and narrow on  
23 a day-by-day, minute-by-minute basis. By anticipating these movements, i.e.,  
24 speculating, our optimization partner can use these same volumes in multiple

1 transactions. That is, when the spreads between months are relatively wide, the  
2 optimizer sells the spread. When the spreads narrow, the position is closed out and  
3 some level of profits are realized. When the spreads again widen, the position is sold  
4 again and the process repeats. If the spreads never narrow but instead stay the same  
5 or continue to widen, the optimizer simply waits for the physical settlement of the  
6 transaction and is not caught "short" because the physical volumes exist at Mist to  
7 backstop the trade.

8 These activities reflect the fact that the price of natural gas is constantly moving  
9 up or down over time and at each location where gas is traded. Of course, the ability to  
10 take advantage of these price movements requires sophisticated trading systems and a  
11 large trading staff to analyze and act quickly when transactional opportunities arise. NW  
12 Natural does not employ such systems or staff in serving its utility customer needs, and  
13 as such cannot engage in this kind of speculative activity on its own.

14 **Q. Please describe liquids extractions.**

15 A. Liquids refer to certain heavier hydrocarbons like ethane, propane, and butane that are  
16 associated with methane production, methane being the primary component of natural  
17 gas. Liquids typically have a market value somewhere between that of methane and oil.  
18 The market value can make the extraction of the liquids from methane profitable,  
19 depending on the spread between methane and Natural Gas Liquids ("NGL") prices, the  
20 relative proportion of the different NGLs in the gas stream, and the cost-effectiveness  
21 and efficiency of the extraction facilities.

22 In British Columbia and the U.S. Rockies, the extraction of liquids occurs in the  
23 production areas, before the gas stream reaches the typical natural gas trading hubs. In  
24 Alberta, however, the industry was built such that the extraction process usually occurs

1 in two stages: a preliminary (“shallow cut”) in the production areas and then a more  
2 extensive (“deeper cut”) at facilities located closer to the provincial borders, which is  
3 where there are additional markets to absorb the NGLs.

4 **Q. How does NW Natural participate in liquids extraction?**

5 A. The Company purchases gas out of Alberta, where a significant amount of extraction  
6 activities take place outside the production fields and after NW Natural has taken  
7 possession of the gas. For this reason, NW Natural is in a position to participate in  
8 liquids extraction by employing a processing company to perform the extraction on the  
9 Company’s behalf.

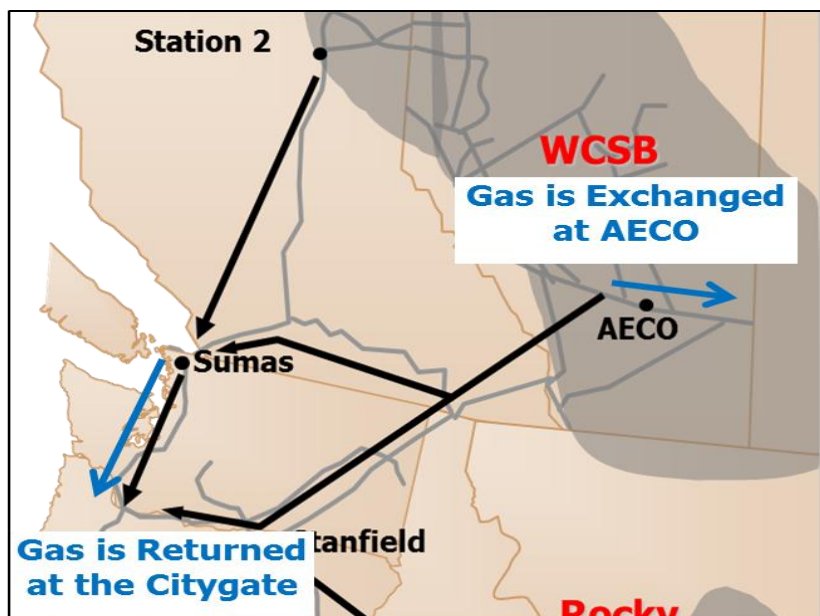
10 **Q. What special skills or knowledge are required for this activity.**

11 A. To take advantage of the economics of liquids extraction requires expertise in different  
12 fuels and different markets than would be typical for a gas LDC. For example, it requires  
13 knowledge of and negotiations with the owners of the various NGL extraction plants. It  
14 requires a trading footprint that extends to the east of Alberta and south to the mid-  
15 Continent markets, not just the Pacific Northwest. These activities require knowledge  
16 and expertise that go beyond the capabilities present within the Company in order to  
17 provide LDC services.

18 **Q. Please describe Portfolio Optimization.**

19 A. Portfolio Optimization can also be thought of as price arbitrage between trading points,  
20 but by directly utilizing LDC gas supply contracts rather than storage capabilities. These  
21 exchanges are made during periods when the Company’s upstream pipeline capacity  
22 and gas commodity contracts open up opportunities for gas movements in new  
23 directions. As with other trading activities previously mentioned, this requires a large

1 and nimble trading staff with systems to track and act quickly on such opportunities. An  
2 illustration of this type of transaction is shown below.



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13 The graphic above also illustrates another point, namely, that optimization transactions  
14 can involve multiple activities. In this example, gas that is purchased by NW Natural in  
15 Alberta is immediately exchanged with the optimization partner, who moves the gas to  
16 eastern markets and replaces the volumes with gas purchased in British Columbia. That  
17 in and of itself may generate revenues, but even if there is no profit in that exchange, the  
18 transaction has provided volumes that can be transported to the Alberta border from  
19 which the liquids can be extracted. So even if the exchange transaction has a negative  
20 value, the net result when combined with the liquids extraction should be positive if the  
21 optimization partner has managed all the risks of these deals, including counterparty  
22 risks such as finding creditworthy for the now-dry gas at the Alberta border.

23 **Q. Please describe Pipeline Capacity Optimization.**

1 A. As previously mentioned, using a third party trading partner that can aggregate  
2 requirements over a much larger market area and potentially combine the pipeline  
3 capacity with some of the other activities mentioned above yields a better result than the  
4 LDC could achieve on its own. Pipeline capacity on its own, however, represents a fairly  
5 small opportunity for optimization.

6 **Q. Please describe Off-System Storage Optimization.**

7 A. This refers to the price arbitrage opportunities discussed above for Mist storage, but  
8 applied to Jackson Prairie and any other storage contracts held by the Company.  
9 Current examples include two 3-year contracts held with storage providers in Alberta.

10 **Q. What level of involvement does the utility in general, and the Gas Supply  
11 department in particular, provide for Optimization Activities?**

12 A. Besides accounting services, the Gas Supply department is involved virtually every day  
13 in consultations with our optimization partner to review current positions, assess  
14 available resources, and determine new opportunities for optimization. The cost of this  
15 utility involvement is billed to the Gas Storage business segment.

16 **Q. Does this conclude your testimony?**

17 A. Yes it does.