# Table of Contents

# List of Figures

## List of Equations



## List of Tables

# I. Executive Summary

## a) Introduction

In January 2009 the Utah Division of Public Utilities (DPU or Division) put together a bid packet and sent out a Request for Proposal. This RFP denoted Solicitation No. N09028 was for a review of Questar Gas Company's natural gas gathering and processing agreements. The Division was seeking to retain an expert to examine the Area Wide Gathering Agreement that QGC has with its sister non-regulated company Questar Gas Management Company (QGM). Williams Consulting, Inc. (WCI) successfully bid to provide this service to DPU. [Note: The author of this report, Williams Consulting, Inc. (WCI), is not affiliated in any way either directly or indirectly with The Williams Companies, Inc., including any subsidiaries, e.g. Williams Field Services (Midstream) or Williams Pipeline.]

In performing our review of the various Questar subsidiaries involved in the natural gas chain supplying Utah's ratepayers, one of WCI's major objectives was to explain and to document the functions and interrelations of the most relevant subsidiaries in the topical areas that the Division identified. In our report we have presented as much pertinent information as we were able to obtain on the activities, sizes, profitability, and missions of the organizations that most affect the ratepayers, in order to develop a comprehensive understanding of their impacts on gas gathering and processing costs.

## b) Chapter 1 - Gathering Agreement Review

As of 2009, Questar Gas Management, a subsidiary of Questar Market Resources, Inc, whose parent company is Questar Corporation, provides gas gathering services through a gas gathering agreement dated September 1, 1993 and amended February 6, 1998, often referred to as the System Wide Gathering Agreement (SWGA, or Agreement). The Agreement has existed for the past three decades with one amendment. The timeline on the next page documents the major changes, including earlier agreements and major policy changes, such as Order 636.

| Date | Event | Description of Event |
|---|---|---|
| October 14,1981 | "The Wexpro Agreement" | October 14, 1981: The 'Wexpro Agreement' dated October 14, 1981 between Mountain Fuel, Wexpro Company, the Utah Division of Public Utilities, the Utah Committee of Consumer Services and the Staff of the Public Service Commission of Wyoming. Essentially, the agreement transferred Leaseholds. All leasehold, operating rights, working interests, mineral and other interests in production which were held by Wexpro on July 31, 1981, Additional area covered under the agreement is based on each prior Wexpro well in a pool with a circle of radius 1980 feet centered at the well drawn around and included. Wells are to be completed in any pool above the lowest point to which such well had been drilled. Lastly, any remaining Wexpro oil and natural gas liquids net revenues will be proportioned as follows: 54% of such remainder will be allocated to Wexpro and placed into an account used solely for the purposes of reducing natural gas rates by Commission order and the remaining 46% will be retained by Wexpro as its separate property and will not be considered utility income or used to reduce natural gas rates. |
| July 1,1984 | "Gas Gathering Agreement" | July 1, 1984 Gas Gathering Agreement between Mountain Fuel Supply Company and Questar Pipeline Company. This was terminated and superseded in September 1993. |
| 1985 | FERC Order 436:<br>Unbundling Gas Sales | 1985: Order 436 required that natural gas pipelines provide open access to transportation services, enabling consumers to negotiate prices directly with producers and contract separately for transportation. In 1987, Order 500 Modified Order 436 to address company take-or-pay issues. |
| March 1,1991 | Pursuant to Questar's FERC gas tariff | Two Rate Schedule CD-1 - EXP 6-30-99 |
| April 8, 1992 | FERC Order 636:<br>Restructuring Rule: Mandated Unbundling | April 8, 1992: Order 636 (The Restructuring Rule). This mandated unbundling of sales services from transportation services, providing customers with full choice of providers and opening these markets to competition; and in 2002, FERC Order 637 further addressed inefficiencies in the capacity release market. The restructuring of the natural gas industry actually began with Order 436 and was substantially completed with Order 636. Order 636 has changed gas transportation patterns and rates. Increased competition among gas suppliers fostered by the new market flexibility has contributed to changes in regional production, transportation, and consumption patterns, and to greater efficiency in the use of the gas industry infrastructure. |
| Effective September 1, 1993<br>dated October 11,1993 | Gas Gathering Agreement (often referred as the System Wide Gathering Agreement-SWGA)<br>REPLACE 1984 Agreement | SWGA - Effective September 1, 1993, Gas Gathering Agreement between Mountain Fuel Supply Company (MFS) and Questar Pipeline Company (QPC). The 1993 Agreement completely replaced the 1984 gathering agreement and was eventually Amended February 6, 1998. (Internally known as the System Wide Gathering Agreement-SWGA) |
| August 31, 1995 | End of 'First Period' stating how gathering rates would be calculated. | From September 1, 1993 to August 31, 1995 is known as the 'First Period' which stated how gathering rates would be calculated. Terminated 8-31-95 |
| March 1, 1996 | Questar Pipeline Company (QPC) sold its Gathering interest to Questar Gas Management Company (QGM) | March 1,1996: Questar Gas Management Company (QGM) assumed all of Questar Pipeline Company's interest |
| August 31, 1997 | End of 'Second Period' stating how gathering rates would be calculated. | From September 1, 1995 to August 31, 1997 is known as the 'Second Period' which stated how gathering rates would be calculated. Terminated 8-31-97 |
| September 1, 1997 | Beginning 3rd and final Period. Components to calculate charges for gathering and transporting Wexpro gas by QGM | From September 1, 1997 until termination of the 'SWGA' - Components to calculate charges for gathering and processing Wexpro gas by QGM |
| January 1, 1998 | Mountain Fuel Supply Company (MFS) became Questar Gas Company.(QGC) | On January 1,1998, Mountain Fuel Supply Company became Questar Gas Company.(QGC) |
| February 6,1998 | Amended 1993 Gas Gathering Agreement<br>Questar Gas Company.(QGC)<br>Questar Gas Management Company (QGM) | On February 6, 1998, Questar Gas Company (Wexpro-Operator) replaced Mountain Fuel Co and Questar Gas Management Company (QGM) replaced Questar Pipeline Company. Major amendment was to Article III - Gathering Charges: i) An allocated portion of the annual cost of service for the prior calendar year will be the ratio of the 'winter period'- January-March and November-December of the same calendar year - |
| March 29, 1999 | DPU Issued ORDER: 95-057-30; 95-057-12;97-057-11 | ALLOWED Gathering Costs be moved from pass through to general rates. However #683 and #685 continue with pass through |
| August 25, 1999 | Questar Gas entered into an additional Gas Gathering Agreement with its affiliate QGM. | A separate agreement replaced, at a lower rate |
| October 28, 2005<br>Eff. Nov. 1, 2005 | DPU - ALL gathering costs are pass through - recovered in the 191 account | ALL gathering costs are pass through - recovered in the 191 account - Amending the March 29, 1999 ORDER 95-057-30 moving gathering costs to General Rates. |

QGM has built or acquired, and maintains and operates facilities assigned to the gathering agreement (SWGA) which include services such as essential wellhead gas conditioning, collection, measurement and field compression. QGM provides these services to QGC's natural gas producing properties that are operated by Wexpro on a cost-of-service basis and to other third-party operators.

Generally, natural gas may contain moisture, impurities or valuable liquids. After leaving the well, the gas is gathered and delivered to a processing plant. Volumes may need the help of compression to move the product through the pipelines. Once the wellhead gas is gathered and processed by QGM, it is delivered to Questar Pipeline Company, another subsidiary of Questar Corporation for transport through its interstate gas pipeline for re-delivery to Questar Gas Company which markets the gas to end users including industrial, residential, and commercial customers.

The SWGA provided for gathering rates covering three specific periods of time. Although all of the rates were based on the cost-of-service, prior terms have been superseded effective as of August 31, 1997.

In the 1998 amendment to the 1993 SWGA, gas gathering charges in Appendix B were modified to incorporate a winter-seasonal volume adjustment. The adjustment involves use of a ratio of the amount of gas volumes contracted to QGC in relation to the actual gas volumes delivered by QGM during the months of November through March. Expenses for the various categories such as Operating and Maintenance (O&M) expenses, depreciation and amortization expenses, and so on use the ratio of the winter months instead of the ratio based on the entire year. For example, for the 2008 SWGA rates, each of the cost centers in the SWGA developed a ratio based on 2007 costs and unitized through application of the throughput ratios from the winter period (January – March 2007 and November - December 2007). The resulting allocated cost ratio was applied to 2007 calendar year throughput to arrive at the composite demand and commodity amounts. The demand component is charged regardless of throughput through the 2008 period and the commodity component on a unit cost per Dth is applied to throughput during the September 1, 2008 through August 31, 2009 period to calculate the monthly charges in the SWGA.

## c) Chapter 2 - Increase in Gathering & Processing Costs and Rate

In 2007, the Division noticed a substantial increase in the gathering and processing costs proposed to be charged by the Company for 2008. WCI was requested, as part of this review, to analyze QGC's gathering & processing costs to determine the cause of

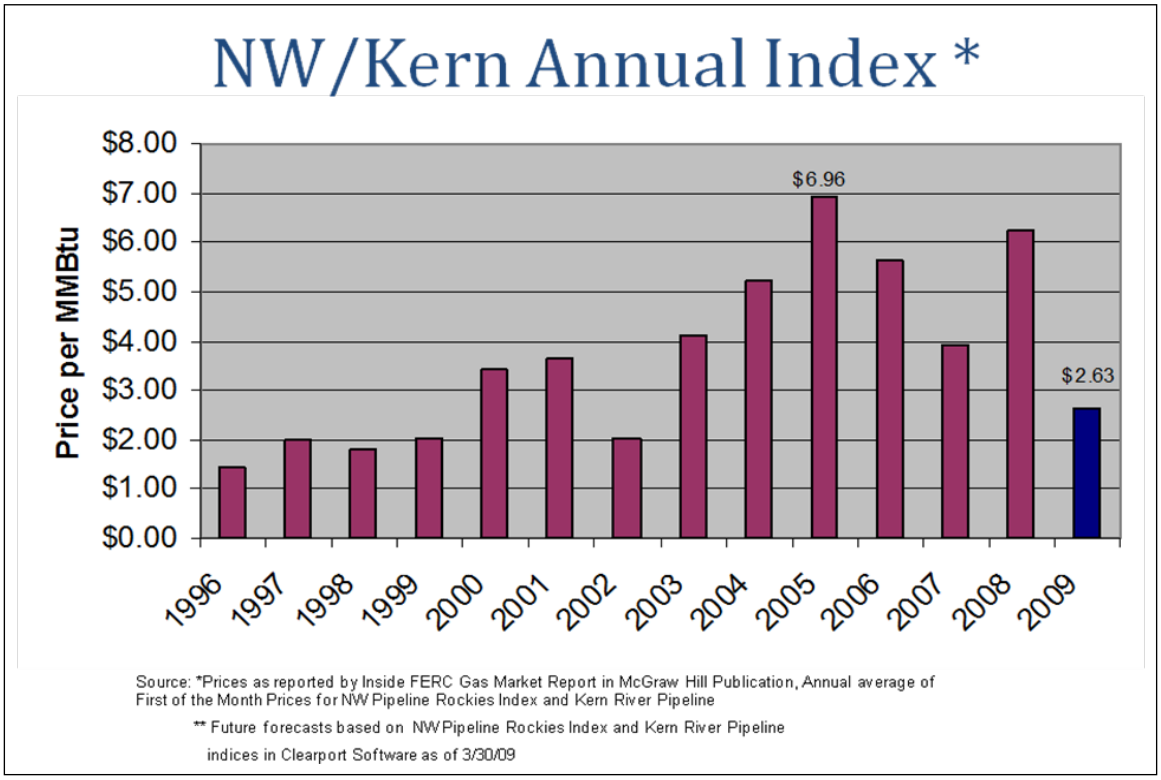
the rate increase, and identify any escalation factors that may account for portions of the increase.

It should be noted that gathering and processing costs make up only about 3% of the total cost of gas delivered to Utah ratepayers. A sharp increase in demand and commodity charges from QGM, beginning in 2006 and based on increased gross plant, G&A, and O&M costs, are the primary drivers for the increase in gathering and processing costs. Since 2007, the unit cost rate curve has flattened.

The gas gathering agreement that is currently in force is unusual in the industry, since cost-of-service is escalated based on a number of implicit factors, and not on an explicit index as is common in many gas gathering contracts.

In the current environment of low gas prices, as depicted in the following graph for the Rocky Mountain area, WCI also understands Utah's gas supply chain is now sometimes incorporating lower-cost spot purchased gas, and not always making use of infrastructure that has been paid for (and is still being paid for) in part by Utah ratepayers.

**Figure 1 – Rocky Mountain Area Trends in Natural Gas Prices**



While WCI understands that QGM gathers QGC gas on a first priority basis, similar to Priority 1 in other contracts, the SWGA does not specifically state the priority level. WCI recommends the priority service level of gas delivered to Utah consumers be stated in the gas gathering agreement, and a review be considered to determine whether Priority #1 represents the best available option for Utah gas ratepayers at this time.

Chapter 1 of this report outlines all of the elements and terms of the System Wide Gathering Agreement. **None of these terms** contain an *explicit* escalation factor, such as those included in most of the other QGC contracts, including third-party contracts. However many of the components of the charges in this contract contain what may be called *implicit* escalators. For instance, some of the components contain current labor costs and these costs can be expected to increase through time, roughly according to local area labor cost indexes. Other components contain current material costs which will also increase through time according to local or national material cost indexes.

Most of the increases in gathering charges affect the gathering rate through the addition of new capital expenditures, as well as increases in G&A and O&M. These expenditures directly increase rate base and thereby increase all of the associated factors that are permitted by the SWGA to be included in gathering charges.

QGC's gas-sourcing areas have changed substantially in recent years both for cost-of-service Wexpro-operated gas supplies and for other natural gas quantities obtained by QGM. They have gravitated toward areas of South-West Wyoming such as the Pinedale area, which has environmental, topographic, and wildlife issues[1], all of which tend to increase gathering costs.

The large increases noted by the Division in gathering charges in the 2007 rate year were primarily a result of a large increase in 2006 O&M costs allocated through the SWGA cost-of-service to QGC. O&M increased by $3.37 million over its level in 2006, (an increase of 51%).

In addition to the O&M increases, gross plant increased 28% (amounting to an increase of $7.77 million above 2005 costs), and increases in general and administration (G&A) costs (an increase of almost $1.0 million above 2005 levels).

[1] Big Game Range winter restrictions for protecting wildlife migration and winter habitat shut down most of the drilling activities for the northern two-thirds of the anticline from November through May in past years. Firms had to shift drilling to fee or state leases, or move to the Pinedale's southern portion until spring. The Pinedale Anticline field overlaps a world-class wildlife resource -- a crucial winter range for one of the largest concentrations of big game in the United States including mule deer, pronghorn, and sage grouse

## d) Chapter 3 - Service Level Benchmarks

As part of this review, WCI was asked to review the service level of the gathering and processing activities that QGM provides to QGC via the SWGA. In particular, WCI was asked to determine whether or not comparative rates could be obtained for similar services by others, in order to assess the reasonableness of the rates charged by QGM to QGC.

QGM's services are basically similar to those WCI documented for other midstream service companies. However QGM operates and prices its gathering services under a three-level priority system, as explained to WCI in its interviews with QGM personnel. This priority system appears to be rather unique in the midstream services industry, although it has some parallels in the pipeline transportation industry.

QGM gathers QGC's gas at the wellhead (operated by Wexpro) and moves it under a demand and commodity rate structure similar to QGM's Priority #1 of its three-priority delivery service. The three priority service levels are:

1. Priority #1 – Firm service with a demand charge as well as a commodity charge
2. Priority #2 – Firm service with no demand charge; just a commodity charge
3. Priority #3 – Interruptible service

Under contract #163, or SWGA, QGM moves the vast majority of QGC's cost-of-service gas and we were told during interviews that this is considered to be Priority #1 since it contains a demand charge for its firm service. As Priority #1, the gas would be moved before any Priority #2 or Priority #3 gas. For instance, if one compressor goes down causing gas flows to be cut back, the Priority #1 gas would be moved first by the remaining compressors, before gas of other Priorities.

WCI notes some points in the SWGA:

1. Like most other midstream operators, the majority of QGM's gathering contracts would be for interruptible service, which would be the last to move in case of capacity restrictions on the lines. Therefore it would require a major loss of flow capacity (81%) before any firm services would be affected.
2. QGM would probably be motivated to move QGC's gas before the gas of many others even without considering its service level of "firm", when its gathering rate is in excess of gathering rates paid by other parties.

3. If conditions became severely limited due to a variety of reasons, QGM's obligation to gather gas could not be enforced, even for a Priority #1 customer, due to Force Majeure clauses in the Agreement.

## e) Chapter 4 - WEXPRO Well and QGM Gathering System Analysis

QGC's properties operated by Wexpro's cost-of-service operations are contractually limited to a finite set of properties set forth in the Wexpro Agreement. However recent advances in technology (notably increased density drilling and multi-stage hydraulic fracture stimulation) have unlocked significant unexploited potential on many of the subject properties. According to Questar's 2008 Form 10-K, Wexpro has identified over $1 billion of additional drilling opportunities that could deliver cost-of-service natural gas supplies to QGC at prices competitive with alternative sources. Therefore Wexpro operations have the potential to grow significantly in future years.

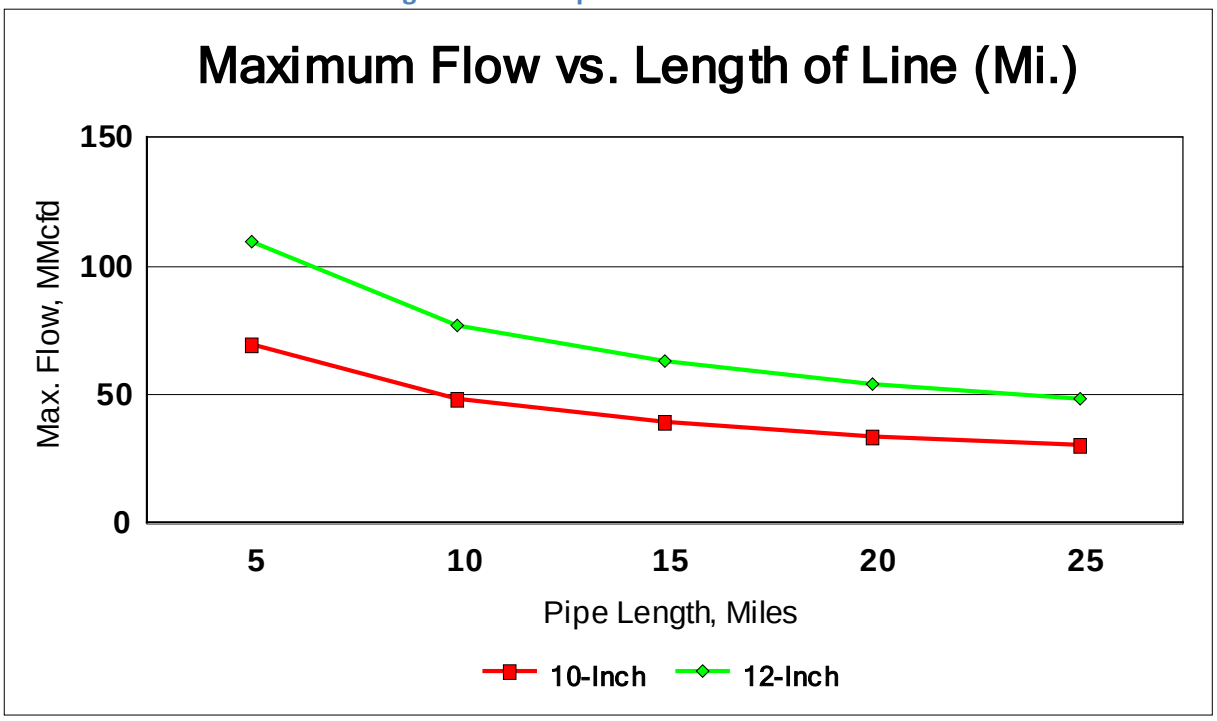
A Supplemental Environmental Impact Statement (SEIS) was submitted in 2006 to the BLM by Questar E&P and others[2]. In September 2008, the Bureau of Land Management issued a Record of Decision (ROD) on the Final Supplemental Environmental Impact Statement for long-term development of natural resources in the Pinedale Anticline Project Area (PAPA). Under the ROD, Wexpro and its sister company, Questar E&P, will be allowed to drill and complete wells year-round in Sublette County, WY and allow QGM to construct new gathering lines.

During interviews with QGM's General Manager of Commercial Operations, WCI was told that larger-diameter main gathering lines were installed at Pinedale during the growth years of 2006, 2007, and 2008. The maximum carrying capacity of a pipeline can be estimated from its diameter, length, and pressure drop. A ten-inch line, such as the one QGM applied for in the EIS, shown in Table 9 in Chapter 4, having a length of only 6,000 feet (1.14 miles), would have a maximum capacity of about 84 MMcfd, estimating its pressure drop at 60 psig.

Longer twelve-inch diameter pipelines, using the same pressure estimates, would have maximum flow rates as shown in the following graph:

[2] http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/pfodocs/anticline/fseis.Par.30367.File.dat/vol1_ea.pdf

Figure 2 - Gas Pipeline Maximum Flows[3]




## f) Chapter 5 - Liquid Content and Shrinkage

Natural gas liquids (NGL) are produced as a small-percentage by-product from wells classified as natural gas wells.

Wexpro manages, develops, and produces cost-of-service reserves for QGC under the terms of the Wexpro Agreement. The following table lists cost-of-service natural gas and oil reserves as estimated by Wexpro reservoir engineers as of December 31, 2008:

Table 1 - Estimated Cost-of-Service Proved Reserves[4]

| | Bcfe | % |
|---|---|---|
| Natural gas (Bcf) | 646.9 | 96.0 |
| Oil (Bcfe)[1] | 27.0 | 4.0 |
| Total proved reserves (Bcfe) | 673.9 | 100.0 |
| Proved developed reserves (Bcfe) | 489.9 | |

[3] Based on discussions with QGM on typical pressure drops (60 PSIG) and nominal pressures
[4] Source: Questar Corporation Annual Reports & 10K Reports

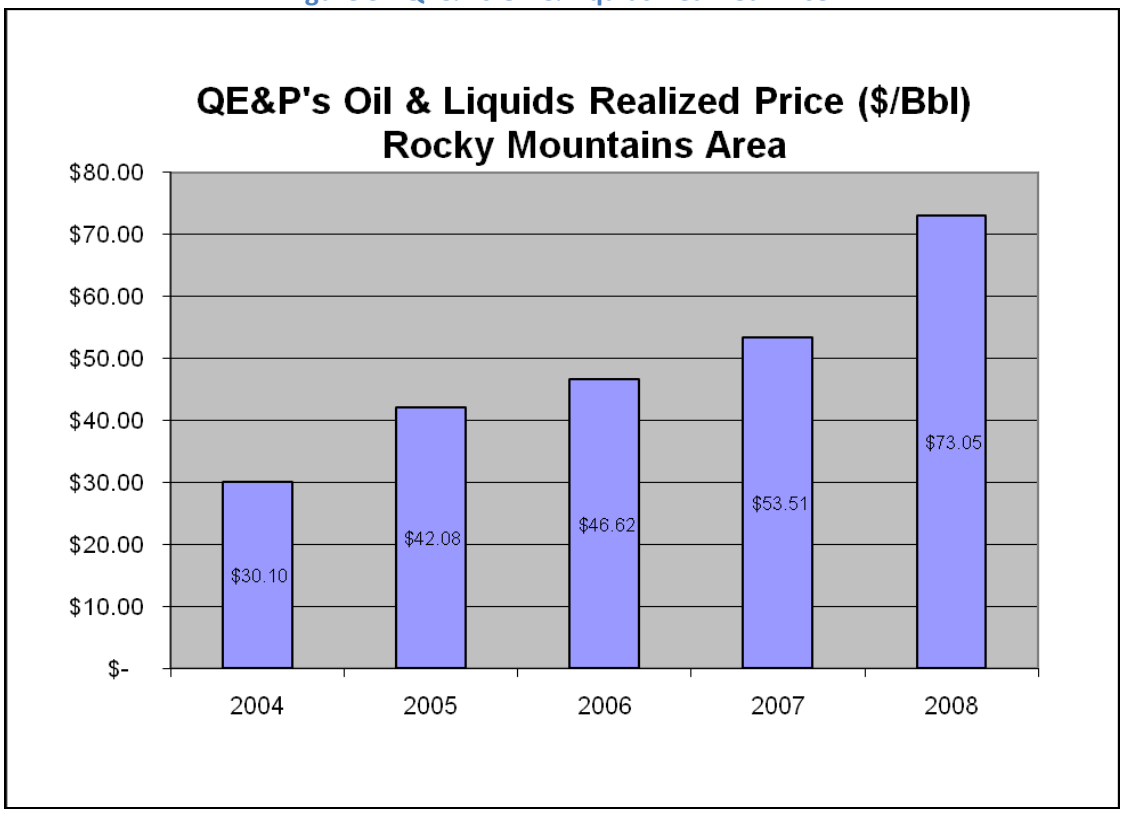
1: Oil volumes are converted to natural gas equivalents assuming one barrel of crude oil, condensate, or NGL is equivalent to 6,000 cubic feet of natural gas.

As shown in the above table, oil accounts for 4% of proved reserves on a volumetric basis.

Shrinkage is the term applied to the losses in volume of QGC's gas when it is being processed by QGM in the plants where liquids are removed. However the system-wide gathering agreement between QGC and QGM requires QGM to redeliver equivalent quantities of gas to the delivery points (downstream pipelines) less fuel gas and lost-and-unaccounted-for gas. Thus **QGM is responsible for, and replaces, any shrinkage** occurring on QGC's gas. Condensate, captured from the gathering systems, is sold and the value is credited to the costs in the annual rate calculation.

In order to estimate the value of the liquids, the chart shown below illustrates the growth in liquids selling prices by QE&P in the Rocky Mountain Area:

Figure 3 - QE&P's Oil & Liquids Realized Price[5]




## g) Chapter 6 - Market Level of Service

The System Wide Gathering Agreement specifies a **cost-of-service** based calculation procedure for determining gathering rates (see Chapter1). The gathering costs are **not** based on a "market" gathering rate.

An alternative technique for determining market levels of service (or rates) for any type of service (including gathering and processing services) would be the use of "market" service offerings and rates in the vicinity; i.e. those provided or charged by third party providers of these services. However this technique requires discovery of typical published market conditions. When published offerings do not exist, an alternate technique for determining market-based conditions is through use of a survey of offerings from third-party providers or users of these services, particularly in nearby areas. WCI conducted this type of survey during the conduct of this study in an attempt to determine ranges of gathering services offered by others. A number of other related items were included in the survey.

[5] Source: Questar Corporation Annual Reports and 10K Reports

WCI's survey consisted of sixteen questions related to gathering and processing. All four of the large gathering and processing firms operating in the vicinity of the Pinedale field that we selected for the survey agreed to cooperate with WCI by answering the questions on the survey form. Survey responses were combined to produce a single representative, but anonymous, response to each question. Then QGM's practices were compared against each combined response.

Some of the comparisons indicated that:

- QGM offers a complete range of midstream services (e.g. gathering, processing, dehydration, compression).
- Without detailed cost results, it appears that QGM's gathering costs may span an equal or greater range compared to others.
- Comparable to the survey answers, QGM escalates the majority of their contracts by explicit indices, including the CPI Index that its competitors use.
- QGM bases its gathering charge mostly on cost-of-service considerations rather than market conditions. This differs somewhat from other midstream providers surveyed, that also consider competitive market factors.
- QGM differs from all survey respondents in offering a two-part gathering rate. No survey respondent reported using a two-part gathering rate.
- QGM's gathering system is similar to most survey respondents, with about 1,600 miles of gathering lines.
- QGM moves gas a distance that is at the low end of the range reported by survey participants. Respondents reported typical distances from five (5) to ninety (90) miles from the wellhead to pipeline receipt points, compared to about 10 to 15 miles for QGM, although some Pinedale distances may be longer...
- QGM sends a somewhat smaller percentage of their gathered gas through processing plants. Survey respondents reported that the vast majority of their gathered well volume goes through a processing plant. The range provided in the survey was between 94% and 100%, compared to about 80% for QGM.
- Respondents reported capacity for a typical processing plant between 1.3 and 1.5 BCF, whereas QGM utilizes about 2 BCF.

- Most respondents reported that whether or not processing rates were escalated annually varied with each contract. When QGM escalates its processing costs, it generally employs a fixed annual percentage escalator.

- Cryogenic gas processing was reported to be the most widely used technique, with refrigeration and gel treating also being employed. QGM also utilizes both cryogenic and refrigeration processes.

- All of the participating firms that offer processing services also offer the option for a producer to participate in a percentage of proceeds for the liquids. QGM offers this participation option as well as a "keep-whole" option among other offerings.

## h) Chapter 7 - Conclusions and Recommendations

WCI has the following conclusions and recommendations based on the findings of this review of QGM's natural gas gathering and processing agreements including the SWGA and non-affiliated gathering agreements:

### Findings and Conclusions

1. QGM's SWGA for QGC's gas properties operated by Wexpro is quite unique. We are not aware of other similar arrangements in the gas industry, wherein gathering rates are not fixed (or possibly varied regularly with escalators) but are instead reset each year based on the amount of rate base utilized in the gathering system. Since there are few, if any precedents, care must be taken to regularly check to see that the gathering charge formulas originally set a decade or more ago are still relevant.

2. In the 1998 amendment to the 1993 SWGA, gathering charges in Appendix B were modified to incorporate a winter-seasonal volume adjustment. This is common practice in the pipeline industry and the adjustment involves use of a ratio of the amount of cost-of-service gas delivered to QGC in relation to the gas volume delivered by QGM to all parties during the months of January – March and November – December of the same calendar year. Expenses for the various categories such as Operating and Maintenance (O&M) expenses, depreciation and amortization expenses, and so on use the ratio of the winter months instead of the ratio based on the entire year

3. Appendix C to the amended 1998 SWGA specifies the cost formula for connecting a new well as requested by the operator Wexpro to QGM. However, from interviews with QGM, it appears this calculation has not been implemented

or charged to QGC since its inception in the amended 1998 SWGA when adding new wells. Questar stated the reason the formula isn't being used is because when the formula is used on a new well connection and the cost to hook that well up, per the formula, is more than the current SWGA cost of service, QGC has the right to take the well to someone other than QGM.

4. Currently, in the environment of low gas prices, new rate-base capital expenditures would be expected to not increase as fast as in recent years. However the longer-term outlook for capital expenditures in the new gathering areas such as Pinedale would be for the return of large increases, which would once again put upward pressure on gathering and processing rates.

5. The services that QGC receives from QGM in the gathering and processing areas are very similar to those offered by a number of competitors, both across the U.S. and in the Wyoming region, as obtained from public information sources such as the internet. WCI has summarized the offerings by a number of midstream service providers including:

    a. Williams Field Midstream Services, a subsidiary of The Williams Companies, Inc.

    b. Atlas Pipeline Partners, LP

    c. DCP Midstream, LLC

    d. TEPPCO (Texas Eastern Products Pipeline Co., LLC) [Merger with Enterprise expected to be approved by the end of 2009]

    e. Ultra Resources, Inc. (Ultra), a subsidiary of Ultra Petroleum Corporation

6. WCI notes that the Priority #1 designation, as used by QGM, signifying firm service with a demand charge in addition to the commodity charge, is not referred to in any part of the System Wide Gathering Agreement. Only firm service is specified, which would also correspond to Priority #2.

7. WCI has located from public sources, gathering rates that contain indexes that can result in higher gathering rates than those charged by QGM. For instance, Atlas charges certain rates as a fraction of gas cost, with some listed at 10% to 16% of the weighted average sales price of gas. In times of rising gas costs, this index can result in substantial gathering costs.

8. WCI notes from information contained in public sources, that Ultra Petroleum, a user of midstream services in the Pinedale and Jonah fields, has conducted apparently successful negotiations resulting in the reduction of certain gathering and processing costs by offering to sign long-term usage contracts which permit the midstream provider to invest in long-term capital equipment such as compressors.

9. The natural gas industry has recently entered a new environment of low gas prices – an environment not seen in recent years. Ramifications for all parts of the E&P industry including gas gathering and processing activities are severe. For instance QGC's production has been curtailed since lower-cost gas can now be obtained by QGC elsewhere. Even though the ratepayers of Utah have a claim on QGC's gas and have historically enjoyed relatively low gas rates because of this gas source, they now find themselves in the position of having to back off on the QGC (Wexpro-operated) source in order to not pay higher gas prices.

10. QGM's interests were historically aligned with those of Utah ratepayers in the prospect of gathering lower-cost QGC reserves. Care must now be taken that the interests of both parties are still aligned. Utah ratepayers for instance under conditions of low gas prices, may sometimes have a declining interest in development of additional QGC reserves. QGM however could hypothetically still enjoy historically high gathering (and possibly development) fees by continuing to gather the QGC reserves, since QGM would still recover their costs-of-service and still enjoy a substantial return on rate base. We note the return on rate base is Commission approved. It is the same ROR that QGC is allowed.

11. The Division employs a Monitor to assure that any new Wexpro-operated wells developed will be economically attractive or they will be declared to be non-commercial wells and are drilled at WEXPRO'S own risk. This is one check on the alignment of interests of both parties. Unfortunately the current low-cost gas environment makes the Monitor's job that much harder. In deciding whether or not a well may be economic, should he/she use today's low prices or a forecast for future prices?

12. WCI judges that the economic impact of the decision regarding whether to continue to produce and gather QGC gas versus the option of purchasing spot-market supplies could have an impact on Utah ratepayers.

13. Survey Conclusions - The following conclusions were drawn by WCI from comparing QGM to the results of the gathering survey:

    a. QGM offers a complete range of midstream services (e.g. gathering, processing, dehydration, compression).

    b. Comparable to the survey answers, QGM escalates the majority of their contracts by explicit indices, including the CPI Index that its competitors use.

    c. QGM bases its gathering charge for QGC on cost-of-service considerations rather than market conditions. This differs somewhat from other midstream providers surveyed that also consider competitive market factors.

    d. QGM differs from all survey respondents in offering a two-part gathering rate. No survey respondent reported using a two-part gathering rate.

    e. QGM, like most survey respondents is not familiar with competitors that also offer two-part gathering rates.

    f. QGM has as large a gathering system as most survey respondents, with about 1,600 miles of gathering lines.

    g. QGM moves gas a distance that is at the low end of the range reported by survey participants. Respondents reported typical distances from five (5) to ninety (90) miles that their firm moves gas from the wellhead to pipeline receipt points, compared to about 10 to 15 miles for QGM (although much further in Pinedale).

    h. QGM sends a somewhat smaller percentage of their gathered gas through processing plants. Survey respondents reported that the vast majority of their gathered well volume goes through a processing plant. The range provided in the survey was between 94% and 100%, compared to about 80% for QGM.

    i. Respondents reported capacity for a typical processing plant between 1.3 and 1.5 BCF, whereas QGM has a larger capacity plant of about 2 BCF.

    j. QGM offers the “keep whole” option, as do some survey respondents.

k. Most respondents reported that whether or not processing rates were escalated annually varied with each contract. When QGM escalates its processing costs, it generally employs a fixed annual percentage escalator.

l. Survey respondents reported that slightly more than half of their processing contracts permitted their processing firm to sell and retain liquids revenues. QGM typically sells liquids that it extracts.

m. Cryogenic gas processing was reported to be the most widely used technique, with refrigeration and gel treating also being employed. QGM also utilizes both cryogenic and refrigeration processes.

n. All of the participating firms that offer processing services also offer the option for a producer to participate in a percentage of proceeds for the liquids. QGM offers this participation option as well as a "keep-whole" option.

14. WCI noted that the cost-of-service calculations for determining gathering costs include charges and returns based on new infrastructure such as pipelines and compressors. However, the greatest growth in cost-of-service came from people-related areas such as O&M and G&A, rather than the infrastructure elements themselves.

## Recommendations

1. WCI notes that the Priority #1 designation, as used by QGM, signifying firm service with a demand charge in addition to the commodity charge, is not referred to in any part of the System Wide Gathering Agreement. Only firm service is specified, which would correspond also to Priority #2. WCI suggests that the service designation in the Agreement be changed to correspond to Priority #1, since this two-part rate is being charged.

2. Especially during an era of extremely low natural gas prices, the Division's oversight becomes more important in reviewing some of the major decisions now facing QGC, such as reducing production at certain Wexpro-operated wells and replacing the gas with lower-cost spot-market supplies. WCI recommends that QGC continues to keep the Division fully informed of these replacement decisions.

3. WCI recommends that QGC adopt industry evaluation techniques such as buy/sell calculations involving variable-cost (as opposed to fixed-cost or full-cost) bases for its produce-vs.-purchase decisions. Major considerations also involved in this decision include the possibility of well damage[6] from being temporarily shut-in. We understand that the Division is currently in the process of having QGC prepare a paper discussing its produce-vs.-purchase decisions for the Commission.

4. WCI recommends that QGC provide pro-active guidelines (as part of its IRP process) for the pace of drilling of additional cost-of-service wells during times of low gas prices, since the Utah ratepayers need to benefit from all additional wells drilled.

5. WCI recommends that the process of field unitization be studied to determine its applicability to portions of the Pinedale area of interest to Wexpro. This technique could develop rules for well drainage that drillers should follow, which would permit wells and gathering systems to be grouped for economies.

6. In order to carry out certain of the above recommendations (especially recommendations 2 and 5) WCI recommends that the Division continue to use the services of their Monitor.

7. WCI observed that the largest recent growth in cost-of-service calculations for determining gathering costs came from people-related areas such as O&M and G&A, rather than from the gathering infrastructure elements themselves. Further investigation into the underlying causes of these recent increases is beyond the scope of WCI's current assignment but seems to be warranted. Therefore WCI recommends that the Division look into these cost areas as part of Account 191 data filings in future years...

[6] The Pinedale anticline of Southwest Wyoming has proved technically challenging to drill and cement. This tight gas reservoir has more than 5,000 ft of vertical-pay interval in stacked-lenticular sands. When a well is "shut-in", gas hydrates form an effective seal mechanism of the sand sediments and cause well damage requiring extensive and expensive re-opening of the well.

# II. Introduction

## a) Background

In January 2009 the Utah Division of Public Utilities (DPU or Division) put together a bid packet and sent out a Request for Proposal. This RFP denoted Solicitation No. N09028, as explained further below, was for a review of Questar Gas Company's natural gas gathering and processing agreements. The Division was seeking to retain an expert to examine the Area Wide Gathering Agreement that QGC; a subsidiary of Questar Corporation has with its sister non-regulated company Questar Gas Management Company (QGM). Responses were due prior to February 17, 2009.

The Division is a Utah state governmental agency with a statutory mandate to represent both the interests of utility customers and utilities in utility proceedings before the Public Service Commission of Utah (PSCU or Commission).

Williams Consulting, Inc. (WCI) responded to this RFP and to a Best and Final clarification request. On April 15, 2009 WCI was notified that the proposal evaluation was complete and that the contract was awarded to WCI, as "the offeror with the most advantageous proposal". The contract duration was for one year and the contract renewal was for five annual renewal periods. Williams Consulting, Inc. (WCI) is not affiliated in any way either directly or indirectly with The Williams Companies, Inc., including any subsidiaries, e.g. Williams Field Services (Midstream) or Williams Pipeline.

## b) Purpose of Request for Proposal (RFP)

As explained by the Division, Questar Gas Company (Company or QGC) is the monopoly provider of natural gas to customers in the State of Utah. The Company files semi-annual pass-through applications in which it seeks to recover the costs associated with the production and or purchase of natural gas as well as the costs associated with the gathering and transportation of those volumes of natural gas consumed by its customers in the State.

The purpose of the RFP is to retain an expert to examine the System Wide Gathering Agreement (SWGA or Agreement) that QGC has with its sister non-regulated company Questar Gas Management Company (QGM).

The Agreement costs are part of the overall costs that make up the system non-gas (SNG) rate in the pass-through filings submitted by QGC. The SNG rate is to recover the costs associated with the gathering, transportation and storage of the natural gas volumes used by the customers of QGC.

## c) Contingency of the Division's Audit of Company's 191 Account upon Results of This Review

The Division recently conducted their annual audit of the Company's Account 191 of the Uniform System of Accounts for the Calendar Year, 2007. The Division found the 191 Account to be stated fairly and in conformance with prior Commission orders. However, the Division noted at that time that their findings are contingent upon three reports:

1. The Independent Accountants' 2007 Performance Review of Wexpro, which had not yet been issued,
2. The hydrocarbon monitor's subsequent findings, and
3. This review of the System Wide Gathering Agreement, since the gathering costs increased significantly in 2007.

Therefore the Division recommended that the rates remain as interim rates until the above items are closed.

## d) Scope of Work

The Division outlined five areas that would form, at a minimum, the scope of work for this review:

1) Review the terms and conditions of the System Wide Gathering Agreement (SWGA). This will include analyzing the components that make up the cost-of-service billings rendered to QGC by Questar Gas Management and what cost escalators are built into the agreement.

2) Determine if the level of service provided by Questar Gas Management is typical of service offered by third party gathering services.

3) Analyze the number of wells delivering gas into each gathering line, the volumes being delivered and the capacity of each gathering system being utilized by QGC production (operated by Wexpro);

4) Determine how the value of liquids contained in the QGC's production is accounted for and whether QGC or QGM is responsible for shrinkage replacement.

5) Determine if the level of service provided is the lower of "cost" or "market" for the areas being gathered and justifies the overall rate charged by QGM to QGC. This may entail trying to obtain market information from third-party providers of gathering and processing services in the southwest area of Wyoming and reviewing the contracts QGC has with non-affiliated third party providers of gathering and processing services.

## e) Outline of Report

The above five scope-of-work topics form the basis of this report and are addressed in Chapters 1,3,4,5, and 6 respectively. Additionally, Chapter 2 has been added to this report in order to focus in detail upon the rise in gathering and processing cost contained in the November, 2007 filing #07-057-09. This emphasis was added by WCI in response to the Division's statement in its Packet for Bid NO9028 that "This RFP is being issued to review the provisions of this System Wide Gathering Agreement ***and in particular to investigate the increase in costs associated with this agreement which occurred in November 2007*** (UPSC Docket No. 07-057-09)." Lastly, Chapter 7 of the report contains WCI's Conclusions and Recommendations.

## f) Project Schedule and Chronological Summary

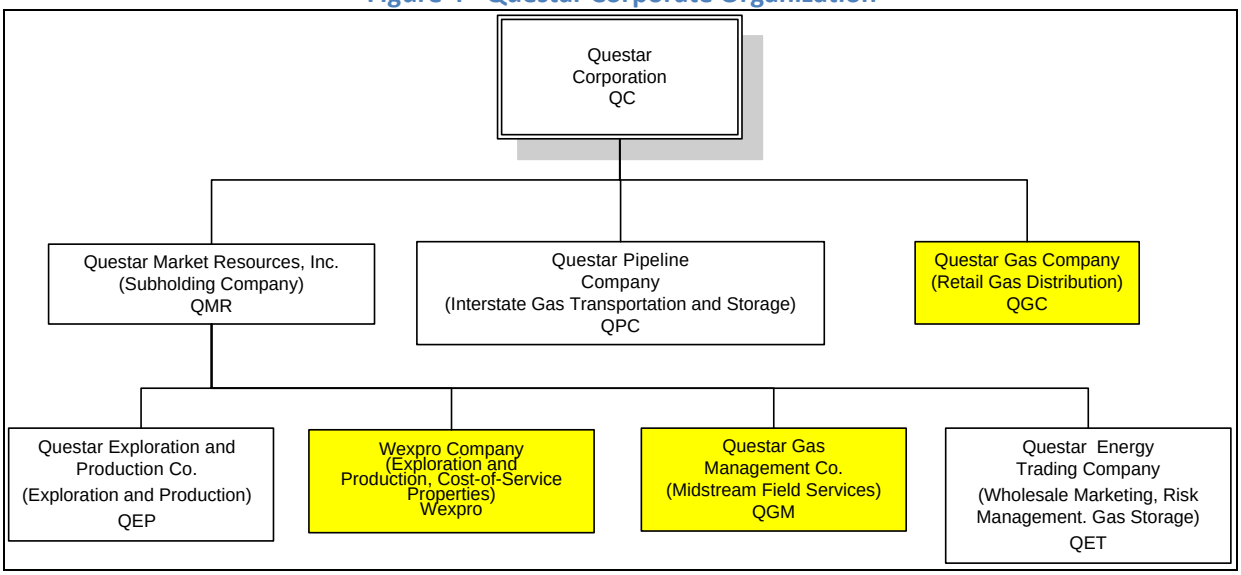
On May 12, 2009 WCI began this review with a kickoff meeting in Salt Lake City between four members of WCI and five members of the Division. On succeeding days interviews were held with personnel from QGC, QGM, and Wexpro. Progress reports were forwarded to the Division on a monthly basis to keep the Division apprised of WCI's progress and to afford them an opportunity to comment on our progress and suggest any necessary changes.

Throughout the term of the study, WCI personnel obtained voluminous pertinent information from sources available over the internet. In particular, Annual Reports and 10-K reports for Questar Corporation, filed information at the Bureau of Land Management (BLM), and information from County sources in southwest Wyoming were obtained from internet websites.

## g) Questar Subsidiaries Organization Chart

The following organization chart pictures the various subsidiaries of Questar Corporation and their reporting relationships. QGC is the gas distribution subsidiary that distributes gas to customers in the State of Utah. It is the only subsidiary of Questar that is regulated by the Division of Public Utilities. Questar Gas Management (QGM), of which Wexpro is an affiliate, operates in the Rocky Mountain region to provide natural gas gathering and processing services for its affiliates and third-party producers. QGM operates gas-processing plants, blending facilities, compression units and related facilities, as well as a 1,600 mile gathering system serving growing production in the Green River Basin in western Wyoming and the Uinta Basin in eastern Utah. In 2006 QGM also owned 50 percent (currently 78%) of Rendezvous Gas Services, LLC, a joint venture that operates gas-gathering facilities in western Wyoming. Rendezvous gathers natural gas for Pinedale Anticline and Jonah field producers for delivery to various interstate pipelines. Under a contract, known as the SWGA, with QGC, QGM also gathers cost-of-service volumes produced from properties operated by Wexpro. QGM is a sister company to QGC and is not regulated by the Division.

Figure 4 - Questar Corporate Organization[7]




## h) Project Objectives

In performing our review of the various Questar subsidiaries involved in the natural gas chain supplying Utah's ratepayers, one of WCI's major objectives was to explain and to document the functions and interrelations of the most relevant subsidiaries in the topical areas that the Division identified. In our report WCI has strived to present as much

[7] Source: DR-1

pertinent information as we were able to obtain on the activities, sizes, profitability, and missions of the organizations that have the most impact on the ratepayers, in order to present a comprehensive understanding of these impacts.

# 1 Chapter 1 - Gathering Agreement Review

As of 2009, Questar Gas Management, a subdivision of Questar Market Resources, Inc, whose parent company is Questar Corporation provides gas-gathering services through a gas gathering agreement dated September 1, 1993 and amended February 6, 1998 (see timeline), often referred to as the System Wide Gathering Agreement (SWGA). The Agreement has existed for the past three decades with one amendment. A timeline of relevant historical agreement and other factors, such as Order 636 is shown in Appendix 8.2.

The gathering rates are calculated each September 1 based on cost-of-service calculated for the prior calendar year. The costs include QGM gas gathering expenses less reimbursable revenues as outlined in paragraph 3 of Appendix B of the SWGA. Another cost-of-service component is the cost associated with connecting new wells added to QGM's SWGA gathering system as demonstrated in Appendix C. Examples of the cost-of-service calculations are represented through tables and charts in section 1-4 of this Chapter.

## 1.1 A Brief History:

On April 8, 1992, FERC Order 636 stated that gas gathering operations were restructured and unbundled, meaning that pipeline companies (Interstate and Intrastate) were no longer permitted to purchase gas directly from the wellhead and sell the gas to distributors. Order 636 necessitated a new Gas Gathering Agreement, effective September 1, 1993, between Mountain Fuel Supply Company and Questar Pipeline Company. The 1993 Agreement completely replaced the existing 1984 gathering agreement.

Questar Gas Management was originally established in 1993 to construct and operate the Blacks Fork processing plant in southwestern Wyoming. QGM assumed all of Questar Pipeline Company's gathering interests on March 1, 1996. In mid-1996, QGM was moved from Questar Pipeline to Questar Market Resources, Inc., a subsidiary of Questar Corporation (an unregulated entity), and acquired the processing plants that formerly belonged to Celsius Energy Company and Universal Resources Corporation.

In 1996, QGM's gathering system consisted of approximately 1,400 miles of gathering lines, compressor stations, field dehydration plants, and measuring stations. The system had been built primarily to gather QGC's production from Questar Market Resources, Inc.'s other subsidiary, Wexpro Company, based on cost-of-service properties.

According to Questar's 2008 Annual Report, QGM now owns 1,598 miles of gathering lines in Utah, Wyoming, and Colorado. In 2007, QGM owned 50% of Rendezvous Gas Services, LLC (Rendezvous) and in 2008 purchased an additional 28%. Rendezvous is owner of an additional 330 miles of gathering lines and associated field equipment, providing gas gathering services for the Pinedale and Jonah producing areas of Wyoming. QGM also owns a portion of 130 miles of additional gathering lines and associated field equipment with other entities.

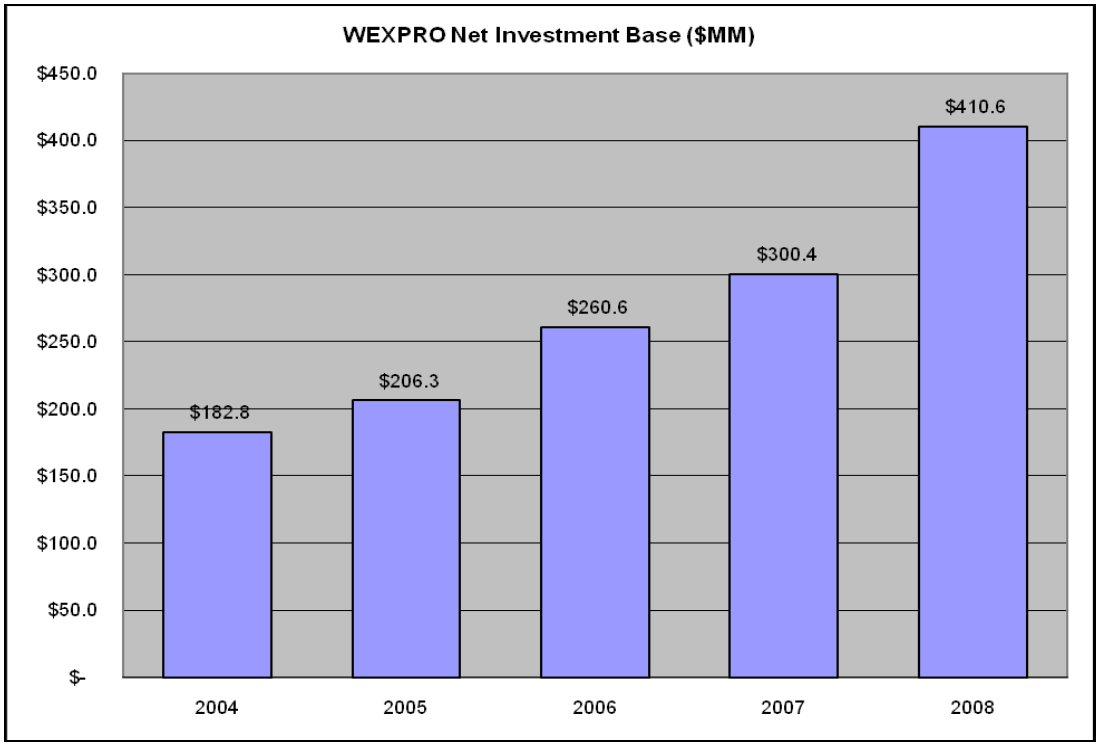
## 1.2 Wexpro Investment Base and Current Capital Expenditure Plans

One of the elements in the development of the cost-of-service for gathering is the return on rate base. Wexpro's ***gross*** property, plant and equipment are carried on Questar's books at $911.5 million, as of December 31, 2008. Under the 1981 Wexpro Agreement, Wexpro earns a 19-20% after-tax unleveraged return on its ***net*** investment in the development of Rockies natural gas reserves on behalf of its affiliate, QGC.

During 2008, Wexpro's ***net*** investment base increased 37% from $300.4 million to a level of $410.6 million. Costs incurred by Wexpro for cost-of-service activities related to production of gas and oil were $148.0 million in 2008. This figure compares with $110.7 million in 2007 and $100.3 million in 2006. However, due to recent market and economic conditions, Questar's plans for total capital expenditures for 2009 have been reduced drastically to about half of their 2008 level, and planned 2009 expenditures for Wexpro developmental drilling have been reduced some 21% to approximately the level spent in 2007.

Net investment base consists of Wexpro's investment in commercial wells and related facilities adjusted for working capital and reduced for deferred income taxes and depreciation. The graph below illustrates the growth that has occurred in Wexpro's net investment base over the period from 2004 through 2008:

Figure 5 - WEXPRO Net Investment Base[8]

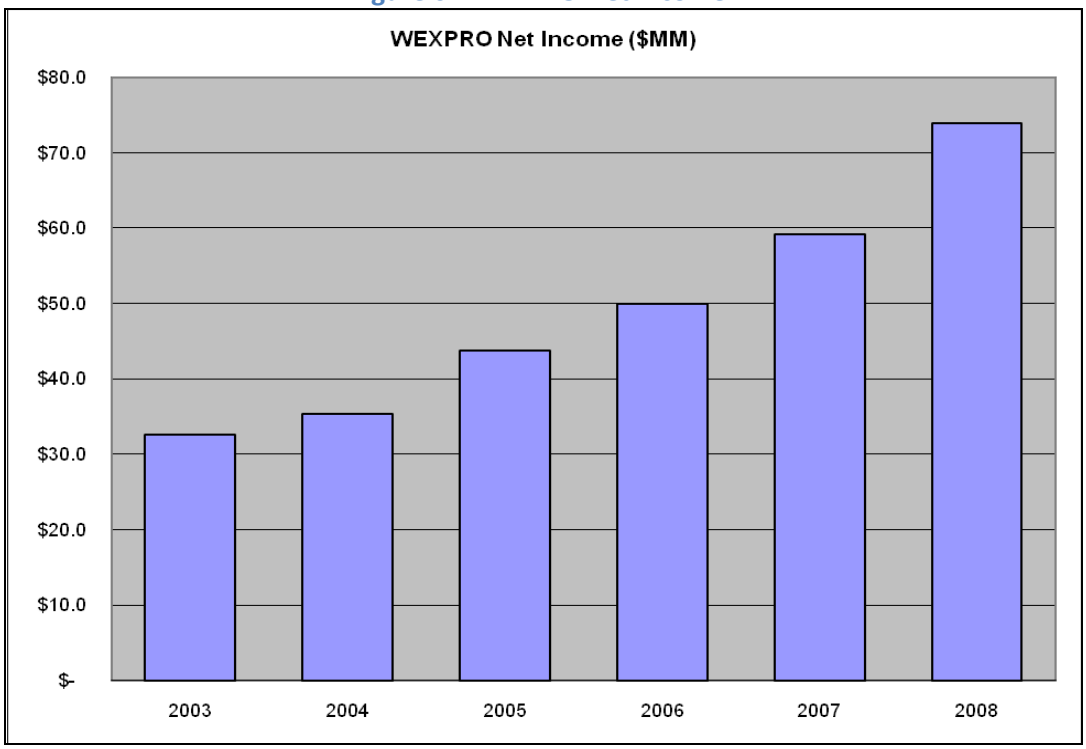



### 1.2.1 Wexpro Earnings

The graph below illustrates the growth that has occurred in Wexpro's net income over the period from 2003 through 2008:

[8] Questar Corporation Annual Reports & 10K Reports

Figure 6 - WEXPRO Net Income[9]



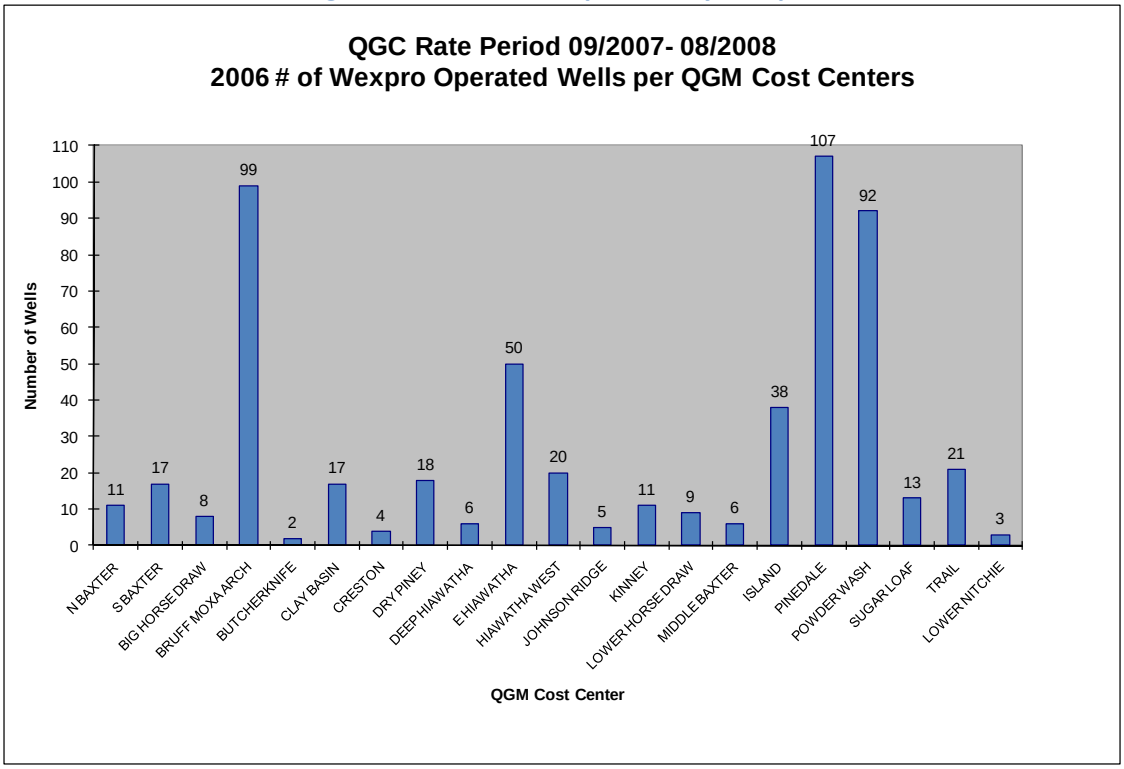

### 1.2.2 Wexpro Current & Potential Wells

***Wexpro-Operated Current Wells***

In the graph below are a list of QGM's twenty-one cost centers and the number of wells, operated by Wexpro, where QGC's gas is produced and gathered by QGM.

[9] Questar Corporation Annual Reports & 10K Reports

Figure 7 – QGC Wells Operated by Wexpro




### *WEXPRO's Potential for Future Wells*

Wexpro's cost-of-service operations are contractually limited to a finite set of properties set forth in the Wexpro Agreement. However recent advances in technology (notably increased density drilling and multi-stage hydraulic fracture stimulation) have unlocked significant unexploited potential on many of the subject properties. According to Questar's 2008 Form 10-K, Wexpro has identified over $1 billion of additional drilling opportunities that could deliver cost-of-service natural gas supplies to QGC at prices competitive with alternative sources. Therefore Wexpro operations have the potential to grow significantly in future years.

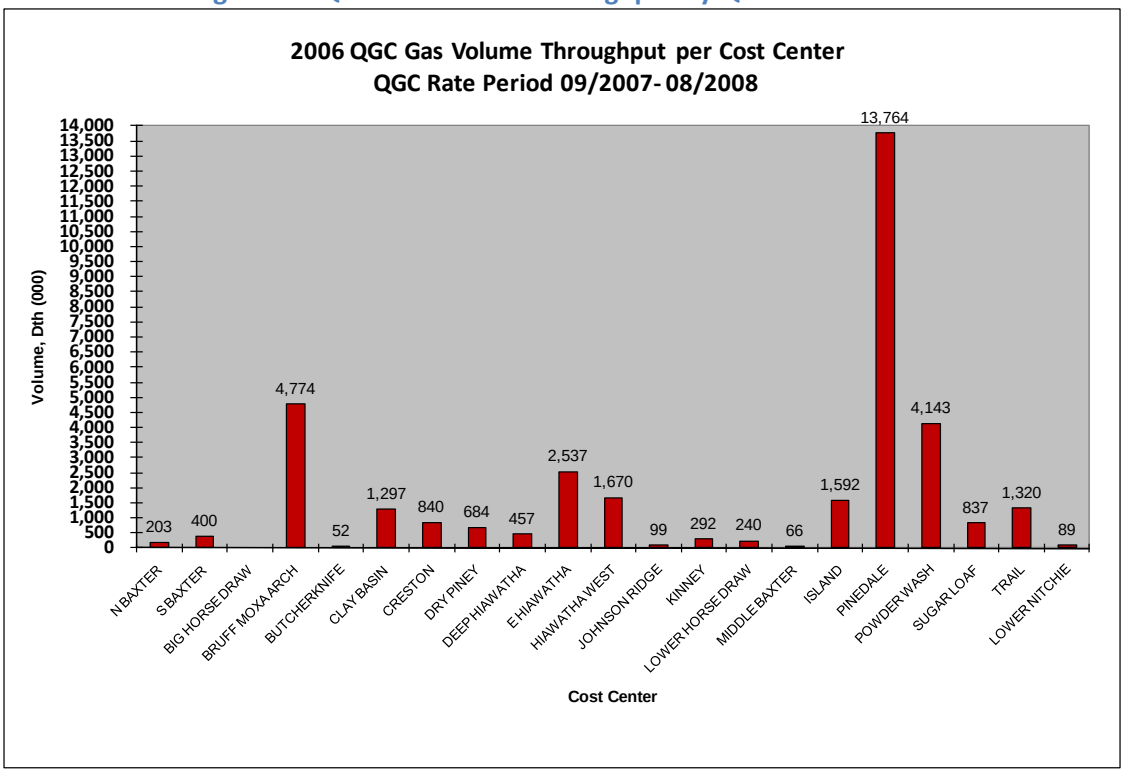
In September 2008, the Bureau of Land Management issued a Record of Decision (ROD) on the Final Supplemental Environmental Impact Statement for long-term development of natural resources in the Pinedale Anticline Project Area (PAPA). Under the ROD, Questar E&P and Wexpro will be allowed to drill and complete wells year-round in one of five Concentrated Development Areas defined in the PAPA. The ROD contains additional requirements and restrictions on development of the PAPA. Thousands of new wells are anticipated in order to develop this field. In order to minimize the drilling and production operation footprint, multiple wells are frequently drilled from a single well pad.

As new wells are developed, new gathering and processing systems will be required which will cause upward pressure on gathering and processing costs.

### 1.2.3 QGC's Gas Produced from Wexpro Wells

In the graph below are QGC's gas volumes gathered into each of the listed QGM cost centers, where QGC's gas is transported from wells operated by Wexpro. Out of the approximately 37.1 million Dth throughput, Pinedale accounts for 37%.

Figure 8 - QGC Gas Volume Throughput by QGM Cost Center




## 1.3 Article I- Dedication of Gas Quantity Stipulated in the SWGA

The SWGA states that QGM shall gather a maximum daily quantity (MDQ) up to 322,812 Dth/day of QGC's gas. The MDQ may be modified if warranted from changes in either production or gas purchases from third parties. Gathering rates are to be re-determined each September 1 and are calculated based on the annual cost-of-service for the prior calendar year.

## 1.4 Article II - Gathering Service in the SWGA

QGM shall gather up to the MDQ of QGC's gas from Wexpro-operated wells on a firm basis level of service. The level of service will be further discussed in Chapter 3 of this report. Further, as long as production does not exceed the MDQ, then any gathering receipt or delivery point may be used on an interruptible basis [10]. (QGM has stated that they do not expect the MDQ to be exceeded, based on historical flows). This receipt or delivery point aspect is not part of this review.

QGM has built or acquired, and maintains and operates facilities assigned to the gathering agreement (SWGA) which include services such as essential wellhead gas conditioning, collection, measurement and field compression. QGM provides these services to QGC gas from Wexpro operated cost-of-service properties and to other third-party operators. Generally, natural gas may contain moisture, impurities or valuable liquids. After leaving the well, the gas is gathered and delivered to a processing plant. Volumes may need the help of compression to move the product through the pipelines. Once the wellhead gas is gathered and processed by QGM, it is delivered to Questar Pipeline Company, another division of Questar, to transport through its interstate gas pipeline for re-delivery to Questar Gas Company which markets the gas to end users including industrial, residential, and commercial customers.

## 1.5 Article III- Calculation of Gathering Charges:

The SWGA provided for gathering rates covering three specific periods of time. Two earlier time periods are not germane to this discussion as they expired August 30, 1997. Although all of the rates were based on the cost-of-service, prior terms have been superseded effective as of August 31, 1997.

In the 1998 amendment to the 1993 SWGA, gathering charges in Appendix B were modified to incorporate a winter-seasonal volume adjustment. The adjustment involves use of a ratio of the amount of gas volumes contracted to QGC in relation to the actual gas volumes delivered by QGM during the months of January - March and November - December of the same calendar year. Expenses for the various categories such as Operating and Maintenance (O&M) expenses, depreciation and amortization expenses, and so on use the ratio of these winter months instead of the ratio based on the entire year.

[10] Article II (f) of SWGA.

*For example, for the 2008 SWGA rates, each of the cost centers in the SWGA developed a ratio based on 2007 costs and unitized through application of the throughput ratios from the winter period (January – March 2007 and November - December 2007). The resulting allocated cost ratio was applied to 2007 calendar year throughput to arrive at the composite demand and commodity amounts. The demand component is charged regardless of throughput through the 2008 period and the commodity component on a unit cost per Dth is applied to throughput during the September 1, 2008 through August 31, 2009 period to calculate the monthly charges in the SWGA.*

The gathering charges permissible by QGM are represented by the sum of two principal calculations as stated previously in this Chapter: 1) Appendix B and 2) Appendix C of the SWGA. The following table shows the calculations agreed upon and set forth in Appendix B to the February 6, 1998 Gathering Agreement. Amounts shown are taken from DPU FDR 1.01, Exhibits A-E.

**Table 2 - Calculation of Cost-of-Service Gas Gathering Rates**[11]

| Cost Item | 2004 Rate Period (9/05-8/06) | 2005 Rate Period (9/06-8/07) | 2006 Rate Period (9/07-8/08) | 2007 Rate Period (9/08-8/09) |
|---|---|---|---|---|
| **O & M Expenses** . These expenses include gathering expenses recorded in FERC Account Nos. 750-754 and 756-769 and 807, including administrative and general (A&G) expenses in Account Nos. 920-932 (excluding 924.1, 928.1, 928.2 and 920.3) and 935. | $7,206,724 | $8,374,459 | $12,707,836 | $12,416,021 |
| **Depreciation & Amortization**- This includes gathering expenses recorded in FERC Account Nos. 403 and 404, including general and intangible amortization expense. | $1,775,205 | $2,039,613 | $2,585,204 | $2,847,915 |
| **Taxes Other Than Income Taxes -** This includes gathering expenses recorded in FERC Account Nos. 408.1 and 408.9, including payroll | Imbedded in O&M | Imbedded in O&M | Imbedded in O&M | Imbedded in O&M |
| **Federal & State Income Taxes** QGC combined federal and state income tax rate shall be applied to the equity portion of the return on rate base | Just for Equity | Just for Equity | Just for Equity | Just for Equity |
| **Total Expenes** | $8,981,929 | $10,414,073 | $15,293,041 | $15,263,937 |
| **Rate Base** – The average rate base shall be determined by taking an average of the beginning and ending months | $16,848,924 | $21,638,398 | $30,493,125 | $32,423,425 |
| Gas Plant | $21,687,276 | $27,856,267 | $35,628,565 | $36,900,601 |
| Accumulated Depreciation and amortization (Fed & St) | - | - | - | - |
| Working Capital | $1,182,287 | $32,390 | $1,323,763 | $1,600,149 |
| Deferred income taxes (Federal & State) | ($6,224,014) | ($6,485,619) | ($6,873,030) | ($6,691,967) |
| QGM's general and intangible plant | $203,375 | $235,360 | $413,828 | $614,643 |
| **Rate of Return**. pre-tax rate of return derived from the overall rate of return allowed by the Utah Public Service Commission for QGC effective at the end of the period | 13.26% | 13.26% | 13.26% | 11.56% |
| **Other Operating Revenue Credits** | $389,112 | $721,155 | $2,180,540 | $1,786,802 |
| **Allocated Cost of Service: Add Total Expenses + Total Rate Base Items - Other Operating Revenue Credits** | **$10,826,984** | **$12,562,169** | **$17,155,890** | **$17,225,283** |
| Revision to 2006 Calculation | | | | ($183,294) |
| Revised Allocated Cost of Service | | | | $17,041,989 |
| **Demand Charge:** | | | | |
| 60% of Allocated Cost of Service | $6,496,191 | $7,537,301 | $10,293,534 | $10,225,193 |
| Monthly Demand Charge (Demand Charge divided by 12) | 541,349 | 628,108 | 857,795 | 852,099 |
| **Commodity Charge:** | | | | |
| 40% of Allocated Cost of Service | $4,330,794 | $5,024,868 | $6,862,356 | $6,816,796 |
| **QGC Throughput (Dth)** | 35,245,913 | 36,492,114 | 37,102,641 | 30,141,558 |
| **Rate Per Dth** - Commodity Only | $0.12 | $0.14 | $0.19 | $0.23 |
| **Rate Per Dth -** (Commodity + Demand Charge) or Equivalent Commodity Rate | $0.31 | $0.34 | $0.46 | $0.57 |

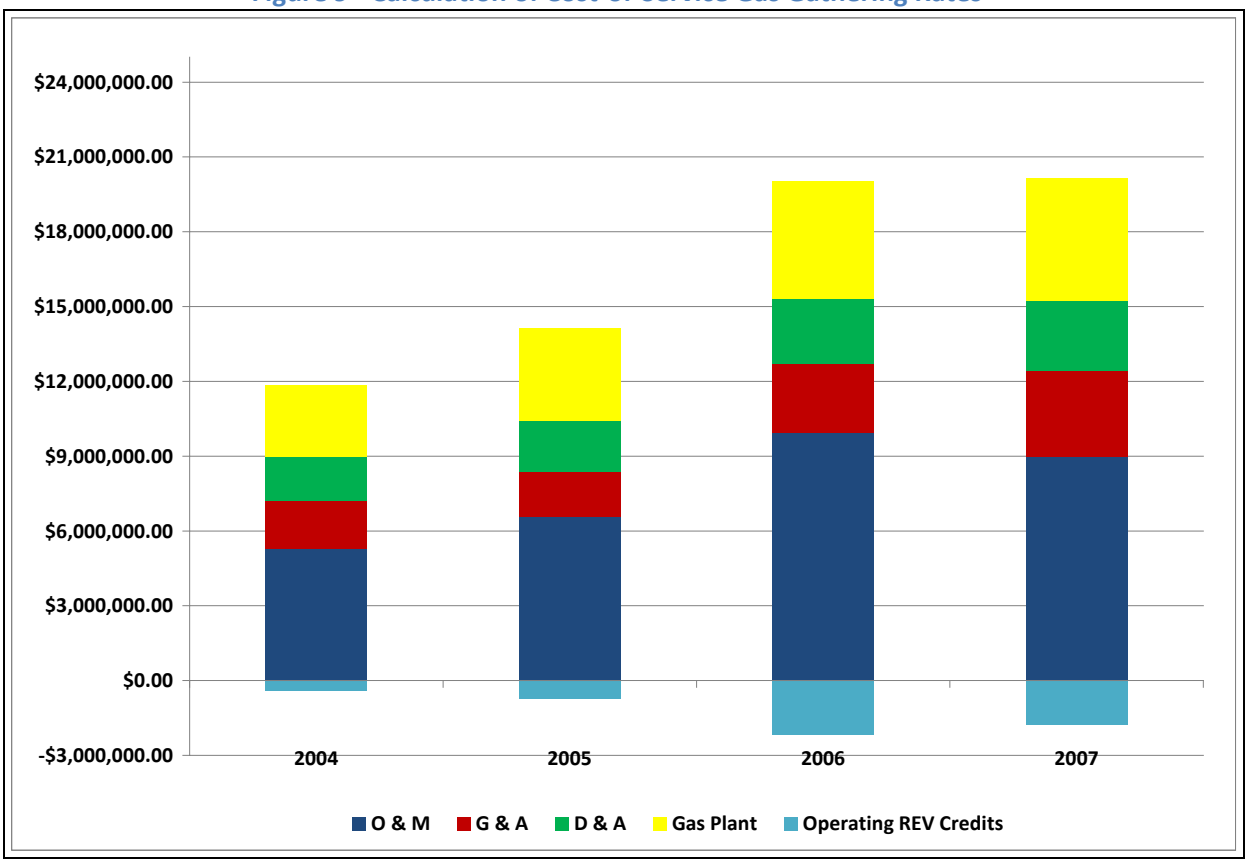
**Notes:** All Expenses and 'Other Revenues' are multiplied by QGC's Winter Period Percentage of Gas Volume Throughput for each Cost Center. Components of O&M Expenses are based on the FERC Account Standards shown in Appendix 8.3.

The following chart graphs the components of the cost-of-service gathering rates charged by QGM as displayed in the table above. The Operating and Maintenance (O&M) expenses comprise the largest share of the costs. All Expenses are multiplied by a factor or ratio of winter period throughput for each QGM cost center. Of these expenses, O&M, G&A, and D&A are categorized using FERC accounting rules as shown in Appendix 8.3. In addition, rate base items, e.g. Gas Plant, Working Capital, Plant Intangibles, and Deferred Federal and State Income Taxes are further multiplied by the rate of return (ROR) QGC is allowed by the Commission. Finally, 'other'

[11] Source: DR 26 and SWGA

operating revenue streams increased in 2006 and 2007 with the increased price of gas, which helped to moderate the overall gathering costs.

Figure 9 - Calculation of Cost-of-Service Gas Gathering Rates[12]




Note: Prior year costs (September 1 to August 31)

### 1.5.1 Calculation of Gathering Rates – Connecting a New Well:

Additional gathering costs QGM may charge QGC are shown here, representing a specific calculation as agreed upon and set forth in Appendix C to the amended 1998 gathering agreement to connect a new well to the SWGA as requested by the operator Wexpro to QGM. However, from interviews with QGM, it appears this calculation has not been implemented or charged to QGC since its inception in the amended 1998 SWGA when adding new wells. Questar stated the reason the formula isn't being used is because when the formula is used on a new well connection and the cost to hook that well up, per the formula, is more than the current SWGA cost of service, QGC has the right to take the well to a different someone other than QGM. We have therefore not investigated the effect of these potential charges as part of this assignment.

[12] DR 26 (DPU 4.08)

**Equation 1 - Calculation of adding a new well to the existing gathering system[13]**

$$Cr = \frac{(1.0-f) \times C}{(1.0-t)}$$

where Cr = Amount to be reimbursed by Mountain Fuel **(QGC)** to Questar **(QGM)**
C = Total actual cost of all new **QGM** gathering facilities required to connect the new well.
t = Combined marginal state and federal income tax rate applicable to **QGM** in the year of the well connection (as a decimal fraction).
f = "Deficiency factor" = Lesser of 1.0 or B ÷ 2,000.
B = "Baseline flow" = (F÷L) x I.
F = Average daily production of the well during a period of 30 consecutive days (to de designated by QGC. During the first 12 months following connection of the well (in MMBtu/day).
L = Length of new gathering lateral to be installed by **QGM** to connect the new well to its gathering system (in miles).
I = **QGC's** working interest in the well to be connected (as a decimal fraction).

## 1.6 Independent Facilities:

The SWGA also stipulates that QGM is allowed to construct and operate other gathering systems that do not transport gas from Wexpro facilities. These costs would be excluded and thus not considered as a cost component to the SWGA.

There are also situations where QGM does not own or operate gathering facilities to handle all the gas committed under the Wexpro Agreement. This gas is transported through third-party or non-affiliated gatherers and delivered to QGC. As of 2009, there are a total of six agreements.

Once the total cost-of-service amounts are computed as described above, the resulting amount is then multiplied by 60%, representing the demand charge (referred to as the reservation charge in the SWGA) and 40% indicating the commodity charge (referenced as the usage charge in the SWGA).For purposes of rate calculations, the demand charge translated to a monthly amount is divided by 12. The commodity charge is divided by the annualized total throughput of the gas volume in Decatherms[14] (Dth).

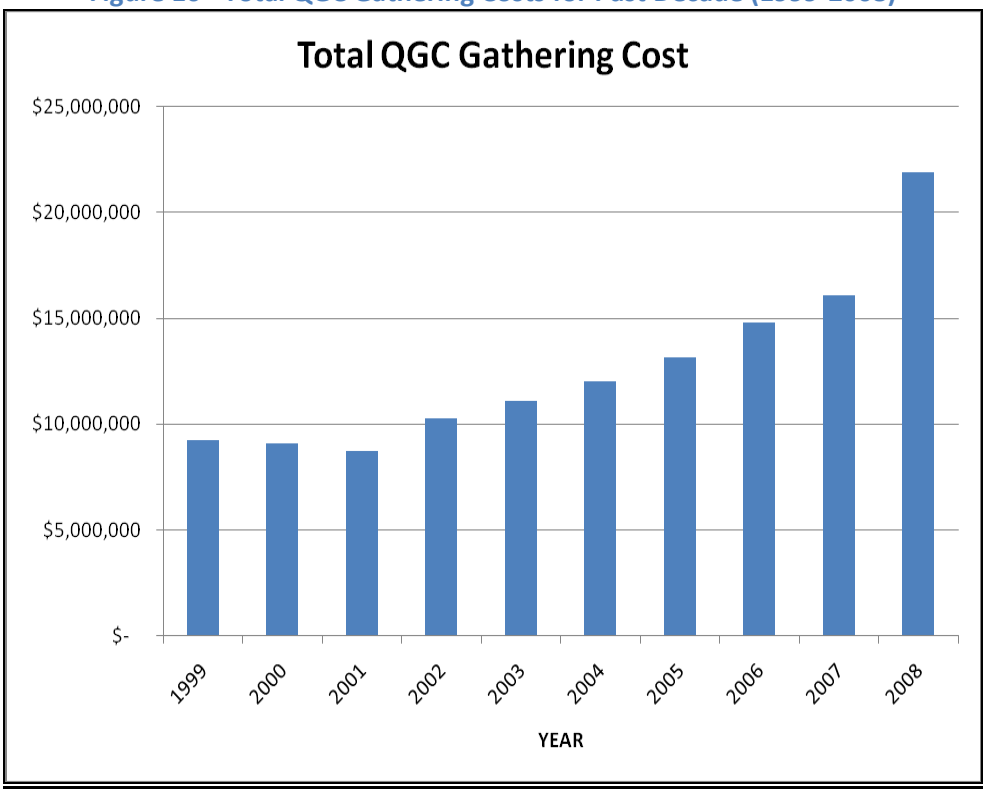
[13] Source: DR 2, SWGA
[14] Decatherms (Dth) a unit of energy equal to one million BTU's

# 2 Chapter 2 - Increase in Costs and Rate

In late 2007, the Division noticed a substantial increase in the projected gathering and processing costs to be charged by QGM for 2008. Increases were noted particularly in both the demand portion of the rate and in the commodity portion of the rate charged by QGM. WCI was requested, as part of this review, to analyze QGM's gathering and processing costs to determine the cause of the rate increase, and identify any factors, including escalation, responsible for the increase.

## 2.1 History of Gathering and Processing Costs

Figure 10 - Total QGC Gathering Costs for Past Decade (1999-2008)




*Source: Monthly "Greyback" bills from Company – Supplied by Division.*

The above graph indicates the substantial rise in gathering costs passed on to ratepayers by QGC under the terms of the System Wide Gathering Agreement. The 2008 value represents application of cost-of-service rates derived in the 2007 historical period to actual throughput in 2008. These costs are charged to QGC primarily by QGM (about 90%) and by Williams Field Service Co. and Mountain Gas Resouces (together about 10%). There are also a few smaller invoices included from other

sources, however they are primarily credits, presumably from the sale of liquids and condensate.

Billed gathering costs grew steadily from less than $10 million per year at the turn of the century, and doubling to approximately $22 million by 2008.

WCI's task was to analyze the elements of the rising costs noted above to determine their cause and the escalators behind them.

## 2.2 Gathering and Processing Costs as a Percentage of all Gas Costs

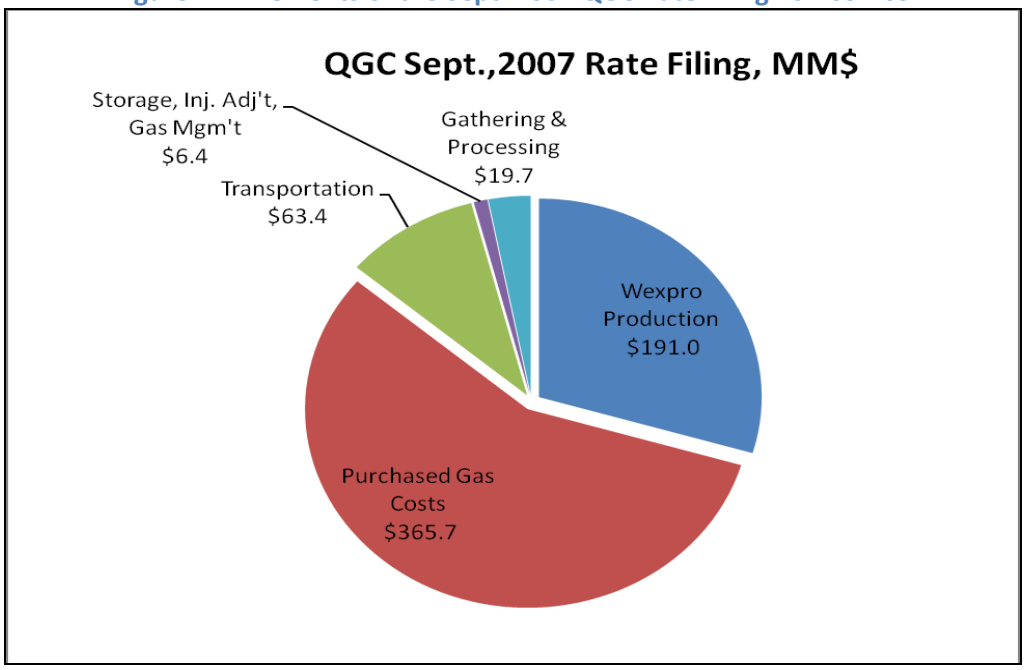
In order to first gain perspective on the relative size of the gathering and processing costs in comparison to all gas costs passed on to the ratepayers of Utah, the following table and pie-chart illustrate that these costs are approximately 3% of the total gas and non-gas costs contained in the 2007 QGC 191 pass through rate filing in Docket No.07-057-09:

**Table 3 - Elements of the Sept. 2007 QGC Rate Filing, #07-057-09**

| | MM$ | % | % Gas Costs | % Non-Gas Costs | % Gath. & Proc. |
|---|---|---|---|---|---|
| Wexpro Production | $ 191.0 | 29.6% | 29.6% | | |
| Purchased Gas Costs | $ 365.7 | 56.6% | 56.6% | | |
| Transportation | $ 63.4 | 9.8% | | 9.8% | |
| Storage, Inj. Adj't, gas Mgm't | $ 6.4 | 1.0% | | 1.0% | |
| Gathering & Processing | $ 19.7 | 3.0% | | 3.0% | 3.0% |
| **Total Utah Gas Costs (After Decrease)** | **$ 646.2** | **100.0%** | **86.1%** | **13.9%** | **3.0%** |

*Note: Total Utah Gas Costs are shown above after proposed decreases by Questar, contained within the filing.*

Figure 11 - Elements of the Sept. 2007 QGC Rate Filing #07-057-09




## 2.3 Recent Two-Year History of Gathering and Processing Costs

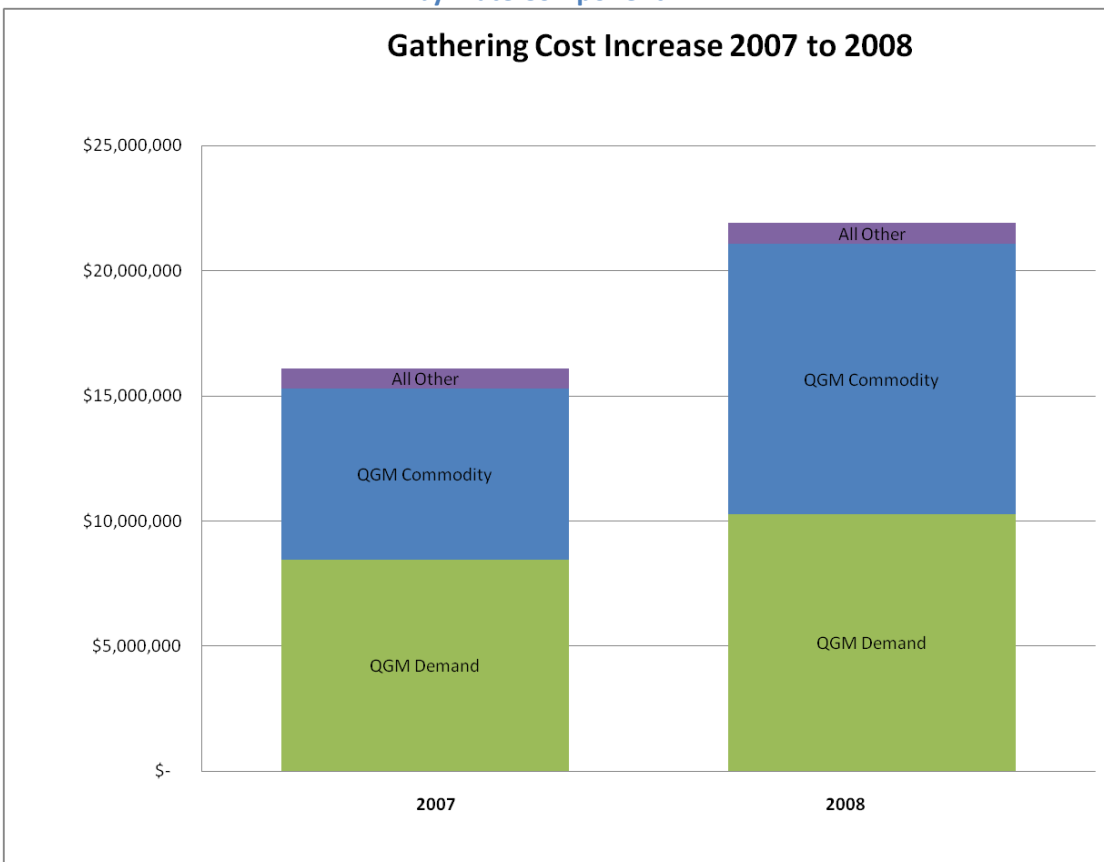
WCI presents below all of the costs and credits that comprise the gathering and processing charges paid by QGC for the years 2007 and 2008. Gathering costs from non-Questar affiliates, as well as credits from liquid sales, are lumped together as "All Other".

Table 4 - Increase in Gathering Costs from 2007 to 2008, by Gathering Company[15]

| | Yearly Cost 2007 | Yearly Cost 2008 | 2008-2007 Increase | % Increase |
|---|---|---|---|---|
| QGM Demand | $ 8,456,044 | $ 10,270,756 | $ 1,814,712 | 21.5% |
| QGM Commodity | $ 6,833,999 | $ 10,811,028 | $ 3,977,029 | 58.2% |
| All Other | $ 812,562 | $ 805,262 | $ (7,300) | -0.9% |

[15] Source: Provided by the Utah DPU

Figure 12 - Increase in Gathering Costs from 2007 to 2008 by Rate Component[16]



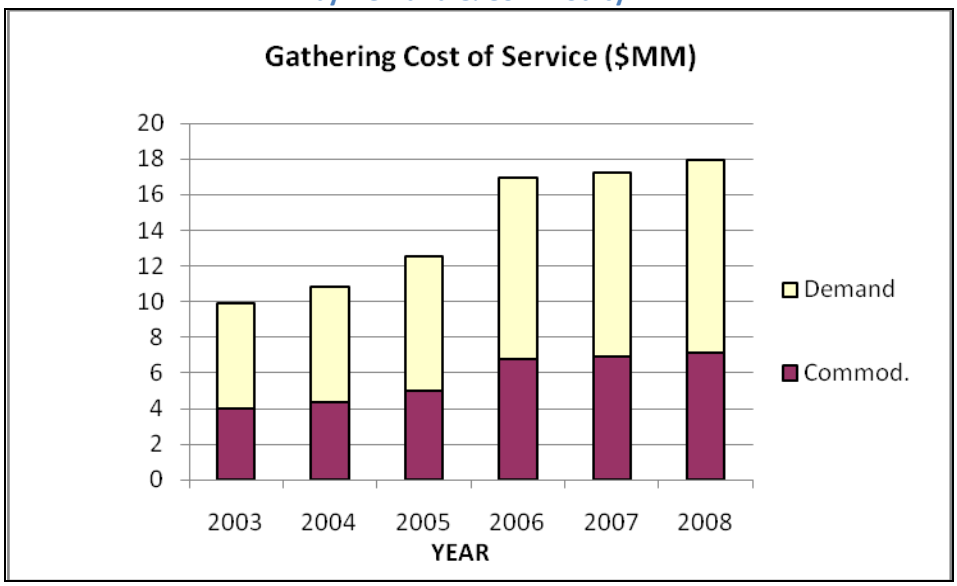

The preceding table and graph indicate that the increases in gathering cost from non-affiliated mid-stream gathering companies and the credits of liquids (not shown in graph) have not been material over the past year. There were large increases however from QGM in the commodity charge and in the demand charge associated with QGM's contract #163 which applies to the vast majority of QGC's gas.

## 2.4 Growth of Gathering and Processing Rate for SWGA (Cost-of-Service)

The following graphs present the recent history of charges assessed through the two-part rate. It illustrates the climb in each part of the rate included in QGM's cost-of-service contract #163 over the six years ending in 2008.

[16] Source Utah DPU

**Figure 13 - Gathering Costs from QGM 2003 to 2008 by Demand & Commodity[17]**



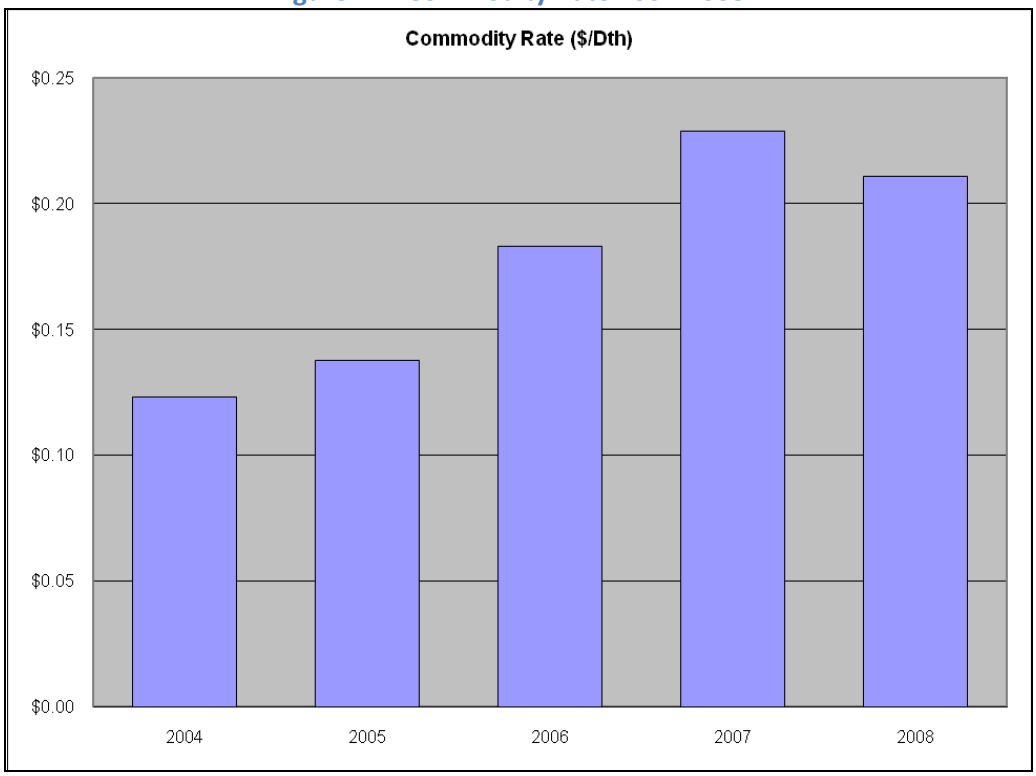

*Note: Revision to 2006 cost, accounted for in 2007, is shown above in 2006.*

The above chart indicates that the growth in QGM's gathering costs for contract #163 has begun to taper off since the large rise noted in 2006.

The chart below shows the commodity value of the charges from QGM. The commodity number is expressed as a $-per-Decatherm rate, calculated by dividing the commodity charge by the volume supplied (expressed as its Decatherm heating value).

[17] Source: Utah DPU

Figure 14 - Commodity Rate 2004-2008[18]

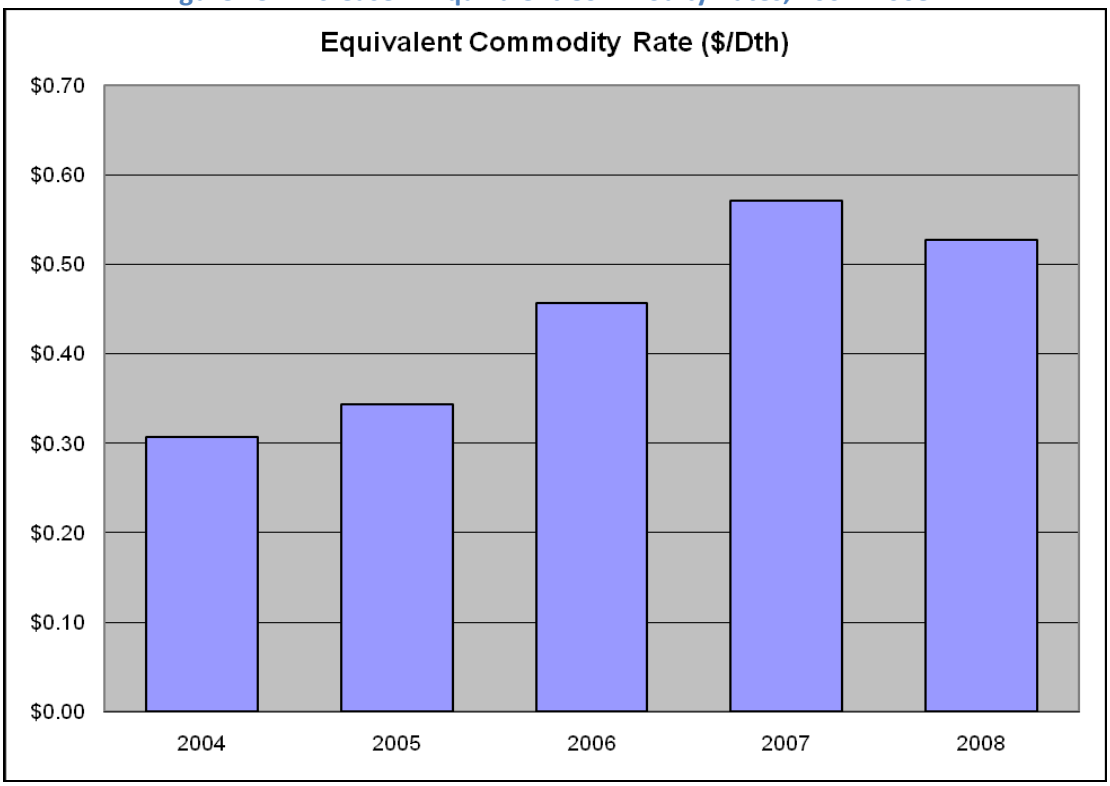



The preceding chart indicates that the commodity rate portion of QGM's charges has shown a peak in 2007, followed by a decline in rate for 2008. The rate declined in 2008, despite an increase in total dollars (as shown above in Figure 7) due to a large increase in Decatherms in 2008 (from 30.1 million in 2007 to 34.0 million in 2008).

The following chart shows the entire charges from QGM (both commodity charge and demand charge) by expressing them both as a single rate – called an ***equivalent*** commodity rate. The equivalent commodity number is expressed as a $-per-Decatherm rate, calculated by dividing the sum of the commodity and demand charges by the volume supplied (expressed as its Decatherm heating value).

[18] Source DR-26

Figure 15 - Increase in Equivalent Commodity Rates, 2004–2008[19]

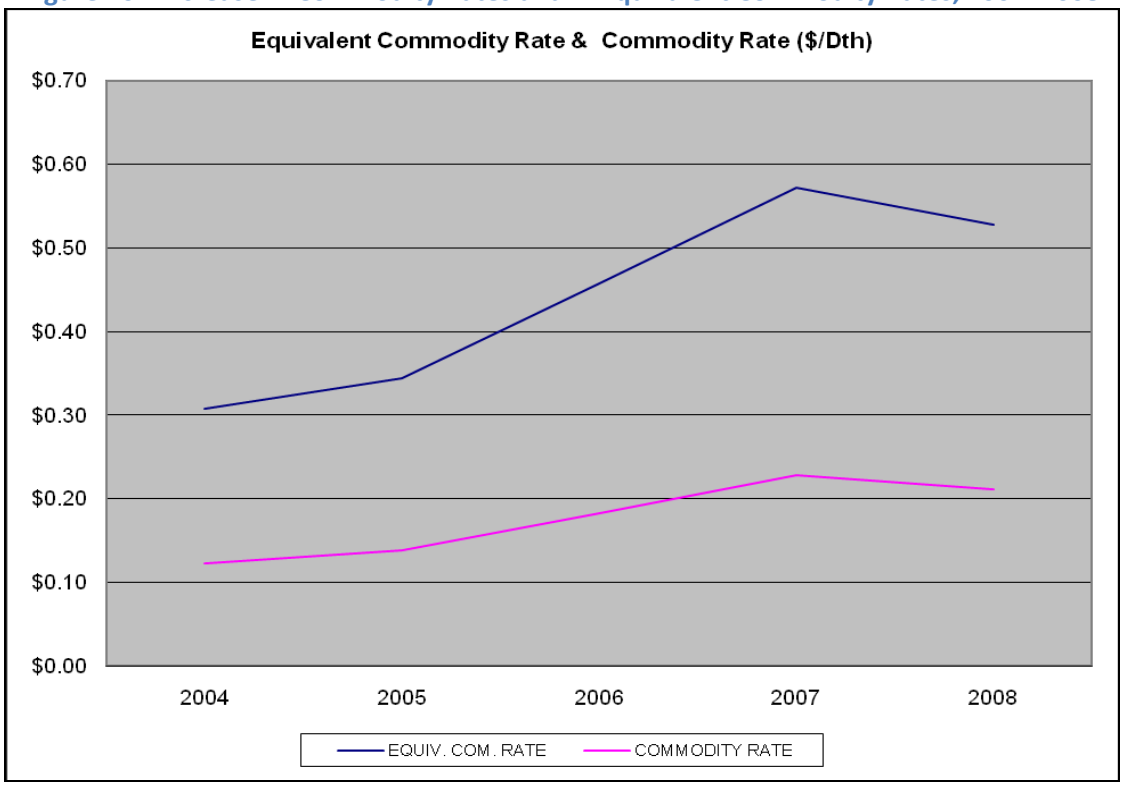



The preceding chart shows a similar pattern to the rate shown in the previous chart, peaking in 2007. However the absolute size of the rate is much greater since it includes the demand charge, as part of the equivalent rate.

Both the commodity rates and the equivalent commodity rates shown in the two previous graphs are depicted in the same chart below.

[19] Source: DR-26

Figure 16 - Increase in Commodity Rates and in Equivalent Commodity Rates, 2004–2008




## 2.5 QGM Operations

Questar Gas Management operates in the Rocky Mountain region to provide natural gas gathering and processing services for its affiliates and third-party producers. QGM operates nearly 1,600 miles of gathering lines along with gas-processing plants, blending facilities, compression units and related facilities, serving growing production in the Green River Basin in western Wyoming and the Uinta Basin in eastern Utah. QGM also owns 78 percent (formerly 50 percent prior to 2008) of Rendezvous Gas Services, LLC, which is a venture that operates gas-gathering facilities in western Wyoming. Rendezvous gathers natural gas for Pinedale Anticline and Jonah field producers for delivery to various interstate pipelines. Under a contract (SWGA) with QGC, QGM also gathers cost-of-service volumes produced from properties operated by Wexpro. About 58 percent of QGM's revenues are derived from fee-based gathering and processing agreements. The remaining revenues come from natural gas processing margins, whereby gas liquids are extracted in the gas processing plants and sold to third parties.

## 2.6 Emphasis on New E&P Areas

Gathering costs are related to the distance that gas has to be delivered to get it from the wellhead to its delivery point on the pipeline. These costs can be minimized if gathering

lines already exist over parts of this transit distance; but there is still a correlation with total distance, since infrastructure costs are required both to reach the existing lines and to increase the capacity of the existing lines, if necessary.

QGC's gas-sourcing areas have changed substantially in recent years both for cost-of-service Wexpro-operated gas wells and for other quantities obtained by QGM. They have gravitated toward areas of southwest Wyoming such as the Pinedale area, both topographically and environmentally challenging for QGM's lines, thereby increasing gathering costs.

During 2008 major changes in the U.S. economy have affected natural gas producers, with fast-falling prices for natural gas. In response, Questar has drastically cut its capital budget to about half of its 2008 expenditures. However this is not expected to translate to relief from growth in all gathering & processing costs. The Pinedale area will be an exception. Keith Rattie, Chairman, President, and CEO of Questar states in Questar's 2008 Annual Report that "We're shifting capital to our higher-margin, higher-return plays at Pinedale and the Haynesville shale [in Louisiana], while curtailing drilling elsewhere in the Rockies and in higher-cost plays in the Midcontinent". Thus, the outlook is for some level of continuing upward pressure on gathering and processing costs, due to the increasing capital expenditures to provide gathering facilities from areas such as the Pinedale area. However growth may be reduced from the high levels observed in the past few years.

## 2.7 Identification of Causes of Increases in Gathering Charges

### 2.7.1 General Causes of Increases in Gathering Charges

Chapter 1 of this report reviewed the terms of the system wide gathering agreement. The agreement allows for certain specific annual and cumulative cost-of-service charges that are incurred by QGM for collecting QGC gas to be included in QGM's gathering charges allocated to QGC.

As new or expanded gathering facilities are added each year to handle increasing gas volumes from new wells, the capital charges incurred for these facilities affect the gathering rates in various ways:

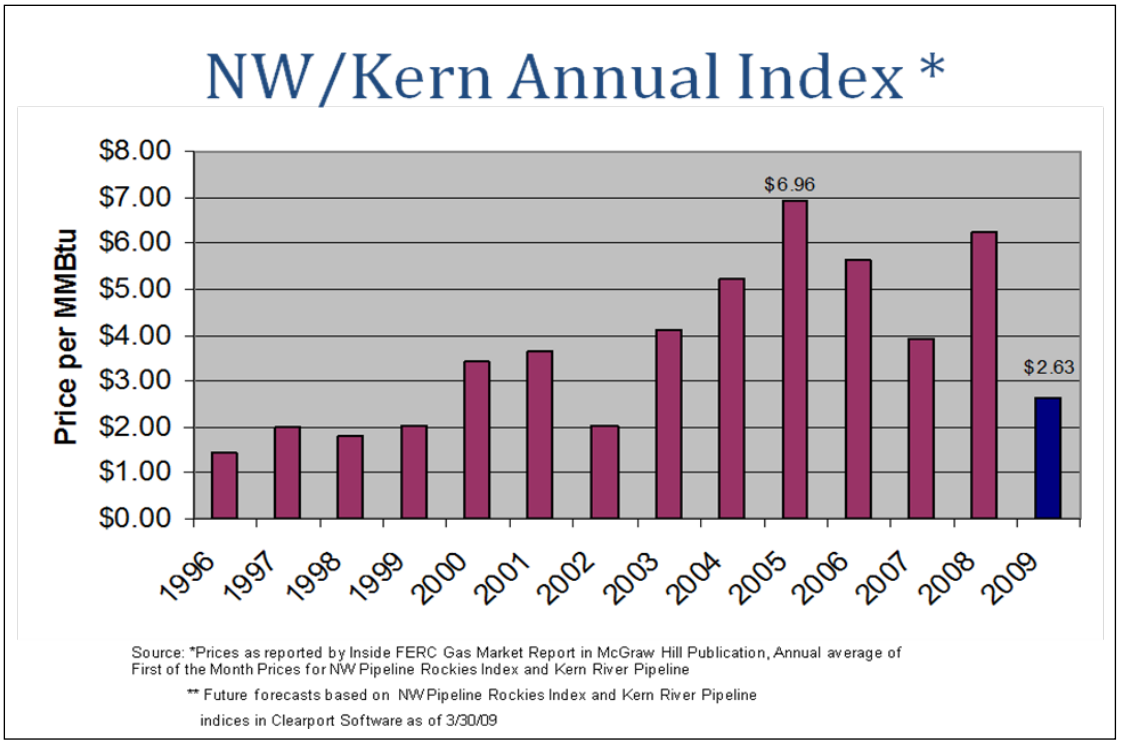
- New capital expenses increase the rate base allocated to the QGC gathering account and are directly reflected in gathering charges, since QGM is permitted by the SWGA to include a return on rate base in its gathering charges. These returns on rate base vary periodically. The returns are governed by Commission order on the after-tax rate of return that Questar Gas is allowed to earn.

- Higher returns on rate base result in higher federal and state income taxes which are permitted by the SWGA to be included in gathering charges.
- New capital expenses result in new depreciation charges which are permitted by the SWGA to be included in gathering charges. Simultaneously, of course, the portion of the depreciation expenses written off will decrease the rate base. Thus whether or not depreciation charges go up or down in a given year depends on whether new depreciation charges (that result from new capital expenses) are greater than the depreciation charges that are written off each year.
- Operating and maintenance expenses increase with additions to rate base which require O&M (which includes implicit increases in local wage rates and material costs).
- Taxes other than income taxes such as property taxes levied by local authorities, are often based on rate base (with or without depreciation) and therefore may also increase as new capital expenses are made in the gathering area.

Currently, in the environment of low gas prices, new capital expenditures would not be expected to increase as fast as in recent years. However the longer-term outlook for capital expenditures in the new gathering areas such as Pinedale would be for the return of large increases, which would once again put upward pressure on gathering and processing rates.

Further, as depicted in the following graph for the Rocky Mountain area, WCI also understands Utah's gas supply chain is now sometimes incorporating lower-cost spot purchased gas, and not always making use of infrastructure that has been paid for (and is still being paid for) in part by Utah ratepayers.

Figure 17 – Rocky Mountain Area Trends in Natural Gas Prices




In the 2007 QGC 191 pass through rate filing Docket No. 07-057-09, as shown above in Report Section 2.2 the gathering and processing costs together account for only about 3% of total gas cost. As gas cost declines, and the ratepayers take advantage of lower-cost spot gas supplies, this percentage would be expected to increase in one regard, because the total gas cost would be expected to decrease. However, the gathering and processing costs themselves would also be expected to decline as less infrastructure capital is required for new gas volumes. It is not clear whether the net effect would be a decline or a rise in the percentage that gathering and processing costs represent as a fraction of total gas cost.

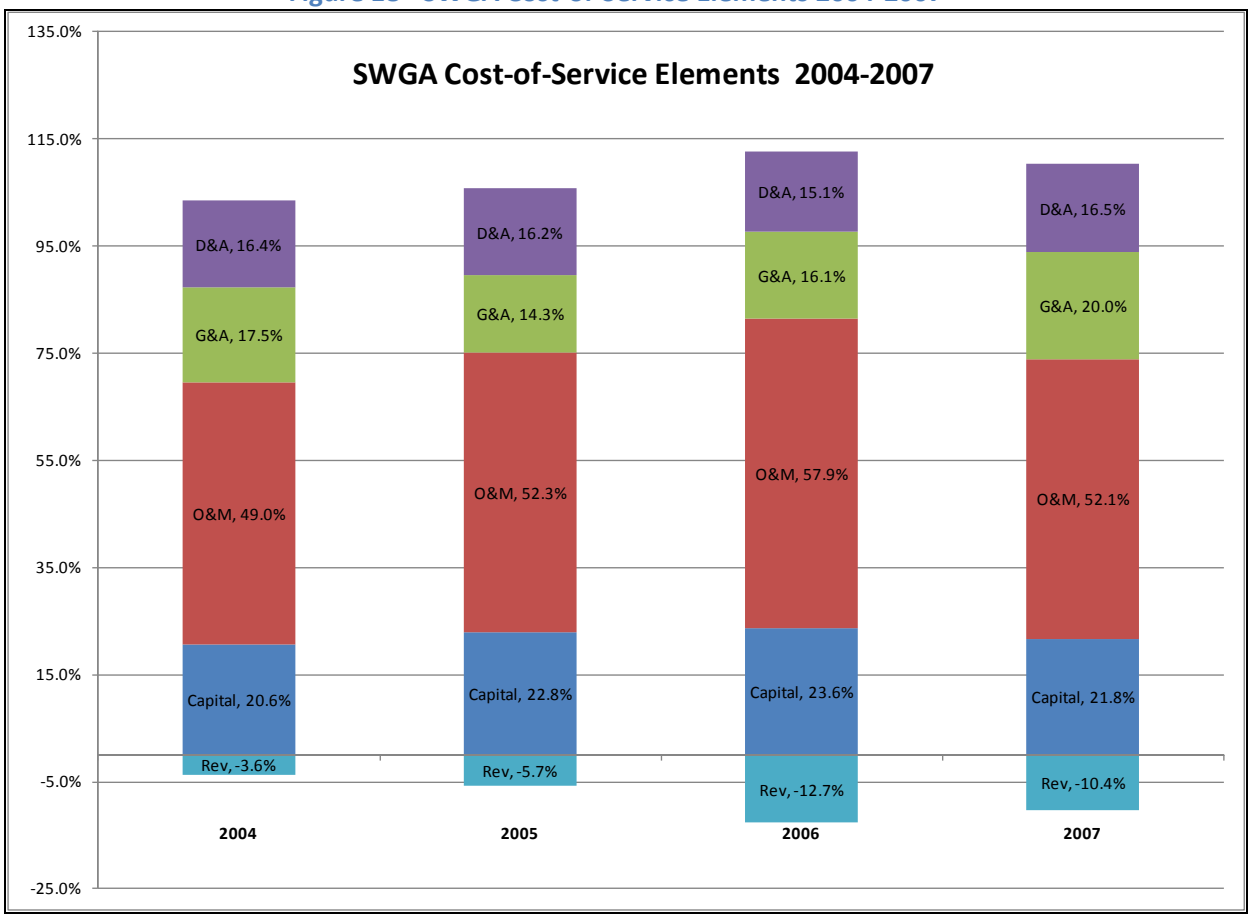
### 2.7.2 Specific Causes of Increases in Gathering Charges

The large increase noted by the Division in gathering charges to be applied in the 2007 rate year were primarily a result of a large increase in 2006 O&M costs allocated through the SWGA cost-of-service to QGC. Of a total increase of $4.6 million, O&M accounted for $3.4 million of the increase, (73%), while capital plant accounted for $1.2 million of the increase (26%) and the $1.5 million increase in G&A and D&A were offset by a similar level of increased revenue credit. In terms of these components, O&M represents nearly 58% of the allocated costs in 2006, a substantial increase from the

52% in 2005. Capital plant has held fairly level at about 21% TO 23%. G&A, while a minor element, has increased steadily since 2003.

The contribution to total cost-of-service for these elements is depicted in the Figure below.

Figure 18 - SWGA Cost-of-Service Elements 2004-2007[20]




## 2.8 Identification of Escalation Factors in Gathering Agreement

In addition to analyzing QGC's gathering & processing costs to determine the cause of the rate increase, WCI was asked to identify any escalation factors responsible for part of the increase.

[20] DR 26

### 2.8.1 Previously Identified Escalation Factors in Gathering Agreements

Previous reviews of Questar PGA filings have identified annual escalation clauses in certain non-affiliate gathering contracts and in one affiliated gathering contract. We have also identified the following escalation clauses in non-affiliate contracts:

- *Contract "A"* – This contract contains an annual escalation clause adjusted by an index price escalator, which is an arithmetic average tied to a basket of published gas prices.
- *Contract "B"* – This contract contains an annual escalator based on changes in the producer price portion of the US GDP or Annual adjustment GDPCP Index (Per Capita Gross Domestic Product).
- *Contract "C"* – This contract does not contain an annual escalator.
- *Contract "D"* – This contract contains an annual escalator based on changes in the GDPCP Index.
- *Contract "E"* – This contract contains an annual escalator based on changes in the Implicit Price deflator for GNP, not to exceed 7%.
- *Contract "F"* – This contract contains an annual escalator based on GDP price deflator.

### 2.8.2 Escalation Factors in Primary QGM Gathering Agreement

The vast majority of QGC's gas is gathered under Contract #163. This is the contract that contains a two-part rate. Since the other gathering contracts contain only single-part rates, contract #163 is responsible for all of the demand charges that are incurred in the gathering and processing area.

Chapter 1 of this report outlines all of the elements and terms of the System Wide Gathering Agreement that comprise contract #163. **None of these terms** contain an *explicit* escalation factor, such as those included in most of the other QGC contracts cited above in the previous section. However many of the components of the charges in this contract contain what may be called *implicit* escalators. For instance, some of the components contain current labor costs and these costs can be expected to increase through time, roughly correlated to local area labor cost indexes. Others contain current material costs which will also increase at a rate correlated to local or national material cost indexes.

Most of the increases in gathering charges however, as outlined above in Section 2.7 affect the gathering rate through increases in O&M expenses and the addition of new capital expenditures. These expenditures directly increase rate base and thereby increase all of the associated factors that are permitted by the SWGA to be included in gathering charges, as outlined in Section 2.7 above, and detailed in Chapter 1 of this report.

# 3 Chapter 3 - Service Level Benchmarks

As part of this review, WCI was asked to determine if the level of service provided by Questar Gas Management is typical of service offered by third party gathering services.

In addition, WCI was asked to determine whether or not comparative rates could be obtained for similar services by others, in order to assess the reasonableness of the rates charged by QGM to QGC, as listed above in Chapter 2 of this report.

## 3.1 Services Offered by Midstream Companies

### 3.1.1 Williams Midstream Services[21]

One of the larger midstream companies is Williams Field Services (WFS), one of the operating companies of Williams Midstream Gas and Liquids, which is a subsidiary of The Williams Companies, Inc. WFS also maintains a significant presence in the Rocky Mountain region including the Jonah and Pinedale areas of Wyoming. As such, WFS would be one of the prime competitors to QGM for gathering and processing services. Williams describes its midstream services – including gathering and processing as listed below:

***Description of Williams Field Services (WFS) Services***

The following is quoted from WFS' 2008 Annual Report:

*"When natural gas producers have finished drilling a well, they are ready for midstream services, also known as gathering and processing. A gathering system looks a lot like a spider web, but in reality, it is more like a funnel, accumulating gas volumes into a central location for processing.*

***Gathering***
*Most natural gas is not ready for use when it comes out of the ground. The gas stream may contain moisture, impurities or valuable liquids like propane. The raw natural gas is delivered from the well to a processing plant through pipelines. The gas is compressed to help move large volumes through piping.*

***Processing***
*When raw gas reaches a natural gas processing plant, the water is removed, or [the gas is] dehydrated, and the gas and valuable liquids are separated. The most common method of extracting the liquids is to cool the gas to extremely low, or cryogenic, temperatures to condense gases heavier than methane.*

[21] Source: WFS 2008 Annual Report

***Fractionation***
*Fractional distillation towers further refine the liquids from the gas processing plant. The most common products of fractionation are ethane-propane mix, propane, iso-butane, normal butane and natural gasoline."*

Because the above services quoted by WFS pretty much parallel those received from QGM, WFS can be considered a competitor to QGM and a potential alternative in certain areas when their costs are lower.

### 3.1.2 Single Priority Gathering Services Offered by Atlas[22]

Another provider of gathering and processing services is ***Atlas Pipeline Partners, L.P.*** (Atlas). Atlas is a publicly-traded, energy master limited partnership engaged in the transmission, gathering, and processing of natural gas in the Mid-Continent United States and the Appalachian Basin. In the Appalachian Basin, Atlas and WFS formed a joint venture, Laurel Mountain Midstream, LLC, to operate more than 1,800 miles of natural gas gathering pipelines in Pennsylvania, New York, Ohio and Tennessee, connecting more than 7,400 wells. The predominant source of gas that APL gathers in the Appalachian Basin is from wells operated by Atlas Energy Resources, LLC

In the Mid-Continent regions of Oklahoma, Arkansas, Kansas and Texas, Atlas owns and operates 9,100 miles of active gathering pipeline, eight natural gas processing plants and one treatment facility.

Atlas describes its gathering services as outlined below:

*ATLAS GATHERING SERVICES*

*"2.1. Receipt of Gas. Subject to the terms, limitations, and conditions of this Agreement, Shipper dedicates, and will cause its Affiliates to dedicate, to this Agreement, and agrees, and will cause its Affiliates to agree, to deliver exclusively to the Receipt Points, and Gatherer agrees to accept at the Receipt Points, on a fully interruptible basis, all of Shipper's Gas; provided, however, that Gatherer shall only be obligated to accept on any Day for gathering hereunder that volume of Shipper's Gas which Gatherer determines, in its sole discretion, it has available capacity to receive.*

*2.2. Redelivery of Gas. Gatherer will gather, compress, and redeliver, on a fully*

[22] Source: http://contracts.onecle.com/atlas-america/viking-gas-2002-01-01.shtml

*interruptible basis, to the Delivery Points, and Shipper will accept, a quantity of gas equal, on a Mcf basis, to the quantity of Shipper's Gas received at the Receipt Points less Shipper's Field Fuel.*

*2.3. Shipper's Field Fuel. Shipper's Field Fuel will be calculated monthly by Gatherer by allocating such quantities of actual Gathering System fuel requirements, shrinkage, and lost and unaccounted for gas between all shippers using the Gathering System. Gatherer may retain and use Shipper's Field Fuel as fuel for compression and other operations on the Gathering System.*

*2.4. Commingling Shipper's Gas. Gatherer shall have the right to commingle Shipper's Gas with other natural gas in the Gathering System. Gatherer may extract, or permit to be extracted, from Shipper's Gas condensate to the extent necessary to meet the quality requirements of the receiving pipeline at the Delivery Points or for proper functioning of the Gathering System."*

Although Atlas would not be considered a direct competitor or an alternative supplier of gathering services to QGC in southwest Wyoming, their gathering services are from similar tight-gas formations. The following contract prices are specified for certain Townships and Counties in Ohio, New York, and Pennsylvania.

**Table 5 - Gathering Agreement Terms[23]**

| Natural Gas Gathering Agreement - January 1, 2002, among ATLAS PIPELINE PARTNERS, L.P. and ATLAS PIPELINE OPERATING PARTNERSHIP, L.P. (Collectively as Gatherer) and ATLAS RESOURCES, INC., ATLAS ENERGY GROUP, INC., ATLAS NOBLE CORPORAATION, RESOURCE ENERGY INC., and VIKING RESOURCES CORPORATION (collectively as shipper) | | | |
|---|---|---|---|
| | | | |
| **Township** | **County** | **State** | **Gathering Rate Terms** |
| Vernon and Gustavus | Trumball | OH | $0.25 per Mcf; Note #1 |
| (NONE SPECIFIED) | Fayette | PA | $0.22 per Mcf; Note #1 |
| Champion and Warren | Trumball | OH | 10% weighted average sales price |
| Brookfield | Trumball | OH | $0.20 per Mcf |
| Hubbard | Trumball | OH | $0.20 per Mcf |
| Springfield and Hermitage | Mercer | PA | $0.29 per Mcf |
| Venango (Barkeyville Borough) | (NONE SPECIFIED) | PA | 16% weighted average sales price |
| Osnaburg | Stark | OH | 10% weighted average sales price |
| Hanover | Columbiana | OH | 10% weighted average sales price |
| Atwater | Portage | OH | 10% weighted average sales price |

[23] Source: http://contracts.onecle.com/atlas-america/viking-gas-2002-01-01.shtml

| | | | |
|---|---|---|---|
| Town of Sherman | Chatauqua | NY | 10% weighted average sales price |
| Blue Rock | Muskingham | OH | 10% weighted average sales price |
| Perry | Lake | OH | 10% weighted average sales price |
| Buffalo | Noble | OH | 10% weighted average sales price |

Note #1: Vernon and Gustavus Townships, as well as Fayette County, also noted to have a term of "10% weighted average sales price".

We note that many of the above gathering costs are stated on the basis of a percentage of the sales price of the gas. These costs would have been quite high during recent periods of high gas prices. In times of rising gas prices such as those experienced a few years ago, tying gathering rates to gas prices results in the equivalent of a cost escalator.

### 3.1.3 Market Rate Gathering Services Offered by DCP Midstream, LLC[24]

**Natural Gas Gathering and Processing Arrangements with Its ConocoPhillips Affiliate**

"We have a fee-based contractual relationship with ConocoPhillips…

One of these arrangements is set forth in a natural gas gathering agreement dated June 1, 1987, as amended, between DCP Assets Holding, LP (successor to the interest of Cornerstone Natural Gas Company) and ConocoPhillips (successor to interest of Phillips Petroleum Company). …

Pursuant to this agreement, we receive gathering and compression fees from ConocoPhillips with respect to natural gas produced by ConocoPhillips that we gather and compress in our Ada gathering system from wells located in a designated area of mutual interest located in northern Louisiana covering approximately 54 square miles. The fees we receive are based on **market** rates for these types of services. To date, ConocoPhillips has drilled and connected approximately 145 wells to our Ada gathering system pursuant to this contract. This agreement expires in 2011. "

### 3.1.4 Gathering Services Offered by TEPPCO Midstream

"The Midstream Segment gathers natural gas from wells owned by producers and delivers natural gas and NGLs on its pipeline systems, primarily in Texas, Wyoming, New Mexico and Colorado. The Midstream Segment also owns and operates two NGL fractionation facilities in Colorado...

[24] Source: 10-K SEC Filing, filed by DCP MIDSTREAM PARTNERS, LP on 3/14/2007

…Our Midstream Segment revenues are earned from the gathering of conventional natural gas and coal bed methane, pipeline transportation of NGLs and fractionation of NGLs. Under our gathering agreements, we gather the natural gas supplied to our systems and redeliver the natural gas for a fixed fee. Gathering revenues are recognized as natural gas is received from the customer. Transportation revenues are recognized as NGLs are delivered. Based upon contract terms, fractionation revenues are recognized based upon the volume of NGLs fractionated at a fixed rate per gallon….

…Our Midstream Segment also includes our equity investment in Jonah, which is a joint venture between us and an affiliate of Enterprise Products Partners that owns a natural gas gathering system in the Green River Basin in southwestern Wyoming. Under its gathering agreements, Jonah gathers and compresses the natural gas supplied to its gathering system and redelivers the natural gas to gas processing facilities and interstate pipelines located in the region for a fee. In addition to gathering natural gas, Jonah also purchases gas at the wellhead and sells gas and condensate."

**Table 6 - Midstream Segment Gathering Rates (2004-2008)[25]**

| Midstream Segment | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|
| **Gathering - Natural Gas - Jonah** | | | | | |
| Bcf | 354.5 | 415.2 | 473.9 | 587.4 | 709.9 |
| Btu (in trillions) | 392.2 | 458.2 | 522.7 | 547.9 | 784.1 |
| Average Fee Per MMBtu | $0.19 | $0.19 | $0.20 | $0.21 | $0.23 |
| **Gathering - Natural Gas - Val Verde** | | | | | |
| Bcf | 144.5 | 180.7 | 181.9 | 175.7 | 166.9 |
| Btu (in trillions) | 122.7 | 159.4 | 160.9 | 156.0 | 149.1 |
| Average Fee Per MMBtu | $0.52 | $0.42 | $0.41 | $0.40 | $0.38 |
| **Fractionation - NCLs** | | | | | |
| Total Barrels (in trillions) | 4.1 | 4.4 | 4.4 | 4.2 | 4.2 |
| Average Fee Per Barrel | $1.80 | $1.75 | $1.66 | $1.77 | $1.75 |
| **Transportation - NGLs** | | | | | |
| Total Barrels (in millions) | 59.5 | 61.1 | 69.7 | 77.0 | 73,6 |
| Average Fee Per Barrel | $0.69 | $0.72 | $0.67 | $0.69 | $0.78 |
| **Sale - Condensate** | | | | | |
| Total Barrels (in thousands) | *84.4* | 62.1 | 74.2 | 89.7 | 76.9 |
| Average Fee Per Barrel | $37.79 | $52.21 | $62.26 | $.59.57 | $74.02 |

[25] Source: TEPPCO-Midstream. 2008 Annual Report

## 3.2 Negotiating for Lower Gathering & Processing Rates – Ultra Petroleum

Ultra Resources, Inc. (Ultra), a subsidiary of Ultra Petroleum Corporation is an operator like Wexpro, a user rather than a provider of midstream services. Most of their current production comes from the Pinedale and Jonah fields in Wyoming. Ultra's gathering costs have reached about $37 million per year. Ultra's unit gathering costs have been as follows[26]:

**Table 7 - Ultra's Gathering Costs**

| Year | Gathering Cost per Mcfe |
|---|---|
| 2006 | $0.22 |
| 2007 | $0.23 |
| 2008 | $0.26 |

Ultra negotiates gathering and processing rates with its midstream providers as stated in its 2008 Annual Report 10K:

"The Company has entered into various gathering and processing agreements with several midstream service providers that gather, compress and process natural gas owned or controlled by the Company from its producing wells in the Pinedale Anticline and Jonah fields in southwest Wyoming. Under these agreements, the midstream service providers have routinely expanded their facility's capacities in southwest Wyoming to accommodate growing volumes from wells in which the Company owns an interest. The Company has, in recent years, been able to lower some of the gathering and processing fees for such midstream services with its midstream providers, in exchange for committing to these longer term arrangements. As a result of such negotiations, two new, large cryogenic gas processing plants have been constructed in southwest Wyoming."

## 3.3 Priority Aspects of Service Afforded to QGC by QGM

QGM's services are basically similar to those listed above for other midstream service companies. However QGM operates and prices its gathering services under a three-level priority system, as explained to WCI in its interviews with QGM personnel. This priority system appears to be rather unique in the midstream services industry, although

[26] Source – Ultra Petroleum annual 10K report

it has some parallels in the pipeline transportation industry. However, the SWGA, which is the topic of this report, is silent on utilization of QGM's priority system.

QGM gathers gas at the wellhead and moves it under one of its three priority delivery service levels. The three priority service levels are:

- Priority #1 – Firm service with a demand charge as well as a commodity charge
- Priority #2 – Firm service with no demand charge; just a commodity charge
- Priority #3 – Interruptible service

The majority of QGM's contracts are Priority #3 as shown in the following table:

Table 8 - QGM Gathering Priorities

| QGM Priority Gas Contracts | Number | Volume |
|---|---|---|
| Priority 1 | 4 | 13% |
| Priority 2 | 3 | 6% |
| Priority 3 | 108 | 81% |
| **Total** | **115** | **100%** |

The figures in the preceding table include the SWGA. Contract #163 covers the vast majority of QGC's Wexpro-operated cost-of-service gas on a "Firm" level of service basis, and is not stipulated to be delivered under QGM's Priority 1-2-3 System. However, is considered to be Priority #1 because it contains both a commodity and a demand charge for its "Firm" service. As Priority #1, the gas would be moved before any Priority #2 or Priority #3 gas. For instance, if one compressor goes down causing gas flows to be cut back, the Priority #1 gas would be moved first by the remaining compressors, before gas of other Priorities.

However as noted in Chapter 1, above, the SWGA apparently does not specifically describe either a two-part rate or a Priority #1 gathering service. The SWGA refers only to a "firm" service, which could be Priority #2 as well as Priority #1. The Division may wish to recommend a change to the description of QGC's service level the next time it is negotiating the terms of the SWGA.

## 3.4 Pipeline Priority Delivery Systems

As mentioned above, QGM's priority gathering structure has similarities to FERC regulated pipeline transportation systems in use by most pipeline companies such as

Williams Pipeline Partners L.P, (WPP) whose general partner is Williams Pipeline GP LLC, which is a subsidiary of The Williams Companies, Inc. These pipeline transportation services are listed below. WPP's firm service contains a two-part rate encompassing demand charges as well as commodity charges.

### WPP's Priority Transportation Services

WPP offers a menu of transportation services that provides flexibility for its customers to help them manage their business needs.

**Firm Service -** Highest priority transportation service offered with a guaranteed availability unless prevented by act of Force Majeure. Service requires a demand charge (reservation) along with a commodity charge. Contract holder may temporally or permanently release this service to other parties, using FERC approved capacity release guidelines.

**No-notice Service -** A bundled service made up of firm transportation and storage services, offered to Local Distribution Companies provides customers on demand delivery to meet peak needs using a combination of transportation and storage. Service requires a demand charge (reservation along with a commodity charge). Transco's service varies from the above service. Every city gate operator with firm storage and transportation services can schedule and yet have the ability and the right to physically take a different quantity than scheduled, up to the city gate operator's total maximum daily quantities for all of their firm no-notice services. Contract holder may temporally release this service to other parties, using FERC-approved capacity release guidelines.

**Interruptible Service -** Lower priority transportation service offered on an as-available basis. This service can be interrupted on a short notice to accommodate a higher priority service. Commodity charges can be less than firm and there are no demand charges with this service.

## 3.5 Assessment of Benefits of QGM's Priority Gathering Service

In assessing the benefits received through QGM's priority level gathering system, WCI also notes a number of related points.

### Assessment of Priority #1 Benefits

QGM's key benefit claim, explained previously, is that under conditions of limited capacity in the gathering system, QGC would benefit since its gas would move ahead of the wellhead gas of another owner/operator.

WCI notes some points in the SWGA:

1. Like most other midstream operators, the majority of QGM's gathering contracts are for interruptible service, which would already be the last to move in case of capacity restrictions on the lines. Therefore it would require a major loss of flow capacity (81%) before any firm services would be affected.

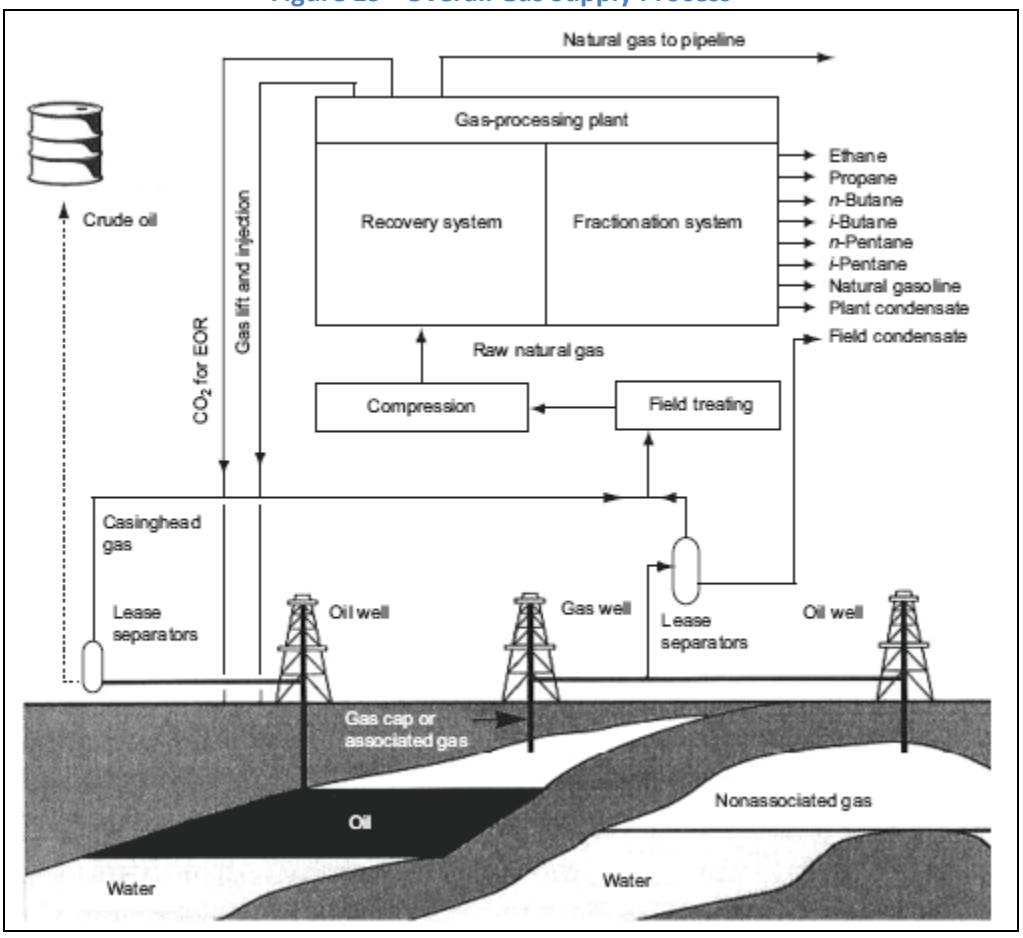
2. QGM would probably be motivated to move QGC's gas before the gas of many others even without considering its priority, when its gathering rate is in excess of gathering rates paid by other parties.

3. If conditions became severely limited due to a variety of reasons, QGM's obligation to gather gas could not be enforced, even for a Priority #1 customer, due to Force Majeure clauses in the Agreement (a copy of the SWGA Force Majeure and excerpts from the Williams Pipeline Partner's Force Majeure elements are shown in Appendix 8.1).

# 4 Chapter 4 – Analysis of Wells and Gathering Systems

The overall gas production, gathering, processing and transportation flow is depicted in the following figure:

Figure 19 - Overall Gas Supply Process[27]




## 4.1 Emphasis on New E&P Areas

QGC's gathering areas have changed substantially in recent years both for cost-of-service Wexpro gas and for other gas quantities obtained by QGM. They have gravitated toward areas of southwest Wyoming such as the Pinedale area, farther from Questar's interstate pipelines.

[27] Cannon 1993

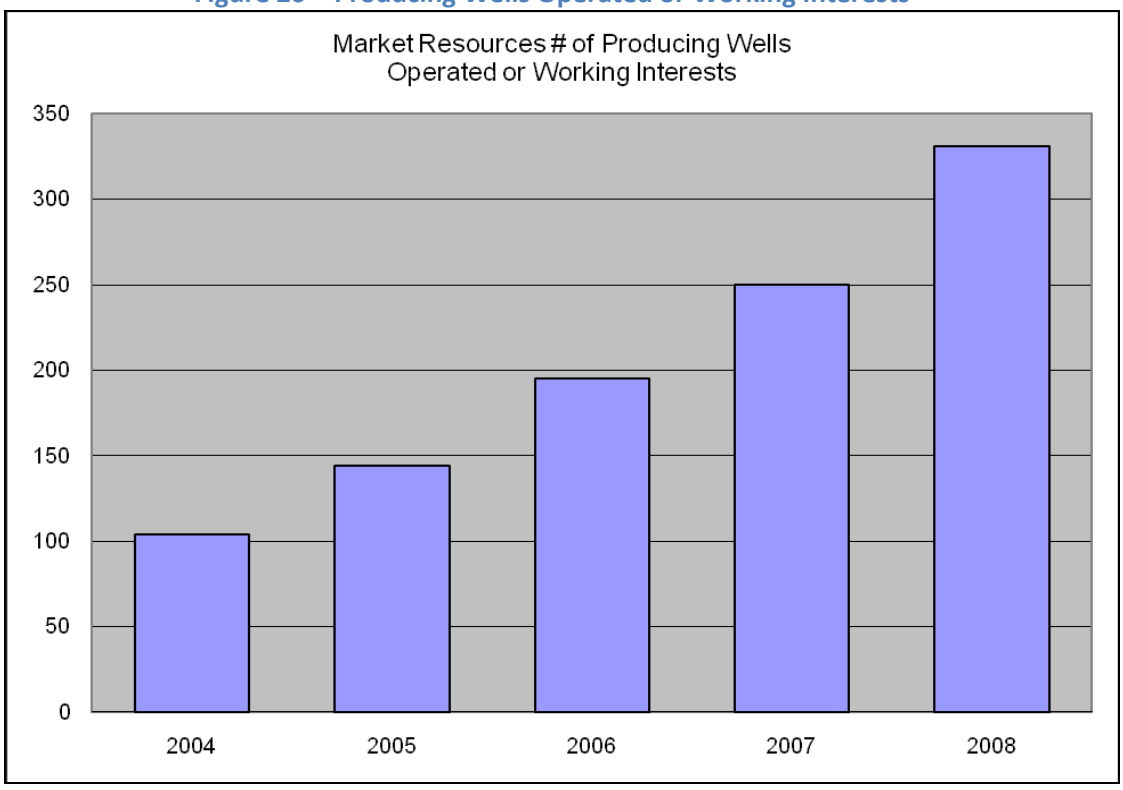
## 4.2 The Pinedale E&P Region

Pinedale is the second largest natural gas field in the United States. At the end of 2006, the entire Pinedale Anticline area incorporated the following infrastructure:

- 662 wells from 348 well pads
- 90 wells drilled a year (average since gas field's authorization in the year 2000)
- 142 miles of gathering pipelines

As of December 31, 2008, Wexpro operated 107 wells in the Pinedale Anticline area. Market Resources is comprised of Wexpro and its sister company, Questar E&P (QE&P) operated and had working interests in another 224, totaling over 331 producing wells, in the Pinedale Anticline compared to 250 at December 31, 2007, 195 as of December 31, 2006, and 144 and 104 at year-end 2005 and 2004. Of the 331 producing wells, Questar E&P has working interests in 309 wells, overriding royalty interests in an additional 21 Wexpro-operated wells, and no interest in one well operated by Wexpro. The following graph illustrates the growth in the number of these wells:

Figure 20 – Producing Wells Operated or Working Interests[28]




[28] Questar Gas Annual Reports & 10K Reports

## 4.3 QGM's Pinedale Complex

QGM's Pinedale processing complex was originally permitted as two facilities, consisting of a natural gas compressor station and a liquids handling facility. The compressor station and the liquids facilities are contiguous to one another, and are now combined as the Pinedale Complex.

The compressor station receives gas from field gathering lines. Condensate is removed via an inlet scrubber and stored for trucking. Liquids are processed through a low pressure separator and condensate stabilizer system before entering a liquids sales pipeline. The gas is directed to six compressor engines and delivered to pipeline sales.

Compressor sizes are:

E-1and E-2: Two 1860 hp Caterpillar G3608 SITA compressor engines,
E-3 and E-4: Two 3720 hp Caterpillar G3616 SITA compressor engines, and
E-5 and E-6: Two 3720 hp Caterpillar G3616 SITA compressor engines.

## 4.4 Pinedale Geologic Structure

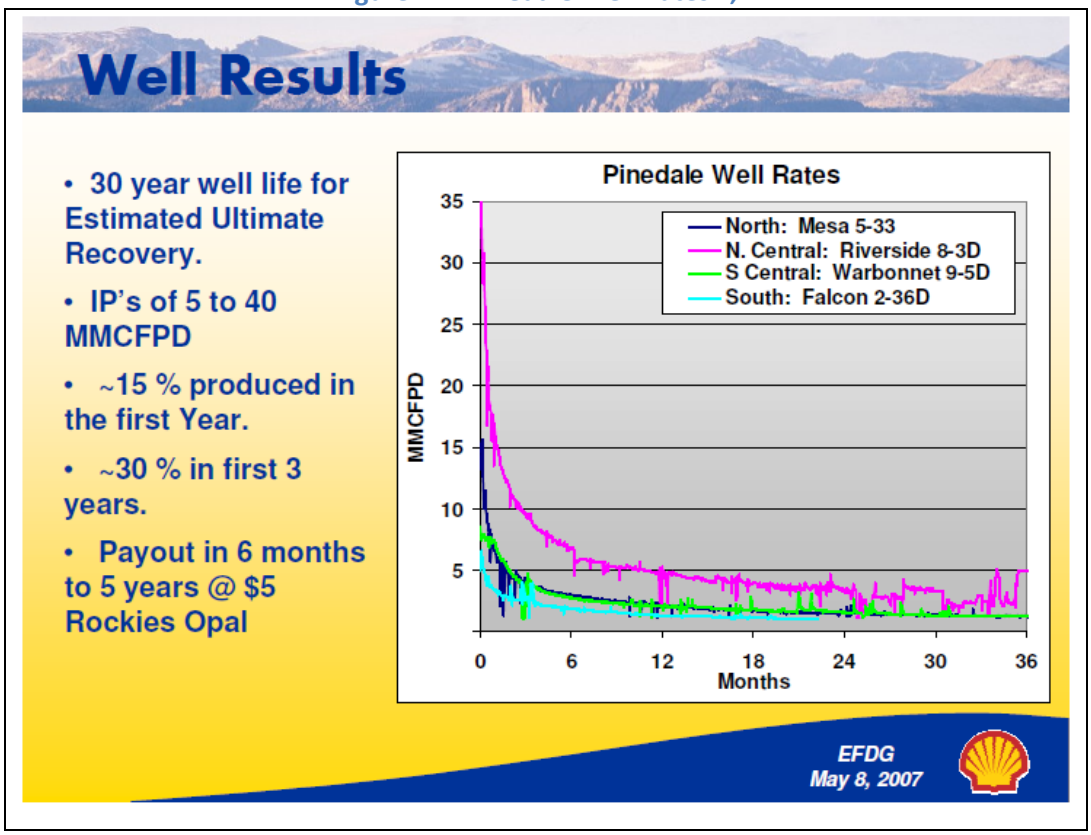
The Pinedale producing area is comprised of tight gas sands containing huge gas resources estimated at 159 tcf by the U.S. Geological Survey. It contains a northwest-southeast trending, doubly plunging, asymmetrical anticline covering 150 square miles. The reservoir section has 6,000 vertical feet of highly discontinuous fluvial sandstones, siltstones, and shales of upper Cretaceous age. Producing intervals lie at depths between 7,000 and 14,000 feet and contain 300 to 1,300 feet of potential pay. The produced gas is mostly methane with few impurities and an average heat content of 1,080 Btu/ Mscf.

The first well was drilled at Pinedale in 1939 (by California Co.), but active field development did not proceed until the mid to late 1900s as improved hydraulic fracturing techniques, higher natural gas prices, and commingled production operations enabled economic stimulation and production from tight sands. Sizeable acreage holders in the field include Shell E&P Co., Ultra Petroleum Corp., and Questar Corp.

## 4.5 Dramatic Decline Rates of Pinedale Wells

In the Pinedale area, well decline rates are dramatic, partly due to the fracturing technique used. Reported Pinedale well decline rates are shown below.

Figure 21 - Pinedale Well Rates[29], [30]




In nearby Jonah, average recoverable reserves of 6 billion cubic feet of gas equivalent (Bcfe) per well have been obtained. Results in the Pinedale have been spottier with some wells initially exceeding 6 Bcfe, others about 2 Bcfe. Open flow production rates have exhibited initial gauges of 10- to 30 MMcf per day along the length of the feature. Production declines are steep, as is the case in the Jonah field.

These steeply declining production curves underscore the need for new well development which would put upward pressure on gathering and operating costs.

## 4.6 Pinedale Environmental Restrictions

Because federal leases covered much of the Pinedale area, operators initially had to await the completion of an environmental-impact statement (EIS) to access that

[29] As presented to the Energy Finance Discussion Group by Chris Bement of Shell Gas, Lead of the Pinedale Development Team, in May, 2007

[30] Source: http://member.ipams.org/public/AsiCommon/Controls/Shared/FormsAuthentication/Login.aspx?ReturnUrl=%2fPUBLIC%2fDefault.aspx (ipams members only may no longer be available)

acreage. In mid-2000, the BLM approved the Pinedale Anticline EIS, which encompassed about 200,000 acres, and allowed wells to be drilled on the federal lands.

While the EIS let development move forward at that time, operators still contended with other restrictions. Big Game Range winter restrictions for protecting wildlife migration and winter habitat shut down most of the drilling activities for the northern two-thirds of the anticline from November through May in past years. Firms had to shift drilling to fee or state leases, or move to the Pinedale's southern portion until spring. The Pinedale Anticline field overlaps a world-class wildlife resource -- a crucial winter range for one of the largest concentrations of big game in the United States including mule deer, pronghorn, and sage grouse. A supplemental EIS agreement with the BLM[31] allowed for year round drilling with the caveat that there would only be so much time allowed to drill in an area and the ROD required that Ultra, Shell, and Questar install liquids gathering system(s) to reduce the amount of truck traffic associated with production. This is expected to eliminate approximately 165,000 truck trips annually during peak production.

## 4.7 Questar Gathering Systems

### 4.7.1 Sample Questar Gathering Systems

Appendices 8.4 through 8.7 contain sample schematic diagrams of four of Questar's gathering systems:

1. Pinedale Anticline Area
2. Powder Wash Area
3. Bruff Moxa Area
4. Hiawatha Area

### 4.7.2 Two Examples of New WEXPRO Wells to be Gathered

WEXPRO recently submitted to the BLM an Environmental Impact Statement (EIS) to drill nineteen new wells in Moffat County, CO. QGM would construct a new gathering line. The new gathering line would have a length of 7,301 feet (mile and a half) and would connect to an existing gathering line of QGM in the same Powder Wash Field.

### 4.7.3 Rendezvous Gas Gathering Company

In 2001 Questar started up and initially owned 50% of a joint venture named Rendezvous Gas Co. (Western Gas Resources through its subsidiary Mountain Gas

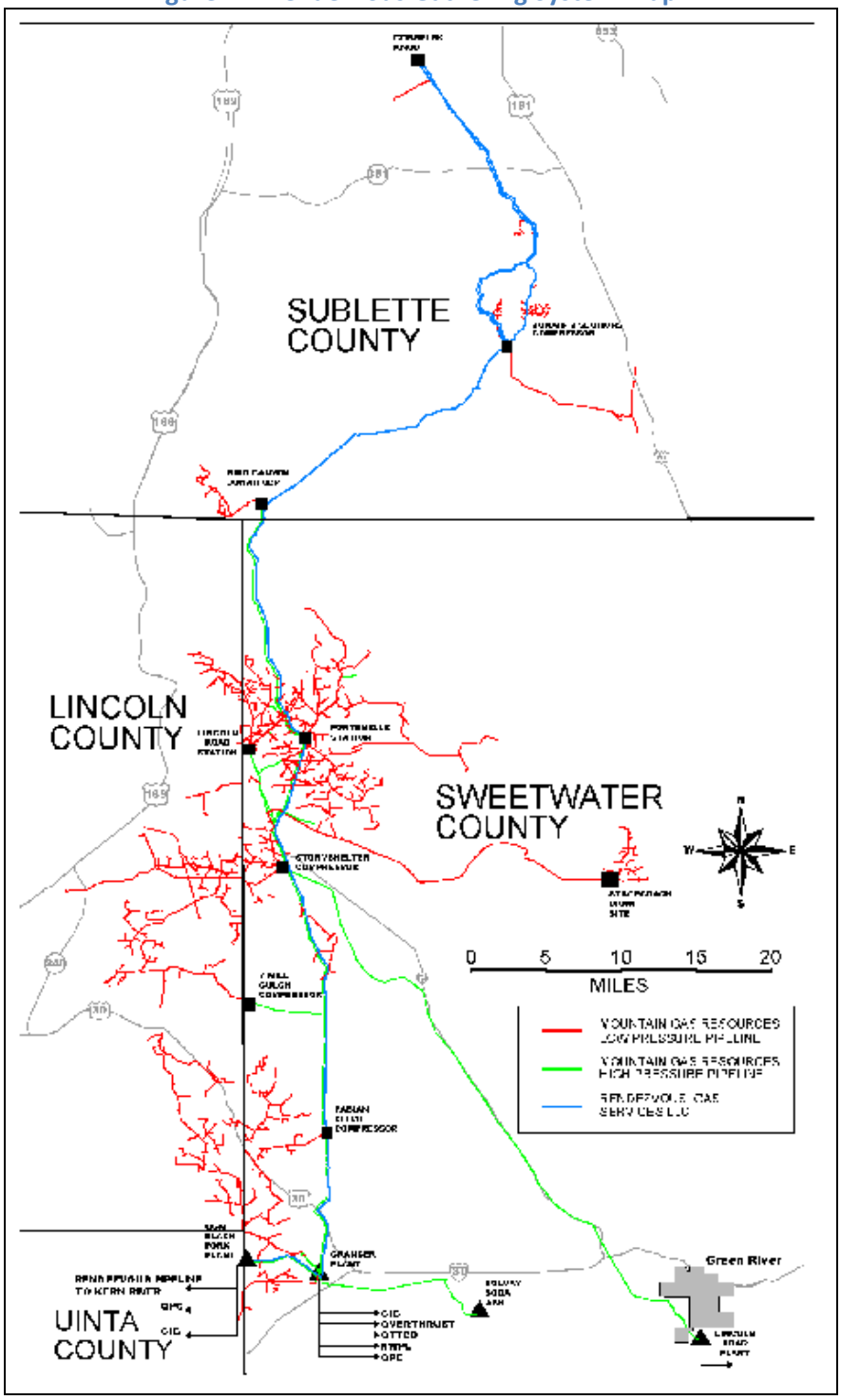
[31] Pinedale SEIS dated 9/12/2008, Section 2.7

Resources, LLC, held the remaining 50%). The initial plan was to build pipeline and compression facilities with a capacity of 275 MMcf per day. During 2008, Questar purchased an additional 28% in Rendezvous, which reports through QGM.

QGM, through its 78% ownership of Rendezvous Gas Services, LLC, owns three 100 mile natural gas pipelines; a 30-inch diameter; a 20-inch diameter; and a 12-inch to Bird Canyon switching to a 16-inch diameter. These pipelines all begin at the Gobblers Knob Compressor Station in Sublette County and extend south on the east side of Fontenelle Reservoir terminating at the Blacks Fork Gas Plant in Sweetwater County, Wyoming. These pipelines are represented under a separate QGM contract #2091 and are not part of the SWGA gathering system.

Rendezvous Gas Services, LLC gathers natural gas for Pinedale Anticline and Jonah field producers for delivery to various interstate pipelines. Shown below is a map of the Rendezvous gathering system as furnished by Anadarko:

Figure 22- Rendezvous Gathering System Map[32]




[32] Source: Anadarko Annual Report

QGM also owns 100% of the FERC-regulated Rendezvous Pipeline Co., LLC (Rendezvous Pipeline). Rendezvous Pipeline operates a 21-mile 20-inch-diameter pipeline between QGM's Blacks Fork gas-processing plant and the Muddy Creek compressor station owned by Kern River Gas Transmission Co.'s (Kern River Pipeline).

## 4.8 QGM Gathering Line Diameters and Capacities

### 4.8.1 QGM Right-of-Way Pipeline Applications

The following QGM Right-of-Way Applications were approved by the BLM during 2006 for the Pinedale area:

## Table 9 - QGM Right-of-Way Pipeline Applications[33]

| RWNUMBER | HOLDER | RECD | PURPOSE | APPROVED | MILES | SIZE OF PIPE in Ft' | WIDTH in Ft' | DIAMETER OF PIPE in IN" | TYPE OF PIPE |
|---|---|---|---|---|---|---|---|---|---|
| W-159580am2 | QGM | 28-Mar-06 | water line - Mesa water line amdt | 28-Aug-06 | 24 | | 30 | 4 | H20 |
| W-162012am1 | QGM | 15-May-06 | CDP site - Mesa 15-6 amdt - Water Handling Facility | 07-Jul-06 | inclusion of WYW-162012 | | | | H20 |
| W-162015 | QGM | 05-May-06 | Lact Facility amdt Facility and Tank Farm | 07-Jul-06 | | | | | |
| W-171653 | QGM | 28-Mar-06 | p/l water Mesa 15-20 | 19-Jul-06 | | 6719 | 30 | 4.9 | H20 |
| W-171657 | QGM | 28-Mar-06 | p/l water Mesa 3-20V | 12-Jul-06 | | 3875 | 30 | 4.9 | H20 |
| W-171665 | QGM | 28-Mar-06 | p/l Lovett Draw | 19-Jul-06 | | 5400 | 50 | 12.75 | GAS |
| W-171669 | QGM | 28-Mar-06 | p/l water Lovett Draw | 19-Jul-06 | | 6800 | 50 | 4.9 | H20 |
| W-171669am1 | QGM | 04-Aug-06 | p/l water Lovatt Draw | 10-Aug-06 | Additional line same trench | 6800 | 50 | 4.9 | H20 |
| W-171706 | QGM | 28-Mar-06 | p/l NGL Mesa 15-6V | 19-Jul-06 | | 1300 | 40 | 6 5/8 | NGL |
| W-171707 | QGM | 28-Mar-06 | p/l water Mesa 15-6V | 19-Jul-06 | | 1300 | 40 | 4.9 | H20 |
| W-171719 | QGM | 24-Apr-06 | p/l North Pinedale 14-8 | 30-May-06 | | 2661 | 40 | | GAS |
| **W-171742** | QGM | 18-Jun-06 | p/l Mesa 15-20 | 19-Jul-06 | | 6000 | 40 | 10 | GAS |
| W-171745 | QGM | 18-Jun-06 | p/l Mesa 3-20V Produced Water | 12-Jul-06 | | 3875 | 30 | 8 | GAS |
| W-171847 | QGM | 27-Jun-06 | p/l Mesa 3-19A | 09-Aug-06 | | 1200 | 40 | | GAS |
| W-171656 | QGM | 28-Mar-06 | p/l water - Mesa 11-20 | 27-Oct-06 | appl withdrawn /closed | | | | GAS |
| W-171673 | QGM | 28-Mar-06 | p/l water - Stewart Point 10AA-17D | 03-Oct-06 | | 300 | 40 | | H20 |
| W-171674 | QGM | 28-Mar-06 | p/l - Stewart Point 10AA-17D | 03-Oct-06 | | 2300 | 40 | | GAS |
| W-171676 | QGM | 28-Mar-06 | p/l - NGL Stewart Point 10AA-17D | 03-Oct-06 | | 300 | 40 | | NGL |
| W-171700 | QGM | 28-Mar-06 | p/l - Mesa 10CA-19D | 03-Oct-06 | | 700 | 40 | 6.625 | GAS |
| W-171701 | QGM | 28-Mar-06 | p/l - NGL Mesa 10CA-19D | 03-Oct-06 | | 700 | 40 | | NGL |
| W-171702 | QGM | 28-Mar-06 | p/l - water Mesa 10CA-19D | 03-Oct-06 | | 700 | 40 | | H20 |
| W-171703 | QGM | 28-Mar-06 | p/l - Mesa 1BD-30D | 03-Oct-06 | | 6200 | 40 | | GAS |
| W-171704 | QGM | 28-Mar-06 | water/l - Mesa 1BD-30D | 03-Oct-06 | | 6200 | 40 | | H20 |
| W-171705 | QGM | 28-Mar-06 | p/l - NGL Mesa 1BD-30D | 03-Oct-06 | | 6200 | 40 | | NGL |
| W-171734 | QGM | 05-May-06 | anode bed - Mesa field | 04-Oct-06 | | | | | GAS |
| W-171768 | QGM | 15-May-06 | p/l & p/l stabilizer | 13-Dec-06 | | 180 | 50 | 5 | GAS |
| W-171769 | QGM | 15-May-06 | p/l & p/l stabilizer | 13-Dec-06 | | 180 | 50 | 6.625 | GAS |
| W-171770 | QGM | 15-May-06 | p/l - Gobblers Knob to Rendezvous | 13-Dec-06 | | 422 | 75 | 4.9 | GAS |
| W-171771 | QGM | 15-May-06 | p/l - Gobblers Knob to Rendezvous | 13-Dec-06 | | 422 | 75 | 6.625 | GAS |
| W-171772 | QGM | 15-May-06 | p/l - Gobblers Knob to Rendezvous | 13-Dec-06 | | 422 | 75 | Varies | GAS |
| W-171848 | QGM | 22-Jun-06 | p/l - Stewart Point 5-20 Loop | 31-Oct-06 | | 2218 | 40 | | GAS |
| W-172047 | QGM | 29-Sep-06 | port trailer mount flare Mesa 12-21 | 13-Dec-06 | Expires 6/30/09 | | | | GAS |
| W-172048 | QGM | 29-Sep-06 | port trailer mounted flare SP 11-28 | 13-Dec-06 | Expires 6/30/09 | | | | GAS |

[33] Source BLM

The R-O-W applications shown in the preceding table include underground installation of pipelines carrying several different types of products, including natural gas, water, NGL's (natural gas liquids), or condensate. Most of the ROW's are 40 feet wide, although some are 20, 30, 50, or 75 feet wide.

A number of the applications are for gas lines. The largest diameter listed is for a twelve and three-quarter-inch line, measuring 5,400 feet in length (about one mile); the longest is for 6,200 feet in length. The pipe material and type of connections are not specified, however only carbon steel lines that are welded at each joint could carry the gas pressures typically encountered at a well-head. The short length of many of the gas lines may indicate they are only carrying gas as far as a processing vessel or to an existing main gathering line already in use by other wells.

During interviews with QGM's General Manager of Commercial Operations, WCI was told that larger-diameter main gathering lines were installed at Pinedale during the growth years of 2006, 2007, and 2008. Ten-inch and twelve-inch diameter lines are common, and they are sometimes looped (paralleled with an additional side-by-side line) for additional capacity as more gas is gathered through them. Typical pressures could range between 650 psig (pounds per square inch gauge) to 660 psig. Booster compressors are typically used to move the gas faster, permitting more to be withdrawn from the wells. A booster compressor could reduce pressure on its inlet side to about 600 psig while delivering pressures at its outlet that are high enough to enter a transporting pipeline.

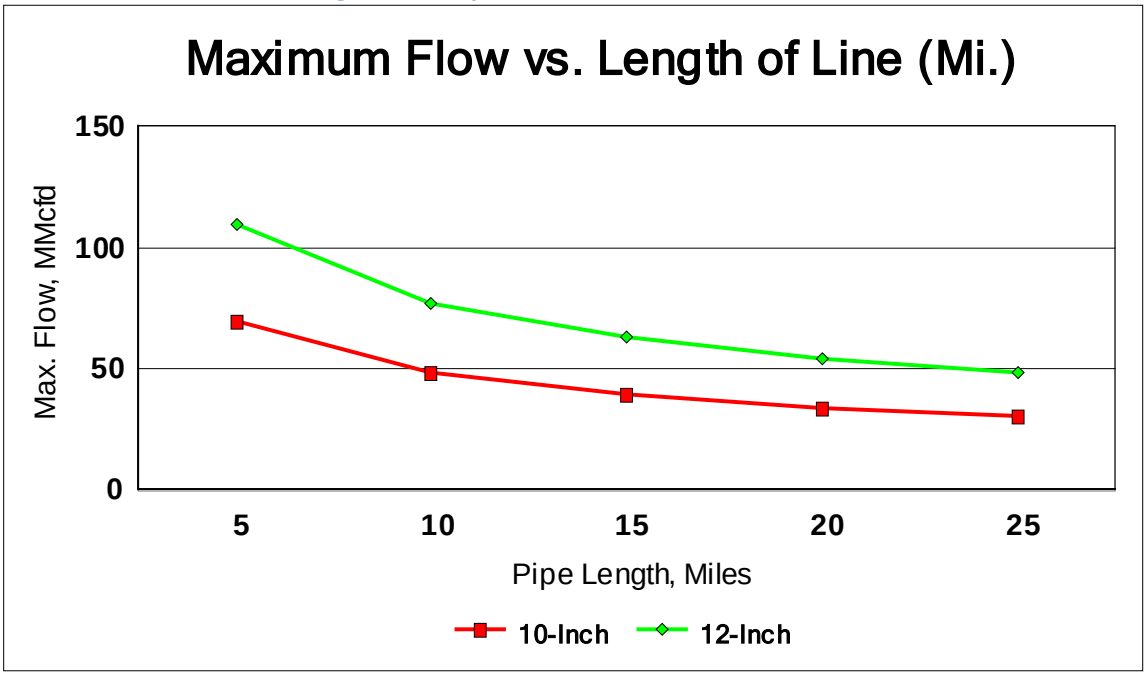
### 4.8.2 QGM Gathering Line Capacities

The maximum carrying capacity of a pipeline can be estimated from its diameter, length, inlet pressure, and outlet pressure.

A ten-inch line, such as the one QGM applied for above, having a length of 6,000 feet (1.14 mile), would have a maximum capacity of about 84 MMcfd, estimating its inlet pressure at 660 psig and its outlet pressure at 600 psig.

Using the same 60 psig pressure drop, a twelve-inch diameter pipeline, would have maximum flow rates as shown in the following graph:

Figure 23 - Pipeline Maximum Flow Rates[34]




## 4.9 Processing Plants

### 4.9.1 Processing Plant Capacity

The following table shows processing plant capacities worldwide and in the U.S., as reported by the Oil & Gas Journal. State totals and Questar plant statistics are also shown as reported for three states. Four QE&P and four QGM processing plants are included in this report.

[34] Based on discussions with QGM regarding typical pressures (60psig) and drops

**Table 10 - Worldwide Processing Plant Capacities**

| Area | Number of plants | Gas Capacity (MMcfd) | Gas Throughput (MMcfd) | Total Liq. Products (1,000 gpd) | Processing/ Conditioning Method |
|---|---|---|---|---|---|
| I. WORLDWIDE | 1,879 | 253,498 | 155,587 | 291,027 | n/a |
| II. UNITED STATES | 577 | 72,343 | 45,897 | 75,758 | n/a |
| III. SELECTED U.S. STATES | | | | | |
| 1) COLORADO | 43 | 3,133 | 1,652 | 2,332 | n/a |
| QE&P -Cutthroat"A", Montezuma Co. (10-37s-19w) | 1 | 4.8 | 2 | 9.5 | refrigeration |
| -Cutthroat"B", Montezuma Co. (26-37n-19w) | 1 | 1.8 | 2.3 | 9.5 | refrigeration |
| -Dove Creek, Dolores Co. (5-40n-18w) | 1 | 12 | 0.9 | 1.7 | refrigeration |
| -Skull Creek, Moffat Co. (32-12n-97w) | 1 | 40 | 43.7 | 3.7 | refrigeration |
| 2) UTAH | 14 | 531 | 243 | 321 | n/a |
| QGM -Price | 1 | - | - | - | - |
| -Red Wash, Uintah Co. (24-7s-23e) | 1 | 80 | - | - | refrigeration |
| 3) WYOMING | 38 | 5,795 | 3,428 | 4,579 | n/a |
| QGM -Blacks Fork, Sweetwater Co. | 1 | 84 | 74.4 | 111.2 | turbo exp. |
| -Vermillion, Sweetwater Co. (34-13n-101w) | 1 | 43 | 36 | 41.3 | turbo exp. |

Notes:
Worldwide, U.S. and State Total statistics shown as of 1-01-09, Source: O&GJ.
Individual processing plant statistics shown as of 1-01-07, Source: O&GJ.

### 4.9.2 Typical Wyoming Processing Plants and Gathering Facilities

Starting at the wellhead a pressurized mixture of gases and liquids is produced, which requires processing prior to transport. The mixture typically contains natural gas, natural gas liquids, condensate, and water. The water and condensate are removed first. The condensate is typically trucked or piped to another party's facility where it is sold.

Next the gas is dried in a unit containing ethylene glycol that removes excess moisture. From there, it is piped to a gathering facility such as the Jonah Gas Gathering Facility (owned by Anadarko) where a 265,000-horsepower compressor sends the gas 55 miles southwest to the Opal Hub. At Opal impurities such as carbon dioxide and hydrogen sulfide are removed using an amine still.

In the final purification step, natural gas liquids (NGL) such as ethane, propane, butane, isobutene, and pentanes are separated from the gas. To do this, a cryogenic plant freezes the gas to minus 175 degrees Fahrenheit. Then it is run through separators that

remove the NGL from the gas (methane). After separation, the NGL are collected for transport.

The Opal Hub is located 15 miles east of Kemmerer and is the destination for a large portion of the natural gas produced in the Upper Green River Valley (UGRV). It has a capacity of 1.45 billion cubic feet of gas per day. At Opal gas is sold, traded, or exchanged and delivered to a pipeline.

### 4.9.3 QGM Processing Plants

Based on interviews with QGM representatives, QGM owns processing plants that, as of 2007, had an aggregate capacity of 474 MMcf of unprocessed natural gas per day. The primary processing plants utilized for Wexpro operated QGC gas include:

1. Blacks Fork — Owned operated by QGM
2. Vermilion — Owned 72% by QGM and operated by QGM
3. Emigrant Trail — Owned & operated by QGM (very little SWGA gas is processed at this plant)

## 4.10 Questar Pipeline Systems

The SWGA notes that QGC's gas could be transported on an interruptible basis once it reaches the pipeline. We have therefore included a description of Questar's relevant pipeline system in the following.

### 4.10.1 Questar Pipeline Sizes

Questar Pipeline and its subsidiaries own 2,503 miles of interstate pipeline. As of 2006, Questar Pipeline had a maximum capacity of 3,442 Mdth per day and firm-capacity commitments of 2,152 Mdth per day. The maximum-daily-capacity figures include 85 Mdth for Southern Trails (a Questar pipeline extending from the San Juan Basin in New Mexico to the California border), and 1,119 Mdth for Overthrust Pipeline (a 168-mile Questar pipeline located in southwestern Wyoming). Questar Pipeline's system ranges in size from lines that are less than four inches in diameter to the Overthrust line that is 36 inches in diameter.

### 4.10.2 Questar Pipeline Company's Core System

Questar Pipeline Company's core-transmission system is the primary feeding line for Utah customers. This system is strategically located in the Rocky Mountain area near large reserves of natural gas in six major Rocky Mountain producing areas. It transports natural gas from these producing areas to other major pipeline systems and to the Questar Gas distribution system. The core of Questar Pipeline Company's system

consists of two East/West lines: the southern line stretches from near Provo, Utah on its western end eastward to the Piceance basin in western Colorado. The northern line stretches from Salt Lake City, Utah through most of the Wyoming Green River Basin. These two roughly parallel East/West lines are connected through a major north/south branch near the Colorado/Utah border forming the shape of the letter “H” turned on its side.

# 5 Chapter 5 - Liquid Content & Shrinkage

Liquids of two different types are produced from Wexpro operations: 1) crude oil liquids; and 2) natural gas liquids (NGL). Crude oil liquids are produced from wells classified as oil wells. Natural gas liquids are produced as a small-percentage by-product from wells classified as natural gas wells. Additionally, the value of condensate that is sold is credited to the costs in the annual rate calculation.

## 5.1 Liquid Hydrocarbon Reserves of Wexpro

### 5.1.1 Wexpro Crude-oil Revenues

In addition to its natural gas reserves, QGC owns oil-producing properties. Under terms of the Wexpro Agreement, revenues from crude-oil sales offset operating expenses and provide Wexpro with a return on its investment. Any remaining revenues, after recovery of expenses and Wexpro's return on investment, are divided between Wexpro (46%) and QGC (54%).

### 5.1.2 Liquid Hydrocarbon Reserves Coexisting with Wexpro Natural Gas Reserves

Wexpro manages, develops, and produces cost-of-service reserves for Questar Gas under the terms of the Wexpro Agreement. The following two tables list cost-of-service natural gas and oil reserves as estimated by Wexpro reservoir engineers as of December 31, 2008:

Table 11 - Estimated Cost-of-Service Proved Reserves

| | |
|---|---|
| Natural gas (Bcf) | 646.9 |
| Oil (Million bbl) | 4.5 |

Table 12 - Estimated Cost-of-Service Proved Reserves

| Reserve | Bcfe | % |
|---|---|---|
| Natural gas (Bcf) | 646.9 | 96.0 |
| Oil (Bcfe) [1] | 27.0 | 4.0 |
| Total proved reserves (Bcfe) | 673.9 | 100.0 |
| Proved developed reserves (Bcfe) | 489.9 | |

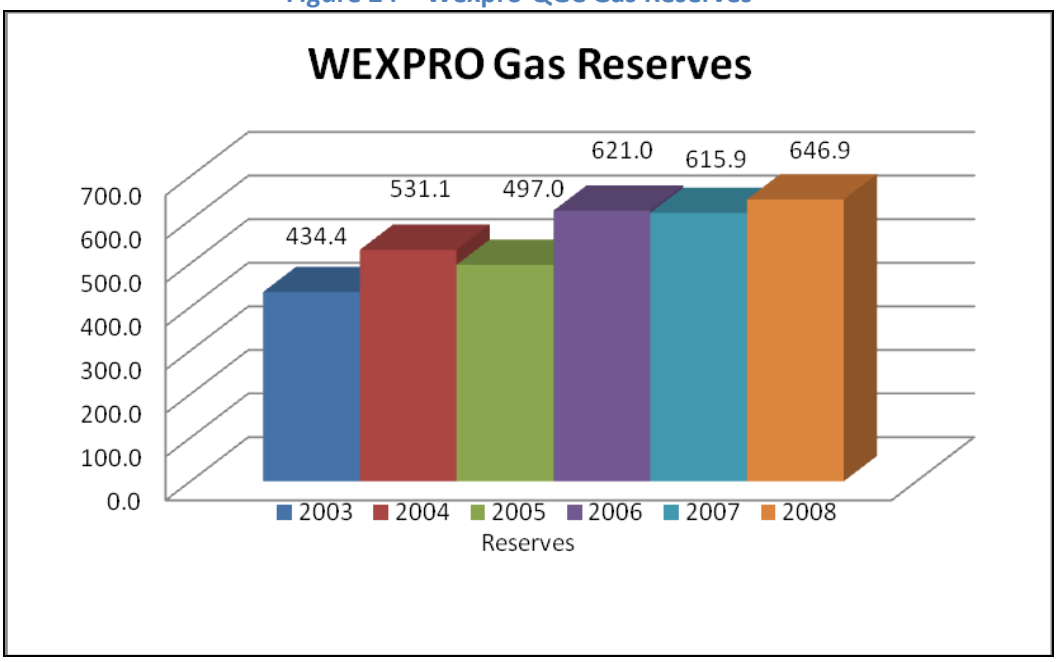
1: Oil volumes are converted to natural gas equivalents assuming one barrel of crude oil, condensate, or NGL is equivalent to 6,000 cubic feet of natural gas.

As shown in the above table, oil accounts for 4% of proved reserves on a volumetric basis. Wexpro reservoir engineers use a minimum producing rate or maximum well-life limit to determine the ultimate quantity of reserves attributable to each well.

## 5.2 QGC Natural Gas Reserve[35] Growth

The following graph shows the growth of QGC gas reserves in the past six years. This is the gas from which NGL is removed in QGM's processing plants:

Figure 24 – Wexpro-QGC Gas Reserves[36]




## 5.3 QGM's NGL Revenues

The sale of natural gas liquids (NGL) is an important contributor to QGM's overall revenue.

QGM employs two different types of processing agreements with QGC:

1. Fee-based Agreements.
2. Keep-Whole Agreement under the SWGA. (Wexpro has a keep-whole processing agreement with QGM which covers most volumes except for the Canyon Creek volumes processed by Wexpro).

[35] These reserves are commonly referred to as "Cost-of-Service" or "Wexpro" Reserves
[36] Source: Questar Corporation Annual Reports & 10K Reports - 2008

About 58 percent of QGM's 2008 net gas-processing revenues (31% in 2007) are derived from fee-based gathering and processing agreements. The remaining revenues come from natural gas processing margins, as in the keep-whole agreements, whereby natural gas liquids (NGL) are extracted in the gas processing plants and sold to third parties.

The keep-whole revenues are derived from natural gas processing margins that in part expose QGM to the "frac[37]" spread. To reduce processing margin risk, QGM has restructured many of its processing agreements with producers from "keep-whole" contracts to "fee-based" contracts.

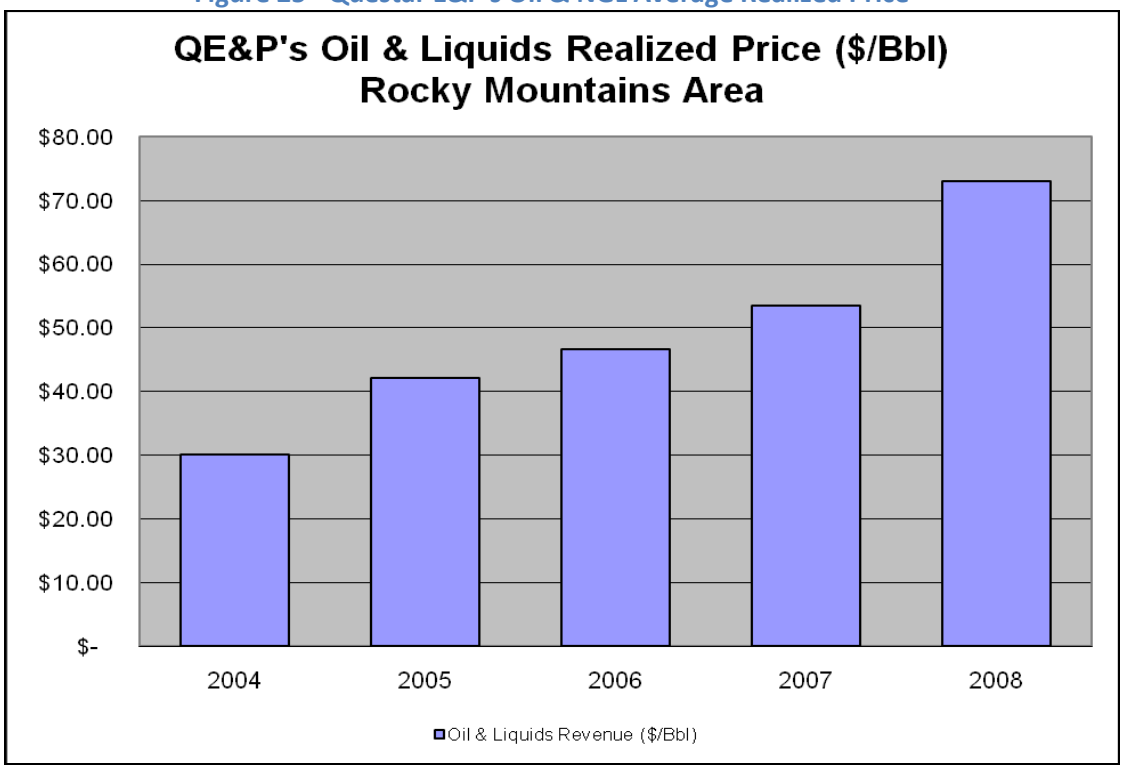
A keep-whole contract, such as the processing contracts that QGC has with QGM, insulates producers such as QGC from frac-spread risk while a fee based contract eliminates commodity price risk for the processing plant owner. To further reduce volatility associated with keep-whole contracts, QGM sometimes enters into forward-sales contracts for NGL or hedges NGL prices and equivalent gas volumes with the intent to lock in a processing margin.

## 5.4 Questar's Average Realized Price Received on Sales of NGL

QGM sells NGL's directly. In order to estimate the size of these revenues, we have shown in the following graph the growth in average realized price that QE&P has received in the Rocky Mountain area over the past five years.

[37] **"frac"** spread is the difference between crude oil and propane prices and natural gas prices and represents the gross profit margin for NGL extraction.

Figure 25 - Questar E&P's Oil & NGL Average Realized Price[38]

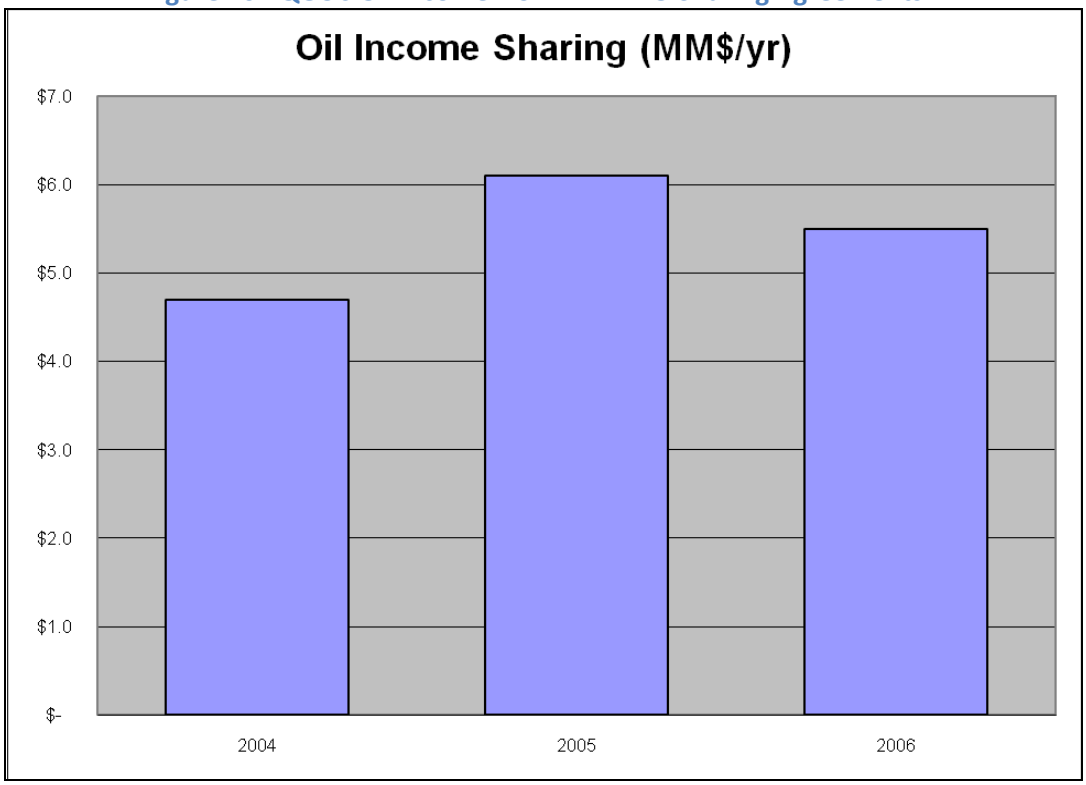



## 5.5 QGC Oil Revenue Stream

The revenues resulting from the sale of oil from QGC's oil wells that are developed and operated by Wexpro are shared with QGC on a 46%/54% basis. QGC's oil Income received from Wexpro sharing agreement is shown in the graph below.

[38] Source: Questar Corporation Annual Reports & 10K Reports

Figure 26 - QGC's Oil Income from WEXPRO Sharing Agreements[39]




## 5.6 Shrinkage of QGC's Gas at Processing Plants

When liquids are extracted from natural gas, "shrinkage" is the term applied to the loss in volume of the gas stream.

Losses in volume or "shrinkage" of QGC's gas occur when it is being processed by QGM in the plants where liquids are removed. The system wide gathering agreement (SWGA) between QGC and QGM requires QGM to replace the lost volume with equivalent quantities of gas for delivery.

Gas volume may also be lost to other processes during transport. Some losses may be designated as fuel gas and lost-and-unaccounted-for gas. Under the SWGA, these volumes are not required to be replaced by QGM.

[39] Source: Questar Corporation Annual Reports & 10K Reports

# 6 Chapter 6 - Market Level of Service

The System Wide Gathering Agreement specifies a cost-based calculation procedure for determining gathering rates (see Chapter1). The gathering rate for the SWGA is not based on a "market" gathering rate.

## 6.1 Setting Gathering and Processing Rates

### 6.1.1 Cost-of-Service Based Rates

The procedure specified in the Gathering Agreement is based on cost-of-service for installing and operating new gathering lines and necessary associated equipment and services. This procedure was selected in part because it mimics the way gathering costs are determined by competitive suppliers of these services in new gathering areas. The cost-of-service rate is recalculated annually to incorporate assets added to the rate base during the past year.

### 6.1.2 Market-Based Rates

An alternative technique for determining market levels of service (or rates) for any type of service (including gathering and processing services) would be the use of "market" service offerings and rates in the vicinity; i.e. rates charged by third party providers of these services. However this pricing technique requires discovery of typical market rates. Unfortunately there are no reputable sources of gathering or processing rates that WCI is aware of. Furthermore in prior hearings, it was asserted that the rates for market services are not comparable.

"*To judge whether rates are reasonable, we believe that the rates and terms of the 1993 gathering agreement should be judged on the circumstances prevailing at the time the agreement was reached. The Division maintains that the rates charged to MFS (QGC) were four times that charged to other customers and this can be taken as prima facia evidence that the rates were unreasonable. However, MFS has presented evidence that there is a difference in the gathering services rendered to MFS that accounts for the difference in the rates charged to MFS and to other customers. We, therefore, conclude that the absolute difference in the rates charged to the different gathering customers may be explained in the variances in the gathering services. There is no evidence of the market price for an identical level of service for gathering in 1996. Lacking a market price for gathering services, we must therefore use costs to judge the reasonableness of the agreement.*

*We believe that it is appropriate to rely upon the fact that the 1993 gathering agreement's rates and terms were determined using cost based principles and*

*accepted by FERC. We recognize that different rate designs and methods may be used by different jurisdictions to determine just and reasonable rates. That different rate designs or methods are permissible, even though there is a difference in the actual rate calculation, is reflective that the 'just and reasonable' conclusion is reached on a continuum of possible outcomes rather than solely one point within a range. We cannot say that one, and only one, rate design and the charges resulting there from must be followed to obtain just and reasonable rates. While we may not choose the rate design employed by the FERC, in 1993, in making our review of the reasonableness of the rates, we also cannot conclude that there was an error in FERC's acceptance of the 1993 gathering agreement terms*."[40]

### 6.1.3 Survey of Market-Based Rates

When published offerings do not exist, an alternate technique for determining market-based conditions is through use of a survey of offerings from third-party providers or users of these services, particularly in nearby areas. WCI conducted this type of survey in an attempt to determine ranges of gathering services offered by others. A number of other related items were included in the survey.

## 6.2 WCI's Survey of Gathering and Processing Rates

### 6.2.1 Survey Questions

WCI's survey, shown below consisted of sixteen questions related to gathering and processing.

[40] Utah Public Commission Order, Dec. 31, 1998 in Docket Nos. 95-057-30, 96-057-12, 97-05-11, pp11-12.

WILLIAMS CONSULTING, INC. CONFIDENTIAL SURVEY
GATHERING & PROCESSING COSTS

NOTE: This is a **CONFIDENTIAL** survey that Williams is conducting for one of its clients. All results of the survey will be grouped with no information given to our client or to survey respondents regarding data obtained from particular survey participants. The final survey results will be distributed to all survey participants in return for their participation.

**SURVEY QUESTIONS**:

1. What mid-stream services does your firm provide?

   Gathering ☐ Processing ☐ Dehydration ☐ Compression ☐ ALL ☐ Other ☐

2. For your Gathering service, what is the current range of costs (in $/MMBtu) your firm charges?

   Lowest Rate ☐ Highest Rate ☐ Typical Rate ☐

3. Is your Gathering rate escalated annually for most_____ or all_____ of your contracts?

   If so, what escalator index is used?_____ .

4. Is your Gathering charge based mostly on your cost of service? Yes ☐ No ☐

   Or, on the market conditions in the area? Yes ☐ No ☐

   If market rate, how is it arrived at? _____

5. Does your firm offer a two-part rate (Demand charge and Commodity charge) for Gathering?

   Yes ☐ No ☐

6. Are you aware of any competing firms that offer a two-part Gathering rate? Yes ☐ No ☐

7. How many miles of gathering lines do you operate?

   0-500 ☐ 501-1000 ☐ more than 1000 ☐

8. What is a typical distance (in miles) that your service moves gas from the wellhead to the pipeline receipt point? _____ miles.

9. How much compression horsepower is installed on average per mile of line? _____

10. What portion of the well volume that you gather goes through a processing plant? ____ %

11. What is the typical processing plant's capacity? _____

12. For your Processing service, what is the current range of costs (in $/MMBtu) your firm charges?

    Lowest Rate ☐ Highest Rate ☐ Typical Rate ☐

13. Is your Processing rate escalated annually for most ☐ or all ☐ of your contracts?

    If so, what escalator index is used? _____

14. Which contract party receives the right to sell liquids removed from the gas?

    Your Firm ☐ Gas Producer ☐ Other ☐

15. What type of gas processing plant do you operate? Refrigeration ☐ Cryogenic ☐

16. Do you offer a percent of proceeds processing fee? Yes ☐ _____% No ☐

### 6.2.2 Determination of Targeted Survey Participants

WCI selected the larger gathering firms operating in the southwestern Wyoming region as its prime targets for survey participants.

As a secondary target group, WCI attempted to entice users of gathering and processing services to also fill out the survey form.

### 6.2.3 Privacy Guarantees to Survey Participants

In order to obtain participants for the survey, WCI assured the participants both anonymity and copies of the final results:

1. All results of the survey will be grouped with no information given to our client or to survey respondents regarding data obtained from particular survey participants.

2. The final survey results will be distributed to all survey participants in return for their participation

### 6.2.4 Participation Obtained in Survey

All four of the large gathering and processing firms operating in the vicinity of the Pinedale field agreed to cooperate with WCI by answering the questions on the survey form.

WCI was unsuccessful in obtaining survey participants from a secondary target group consisting of users of gathering and processing services. Some firms (particularly the users of gathering and processing services) cited confidentiality agreements which prohibited release of any information on their contracts, particularly price information.

## 6.3 Results of WCI's Survey of Gathering and Processing Rates

The following information has been summarized from the survey responses. Respondents did not necessarily answer all questions:

**Question 1**: Some of the firms participating in the survey offered multiple midstream services (e.g. gathering, processing, dehydration, compression). Some specialized in offering only one or two of the midstream services.

**Question 2**: Gathering rates ranged between $0.10 and $0.50 per MCF, as reported by one respondent (the only respondent who provided numerical information). It was noted that the higher rates applied to the use of midstream services in addition to gathering, for instance dehydration or compression.

**Question 3**: Most respondents replied that the majority of their contracts are escalated by explicit indexes. The CPI was cited most often.

**Question 4**: Results were split fairly even on whether the respondent's gathering charge is based on cost-of-service considerations or on market conditions. Other factors influencing the rate include the volume and quality of gas being moved.

**Question 5**: None of the respondent reported the use of a two-part gathering rate. One respondent relates the gathering rate to a demand and commodity rate structure similar to a pipeline's, and feels it isn't directly comparable since there are multiple gathering route options that blur the concept of line "capacity."

**Question 6**: Only one respondent reported knowledge of a two-part rate being used by a competing firm.

**Question 7**: Most respondents operated more than 500 miles of gathering lines.

**Question 8:** Respondents reported typical distances from five (5) to ninety (90) miles that their firm moves gas from the wellhead to pipeline receipt points.

**Question 9**: The respondents did not report sufficient information regarding compressor horsepower to make a generalization.

**Question 10**: Survey respondents reported that the vast majority of the gathered well volume goes through a processing plant. The range provided was between 94% and 100%.

**Question 11**: Respondents reported capacity for a typical processing plant between 1.3 and 1.5 BCF.

**Question 12**: There were insufficient numerical responses to specify a current range of processing costs.

**Question 13**: Most respondents reported that whether processing rates were escalated annually or not varied with each individual contract.

**Question 14**: Survey respondents reported that slightly more than half of their processing contracts permitted their processing firm to sell and retain liquids revenues.

**Question 15**: Cryogenic gas processing was reported to be the most widely used technique, with refrigeration and gel treating also being employed.

**Question 16**: All of the participating firms that offer processing services also offer the option for a producer to participate in a percentage of proceeds for the liquids.

## 6.4 Comparison of QGM to Market Survey Results

The following is a comparison of QGM's gathering and processing activities against the compiled answers to each survey question.

**Question 1**: QGM offers a complete range of midstream services (e.g. gathering, processing, dehydration, compression).

**Question 2**: Without detailed cost results, it appears that QGM's gathering costs may span an equal or greater range compared to others.

**Question 3**: Comparable to the survey answers, QGM escalates the majority of their contracts by explicit indices, including the CPI Index that its competitors use.

**Question 4**: QGM bases its gathering charge mostly on cost-of-service considerations rather than market conditions. This differs somewhat from other midstream providers surveyed, that also consider competitive market factors.

**Question 5**: QGM differs from all survey respondents in offering a two-part gathering rate. No survey respondent reported using a two-part gathering rate.

**Question 6**: QGM, like most survey respondents is not familiar with other competitors who offer two-part gathering rates.

**Question 7**: QGM has as large a gathering system as most survey respondents, with about 1,600 miles of gathering lines.

**Question 8**: QGM moves gas a distance that is at the low end of the range reported by survey participants. Respondents reported typical distances from five (5) to ninety (90) miles from the wellhead to pipeline receipt points, compared to about 10 to 15 miles for QGM, although certain Pinedale distances may be longer.

**Question 9**: QGM's compressor horsepower cannot be compared against that of survey participants since the participants did not report sufficient compressor horsepower information to make a generalization.

**Question 10**: QGM sends a somewhat smaller percentage of their gathered gas through processing plants. Survey respondents reported that the vast majority of their gathered well volume goes through a processing plant. The range provided in the survey was between 94% and 100%, compared to about 80% for QGM.

**Question 11**: Respondents reported capacity for a typical processing plant between 1.3 and 1.5 BCF, whereas QGM utilizes about 2 BCF...

**Question 12**: QGM's processing fees cannot be compared against those of firms in the survey since there were insufficient numerical responses to specify a current range of processing costs. However QGM also offers the "keep whole" option, as do some survey respondents.

**Question 13**: Most respondents reported that whether or not processing rates were escalated annually varied with each contract. When QGM escalates its processing costs, it generally employs a fixed annual percentage escalator.

**Question 14**: Survey respondents reported that slightly more than half of their processing contracts permitted their processing firm to sell and retain liquids revenues. QGM typically sells liquids that it extracts.

**Question 15**: Cryogenic gas processing was reported to be the most widely used technique, with refrigeration and gel treating also being employed. QGM also utilizes both cryogenic and refrigeration processes.

**Question 16**: All of the participating firms that offer processing services also offer the option for a producer to participate in a percentage of proceeds for the liquids. QGM offers this participation option as well as a "keep-whole" option.

# 7 Chapter 7 – Findings, Conclusions and Recommendations

WCI has the following conclusions and recommendations based on the findings of this review of QGM's natural gas gathering and processing agreements including the SWGA and non-affiliated gathering agreements:

## 7.1 Findings and Conclusions

1. QGM's SWGA for QGC's gas producing properties operated by Wexpro is quite unique. We are not aware of other similar arrangements in the gas industry, wherein gathering rates are not fixed (or possibly varied regularly with escalators) but are instead reset each year based on the amount of rate base utilized in the gathering system. Since there are few, if any precedents, care must be taken to regularly check to see that the gathering charge formulas originally set a decade or more ago are still relevant.

2. In the 1998 amendment to the 1993 SWGA, gathering charges in Appendix B were modified to incorporate a winter-seasonal volume adjustment. This is common practice in the pipeline industry and the adjustment involves use of a ratio of the amount of cost-of-service gas delivered to QGC in relation to the gas volume delivered by QGM to all parties during the months of January – March and November – December of the same calendar year. Expenses for the various categories such as Operating and Maintenance (O&M) expenses, depreciation and amortization expenses, and so on use the ratio of the winter months instead of the ratio based on the entire year.

3. Appendix C to the amended 1998 SWGA specifies the cost formula for connecting a new well as requested by the operator Wexpro to QGM. However, from interviews with QGM, it appears this calculation has not been implemented or charged to QGC since its inception in the amended 1998 SWGA when adding new wells. Questar stated the reason the formula isn't being used is because when the formula is used on a new well connection and the cost to hook that well up, per the formula, is more than the current SWGA cost of service, QGC has the right to take the well to someone other than QGM.

4. Currently, in the environment of low gas prices, new rate-base capital expenditures would be expected to not increase as fast as in recent years. However the longer-term outlook for capital expenditures in the new gathering areas such as Pinedale would be for the return of large increases, which would once again put upward pressure on gathering and processing rates.

5. The services that QGC receives from QGM in the gathering and processing areas are very similar to those offered by a number of competitors, both across the U.S. and in the Wyoming region, as obtained from public information sources such as the internet. WCI has summarized offerings by a number of midstream service providers including:

    a. Williams Field Midstream Services, a subsidiary of The Williams Companies, Inc.
    b. Atlas Pipeline Partners, LP
    c. DCP Midstream, LLC
    d. TEPPCO (Texas Eastern Products Pipeline Co., LLC) [Merger with Enterprise expected to be approved by the end of 2009]
    e. Ultra Resources, Inc. (Ultra), a subsidiary of Ultra Petroleum Corporation

6. WCI notes that the Priority #1 designation, as used by QGM, signifying firm service with a demand charge in addition to the commodity charge, is not referred to in any part of the System Wide Gathering Agreement. Only firm service is specified, which would also correspond to Priority #2.

7. WCI has located from public sources, gathering rates that contain indexes that can result in higher gathering rates than those charged by QGM. For instance, Atlas charges certain rates as a fraction of gas cost, with some listed at 10% to 16% of the weighted average sales price of gas. In times of rising gas costs, this index can result in substantial gathering costs.

8. WCI notes from information contained in public sources that Ultra Petroleum, a user of midstream services in the Pinedale and Jonah fields, has conducted apparently successful negotiations resulting in the reduction of certain gathering and processing costs by offering to sign long-term usage contracts which permit the midstream provider to invest in long-term capital equipment such as compressors.

9. The natural gas industry has recently entered a new environment of low gas prices – an environment not seen in recent years. Ramifications for all parts of the Exploration & Production industry including gas gathering and processing activities are severe. For instance QGC's production has been curtailed during the summer months since lower-cost gas can now be obtained elsewhere. Even though the ratepayers of Utah have a claim on QGC's gas and have historically

enjoyed relatively low gas rates because of this gas source, they now find themselves in the position of having to back off on the QGC (Wexpro-operated) source in order to not pay higher gas prices.

10. QGM's interests were historically aligned with those of Utah ratepayers in the prospect of gathering lower-cost QGC reserves. Care must now be taken that the interests of both parties are still aligned. Utah ratepayers for instance under conditions of low gas prices, may sometimes have a declining interest in development of additional QGC reserves. QGM however could hypothetically still enjoy historically high gathering (and possibly development) fees by continuing to gather the QGC reserves, since QGM would still recover their costs-of-service and still enjoy a substantial return on rate base. We note the return on rate base is Commission approved. It is the same ROR that QGC is allowed.

11. The Division employs a Monitor to assure that any new Wexpro-operated wells developed will be economically attractive or they will be declared to be non-commercial wells and are drilled at their own risk. This is one check on the alignment of interests of both parties. Unfortunately the current low-cost gas environment makes the Monitor's job that much harder. In deciding whether or not a well may be economic, should he/she use today's low prices or a forecast for future prices?

12. WCI judges that the economic impact of the decision regarding whether to continue to produce and gather QGC gas versus the option of purchasing spot-market supplies could have an impact on Utah ratepayers.

13. Survey Conclusions - The following conclusions were drawn by WCI from comparing QGM to the results of the gathering survey:

    a. QGM offers a complete range of midstream services (e.g. gathering, processing, dehydration, compression).

    b. Comparable to the survey answers, QGM escalates the majority of their contracts by explicit indices, including the CPI Index that its competitors use.

    c. QGM bases its gathering charge for QGC on cost-of-service considerations rather than market conditions. This differs somewhat from other midstream providers surveyed that also consider competitive market factors.

d. QGM differs from all survey respondents in offering a two-part gathering rate. No survey respondent reported using a two-part gathering rate.

e. QGM, like most survey respondents is not familiar with competitors that also offer two-part gathering rates.

f. QGM has as large a gathering system as most survey respondents, with about 1,600 miles of gathering lines.

g. QGM moves gas a distance that is at the low end of the range reported by survey participants. Respondents reported typical distances from five (5) to ninety (90) miles that their firm moves gas from the wellhead to pipeline receipt points, compared to about 10 to 15 miles for QGM, although further distances are common in the Pinedale area.

h. QGM sends a somewhat smaller percentage of their gathered gas through processing plants. Survey respondents reported that the vast majority of their gathered well volume goes through a processing plant. The range provided in the survey was between 94% and 100%, compared to about 80% for QGM.

i. Respondents reported capacity for a typical processing plant between 1.3 and 1.5 BCF, whereas QGM has a larger capacity plant of about 2 BCF.

j. QGM offers the “keep whole” option, as do some survey respondents.

k. Most respondents reported that whether or not processing rates were escalated annually varied with each contract. When QGM escalates its processing costs, it generally employs a fixed annual percentage escalator.

l. Survey respondents reported that slightly more than half of their processing contracts permitted their processing firm to sell and retain liquids revenues. QGM typically sells liquids that it extracts.

m. Cryogenic gas processing was reported to be the most widely used technique, with refrigeration and gel treating also being employed. QGM also utilizes both cryogenic and refrigeration processes.

n. All of the participating firms that offer processing services also offer the option for a producer to participate in a percentage of proceeds for the

liquids. QGM offers this participation option as well as a "keep-whole" option.

14. WCI noted that the cost-of-service calculations for determining gathering costs include charges and returns based on new infrastructure such as pipelines and compressors. However, the greatest growth in cost-of-service came from people-related areas such as O&M and G&A, rather than the infrastructure elements themselves.

## 7.2 Recommendations

1. WCI notes that the Priority #1 designation, as used by QGM, signifying firm service with a demand charge in addition to the commodity charge, is not referred to in any part of the System Wide Gathering Agreement. Only firm service is specified, which could correspond also to Priority #2. WCI suggests that the service designation in the Agreement be changed to correspond to Priority #1, since this two-part rate is being charged.

2. Especially during an era of extremely low natural gas prices, the Division's oversight becomes more important in reviewing come of the major decisions now facing QGC, such as reducing production at certain Wexpro-operated wells and replacing the gas with lower-cost spot-market supplies, WCI recommends that QGC continues to keep the Division fully informed of these replacement decisions.

3. WCI recommends that QGC adopt industry evaluation techniques such as buy/sell calculations involving variable-cost (as opposed to fixed-cost or full-cost) bases for its produce-vs.-purchase decisions. Major considerations also involved in this decision include the possibility of well damage[41] from being temporarily shut-in. We understand that the Commission is currently in the process of having QGC prepare a paper discussing its produce-vs.-purchase decisions for the Commission.

4. WCI recommends that QGC to provide pro-active guidelines (as part of its IRP process) for the pace of drilling of additional cost-of-service wells during times of low gas prices, since the Utah ratepayers need to benefit from all additional wells drilled.

[41] The Pinedale anticline of Southwest Wyoming has proved technically challenging to drill and cement. This tight gas reservoir has more than 5,000 ft of vertical-pay interval in stacked-lenticular sands. When a well is "shut-in", gas hydrates form an effective seal mechanism of the sand sediments and cause well damage requiring extensive and expensive re-opening of the well.

5. WCI recommends that the process of field unitization be studied to determine its applicability to portions of the Pinedale area of interest to Wexpro. This technique could develop rules for well drainage that drillers should follow, which would permit wells and gathering systems to be grouped for economies. .

6. In order to carry out certain of the above recommendations (especially recommendations 2 and 5) WCI recommends that the Division continue to use the services of their Monitor...

7. WCI observed that the largest recent growth in cost-of-service calculations for determining gathering costs came from people-related areas such as O&M and G&A, rather than from the gathering infrastructure elements themselves. Further investigation into the underlying causes of these recent increases is beyond the scope of WCI's current assignment but seems to be warranted. Therefore WCI recommends that the Division look into these cost areas as part of Account 191 data filings in future years.

# 8 Appendix

| Appendix # | Chapter/Section # | Description |
|---|---|---|
| 8.1 | 3.5 | Definitions of Force Majeure Clauses |
| 8.2 | 1 | Gathering Agreement Timeline |
| 8.3 | 1 | FERC Account Definitions |
| 8.4 | 4.7 | Pinedale Area Diagram |
| 8.5 | 4.7 | Powder Wash Diagram |
| 8.6 | 4.7 | Bruff Moxa Diagram |
| 8.7 | 4.7 | Hiawatha Diagram |

## 8.1 Definition of Force Majeure Clauses:

**Definition of Force Majeure in System Wide Gathering Agreement**

"*9 Force Majeure*

9.1 *Definition.* The term "force majeure" as employed in this agreement will mean acts of God, strikes, lockouts or other labor or industrial disturbances, acts of the public enemy, wars, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, tornadoes, severe weather, storms floods, washouts, arrest and restraint from rulers (sic) of people, necessity for compliance with any court order, law ordinance or regulations promulgated by a governmental authority having jurisdiction, civil disturbances, explosions, breakage or accident to machinery, instrumentation, or lines of pipe, sudden partial or sudden entire failure of wells, freezing of wells or pipelines, inability to secure right-of-way, materials, supplies or labor, including inability or failure to obtain materials and supplies due to governmental regulations, and causes of like or different kind, whether enumerated in this agreement or not, and not within the control of the party claiming force majeure, and which by the exercise of due diligence such party is unable to overcome.

9.2 *Notice.* If either party is rendered wholly or partially unable to carry out its obligations under this Agreement due to force majeure, the party shall give written notice describing the event of force majeure as soon as is reasonably possible after the occurrence. The obligations of the Parties, other than to make payments of amounts due so far as they are affected by such force majeure, will be suspended during the continuance of the event of force majeure, but for no longer period. The affected party

shall remedy the event of force majeure in a commercially reasonable manner. Nothing in this Agreement shall be construed to require either party to settle a strike or labor dispute against its better judgment."

**Williams Pipeline Definition**

"Force Majeure Event" means any act of God, strike, lockout, or other industrial disturbance, act of a public enemy, sabotage, war (whether or not an actual declaration is made thereof), blockade, insurrection, riot, epidemic, landslide, lightning, earthquake, flood, storm, fire, washout, arrest and restraint of rules and peoples, civil disturbance, explosion, breakage or accident to machinery or line or pipe, hydrate obstruction of line or pipe, lack of pipeline capacity, repair, maintenance, improvement, replacement, or alteration to plant or line of pipe or related facility, failure or delay in transportation, temporary failure of gas supply or markets, freezing of the well or delivery facility, well blowout, cratering, partial or entire failure of the gas well, the act of any court, agency or governmental authority, or any other cause, whether of the kind enumerated or otherwise, not within the reasonable control of the party claiming suspension.

## 8.2 Gathering Agreement Timeline

| Date | Event | Description of Event |
|---|---|---|
| October 14,1981 | "The Wexpro Agreement" | October 14, 1981: The 'Wexpro Agreement' dated October 14, 1981 between Mountain Fuel, Wexpro Company, the Utah Division of Public Utilities, the Utah Committee of Consumer Services and the Staff of the Public Service Commission of Wyoming. Essentially, the agreement transferred Leaseholds. All leasehold, operating rights, working interests, mineral and other interests in production which were held by Wexpro on July 31, 1981. Additional area covered under the agreement is based on each prior Wexpro well in a pool with a circle of radius 1980 feet centered at the well drawn around and included. Wells are to be completed in any pool above the lowest point to which such well had been drilled. Lastly, any remaining Wexpro oil and natural gas liquids net revenues will be proportioned as follows: 54% of such remainder will be allocated to Wexpro and placed into an account used solely for the purposes of reducing natural gas rates by Commission order and the remaining 46% will be retained by Wexpro as its separate property and will not be considered utility income or used to reduce natural gas rates. |
| July 1,1984 | "Gas Gathering Agreement" | July 1, 1984 Gas Gathering Agreement between Mountain Fuel Supply Company and Questar Pipeline Company. This was terminated and superseded in September 1993. |
| 1985 | FERC Order 436:<br>Unbundling Gas Sales | 1985: Order 436 required that natural gas pipelines provide open access to transportation services, enabling consumers to negotiate prices directly with producers and contract separately for transportation. In 1987, Order 500 Modified Order 436 to address company take-or-pay issues. |
| March 1,1991 | Pursuant to Questar's FERC gas tariff | Two Rate Schedule CD-1 - EXP 6-30-99 |
| April 8, 1992 | FERC Order 636:<br>Restructuring Rule: Mandated Unbundling | April 8, 1992: Order 636 (The Restructuring Rule). This mandated unbundling of sales services from transportation services, providing customers with full choice of providers and opening these markets to competition; and in 2002, FERC Order 637 further addressed inefficiencies in the capacity release market. The restructuring of the natural gas industry actually began with Order 436 and was substantially completed with Order 636. Order 636 has changed gas transportation patterns and rates. Increased competition among gas suppliers fostered by the new market flexibility has contributed to changes in regional production, transportation, and consumption patterns, and to greater efficiency in the use of the gas industry infrastructure. |
| Effective September 1, 1993<br>dated October 11,1993 | Gas Gathering Agreement (often referred as the System Wide Gathering Agreement-SWGA)<br>REPLACE 1984 Agreement | SWGA - Effective September 1, 1993, Gas Gathering Agreement between Mountain Fuel Supply Company (MFS) and Questar Pipeline Company (QPC). The 1993 Agreement completely replaced the 1984 gathering agreement and was eventually Amended February 6, 1998. (Internally known as the System Wide Gathering Agreement-SWGA) |
| August 31, 1995 | End of 'First Period' stating how gathering rates would be calculated. | From September 1, 1993 to August 31, 1995 is known as the 'First Period' which stated how gathering rates would be calculated. Terminated 8-31-95 |
| March 1, 1996 | Questar Pipeline Company (QPC) sold its Gathering interest to Questar Gas Management Company (QGM) | March 1,1996: Questar Gas Management Company (QGM) assumed all of Questar Pipeline Company's interest |
| August 31, 1997 | End of 'Second Period' stating how gathering rates would be calculated. | From September 1, 1995 to August 31, 1997 is known as the 'Second Period' which stated how gathering rates would be calculated. Terminated 8-31-97 |
| September 1, 1997 | Beginning 3rd and final Period. Components to calculate charges for gathering and transporting Wexpro gas by QGM | From September 1, 1997 until termination of the 'SWGA' - Components to calculate charges for gathering and processing Wexpro gas by QGM |
| January 1, 1998 | Mountain Fuel Supply Company (MFS) became Questar Gas Company.(QGC) | On January 1,1998, Mountain Fuel Supply Company became Questar Gas Company.(QGC) |
| February 6,1998 | Amended 1993 Gas Gathering Agreement<br>Questar Gas Company.(QGC)<br>Questar Gas Management Company (QGM) | On February 6, 1998, Questar Gas Company (Wexpro-Operator) replaced Mountain Fuel Co and Questar Gas Management Company (QGM) replaced Questar Pipeline Company. Major amendment was to Article III - Gathering Charges: i) An allocated portion of the annual cost of service for the prior calendar year will be the ratio of the 'winter period'- January-March and November-December of the same calendar year - |
| March 29, 1999 | DPU Issued ORDER: 95-057-30; 95-057-12;97-057-11 | ALLOWED Gathering Costs be moved from pass through to general rates. However #683 and #685 continue with pass through |
| August 25, 1999 | Questar Gas entered into an additional Gas Gathering Agreement with its affiliate QGM. | A separate agreement replaced, at a lower rate |
| October 28, 2005<br>Eff. Nov. 1, 2005 | DPU - ALL gathering costs are pass through - recovered in the 191 account | ALL gathering costs are pass through - recovered in the 191 account - Amending the March 29, 1999 ORDER 95-057-30 moving gathering costs to General Rates. |

## 8.3 Selected FERC Account Definitions[42]

**750 Operation supervision and engineering**.

A. This account shall include the cost of labor and expenses incurred in the general supervision and direction of the operation of production and gathering systems. Direct supervision of specific activities such as turning on and shutting off wells, operating measuring and regulating stations, etc., shall be charged to the appropriate account. (See operating expense instruction 1.)

B. For Nonmajor companies, this account shall include the cost of supervision and labor in the operation of gas wells, lines, compressors and other equipment of the natural gas production and gathering system including miscellaneous labor such as care of grounds, building service, and general clerical and stenographic work at field offices.

Items
1. Supervision. (See operating expense instruction 1.)
2. Gas depletion and gas reserve activities.
3. Geological activities in connection with gas production.
4. Rights-of-way office activities and supervision, not in connection with construction or retirement work, or storage.

**754 Field compressor station expenses.**

This account shall include the cost of labor, materials used, except fuel, and expenses incurred in operating field compressor stations.

Items
*Labor:*
1. Supervising.
2. Operating and checking engines, equipment valves, machinery, gauges, and other instruments, including cleaning, wiping, polishing, and lubricating.
3. Operating boilers and boiler accessory equipment, including fuel handling and ash disposal, recording fuel used, and unloading and storing coal and oil.
4. Repacking valves and replacing gauge glasses, etc.
5. Recording pressures, replacing charts, keeping logs, and preparing reports of station operations.
6. Inspecting and testing equipment when not specifically to determine necessity for repairs or replacement of parts.
7. Pumping drips at the station.
8. Taking dew point readings.
9. Testing water.
10. Cleaning structures, cutting grass and weeds, and minor grading around station.
11. Cleaning and repairing hand tools used in operations.
12. Driving trucks.
13. Watching during shut downs.
14. Clerical work at station.

[42] http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=5b2033a9494a622f2fa2666c5f2911b7&rgn=div5&view=text&node=18:1.0.1.6.46&idno=18

*Materials and expenses:*
15. Scrubber oil.
16. Lubricants, wiping rags, and waste.
17. Charts and printed forms, etc.
18. Gauge glasses.
19. Chemicals to test waters.
20. Water tests and treatment by other than employees.
21. Janitor and washroom supplies, first aid supplies, landscaping supplies, etc.
22. Employees' transportation and travel expenses.
23. Freight, express, parcel post, trucking, and other transportation.
24. Utility services: light, water, telephone.

**756 Field measuring and regulating station expenses.**

This account shall include the cost of labor, materials used and expenses incurred in operating field measuring and regulating stations.

Items
*Labor:*
1. Supervising.
2. Recording pressures and changing charts, reading meters, etc.
3. Estimating lost meter registrations, etc., except gas purchases and sales.
4. Calculating gas volumes from meter charts, except for gas purchases and sales.
5. Adjusting and calibrating measuring equipment, changing meters, orifice plates, gauges, clocks, etc., not in connection with maintenance or construction.
6. Testing gas samples, inspecting and testing gas sample tanks and other meter engineer's equipment, determining specific gravity and Btu content of gas.
7. Inspecting and testing equipment not specifically to determine necessity for repairs including pulsation tests.
8. Cleaning and lubricating equipment.
9. Keeping log and other operating records, preparing reports of operations, etc.
10. Attending boilers and operating other accessory equipment.
11. Installing and removing district gauges for pressure survey.
12. Thawing freeze in gauge pipes.
13. Inspecting and pumping drips, dewatering manholes and pits, inspecting sumps, cleaning pits, etc., blowing meter drips.
14. Moving equipment, minor structures, etc., not in connection with construction, retirement, or maintenance work.
*Materials and expenses:*
15. Charts and printed forms, stationery and office supplies, etc.
16. Lubricants, wiping rags, waste.
17. Employees' transportation and travel expense.
18. Freight, express, parcel post, trucking and other transportation.
19. Utility services: light, water, telephone.

**769 Maintenance of other equipment**.

This account shall include the cost of labor, materials used and expenses incurred in maintenance of other production and gathering equipment includible in account 337, Other Equipment. (See operating expense instruction 2.)

**807 Purchased gas expenses**.

A. This account shall include expenses incurred directly in connection with the purchase of gas for resale.
B. The utility shall not include as purchased gas expense, segregated or apportioned expenses of operating and maintaining gathering system plant whether such plant is devoted solely or partially to purchases of gas, except that the utility shall include the cost of turning on and off purchase gas wells and operating measuring stations devoted exclusively to measuring purchased gas.
C. In general, it is intended that this account include only the expenses directly related to purchased gas, including the expenses of computing volumes of gas purchased, and special items directly related to gas purchases which are not includible in other accounts.
D. This account shall be subdivided as follows:
807.1 Well expenses—Purchased gas.
807.2 Operation of purchased gas measuring stations.
807.3 Maintenance of purchased gas measuring stations.
807.4 Purchased gas calculations expenses.
807.5 Other purchased gas expenses.

***Accounts 408.1 and 408.2***
A. These accounts shall include the amounts of ad valorem, gross revenue or gross receipts, taxes, state unemployment insurance, franchise taxes, federal excise taxes, social security taxes, and all other taxes assessed by federal, state, county, municipal, or other local governmental authorities, except income taxes.

B. These accounts shall be charged in each accounting period with the amounts of taxes which are applicable thereto, with concurrent credits to account 236, Taxes Accrued, or account 165, Prepayments, as appropriate. When it is not possible to determine the exact amounts of taxes, the amounts shall be estimated and adjustments made in current accruals as the actual tax levies become known.

C. The charges to these accounts shall be made or supported so as to show the amount of each tax and the basis upon which each charge is made. In the case of a utility rendering more than one utility service, taxes of the kind includible in these accounts shall be assigned directly to the utility department the operation of which gave rise to the tax in so far as a specific utility department, it shall be distributed among the utility departments or nonutility operations on an equitable basis after appropriate study to determine such basis.

Note A: Special assessments for street and similar improvements shall be included in the appropriate utility plant or nonutility property account.

Note B: Taxes specifically applicable to construction shall be included in the cost of construction.

Note C: Gasoline and other sales taxes shall be charged as far as practicable to the same amount as the materials on which the tax is levied.

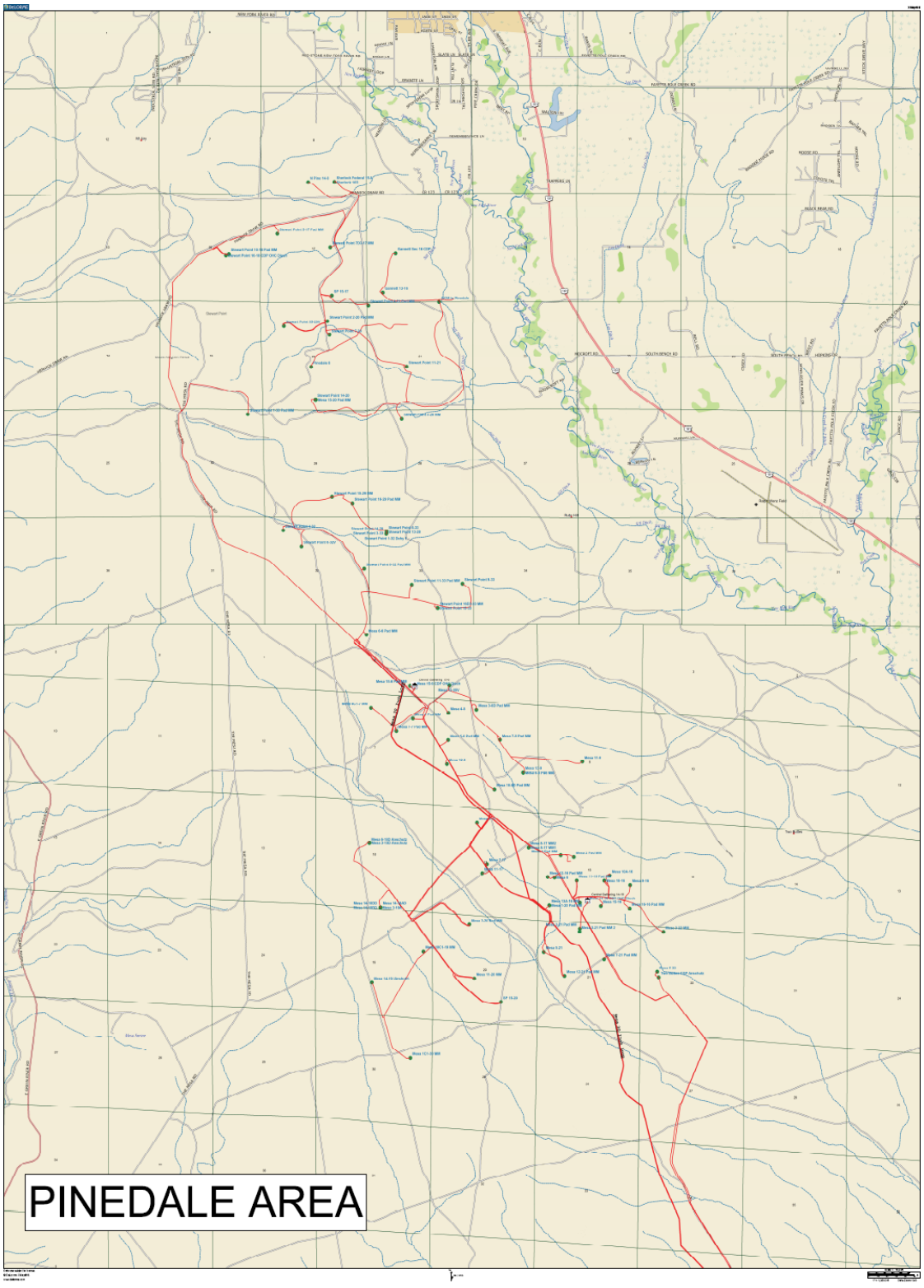
Note D: Social security and other forms of so-called payroll taxes shall be distributed to utility departments and to nonutility functions on a basis related to payroll. Amounts applicable to construction shall be charged to the appropriate plant accounts.

Note E: Interest on tax refunds or deficiencies shall not be included in these accounts but in account 419, Interest and Dividend Income, or 431, Other Interest Expense, as appropriate.

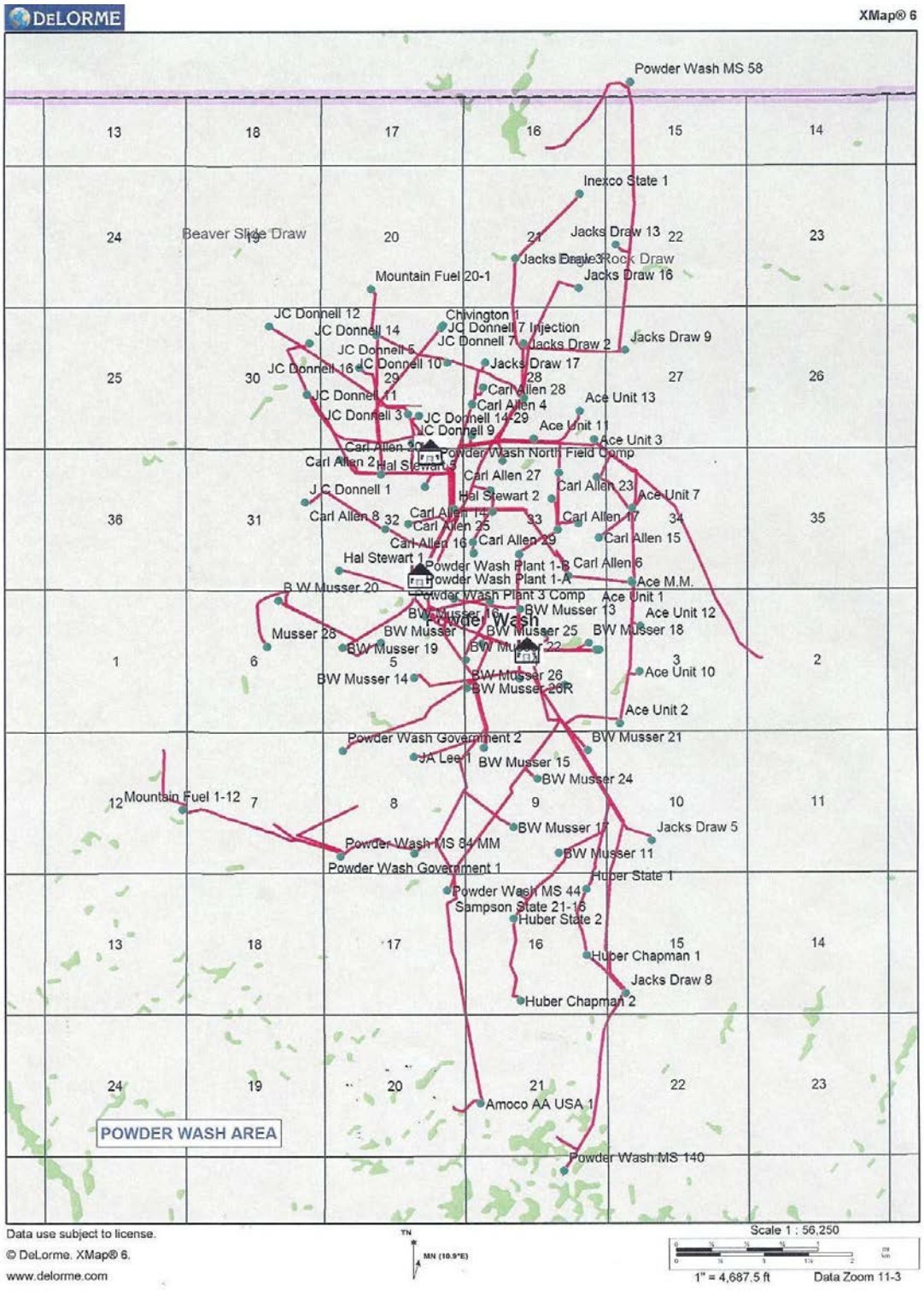
**408.1 Taxes other than income taxes, utility operating income**.

This account shall include those taxes other than income taxes which relate to utility operating income This account shall be maintained so as to allow ready identification of the various classes of taxes relating to Utility Operating Income (by department), Utility Plant Leased to Others and Other Utility Operating Income.

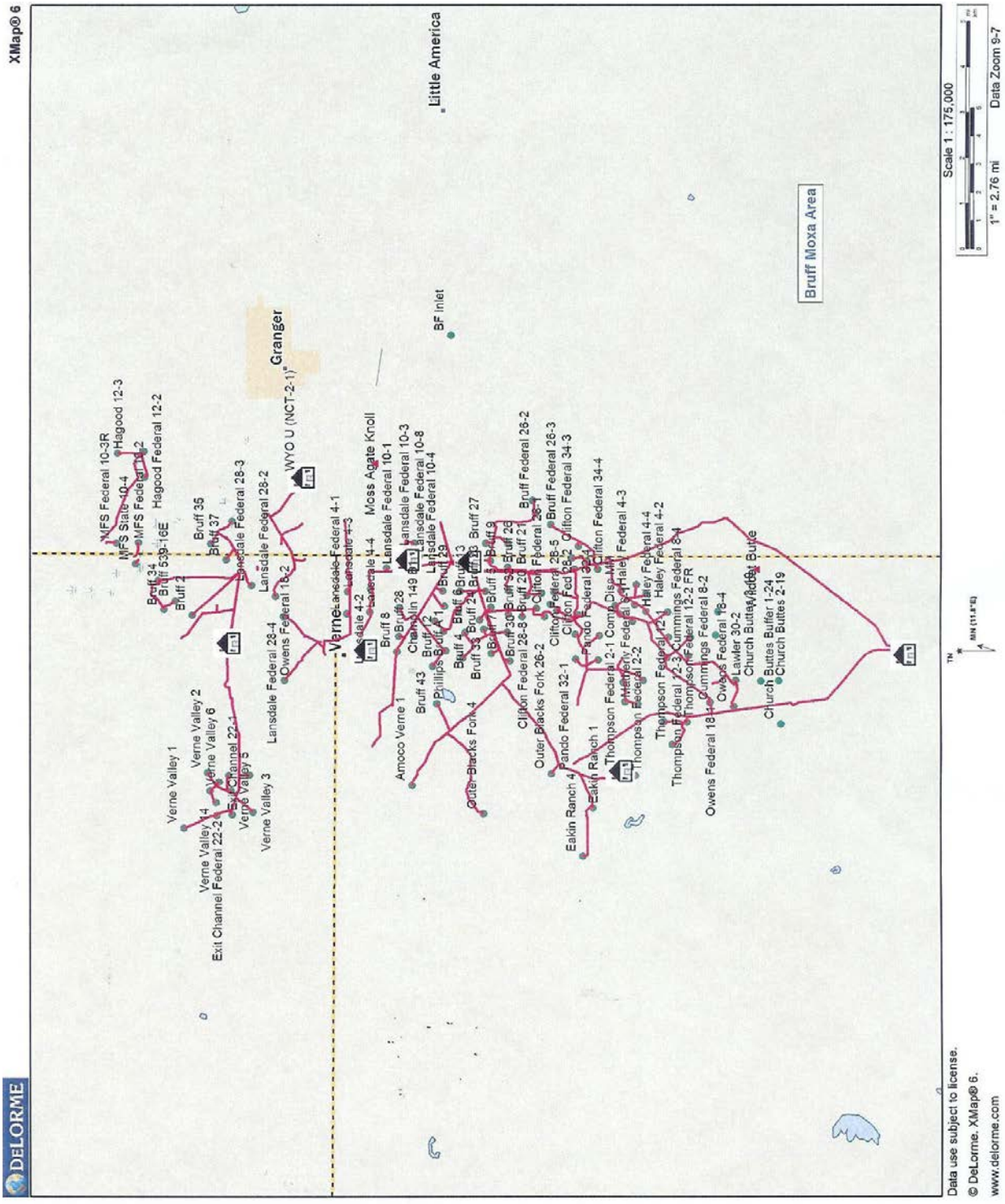
## 8.4 Pinedale Anticline Diagram



## 8.5 Powder Wash Diagram



## 8.6 Bruff Moxa Diagram



## 8.7 Hiawatha Area Diagram