

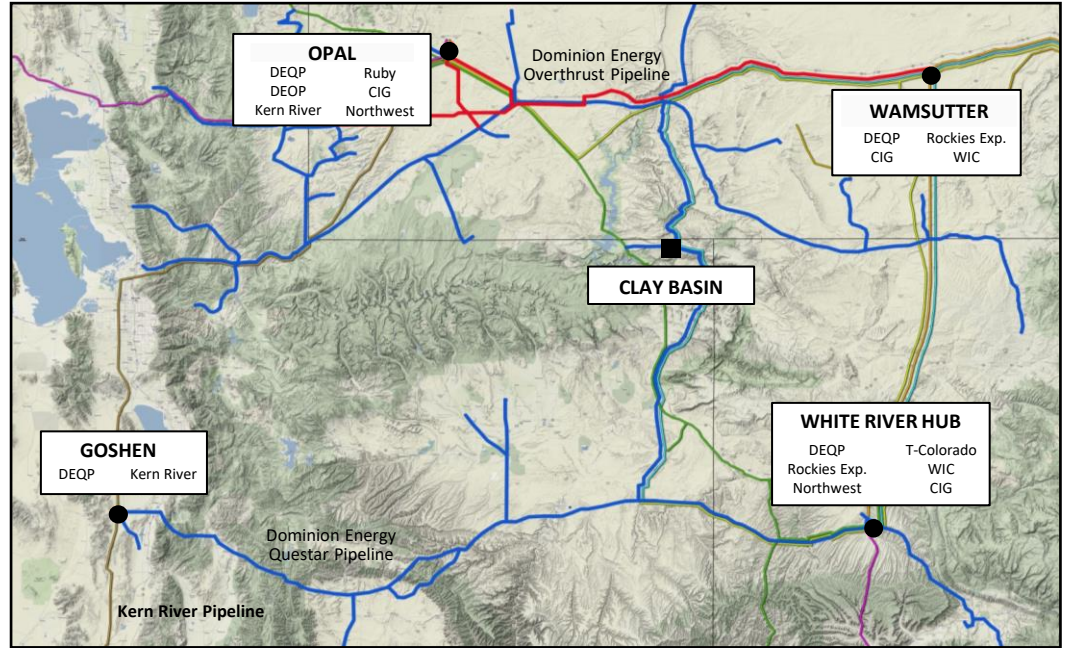
# Clay Basin Storage

The largest natural gas storage facility in the Rocky Mountain Region



# Clay Basin Storage

Regional Information	Description
Natural Gas Storage (BCF)	<ul style="list-style-type: none"> <li>• 54 Bcf working gas</li> <li>• 66.21 Bcf cushion gas</li> </ul>
Interconnect Capacity (Dth/d)	<p>Dominion Energy Questar Pipeline (DEQP)</p> <ul style="list-style-type: none"> <li>• Injection: 217,000</li> <li>• Withdrawal: 700,000</li> </ul> <p>Northwest Pipeline</p> <ul style="list-style-type: none"> <li>• Injection: 250,000</li> <li>• Withdrawal: 320,000</li> </ul> <p>* Numbers listed are meter sizing, and actual volumes depend on pipeline conditions</p>
Location	<ul style="list-style-type: none"> <li>• Daggett County, Utah</li> <li>• NE corner of Utah near Wyoming and Colorado borders</li> <li>• 50 miles from Rock Springs, Wyoming</li> </ul>



# Clay Basin Storage

## **Facilities:**

- 89,000 feet of 6 and 10 inch field lines
- 29 field dehydration units
- 44 injection and withdrawal wells

## **Compressors:**

- Five 2,600 HP reciprocating compressors
- Three 6,500 HP turbine compressors
- One 1,680 HP compressor (Park & Loan)

## **Services Opportunities:**

- Firm Storage
- Interruptible Storage
- Capacity Release
- Release of Injection/Withdrawal Rights
- In-place Transfers
- Park and Loan Service

# Clay Basin Storage: Injection

- The injection season starts approximately May 1 and ends October 31
- During the start of the injection season, the average injection volume is 300 MMcf
- Formula for injection allocation:
  - Injection Allocation =  $(X/Y) * Z$
  - X= Firm Shipper's annual working gas
  - Y = Sum of the annual working gas of all firm shippers
  - Z = Available injection capacity on any day



# Clay Basin Storage: Withdrawal

- The withdrawal season starts approximately November 1 and ends March 31
- During the start of the withdrawal season, the average withdrawal volume is 500 MMcf
- The actual withdrawal rate varies with the working gas volume and the takeaway pipeline pressures
  - $\text{Withdrawal Allocation} = [(A/B) * (C-D)] + E$
  - A = Firm Shipper's working gas remaining in storage
  - B = Total working gas remaining in storage for all shippers
  - C = Maximum possible reservoir deliverability
  - D = Sum of firm shipper's minimum required deliverability
  - E = Firm shipper's minimum required deliverability

# Clay Basin Storage: Firm Storage Rates

- Firm Storage Service (Rate Schedule FSS):
  - Reservation (Maximum)
    - Monthly Deliverability: \$2.85338
    - Monthly Capacity: \$0.02378
  - Usage Charges (Maximum)
    - Injection: \$0.01049
    - Withdrawal: \$0.01781
- Fuel is reimbursed in kind and calculated using Utility and Compressor/Dehydration calculations (refer to DEQP FERC Gas Tariff)
- Clay Basin Conditioning Reimbursement Factor (refer to DEQP FERC Gas Tariff & Appendix)
- Shippers arrange separately for transportation services to/from Clay Basin

# Clay Basin Storage: Cost Estimation Example

<u>Clay Basin Cost Estimation</u>			
Total Dth's:	1,000,000	Deliverability Rate:	\$2.853380
Withdrawal Days:	120	Capacity Rate:	\$0.023780
MRD (see below)	8,333	Injection Rate:	\$0.010490
Equivalent MCF	938,967	Withdrawal Rate:	\$0.017810
Deliverability Charges (MRD * Del Rate * 12 Months)		Effective one-part Rate: \$0.5990	
Capacity Charges (Total Dth's * Cap Rate * 12 months)		<p style="text-align: center;">Estimated Charges: \$598,998 Total does not include fuel</p>	
Injection Charges (Total Dth's * Inj Rate)			
Withdrawal Charges (Total Dth's * Withdrawal Rate)			
<p>MRD – Minimum Required Deliverability means the minimum withdrawal rate or quantity of gas that the shipper may withdraw on a firm basis each day up to and including the last day of the withdrawal period, subject to the shipper having working gas remaining in storage. It shall be determined by dividing the shipper's annual working gas by the product of 150 days and the decimal equivalent of an 80 percent load factor.</p>			

## Clay Basin Calculations(Estimates)

01/06/2018

Input data in the [blue boxes](#).

### Calculate Worksheet

#### Firm Injection Withdrawal Allocation Calculation

The injection and withdrawal definition can be found in [Part 2 Section 9.2 of Questar's Tariff](#).

$MRD = \text{Annual Working Gas} / 150 \text{ days} * .80 \text{ or } 120$

#### Annual Working Gas (dth)

Sum of Annual Working Gas volumes (dth)\*

\* excludes QPC's firm balancing account WG volumes

1,000,000	AWGV	Calculate
51,386,250		

#### Firm Injection Allocation = (X/Y)\*Z

X= Firm Shipper's annual working gas(dth)

1,000,000	X
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Y= Sum of Annual working gas of all firm shippers(dth)

54,581,250	Y
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Z= Available injection capacity(dth)

195,000	Z
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**Note:** Injection capacity can range anywhere from 250,000 dth/day to 360,000 dth/day.

Daily injection capacity can be found on QPC's web site under daily storage capacity.

Injection Allocation: 3,573 dth/day

#### Firm Withdrawal Allocation = [(A/B) \* (C-D)] + E

A = Individual FSS working gas remaining in storage(dth)

500,000
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B = Total working gas remaining in storage for all FSS(dth)

32,846,799	B
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Shippers

C = Maximum possible reservoir deliverability attributable to the sum of cushion and FSS shipper's working gas inventory(dth)

680,000	C
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D= Sum of FSS shippers minimum required deliverabilities (dth)

428,222	D
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E= FSS shipper's required minimum deliverability(dth)

8,333	E
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Firm Withdrawal Allocation: 12,166 dth/day

MRD: 8,333 dth/day

Minimum Required Deliverability , as defined in the tariff, is equal to :

The minimum withdrawal rate or quantity of gas that firm shipper may withdraw on a firm basis each day up to and including the last day of the withdrawal period, subject to shipper having working gas remaining in storage. It shall be determined by dividing shipper's annual working gas by the product of 150 days and the decimal equivalent of an 80% load factor. Thus:

**Disclaimer: Worksheet and calculations to be used solely for the purpose of estimating firm injection and withdrawal allocation capacities. Please contact QPC marketing and scheduling for actual numbers.**

For interruptible withdrawal amount, please refer to the [tariff Part 3 Section 10.2 b](#).

## Calculation Example for:

- MRD
- Injection
- Withdrawal

Injection Allocation: 3,573 dth/day

Firm Withdrawal Allocation: 12,166 dth/day

MRD: 8,333 dth/day



# Clay Basin Storage: Interruptible Rates

- Interruptible Storage Service (Rate Schedule ISS)
- Usage Charge: (Maximum)
  - Inventory: \$0.05927  
*Applied to the average monthly working gas balance*
  - Injection: \$0.01049
  - Withdrawal: \$0.01781
- Fuel is reimbursed in kind and calculated using Utility and Compressor/Dehydration calculations (refer to DEQP FERC Gas Tariff)
- Clay Basin Conditioning Reimbursement Factor (refer to DEQP FERC Gas Tariff & Appendix)
- Shippers arrange separately for transportation services to/from Clay Basin

# **Stipulation Agreement: Background Information**

## **Issue:**

- Under Part 3 of the DEQP FERC Gas Tariff, Clay Basin set CHDP limits at a CHDP equal or less than 35-degrees Fahrenheit.
- Other downstream pipelines, including pipelines that interconnect with Clay Basin storage facilities, operate with a Tariff CHDP specification of 15-degrees Fahrenheit which is below Clay Basin's specification. This impacted Clay Basin's ability to deliver gas to downstream pipelines at their CHDP specifications.

## **Negotiated Solution:**

- DEQP and its customers reached an agreement and DEQP filed Tariff provisions in August 2007 specifying a reimbursement methodology for gas conditioning services at DEQP's Clay Basin reservoir.
- Under this agreement, DEQP recovers the cost of providing gas conditioning service first from the sale of liquids recovered during the gas conditioning process and second from the sale of natural gas provided by customers.
- On November 7, 2007 the FERC approved the Stipulation and revisions to DEQP's Tariff went into effect January 1, 2008.

# Stipulation Agreement: Cost of Service

## **Liquids Revenue & Conditioning:**

- According to DEQP's FERC Gas Tariff Section 16.4(a), for each twelve month period ending April 30<sup>th</sup>, DEQP retains all revenues from the sale of liquids obtained in the conditioning process up to the cost of service amount listed in the tariff. Revenue received from the sale of liquids is posted monthly on DEQP's website.

## **When Liquid Revenue is forecast to be below the required annual cost of service amount, DEQP collects a Conditioning Reimbursement Factor:**

- DEQP calculates and posts the factor by March 31<sup>st</sup> of each year.
- The Conditioning Reimbursement Factor is a percentage of injections and withdrawals that is collected monthly as part of fuel. The gas is valued at the first of the month index and is posted monthly on DEQP's website.
- Calculation of the Conditioning Reimbursement Factor is defined in tariff section 16.4(b).

# **Stipulation Agreement: Annual Reimbursement Adjustment**

- For the 12 months ending April 30 of each year, the revenue from the sale of liquids obtained in the gas conditioning process is added to the value of the gas collected from the Conditioning Reimbursement Factor to determine the total revenue collected under the stipulation
- Any excess revenue is returned to customers and any shortage is obtained from customers in July of each year. This Annual Reimbursement Adjustment is defined in DEQP's tariff sections 16.3(b) and 16.4(c).
- The Annual reconciliation is normally done in the form of a gas transferred to or from the customers Clay Basin storage account in July of each year. The gas is valued at the July 1 index for that year. Under section 16.3(b)(iii) the customer and DEQP can negotiate a settlement payment by one party to the other in lieu of a transfer in kind.

# Contact Information:

**Please Contact Your Marketing or BD Rep for Assistance**

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