



**Diane Roy**  
Vice President, Regulatory Affairs

**Gas Regulatory Affairs Correspondence**  
Email: [gas.regulatory.affairs@fortisbc.com](mailto:gas.regulatory.affairs@fortisbc.com)

**Electric Regulatory Affairs Correspondence**  
Email: [electricity.regulatory.affairs@fortisbc.com](mailto:electricity.regulatory.affairs@fortisbc.com)

**FortisBC**  
16705 Fraser Highway  
Surrey, B.C. V4N 0E8  
Tel: (604) 576-7349  
Cell: (604) 908-2790  
Fax: (604) 576-7074  
Email: [diane.roy@fortisbc.com](mailto:diane.roy@fortisbc.com)  
[www.fortisbc.com](http://www.fortisbc.com)

June 9, 2017

Cascadia Energy Ltd.  
Suite 2 – 720 Beatty Street  
Vancouver, B.C.  
V6B 2M1

Attention: Mr. Nick Caumanns, President

Dear Mr. Caumanns:

**Re: FortisBC Energy Inc. (FEI)**  
**Project No. 3698899**  
**2016 Rate Design Application (the Application)**  
**Response to Cascadia Energy Ltd. (Cascadia) Information Request (IR) No. 1**

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On December 19, 2017, FEI filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-30-17 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to Cascadia IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

**FORTISBC ENERGY INC.**

***Original signed:***

Diane Roy

Attachments

cc (email only): Commission Secretary  
Registered Parties

|   |                                  |
|---|----------------------------------|
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**Question 1**

**Page 10-14**

**14 In part due to the above described balancing provisions, the amount of inventory held on FEI's**

**15 System can vary.**

a. Please describe whether this inventory is physical or virtual.

**Response:**

Pipeline line-pack is physical. FEI manages system supply and demand imbalances in total, taking into account line-pack, Operational Balancing Agreements (OBA), storage injections or withdrawals or gas sold in the market. Inventories held on FEI's system on behalf of transportation customers are virtual and represent an accounting of the daily and cumulative imbalance between supply and demand.

14  
15

b. What is theoretically the maximum amount of inventory that the system can hold?

16  
17  
18

**Response:**

The following table shows the maximum theoretical line-pack of FEI's three main transmission systems (Coastal, Interior and Vancouver Island):

19  
20  
21

| Region                               | Theoretical Maximum Line-pack (in 10 <sup>3</sup> m <sup>3</sup> ) |
|--------------------------------------|--|
| Coastal Transmission System          | 4748   |
| Interior Transmission System         | 14789  |
| Vancouver Island Transmission System | 6434   |

22

Note that "theoretical maximum" represents inventory levels in static systems with zero demand, and is therefore practically unachievable and unsustainable. As a comparison, the next table lists the highest historical line-pack inventory seen in the same three systems in the past five years.

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| Region                               | Highest Line-pack recorded<br>from 2012-2017 (in 103m3) |
|--------------------------------------|---|
| Coastal Transmission System          | 4523  |
| Interior Transmission System         | 13539   |
| Vancouver Island Transmission System | 5969  |

1

2 It is important to understand that the Interior system is subdivided into different pipeline sections  
3 that do not necessarily share common inventory due to location and/or difference in pipeline  
4 operating pressure. An example would be the Southern Crossing Pipeline (SCP). The line-pack  
5 inventory held in the rest of the Interior system cannot be transferred to the SCP due to the  
6 latter's higher operating pressure. The numbers provided above are regional totals and do not  
7 take into account these pipeline differences.

8 It is also important to differentiate that the numbers provided above represent highest total line-  
9 pack inventory, and not usable line-pack inventory. Usable line-pack is dynamically determined  
10 on a continuous basis and therefore not tracked, and is dependent on a variety of factors such  
11 as weather conditions, system demand, pipeline operational requirements, and the operational  
12 state of interconnecting pipelines.

13

14

15

16 c. What is the minimum volume obligation FortisBC has to return inventory to  
17 customers on any given day?

18

19 **Response:**

20 FEI is not obligated to provide a minimum volume of imbalance return. Imbalance return is an  
21 interruptible service for which FEI reserves the right to reduce or eliminate this service. FEI  
22 typically reduces or eliminates this service when colder weather occurs.

23 Historically, FEI has set imbalance returns to 40,000 GJ at each of the Lower Mainland and the  
24 Interior locations. With the amalgamation of the gas utilities in January 2015, transportation  
25 customers on Vancouver Island were pooled with existing groups in the Lower Mainland. If  
26 Shipper Agents choose to pool their Vancouver Island customers in a daily Lower Mainland  
27 group, then this service will be available to Vancouver Island customers as well.

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- d. What is the approximate range of physical “line-pack”, in its conventionally understood meaning and stated in energy units of GJ’s, that the FortisBC system has?

**Response:**

Measurement data for the period November 1, 2012 to May 15, 2017 illustrates the line-pack operating range for each of the regions within the FEI system as follows (Minimum / Maximum / Average measurement expressed in GJ):

1. Vancouver Island Transmission System – 133,500 / 237,300 / 201,900

2. Coastal Transmission System – 134,500 / 182,600 / 165,900

3. Interior Transmission System – 288,700 / 552,300 / 400,600

The Interior system above is comprised of three segments including Savona to Oliver, Oliver to East Kootenay Exchange (EKE), and the Southern Crossing Pipeline (SCP).

The line-pack for each of the systems above will vary based on operational conditions and subject to changes in firm core load and system balancing requirements, third-party regional pipeline capacity and maintenance driven constraints, and FEI system capacity and maintenance driven procedures.

The line-pack is required to meet operational pressure parameters and a directional flow of gas. Usable line-pack, or actual volume of gas that can be used as a supplement to system demand balancing, varies and is typically less than the overall available system line-pack.

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1    **Question 2**

2    **Page 10-14**

3            **28 As seen in Figure 10-5 below, gas supply frequently deviates from demand by**  
4            **as much as**

5            **29 50,000 GJ/day once the day comes to a close.**

6            a.        Given that Fortis allows up to 40,000 of inventory return is 50,000 GJ of “under-  
7                      supply” causing a 10,000 GJ variance onerous over the total load?

8  
9    **Response:**

10 Imbalance return is a service which FEI provides to Shipper Agents in order for them to access  
11 their banked supplies on the system. This service provides a benefit to Shipper Agents as the  
12 gas from imbalance returns is added to their physical supply brought onto the system, which  
13 can help to reduce the potential for balancing charges.

14 When transportation customers oversupply or request imbalance return service to draft the  
15 system, FEI uses midstream resources, including upstream and downstream storage,  
16 Westcoast OBA, or the buying and/or selling of gas on the day, in order to provide either of  
17 these services.

18 While FEI has historically allowed the withdrawal of banked inventory using imbalance return to  
19 a maximum of 40,000 GJ, the actual amount used on the day is typically less.

20 Regardless of the cause of the variance, a swing of 50 TJ on a given day is significant and  
21 requires FEI to bring the system back into balance.

22  
23

24  
25            b.        What is the maximum amount of over supply?

26  
27    **Response:**

28 The maximum amount of oversupply that the FEI system can absorb on a daily basis is different  
29 between the three major regional load centers, the Coastal Transmission System (CTS) that  
30 serves the Lower Mainland, the Vancouver Island Transmission System that serves Vancouver  
31 Island (VI System) and the Interior Transmission System (ITS) that serves the B.C. Interior.

32 Based on historical data, the CTS has an approximate maximum usable line-pack space of  
33 46,000 GJ that can potentially be used to absorb oversupply. Similarly, the approximate  
34 maximum usable line-pack space on the VI System is 75,000 GJ, while the ITS has 247,000 GJ  
35 for that purpose.

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3

4 c. When do under-supply situations occur in terms of peak or non-peak days?

5

6 **Response:**

7 On normal, non-peak days throughout the year, both over and undersupply situations can occur.

8 On peak days, Shipper Agents tend to oversupply to avoid charges. However, there is no

9 guarantee of an oversupply on peak days. FEI has observed that some Shipper Agents have

10 undersupplied on peak day occasions and incurred charges.

11

12

13

14 d. When do over-supply situations occur in terms of peak and non-peak days?

15

16 **Response:**

17 Please refer to the response to Cascadia-FEI IR 1.2c.

18

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1 **Question 3**

2 **Page 10-14**

3 **30 .... These imbalances require FEI to use**

4 **31 midstream resources to withdraw or inject quantities of gas, often on an**  
5 **intraday basis, to**

6 **32 balance the entire System.**

- 7 a. What is the coincidence of the use of these resources by FortisBC for core  
8 market and transport customer use? In other words, are these resources used  
9 coincidentally for the two different customer groups or are they used specifically  
10 for transport customer group?

11  
12 **Response:**

13 When system imbalances occur either from sales or transportation customers, FEI responds in  
14 a timely manner to balance the system. FEI manages and balances the system as a unified  
15 whole.

16  
17

- 18  
19 b. What are the actual costs incurred in the use of the resources in each of the last  
20 three gas years?

21  
22 **Response:**

23 The annual cost of the transportation and storage resources included in FEI's midstream  
24 portfolio is approximately \$170 million. The following table provides 2015 and 2016 actual and  
25 2017 forecast costs incurred for firm transportation and storage services. The costs do not  
26 include mitigation or commodity-related charges.

|  | <u>2015A</u> | <u>2016A</u> | <u>2017F</u> |
|--|--------------|--------------|--------------|
| <b>Storage &amp; Transportation Costs</b><br><b>(CAD\$ Million per Year)</b> | 160          | 168          | 170          |

27  
28  
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- 30  
31 c. What is the incremental costs caused by the transportation customer groups for  
32 the use of these resources in each of the last three years?

33

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1 **Response:**

2 Midstream resources mostly include third party transportation and storage. These resources are  
3 held on behalf of Rate Schedule 1 to 7 customers. Transportation customers do not pay for  
4 these resources.

5 Black & Veatch used a replacement cost methodology which assessed the average cost of  
6 securing balancing resources per GJ under various balancing tolerances.. Please refer to  
7 Appendix 10-1 in the Application.

8



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1    **Question 4**

2    **Page 10-15**

3            ***18...Under normal***

4            ***19 circumstances, FEI requests that shipper agents holding both daily and***  
5            ***monthly balanced***

6            ***20 groups keep to a 2 to 3 day pack/draft balancing inventory level, which FEI has***  
7            ***deemed to be***

8            ***1 reasonable to manage the System as a whole.***

9            a.        Why has FortisBC “deemed” this as a reasonable amount?

10

11    **Response:**

12    FEI adopted the 2 to 3 day guideline in order to limit excessive drafting or packing. As stated on  
13    page 10-16 of the Application, the 2 to 3 day guideline is based on the average consumption of  
14    the daily and monthly balanced groups divided by the total inventory held.

15

16

17

18            b.        When was the 2-3 day amount determined as reasonable?

19

20    **Response:**

21    FEI is unable to pinpoint specifically when this guideline was developed. The guideline has been  
22    in place for a number of years and Shipper Agents have generally not questioned the need or  
23    rationale for this balancing requirement.

24

25

26

27            c.        For inventories larger than 2-3 days, where is the inventory held?

28

29    **Response:**

30    Please refer to the response to Cascadia-FEI IR 1.1a.

31

32

33

34            d.        For all inventories held, what is the risk to FortisBC for holding those inventories?

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1

2 **Response:**

3 The risk of holding these inventories is that FEI must return this gas on a later date, and may  
4 incur the use of midstream resources to do so. As indicated in the Application, FEI currently  
5 does not recover costs from transportation customers when midstream resources are used for  
6 this purpose.

7

8

9

10 e. For all inventories held, what is the cost to FortisBC for holding those  
11 inventories?

12

13 **Response:**

14 For managing inventories on FEI system, FEI may rely on its OBA with Westcoast, sell or  
15 purchase day gas, or inject into/withdraw from gas storage. In the Application, FEI quantified the  
16 variable costs involved in moving gas in and out of storage (see Table 10-9 on page 10-37). The  
17 total annual cost of FEI's midstream portfolio to hold storage and transportation resources under  
18 the Annual Contracting Plan is included in the response to Cascadia-FEI IR 1.3b.

19

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1    **Question 5**

2    **Page 10-16**

3            ***22...These provisions include the ability for FEI***

4            ***23 to limit or reduce inventory, to modify the shipper agent's requested quantities***  
5            ***to limit or adjust***

6            ***1 its inventory accumulation, and to limit or remove a shipper agent's excess***  
7            ***inventory and return***

8            ***2 it at a later date.***

9            a.        Given the complete control FortisBC has over the timing and amount of inventory  
10            return, why are additional restrictions needed?

11  
12    **Response:**

13    The tools within the tariffs are in place for FEI to help manage specific Shipper Agents on both a  
14    group and individual basis as necessary.

15    FEI is proposing amendments to existing balancing tolerances. FEI observes that some Shipper  
16    Agents manage their customer portfolio differently than others under the existing balancing  
17    provisions. Given this, and the reasons explained in the Application, the proposed changes of  
18    tightening the existing balancing provisions and establishing exclusive daily balancing will place  
19    all transportation customers under the same set of rules and achieve an equal playing field for  
20    all.

21  
22

23  
24            b.        What control does FortisBC not have under the present rules and structures that  
25            the proposed changes will provide?

26  
27    **Response:**

28    FEI is unable to predict or control the behavior of Shipper Agents. However, the proposed  
29    changes provide incentives for Shipper Agents to manage their gas supply more closely and  
30    tightly.

31

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1    **Question 6**

2    **Page 10-18**

3            ***21 Balancing Tolerance: There are no daily balancing requirements applicable to***  
4            ***monthly 22 balanced customers whereas daily balanced transportation customers***  
5            ***are held to a 20%***  
6            ***23 tolerance level.***

7            a.        Are there any times when this is not true, such as during supply restrictions?

8

9    **Response:**

10    Yes, during a supply restriction all transportation customers including both daily and monthly  
11    balanced customers must adhere to a 5 percent balancing tolerance.

12

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1    **Question 7**

2    **Page 10-19**

3            **7    10.4.1 Balancing Provisions**

4            **8    Monthly balanced customers do not incur the same charges that daily**  
5            **balanced customers are**

6            **9    subject to, which does not accord with Principle 3 or Principle 8. Monthly**  
7            **balanced customers**

8            **10 can incur significant daily imbalances, with no charges or tolerance limits.**

9            a.     Please confirm that the transportation contract is between FortisBC and the  
10            individual transportation service customer.

11

12    **Response:**

13    The Transportation Agreement is between FEI and the individual transportation service  
14    customer; however, as part of the transportation agreement the customer appoints a Shipper  
15    Agent to act as their agent for all matters relating to gas supply and transportation service on  
16    the FEI system.

17

18

19

20            b.     Please describe, generally, the differences between small volume transport  
21            customers accessing rates 23, 25, 27 and large volume customers using rate 22,  
22            in terms of resources, gas market sophistication, awareness of daily loads and  
23            other relevant factors.

24

25    **Response:**

26    Customers served under Rate Schedules 23, 25, and 27 essentially have access to the same  
27    data that is available to RS 22 customers. Both current and historical daily consumption data is  
28    available to all of these customers through their account online, and daily consumption is also  
29    included on their monthly invoices. The gas market sophistication of individual customers  
30    varies; however, the Shipper Agent's role is to manage gas purchases and transportation  
31    service on the FEI system on behalf of their customers on a pooled basis. Forecasting loads  
32    based upon weather forecasts or requesting load forecasts from customers with process loads  
33    is part of that role. Today, when the customer appoints their Shipper Agent, they acknowledge  
34    that, if they are included in a group that has an RS 22 customer that the group as a whole will  
35    be subject to the group nominations and daily balancing of RS 22.

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- c. Please describe the potential impact of a Rate 23, 25, or 27 customer in terms of daily imbalance on the operations of the utility ?

**Response:**

FEI observes that, today, many Shipper Agents pool monthly balanced customers under Rate Schedules 23, 25, and 27 with a RS 22 customer. By doing this, the group as a whole must adhere to daily balancing provisions and rules, including the 20 percent tolerance.

FEI recognizes that exclusive daily balancing provisions may incent Shipper Agents to over-deliver in order to avoid potential charges. If the proposed changes are implemented, FEI will continue to monitor and work with Shipper Agents to ensure that imbalances are maintained within the 2 to 3 day limit to minimize the impact on the utility.

- d. What effect does limiting small volume customers to daily balancing match Principle 5, Principle 4, Principle 3?

**Response:**

FEI has interpreted “small volume customers” to be those under RS 23.

The proposed changes in this Application aim to make customers of all sizes pay for their fair share of the costs (Principle 2), and provide the price signals to incent the proper behavior of balancing more tightly (Principle 3). Leveling the playing field by requiring all customers to be daily balanced aligns with Principle 5. Regarding customer understanding and acceptance (Principle 4), FEI expects that over time all customers will learn and understand the changes in the model. Shipper Agents can, and should, also assist in achieving improved understanding of the new rules by direct communication with their customers.

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1    **Question 8**

2    **Page 10-18**

3            ***24 FEI understands that customers are capable of balancing to a tighter tolerance***  
4            ***level and***

5            ***25 that numerous other jurisdictions require tighter tolerance levels.***

6            a.     Please provide support for your statement of tighter tolerances in other  
7                        jurisdictions?

8  
9    **Response:**

10   Please refer to the jurisdictional research and comparison in Appendix 10-1, Black & Veatch  
11   Transportation Service Model Review.

12  
13

14  
15            b.     Please provide a listing of other jurisdictions and their balancing provisions  
16                        delineated by customers size and class.

17  
18   **Response:**

19   Please refer to the jurisdictional research and comparison in Appendix 10-1, Black & Veatch  
20   Transportation Service Model Review.

21  
22

23  
24            c.     Why does FortisBC believe that the precedent in “other jurisdictions” make a  
25                        relevant template for, or justify how, balancing tolerances or provisions should be  
26                        set in British Columbia?

27  
28   **Response:**

29   It is reasonable and relevant to look at the business models adopted by LDCs in other  
30   jurisdictions in order to gain knowledge of the operating rules used by other utilities, and to  
31   understand which practices are common or typical in the industry.

32   The industry as a whole has changed since the inception of FEI’s transportation model in the  
33   early 1990s. The marketplace for trading and nominating gas has matured over time, which has  
34   led the industry to balance pipeline systems on a daily basis, among other changes.

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2 FEI has sought feedback and input from industry in the stakeholders' workshops held in 2016  
3 for this rate design application. In addition to the jurisdictional data, FEI considered the  
4 analytical work and consultation from Black & Veatch. All of the above, combined with the  
5 history and experience of FEI staff themselves, have together formed the basis for the proposed  
6 changes in this Application.

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1    **Question 9**

2    **Page 10-19**

3            *In addition to tightening the tolerance to 10%, FEI is proposing to amend the*  
4            *31 balancing charges to provide an incentive to encourage more efficient use and*  
5            *discourage*  
6            *32 inefficient use of the FEI System resources, in accordance with Principle 3. As*  
7            *discussed*  
8            *33 below, FEI is proposing a tiered charge whereby charges increase as tolerance*  
9            *ranges are*  
10           *34 exceeded, which achieves Principle 5.*  
11           *And*

12   **Page 10-25**

13           *10.6.2.3 Balancing Option 3 – Daily Balancing*  
14           *20 The third option would be to remove the monthly balancing provisions entirely*  
15           *and move all*  
16           *21 transportation customers to daily balancing. Based on the principle of*  
17           *fairness, this option*  
18           *22 would treat all customers and shipper equally.*

19  
20           a.        Please detail which resources are being used inefficiently?

21  
22   **Response:**

23   FEI uses midstream resources contracted on behalf of sales customers to balance the system  
24   as a whole, including imbalances arising from transportation customers. In doing so,  
25   transportation customers receive the benefits from these midstream resources which are paid  
26   for by sales customers; however, transportation customers do not pay a midstream charge.  
27   Given this, the midstream resources are being used inefficiently, since there is insufficient  
28   incentive for transportation customers not to rely on these midstream resources and no cost  
29   recoveries are collected and applied back to the midstream to compensate sales customers.

30  
31

32  
33           b.        What is the expected cost savings of this change?  
34

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1 **Response:**

2 Please refer to the response to CEC-FEI IR 1.56.1.

3

4

5

6 c. Please describe how application of the same balancing provisions for small  
7 unsophisticated transport customers and large volume more sophisticated  
8 customers accords to Principle 8, where the basic fairness test is equal and  
9 reasonable access to a similar type of service (transportation service)?

10

11 **Response:**

12 All transportation customers have equal and reasonable access to transportation service, and,  
13 under FEI's rate design proposals, would be subject to the same balancing rules, which would  
14 enhance interclass equity. Transportation customers with both small and large volumes receive  
15 benefits from pooling and the experience of Shipper Agents to best manage customers' supply  
16 and demand. It is the role of the Shipper Agent to help manage the gas supply needs of  
17 transportation customers, regardless of their size, market understanding or sophistication.

18

19

20

21 d. How would an individual Rate 23 transportation customer deal with daily  
22 balancing and a 10% tolerance?

23

24 **Response:**

25 It is the responsibility of the Shipper Agent representing its customers to discuss and deal with  
26 the proposed changes. The role of the Shipper Agent is to manage the customer's business  
27 and manage to the Tariff as part of the transportation service model. Today, some Shipper  
28 Agents have already chosen to pool RS 23 customers in daily balanced groups.

29

|   |                                  |
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1   **Question 10**

2       Preamble:

3       All customers in the FortisBC service area are captive to FortisBC. In dealing with core  
4       market customers, FortisBC has access to core market resources, including information  
5       resources, to manage load swings. Some of these resources are captured by mid-  
6       stream charges, however some are part of costs paid for by all customers who pay  
7       transport charges. These resources are excluded from access by transportation  
8       customers.

9       For example, FortisBC has real-time access to system flows for all of it's customers.  
10      Transport customers do not have access to their own flow information which could  
11      potentially help them manage peak-day and other constrained events.

12      **Page 10-24**

13      ***The combination of improved technology and increased nomination cycles has***  
14      ***resulted in***

15      ***2   greater ability for market participants to match supply and demand more***  
16      ***closely on a daily***

17      ***3   basis. The examples provided here show that shipper agents with both large***  
18      ***and small***

19      ***4   customer groups are able to manage and balance within a tighter tolerance.***  
20      ***FEI's upstream***

21      ***5   and downstream pipelines have operational requirements to balance daily and,***  
22      ***as such,***

23      ***6   balancing transportation service daily would align better operationally.***

24      ***7   Transportation customers have access to tools to amend gas requirements on***  
25      ***the day to reflect***

26      ***8   changes in load.***

27      a.     Please describe the changes in technology over the past 5 years that give  
28             customers better ability to understand "changes in load".  
29

30      **Response:**

31      Please refer to the response to BCUC-FEI IR 1.56.1.

32

33

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- 1           b.       How has FortisBC transportation volumes reporting (i.e. burn reports) changed  
2                   over the last 5 years? 10 years?

3  
4    **Response:**

5    Please refer to the response to BCUC-FEI IR 1.56.1.  
6  
7

- 8  
9           c.       What changes has FortisBC proposed to match increased load information with  
10                  the proposed tighter tolerances?

11  
12   **Response:**

13   FEI is not proposing any changes to the load information made available in WINS or SCADA.  
14   Please refer to the responses to Absolute-FEI IR 1.1 and BCUC-FEI IR 1.56.1.  
15  
16

- 17  
18          d.       In proposing to tighten tolerances, how will Fortis increase the timeliness of the  
19                  flow information provided customers?

20  
21   **Response:**

22   Please refer to the response to Cascadia-FEI IR 1.10c.  
23  
24

- 25  
26          e.       In proposing to tighten tolerances, how will Fortis increase the accuracy of the  
27                  flow information provided customers?

28  
29   **Response:**

30   Please refer to the response to Cascadia-FEI IR 1.10c.  
31  
32

- 33  
34          f.       In proposing to tighten tolerances, can Fortis provide SCADA data for all  
35                  customers subject to those new tight tolerances?

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1

2 **Response:**

3 Real-time SCADA data is currently only available for large gas users, namely RS 22 customers  
4 that are primarily served off the transmission pressure system. Gas Control has no need to  
5 have SCADA data at all customer sites as many are too small individually, and are mostly  
6 served off of the distribution system. FEI does not intend to offer SCADA for all customers on  
7 the system.

8

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1    **Question 11**

2    **Page 10-25**

3            ***FEI is held to daily balancing at the major interconnecting points at the Lower***  
4            ***Mainland***

5            ***33 and Interior, and in the interest of fairness, FEI proposes that daily balancing***  
6            ***provisions apply***

7            ***34 equally across all regions.***

8            a.        Please explain why this is a relevant argument in favour of similar rules for  
9                      FortisBC transport customers?

10

11    **Response:**

12    FEI has made numerous points as to the benefits and justification to move to exclusive daily  
13    balancing, one of which is that FEI is held to daily balancing at its interconnects with upstream  
14    pipelines. The fact that FEI is held to daily balancing is consistent with the conclusion that the  
15    general industry practice is daily balancing. It also shows that, to the extent that transportation  
16    customers do not balance daily, FEI is correcting for those imbalances as part of balancing the  
17    system on a daily basis. It is reasonable that transportation customers, who represent  
18    approximately 40% of the annual throughput, should be held to the same standard as FEI.

19

20

21

22            b.        Does FortisBC postulate that typical transport customers have similar resources  
23                      and access to the market that FortisBC does?

24

25    **Response:**

26    No. FEI expects Shipper Agents to have the resources and tools in place to manage the needs  
27    of their customers. FEI is not aware of the commercial arrangements that each Shipper Agent  
28    has made on behalf of its customers.

29

30

31

32

33            c.        Does the 'principle of fairness' apply between the utility and its customers?

34

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1    **Response:**

2    The reference to the “interest of fairness” in the question preamble above reflects that it is fair to  
3    have daily balancing provisions apply equally to all transportation customers across all regions  
4    as described in section 10.6.3 of the Application.

5  
6

7

8           d.     If yes to c, should FortisBC only be allowed access to its own flow data two days  
9                 after the fact and that data be based on unverified estimates as a matter of  
10                “fairness”?

11

12   **Response:**

13   With respect to how FEI forecasts load requirements for sales customers, please refer to the  
14   response to BCUC-FEI IR 1.56.1.

15

|   |                                  |
|---|----------------------------------|
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1    **Question 12**

2    **Page 10-28**

3            ***Table 10-5 & 10-6***

- 4            a.      Please provide the relevant dates and amount and type of reduction for the time  
5                      period indicated.

6  
7    **Response:**

8    Table 10-5 provided the number of days that imbalance return was either reduced or eliminated  
9    during the period from 2008 to 2015. Attachment 12a provides the dates, type and amount of  
10   the imbalance return reduced or eliminated for the corresponding days in Table 10-5 of the  
11   Application.

12

13

14

- 15            b.      Please update the table to include the most recent winter.

16

17    **Response:**

18    Tables 10-5 and 10-6 have been updated below to include the 2016/17 winter.



**Table 10-5 (Updated): Days of Reduction or Elimination of Imbalance Return by Location**

| YEAR                                  | Interior   |            | Lower Mainland |            |
|---------------------------------------|------------|------------|----------------|------------|
|                                       | Reduced    | Eliminated | Reduced        | Eliminated |
| 2008                                  | 76         | 50         | 76             | 50         |
| 2009                                  | 16         | 12         | 17             | 12         |
| 2010                                  | 2          | 20         | 2              | 20         |
| 2011                                  | 7          | 20         | 7              | 20         |
| 2012                                  | 0          | 17         | 0              | 16         |
| 2013                                  | 18         | 15         | 18             | 15         |
| 2014                                  | 12         | 27         | 12             | 27         |
| 2015                                  | 0          | 17         | 0              | 27         |
| 2016                                  | 17         | 32         | 17             | 32         |
| 2017                                  | 12         | 27         | 12             | 27         |
| <b>Total</b>                          | <b>160</b> | <b>237</b> | <b>161</b>     | <b>246</b> |
| <b>Total Reduced &amp; Eliminated</b> | <b>397</b> |            | <b>407</b>     |            |

**Table 10-6 (Updated): Days of Supply Curtailment by Region**

| YEAR                     | Interior  | Lower Mainland |
|--------------------------|-----------|----------------|
| 2008                     | 9         | 9              |
| 2009                     | 0         | 0              |
| 2010                     | 3         | 3              |
| 2011                     | 2         | 2              |
| 2012                     | 3         | 3              |
| 2013                     | 4         | 4              |
| 2014                     | 11        | 11             |
| 2015                     | 0         | 0              |
| 2016                     | 7         | 7              |
| 2017                     | 12        | 12             |
| <b>Total Curtailment</b> | <b>51</b> | <b>51</b>      |

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c. Please explain the difference between Table 10-5 and Table 10-6 on page 10-30.

**Response:**

Table 10-5 provides the number of days that imbalance return was reduced or eliminated in the past.

Table 10-6 provides the number of days for which FEI issued supply restrictions. Typically, when a supply restriction is in effect, imbalance return has already been eliminated and all customers during the restricted time period must balance daily and adhere to a 5 percent balancing tolerance. If under-deliveries occur, customers may be subject to unauthorized over-run charges.

d. Please detail the dates to which imbalance return, or any other restrictions applied to Rate 7 or Rate 14 customers during the date ranges shown in the tables.

**Response:**

Imbalance return or supply restrictions do not apply to RS 7 customers on the days provided in Tables 10-5 and 10-6. RS 14A customers are managed under FEI's transportation model, and therefore, they are treated the same way as other transportation customers. Given FEI does not have a daily balanced group under RS 14A, they are not impacted by the changes to imbalance return listed in Table 10-5; however, similar to all other Shipper Agents, FEI is impacted by supply restrictions on the same days as indicated in Table 10-6.

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1   **Question 13.1**

2   **Page 10-30 & onwards**

- 3           a.     Please describe, in summary the jurisdictions where all conditions of :  
4                   a low balancing tolerance (<20%) AND daily balancing AND suspension of  
5                   balancing were simultaneously in effect.

6  
7   **Response:**

8   Please refer to the jurisdictional research and comparison in Appendix 10-1, Black & Veatch  
9   Transportation Service Model Review.

10  
11

12

13   **Question 13.2**

14           ***From 10-1 Black & Veatch Transportation Service Model Review Page 2***

15           ***Daily balancing is required by many LDCs, typically depending on proximity to***  
16           ***major market hubs,***

- 17           a.     Please discuss how the BC Gas system and its proximity to either Stn 2, or  
18                   Sumas market hubs, and the very limited supply options its transport customers  
19                   have, comports to this description , i.e closer to major market hub= tendency to  
20                   daily balancing?

21  
22   **Response:**

23   The gas supply business is conducted on a day-out basis whereby supply is ordered a day  
24   ahead to meet the next day's demand. However, on the actual gas day, the forecast demand  
25   may undergo changes due to various reasons including temperature changes. Customers  
26   closer to major market hubs are likely to be daily balanced because they have several ways to  
27   contract for their daily gas supply requirements. For instance, customers in Alberta have  
28   access to the AECO/NIT marketplace, which has multiple natural gas price indices that  
29   customers can transact on to meet their changing needs within a gas day. By comparison,  
30   customers in B.C. rely on the Station 2 and Sumas marketplace, which do not have the same  
31   characteristics as the AECO/NIT marketplace, mainly because lower amounts of gas are  
32   transacted at these hubs. The Station 2 and Sumas market hubs have few same-day gas  
33   transactions, which is reflected in the fact that these two hubs do not have a recognized intra-  
34   day index.

35   Customers in B.C. are also affected by the limited transportation pipeline capacity available in  
36   the region, as they are heavily dependent on supply from one pipeline system (Westcoast's T-

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1 South pipeline). Therefore, even if there was a daily index or a market to buy the gas at Station  
2 2, it would be challenging to move the gas on the day, given that Westcoast's T-South pipeline  
3 is currently fully contracted, and runs at maximum throughput throughout the winter.

4 Given these circumstances within the region, customers in B.C. may need to hold physical  
5 assets in the region to be daily balanced. The physical assets in the region include  
6 transportation capacity on third-party pipeline systems and storage in the market area (i.e. Mist  
7 and JPS). There are fixed costs for securing these assets.

8  
9  
10  
11 b. In how many jurisdictions studied did the utility have 'carte blanche' allowance to  
12 limit or curtail such as FortisBC has?

13  
14 **Response:**

15 FEI does not have 'carte blanche' allowances to limit or curtail customers on FEI's system. FEI  
16 conducts its business with respect to supply restrictions and/or curtailment orders in accordance  
17 with the terms and conditions approved by the Commission.

18 Generally, the utilities included in the jurisdictional review have provisions governing differences  
19 in their operating practices under normal and restriction/curtailment conditions.

20  
21  
22  
23 **Question 13.3**

24 ***Page 5***

25 **3.2 BASE CASE – REPLACEMENT COST OF BALANCING RESOURCES**

26 The aggregate total of all shipper agents' annual balancing costs (consisting of  
27 reservation and commodity charges in the base case) was divided by the total  
28 transportation throughput on the System (72,381,734 GJ for 2015) to arrive at the  
29 average cost of securing balancing resources per GJ under various threshold cases (5-  
30 20%).

31 a. Did the cost study consider the benefits of the extra gas supply from  
32 transportation customers available to the utility on peak days when customers  
33 typically oversupply expected demand to avoid penalties and such gas is  
34 available to the utility by default?  
35

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1    **Response:**

2    FEI did not consider the extra gas supply from transportation customers on a peak day as FEI is  
3    unable to rely on this gas as a source of supply. FEI expects Shipper Agents to bring on  
4    sufficient supply to meet their customer demand in order to avoid charges. FEI presumes the  
5    Shipper Agents over-supply in some cases to manage their costs, but FEI does not know the  
6    specific business reasons that have led the Shipper-Agent to over-supply.

7

8

9

10           b.       What is the option analysis value of this implicit resource?

11

12    **Response:**

13    There was no value assigned as FEI is unable to rely on the occasions on which Shipper  
14    Agents over-supply. Please refer to the response to Cascadia-FEI IR 13.3a.

15

16

17

18           c.       Were the costs calculated as incremental or stand alone?

19

20    **Response:**

21    There were no costs calculated as this supply is not factored into the replacement cost analysis.  
22    Please refer to the response to Cascadia-FEI IR 13.3a.

23

24

25

26           d.       If stand-alone, why? Why would an incremental cost analysis not be more  
27                      realistic and fair?

28

29    **Response:**

30    Please refer to the response to Cascadia-FEI IR 13.3c.

31

32

33

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**Question 13.4**

**Page 9**

**4.1 REVIEW OF SHIPPER AGENTS' BALANCING HISTORY**

Given the shipper agents' different strategies, FEI sought to determine if some strategies allow shipper agents to consistently balance their load to specific thresholds, namely 20% (the current threshold on the system), and 10%. The goal was to be able to assess the feasibility of balancing to these thresholds: if several shipper agents are currently balancing to a 10% or 20% level, it is reasonable to suggest that it is feasible for shipper agents not currently balancing to these thresholds to change their nomination patterns to also meet these thresholds.

An analysis of balancing data from 2014 and 2015 found that nearly half of the shipper agent pools are consistently balancing to 10% and 20% thresholds, while the other pools are frequently out of balance, in some cases by a large margin.

Preamble: This study is in the vacuum of Fortisbc enforcing the current authorities they have with regard to managing balancing and inventories.

- a. Please detail how many times and in what manners customers have been warned in regards to nomination practices.

**Response:**

Since the Monthly Balancing Gas Decision, and in particular over the last winter, FEI has issued approximately 10 warnings per week, both verbally and in writing to Shipper Agents to correct nominating practices. On about five occasions over the last winter, FEI physically amended the nominations of Shipper Agents. These warnings and actions were issued to correct both over-supply and under-supply situations.

- b. Please detail cases where restrictions, outside of normal notices, were enforced to correct poor nomination practices by customers.

**Response:**

No restrictions outside of the operational practices as allowed within the Terms and Conditions of the Transportation Tariffs have been exercised.

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- 1  
2 c. Has FortisBC ever suspended inventory return to enforce inventory levels or  
3 nominating practices?  
4

5 **Response:**

6 FEI interprets the meaning of “inventory return” to mean imbalance return.

7 As discussed in Section 10.7.1 of the Application, FEI has limited or eliminated imbalance return  
8 in order to force Shipper Agents with daily balanced groups to nominate appropriately and bring  
9 on sufficient physical supply to meet daily demand. These restrictions typically occur during  
10 colder weather.

11 In the last several years, FEI has not suspended the use of imbalance return to a specific  
12 Shipper Agent, nor has FEI withheld a Shipper Agent’s inventory to return at a later date.

- 13  
14  
15  
16 d. Detail ANY ways in which FortisBC has EVER attempted to enforce what it  
17 considers reasonable nominating practice.  
18

19 **Response:**

20 Please refer to the previous response to Cascadia-FEI IR 1.13.4a.  
21

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1    **Question 14**

2    **Page 6-30**

3            **1    6.5.1 R:C Ratios – The Range of Reasonableness**

4            **2    R:C ratios are assessed based on whether or not they fall within an**  
5            **established “range of**

6            **3    reasonableness”. FEI believes that the appropriate range of reasonableness**  
7            **for evaluating its**

8            **4    R:C ratios is 90 per cent to 110 per cent. In theory, the R:C ratio should equal**  
9            **100% for each**

10           **5    rate schedule, indicating that the revenues recovered from each rate schedule**  
11           **would equal the**

12           **6    indicated cost to serve them. However, achieving unity implies a level of**  
13           **precision that does not**

14           **7    exist with any COSA. As a COSA study necessarily involves assumptions,**  
15           **estimates,**

16           **8    simplifications, judgments and generalizations, a range of reasonableness is**  
17           **warranted and**

18           **9    accepted when evaluating the appropriateness of the R:C ratios.**

19           a.    The total annual costs in the COSA study exceed \$780,000,000. The range of  
20           reasonableness for R:C ratios is given as 90-110 percent, or a 20% band. Given  
21           that the 20% band on the total costs is \$156,000,000 how is this broad level of  
22           cross subsidy warranted ?

23  
24    **Response:**

25    The range of reasonableness refers to a band of plus or minus 10% around the allocated costs  
26    of a particular rate class. There is no band of plus or minus 10% around the total cost of service.  
27    The rates of all rate schedules in aggregate are designed to collect 100% of the cost of service  
28    (or revenue requirement) of the utility.

29    For the reasons discussed in section 6.5.1 of the Application, it is not accurate to describe the  
30    range of reasonableness as a cross subsidization. Please refer to the response to BCUC-FEI IR  
31    1.14.1 for further discussion of the range of reasonableness.

32

33

34



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- 1           b.       Even if inaccuracies exist to prevent exact cost assignments, what is the  
2                   rationale for not using the derived values as representing the best available data  
3                   and methodology?  
4

5       **Response:**

6       Please refer to Section 6.5.1 of the Application and the response to BCUC-FEI IR 1.14.1.  
7  
8

- 9  
10          c.       Rate 27 Customers and Rate 22 Customers pay 7 and 18 times their costs of  
11                   service respectively. Given the range of 110-90 % described above, how is this  
12                   justified.  
13

14       **Response:**

15       As discussed in Section 6.5.2, page 6-35 of the Application, RS 22 is predominantly interruptible  
16       and RS 7/RS 27 are fully interruptible rate schedules. These rate schedules do not drive system  
17       capacity additions and consequently are not allocated any demand-related costs of the FEI  
18       system. This is the reason that their R:C ratios are exceptionally high. It is important to note  
19       that the charges within these rate schedules are set based on a discount from the firm service  
20       rates and not from their allocated costs from the COSA model. Therefore, the R:C ratios for  
21       these rate schedules are not considered for rate design.  
22  
23

- 24  
25          d.       Given that residential customers underpay their costs by 6.9% on \$510 Million (  
26                   or about \$35 Million while Rate 22 Customers overpay by 1764% on \$806K  
27                   costs, or about \$13 Million, why should these two rate classes not be  
28                   rebalanced?  
29

30       **Response:**

31       Please refer to the response to Cascadia-FEI IR 1.14c regarding the reason for higher R:C  
32       ratios for RS 22 customers. FEI has discussed the final R:C ratios for residential customers  
33       after proposed rate design changes and rebalancing in Section 12 of the Application. Table 12-3  
34       shows the final R:C ratio for Residential customers to be 96.4 percent which is within the 90  
35       percent to 110 percent range of reasonableness.  
36

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**Question 15**

**Page 6-35**

**RS 22 is**

**17 predominantly interruptible and RS 7/RS 27 is fully interruptible. These rates do not drive**

**18 system capacity additions, and consequently are not allocated any demand-related costs.**

- a. FortisBC does not build capacity for these clients. What is the avoided cost of that capacity? In other words, if FortisBC had built the capacity to make these customers firm, what would the incremental cost be, on a total and per GJ basis, be? What is the VALUE of interruptibility that FortisBC gets from these clients?

**Response:**

Regarding the avoided cost associated with providing interruptible service versus firm service on a total cost and a per GJ basis, please refer to Exhibit B-1, Section 9.6.4 and Appendix 9-3. FEI itself does not receive any value from customers who receive interruptible service; however, FEI's firm customers have slightly lower rates than they otherwise would if interruptible service was not made available to RS 7/27 and RS 22.

- b. If any interruptible customer wishes to upgrade to full firm service, are they required to pay for or contribute to the system upgrades required, and in what ways, specifically?

**Response:**

FEI does not presently anticipate that any interruptible customers would want to switch to fully firm service, as the interruptible Delivery Charge for RS 7/27/22 is priced at a discount from the average firm RS 5/25 rate, and the customers on interruptible service have already made the capital investments necessary to be able to have the ability to switch to higher cost alternative fuels during peak weather conditions when interrupted by FEI.

Within the FEI tariff, when a customer wishes to switch from interruptible to firm sales or transportation service, the customer agrees within their service agreement to reimburse FEI for any costs that are reasonably incurred to provide such service after receiving an estimate from FEI.

|   |                                  |
|---|----------------------------------|
| FortisBC Energy Inc. (FEI or the Company)<br>2016 Rate Design Application (the Application) | Submission Date:<br>June 9, 2017 |
| Response to Cascadia Energy Ltd. (Cascadia) Information Request (IR) No. 1                  | Page 34                          |

- 1  
2  
3  
4 c. If Interruptible customers to not drive system capacity additions, and if they must  
5 pay for such additions if they were to become fully firm, why are they not  
6 considered marginal customers and charged the marginal cost of service rates?  
7

8 **Response:**

9 Please refer to the response to BCUC-FEI IR 1.32.5.  
10  
11  
12

- 13  
14 d. Bypass customers pay firm rates that are in some cases as low as the rates  
15 interruptible customers should pay based on the COSA. Are interruptible  
16 customers charged higher rates simply because they are 'captive' and they have  
17 no other choice?  
18

19 **Response:**

20 Bypass customer rates are based on what the customer's cost would be to build, own and  
21 operate their own pipeline; it is a competitive alternative to the utility's charges for the service  
22 being provided. With the Bypass rate the customer is indifferent between receiving service from  
23 FEI or building its own pipeline and interconnecting with the upstream pipeline, and FEI retains  
24 revenue that would otherwise have been lost and would have to be recovered from all other  
25 non-bypass customers.

26 The setting of RS 7/27 Interruptible rates is a separate determination that results in rates that  
27 are priced at a discount from the RS 5/25 General Firm Service rates as described in FEI's  
28 Application Exhibit B-1, Section 9.6.

29 Large industrial customers are not captive and have alternative fuel choices. Examples of this  
30 are cement plants fuel switching from gas to burn coal, and greenhouses or sawmills switching  
31 from gas to burn biomass.  
32

**Attachment 12a**

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|      |           |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|-----------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY   | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2008 | 1/1/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/2/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/15/2008 | Reduced           | 26,500                               | 17,150 | 13,500                               | 22,850 |
| 2008 | 1/16/2008 | Reduced           | 26,500                               | 18,150 | 13,500                               | 21,850 |
| 2008 | 1/17/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/18/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/19/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/20/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/21/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/22/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/23/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/24/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/25/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/26/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/27/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/28/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/29/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/30/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 1/31/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/1/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/2/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/3/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/4/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/5/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/6/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/7/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/8/2008  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 2/9/2008  | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/10/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/11/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/12/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/13/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/14/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/15/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/16/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/17/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/18/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/19/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/20/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 2/21/2008 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 6/10/2008 | Reduced           | 15,000                               | 15,000 | 25,000                               | 25,000 |
| 2008 | 6/11/2008 | Reduced           | 15,000                               | 15,000 | 25,000                               | 25,000 |

|      |           |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|-----------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY   | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2008 | 6/12/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 6/13/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 6/14/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 6/15/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 6/16/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 6/17/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/17/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 6/18/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/19/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/20/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/21/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/22/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/23/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/24/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/25/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/26/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/27/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/28/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/29/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 6/30/2008 | Reduced           | 5,000                                | 5,000  | 35,000                               | 35,000 |
| 2008 | 7/1/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/2/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/3/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/4/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/5/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/6/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/7/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/8/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/9/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/10/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/11/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/12/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/13/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/14/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/15/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/16/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/17/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/18/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/19/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/20/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/21/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/22/2008 | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |

|      |            |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|------------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2008 | 7/23/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/24/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/25/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/26/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/27/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/28/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/29/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/30/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 7/31/2008  | Reduced           | 25,000                               | 25,000 | 15,000                               | 15,000 |
| 2008 | 8/1/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/2/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/3/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/4/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/5/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/6/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/7/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/8/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/9/2008   | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/10/2008  | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/11/2008  | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/12/2008  | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/13/2008  | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 8/14/2008  | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2008 | 12/13/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/14/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/15/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/16/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/17/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/18/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/19/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/20/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/21/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/22/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/23/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/24/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/25/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/26/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/27/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/28/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/29/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/30/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2008 | 12/31/2008 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |

|      |            |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|------------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2009 | 1/1/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/2/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/3/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/4/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/5/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/6/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/7/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/8/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/9/2009   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/10/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/11/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/12/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/24/2009  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 1/25/2009  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 1/26/2009  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 1/27/2009  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 1/28/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/29/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/30/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 1/31/2009  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2009 | 11/9/2009  | Reduced           |                                      | 39,999 | 40,000                               | 1      |
| 2009 | 12/8/2009  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/9/2009  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/10/2009 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/11/2009 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/12/2009 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/13/2009 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/14/2009 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2009 | 12/15/2009 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/20/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/21/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/22/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/23/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/24/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/25/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/26/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/27/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/28/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/29/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 11/30/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/1/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/2/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |



|      |            |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|------------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2010 | 12/3/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/4/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/5/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/6/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/7/2010  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/8/2010  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2010 | 12/9/2010  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2010 | 12/30/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2010 | 12/31/2010 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/1/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/2/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/3/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/4/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/5/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/6/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/7/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/8/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/9/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/10/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/11/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/12/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 1/18/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 2/19/2011  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2011 | 2/20/2011  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2011 | 2/21/2011  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2011 | 2/22/2011  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2011 | 2/23/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 2/24/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 2/25/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 2/26/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 2/27/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 2/28/2011  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 3/1/2011   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2011 | 11/19/2011 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2011 | 11/20/2011 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2011 | 11/21/2011 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2012 | 1/13/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/14/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/15/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/16/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/17/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/18/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |

|      |            |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|------------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2012 | 1/19/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/20/2012  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 1/21/2012  | Eliminated        | 0                                    |        | 40,000                               | 40,000 |
| 2012 | 12/20/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/21/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/22/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/23/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/24/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/25/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/26/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2012 | 12/27/2012 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/10/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/11/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/12/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/13/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/14/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/15/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/16/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 1/17/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/18/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/19/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/20/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/21/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/22/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/23/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 1/24/2013  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 11/21/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 11/22/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 11/23/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 11/24/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 12/3/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/4/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/5/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/6/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/7/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/8/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/9/2013  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/10/2013 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/11/2013 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2013 | 12/12/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 12/13/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 12/14/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |

|      |            |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|------------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2013 | 12/15/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2013 | 12/16/2013 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 2/1/2014   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 2/2/2014   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 2/3/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/4/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/5/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/6/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/7/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/8/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/9/2014   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/10/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/11/2014  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 2/12/2014  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 2/22/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/23/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/24/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/25/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/26/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/27/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 2/28/2014  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 3/1/2014   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 3/2/2014   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 3/3/2014   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 3/4/2014   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 11/13/2014 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 11/14/2014 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 11/15/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 11/16/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 11/17/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 11/18/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 11/19/2014 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2014 | 11/29/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 11/30/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/1/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/2/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/3/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/4/2014  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/29/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/30/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2014 | 12/31/2014 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 1/1/2015   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |

|      |            |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|------------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2015 | 1/2/2015   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/23/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/24/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/25/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/26/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/27/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/28/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/29/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 9/30/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 10/1/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 10/2/2015  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/24/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/25/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/26/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/27/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/28/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/29/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 11/30/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/24/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/25/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/26/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/27/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/28/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/29/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/30/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2015 | 12/31/2015 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/1/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/2/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/3/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/4/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/5/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/6/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/7/2016   | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2016 | 1/8/2016   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 1/9/2016   | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 1/10/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 1/11/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 1/12/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 6/20/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 6/21/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 6/22/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2016 | 6/23/2016  | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |

|      |            |                   | Imbalance Return Available (GJ/d) |        | Imbalance Return Reduction (GJ/d) |        |
|------|------------|-------------------|-----------------------------------|--------|-----------------------------------|--------|
| Year | GAS_DAY    | Type of Reduction | INT                               | LML    | INT                               | LML    |
| 2016 | 6/24/2016  | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 6/25/2016  | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 6/26/2016  | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 6/27/2016  | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 8/31/2016  | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 9/1/2016   | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 12/5/2016  | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/6/2016  | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/7/2016  | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/8/2016  | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/9/2016  | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/10/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/11/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/12/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/13/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/14/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/15/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/16/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/17/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/18/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/19/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/20/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/21/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/22/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/23/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/24/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/25/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/26/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/27/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2016 | 12/28/2016 | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 12/29/2016 | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 12/30/2016 | Reduced           | 20,000                            | 20,000 | 20,000                            | 20,000 |
| 2016 | 12/31/2016 | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/1/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/2/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/3/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/4/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/5/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/6/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/7/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/8/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |
| 2017 | 1/9/2017   | Eliminated        | 0                                 | 0      | 40,000                            | 40,000 |

|      |           |                   | Imbalance Return<br>Available (GJ/d) |        | Imbalance Return<br>Reduction (GJ/d) |        |
|------|-----------|-------------------|--------------------------------------|--------|--------------------------------------|--------|
| Year | GAS_DAY   | Type of Reduction | INT                                  | LML    | INT                                  | LML    |
| 2017 | 1/10/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/11/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/12/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/13/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/14/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/15/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/16/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/17/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 1/18/2017 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2017 | 1/19/2017 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2017 | 1/20/2017 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2017 | 1/21/2017 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2017 | 1/22/2017 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2017 | 1/23/2017 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2017 | 1/24/2017 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2017 | 1/25/2017 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2017 | 1/26/2017 | Reduced           | 30,000                               | 30,000 | 10,000                               | 10,000 |
| 2017 | 1/31/2017 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2017 | 2/1/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/2/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/3/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/4/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/5/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/6/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/7/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/8/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/9/2017  | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/10/2017 | Eliminated        | 0                                    | 0      | 40,000                               | 40,000 |
| 2017 | 2/11/2017 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |
| 2017 | 2/12/2017 | Reduced           | 20,000                               | 20,000 | 20,000                               | 20,000 |