P.S.C.U. Docket No. 04-057-04
Data Request No. 2.6
Requested by Division of Public Utilities
Date of QGC Response October 4, 2004

2.6 Identify all situations during the past five years when gas from the Uinta Basin and parts farther east were not able to get to the Payson Gate and Indianola gate because Ferron area gas was pushing it back east. Provide the dates, duration of the event and volumes delivered to the Indianola and Payson Gates during these time periods. Provide an explanation of each event that caused this to happen.

Answer: The response to this data request is slightly different than what was explicitly requested based on follow-up discussions with the Division. This response answers the underlying question of how QPC could have blended historical and current gas volumes to meet the gas interchangeability requirements of QGC assuming the CO_2 Plant is unavailable.

The first approach examined was a concept called "Gross Blending". This concept requires the co-mingling of all gas received into QPC's system to a common pressure and gas quality. Under this concept, the quality of gas delivered to Payson and Indianola would be determined by the relative mix of upstream supplies received into QPC's system. This is the simplest and least costly type of blending.

After researching historical gas entering QPC's system from 12/1/2001 until present, an average volume and quality of gas from the coal seam methane developments was determined. It is this gas that would need to be blended with the higher Btu Uinta Basin gas to meet the QGC's requirements at the Payson and Indianola delivery points. Based on existing compositional data from supply sources that would be available to blend, a 1030 Btu was assumed as the minimum limit for interchangeability. The 1030 Btu provides a small operating margin that would be required if blending were relied upon as the primary means for controlling interchangeability. This point is plotted relative to the lower bounds of gas interchangeability on the attached graph, Figure 1. Figure 1 was shown previously as a reference in Case No. 98-057-112. Using the historical value for coal seam production volumes and Btu's and knowing the Uinta Basin gas Btu's, the volume needed of Uinta Basin gas required to blend the gas stream to a 1030 Btu can be solved.

Knowing the volumes required to blend the coal seam gas to the interchangeable Btu allows the calculation of the total minimum volumes delivered to Payson, Indianola, and Goshen to ensure all gas meets the 1030 Btu. This concept is illustrated diagrammatically in Figure 2. The algebraic expression that

mathematically describes how the minimum total delivered volume was calculated is shown on Worksheet #1. This total volume is the *minimum* "gross blending" volume required to meet QGC's quality requirements – in other words, demand between Payson, Indianola, and Goshen must be maintained above this minimum to provide interchangeability gas to QGC. Delivered volumes below this amount cause the Btu's in the gas to decrease and the gas would not meet QGC's minimum Btu specification. As is shown in Worksheet #1, the minimum calculated volume for gross blending is 362 MMscf/D. This value was calculated based on recent coal-seam gas volume levels assuming the production contains 3% CO_2. This combined demand for Indianola and Payson was assumed to be 125 MMscf/D based on historical data from the time ML 104 became operational to present as shown on Figure 3. Shown in Figure 4 is a graph of historical daily combined demand to Goshen, Payson and Indianola. Superimposed on the graph is the gross-blending minimum volume of 362 MMscf/D. There were a total of 639 days (62% of the time) that total gas deliveries did not meet this required minimum. This data clearly shows that gross blending could not substitute for operating the CO_2 plant.

The second approach assumes QPC can precisely blend the high and low Btu streams to ensure a minimum 1030 BTU stream is delivered to the Payson and Indianola gates. The "precision blending" approach assumes as much of the coal-seam production as possible is delivered into ML 104 and the remaining coal-seam gas is blended with Uinta Basin gas and delivered into ML 40. Precision blending would require QPC to install additional facilities to enable blending on a near real-time basis.

This approach is illustrated diagrammatically in Figure 5. Shown in Worksheet #2 is the mathematical model that describes the method along with the derivation of minimum demand. The minimum demand to achieve a Btu of 1030 to Payson and Indianola was calculated to be 276 MMscf/day. Also shown on the graph in Figure 4 is the minimum demand limit of 276 Mmscf/day for precision blending. During the time period shown on the graph, there were a total of 124 days (12.1% of the time) where total demand to Goshen, Payson, and Indianola was less than 276 Mmscf/D.

Note on the graph that the majority of days when demand was less than 276 MMscf/day occurred prior to winter of 2002. The primary explanation for this trend was that the gas markets on Kern River were not as attractive as they have been for the past two years. Most of the excursions below the precision blending limit after this initial period were due to equipment failure and planned maintenance, both on QPC and Kern's systems. Included as Figures 6 and 7 are examples of outage events documented in the response to Data Request No. 2.2. Both figures show plots of hourly total ML 40 and 104 volumes for two time periods: 9/21/04 to 9/22/04 and 9/25/03 to 9/27/03. The daily volumes associated with these two examples are clearly shown falling below the 276 MMscf/day limit

on Figure 4. Figures 6 and 7 also show that hourly volumes fell below the 276 MMscf/day level for an extended period of time.

There were other events documented in the response to Data Request No. 2.2 where daily volumes did not fall below the precision-blending limit on Figure 4 but did exceed the limit on an hourly basis. One such event is illustrated in Figure 8, a graph showing hourly volumes for the 2/28/04 to 2/29/04 period. During this event, the minimum volume was exceeded for four hours but when averaged over the course of the day, the volume was within the precision blending limit. Included as Figure 9 is a graph that shows the total number of hours per month that the precision-blending limit was exceeded during the time period in question.

The examples presented above show the difficulty of managing the gas blend to Payson and Indianola without the availability of the CO_2 plant. Gas blend excursions could be of multi-day duration due to changes in gas markets or may last several hours or days due to equipment failure and scheduled maintenance. As was mentioned earlier in this response, blending on a precision basis would require QPC to install and operate incremental facilities. QPC would have no obligation to install these incremental facilities and its installation costs, as well as operational costs, would have to be addressed at the FERC.

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