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The Newsletter of the Wyoming Pipeline Authority

DOWN THE PIPE

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Jeffries' Executive Summary

The Wyoming Pipeline Authority (WPA) is working to protect and enhance the value of oil and natural gas produced in Wyoming. *Better prices for these products yields higher state taxes and royalties and healthier state budgets.* The WPA accomplishes this mission principally by working to ensure that adequate pipeline capacity and related infrastructure are in place to move production from Wyoming to higher priced markets.

Adequate natural gas pipeline capacity is the area of greatest focus for the WPA. Wyoming natural gas production has and will continue to grow. Pipeline capacity to carry that production to distant markets must also grow. During periods where production growth has outpaced the growth in pipeline capacity, the price for natural gas in Wyoming has suffered. That price differential penalty gets worse as the pipeline system fills up and abates when capacity is added.

The following chart shows the penalty suffered for natural gas produced in Wyoming when compared to the price for gas produced in the US Gulf Coast. Penalties in price relate directly to reduced tax and royalty collections for the State of Wyoming.
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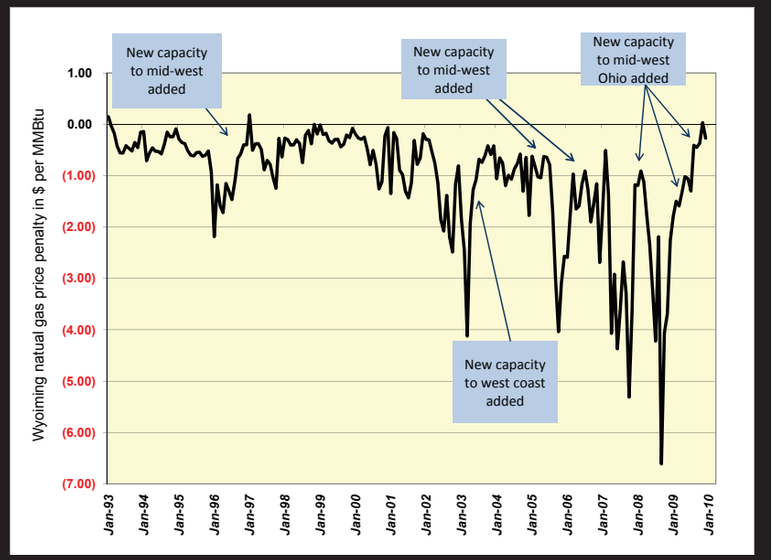
Jeffries' Executive Summary, *continued from cover*

A $1.00 improvement in the annual average price of natural gas in Wyoming is worth approximately $230 million in additional annual state revenue. The most important mission of the WPA is to get take away pipeline capacity built promptly to prevent or minimize the price penalties suffered by Wyoming natural gas. Since 2000, the WPA has helped double the amount of pipeline take away capacity available to Wyoming.



The WPA works to obtain better prices for Wyoming production and higher tax collections by the State of Wyoming by:

- *Advocating* before the Federal Energy Regulatory Commission (FERC) for the timely approval of new natural gas pipelines.
- *Educating* state regulators in other states why additional pipeline capacity from Wyoming to their state is in their interest. The WPA has presented the case for relying on dependable Wyoming gas to representatives of nearly every state public utility commission in the western half of the US.
- *Rebutting* attempts to push Wyoming natural gas out of existing markets. When a pipeline outside of Wyoming proposed terms and conditions that discriminated against Wyoming production, the WPA successfully challenged the proposal before the FERC.
- *Exposing* attempts to inhibit the free movement of crude oil to markets. When a refinery in Utah fought a proposed change in crude oil pipeline operations in Wyoming in order to keep south west Wyoming crude oil captive to depressed prices, the WPA intervened before the FERC. The FERC ruled in favor of the pipeline company.
- *Highlighting* opportunities for producers to participate in pipeline expansions. The WPA conducts at least four public meetings per year.

FERC INTERVENTION OVER CRUDE OIL CONCERNS: ROCKY MOUNTAIN PIPELINE SYSTEM

The Federal Energy Regulatory Commission (FERC) regulates the interstate transmission of electricity, natural gas, and oil. The WPA provides a unique position in proceedings before the FERC because the WPA represents the interests of Wyoming as opposed to the more narrowly focused commercial interests of the other parties in these proceedings.

The U-Crude Pipeline is owned and operated by Rocky Mountain Pipeline Systems (RM) and historically delivered crude oil to the Salt Lake City, Utah, refining region. RM sought FERC approval to change the direction of flow on their system to accommodate the surge in Southwest Wyoming Sweet Crude production (the 'surge' was a yield of condensate as a byproduct from increased natural gas drilling and therefore exasperated the existing crude pipeline infrastructure). The existing direction of flow on the line was to the west and the increased crude oil and condensate production exceeded the amount of refining capacity in the SLC region. This mismatch of supply and demand resulted in lower prices for crude oil and condensate in Southwest Wyoming as these supplies competed for access to this limited market. RM determined that a change in the direction of the flow on the line eastward towards Cushing, Oklahoma markets would yield better pricing for Wyoming producers. With the support of the WPA, RM prevailed in their efforts in the FERC proceedings and reversed their pipeline flow direction and indeed narrowed the differential for southwest Wyoming sweet crude pricing.

Pipeline Expansions, *continued from page 5*

to an existing pipeline system that originates in Alberta, Canada and serves the upper Midwest. Bison will be a 30 inch diameter pipeline (originally proposed as 24 inch) and will add 0.5 Bcf/d of additional export capacity from Wyoming. The WPA helped Bison recognize the opportunities that would accompany the larger line size. Bison also has the option of building back to Wamsutter, Wyoming, providing an additional outlet for southwest Wyoming produced natural gas.

The WPA intervened at the FERC in support of Kern, Bison and Ruby because the added capacity of all three of these projects will improve the price for natural gas produced in Wyoming.

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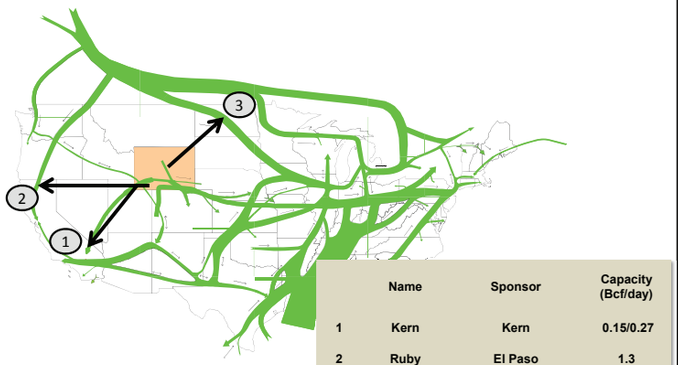
PIPELINE EXPANSIONS: REX IN FULL SERVICE, NEW PROPOSALS MOVING FORWARD

Rockies Express Pipeline (REX) is one of the largest pipelines to be built in the United States and became fully operational on November 11, 2009. REX delivers Rocky Mountain natural gas to Ohio via a 1,700 mile path. The $6.7 billion dollar project provides an additional outlet for Rockies production and eliminated a capacity bottleneck. Removing capacity bottlenecks leads to higher well head prices. This is good news for Wyoming as higher prices lead to higher tax and royalty revenues for the State.

Additional pipeline export capacity is still in the works



	Name	Sponsor	Capacity (Bcf/day)
1	Kern	Kern	0.15/0.27
2	Ruby	El Paso	1.3
3	Bison	Northern Border	0.4

The more recent downtrend in drilling in the Rockies is due to a decrease in industrial consumption of natural gas because of a depressed economy and from an increase in production in other areas of the country but not from pipeline bottlenecks. With a return of consumer demand and resumption in drilling in the Rockies, there will be a need for added export capacity from Wyoming.

The initial Kern River Pipeline was constructed in 1993 and was a major project in the development and marketability of natural gas for Wyoming. With the growth in production in Wyoming and the demand for clean natural gas energy, Kern has decided to move forward with an expansion of their 2 billion cubic feet per day (Bcf/d) capacity pipeline by adding additional pipeline infrastructure and compression. Additional pipe over the Wasatch Mountains from Opal, Wyoming, to Salt Lake City, Utah, will assist in both transportation and storage of natural gas. Additional compression in the Las Vegas, Nevada, area will assist in improving pressure and flow on the pipeline. These additions will add almost 0.3 Bcf/d of capacity to the Kern River system.

In addition to the Kern River project, two other projects are well into the process to deliver Rockies gas to the consuming regions of the nation. El Paso's Ruby Pipeline will transport natural gas from Opal, Wyoming, to Malin, Oregon – located on the California/Oregon border. Malin is a strategic location or hub for delivering natural gas to the west coast market place. Ruby's 42 inch diameter pipeline will deliver an additional 1.3 Bcf/d of Rockies natural gas providing additional robustness to the Rockies' pipeline infrastructure. Another notable project is the proposed Bison Pipeline. Bison will initially deliver Powder River Basin gas to Chicago and the upper Midwest via a connection

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- *Outreach* to educate the citizens of Wyoming on the impact of pipeline infrastructure to Wyoming. WPA has delivered over fifty presentations to the public in the last 2 years detailing how infrastructure affects prices, tax collections and how the legislature through its support of the WPA is helping Wyoming to get a higher value for its energy products.
- *Planning* for the future. The WPA works to anticipate where the next infrastructure bottleneck will arise and harm Wyoming's interests.
- *Collaborating* within the State. The WPA and the Enhanced Oil Recovery Institute at the University of Wyoming (EORI) have developed a model of an efficient carbon dioxide pipeline system that would promote the production of an additional 286 million barrels of Wyoming oil which would yield $3.2 billion in additional taxes and royalties for the state (based $70 per barrel oil).
- *Compiling* a reliable record of what already exists. The WPA maintains a digital database of the natural gas, crude oil, refined products and carbon dioxide pipelines within the state.

The WPA conducts its operations efficiently and at low cost. When the WPA's work succeeds in raising the annual price of natural gas in Wyoming by $0.002 (two tenths of one cent) for one year, the added tax and royalty collections of the State completely offsets the WPA's annual operating expense.

NEW – ACCESS OUR EXTENSIVE PIPELINE DATABASE ON-LINE!

The Wyoming Pipeline Authority has implemented a web-based map server focused on Wyoming's pipeline infrastructure via the internet where you can view our database. Located under the Pipelines/Maps tab of our website, the map was launched with a set of frequently requested information including details about pipelines, processing plants, gas storage, and compressor stations. This data is always up-to-date and reflects the most recent information. This tool is easy to navigate and is ideal for planning, decision making, and project development. You are no longer excluded if you do not have ArcGIS software on your workstation. We invite you to visit the web-server link at http://mapserver.wyopipeline.com/PipelineInfrastructure/Default.aspx and peruse all the compiled information.

WIND POWER AND NATURAL GAS FOR BACKUP POWER GENERATION

Wyoming has abundant wind generation opportunities. However, the intermittent and variable nature of wind resources creates challenges when integrating that resource into the electrical grid.

First the wind resource must be connected to the grid. Since an electrical transmission line (power line) to move the wind to market must be large enough to move the peak amount of power produced, the power line serving only wind resources on average may only run slightly less than forty percent (40%) full. This is because the wind is not always blowing hard enough to take advantage of the full capacity of the wind farm. Unfortunately, the full cost of the power line then must be recovered on the amount of power actually generated and that is only 40% of the line capacity. This phenomenon makes the price of wind power at the far end of the power line appear higher that it would be if the cost of the power line could be spread across more power.

"Additional gas fired electric generation could spread out the cost of new power lines..."

The second challenge presented by wind generation is that the wind speed changes. When wind either drops precipitously or dramatically increases, some other form of generation on the electric grid must quickly respond to balance overall generation with consumption.

Electric generation powered by natural gas provides a solution to both of these challenges. Gas fired generation can be operated as a companion to wind generation to insure that power lines are more fully utilized and can also provide the rapid response required to offset the changes in wind speed and resulting wind farm output. Gas fired electric power plants in turn need a fuel supply source that can also respond quickly. Natural gas storage provides the capability for natural gas pipelines to respond to sudden and large changes in demand such as a power plant can create.

The Wyoming Pipeline Authority and the Wyoming Infrastructure Authority are collaborating to identify the opportunities for gas pipeline and gas storage enhancements to support the growth of natural gas fired generation in Wyoming. Additional gas fired electric generation could spread out the cost of new power lines, add to the stability of the electric grid and add additional electric generation equipment to the property tax base in Wyoming.

OPPORTUNITIES WITH CARBON DIOXIDE ARE DEVELOPING WITHIN WYOMING

According to extensive analysis done by the Enhanced Oil Recovery Institute at the University of Wyoming (EORI), there are over 280 million barrels of oil that could be recovered from existing oil fields in Wyoming by using carbon dioxide reservoir flood techniques. Based on a price of $70 per barrel, the additional tax revenues to the State of Wyoming from these additional barrels of oil would be approximately $3.2 billion. Potential future sources of carbon dioxide for these operations include existing natural gas treating plants, potential coal gasification projects, and the exhaust gas from existing coal-fired power plants. Carbon dioxide recovered from these sources that exceed the demand for enhanced oil recovery operations would be destined for sequestration sites being studied by the University of Wyoming and the Wyoming Geological Survey.

"...additional tax revenues to the State of Wyoming from these additional barrels of oil would be approximately $3.2 billion."

A pipeline system to carry carbon dioxide from these sources to targeted oil fields is critical to the success of the operations at both ends of the pipeline. Wyoming is fortunate to have an existing carbon dioxide system that serves the current needs but expansion will be necessary to meet the opportunities in the future.

The WPA and EORI have collaborated on a study of what a robust and efficient carbon dioxide system for Wyoming would entail. Using the location of the oil fields that EORI identified as candidates for enhanced oil recovery and the locations of potential future supplies of carbon dioxide, a proposed pipeline system was designed that accounted for the various demands that would be placed on the system over time. The design included pipeline capacity to carry carbon dioxide to permanent sequestration sites in southwest Wyoming.

One of the goals of the cooperative project is to alert the State and private interests to future possibilities that are worthy of consideration when planning pipeline expansions and new construction. As an example of early success, the sponsor of a proposed carbon dioxide pipeline increased the diameter from 8 to 10 inches resulting in a 56% increase in capacity in order to accommodate future uses of the line. The sponsor referenced the work of the EORI and the WPA as the catalyst for this change. By helping the participants in the carbon dioxide market place understand all of the potential demands on a carbon dioxide pipeline system chances are lessened that the Wyoming will suffer a future bottleneck in the system in the future.

This collaboration between the WPA and the EORI is an effort to stay in front of infrastructure issues that could otherwise impede the future development of Wyoming's abundant natural resources.