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Taking the 'mystery' out of RIK

DENVER, Colo. – A unique partnership between the Interior Department's Minerals Management Service and the Colorado School of Mines in Golden, Colo., has produced new computing models to help optimize federal royalties from natural gas produced in the Gulf of Mexico.

"We've shown it works," said Steven Stoddard, the Colorado School of Mines doctoral candidate who helped develop the computing models while working side-by-side with federal employees in Denver. In fact, Stoddard said, the models were developed "to handle even more complex problems" that might arise in the future.

The new computing models are the result of a March 2002 letter of cooperation signed by the Minerals Management Service (MMS) and the Colorado School of Mines (CSM) with the objective of maximizing royalties from natural gas produced in the Gulf of Mexico. In particular, the goal was to help develop new tools that MMS could use to determine whether it was in the government's and taxpayers' best interests to take natural gas royalties "in-kind," in the form of product or natural gas, as opposed to the more traditional royalty "in-value," or cash payment.

"And if you take it in-kind," Stoddard said, "what do you do with it?"

In recent years, the Minerals Management Service has been applying the royalty-in-kind (RIK) approach through several pilot projects to evaluate the merits of RIK as a viable option to more efficiently manage the nation's royalty assets. Based on early successes in the program, MMS has been moving forward with RIK as a viable option for management of the nation's royalties from production on federal lands, which generally amount to some $5 to $10 billion annually.

Determining whether it is in the government's best interests to take royalties "in-kind" or "in-value," however, can be a daunting task. What is the history of the gas field? What is the current fair market value of the gas? Which pipelines are available to transport the product, and at what cost? What sales arrangements are required, and where can the gas be processed?

Faced with this challenge, Stoddard merged mathematics, economics, systems design and raw data to develop the new computing models to answer these and other questions. "We had all the data," he said, "but we didn't have the tools to access it. Now, we can look at the whole life of the property…we can prospect for new opportunities." In a recent case, the models were used in the analysis of one major natural gas marketing opportunity that resulted in an estimated $3.5 million annual increase in royalties.

Stoddard points to the "Royalty Maximizer" computer model as the key that "solves the problem." The new computing model "tells us which conversion is best (in-kind or in-value), which pipeline(s) should be used to transport the gas, and to which gas plants the product should be delivered." All with the aim of optimizing government and taxpayer royalty assets. "And," Stoddard added, "the time it takes to complete the process has been dramatically reduced."

To test the new computing models, Stoddard and MMS employees looked closely at previous transactions and ran the numbers through the new models, which analyzed "tens of thousands of lines of data." The new models work, Stoddard said, "they've been validated."

In addition to taking the "mystery" out of RIK options, the new computing models provide an effective tool to improve government efficiency and reduce costs. Staff time required to evaluate royalty-in-kind options is substantially reduced. In addition, taking royalties in-kind in the form of product eliminates costly and time-consuming audits to validate that royalty-in-value cash payments were properly calculated. In the past, that auditing process for royalty payments could take several years to complete, which is one reason the oil and gas industry generally supports the government's RIK efforts.

Stoddard, a major in the U.S. Army who earned his doctorate's degree while on active duty, sees additional uses for the new computing models in the future. Capabilities can be added to deal with larger and more complex problems, including how to get natural gas produced in the Gulf of Mexico delivered to more distant locations in the United States. The models will also confirm cases where it is best for MMS to continue to take its royalties "in-value," or as cash payments, as part of its overall asset management strategy.

Stoddard said similar computing models can help the Department of Defense in terms of troop movements and logistics, to evaluate base realignments and closures, and determine optimal force situations, including predicting the outcome of specific campaigns.

MMS Assistant Program Director Milt Dial, noting the success of this partnership, said the agency has already brought in another School of Mines doctoral candidate to look at optimizing royalties from crude oil produced on federal leases.

"We both benefited from this mutual relationship." Dial said. "It allowed the School of Mines to apply academic research to real workplace challenges," he noted, "and it provided MMS employees with useful tools to better manage government and taxpayer assets."

MMS is the Department of Interior agency that manages the nation's oil, natural gas and other mineral resources on the Outer Continental Shelf in federal offshore waters. MMS also collects, accounts for and disburses mineral revenues from federal and American Indian lands. Those revenues totaled more than $6 billion in 2002 and more than $127 billion since MMS was created in 1982.

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