

Probabilistic Risk-Based Decision Support for Oil and Gas Exploration and Production Facilities in Sensitive Ecosystems

FEW 49345

Goal

The goal of the overall project is to develop a web-based decision support tool that will be used by mid-and small-sized oil and gas companies as well as environmental regulators and other stakeholders to proactively minimize adverse ecosystem impacts associated with the recovery of oil and gas reserves in sensitive areas. ANL's role in the project is to develop a database of exploration and production (E&P) equipment and operational technologies that have been demonstrated to have lower impact on sensitive ecosystems than do conventional technologies.

Performers

Argonne National Laboratory (ANL), Washington, DC
University of Arkansas (UA), Fayetteville, AR

Results

The project team has held three meetings with stakeholders. The first meeting was held in Fayetteville in October 2006 with industry and regulatory agency stakeholders. Following that meeting, ANL was asked to prepare a report that summarized all the regulatory requirements facing oil and gas operators in Arkansas. The draft report was completed in November 2006. A second meeting was held with just the regulatory agencies in Little Rock, AR, in December 2006 to discuss their concerns and interests and to receive feedback on the draft report.

Benefits

The benefits of the project are better environmental protection while operating in sensitive environments. The decision tools developed through the project will allow operators to select locations within their leases and technologies that minimize environmental impacts while still allowing hydrocarbon production. Once the tool is demonstrated in the Fayetteville Shale formation, the concept can be transferred to other locations.

Background

ANL is a partner in a larger project awarded under NETL's Low Impact Natural Gas and Oil (LINGO) solicitation. The lead contractor is UA. The full project is titled Probabilistic Risk-Based Decision Support for Oil and Gas Exploration and Production Facilities in Sensitive Ecosystems.

Summary

Project activities began in October 2006. The project will develop a web-based decision support tool that will be used by mid-and small-sized oil and gas exploration and production companies as well as environmental regulators and other stakeholders to proactively minimize adverse ecosystem impacts associated with the recovery of oil and gas reserves in sensitive areas in the Arkansas region. This decision support tool will rely on creation of a database of existing E&P technologies that are known to have low ecosystem impact as the primary objective of Phase 1 of the project. The technology database will be coupled with a web-based geographic information system interface that will provide site-specific ecosystem risk analysis for E&P facility layouts as the primary deliverable of Phase 2 of the project. The decision support tool will include evaluation of risks to the ecosystem, including wildlife; risk posed beginning with road layout, including decisions regarding temporary vs. permanent roads; hazards associated with erosion and sediment runoff to surface waters; drill pad construction and placement and well spudding, as well as probabilistic reliability estimations of ecosystem damage and costs associated with accidental releases of produced fluids during the course of the active extraction; and abandonment and closure of the production site.

Current Status (July 2007)

Following the December 2006 meeting with regulators, ANL is waiting to receive comments on its draft regulatory summary. At that meeting we learned that the Arkansas Oil and Gas Commission was in the process of revising

and renumbering its full set of regulations. This means that the draft report will soon be outdated. ANL will wait until the Oil and Gas Commission completes the revisions before updating the regulatory report. A third meeting was held with just industry stakeholders in March 2007. A final version of the regulatory summary will be developed.

ANL will soon begin developing a summary of existing practices used by operators in the Fayetteville Shale area.

Funding

This project was selected under solicitation, DE-PS26-06NT15570, LINGO.

Project Start: October 1, 2006

Project End: September 30, 2008

Anticipated DOE Contribution: \$180,000

Performer Contribution: \$0 (0% of total)

Contact Information

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