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February 7, 2011

## Report details drilling damage to forest

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CHARLESTON, W.Va. -- A natural gas drilling operation in the Fernow Experimental Forest in Tucker County killed dozens of trees, damaged roads and eroded the land, according to a new U.S. Forest Service scientific report.

The report provides one of the most detailed glimpses so far of the potential impacts from the boom in West Virginia's natural gas industry, and offers potential lessons for policymakers and regulators trying to grapple with the growth in drilling.

"It sort of opened our eyes to the issues," said Thomas M. Schuler, an agency forester and one of the report's authors. "This is an issue that is affecting West Virginia, Pennsylvania, parts of the northeast and other parts of the country."

The 28-page report, released last month, documents the development and impacts of a relatively small natural gas well within the experimental forest, which is part of the Monongahela National Forest.

Berry Energy began work on what was called the B-800 project in 2007. The project involved a drilling pad, associated roads and a pipeline, with the right-of-way construction alone resulting in the cutting of more than 700 trees.

The well itself involved using water and chemicals to "fracture" rocks deep underground and release natural gas. But the site was not drilling into the Marcellus Shale, and involves much less "fracking fluid" than a Marcellus well, officials said.

But the company's plan involved using hydrochloric acid as one of its drilling fluids, and a drilling accident and the land disposal of used fracking fluids damaged the forest.

In May 2008, drilling fluids were sprayed into the air because of "a loss of control of the drill bore." Scientists found "browning of foliage and a lack of ground vegetation" and the leaves fell off many trees in the area, the new report said. The effects were still evident several months later, but trees showed "no noticeable symptoms" by the summer of 2009, the report said.

Forest Service scientists said the hydrochloric acid could have caused the damage, or high chlorides in the drilling fluids could have been responsible.

"Clearly, a better knowledge of the chemical makeup of the drilling and hydrofracking fluids is needed in order to understand and predict possible impacts on the resources," the report said.

Also, the company disposed of some of its used drilling fluids by spraying them onto the land in the forest, a practice that is generally legal for wells in West Virginia, but is not permitted for Marcellus operations. Nearly 100,000 gallons of the fluids were sprayed onto two sites at the Fernow.

At one of the spraying sites, nearly 150 trees were killed and ground vegetation was destroyed. At this site, the damage got worse a year after the spraying.

Forest Service scientists found "substantial damage to roads" during development of the well site, and also documented increased runoff from the site, especially when silt fences installed by the company failed or were overtopped by runoff.

The report did not examine whether drilling fluids ended up in groundwater or streams in the area, or provide any detailed information about potential impacts on sensitive caves in the area or to the wildlife in the forest.

Report authors included at least three Forest Service scientists, including Schuler, who had warned about potential impacts of the drilling on the caves and the endangered bats that live in them.

"This case study identifies some expected and unexpected impacts, which might be used to predict environmental effects of similar developments," the report said. "Our experiences can help inform both public and private land managers as to the range of possible outcomes from the development."

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