



Shell's Shale Plans...? (or Why I Am an Oil Shale Skeptic)

Posted by [Robert Rapier](#) on May 12, 2008 - 10:00am

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It isn't hard to see why I am an oil shale skeptic. I outlined my reasons in two essays on oil shale: "[Oil Shale Development Imminent](#)" and [Oil Shale = Cellulosic Ethanol](#).

In those essays, I provided some history of oil shale, discussed Shell's unique process, as well as the reasons those "trillions of barrels" remain elusive. But one of Shell's recent moves has raised some eyebrows, as they are in the process of buying up water rights in Colorado to process the shale.



Green River Formation: Trillions of Barrels of Oil?

First, a quick review on their process. Shell's process is *in situ* retorting, as explained [here](#):

Shell Oil is currently developing an *in situ* conversion process (ICP). The process involves heating underground oil shale, using electric heaters placed in deep vertical holes drilled through a section of oil shale. The volume of oil shale is heated over a period of two to three years, until it reaches 650–700 °F, at which point oil is released from the shale. The released product is gathered in collection wells positioned within the heated

zone.

Shell's current plan involves use of ground-freezing technology to establish an underground barrier called a "freeze wall" around the perimeter of the extraction zone. The freeze wall is created by pumping refrigerated fluid through a series of wells drilled around the extraction zone. The freeze wall prevents groundwater from entering the extraction zone, and keeps hydrocarbons and other products generated by the in-situ retorting from leaving the project perimeter.

It is very difficult for me to see how any company is going to make a go of it, given the need to simultaneously heat and freeze the ground for several years. However, as I was recently passing through the Denver Airport - I spotted this story in the Denver Post:

[Shell makes run on water](#)

Shale country tends to be dry country, and Shell's process uses a lot of water. Some excerpts from the story:

In its quest to melt oil out of western Colorado's shale, Royal Dutch Shell has been buying up land and water rights in anticipation of what is likely to be a thirsty new industry.

Some officials, however, worry that the demands of the oil-shale industry could drain every drop of the region's remaining water.

"On the upper end, we're looking at potentially several hundred thousand acre-feet of water — more than people think is commonly available to develop in the Colorado River," said Dan Birch, deputy general manager for the Colorado River Water Conservation District.

Shell and other energy companies have amassed tens of thousands of acres of cropland, ranches and open space — including a state wildlife area — to gain water that would be needed to power the oil-shale process.

Count me among those who thinks this is a bad idea. We are pulling down aquifers now; I hate to see us accelerate that process to produce oil from shale. The energy return is already going to be very marginal. If it was any better than that for tar sands, they would already be producing oil from shale. But now add the fact that they are going to be using up water in dry areas, and it looks to me like a losing proposition.

While the claims of the oil potential there are pretty huge, so are the water requirements:

The Bureau of Land Management estimates the shale formation in western Colorado could yield as much as 1.8 trillion barrels of oil.

Getting that oil, however, could require three times as much water to operate power plants, according to some estimates.

"The volumes are pretty enormous," said Bart Miller, water-program director for conservation group Western Resource Advocates.

"The net water requirements . . . were something in the neighborhood of 200,000 to 300,000 acre-feet annually," Miller said. "To put that in context, that's the consumption of about 2.5 million people."

A couple of things. First, there are also trillions of dollars of gold in the oceans. Just because a resource exists doesn't mean you can devise a cost-effective way to utilize it. Second, that 1.8 trillion is certainly not a net value. The net value is going to be far less, as it is going to take energy to process the oil. Even if the EROEI was 2 to 1, and I doubt it is, that would mean it would take almost a trillion barrels - all contributing more pollution to the environment - to process the 1.8 trillion barrels.

I remain skeptical. Oil shale, like cellulosic ethanol and algal biodiesel - has always been just around the corner from commercialization. I think it will remain around the corner. On the other hand, the people at Shell are buying up those water rights for a reason...



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