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Oil Shale Development Will Threaten Water Supplies
BLM & Industry Need to Make Full Water Impacts Public

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Conservationists warned of the potential impact of oil shale development on western Colorado's water resources and called on the energy industry to fully disclose to West Slope residents and governments how development will impact water supplies and water quality.

A commercial oil shale industry is projected to have a dramatic effect on Colorado's water supplies and potentially its water quality. Water requirements for traditional mining and surface retort oil shale development are well documented, but estimates for in-situ production, which is being proposed at five sites in the Piceance Basin of Colorado, haven't been made public. This water would have to come from a combination of Colorado's unused share of the Colorado River – if any remains – and from existing users such as the agricultural and ranching operations.

"Drought and population growth are already affecting valuable water supplies across the West, said David Atkins, an independent hydrologist with Watershed Environmental. Adding the substantial requirements for a commercial-scale oil shale industry to this mix might bring the region to the tipping point."

Producing oil from shale uses water on site both during and after production (to cleanse the production zone after the oil has been extracted). For example, Shell recently disclosed in a permit application for its small research and demonstration site that it will have to rinse its underground production area over 20 times, requiring up to 4 acre-feet each day for over two years and resulting in massive water disposal challenges.

A 2005 analysis by the RAND Corporation concluded that the Colorado River's main stem and several tributaries would be "highly impacted" regardless of which technologies for oil shale development are employed. A 2006 analysis by a Los Alamos researcher concluded that the White River could support a 500,000-barrel per day commercial operation *if* a 16,000 acre-ft reservoir is built in the watershed *and* extractions are limited to 70,000 acre-feet per year. However, the Bureau of Land Management envisions a one- to three-million barrel-per-day production level. The Los Alamos report calls for a regional assessment of the cumulative impact of the oil shale industry to water resources in the Colorado River Basin.

The water needed onsite for oil production is only part of the puzzle. Water is also required to produce the enormous amounts of electricity necessary to convert the kerogen in the rock into utilizable fuels. The new power production needs of a one million barrel-per-day operation would be about 150,000 acre-feet of water per year, according to the Los Alamos analysis.

Taking into account the water required for onsite production and offsite power generation, the commercial-scale oil shale production rate proposed could consume over 300,000 acre-feet of water per year. For comparison, this amount of water could supply the household needs for two cities the size of Denver.

Next week, the State of Colorado is expected to submit its comments on the preliminary draft Oil Shale and Tar Sands Leasing Programmatic Environmental Impact Statement (PEIS), a document that could determine the future of vast swaths of Colorado's West Slope. The State of Colorado, along with 13 other state and local governments, is a cooperating agency on the Programmatic EIS and was supposed to be a full partner in its preparation. On May 14, however, the BLM denied a request by Colorado Governor Ritter and Wyoming Governor Freudenthal for more time to review the seven-volume, 2000-page draft.

Advocates called on developers doing research and development to release specific numbers on their water needs. "This is critical information that we need to plan for our future and underscores why we need to be careful. We shouldn't rush into commercial development of oil shale until research and development projects prove it can be done with the water we have available, " said Cathy Kay, of Western Colorado Congress.

Oil shale development also poses a potentially serious threat to water quality. The process of transforming the kerogen in shale into oil leaves behind salts and numerous toxic, water-soluble chemicals that could leach into the groundwater that is the source of much of the region's surface water during the critical time when flow is lowest. Flushing these chemicals from the oil shale production zone, as several companies propose, would also create large volumes of highly saline water that will require further treatment. But like oil shale production itself, the technical feasibility of isolating and treating contaminated groundwater has not been demonstrated. The toxic chemicals left behind in the spent shale could potentially pollute important water sources including the Colorado River and some of its tributaries.

"These companies have rights to enormous amounts of water and that is a big concern of everybody, particularly in the Colorado and Yampa river basins," said Ken Neubecker, vice president of Colorado Trout Unlimited. "Were not opposed to energy development, but it has to be done responsibly. And that certainly includes protecting water quality."

In-situ production pilot tests conducted in the late 1970's demonstrated that the porosity and hydraulic conductivity of the retorted shale will increase following oil production. Thus there will be ample opportunity for salts and toxic substances to leach out and reach downstream water resources long after production has stopped. Contaminants in the underground water could take years to reach surface water, posing serious repercussions to senior and junior water rights holders in the White River basin and to Lower Colorado River Basin States.

The oil shale deposits of the Green River Basin lie in one of the country's most arid regions, one whose vulnerability to drought was laid bare in the past six years. The availability of new water to meet the needs of a commercial oil-shale industry is far from certain. Decisions made about oil shale leasing today could have ramifications for the next 400 years, the period of time that western oil shale resources are expected to provide a significant portion of our nation's energy needs.

"There needs to be a thorough understanding and public conversation about oil shale's total water demands and impacts on water quality," said Kay, of Western Colorado Congress. "And Colorado's West Slope needs to be included in the discussion about how water for oil shale development fits into regional water needs for local agricultural, recreation and community growth."

As part of the research, development, and demonstration process, the BLM must:

- Develop a comprehensive baseline flow and water quality data and monitoring network in the Piceance and White River Basins.
- Develop realistic estimates for the volume of water required for all phases of oil shale development and production.
- Develop reliable estimates of total water consumption for all components, direct and indirect, that are necessary for commercial development.
- Demonstrate effective treatment and discharge options for water recovered from retort zones.
- Quantify impacts on the quality of groundwater and surface water from oil-shale development.
- Evaluate sources for potential water supply and the legal implications for availability of water.

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