

State Corporation Commission CONSERVATION DIVISION Docket no.14-CONS-863-CUIC

Protestant's Pre-filed Direct Testimony: Roma and Ralph Earles (adjacent landowners) Address: 1780 N 300 Rd, Baldwin City, KS 66006

In the Matter of the Application of Altavista Energy, Inc., to authorize the injection of salt water into the Squirrel Formation at the Jim Bell Lease, Well No. AI-1, AI-2, AI-3, AI-4, AI-5, AI-6, AI-7, AI-8, AI-9, AI-10, AI-11, AI-12, AI-13, AI-14, AI-16, located in Douglas County, Kansas.

We, Roma and Ralph Earles, own 135 acres of woods, native prairie and hay meadows immediately adjacent (to the west) of the land with the wells listed in the docket referenced above. We manage the land for hay production for livestock (beef and horses), for foraging for our own food (primarily berries and mushrooms), for wildlife habitat and for recreation (fishing, hunting, swimming and trail hiking). Our 135 acre tract is protected from development (including minerals development) by a conservation easement with the Kansas Land Trust.

We have a number of major concerns regarding the proposed injection wells.

Conservation of water and protection of water from pollution have become major issues for Kansas and the nation. Though we enjoy a great deal more rain than much of the State our water resources are limited and deserve careful and studied protection. Altavista's application allows for use of water from wells (both oil wells from which "salt water" has been separated and wells drilled specifically to provide water) on the lease or a Rural Water tap. We object to the use of water from our Rural Water district for oil and gas production. We helped pay for the development of the district to serve farm homes and livestock, not for energy development. The use of potable water for injection wells cannot be justified and its availability should not be included in the application. Furthermore, injection of "salt water" separated from the oil extracted from wells includes a good number of chemical elements in addition to saline. In 1988 the oil and gas industry, with the help of Bill Bryson, then head of the Kansas Corporation Commission's Conservation Division, convinced the EPA to define all material resulting from the oil and gas drilling process as "non-hazardous" regardless of its content or toxicity. Mr. Bryson has said that it took a lot of talking to get the EPA to go along with that. Many large injections of this polluted water, which often contains benzene and other cancer causing chemicals, will eventually contaminate the relatively shallow water table in the area (either through cracked casings or seeping through rock and soil formations that have been rearranged by the injections). We have four ponds downstream from the proposed injection wells and want the water there to remain clean for swimming and fishing for healthy edible fish. We asked Larry Marchant, at the District Office of the KCC Conservation Division in Chanute, whether there had been any tests of the "salt water" being injected into the wells and he explained that since it was coming out of the Squirrel formation and going back into the same, that no tests had been made. We also asked about whether surrounding water wells and ponds had been tested for possible contamination from the injection wells. They have not.,

We are concerned about contamination of the soil that may occur from spilling around well heads, improper disposal of left over waste water (Mr. Marchant indicated that it is all injected back into the wells, but there have been anecdotal reports of dumping in roadside ditches), spilling around storage tanks and seepage from well casings and pipes that have developed flaws in their integrity. It is our understanding that these wells are to be tested for structural integrity every 5 years. A lot of damage could occur from leaking between tests even if all wells are tested on schedule. A ProPublica review of well records, case histories and government summaries of more than 220,000 well inspections revealed that structural failures inside injection wells are routine. "From late 2007 to late 2010, one well

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integrity violation was issued for every six deep injection wells examined—more than 17,000 violations nationally. More than 7,000 wells showed signs that their walls were leaking.”

A recent study published by the Journal “Science” looking at the connection between deep injection wells and increased earthquakes in Oklahoma was reported by the AP on July 4<sup>th</sup>. Though that study looked at injections many times deeper than proposed here, a couple of the conclusions of the lead author Cornell University seismologist Katie Keranen are applicable. According to the AP report, “researchers originally figured the water diffused through underground rocks slowly. But instead it is moving faster and farther and triggers quake fault lines that already were likely ready to move..You really don't need to raise the pressure a great deal.” The build up of fluid from the injections creates more pressure that has to go somewhere and does more than push additional oil in surrounding wells. Kansas has done well to establish the Induced Seismicity State Task Force in view of the more than 60 earthquakes that have been recorded in southern Kansas in the past year. Rex Buchanan, director of KGS and head of the task force, says “you've seen larger volumes of water than we've historically seen and some of these horizontal wells are extremely productive in terms of salt water. So in some locations we are putting more salt water back in the ground even from 10 years ago. That's one possible explanation, but again the jury's still out.” While the “jury's still out” it would be prudent not to increase the volume of “salt water” injections.

The proliferation of these wells –such as is being requested in this application—is changing the geology below the oil field in unpredictable ways that threaten soil and water. Stefan Finsterle, a leading hydrologist at Lawrence Berkley National Laboratory, who specializes in understanding the properties of rock layers and modeling how fluid flows through them, says, “There is no certainty at all in any of this, and whoever tells you the opposite is not telling you the truth...You have changed the system with pressure and temperature and fracturing, so you don't know how it will behave.”

It is our understanding from speaking to Alan Snider, Director of the KCC Conservation Division, on the phone that there are only about 40 people to monitor over 70,000 wells of all types in Kansas. They cannot possibly get around to examining more than a small percentage of the wells. ProPublica has reported that Kansas shut down at least 47 injection wells in 2010, filling them with cement and burying them, because their mechanical integrity could not be restored. Larry Marchant, at the District Office of KCC Conservation Division in Chanute, told us by phone that in 2013 the number of injection wells shut and plugged because of mechanical integrity failures was 167, mostly in wells 20-25 years old. Obviously, failures occur increasingly often and a considerable amount of fluids escape before the failures are repaired or shut and plugged. Mr. Marchant indicated that the Conservation Office relies on reports from the oil and gas industry and on the public to address any problems that occur between the mechanical integrity tests that are conducted every 5 years. He said that his office has 12 people to monitor wells in 32 counties. He acknowledged being “spread a little thin,” but assured us “I really honestly believe there are no real problems.” He did add, “There are no guarantees.” We discussed the fact that it may take some considerable time for any problems to become obvious from injections 820-830 feet below the oil field. We appreciated the frank straightforward answers to our questions from Mr. Snider and Mr. Marchant.

However, we are convinced that Kansas is ideally suited to lead the nation in the development of non-carbon, non-polluting energy from wind, solar and geo-thermal sources. We want to do our part to pass to future generations Kansas soil that is naturally fertile with few contaminants, water that is clean enough for fish and wildlife and easily made potable for human consumption and air that is constantly becoming more breathable because we are weaning ourselves from the fossil fuels that contribute so much to man-made climate change. Kansas has made amazing progress since the incentives for

development of alternative energies was passed by the legislature. It is time for a real transition away from the temporary carbon fuels to long term sustainable energy sources.

There are plenty of oil and gas wells in the Squirrel formation. It was disconcerting for us to learn that the 8 wells in this application have already been drilled. We strongly recommend that the application from Altavista Energy to drill additional wells and/or inject "salt water" into the wells (AI-1 through AI-14 and AI-16) on the Jim Bell lease be denied and that monitoring of the existing wells be conducted regularly.

References: ProPublica, June 21, 2012. "Injection Wells: The Poison Beneath Us"

AP, Lawrence Journal World, July 4, 2014. "Study shows how drilling wastewater causes quakes"

Jade DeGood, [jdegood@kwch.com](mailto:jdegood@kwch.com). Posted Apr. 16, 2014. "More earthquakes in Kansas"

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