

Groundwater Impact Statement II
Concerning the Proposed Ethanol Plant near Rogersville, MO
from the Webster County Groundwater Impact Committee
11/14/2006

The Webster County Groundwater Impact Committee was commissioned by the county commission to collect and assimilate data to evaluate the potential impact of an ethanol plant upon the area's groundwater supply, for public information and awareness. We have done that, but we also believe it is our responsibility to evaluate and comment on the accuracy and relevancy of other information given to the public on this issue for which we were commissioned to assist the public. Gulfstream Bioflex Energy (GBE), the company constructing the plant, has provided such information, and our objective here is to provide an objective analysis of their statements for our last report before terminating the committee.

First, it is important to review the committee's reasons for the conclusion that the plant's water extraction will likely have a significant negative impact on the accessibility of groundwater. It is important to note that this is not saying that the entire groundwater supply will be depleted. It is simply saying it is likely that some wells will be affected due to declining water tables, and it will likely be more difficult or costly to access groundwater for domestic use.

The basis for this conclusion is from two sources. One is the statement from hydrogeologist Jim Vandike, the groundwater section chief with MoDNR, Missouri's foremost expert on the subject. The second is based on the data assimilated for this study. There are four factors or premises for our conclusion.

1. Many of the water tables in the area within a ten mile radius are in rapid decline. In the last year alone, over five hundred pumps have been lowered and over 100 new wells drilled due to declining water tables, according to a recent well-driller's survey.
2. Typically, the predominant factor in declining water levels is the extraction of water from wells. The declining water levels correspond to and are in areas of rapid growth and increased water use.
3. The amount of water needed for an ethanol plant is comparable to an amount needed for a large percentage of the local population.
4. The water extracted for an ethanol plant will be from the same aquifer, water bearing bedrock formations, as for the private wells.

If these premises are accurate and are applicable to this specific site, it must follow that it is likely that the new high yield wells will significantly lower the water table. It needs to be noted that there could be some question concerning the applicability of factors one and two. Regarding factor one, the data showing the declining water tables is not necessarily for the exact spot of the new wells, but is in an area of similar topography and geological characteristics.

Regarding factor two, the source of the declining water tables could also include climatic conditions that also impact water tables to a certain degree, but water extraction clearly is a major factor during periods of climatic stress. Historically, increased water usage has been correlated to declining water tables even during non-drought periods. Some other areas outside the more populated areas are not experiencing dramatic changes in water tables, which would tend to indicate that increased water usage is the predominant cause.

Following are GBE's statements, **in bold text**, concerning the water impact of their plant in the order they have been provided, and our review of those statements.

1. **GBE stated their wells will not affect the domestic wells since they will case out the formations providing water for domestic use.** This is a common incorrect assumption that the individual formations within the Ozark Aquifer are separated, when in fact they comprise one aquifer. Hydrogeologists explain that this means one has to assume, in a specific location, extracting water from a lower formation will create a drawdown of water from the upper formations at some point.

2. **GBE stated in court they would drill below the Ozark Aquifer into the Davis Formation.** This would be ineffective since the Davis Formation does not produce any significant amount of water. DNR states it is not a significant aquifer and classifies it as a confining (restrictive) unit. It separates two aquifers, the Ozark Aquifer above and the St. Francois Aquifer below. The St. Francois Aquifer has a significant amount of water, but its production is not comparable to that of the Ozark Aquifer.

3. **GBE has cited the vast amount of water and the extensive area of the Ozark Aquifer,** apparently to show how their wells could not impact it. This gives the false impression and misconception that the aquifer is one continuous body of water that is evenly distributed throughout its extensive area. Hydrogeology is much more complex than that. The status of the aquifer in any one location is affected by its specific recharge area, geological variations, faults, geological fractures, water extraction, proximity to large losing streams and other factors.

For example, the Roubidoux Formation is the most prolific water producing formation for domestic wells, yet there are areas where the formation does not produce as well due to variations in bedrock characteristics, among other factors. In addition, there are locations in the Mansfield, Macomb and Norwood area in Wright County where this formation is dry. The fact that GBE is drilling a test well verifies that there are drastic variations in the groundwater status from one area to another; otherwise, why not rely on DNR's monitoring well at Marshfield.

GBE made the following statement, **"From the date GBE began drilling the test well, the Ozarks Aquifer water level in Webster County increased four feet"**. This statement gives the perception that the water level has increased throughout the county. That is a false perception. All one knows is that the water level has increased four feet in the Ozark Aquifer at the Marshfield monitoring well. Since the date GBE began drilling the test well, at least three residents within a ten mile radius of Rogersville, as reported by one well driller, have had water shortages, not because of the test well, but it illustrates that the water level has not risen throughout the area.

4. **GBE emphasized the high production of deep wells, including their own well,** extracting water from the most productive portions of the aquifer. But that does not address the main concern. The main concern is not depleting the total water supply, but rather the drawdown effect in a specific area of drastically declining water tables.

5. **GBE has stated that other deep wells are not impacting the aquifer.** However, there was no relevant data given to substantiate this claim. First, these wells, other than the Rogersville wells, are in different locations with different characteristics, thus they cannot provide relevant data. For example, the Marshfield wells are in a different geological setting, just outside the

Springfield Plateau region that Rogersville is in. These wells are in an area not limited by the presence of the confining Northview Shale Formation which restricts water flow into the Ozark Aquifer, as it does in the Rogersville area.

Secondly, there was not any monitoring data provided except to show that the water table has stabilized on three of the wells cited after initial drawdown. No information was given on the static water level before pumping was initiated or any data from monitoring wells regarding the impact of high yield wells before and after pumping began. **GBE stated their test well did not impact a nearby monitoring well.** That is a fair statement since there has not been any significant water removal yet. In fact, it could take up to two years, if ever, before the water table is stabilized under normal high-yield well pumping for the plant.

Third, residents in the proximity of deep municipal wells are usually supplied by those wells and not reliant upon domestic wells that could be impacted. In Greene County where there are domestic wells in the area of deep wells, it is not an uncommon occurrence for residents to report water shortages during periods of pumping.

Fourth, there has been no evidence provided that indicates the Rogersville wells are not a major contributor to the acute decline in groundwater levels southwest of the city.

GBE has not provided any information that has refuted, challenged or addressed even one of the factors or premises stated above for the justification of the committee's conclusion. As stated previously, there are slight possibilities for exceptions to our premises underlying our objective decision. However, as with most scientific decisions, as well as other critical decisions, one has to deal with probabilities, not possibilities. Therefore, the committee's conclusion remains unchanged in stating that the data indicates a high probability that these high-yield wells will negatively impact the degree of accessibility of groundwater for domestic use.

This conclusion is for a unique high elevation area on the watershed divide in the Springfield Plateau region that is already experiencing drastic declines in the accessibility of groundwater, resulting in higher cost, for the rapidly growing residential community.

This report, along with the well-drillers' survey, concerning the groundwater status of the Rogersville area, completes the committee's responsibilities. The Webster County Groundwater Impact Committee is officially terminated as of November 18, 2006.

Webster County Groundwater Impact Committee
Karen Asher, Chair
Larry Alberty, member
Joe Blaine, member
Joyce Noland, member
Bob Schultheis, technical adviser, non-voting member