

Subject: RE: EGR of Antrim gas in Michigan
From: Robert Warren Howarth <howarth@cornell.edu>
Date: 9/28/2020, 8:51 AM
To: Ellis Boal <ellisboal@voyager.net>, "Anthony R. Ingraffea" <ari1@cornell.edu>
CC: LuAnne Kozma <luannekozma@gmail.com>

Hi Ellis --

We need to be moving away from all use of fossil fuels ASAP, so this project seems to me to be very much moving in the wrong direction....

Keep up the good fight,

Bob Howarth

Robert W. Howarth, Ph.D.

The David R. Atkinson Professor of
Ecology & Environmental Biology
Chair, the University Assembly
Cornell University, Ithaca, NY USA

<http://www.eeb.cornell.edu/howarth/>

From: Ellis Boal [ellisboal@voyager.net]
Sent: Saturday, September 26, 2020 21:55
To: Anthony R. Ingraffea; Robert Warren Howarth
Cc: LuAnne Kozma
Subject: EGR of Antrim gas in Michigan

Tony, Robert,

Hope you are both well in these perilous times.

You may recall my wife LuAnne Kozma and I corresponded with you in 2016 and previous regarding frack activities in Michigan.

LuAnne leads a statewide ballot initiative here which collected 271,000 voter signatures for a ban of horizontal fracking and waste, reversal of the state's 1930s-era policy requiring our oil-gas regulators to "foster" the oil-gas industry "favorably" and "maximize" oil-gas production, and replacement with a requirement that regulators protect "climate," which they now have no obligation to even try to protect.

We turned in the signatures two years ago. We have sued five times, with interim success at one point, and still are litigating whether the initiative will actually go on the ballot in 2022.

Tony helped us with the wording of the initiative, finalized in 2015. The ballot language is here: https://www.letsbanfracking.org/ballot_language<<https://www.letsbanfracking.org/lawsuit>>

I wrote a piece two years ago exhaustively detailing the history of oil-gas regulation in

Michigan and the climate implications of the initiative: <http://banmichiganfracking.org/?p=4875> .

Anyway we thought you might be able to help with the following, or if not, direct us to someone more knowledgeable.

Riverside Energy, a Texas company with offices in Michigan, got state approval the other day for a pilot CO2-injection enhanced gas recovery operation in the Antrim shale of northern lower Michigan not far where we live.

The Antrim was one of the first economic shale-gas plays in the US and has been actively developed since the 1980s. The shale is biogenic. After decades of production, Antrim wells are far down the decline curve. Over that time, the CO2 percentage in produced gas has increased.

Injection would start at two wells, for which I could get and send you detailed descriptions.

Because a significant amount of CO2 currently accompanies the methane coming out of Antrim wells, Riverside has a processing plant nearby which separates them, pipes the methane away to market, and vents the CO2 to the atmosphere. It plans to re-engineer that plant so as to capture, compress, dehydrate, and recycle the CO2 for injection. Below, the rock will adsorb and sequester it, and release methane in its place.

I attach Riverside's petition, verified statement, and the order. The verified statement is by an engineer, and includes two articles from reliable institutions on which the approval order relied.

Riverside has also applied for an EPA permit. I have a request in for those documents.

Riverside has been the largest gas producer in the state for two years now. It owns 4300+ Antrim wells. Publicity materials say this project "will provide proof of concept for a technical and commercial success ultimately paving the way for application to potentially all 10,000+ Antrim Shale wells."

Because the Antrim is naturally highly fractured, fracking there has tended to be vertical or low-volume horizontal, so even if successful our initiative's "ban" language might not stop this project.

But we wonder if the climate-protection language might. True, injection of CO2 would seem to benefit climate. But Riverside forecasts this small "proof-of-concept" project will result in incremental recovery of 3.1 to 7.7 billion cubic feet of gas (and add gross revenue of about \$5.5 million).

I would think that at least some -- and maybe a significant fraction -- of the recycled CO2 would end up being leaked to the atmosphere despite Riverside's best efforts. But suppose not.

Question: If the project succeeds and is then applied successfully to 10,000 wells which were otherwise about to play out -- such that US methane production were multiplied exponentially to leak from pipelines or burn at power plants around the world -- would that offset the climate benefit of CO2 sequestration?

After all, as your writings have shown, in the 20-year short term methane is far more destructive to climate than CO2.

The other day our governor issued a directive calling for a "carbon neutral" state by 2050. https://www.michigan.gov/whitmer/0,9309,7-387-90499_90704-540278--,00.html .

Does this sound like part of a carbon neutrality plan? Is "carbon neutrality" even the

right approach? Thanks for your thoughts.

Ellis Boal, 231-547-2626

LuAnne Kozma, 231-547-2828

— Attachments: —

Howarth Chapter 7 -- Methane and climate change -- FINAL.pdf

635 KB