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These [notes] COMMENTS are written AND SUBMITTED after closely examining Chapters 4, 5 and Summaries of Chapter 6 of the Revised Draft Supplemental Generic Environmental Impact Statement (RDSGEIS). I regret to preface my comments with the impression that this document seems to be dishonest because it clearly states 90% of 'natural' gas drilling in New York state will be horizontal hydraulic fracturing (HVHFF). Yet approximately 90% of these chapters discuss vertical drilling. Why is HVHFF getting short shrift even if there has only been fifteen years of experience with this process in New York; surely there is more information that should be available. In addition calculation of the maximum amount of water used for multiple stages was reduced by three million gallons (RDSGEIS Ch5 pp.5-93). There is also the woefully inadequate list of products used in this process, when there are almost one thousand items that may be used. This RDSGEIS is seriously flawed when substantive data is left out or erroneous.

CHAPTER 4

Geology

The chapter states "the geologic history has periods of uplift, pressure, volcanoes, erosion and glacial ice therefore the variation and location of types of strata are unpredictable" also "rocks on opposing sides have been displaced." Turning solid rock into shifting sands by high pressure blasting to release 'natural' gas is a formula for displacing rock. You indicate there may be buried faults in NY and stated; "Bedrock consists of sedimentary rocks that include shales, siltstones, sandstones, evaporates and limestones in layers which varies in thickness, porosity and depth." Taking into account the many periods of thrusting, continental collisions and glacial activity in the region, it seems likely that HVHFF is a good way of discovering hidden faults which may end with bad results since little is known of its effect on surrounding rock fissures. Also HVHFF will be on multi-well pads which extend out laterally to connect the wells underground "Use of longer lateral well bores is another potential method for developing larger areas". Another quote: "methods of inducing seismic waves range from manually

striking the ground with weight, to setting off controlled blasts – short-duration, controlled injection used for hydraulic fracturing so earthquakes can be caused by other human activities of which hydraulic fracturing is definitively suspect”. It is with increasing certainty that HVHFF has been linked to serious seismic activity, so much so, that studies are underway by the US Geological Society. Additionally fractures can form in unforeseen orientation and direction with HVHFF, as methods for limiting fracture growth are not completely understood. Refracturing can often extend the fracture length beyond the original fracture height and length. Therefore, given the unforeseeable seismic consequences of hydraulic blasting, the precautionary principle should be applied prior to any decision in regard to blasting.

The claims made re water contamination by methane, chemicals used in HVHFF, wastewater, accidents and pipelines are so serious that no drilling permits should be considered in NY. Water courses here are extensive and contiguous. The problems the state already faces with multiple serious rainstorm and snowstorm events are a limiting factor when considering HVHFF since “The total amount of fracturing additives and water used in hydraulic fracturing of horizontal wells is considerably larger than for traditional vertical wells. This suggests the potential environmental consequences of an upset condition could be proportionally larger for horizontal well drilling and fracturing operations.” Multi-well pads are considered to have less environmental impact and are therefore favored by the Department of Environmental Conservation (DEC). However, all industry decisions are based on cost effectiveness with very little or no environmental consideration; “Materials and techniques are constantly evolving to increase efficiency of the fracturing process and increase reservoir production”. The corporations claim that their reuse wastewater is their contribution to helping the environment. In addition, the DEC is taking into account only surface disturbance when there is massive destruction taking place underground.

The argument has been made that fluid and methane do not migrate through the layers of rock to the surface so do not contaminate ground or surface waters. However it fails to mention the wellbore that could open up a clear pathway. Cement is the sealant, the nature of which is to crack on cooling and erode over time. Besides, the exploding rock in the HVHFF process creates mini earthquakes that displaces the flexible pipes so that methane and fluid will flow through to the surface. “The steel casings used in modern wells are flexible and are designed to deform to prevent rupture”.

CHAPTER 5

Water Withdrawal

“Total daily freshwater withdrawal in NY has been estimated at approx 10.3 billion gallons. This equates to an annual total of about 3.8 trillion gallons. Based on this calculation at peak activity HVHHF would result in increased demand for fresh water in NY of 0.24%”. This water will be permanently removed from the fresh water supply peak with HVHHF activity lasting ten years at best. What would decisionmakers consider as enough economic support to the state that could justify the permanent loss of 38 trillion gallons of water from our limited finite supply? We need to take a good look at the potential negative effects on stream flow, fish and aquatic organisms, surface and groundwater depletion, water quality degradation, wetland hydrology and habitat, loss of aquifer storage due to compaction, changes in water quality and quantity, endangered, rare or threatened species, water withdrawal infrastructure, existing water users and the reliability of their supplies – need I go on? It is not a question of whether there will be a catastrophic event, but when, with a projected 40,000 wells.

Stormwater

NY is currently in the process of complying with the new stormwater regulations in which runoff from construction sites are further restricted, while having record storms which has devastated infrastructure and many communities. It is likely that these storms could possibly create conditions for HVHHF problematic events not only during drilling activity but after, when the wells are sealed off. In addition to the possibility of spills and construction accidents, flowback water and escaping methane is already contaminating the land, air and water so in storm events, damage is expected to multiply.

Waste

It is incomprehensible why HVHHF waste is not considered hazardous and treated as such. The excessive number of chemicals, toxic and carcinogenic compounds that make up the fracking fluid, plus the combinations formed warrant this designation. When NORM concentrations are added as well as microbial pathogens from underground, there needs to be a change from HVHHF waste being termed industrial.

“The problem with radioactive materials in shale is that they become concentrated during the gas extraction process – into levels that are hazardous to human health. Radon has to be removed from the raw gas – or it will end up in the propane extracted from the gas. If it is flared, it is heavier than air, so it sinks around the gas processing plants. Radium comes back from the frack

flowback in solution – meaning it cannot be removed by simple filtration. If it is removed by processing, the remaining sludge is highly radioactive – and difficult to dispose of safely”. James Northrup

Sludge, solids, and brine are also of concern for disposal because of the large volume and lack of treatment plants.

Fragmentation

Most lands being considered for HVHFF in NY is forested so the construction of wellpads create openings and edge habitat where many invasive species thrive. “While fragmentation of all habitats is of conservation concern, the fragmentation of grassland and interior forest habitats are of utmost concern in NY”, “human actions - both intentional and accidental – are the primary means invasive species introductions to new ecosystems”

Invasive species may be introduced through machinery for clearing the land that inadvertently remove the plants and later discharge them to another area on their tires; fill used on road construction can introduce invasive plants contained in the material; the withdrawal, transport and use of water is also a vehicle for the introduction of invasives. These problems and the high noise created, give additional stresses to all plant and animal wildlife but especially to endangered and threatened species.

The DEC is charged with sustainable use of natural resources for recreational and educational uses and industrial uses must be prohibited if they interfere with those obligations. Protection of open space is a DEC ‘high priority’ and destruction by HVHFF can be considered illegal and unconstitutional because loss of forest means loss of their abilities to purify the air and water. Vapors from compressor stations and condensate tanks, truck and machinery emissions as well as flaring and venting, add particulates and pollutants, further endangering the environment leading to loss of its innumerable benefits for life support.

Conclusion

Much is said about mitigation and regulation but since consumption of fossil fuels are on the brink of extinction, shouldn’t our efforts be about preservation, conservation and prevention.

“One of the mitigation “measures” noted by industry in their Information Report, at least for NOx emissions, is to allow for the “natural” fleet turnover of the EPA tiers as these requirements would “kick-in” over time. This suggestion is not an acceptable scheme.”

Nothing in this RDSGEIS gives the cumulative effect of environmental pollution, human health effects of chemicals used, reduced availability of water or waste elements of toxic produced and flowback fluids. 'Natural' gas has been presented as a transition fuel; however, reserves are over-estimated by as much as 100% and would be expected to cover today's consumption for approximately 7-10 years. There is clearly more risk in the shale plays than is worth the investment. Economic resources would be better invested in renewable energy.

"Compared to their peer counties in the West, energy focusing (EF) counties saw a decline in personal income, employment, and population, and a rise in average earnings per job and per capita income from 1990 to 2005. This means that relative to their peers, EF counties underperformed in terms of growth and real personal income, employment and population. in this economy there is no guarantee that counties that develop fossil fuel reserves have any significant advantage over those counties without those resources". Quoted from a report from Headwaters Economics, Bozeman, Montana, September 2008 – 'Fossil Fuel Extraction as a County Economic Development Strategy.'

All viable scientific and economic studies point to the inevitable destruction of our natural resources and community character due to HVHFF. It should be obvious that no more time, effort and resources should be placed into this type of an industry.

Respectfully submitted,

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