

August 3, 2017

**VIA FEDERAL EXPRESS**

Ms. Linda Collart  
Regional Mineral Resources Supervisor  
New York State Department of Environmental Conservation  
Division of Mineral Resources, Region 8  
6274 East Avon-Lima Road  
Avon, New York 14414-9516

Re: NOTICE OF INCOMPLETE APPLICATIONS  
Tioga Energy Partners, LLC Well Drilling Permit Applications  
Snyder E 1 (API 31-107-30000-00-00)  
Snyder E 1-A (API 31-107-30000-01-00)

Dear Ms. Collart:

This office represents Tioga Energy Partners, LLC ("TEP"). Attached to this letter is a complete response to the Notice of Incomplete Applications ("NOIAs") referenced above. For ease of review, the attached NOIA response sets forth each comment provided by the Department, followed by TEP's response with references to applicable attached exhibits.

In addition to the specific technical information contained in the attached response, and based upon both TEP's standard operating procedures and consideration of the Department's comments, set forth below is a summary of safety and environmental protection measures that have been incorporated into the project as part of TEP's continuing efforts to eliminate or minimize potential environmental impacts.

**Project Summary**

This waterless hydraulic fracturing ("WLHF") project is located in the Town of Barton, Tioga County, New York. The spacing unit for the project is approximately 53.86 acres and is made up of unoccupied property owned by the Snyder Farm Group, a group of five longtime Tioga County farm families.

The project includes: (1) the drilling and completion of a stratigraphic test well (Snyder E1); (2) the plugback of the E1 well; (3) the drilling of a horizontal well (Snyder E1-A) in the Marcellus

shale; and, (4) the completion of the Snyder E1-A well utilizing liquefied petroleum gas (“LPG”), a WLHF technology (the “Project”). The proposed construction time is approximately 106 days; including 2 days for rig up/down, 17 days of vertical drilling for the Snyder E1 well, 2 days for plugback, 8 days for horizontal drilling of the Snyder E1-A well, 11 days of well completion (during daylight hours only) and approximately 66 days for flowback.

LPG technology was analyzed in the alternatives section of the Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program dated May 2015 (“2015 FSGEIS”). See 2015 FSGEIS at 9-9 to 9-10. The 2015 FSGEIS<sup>1</sup> describes a number of environmental benefits from utilizing this technology. For example, use of LPG instead of water eliminates the need to acquire and transport water. LPG is inert and does not react with or dissolve the minerals and salts in the rock; this also prevents the transportation of minerals, salts or naturally occurring radioactive material (“NORM”) to the surface. In addition, the use of LPG instead of water results in a reduction in the number of additives used for fracturing as compared to high volume hydraulic fracturing (“HVHF”). LPG is a better carrier of proppant due to the higher viscosity of propane gel, and once fracturing is complete the LPG returns to a gaseous state, leaving only the proppant in the fractures while the gas returns to the surface and is collected and recycled. WLHF also inhibits the formation damage which can occur during hydraulic fracturing with conventional fluids.

The LPG technology proposed for the Project is a patented system carried out in a closed loop system with no exposure to the atmosphere. WLHF has never caused ground or surface water contamination, nor induced felt (i.e. >3.0 on the Richter Scale) seismicity.

### **Environmental and Public Safety Protections and Safeguards**

- 1) **Siting and Potential Receptors** - The Project meets or exceeds all of the 1992 GEIS well siting requirements. The proposed well is located in a remote rural area with no non-owner occupied residences, water wells or sensitive environmental receptors within ½ a mile (approximately 2,700 feet) of the proposed WLHF operation, except for the Snyder farm pond located approximately 750 feet west of the proposed surface location.
- 2) **Health and Safety** - Onsite worker and public health and safety issues associated with the use of propane to stimulate the well have been extensively addressed in TEP's *Emergency Response Plan for Well Site Construction, Drilling and Completion Operations, including Hydraulic Fracturing and Flowback Operations* dated May 2017. This plan is comprehensive and includes, but is not limited to: emergency notification and reporting requirements; a listing and timing of pre-stimulation notifications; details regarding the use of monitoring equipment to detect gas leaks during stimulation; a description of employee training; identification of hazards

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<sup>1</sup> It is noted that the 2015 FSGEIS specifies that applications that “propose the use of LPG as the primary carrier fluid will be reviewed and permitted pursuant to the 1992 GEIS and Findings Statement.” *Id.* at page 9-10.

and description of accident prevention procedures; details of response equipment that will be onsite; implementation plans for initial response actions for various emergencies; and onsite security measures.

Since 2008 when the first WLHF operation was performed in Canada, the technology has been used to successfully treat more than 2,600 zones at over 800 well sites in North America with just one attributable accident. The single incident involved GasFrac employees who did not follow established procedures. In this incident, after a leak from a pump had been detected by the on-site lower explosive limit (“LEL”) monitors, emergency shutdown procedures were implemented. Three GasFrac employees failed to proceed to the safe muster point as required. When these employees moved toward the pump; a fire occurred and some suffered burns. GasFrac immediately suspended operations until a thorough investigation had been completed. Based on the findings of the investigation, Gasfrac increased the number of LELs it used on site so that nearly every piece of equipment has its own LEL monitor and instituted the use of infrared cameras as part of its safety program. In addition, a “hot zone” was established with a zero tolerance policy on entering the hot zone during fracturing operations. Since these protocols and changes were implemented five years ago, there have been no incidents related to the GasFrac process. These same safety measures and protocols will be required and used in TEP's WLHF operation, regardless of the contractor or TEP personnel selected to perform the WLHF operation.

With respect to hydraulic fracturing additives and their chemical constituents proposed for use in the stimulation operation, hydraulic fracturing using liquid propane requires only three additives, which is far fewer than the HVHF technology reviewed in the 2015 FSGEIS. These additives will be properly managed to avoid spills, including arrival and storage in closed trailers with secondary containment. The entire WLHF process will be conducted via a closed system which significantly reduces the potential for water or air impacts. All information regarding the chemical constituents of the WLHF treatment to be used for the project have been provided to the Department and TEP did not request any confidential treatment of such information. Further, only a portion of the approximately 671,500 gallons of propane that will be used for hydraulic fracturing will be stored on-site at any given time. Because the hydraulic fracturing is performed in multiple stages, the maximum volume of propane that will be on location at any given time will be approximately 170,000 gallons, including any delivery trucks which may be waiting to offload propane. As noted above, the WLHF and flowback operations will be approximately 2,700 feet from any receptors, including publicly traveled roads.

- 3) Noise, Odors, and Emissions** - Noise, odors, and emissions have been addressed in the application documents and reviewed by the Department. These potential impacts are temporary, construction type impacts of limited duration. Some noise will be associated with trucks and onsite equipment operating at the site for the length of time that the WLHF operations and flowback are ongoing. The estimated total time frame for these operations is 66

days. The stimulation operations (i.e., propane pumping) will be conducted only during daylight hours for a total of approximately 5 days over the 11-day well completion period, which is when the highest level of the noise generating operations will be conducted.

A natural gas/LP-powered refrigeration unit which will run for the duration of the approximately 66-day flowback phase. There are no odors anticipated from the stimulation and flowback operations that would occur routinely (i.e., that would last for more than one hour per day). Emissions would only be associated with trucks delivering or removing materials, heavy equipment operation, limited duration flaring during equipment purging of propane at the end of each day during hydraulic fracturing (i.e., approximately one two-hour event per day for approximately five days), and power generation at the site during stimulation and refrigeration unit and line heater operation during the flowback phase. Emissions from trucks, equipment and flare would be of temporary, limited duration, during the 66-day time frame for the flowback operations. The majority of trucks and equipment will be onsite along with the minor flaring events during the 11-day stimulation period. As stated above, the operations will be conducted in a remote area with no residences or sensitive environmental receptors nearby.

- 4) Ground and Surface Waters** - Potential for groundwater or surface water contamination has been addressed in the application documents and measures proposed by the applicant, and is summarized as follows:
- a) Pre-drilling and post-drilling/stimulation monitoring will be conducted by the operator to evaluate water quality in nearby residential water wells, and the farm pond which is approximately 750 feet from the proposed well location. Data on the depth of wells will be collected and recorded, where available. All monitoring information and data would be available to the Department upon request.
  - b) As noted in the NOIA response, the site has coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity and a Stormwater Pollution Prevention Plan (SWPPP) has been prepared to address any potential for impacts associated with offsite runoff and erosion.
  - c) The well site is not located over or adjacent to any Primary or Principal Aquifer as designated by the Department's Division of Water. The well site is in the Clinton Street Ballpark Sole Source Aquifer (SSA) which is mapped as all of Tioga and Broome Counties. SSAs are designated by the US Environmental Protection Agency (EPA) as the sole or main source of drinking water for a community, under provisions of the Federal Safe Drinking Water Act. The designations are made in response to a petition from the locality, and after public hearing. The designation would only require EPA review of a project that will receive federal financial assistance so it is not applicable to this Project. Further, NYSDEC DOW TOGS 2.1.3 Primary and Principal Aquifer Determinations states that

“[a]t the present time, the programmatic implications of Sole Source designation are limited. The principal benefit is symbolic, in drawing attention to the aquifer” and that there is no direct technical relationship between the designation of “Sole Source” aquifers and determinations of Primary and Principal Aquifers.

- d) The well will be constructed with multiple cemented casing strings, including surface, intermediate and production casing strings, to ensure that any fresh water bearing zones are isolated from the propane that is to be injected into the production casing. Centralizers will be used on the casing strings to ensure centering of the casing in the hole and circulation of cement. The surface casing will be set prior to encountering measurable quantities of naturally occurring shallow gas, in accordance with the Division of Mineral Resources’ (“DMN”) Casing and Cementing Practices. Nevertheless, a gas block cementing additive will be used for surface casing cementing to prevent potential cement channeling due to any naturally-occurring biogenic gas. Further, a cement bond evaluation will be performed on the intermediate and production casing strings to ensure that adequate zonal isolation exists to prevent movement of fluids, including gases between zones.
- e) As enhanced mitigation, the well will be drilled with a closed-loop tank system without the use of any lined pits.
- f) There is approximately 2,800 feet of cap rock forming vertical separation between the top of the target production zone and groundwater along the entire length of the horizontal wellbore.
- g) The production casing will be tested with drilling mud, brine or fresh water to a pressure of at least the maximum anticipated WLHF pressure prior to the introduction of propane into the well. High-pressure wellheads will be used for WLHF operations and the flowback phase to ensure control of the well and containment of injected and recovered propane.
- h) Chemical additives for WLHF operations will arrive and be stored onsite in self-contained, covered trailers until they are dispensed directly into the blender unit. These trailers also serve as secondary containment with a drip-proof containment system.
- i) Within the area comprised by the proposed 53.86 acre spacing unit and within a two-mile radius of the well’s location, the Department’s oil and gas searchable database was evaluated for other regulated wells, including abandoned wells. No wells were found within one mile of the well location. As such, there are no other wellbores of record which intercept the target production zone or otherwise could provide a conduit to fresh groundwater.

- j) WLHF and flowback operations will be immediately shutdown should a non-routine incident occur or an anomalous condition including a pressure and/or flow condition be encountered. Additionally, TEP would be required to provide oral notification to the Department within two hours of the incident, followed by the filing of a Non-Routine Incident Report (form available at <http://www.dec.ny.gov/energy/4761.html>) within twenty-four hours of the incident. The Department would have to review and approve any Corrective Action Plan (CAP) proposed by TEP prior to the recommencement of activity.
- k) Following WLHF operations, the well will be flowed back creating a pressure sink toward the well. Virtually all injected propane will be recovered during the flowback phase and production of the well.
- 5) **Transportation** – Overall, the traffic generated by the Project is approximately 77% less than that anticipated for a high volume hydraulic fracturing (“HVHF”) well<sup>2</sup>. This is largely due to the WLHF process, which does not utilize water and which requires fewer additives. Traffic will consist of 10 to 15 truck trips per day delivering propane to the site during the 11-day stimulation time frame and averaging one truck trip per day (with a maximum of 4 truck trips per day) removing propane from the site for the approximately 66 days required to flow back the well. There will be approximately 25 additional truck trips associated with bringing equipment, sand, and other additives for the stimulation operations. Propane is transported in the same type of trucks that routinely deliver propane to commercial customers and deliveries will be made during daylight hours only. Access to the well site is from Hamilton Valley Road which is maintained by Tioga County. Tioga County has indicated that the proposed propane delivery truck traffic will not impact the county road. The propane supplier, Mirabito Energy Products, is a local business. The route that the propane trucks will use include only state and county roadways.
- 6) **Historic and Archeological Cultural Resources** - The Project will have no impact on archaeological and/or historic resources listed in or eligible for the New York State and National Registers of Historic Places as determined by the New York State Office of Parks, Recreation and Historic Preservation (“OPRHP”) in their letter dated July 30, 2015.
- 7) **Rare or Significant Natural Communities** - There are no rare or significant natural communities located at or near the proposed well location as determined by the New York Natural Heritage Program in their letter dated August 31, 2015. With respect to the Endangered Species Act of 1973, the United States Department of the Interior Fish and Wildlife Service made an October 20, 2015 determination of No Effect and/or No Impact.

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<sup>2</sup> See, FSGEIS Table 6.60

- 8) **Critical Environmental Areas** - There are no areas near the proposed well location that have been designated by a state or local agency as having exceptional or unique environmental characteristics.
- 9) **Agricultural Land Resources** - The Project will have no impact on agricultural land. The site of the Project is a pre-existing well pad and access road. No additional land disturbance will be required for the Project.
- 10) **Waste Disposal** - Waste generation and disposal is addressed in the application documents. There should be little if any waste generated from the WLHF operation. The recovered propane during flowback is suitable for reuse in residential, commercial, or industrial applications. It is anticipated that 92% of the propane used during stimulation will be recovered within 66 days and the remaining percentage will be mixed with natural gas and produced. It is unlikely that any significant amount of waste water will be generated during flowback since no water will be used in the stimulation operation. Solid waste generated may include drill cuttings/mud, small amounts of sand and non free-phase formation water (i.e., not free liquid) produced during the flowback operation that would be disposed of at a facility permitted to accept this waste. The facilities identified by TEP for this waste disposal are the Casella Waste Services' ("CWS") New York Chemung County and Hyland Landfills, respectively. Correspondence from CWS dated October 1, 2015 confirms its ability and willingness to accept these generated wastes from TEP. While free-phase flowback wastes and production brine are not anticipated by TEP, a second letter submitted by TEP from CWS dated October 1, 2015 identifies the McKean County Landfill in Pennsylvania as the disposal location for these potential wastes.
- 11) **Visual Impacts** - Any visual impacts associated with the WLHF and recovery of propane during the associated flowback phase would be temporary and of limited duration. The closest residence is downhill and approximately 2,700 ft. from the well location and the well pad is screened from view by trees and intervening topography.
- 12) **Project Support** – As previously provided to the Department, support for the Project is reflected by Resolutions from a) Town of Barton, New York, dated July 13, 2015, b) Tioga County, New York dated August 11, 2015 (Resolution No. 196-15), c) Town of Chemung, New York dated August 26, 2015 (Resolution 2015-073) and d) Town of Spencer, New York dated September 28, 2015 (Resolution 3). It is also noted that no local approvals are required for the Project.

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TEP's complete response to the NOIAs is attached. TEP appreciates the Department's time and consideration of these applications. Please feel free to contact me should you have any questions or need anything further.

Very truly yours,

COUCH WHITE, LLP



Adam J. Schultz

AJS/elb  
Attachments

cc: Carrie W. Friello, Chief Oil & Gas Regulation Section  
Jennifer Maglienti, Counsel