



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

STATEMENT OF BASIS

FOR

U. S. EPA's UNDERGROUND INJECTION CONTROL (UIC) PROGRAM  
DRAFT CLASS IID PERMIT NUMBER PAS2D020BCLE

FOR

Windfall Oil and Gas Inc.  
63 Hill Street  
Falls Creek, Pennsylvania 15840

FOR

A project consisting of one Class II-D injection well, the Zellman #1, used for the disposal of fluids produced in association with oil and gas production operations. The proposed well will be located in:

Brady Township  
Clearfield County, Pennsylvania  
Latitude 41°04'55.00" Longitude -78°44'48.95"

On April 11, 2012, Windfall Oil and Gas Inc. (Windfall) submitted a UIC permit application for the construction and operation of the above referenced injection well. EPA has reviewed this application, as well as subsequent submittals of additional information, and has found the application to be acceptable.

The draft permit specifies conditions for construction, operation, monitoring, reporting, and plugging and abandonment, which are specified so as to prevent the movement of fluids into an Underground Source of Drinking Water. General provisions for EPA UIC permit requirements are found at 40 CFR Parts 144 and 146. In addition, permit conditions specific to this project, are as follows:

**Area of Review:** This is an area surrounding the project or a well which the applicant must, first research, and then develop a program for corrective action to address any wells which penetrate the injection zone and which may provide conduits for fluid migration. Windfall has chosen a one-quarter mile fixed radius as the Area of Review around the proposed injection well and has provided documentation on the well population within the one-quarter mile Area of Review. To



determine whether the one-quarter mile fixed radius was acceptable, EPA conducted a zone of endangering influence (ZEI) calculation using geologic and operational parameters provided in the permit application. The ZEI calculation confirmed that the one-quarter mile fixed radius chosen by Windfall was acceptable. To determine the existence of wells located in the Area of Review, Windfall conducted research of Pennsylvania Department of Environmental Protection Bureau of Oil and Gas well records, conducted a field survey of the area, and made contact with local surface owners. No wells were found which penetrate the injection zone within this Area of Review. Windfall did locate one shallower oil and gas production well within the one-quarter mile Area of Review. This well will have no influence over the injection operation since it penetrates a shallower geologic formation. If any other well, which penetrates the injection zone, is located at a future date, corrective action will be performed on that well in the form of plugging and abandonment.

**Underground Sources of Drinking Water (USDWs):** USDWs are defined by the UIC regulations as aquifers or portions thereof which contain waters that have 10,000 parts per million or less of Total Dissolved Solids and which are being or could be used as a source of drinking water. The permittee has identified the lowermost USDW's depth to be approximately 800 feet below surface elevation. The geologic name of this formation is the Mississippian Pocono Formation. The proposed construction of the injection well will meet the regulatory criteria of 40 CFR §146.22. This well will have a ground water protective string of casing run from the surface to approximately 170 feet and cemented back to the surface as well as surface casing run from the surface to approximately 1000 feet and cemented back to the surface. The regulations require that surface casing be placed to at least 50 feet below the lowermost USDW and cemented back to the surface. **Note: A second water protective string of casing will also be run from the surface to approximately 375 feet and cemented back to the surface. Therefore, in addition to the surface casing required by the UIC program, this well design will provide two additional casing strings to protect ground water resources.**

**Injection and Confining Zones:** Injection of fluids for disposal is limited by the permit to the Huntersville Chert/Oriskany Formation in the interval between approximately 7300 feet through 7387 feet. This injection zone is separated from the lowermost USDW by an interval of approximately 6500 feet, while the confining zone, immediately adjacent to the injection zone, is comprised of approximately 50 feet of limestone.

**Geologic and Seismic Review:** The permittee submitted, and EPA Region III has also obtained, geologic information of public record which indicates the possible presence of several faults within one-quarter mile of the injection well site. These faults are documented as basement faults, meaning they originate in Precambrian, crystalline bedrock. The Precambrian rock is located at a depth of approximately 16,500 feet at the proposed Windfall injection well site. Because these faults are not exposed at the surface they are inferred from various types of geophysical imagery. The depth of the proposed injection well is approximately 7300 feet, so if these faults exist, they originate approximately 9200 feet below the proposed injection zone. The review of historic seismic events, from 1938 to the present, from seismometers located in the

vicinity of the proposed injection well, indicates that minor seismic events (magnitude 0-3), unrelated to injection operations, have been recorded in this area of Pennsylvania. Earthquake activity in Pennsylvania has been basement related, either from basement faulting or faulting at shallower depths induced by tectonic stresses originating from the basement. Historic gas production results in the vicinity of the injection well site have shown that nearby faults appear to act as a geologic trap for gas production. Gas wells have been productive between the fault lines but non-productive outside these fault lines. This would indicate that the faults are not transmissive to gas migration and would also indicate good confinement of injection fluid and existing formation fluids as well. EPA has developed two permit conditions that will assist in the prevention of seismic activity related to injection. Subsequent to mechanical integrity testing, a pressure fall-off test will be required to determine injection reservoir bottom-hole pressure as well as determine the flow conditions that the injection formation exhibits during injection operation. Pressure fall-off tests will be required on an annual basis. In addition, the permit does not allow the injection zone to be fractured or fractures that may exist in the injection zone to be propagated, during injection operations. By preventing fracture development or fracture propagation, migration and storage of fluid in the formation will be controlled by the primary permeability and porosity currently in place within the injection zone.

**Injection fluid:** The permit limits this well to the disposal of produced fluids associated with oil and gas production activities with an expected maximum volume of 30,000 barrels per month. Since this is a proposed commercial disposal well, the sources of the disposal fluids have not been determined. However analyses of potential sources of fluid, which included analyses of specific gravity, was provided to EPA Region III to enable the calculation of the injection well's maximum injection pressure.

**Maximum Injection Pressure:** The maximum allowable surface injection pressure for the permitted operation will be 2593 pounds/square inch (psi) and the maximum bottom-hole pressure will be 6575 psi. These maximum pressures were developed using a specific gravity for the injection fluid of 1.26 and an injection well depth of 7306 feet. Injection pressure as well as annular pressure will be continuously monitored. These pressure limitations will meet the regulatory criteria of 40 CFR § 146.23(a) and has been calculated using the depth to the top of the Huntersville Chert/Oriskany Formation near the facility location and the anticipated specific gravity of the injection fluid. The maximum injection pressure has been calculated to prevent the fracturing of the Huntersville Chert/Oriskany Formation during operation.

**Monitoring and Reporting Requirements:** The permittee will be responsible for monitoring injection pressure, annular pressure, flow rate and cumulative volume on a continuous basis and reporting this data to EPA on an annual basis. The permittee is also required to conduct a mechanical integrity test (MIT) once every two years and a pressure fall-off test annually. These tests will provide EPA with an evaluation of the integrity of the casing, tubing and packer in the well, documentation as to the absence of fluid movement into or between USDWs and flow conditions that exist in the injection zone during operation, thus helping to assure that USDWs are protected.

**Plugging and Abandonment:** The facility has submitted a plugging and abandonment plan that will result in an environmentally protective well closure at the time of cessation of operations. The permittee has also made a demonstration of financial responsibility that indicates adequate resources will be maintained for well closure and should preclude the possibility of abandonment without proper closure.

**Expiration Date:** A final permit, when issued, will be in effect for five years from the date of permit issuance. Annual review of the permittee's operation will be conducted. This proposed draft permit contains essentially the same conditions as the final permit will unless information is supplied to EPA which would warrant alternative conditions or actions on this permit application.

**Additional Information:** Questions, comments and requests for additional information may be directed to:

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A public hearing has been tentatively scheduled for Monday, December 10, 2012 at 7:00 PM, at the Brady Township Community Center, 71 Community Street, Luthersburg, Pennsylvania 15848. Requests to hold a public hearing must be received in the office listed above by December 4, 2012. When requesting a public hearing, please state the nature of issues proposed to be raised. EPA expressly reserves the right to cancel this hearing unless a significant degree of public interest, specific to the proposed UIC brine disposal injection operation, is evidenced by the above date. The Administrative Record for this action will remain open for public comment until Monday, December 10, 2012.