

Injection Well Operation and Monitoring:

To prevent well failure that might cause migration of contaminating fluids into a USDW, the 7-inch casing was cemented from approximately 501 feet to the surface (with cement returns noted at the surface).

The operator has designated the Clara #11 (37-105-21136-00-00) and the Clara #19 (37-105-21359-00-00) wells, both within the AOR, as monitor wells. The operator will pump off all fluid in the monitor wells and then monitor the fluid pumping time in these wells during injection into the Clara #20 to determine if there is excess fluid entry into the monitor wells. With respect to monitoring the Clara #20 itself, the annulus of the 2.375-inch tubing will be kept full of fluid and monitored with a pressure gauge for any pressure anomalies or changes in the fluid level due to packer or tubing failure. If that happens, the tubing will be pulled, inspected, and replaced as needed.

A well failure procedure will be initiated once a failure is observed or if the monitor wells show fluid or pressure anomalies. If an anomaly is observed or indicated the operator will cease injection operations immediately and notify the PADEP Northcentral Regional Office and EPA Region 3 for guidance and assistance investigating this occurrence. Producer wells within the one-mile buffer, with the possible exception of the monitor wells, will continue to operate, but injection operations will be suspended until the operator gains approval from all regulating agencies to continue operation.

For monitoring the Clara #20, the operator will install a float switch with an indicating light within the 4.5-inch intermediate casing, to stop the injection should that casing begin to fill with injection fluid, indicating a failure of the 2.375-inch injection tubing. A pressure relief valve will be installed on the 2.375-inch tubing and fluids will be piped back to a tank. Should the injection tubing become obstructed for any reason, all fluid would return to the tank and an indicating light on the operating panel will signal the operator of the problem. Also, should the pressure relief valve open, injection will cease until the valve is manually closed. Spill clean-up materials will be stored within the operations shed on the lease.

Roulette Oil & Gas Co, LLC will daily monitor the well and record injection pressures, volumes and any leaks in the annulus. When pumping the monitor wells in the Area of Review, the operator will monitor the production volumes and pressure to identify any anomalies. The operator plans to have personnel physically on site on a daily basis to monitor the wells in the Area of Review.

Finally, mechanical integrity tests on the 2.375-inch tubing in the injection well will be performed on a regular basis by pressuring up the annulus.