

Kelly

Air Force Base

Installation Restoration Program



Horizontal Wells proposed as a solution to intercept water at East Kelly's border

The Proposed Plan for an Interim Remedial Action to contain contaminated shallow underground water from a source at the northwest corner of East Kelly offered a series of collection trenches along the southern and eastern borders of the base. Wells were recommended as an alternative in areas where underground utilities made trenches impractical. The goal was to remove enough water from a capture zone near the base boundary to prevent further movement of contamination beyond the fence.

The proposed trenches would have been 40 feet deep and 60 feet wide at the surface. They would have involved digging out and replacing hundreds of tons of soil. The trench construction work would have taken place over several months, causing inconvenience and irritation to nearby homes and businesses. In designing the system, engineers found that underground water and sewer lines, gas lines and electrical utilities, above-ground obstacles ranging from paved streets to building foundations, and the active railroad line on the east side of the property would combine

Groundwater modeling shows that horizontal wells would be as effective as the proposed collection trenches for stopping the movement of underground water beyond the base boundary. Kelly officials say wells will also be less of an inconvenience to the community during installation.

to limit the actual area in which collection trenches could be placed.

A series of vertical wells, with the limited capture area surrounding each well, was found to be costly and might not be sufficient to stop the contamination at the boundary. The environmental cleanup contractor and the Air Force have decided to evaluate a new technology – horizontal well drilling – that may provide an effective and economical solution. Preliminary studies using groundwater modeling indicate that horizontal wells would contain the shallow underground water as efficiently as the proposed trenches.

A constructability study involving the installation of a horizontal well began March 9 on East Kelly. A horizontal

well is being installed reaching 600 feet from the point at which the drill rig sets up.

The noise, dust and inconvenience of excavating a trench or installing many wells will be avoided because the 600-foot horizontal well proceeds out from a single location. Recent advances from the oil industry make it possible to precisely place a horizontal well in a thin layer of underground water like that which exists at East Kelly. Until recently, the advanced precision equipment to do this had not been developed.

The well drilling equipment enters the ground at a single point, just as a vertical well would do. Using directional drilling equipment and the most advanced drill-head positioning technology, the well

makes an underground turn, so that the well casing and screened portion where water enters will be sideways – parallel to the surface. The drilling goes beneath underground utilities rather than around or through them as a series of wells or a collection trench would do.

As wells draw water out of the ground, a phenomenon known as “draw-down” occurs. This is a dip in the water table that represents a relatively dry spot. Horizontal wells distribute this draw-down over a larger area than vertical wells and withdraw more water per well. Kelly officials say that this will result in a system that can be as efficient as the original proposals, but cost less and create less disturbance for the surrounding neighbors.

