

## **Appendix C**

### **Hydrologic Assessment of Dewatering for Installation of the Belcher Road Water Transmission Line**

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The rate of pumping resulting from aquifer dewatering for installation of the planned water transmission line beneath Belcher Road is expected to be larger than any of the discharge rates associated with drainage infrastructure installation along either side of Bryan Dairy Road or Belcher Road. The increased pumping rate is partly due to the large size of the water transmission pipe (42-inch diameter), which will require dewatering well points on both sides of the pipe's footprint rather than just along one of its sides. In addition, the anticipated invert elevation of the pipe is 12 feet (ft) below land surface (bls), which means that groundwater levels will need to be drawn down to about 14 to 15 ft bls. The deepest water levels required for installation of drainage infrastructure near the intersection of Bryan Dairy and Belcher roads is about 12 ft bls.

An estimate is developed in this appendix for the rate of dewatering discharge that DOE will handle to accommodate installation of 480 ft of the water line extending northward from the intersection of Bryan Dairy and Belcher roads, with the north end of this pipe section approximately coinciding with the north border of Building 100's southeast parking lot. The estimate is based on pumping rates derived from the modeling of dewatering along the south side of Belcher Road, which accounted for the installation of 480 ft of 24-inch-diameter drain pipe connecting four separate drainage structures. The simulated steady-state groundwater levels in this latter case are about 12 ft bls, and the total modeled dewatering discharge rate is 12.6 gallons per minute (gpm). South of Bryan Dairy Road, the spacing between dewatering well points ranges from 5 to 6 ft, and a total of 110 well points are used to simulate the dewatering. Modeled pumping rates for individual wells in this case vary from 0.08 to 0.2 gpm.

It is assumed here that 220 well points will be used to dewater in the vicinity of 480 ft of water transmission line beneath Belcher Road. Taking into consideration that this number of wells is twice the number used to model dewatering south of Bryan Dairy Road and that drawdowns under Belcher Road will need to be about 2 to 3 ft larger than those simulated for Bryan Dairy Road, a conservative estimate of the total discharge rate from the water line transmission would exceed twice the 12.6 gpm rate associated with the Bryan Dairy Road design. However, because the cones of influence created by each well point are expected to greatly overlap, the per-well pumping rates associated with installation of the water line will likely be significantly less than the rates of 0.08 to 0.2 gpm applied in the Bryan Dairy Road simulation. Accordingly, a more reasonable estimate of the total discharge rate is 25 gpm, or about double the pumping rate estimated along the south side of Bryan Dairy Road.

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