

APPENDIX 5.15B

Evaluation of Potential Groundwater Impacts

Potential Groundwater Impacts Associated with the LEC Potable Supply Well

PREPARED FOR: Catherine Lambert
PREPARED BY: Toni Pezzetti, PG, CHG
COPIES: Sarah Madams
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A potable groundwater supply well is planned for installation at the Lodi Energy Center (LEC), located adjacent to the White Slough Water Pollution Control Facility (WPCF), off of North Thornton Road and just west of Interstate 5. The NCPA Combustion Turbine Project STIG #2 (STIG plant) is also located adjacent to the planned LEC. The LEC will obtain its potable water from an onsite groundwater well. Potable water will be used for eye-wash stations, drinking fountains, and sanitary facilities, as needed.

The potable well is planned to produce approximately 450 gallons per day, Monday- Friday, and 90 gallons per day on Saturday and Sunday. The overall volume of potable water to be used by the facility is less than 0.4 acre-feet per year, with a maximum pumping rate of less than 1 gallon per minute.

The LEC potable well will draw from the Eastern San Joaquin Subbasin within the highly productive San Joaquin Valley Groundwater Basin. Irrigation well yields in the fresh water-bearing formation underlying the subbasin range from approximately 650 to 1,500 gallons per minute (DWR, 2006). Domestic wells in the Eastern San Joaquin Subbasin range from approximately 25 to 993 feet in depth, averaging approximately 242 feet (DWR, 2006). Irrigation wells in the subbasin range from approximately 75 to 780 feet in depth, averaging approximately 349 feet (DWR, 2006).

Groundwater in the LEC vicinity flows generally from west to east (City of Lodi, 2006). To the east of the facility, groundwater use for irrigation is higher than it is to the west (City of Lodi, 2006). Therefore, the local gradient is consistently to the east. Regionally, the hydrologic gradient and groundwater movement are controlled by a pumping cone depression around the City of Stockton that persists throughout the year, and the groundwater moves in an east-southeasterly direction (City of Lodi, 2006).

The proposed LEC potable well is planned to be screened several hundred feet below ground surface below the known area of low-quality shallow groundwater. The target aquifer is the Laguna Formation, which has average irrigation well yields of 900 gallons per minute in the subbasin (DWR, 2006). The well will be screened at a sufficient depth to be unaffected by the existing shallow low-quality groundwater. Several actions are proposed to provide extra surety regarding groundwater protection of the new potable well.

1. 75 feet of cemented surface casing will be installed instead of the required 50 feet at the well to provide extra protection

2. Vertical hydraulic gradients will be estimated annually using the existing shallow groundwater monitoring wells
3. A sampling port will be installed at the well and the well will be sampled for general chemistry parameters, nitrates, and coliform at least annually.

Given the low production rate of the proposed potable well relative to what the aquifer is capable of producing, the overall effect on local groundwater levels is expected to be negligible. An extensive monitoring well network exists for several miles surrounding the WPCF, allowing actual water level and water quality effects to be observed.

Local estimates of aquifer properties are not available for detailed evaluation of potential changes in groundwater levels during operation of the onsite potable well. However, C2VSIM, a Central Valley groundwater model recently developed by the Department of Water Resources, used an input value for hydraulic conductivity of approximately 40 feet per day for the area near the WPCF. Estimating that the aquifer thickness at the WPCF is 500 feet, a well pumping at an estimated rate of 10 gallons per minute would have a drawdown of between 0.1 and 0.2 feet. That drawdown would be anticipated to return to static conditions within seconds of the pump being turned off. It is assumed that a holding tank will be installed near the well head and that the well will pump at a higher rate than needed for only the period of time it takes to fill the tank and maintain system pressure. Operation of this well is not expected to have any measurable effect on production wells or surface water bodies within 0.5 mile of the LEC potable well or contribute to the migration of groundwater contaminants.

References

California Department of Water Resources (DWR). 2006. San Joaquin Valley Groundwater Basin. Bulletin No. 118.

City of Lodi. 2006. City of Lodi White Slough WPCF Soil and Groundwater Investigation Existing Conditions Final Report.

http://www.lodi.gov/public_works/pdf/Groundwater%20Investigation%20Report/Chapter%202%20Facility%20Description.pdf. Accessed July 14, 2008.