Geologic Review: Reducing Oil and Gas Environmental Impacts

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In 1982 the Coastal Management Division of the Louisiana Department of Natural Resources requested that the Louisiana Geological Survey (LGS) develop a program to reduce the environmental impact of permits involving oil and gas drilling in the Louisiana Coastal Zone. LGS responded with the Geologic Review program, designed to significantly reduce environmental impacts from oil and gas operations while not placing undue restrictions upon them. Geologic Review was successful, and in 1984 the New Orleans District of the U.S. Army Corps of Engineers joined the program.

Since 1984, oil and gas permit applications made to these two agencies which involved environmental impact to wetlands or other environmentally sensitive areas have had their geologic, engineering, lease, and site-specific data reviewed and evaluated to determine if there were any less-damaging feasible alternatives available. These alternatives have involved such concepts as the use of directional drilling and/or alternate, less-damaging access routes or methods while still allowing the well to be drilled and while also avoiding or minimizing any environmental impact involved. Geologic Review has been an outstanding success; the average length of board roads and canals permitted in the combined area of operations has been reduced by approximately three-fourths since the program began.

During 1997-1998, based on available data from issued permits, Geologic Review was once again successful in significantly reducing the environmental impacts of proposed oil and gas canals, slips, board roads, and ring levees permitted in the area of operations.

Hydrogeologic Definition of the Norco Aquifer in the Geismar, Louisiana Area

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The Norco Aquifer is the shallowest, regionally continuous aquifer in the Geismar, Louisiana area. The aquifer is an important source of drinking water in the area. The aquifer is also used for process water supply by many of the plants in the area.

The Norco Aquifer has not been publicly studied since the mid-1960's in the Geismar area. Past geophysical well logging combined with recent geophysical logging, well installations, pumping tests, and three-dimensional geologic modeling has resulted in an updated understanding of the geologic and hydrogeologic setting of the Norco Aquifer in the Geismar area. The top and bottom elevations, and the net thickness of the aquifer have been defined from the many wells and test holes that have been completed since the 1960's. Recent pumping tests, with nearby monitoring wells, have provided a detailed understanding of the hydrogeologic properties of the aquifer.

The understanding of the relationship between the Mississippi River and the Norco Aquifer in the Geismar area has changed with the collection of recent data. The groundwater within the aquifer was previously thought to flow both away from and toward the Mississippi River, based on the stage of the river. Recent water level elevation and river stage data have shown that groundwater flow in the Geismar area is always away from the river and the flow direction is fairly constant.