Richton Report

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A Newsletter about the Strategic Petroleum Reserve Project in Richton, MS
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Editor's Corner

This issue of the Richton Report describes the scientific studies performed on the Pascagoula River and in the Gulf of Mexico to assist the on-going preparation of the Supplemental Environmental Impact Statement (SEIS) for the proposed Department of Energy (DOE) Richton Strategic Petroleum Reserve (SPR) facility. The studies were performed to determine the possible impacts of the proposed new site and were a result of collaboration with other Federal and Mississippi State agencies. Summaries of the studies are provided below and full reports also will be posted on our website at http://www.fe.doe.gov/programs/reserves/spr/expansion-eis.html once they are finalized. The draft SEIS will be published for public review and comment this spring.

IMPACT TO PASCAGOULA RIVER SALT WATER WEDGE

DOE is currently evaluating a change to the proposed Richton SPR project to move the raw water intake structure (RWI) from the Leaf River to the Pascagoula River to take advantage of higher overall flows and to minimize potential impacts to sensitive biological resources. The RWI would remove 50 million gallons a day (MGD) of fresh water from the river during the development phase for dissolution of caverns at the site. As part of the SEIS, DOE undertook an analysis to determine if the reduction in flow of the Pascagoula over the estimated 5-year solution mining period would result in changes to salinity in river water at the mouth of the Pascagoula where it empties into the Mississippi Sound. The model used to evaluate salinity intrusion was developed by the U.S. Army Corps of Engineers and the Massachusetts Institute of Technology, and was calibrated to salinity data collected during the most recent annual survey by the U.S. Geological Survey. DOE is currently running the model to evaluate the effects of the RWI withdrawal under two separate low-flow scenarios.

PASCAGOULA RIVER HABITAT FOR SENSITIVE AQUATIC SPECIES

DOE worked collaboratively with the U.S. Fish and Wildlife Service and biologists from the Mississippi Department of Wildlife, Fisheries, and Parks to analyze the potential impact of water withdrawal at Merrill upon sensitive aquatic species in the Pascagoula River. The team selected the yellow blotched map turtle, pearl darter and gulf sturgeon as representative species of the Pascagoula River ecosystem because they are listed as either a threatened or endangered species or candidate for listing under the Endangered Species Act. The technique used for the analysis is known as the "In Stream Flow Incremental Methodology" (IFIM) to estimate the potential loss of habitat due to water withdrawal, and the likely impacts on aquatic life. The IFIM analysis showed very small changes in the amount and quality of habitat due to the proposed withdrawal. Species experts reviewed the IFIM results and determined that the impact on aquatic life would be negligible.

One of the Pascagoula river bend habitats studied with the IFIM technique.

BRINE DIFFUSION IN THE GULF OF MEXICO

To evaluate the impacts of discharge brine from cavern dissolution at the proposed Richton SPR site upon water quality in the Gulf of Mexico, DOE used a multi-stage modeling approach by first evaluating the impacts to the area immediately surrounding the brine discharge in the Gulf using the "near field" models CORMIX and the U.S. EPA model UM3 (Visual Plumes model framework). For the models, DOE used the hydro-

dynamic data available from 3-D baroclinic modeling analysis previously performed by the Mobile District of the U.S. Army Corps of Engineers to describe marine currents, salinity, and temperature for two separate seasons in the project area. These models account for the mixing induced by the discharge velocity and allow differentiation of salinity levels very close to the diffuser. Next, DOE performed a "far field" analysis to estimates brine movement and mixing further away from the discharge point due to currents, tides, and differences in density. The Lagrangian particle model, coupled with the slope of the ocean bottom, determined where the brine would flow.

Results of the modeling analysis indicate that the excess salinity drops rapidly within a meter of the diffuser, and then decreases gradually with distance. The elevated salinity plume then flows along the ocean bottom, and moving along ocean bed contours, flows generally towards the south-southeast, resulting in no impact to the barrier islands or Mississippi Sound. The U.S. Army Corps of Engineers provided guidance and technical review of this study and are currently reviewing the final report.

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