Impact of Offshore Exploratory Drilling: Is it Significant? You Be the Judge

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Twelve exploratory well sites in the eastern Gulf of Mexico were examined using scuba and two research submersibles. When examined, the period of time since cessation of drilling ranged from 15 months to 28 years. Sites studied using scuba ranged from 5 to 25 m deep, and environments included coral reefs, grass beds, and rippled sand bottoms. Biological assessment methods were used to evaluate impacts of drilling. Deeper sites examined using research submersibles ranged from 21 to 150 m of water, and environments included tropical hard bottoms, coarse sand (both quartz and carbonate), mud, and pinnacle reefs. This study focused on quantitative measurement and distribution of drill cuttings, barium, and trace metals.

The areas impacted ranged from a few square meters (1/200th of an ac) to 13,352 m^2 (more than 3 ac). Recovery to predrilling conditions was essentially complete at several sites, but some, especially the deep-water sites, will require many years. Recovery, defined as burial, overgrowth, or removal of cuttings and barium by storm-generated waves and currents, is controlled primarily by water depth, temperature, and water clarity. Shallow-water sites (<40 m) return to predrilling conditions much more quickly (5–15 yr) than do deeper sites, where water temperature is low, water and sediment movement is reduced, and the growth rate of encrusting organisms is slow. Used welding rods, the most common and useful indicator of offshore drilling activity, have a seafloor life of between 20 and 30 yr. At sites having the most debris or structures, fish abundance and diversity are invariably enhanced. Conversely, resident fish were absent from a 17-yr-old site, where the borehole and other debris were obscured by sediment.

Naturally Occurring Radioactive Material in the Oil and Gas Industry

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Naturally occurring radioactive material (NORM) has been found in the Earth's crust and soil, the water we drink, the food we eat, the air we breathe, and the tissues of every living organism. It is relatively easy to determine "concentrations," or specific activity levels, in the range of 1 part per trillion for radioactive materials. With radioactive elements so abundant and detection possible at such low levels, the presence of NORM in oil and gas operations shouldn't be surprising. In fact, this presence has been recognized since at least the 1930's, but the phenomenon received only minimal attention in the United States until the mid-1980's. At that time regulatory agencies in several oil- and gas-producing states began to focus on NORM in the exploration and production segment of the industry, expressing concern over potential health and safety implications. The most significant aspects of NORM in oil production operations include original source, transport media, composition/radionuclides present, measurement methods, health/safety issues, waste classification, and waste disposal. In addition, I will summarize industry-sponsored NORM data collection and analysis efforts being conducted to aid in development of sound policies and procedures to address environmental, health, and safety issues. Current activities by state and federal regulatory agencies relevant to NORM in the oil and gas industry will also be reviewed.