Natural Attenuation of Explosives at the Louisiana Army Ammunition Plant, Minden, Louisiana

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A three-year study of natural attenuation of explosives at Louisiana Army Ammunition Plant (LAAP) is currently being conducted. This research effort is a demonstration project designed to assess the feasibility of, and to develop the guidance for, selection and implementation of natural attenuation of explosives as a possible remediation alternative for groundwater and soils.

LAAP is a government owned facility located 22 miles east of Shreveport, Louisiana. The 14,974 acre plant manufactured high explosives (TNT and RDX) and load and pack ammunition items between 1942 and 1995. As part of the manufacturing activities, 16 unlined ponds were dug in fine grained silty-sands to contain the wastewater contaminated with TNT and RDX. These ponds covered an area of approximately 25 acres and received explosive-laden water sporadically between 1942 and 1981. LAAP was selected for the natural attenuation project because the source of contamination has been removed, ten years of annual ground water quality data exists, and 71 monitoring wells are installed on the site. Of the 71 existing wells, 30 were selected for a two year sampling program. These 30 wells were sampled and analyzed for explosives monthly from February through August 1996 and will be monitored quarterly through 1998.

Preliminary examination of plume maps revealed that RDX has migrated farther than TNT is spite of the greater aqueous solubility of TNT. This observation supports the case that natural attenuation of TNT is occurring at LAAP.

Interpreting Sequence Stratigraphic Architecture From Biostratigraphic Signatures: Case Studies From the Northern Gulf of Mexico

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Digital capture of microfossil data from well and outcrop samples permits rapid computer analysis and plotting biostratigraphic range charts, cross plots, and 'curves'. Integrating these biostratigraphic plots with log and seismic data indicates the microfossil record reliably characterizes the key stratal surfaces (flooding surfaces and sequence boundaries) which underpin the interpretation of sequence stratigraphic architecture.

Using in-house software (The Integrated Paleontologic System=IPS), I generated and interpreted biostratigraphic plots integrated with log data for >200 wells in the northern Gulf of Mexico. The well sections range in age from Oligocene to Pleistocene and represent deposition in fluvio-deltaic through lower-bathyal paleoenvironments. Field- to exploration-scale case studies illustrate the value of using biostratigraphic signatures to help solve geologic problems via an integrated, sequence-stratigraphic approach.

IPS-generated paleobathymetry curves covering various chronostratigraphic intervals from many Gulf locations provide the raw material for defining local to regional, relative sea-level events. Also, the vertical succession of paleobathymetry changes associated with higher-order sequences can produce unique stratigraphic signatures useful for detailed correlation.

Future research should: (1) document biostratigraphic signatures across well-constrained cycles in sea level from different dip positions and accommodation settings; (2) apply numerical techniques to integrate biostratigraphic data with log and seismic attributes and achieve computer-generated geologic interpretations.

Borehole Electrical Images And Dipmeter Patterns of Fluvial-Deltaic Reservoirs: Outcrop Examples From Arkansas

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Stratigraphic interpretation and modeling of sedimentary successions and characterization of reservoir intervals have benefited from development of borehole electrical imaging technology. The ability to resolve individual bedding features and faults has made this technology a valuable subsurface tool. While a complete analysis combines integration of images and core data, core is often not available. This paper bridges the gap by presenting the results of an outcrop-logging program and provides *new* information on recognizing sedimentary and dip features in the most common fluvialdeltaic reservoir sand bodies.

Gamma ray, induction, and FMI data collected during this study are compared to 3-D exposures of Pennsylvanian meanderbelt, distributary mouth bar, and delta-front deposits exposed at several quarry localities in the Arkansas Valley.