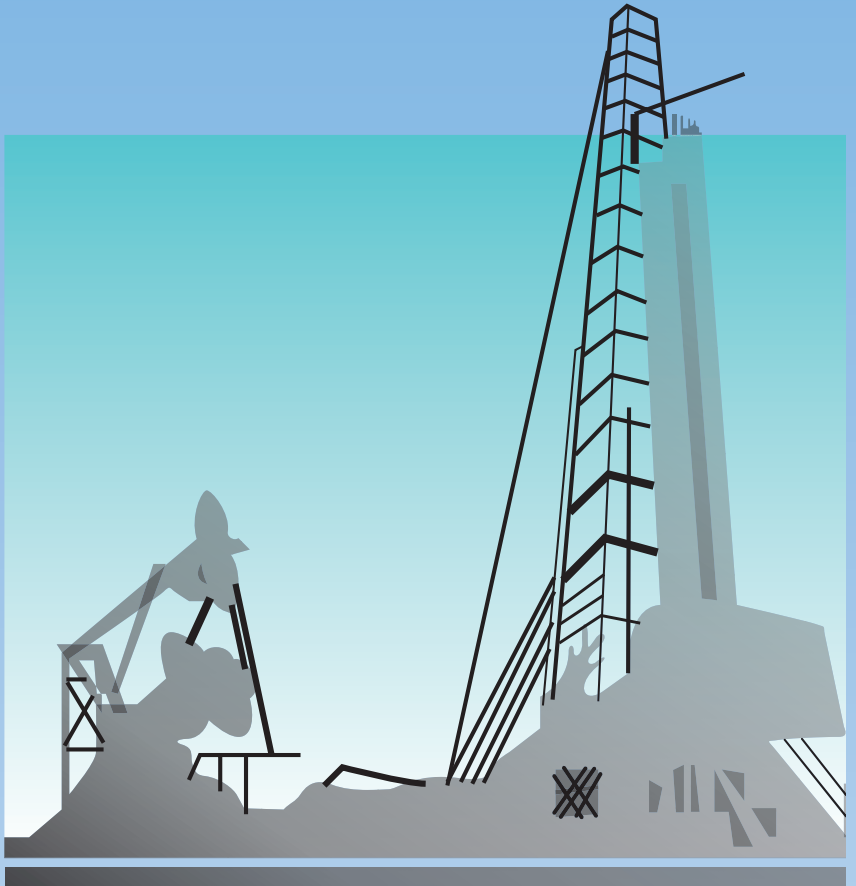
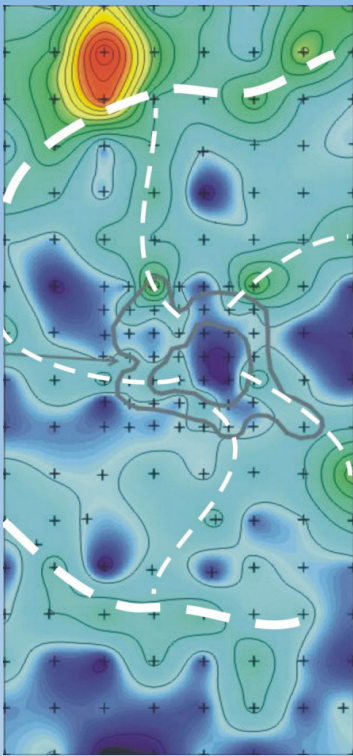


# Enzyme Leach<sup>SM</sup> Services for Petroleum Exploration



Leading Edge Technology for Mapping  
Reservoirs and Subsurface Structures

# Enzyme Leach<sup>SM</sup> Services

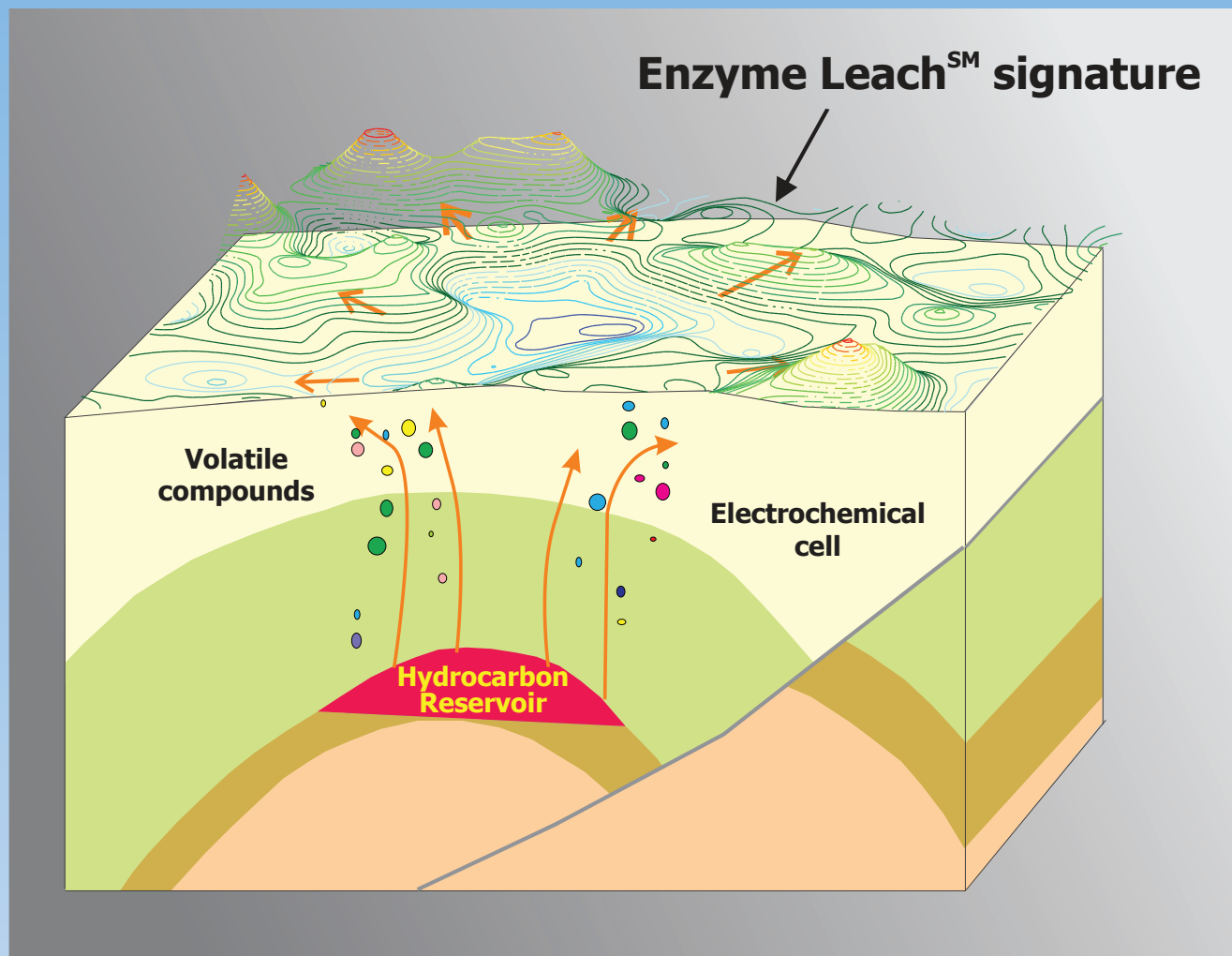
Survey Design

Mobilization and Sample Collection

Data Evaluation and Plotting

Pattern Interpretation

Report Generation and Target Recommendation






Enzyme Leach<sup>SM</sup> Services aid in the detection of hydrocarbon accumulations at depths ranging from a few hundred meters to more than five thousand meters. Our proprietary selective extractions were developed over the past 31 years and have been successfully utilized to locate oil and natural gas accumulations. Petroleum reservoirs are indicated by a host of elements that are distributed into positive and negative patterns at surface, above and around the edges of oil and gas deposits. Trace elements become trapped at parts-per-billion and parts-per-trillion levels within amorphous manganese oxide coatings on sand and silt grains in the soil or sediment in the near-surface environment. Selective leaching of the amorphous MnO<sub>2</sub> and subsequent analysis for 68 trace and major elements by ICP-Mass Spectrometry reveals repeatable patterns that indicate subsurface hydrocarbon accumulations. Determining a large number of parameters makes the technology robust.

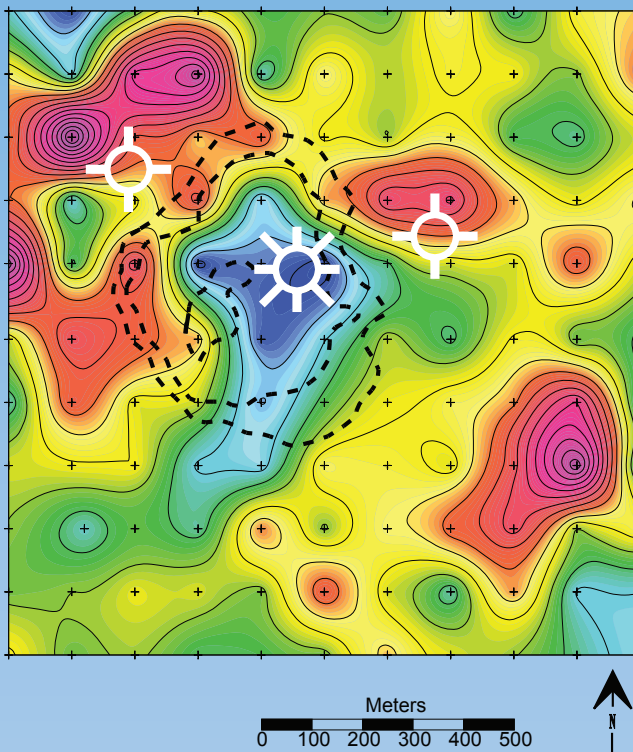
*Enzyme Leach<sup>SM</sup>* Services will take your project from survey design and sample collection to data interpretation and target definition. Our expert staff of geologists and geochemists will design the most appropriate soil geochemistry program for your project. Our years of experience, discovery successes, and ongoing research programs combine to make us the leader in selective extraction geochemistry.

Pricing for *Enzyme Leach<sup>SM</sup>* surveys is based on a per data point charge, plus sample collection and mobilization to the project area. Quotes available on request.




Combined factor plot of *Enzyme Leach<sup>SM</sup>* data with superimposed 3D seismic time structure contours above the Camp Cooley 65 acre pinnacle reef at a depth of 4300 m (40 BCF est.).

-  Producing gas well
-  Dry well
-  *Enzyme Leach<sup>SM</sup>* Soil Sample

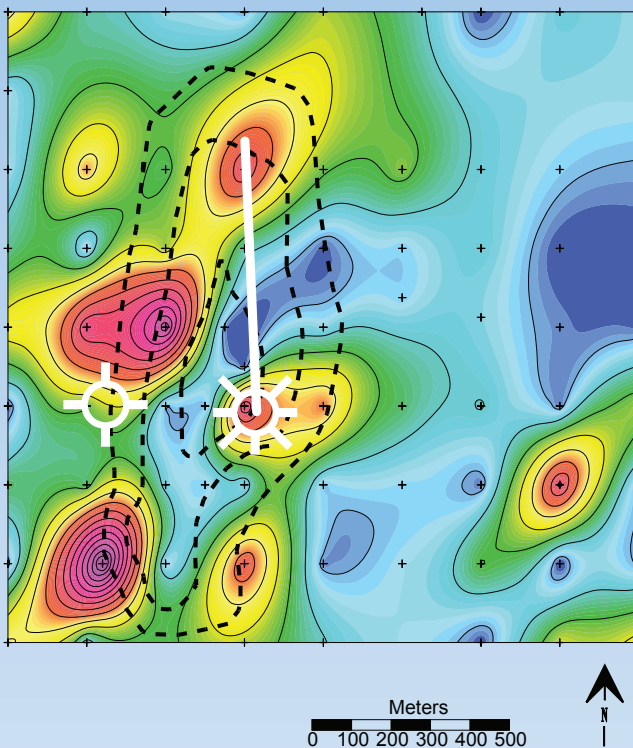
See Tompkins, R., Clark, J.R., Ziegler, D., Schumacher, D., Hitsman, D., and Reeves, S., 2001, Remote sensing of Cotton Valley reef complexes East Texas Basin, in prep.



Combined factor plot of *Enzyme Leach<sup>SM</sup>* data with superimposed 3D seismic time structure contours above the Bromhead oil pool at a depth of 2850 m.

-  Original surface location of well and horizontal portion of well at depth
-  Dry well
-  *Enzyme Leach<sup>SM</sup>* Soil Sample

See Dunn, C.E., Haidl, F.M., Yeager, J.R., Butrenchuk, E., Dorval, D., and Larson, B., 1998, Surface geochemical patterns derived from selective leaching of soils over a deep Ordovician oil pool, Bromhead, southeastern Saskatchewan, in: Eighth International Williston Basin Symposium, Special Publication Number 13, Saskatchewan Geological Society, Eds. Christopher, J.E., Gilboy, C.F., Paterson, D.F., and Bend, S.L.



# Lone Star Energy makes onshore Morocco petroleum discovery with SRM™ (Sedimentary Residual Magnetics), MBS™ (Magnetic Bright Spot), 2D Seismic, and Enzyme Leach<sup>SM</sup>

## Excerpts from Lone Star Energy press release

“(Morocco, August 21, 2000) - Lone Star Energy, a Moroccan-based and associated company of Skidmore Energy, Inc., USA, drilled an important discovery well on Block III of the Talsinnt Permit. The Talsinnt Permit is located in the High Plateau area of northeastern Morocco.”

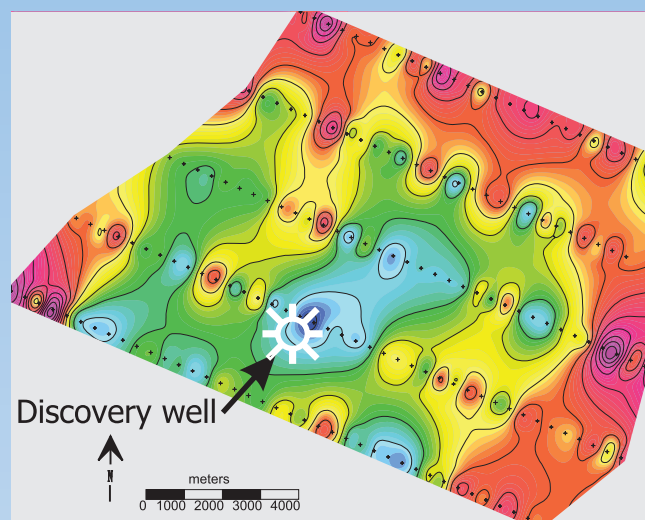
“The SBK #1 discovery well encountered a gross interval of the TAGI Reservoir at 3425-3505 m. Two (2) zones were isolated for production testing and modeling. A drill stem test (DST) indicates a reservoir pressure of 7175 PSI and a production rate of 2500 MCFGPD, with minor amounts of light oil. Analysis of the DST results indicates good reservoir conditions, with expectations of primarily oil production and a potential reserve estimate of 50 - 100 MMBOE for the prospect.”

## Excerpts from November 30, 1999 Enzyme Leach<sup>SM</sup> Services report

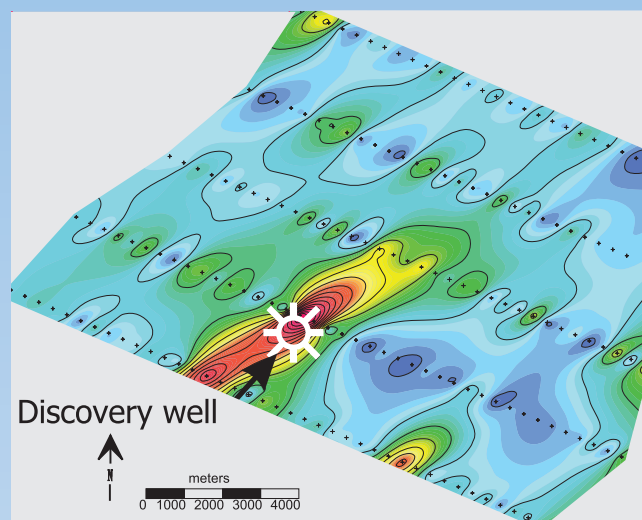
“Enzyme Leach<sup>SM</sup> data were generated from soils collected at 168 sample sites in a soil survey contracted by Skidmore Energy Inc., Lone Star Energy in the Talsinnt Block, Fom Messaoud petroleum exploration project, Morocco. A well defined high-contrast oxidation halo is present within the sampled area and is best indicated by many of the oxidation suite elements.”

“Bromine and chlorine are most enriched along the eastern margin of the oxidation halo... The Br, and particularly Cl values (up to 0.2% Cl) at these locations are very high relative to data from numerous Enzyme Leach<sup>SM</sup> surveys and are strongly indicative of a reduced body in the subsurface.”

### Enzyme Leach<sup>SM</sup> Arsenic



### Enzyme Leach<sup>SM</sup> Iodine



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