

Salton Sea Scientific Drilling Program Monitor

A PERIODIC REPORT OF SSSDP EVENTS PREPARED BY THE U.S. DEPARTMENT OF ENERGY, IN COOPERATION WITH THE U.S. GEOLOGICAL SURVEY AND THE NATIONAL SCIENCE FOUNDATION.

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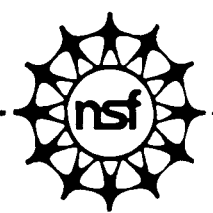
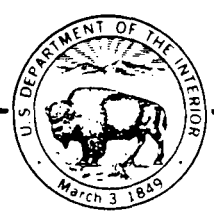
INTRODUCTION

The Salton Sea Scientific Drilling Program (SSSDP) is an \$8 million venture designed to probe the roots of one of the world's hottest geothermal fields. Temperatures of up to 750 degrees Fahrenheit (400 degrees Celsius) are expected to be encountered at the projected well depth of 10,000 feet. The SSSDP was organized to scientifically study a deep hydrothermal system driven by the thermal regime of an active continental spreading zone.

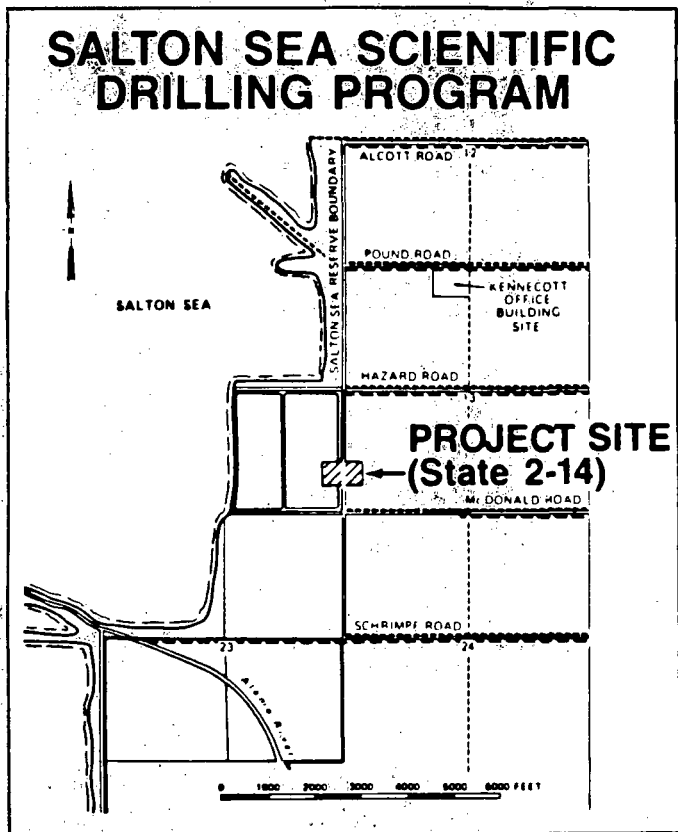
The SSSDP scientific experiments package, excluding hardware development, consists of 27 funded projects and 5 projects that require nonfunded access to SSSDP

samples. The success of the experiments -- which address the four categories of geochemistry, petrology, geophysics, and bio-organic studies -- hinges on the ability to collect high-quality rock, fluid, and gas samples from the SSSDP well. Two significant areas of scientific study are the nature of micro-organisms in hot, saline environments and the genesis of ore-forming minerals within hydrothermal systems. Those scientific experiments that will be performed concurrently with drilling activities include fluid recovery and analysis and geophysical studies; these experiments are listed in the table below.

<u>INSTITUTION</u>	<u>TITLE OF PROJECT</u>	<u>FUNDING AGENCY</u>
LANL, LBL	"In-Situ Fluid Sampling of the SSSDP Well"	DOE/OBES
USGS	"Small-Volume In-Situ Fluid Sampling Using Synthetic Fluid Inclusions"	USGS
USGS	"Liquid and Gas Sampling and Analyses"	USGS
LBL	"Reflection Profiling at the SSSDP Site"	DOE/OBES
USGS	"Geothermal Logging, Analysis, and Interpretation"	USGS
USGS	"Acoustic Characterization of Fractures and Hydrothermal Alteration in the SSGF"	DOE/GTD
LLNL	"Constraints from Borehole Gravity on Geothermal Models and Resource Definition in the SSGF"	DOE/OBES
USGS	"Thermal Profiling in the SSSDP Well"	USGS



The SSSDP--so named because of the project's location near the southeast shore of the Salton Sea in California's Imperial Valley (a location map is pictured below)--is the first major effort of the Conti-



mental Scientific Drilling Program: a joint research project being performed by the U.S. Department of Energy, the National Science Foundation, and the U.S. Geological Survey (USGS). Bechtel National, Inc. has been contracted to conduct drilling and engineering operations with the cooperation of Kennecott Corporation, the leaseholder of the project site, and other companies. Dr. Wilfred A. Elders of the University of California at Riverside is the Chief Scientist in charge of coordinating the scientific activities of the program. Dr. John Sass of the U.S. Geological Survey is the on-site Science Manager responsible for the

collection of scientific data at the site.

One of the key attributes of the SSSDP is that all the scientific data generated by the project will eventually be made available to the public. The rationale for undertaking the program centered around the fact that sufficient subsurface data from the Salton Sea Geothermal Field (SSGF) has not been publicly available. Making available a complete set of data from the deeper regions of the SSGF will allow scientists to study in detail the characteristics of a very high-temperature, high-saline hydrothermal convection system for the first time.

DRILLING ACTIVITIES

The scientific well was spudded at midnight on October 23, 1985. By Thursday of the following week (October 31), the well had been drilled to a depth of 1,576 feet and 24.6 feet of core had been taken from the interval 1,553' to 1,577.6', with a recovery factor of 100%. Temperature of the mud at this point was 135 degrees F (57 degrees C), which relates to a subsurface temperature of about 220 degrees F (104 degrees C). On Friday (November 1), a change in lithology from shale to anhydrite was noted near 1,900', and the second core run was made between 1,983' and 2,012.2', with 100% recovery. On November 2, a third core run was made between 2,447' and 2,478', again with 100% recovery. Calcite veining and pyrite along open fractures were noted in the core. The fourth core run was made on November 4, when an interval of 60 feet was attempted from 2,970' to 3,030'. Core

with a standby period of several months following well completion to allow the well to approach thermal equilibrium with the surrounding geothermal system. Limited flow tests are scheduled to be performed at the first lost circulation zone below 3,500', at the first lost circulation zone below 6,000', and from the entire open hole

interval between 6,000' and the total depth of the well. Spent brine from the first two flow tests will be reinjected into the well after a brief settling period. Spent brine from the final flow test will be disposed of off-site at an approved facility. The overall program schedule shows completion in late 1986.

This is the first in a series of periodic reports monitoring the activities of the Salton Sea Scientific Drilling Program (SSSDP). The intent of the "Monitor" is to provide a timely report of SSSDP events to its many participants and other interested parties. Items to be tracked in the Monitor include drilling activities, logging, and downhole scientific experiments. The Monitor will be published every 2 to 4 weeks during the drilling phase of the program and bi-monthly following the completion of drilling.