3D Petrel Geomodeling: Proposal for Redevelopment of a Hydrocarbon Reservoir

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*Note that all names, locations, and statistics were modified according to privacy rights by Occidental Petroleum Corporation

Abstract

Occidental Petroleum Corporation purchased the Black Mamba Oil Field from Vintage Petroleum Inc. in 2005. The Black Mamba Oil Field consists of two lithologically similar oil-producing reservoirs called the Phacodies and Pequena. These two reservoirs have not been redeveloped for over 30 years until recently. Oxy conducted recompletions of various wells in the Phacodies reservoir that resulted in production increases cumulating to ~200 BOPD. Thus, it is desirable to redevelop the Pequena reservoir. As a geoscience intern for the summer of 2010, my project was to create a Petrel 3D model of the Pequena reservoir and propose redevelopment opportunities. 3D models can reveal various properties of a hydrocarbon reservoir. It displays visual cues of the preferred areas for redevelopment. To create an accurate 3D model of the Pequena reservoir, various resources had to be assembled to verify the accuracy of the model. Production data and previous studies by Texaco were used during this phase of the study.

Since the Pequena reservoir has not been redeveloped for over 30 years, new technological advances in the oil and gas industry can be implemented into the

redevelopment proposal. An important aspect of the project was to distinguish how much oil can be produced from the Pequena reservoir. Synthesizing these data sets with other data derived from various resources aid in the proposal for redevelopment of the Pequena reservoir.