Scaleable Surveillance Log-Based Reserve Methodology and Tools Employed at the Kern River Field

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The >7500-acre Kern River field, located 10 km northeast of Bakersfield, California, is the largest net oil producing (98,000 BOEPD) and largest proved reserve asset in the ChevronTexaco San Joaquin Valley Business Unit portfolio. The reserve estimation methodology employed at Kern River is unique in that it uses Carbon/Oxygen (RST) oil saturation surveillance data from over 660 temperature observation wells (TOWs) across the field, originally employed for reservoir management, to derive volumetric reserve and contingent resource estimations. Estimations are scalable from the entire field to individual steamflood patterns. Reservoir parameters for calculation of reserves are obtained from wireline data from individual TOWs and geostatistically interpolated between wells to populate the 9 producing reservoir intervals. Formation resistivity is used to generate field-wide, zone net-thickness volumes. RST oil saturation, collected from approximately one-third of the TOWs annually, is used to generate field-wide, zone average oilsaturation volumes. Values from each property volume are back-interpolated onto the 2950 steamflood patterns throughout the field. P1-P3 reserve and contingent resource volumes are calculated at the pattern level using the interpolated inputs and varied residual oil-saturation values. The resulting 79,650+ pattern-reserve category-reservoir interval combinations are loaded into a database for interrogation. A user-interface tool was developed to query and display the data in graphic and tabular format for a single pattern up to an entire steamflood project (40+ patterns). Data are exportable for printing or for easy loading into geologic mapping packages and engineering spreadsheet analyses. The tool assists the Kern River Asset Development Team with strategic opportunity identification and prioritization and is used by the Kern River Asset Technical Team for tactical project execution and maintenance.