



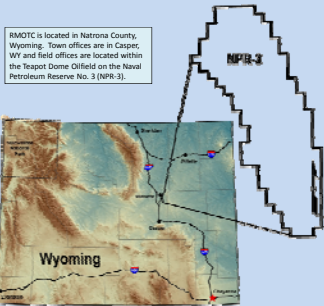
Implementation of GIS Technology at the Rocky Mountain Oilfield Testing Center, Casper, Wyoming



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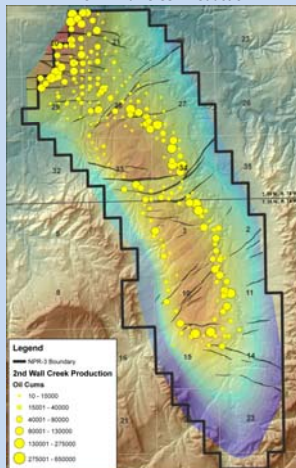
ABSTRACT

The Rocky Mountain Oilfield Testing Center (RMOTC) operates the Teapot Dome Oilfield near Casper, Wyoming, also known as Naval Petroleum Reserve No. 3. During the past three years, RMOTC has been gathering and consolidating over 80 years of oilfield data and entering that information into a modern geo-computing environment and relational database. A major part of this process includes the implementation of ArcGIS. Over the past 2½ years, RMOTC has upgraded its GIS capabilities to display facilities, pipelines, well locations, roads, utility lines, remote sensing data, and other features in real world spatial coordinates. This is a major upgrade over past practices of using drafting software with stand-alone coordinate systems, not spatially referenced, for creating maps of the field and facilities. The GIS has allowed RMOTC personnel to display and integrate a large variety of spatial data in ways that were not possible before. RMOTC uses ArcGIS to store and display information used in a variety of oilfield applications such as creating basemaps of field infrastructure and facilities, displaying well production data, incorporating geological and geophysical interpretation, pipeline leak assessment and flow assurance, environmental monitoring, tracking oilfield operations, etc. The data and maps generated by ArcGIS have been greatly appreciated by RMOTC scientists and engineers as well as RMOTC project partners. Implementation of GIS technology has helped RMOTC to become the premier oilfield testing and demonstration center in the United States.



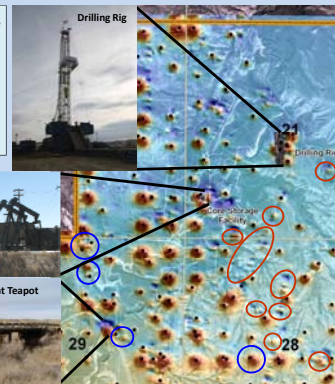
Basemap of NPR-3 using ArcGIS software after GIS Technology implementation at RMOTC. The features here are all tied to the NAD 1983 Wyoming State Plane East Central Zone reference system.

NPR-3 2nd Wall Creek Production

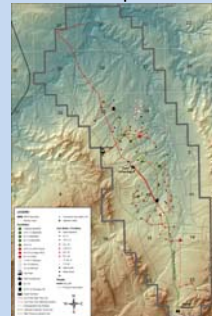


Map displaying production bubbles of cumulative oil produced from the 2nd Wall Creek Member of the Frontier Formation.

Map showing the results of an aerial magnetic survey of the Teapot Dome Oilfield. The bright spots on the map indicate magnetic anomalies such as borehole casing strings, buildings, equipment, and other infrastructure. The known or supposed locations of wells are posted on top of the magnetic data allowing RMOTC to validate the spatial coordinates of NPR-3 wells. The blue circles identify incorrect well locations and the red circles are anomalies with no associated wells.

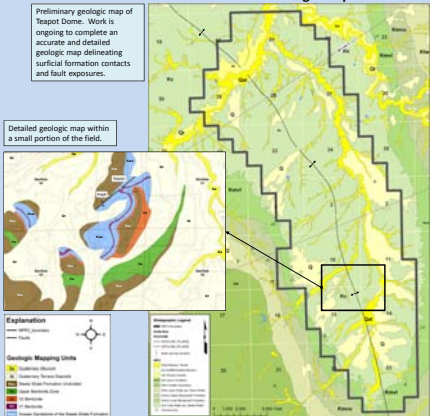


Gas Flowline Optimization



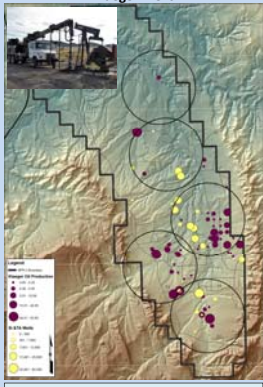
Map showing the high and low pressure gas collection systems at NPR-3.

NPR-3 Geologic Map



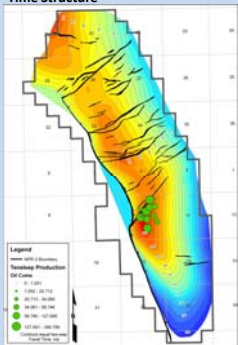
Detailed geologic map within a small portion of the field.

Klaeger Wells



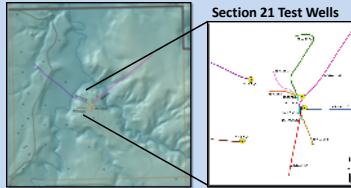
Map showing patterns and production results after treating wells with a Klaeger swabbing unit. This map allows RMOTC production engineers to analyze the effects of the well treatments for future planning.

NPR-3 Tensleep Time Structure



Geologic time structure map showing the top of the Tensleep A Sand as interpreted from seismic data. The green bubbles represent cumulative production from the Tensleep Formation.

Section 21 Test Wells



Map displaying one well pad that has been used by several RMOTC partners to test different drilling technologies including rotary steerable tools, specialized drill bits, coring mechanisms, and other drilling-related equipment. The map shows a birds-eye view of the boreholes drilled from the surface locations.

Three-dimensional view of the Teapot Dome Oilfield showing the subsurface structure of two oil-producing units and the deviated wellbore paths from holes drilled on the 45-21 surface pad.

