

## **Chapter 9 Conclusions: Reasonable Foreseeable Development Scenario**

### **9.1 Potential for occurrence: High**

The overall potential for occurrence of oil and gas resources in the eastern Valle Vidal Unit is high using the ranking method described in this report. This rank is based on geologic conditions predicted to be present at the site relative to that of adjacent lands being actively and economically developed. The primary play of interest is the areally-extensive, shallow (less than 2000 ft deep) coalbed methane and low permeability sandstone natural gas play associated with the Vermejo and Raton Formations. There is some uncertainty as to the quality and economics of this play due to lack of coal quality data in the southern part of the study area. However, there is no negative evidence. The potential for igneous-influenced, increased coal maturity in this area is encouraging.

Another high potential occurrence play using the ranking method described in this report is the fractured “shale” blanket-type Pierre-Dakota play. There is also a lesser possibility of conventional reservoir traps in the Dakota Sandstone. A third play based on postulated presence and source rock potential of the Pennsylvanian Sandia Formation is assigned a low potential due to uncertainty and lack of positive indicators such as oil or gas shows nearby.

### **9.2 Potential for development: High**

The potential for development of oil and gas resources at the eastern Valle Vidal Unit is high based on the ranking scheme described in this report. If allowed to lease the eastern Valle Vidal Unit, oil and gas operators will be primarily interested in the immediate economic benefit of developing the coalbed methane resources. Development will proceed from an initial phase of testing 5 to 10 selected sites to evaluate geologic and economic conditions, primarily gas-in-place and net coal thickness in the Vermejo Formation for comparison with productive gas wells on the adjacent Vermejo Park Ranch. A second phase will focus on bringing in the proper infrastructure to produce the area as a whole. This phase involves construction of a pipeline that will require negotiation to be successful and therefore not evaluated here as to economic feasibility. Other infrastructure development will be gas compression and water handling and disposal facilities. A third phase will involve drilling every allowed location on 160 acre spacing where feasible using conventional vertical drilling technology. A fourth phase might involve drilling problematic locations using deviated (not horizontal) wellbores if economics prove to be sufficient. Deep targets will be tested as a side benefit of drilling water disposal wells and may not require additional locations.

### **9.3 Drilling activity and surface use forecast**

Development of the coalbed methane resource is not likely to require reflection seismic data. Evaluation of deeper plays would benefit from such data. Operators in the region have expressed interest in 3-D seismic data with lines/cross-lines spaced closer than ¼ mile. No evidence of existence of 3-D seismic data or current acquisition activity was found in the vicinity. If acquired later in the RFDS, seismic acquisition by vibroseis source (trucks) may be able to take advantage of existing lease roads to minimize disturbance.

Over the 20 year life of the RFDS, it is predicted that a minimum of 195 total wells would be drilled on a total of 191 surface locations at 160-acre per well spacing. Four wells will be drilled as water disposal wells/deep tests and could be placed on an existing well pad for a shallow coalbed methane well. The area of disturbance for each location need not be large because the shallow depth and minimal required equipment would allow for small locations. Innovative and environmentally progressive development practices could significantly reduce impacts to alternative land uses while promoting maximum economic benefit. Flexibility in spacing rules and better-than-anticipated geologic conditions could allow expansion to a total of 254 wellbores on 250 surface locations.

Approval for 80-acre infill (increased density) drilling locations may be needed to produce the resource within the 20-year time frame. Presently there is insufficient evidence to determine the possibility that downspacing will occur. Some operators believe that there will eventually be sufficient justification for this. If 80-acre per well spacing is approved, this would essentially double the number of locations. Therefore, a range of between 191 and 500 surface locations (well pads) is possible within the 20-year life of the RFDS.

Coalbed methane plays benefit from planned dewatering of coal over a large area. If the Carson National Forest allows oil and gas leasing and development, it is worth considering leasing the eastern Valle Vidal Unit as a contiguous block of acreage in order to drain the natural gas reserves most efficiently, economically, with the least disturbance, and to prevent duplication of infrastructure.