# PRESENTATION AND EXHIBITS
# for the
# SAN JUAN BASIN COALBED METHANE
# SPACING STUDY

***Presented at the***

## *NEW MEXICO OIL CONSERVATION DIVISION*
## *EXAMINER HEARING*

***CASE NO. 9420, ORDER NO. R-8768***
***FEBRUARY 21, 1991***

## STUDY OVERVIEW AND CONCLUSIONS

### Introduction

In May 1989, the Coalbed Methane Committee (CMC) agreed that a reservoir engineering study of the basal Fruitland coalbed methane resources in the San Juan Basin would greatly assist the New Mexico Oil Conservation Division and the Colorado Oil and Gas Conservation Commission in developing the appropriate fieldwide rules for optimum well spacing and conservation of the resource. GRI also was interested in conducting a study to determine the relationship between reservoir properties and productivity. The CMC and GRI agreed to cooperate in a study to fulfill these mutually compatible objectives. GRI requested its contractor, ICF Resources Incorporated, to prepare a proposal outlining the methodology and requirements to perform the study. This proposal became the technical basis for the joint agreement between GRI and the CMC, the study commenced in September 1989.

The primary objective of the CMC in this effort has been to develop an appropriate methodology for evaluating well spacing in the development of the coalbed methane resources of the San Juan Basin. ICF Resources proposed meeting this stated objective by concentrating its efforts on the reservoir characterization of selected field sites and the completion of sensitivity analyses based on reservoir simulation techniques. Reservoir characterization of selected field sites under active coalbed methane development provides the means by which key reservoir parameters can be defined on a site specific basis. Once the key parameters such as cleat permeability and porosity, coal thickness, reservoir pressure, initial gas content, sorption isotherm characteristics, and initial water saturation have been determined, the sensitivity of gas and water production to a wide range in these parameters can be evaluated with an appropriate coalbed methane simulator.

As one of the most productive basins in the United States, the San Juan Basin has been the focus of active research in recent years. In order to advance the body of knowledge on all facets of commercial coalbed methane resource development in the basin, the Gas Research Institute has funded much of this research effort. The foundation of the CMC Fruitland spacing study relied extensively on contributions from two such recently completed studies[1, 13] funded by GRI.

Identification and location of coalbed methane wells in the San Juan Basin was conducted by the Texas Bureau of Economic Geology[1], under contract to GRI, and provided the foundation for the selection of areas under active coalbed methane development within the basin. On the basis of hydrodynamics and geology, the San Juan Basin was divided into three main regions having similar reservoir characteristics[1]. These are: the overpressured north-central part of the basin designated as Area 1, the underpressured regional discharge area in the west-central part of the basin designated as Area 2, and the underpressured eastern part of the basin designated as Area 3 (Exhibit 1). It should be noted that the boundaries between these areas are very complex and are not as well defined as shown in Exhibit 1. The implications of these subdivisions on reservoir characterization and performance will be discussed in detail later.

Resource Enterprises, Inc., under contract to GRI, conducted the Western Cretaceous Coal Seam Project[13] with the objectives of evaluating the areas of exploration geology, drilling, formation evaluation, completion engineering, production operations, and field development in the northern San Juan Basin. As a result of the major formation evaluation efforts performed for the study, realistic ranges in reservoir properties were identified and became invaluable in constructing and designing the sensitivity analyses for Areas 1, 2 and 3.

In addition to the public data available through GRI funded research, individual members of the Coalbed Methane Committee provided both their experience and selected data throughout this cooperative effort. Primary responsibility for the oversight of the project resided with the Gas Research

# SAN JUAN BASIN
# AREAS 1, 2 AND 3