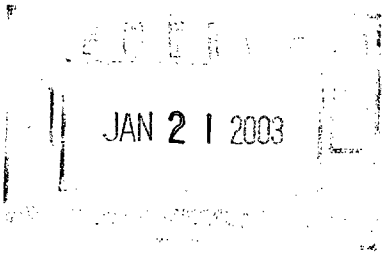
pKRV0302228014 AMEND SWD-838 NA

Duke Energy Corporation
5400 Westheimer Court
P.O. Box 1642
Houston, TX 77251-1642

WVJ

Mr. William V. Jones, Hearing Examiner
Oil Conservation Division
New Mexico Department of Energy,
Minerals and Natural Resources
1220 South St. Francis Drive
Santa Fe, NM 87505



Mr. Russell E. Bentley
Duke Energy
5400 Westheimer Court
Houston, TX 77056-5310

January 17, 2003

Dear Mr. Jones,

Duke Energy Field Services, LP (DEFS) is currently completing its Duke AGI #1 located at 1232 feet from the South line and 1927 feet from the East line (Unit O) of Section 7, Township 18 South, Range 28 East, NMPM, Eddy County, New Mexico. The currently authorized Administrative Order (SWD-838-A dated 29-May-2002, as amended October 28, 2002) requires DEFS to operate the injection well or system **"with a pressure limiting device which will limit the wellhead pressure on the injection well to no more than 2,240 psi"**. The 2,240 psi figure is assumed to be the additional surface pressure required to fracture the reservoir rock if a normal (water) pressure gradient exists in the borehole.

It is requested that the OCD amend the Administrative Order (SWD-838-A) to increase the maximum allowed injection pressure from 2,240 psi to 3,240 psi. This will correct for the pressure difference between a normal (water) pressure gradient and a column of acid-gas and insure there is no misunderstanding between DEFS and the OCD about the proper surface pressure range that DEFS should operate within.

Most reservoir rocks are assumed to be in equilibrium with a normal hydrostatic pressure gradient of 0.433 psi/ft acting on them. At 11,200 ft the normal hydrostatic pressure can be calculated to be approximately 4,850 psi (11,200 x 0.433 psi/ft). Empirical rock mechanics data suggest that at some additional pressure gradient (perhaps 0.2 psi/ft), a reservoir can be actually fractured. In the Order, 2,240 psi represents the additional amount of surface pressure required to fracture the reservoir rock at 11,200 ft (11,200 x 0.2 psi/ft) if that reservoir rock already has a normal hydrostatic pressure of water acting on it.

DEFS will <u>not</u> have a normal hydrostatic pressure column once its injection operation starts. The estimate of the specific gravity (to water) of acid-gas is 0.8. At 11,200 ft, the hydrostatic pressure exerted by a column of acid-gas "fluid" is 3,880 psi (0.8 x 0.433 x 11,200). This is nearly 1,000 psi less than the 4,850 psi of "normal"