

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION**

**IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
FOR THE PURPOSE OF CONSIDERING:**

**APPLICATION OF DUKE ENERGY FIELD SERVICES, LP FOR AN ACID GAS
INJECTION WELL, LEA COUNTY, NEW MEXICO**

**CASE NO. 13589
ORDER NO. R-12546**

ORDER OF THE OIL CONSERVATION COMMISSION

BY THE COMMISSION:

THIS MATTER came before the Oil Conservation Commission (the Commission) for hearing on March 13, 2006, and the Commission, having carefully considered the evidence, the pleadings and other materials submitted by the parties hereto, now, on this 5th day of May, 2006,

FINDS:

1. Notice has been given of the application and the hearing of this matter, and the Commission has jurisdiction of the parties and the subject matter herein.

2. On September 13, 2005, Duke Energy Field Services, LP ("Applicant", "operator" or "Duke") filed an administrative application (OCD Form C-108 and attachments), seeking authority to inject acid gas (hydrogen sulfide and carbon dioxide) into the Lower Bone Springs (Wolfcamp) formation, at a depth interval of 8,700 to 9,000 feet below the surface, through a well it proposes to drill at a location 1,980 feet from the South line and 1,980 feet from the West line (Unit K) of Section 30, Township 18 South, Range 37 East, in Lea County, New Mexico. The purpose of injection is to dispose of natural gas processing wastes from Applicant's Linam Plant, located in the Northeast Quarter of Section 6, Township 19 South, Range 37 East, in Lea County.

3. The original application proposed an alternative injection zone in the Brushy Canyon formation at a depth interval of 5,000 to 5,300 feet below the surface. However, that alternative request was subsequently withdrawn and is not now before the Commission.

4. At the direction of the Director of the Oil Conservation Division (the Division), pursuant to Division Rule 1218.B, this case was set for hearing before the Commission.

5. At the hearing, AC Ranch Partnership (AC Ranch), a surface lessee of land in proximity to the proposed injection site, and Randy Smith (Smith), a surface owner and resident in the vicinity of the proposed injection site, appeared as protestants, and offered evidence in opposition to the permit sought by Applicant. The Division appeared as an intervenor, and offered evidence relevant to conditions it urged the Commission to place upon the permit if granted.

Applicant's Evidence

6. The Applicant produced two witnesses, Chris Root, a chemical engineer employed by the applicant and the project manager for this project, and Alberto Gutierrez, a geologist, employed by Geolex, Inc., a consultant to Applicant.

7. Mr. Root described the proposed system for transporting acid gas extracted from the natural gas stream at the Linam plant to the injection well and injecting it into the well. He testified that implementation of the proposed system would allow deactivation of the sulfur recovery system currently in use at the plant. This would improve environmental protection by reducing the plant's emissions of sulfur dioxide and carbon dioxide and replacing an aging system with a newer and more modern system, which would also improve plant reliability. Mr. Root testified specifically that acid gas injection is the best available control technology for sulfur recovery from a natural gas stream.

8. The proposed system, as Mr. Root described it, will consist of a compressor system at the Linam Gas Plant that will compress the acid gas to a pressure of approximately 90 psig, an 8 inch diameter pipeline that will transport the gas approximately one and one-half miles to the injection well, and another compression system at the injection well that will further compress the acid gas for injection into the wellbore. Mr. Root testified that this configuration will minimize hydrogen sulfide exposure for plant personnel and for the public. Each element of the system will be equipped with emergency shut-down valves that will activate in case of a malfunction, and there will be flaring systems at the plant and at the well site to flare any hydrogen sulfide that must be released to the atmosphere. The pipeline will consist of a steel outer structure with a high density poly-ethylene (HDPE) plastic liner, which will be constructed to permit detection of leaks from the liner. The system will include additional safety features that Mr. Root described in detail.

9. Mr. Root further testified that the Applicant would prepare a hydrogen sulfide contingency plan that would comply with OCD Rule 118 prior to activating the system. The H₂S contingency plan will provide, among other things, a means of alerting persons in the vicinity in event of an H₂S release. Mr. Root further testified that he had reviewed the recommendations proposed by the Division, and that these proposals are acceptable to, and will be implemented by, the Applicant.

10. Mr. Gutierrez testified that Duke engaged his employer, Geolex Incorporated, to locate a suitable subsurface reservoir into which it could inject the acid gas stream from the Linam Gas Plant. He found that there was no suitable reservoir underlying the plant. However, the Bone Springs formation and the Brushy Creek formation at the proposed injection site, approximately one and one-half mile from the site met the requisite criteria. Based on his stratigraphic studies of these formations, Mr. Gutierrez concluded that these formations have the necessary porosity and permeability such that the acid gas can be successfully injected and are geologically sealed to prevent escape of the injected fluids. Duke obtained seismic information for the area, and Mr. Gutierrez confirmed his conclusions by reference to the seismic data. Furthermore, the results of previously drilled deep wells in this vicinity indicated no significant prospects for oil and gas production from or below the proposed injection zone.

11. Mr. Gutierrez further testified that fresh water wells in the vicinity produce water from the Ogallala or shallower aquifers, and that fresh water is not deeper than 200 feet below the surface. The Duke injection well will have surface casing to a depth of 540 feet, and all three casing strings will have cement circulated to surface. Injection will be accomplished through sealed tubing, and the casing-tubing annulus will be filled with diesel.

12. Mr. Gutierrez further testified that Duke will maintain an injection pressure of 2,600 to 2,700 psi, and will perform the necessary step-rate tests, as required by the Division, to demonstrate that these pressures will not result in formation damage. Pressures will be continuously monitored.

13. Consideration was given to drilling a directional injection well from the plant site. Mr. Gutierrez testified that Duke rejected this alternative because it has never been done for acid gas injection, and Duke did not want to attempt to pioneer a new technique for this type of operation.

14. The surface and minerals at the proposed injection site are owned by the State. Duke obtained an easement from the State Land Office for its surface facilities. Duke also obtained an oil and gas lease, but they did this merely to protect their rights in case hydrocarbons are encountered. Duke relies on the easement as conferring rights to maintain the injection facility at the subject site.

15. Mr. Gutierrez further testified that Duke had furnished notice to all "affected persons" within a one-mile radius of the wellbore, and to the City of Hobbs, as advised by the Division. After consultation with the State Land Office, **Duke** did not notify the surface grazing lessee.

16. On cross-examination, Mr. Gutierrez testified that the direction and distance that the acid gas would travel within the Bone Spring formation would depend on the available porosity and permeability, but that it might travel outside the boundaries of the land leased by Duke.

Protestants' Evidence and Statements

17. The protestants produced two witnesses: S.G. Cobb, a partner in AC Ranch, grazing lessee of the land at the proposed injections site, and Randy Smith, owner of the surface of the half-section immediately north of the proposed injection site, whose home lies approximately one and one-half miles north of the injection site. Mr. Cobb and Mr. Smith testified that they object to location of the injection well as proposed.

18. Gale Henslee and Bobby Gonzales, employees of Xcel Energy, owner of the Maddox power plant, located approximately one-half mile east of the proposed injection site made statements. They stated that approximately fourteen employees are present full-time at the Maddox plant, and contractors are present and working there from time to time. Mr. Henslee and Mr. Gonzales articulated concerns about the safety of these persons in the event of an emergency caused by a hydrogen sulfide release.

The Division's Evidence

19. The Division, as intervenor, presented two witnesses: William Jones, a petroleum engineer whose duties include reviewing applications for injection permits, and Wayne Price, Chief of the Division's Environment Bureau.

20. Mr. Jones testified that in his opinion Duke's proposed facility was generally well designed, and he approved of it; though he believed Duke should have given more consideration to drilling a directional well from the plant site. Mr. Jones proposed certain conditions concerning the operation and testing of the well that he would recommend be included in the permit.

21. Mr. Price testified that Duke's proposed surface installations to convey the acid gas from the plant to the injection site would require Division approval through a modification of its discharge permit for the facility, a plan the Division approved pursuant to the Water Quality Act, NMSA 1978 Section 74-6-5, as amended. He further testified that Duke would be required to prepare a hydrogen sulfide contingency plan pursuant to Division Rule 118, and that the Environment Bureau would require that the hydrogen sulfide contingency plan be submitted for Division approval in connection with Duke's discharge plan modification, although Rule 118 does not expressly require such approval. Mr. Price also recommended certain precautionary measures, including installation of hard-wired alarm systems to alert neighboring residents and facilities of a hydrogen sulfide release, erection of a warning device on the adjacent public highway and plans to close the highway in event of an emergency.

The Commission's Conclusions

22. The Commission concludes that the proposed injection operation can be conducted in a safe and responsible manner, as proposed, without causing waste, impairing correlative rights or endangering fresh water, public health or the environment.

23. The proposed operation is an environmentally superior means of disposing of wastes generated at the Linam Gas Plant because it will allow reduction of emissions of certain pollutant, as compared to the continued operation of the plant's existing sulfur recovery system. Also the proposed facility will provide for sequestration of greenhouse gases, hydrogen sulfide and carbon dioxide.

24. The proposed injection operation can be conducted without undue risk to residents and others in the vicinity of the plant and injection location. However, in view of the highly toxic nature of hydrogen sulfide in the concentrations that will be present in the proposed system, specific measures, as described in the ordering paragraphs below, should be implemented to provide warning of hydrogen sulfide releases.

25. The surface installations of the proposed system are also subject to Division approval as a modification of the discharge permit granted to the Linam Gas Plant by the Division pursuant to the Water Quality Act, NMSA 1978 Section 74-6-5, as amended.

26. Although there is some evidence that fluids injected pursuant to the license granted by this order might migrate beyond the lateral limits of the particular tract on which the injection facility will be located, the Commission concludes that it is unnecessary that the Commission make a finding with respect to that possibility. The New Mexico Supreme Court in *Snyder Ranches, Inc. v. Oil Conservation Commission*, 789 P.2d 587 (NM Sup 1990) indicated that the Commission's issuance of an injection permit constitutes only a license to engage in activities otherwise within the property rights of the Applicant. If, at some future time, activity conducted within the scope of the permit exceeds those property rights, this would be a matter for adjudication in the courts, and not within the jurisdiction or competence of the Commission.

27. The easement granted to the Applicant by the New Mexico Land Office for installation of the necessary surface facilities constitutes sufficient evidence that the Applicant has a good faith claim of a legal right to conduct the proposed activity.

IT IS THEREFORE ORDERED THAT:

A. Duke Energy Field Services, LP is hereby authorized to drill and complete its proposed Linam AGI Well No. 1, to be located 1980 feet from the south line and 1980 feet from the West line (Unit K) of Section 30, Township 18 South, Range 37 East, NMPM, in Lea County, New Mexico, in such manner as to permit the injection of acid gas, consisting principally of hydrogen sulfide and carbon dioxide, for disposal into the Lower Bone Spring formation at a depth of 8,700 feet to 9,000 feet below the surface, through 3 1/2 inch tubing set in a packer located approximately 8,600 feet below the surface.

B. The operator of the well (Applicant or any successor operator) shall take all steps necessary to insure that the injected gas enters only the proposed injection interval and does not escape to other formations or onto the surface.

C. The well shall be constructed substantially in accordance with the description in the Injection Well Data Sheet attached to Form C-108 filed by the Applicant in this case, including setting surface casing at least 540 feet below the surface and setting a total of three casing strings, all with cement circulated to the surface.

D. During drilling operations, the operator shall monitor the well for hydrocarbon shows. Any hydrocarbon shows within the Lower Bone Spring shall be reported to the Division prior to commencement of injection.

E. Copies of the logs of the completed well, including a dipole sonic log or a formation microscanner log over the Lower Bone Spring, and a letter setting forth the estimated static bottom-hole pressure of the injection formation shall be delivered to the Division's Hobbs District Office prior to commencement of injection.

F. After installation of the injection tubing but prior to commencing injection operations, and at least once every five years thereafter, the operator shall pressure test the casing from the surface to the packer-setting depth to assure casing integrity.

G. The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or approved leak-detection device in order to detect any leakage in the casing, tubing or packer.

H. The operator shall insure that the injected gas is properly dehydrated prior to entering the injection zone.

I. The operator shall record injection rates and pressures on a continuous basis and report these readings annually, or more often if requested, to the Engineering Bureau in the Division's Santa Fe Office and to the Division's Hobbs District Office. Each such report shall include the well name, location, API Number and the number of this order.

J. The injection well or system shall be equipped with a pressure limiting device that will limit the wellhead pressure on the injection well to no more than 2644 psi while injecting acid gas with an approximate specific gravity of 0.8. The operator shall attempt to maintain the injected fluid in the non-corrosive phase with minimum pressure regulating devices as necessary.

K. The Director of the Division may authorize an increase in injection pressure upon a proper showing that such higher pressure will not result in migration of the injected gases from the permitted injection formation. Such showing shall consist at least of a valid step-rate test run in accordance with procedures acceptable to the Division. Any step-rate test shall be run with an inert fluid such as produced water, and not with acid gas.

L. The operator shall notify the Hobbs District Office of the Division of the time of the setting of the tubing and packer and of any mechanical integrity test so that such operations can be witnessed or inspected.

M. Without limitation of the duties of the operator as provided in Division Rules 19 and 116, the operator shall immediately notify the Hobbs District Office of the Division of any failure of the tubing, casing or packer in the well, or of any leakage or release of water, oil or gas from or around any producing or plugged and abandoned well in the area, and shall take such measures as may be timely and necessary to correct such failure or leakage.

N. Prior to commencing injection, the operator shall secure Division approval of an appropriate modification of the discharge permit for the Linam Gas Plant to specifically authorize the proposed operation.

O. Prior to commencing injection, the operator shall prepare and secure approval by the Division's Environment Bureau of, a hydrogen sulfide contingency plan that complies with Division Rule 118, and includes, without limitation: (i) installation of alarm systems with hard-wired connections from the H₂S monitoring systems at the Linam Plant and at the injection facility to audio and visual alarms at the Excel Maddox station and at the Linam Plant, and to an audible alarm at the Randy Smith home; (ii) additional H₂S monitoring stations located to the east of the facility, in addition to those proposed in the application, the number and placement of such stations to be approved by the Division's Environment Bureau; (iii) warning devices that can be activated in the event of a hydrogen sulfide release (with wind socks) along roads that the proposed acid gas pipeline will cross, at locations to be approved by the Division's Environment Bureau, and (iv) continuous pressure monitoring and sampling of the pipeline microannulus at all sampling points.

P. The proposed acid gas pipeline system shall be buried at least three feet below the surface. All road crossings shall be installed in conduits designed and constructed to prevent damage due to traffic or routine road maintenance. The pipelines shall be constructed and maintained as if they were subject to United States Department of Transportation rules. Pipeline markers shall alert the public to the presence of poisonous gas.

Q. Prior to commencing injection, the operator shall submit to the Engineering Bureau in the Division's Santa Fe Office written evidence of satisfaction of the conditions precedent to injection provided in this order and obtain an administrative order acknowledging compliance with those conditions and authorizing commencement of injection.

R. The operator shall submit monthly reports of injection volumes to the Division on Form C-115, in accordance with Division Rules 706 and 1115.

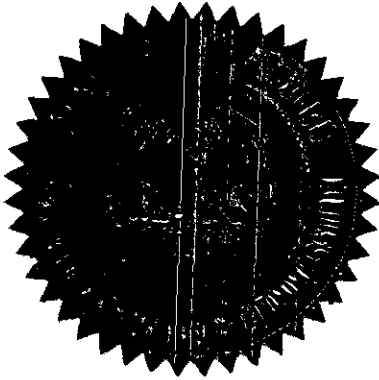
S. The injection authority herein granted shall terminate one year after the effective date of this order if the operator has not commenced injection operations pursuant hereto; provided however, the Division Director, upon written request of the operator, may extend this time for good cause shown.

T. Compliance with this order does not relieve the operator of the obligation to comply with other applicable federal, state or local laws or rules, or to exercise due care for the protection of fresh water, public health and safety and the environment.

U. The Division Director may amend this order by administrative order, after proper notice, and in the absence of protest.

V. Jurisdiction of this case is retained for entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



**STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION**

A handwritten signature in dark ink, appearing to read 'Mark E. Fesmire'.

MARK E. FESMIRE, P.E. CHAIRMAN

A handwritten signature in dark ink, appearing to read 'Jami Bailey'.

JAMI BAILEY, C.P.G., MEMBER

A handwritten signature in dark ink, appearing to read 'William Olson'.

WILLIAM OLSON, MEMBER

SEAL