

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

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

**CASE NO. 14330
ORDER NO. R-13222**

**APPLICATION OF GANDY CORPORATION FOR AUTHORIZATION TO
INJECT, LEA COUNTY, NEW MEXICO**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on September 21, 2009, at Santa Fe, New Mexico, before Examiner William V. Jones.

NOW, on this 1st day of March, 2010, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner,

FINDS THAT:

(1) Due public notice has been given, and the Division has jurisdiction of this case and its subject matter.

(2) The applicant, Gandy Corporation ("Gandy" or "applicant"), seeks authority to utilize the Albacore 25 Com Well No. 1 (API No. 30-025-37054 the "subject well") located 1310 feet from the South line and 1350 feet from the West line, Unit N of Section 25, Township 16 South, Range 35 East, NMPM, Lea County, New Mexico, to dispose of oil field produced waters into the Abo formation from 8918 feet to 8952 feet and the Lower Wolfcamp formation from 10,506 feet to 10,690 feet.

(3) On January 26 of 2009, the Division received an administrative application from Gandy Corporation (OGRID 8426) through its agent, Mr. Terry M. Duffey of Everquest Energy Corporation, seeking to utilize this well for commercial disposal of oil field waste waters. Gandy provided notice to approximately 25 affected parties (as defined in Division Rule 26.7A) of its intent to use this well for disposal purposes. V-F Petroleum Inc. ("V-F"), an affected party was provided notice by Gandy and protested the administrative application. Gandy subsequently filed to have this matter considered before an examiner.

(4) V-F appeared at the hearing in opposition to Gandy and presented testimony and exhibits. No party other than Gandy and V-F Petroleum, Inc. entered an appearance in this case. No party other than V-F opposed this application.

(5) Gandy was represented at the hearing by technical experts including representatives from Everquest Energy Corporation ("Everquest") and Primero Operating, Inc. ("Primero"). Everquest, Primero, and V-F each own and operate producing wells in New Mexico.

(6) As preparation for this hearing, Gandy successfully petitioned the Division to issue a subpoena (issued June 5, 2009), for mudlogs from V-F's Blue Fin 25 Well No. 1 (API No. 30-025-35865) and V-F's Eidson 26 Well No. 1 (API No. 30-025-34196). These mudlogs were referred to at the hearing, but were not entered as exhibits due to confidentiality issues.

(7) Gandy presented exhibits and testimony from three experts; the owner of Primero, a geologist and an engineer as follows:

a. The Albacore 25 Com Well No. 1 was drilled by Chesapeake Operating, Inc. in 2005 to the Mississippian Chester formation. The Chester Lime, Chester Shale, and Atoka were tested, and the Atoka formation was completed and produced until 2007 when the well was Temporarily Abandoned. In 2008, Primero Operating Inc. ("Primero") took over operations of this well and tried unsuccessfully to complete an additional interval in the Upper Pennsylvanian.

b. Primero subsequently plugged the well out of the Pennsylvanian and perforated, completed, and tested two intervals in the Permian Lower Wolfcamp formation and then one in the Permian Abo formation as follows:

i. Lower Wolfcamp perforations from 10,660 to 10,690 feet were acidized and then swabbed long enough to recover more than the load fluids. The two or three day swab test yielded no oil or gas and showed very high permeability. The swabbing was unable to lower fluid levels below 4700 feet from surface.

ii. Lower Wolfcamp perforations from 10,506 to 10,542 feet were acidized and then swabbed with the same result.

iii. Abo perforations from 8918 to 8952 feet were acidized and then swabbed, yielding only water with an estimated 200 feet of fluid entry per hour.

c. Primero selected the two Lower Wolfcamp intervals for testing based on adequate log porosity and some mudlog shows. The mudlog "show" was most favorable in the upper interval. The swab tests confirmed that permeability and porosity were adequate, but tested intervals were, in fact, water saturated. Other intervals with mudlog "shows" were not tested because of inadequate log porosity.

d. Gandy Corporation has a commercial disposal business and expressed an interest in purchasing or otherwise using this wellbore for disposal purposes into the same perforations tested by Primero – contingent on a permit being issued by the Division. Primero is also interested in parting with this well after the poor testing results in those intervals.

e. Gandy has conducted an injectivity test on the well, pumping into an interval consisting of both the Abo and highest Wolfcamp perforations at a rate of 2.75 barrels per minute. After drilling out the plug above the lowest Wolfcamp perforations, Gandy could not circulate the well even when pumping at 4 barrels per minute.

f. Gandy's geologist testified that the Lower Wolfcamp formation in the vicinity of the Albacore 25 Com Well No. 1 is on a structural "low". The Wolfcamp produces oil some distance to the west and is considered "wet" to the east.

g. Gandy's engineer testified that the Townsend-Wolfcamp Pool has disposal wells within the pool that have injected for years with no large increase in water production from surrounding oil producers.

h. The Wolfcamp for various reasons is not generally a good candidate for secondary oil recovery through waterflooding. Stratigraphic discontinuity and the inability to "bank oil" were both cited as reasons for the Wolfcamp being a poor candidate.

i. Gandy utilized a Landman to determine ownership within the ½ mile area of review ("AOR") for purposes of providing notice.

(8) V-F Petroleum Inc. presented exhibits and testimony from a geologist as follows:

a. V-F has one deep gas well, the Blue Fin 25 Well No. 1, located within the ½ mile Area of Review of the subject well. V-F also operates the Eidson 26 Well No. 1 and may now operate the Blue Fin 24 Well No. 1 and the Eidson 23 Well No. 1; both located approximately a mile northeast and north of the subject well.

b. V-F has in its possession data collected from these wells, such as cutting samples, electric logs and mudlogs and has processed seismic data and conducted geologic studies in this area – all within the Lower Wolfcamp and upper Pennsylvanian.

c. V-F believes this general area directly north and east of the Albacore 25 Com Well No. 1 is possibly prospective for oil and gas recovery from layered limestone “mounds” possibly similar to the prolific Dagger Draw area. The top of this mound group is expected to have an impenetrable caprock and completion testing of these types of reservoirs sometimes takes many days of producing water before oil and gas are produced.

d. Based on seismic surveys and on regional geologic studies, several mounds may exist and V-F has plans to use existing wellbores as they become available to further define or prove up this reservoir.

e. V-F would have perforated and tested additional intervals in the subject well and believed the two tested intervals should have been swabbed longer.

f. The Lower Wolfcamp and Upper Pennsylvanian formations have numerous vertical fractures or faults and the limestone has been dolomitized with water movement through these fractures.

g. V-F does not object to the use of the Abo formation for disposal purposes.

(9) Division records indicate Gandy Corporation (OGRID 8426) as of the date of this order is in compliance with Division Rule 5.9.

(10) It was not apparent from this testimony or reviewing this application which of the noticed parties was the owner of the surface land on which the subject well is located. Gandy should be required to specify who is the surface owner and provide proof this surface owner has been notified.

(11) Division records indicate wells in this area are cased with surface pipe covering the shallow fresh water intervals, intermediate pipe set either into the Grayburg formation or at the top of the San Andres formation, and production pipe set below the prospective gas intervals in Pennsylvanian or Mississippian aged rocks.

(12) The surface and intermediate pipes adequately protect fresh water intervals from possible invasion and contamination. The subject well is located miles north and east of the Capitan Reef and of any Potash operations.

(13) Other than the Albacore 25 Com Well No. 1, there are three deep wells in this ½ mile AOR that penetrate the Lower Wolfcamp formation. All three are currently gas wells producing from either Pennsylvanian or Mississippian aged rocks. Division records indicate all four wells in the AOR are cemented properly to at least the top of the Wolfcamp formation at approximately 9650 feet. Cement records indicate tops are much higher than this, but cement bond logs sometimes show poor bond above the Wolfcamp. Cement diverter "stage" tools installed on production pipe are frequently set at some depth above the Wolfcamp formation, and the Abo formation was reported to be covered with cement of some quality.

(14) V-F does not object to use of the Abo for disposal, nor did any other affected party. Primero operates the nearest Abo producing well located approximately 3800 feet from the subject well. Division records show this Eidson Well No. 1 (API No. 30-025-21185) to be in the Townsend-Abo Pool and reporting just over 2 barrels of oil per day. Nothing was presented in this case to show that waste might occur by disposal into the Abo formation.

(15) V-F's geologist seems interested in locating limestone "mounds" that would produce within the Lower Wolfcamp and Upper Pennsylvanian and did not express interest in intervals above the Lower Wolfcamp. It seems interesting that V-F's geologist and Gandy have not examined this wellbore to locate disposal intervals suitable to both parties. Division logs indicate the San Andres has low porosity and bond logs indicate it may not be adequately cemented, but intervals within the Upper Wolfcamp have good porosity and drilling mud invasion.

(16) Although at a structural "low" and apparently wet from the lack of overnight gas, the lack of oil on the first run, and the volume of swabbed water, these two Lower Wolfcamp intervals were chosen because of high porosity and some mudlog shows. The resistivity log indicates that significant invasion could have occurred while drilling and this is supported by the disparity between what the cement bond log shows and the volume of pumped cement. The swab testing was prudently stopped after three days of poor results – but based on the reported swab-down depth, swabbing only reduced the pressure on top of the perforations to approximately 2400 psi. Ideally, the completion should have been tested by pumping off the head over the perforations. Clearly this was not practical when looking for a conventional reservoir and was not indicated.

(17) The Albacore 25 Com Well No. 1 is located less than 1 mile east or north of oil pools which have been expanded over the years. The Shoe Bar-Upper Pennsylvanian Pool once included the Lower Wolfcamp intervals; the subject well is less than ¼ mile north and ½ mile east of this pool's boundaries. The subject well is less than ½ mile east of the Shoe Bar-Wolfcamp Pool boundary and less than ¾ mile northwest of the South Shoe Bar-Wolfcamp Pool boundary. The subject well is also less than ½ mile east of the Townsend-Abo Pool boundary.

(18) The exploration concept of looking for oil and gas charged limestone "mounds" deviates from conventional thinking but has precedence in, for example, the very prolific Dagger Draw area. Unfortunately, V-F did not present a petroleum reservoir engineer to explain in engineering terms the possible similarities between this area and the Dagger Draw. The fact remains that unconventional reservoirs and drilling methods have in recent years come to prominence in the oil patch.

(19) Probably the biggest technical issue in this case is whether V-F's exploration prospects would be harmed by high volume disposal into the existing Lower Wolfcamp perforations within the Albacore 25 Com Well No. 1. There was testimony on both sides that it is difficult to determine where disposal into this Lower Wolfcamp actually goes once it leaves the wellbore. Gandy's witnesses explained it with "discontinuity" and V-F's geologist explained it with the layered "mound" concept and the presence of vertical fracturing. Gandy maintained that existing data shows disposal does not harm surrounding wells, while V-F claimed disposal could possibly mask its planned future testing of this "mound" reservoir concept.

(20) Division records show that V-F Petroleum, Inc. (OGRID 24010) operates 68 oil and gas production wells in New Mexico and it was apparent from the testimony that its geologist has experience and an understanding of this "mound" concept. V-F has invested in geologic studies and processing and interpreting seismic data and has focused in the area just north and east of this proposed disposal well. V-F has thus defined limestone "mound" prospects and has the correlative right to drill or recomplete existing wells to prove up these prospects. It seems prudent that existing wellbores be used for this purpose as the lower completions in these wells deplete.

(21) To prevent possible waste of oil and gas reserves, the application of Gandy Corporation to dispose of oil field waste waters into the Lower Wolfcamp interval from 10,506 feet to 10,690 feet should be denied.

(22) The portion of Gandy Corporation's application to use this well for disposal purposes into the Abo formation from depths of 8918 to 8952 feet should be approved.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Gandy Corporation ("Gandy" OGRID 8426), is hereby authorized to utilize the Albacore 25 Com Well No. 1 (API No. 30-025-37054) located 1310 feet from the South line and 1350 feet from the West line, Unit N of Section 25, Township 16 South, Range 35 East, NMPM, Lea County, New Mexico, to dispose of UIC Class II oil field produced waters into the Abo formation from 8918 feet to 8952 feet.

(2) The portion of Gandy's application seeking to dispose into the Lower Wolfcamp formation from 10,506 feet to 10,690 feet is hereby denied.

(3) Within 60 days of the date of this order, Gandy Corporation shall provide proof in writing to the Division director that the surface owner of this well site has been notified of this application and has not objected within 15 days of having been provided this notice. If Gandy does not provide this proof or if an objection is received in writing from this surface owner, this disposal permit shall expire *ipso-facto*.

(4) The disposal well shall be equipped with plastic-lined tubing set in a packer located no more than 100 feet above the top of the permitted disposal interval.

(5) After installing tubing, the casing-tubing annulus shall be loaded with an inert, non-corrosive fluid and equipped with a pressure gauge or an approved leak detection device in order to determine leakage in the casing, tubing, or packer. The casing shall be pressure tested from the surface to the packer setting depth to assure casing integrity.

(6) The wellhead injection pressure on the well shall be limited to **no more than 1784 psi**. In addition, the injection well or system shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface injection pressure to the maximum allowable pressure for this well.

(7) The Division Director may administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in migration of fluids out of the injection formation or the fracturing of the injection formation or confining strata. Such showing shall consist of at least an approved Step Rate injection Test.

(8) The operator shall notify in advance the supervisor of the Hobbs district office of the Division of the date and time of changes in packer, tubing, mechanical integrity tests, or any other work to be performed on this well.

(9) The operator shall immediately notify the Supervisor of the Division's Hobbs District Office of the failure of the tubing, casing or packer in the disposal well or the leakage of water, oil or gas from or around this well or any producing or plugged and abandoned well within the area, and shall take all steps as may be timely and necessary to correct such failure or leakage.

(10) The operator shall notify the supervisor of the Division's Hobbs district office of the date and time of the installation of disposal equipment and of any mechanical integrity test so that the same may be inspected and witnessed. The operator shall provide written notice of the date of commencement of disposal to the Division's district office. The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Division Rules 26.13 and 7.24.

(11) Without limitation on the duties of the operator as provided in Division Rules 30 and 29, or otherwise, the operator shall immediately notify the Division's

district office of any failure of the tubing, casing or packer in the well, or of any leakage or release of water, oil or gas from around any produced 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.

(12) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface using any conduit such as fractures or wells.

(13) The injection authority granted under this order is not transferable except upon division approval. The division may require the operator to demonstrate mechanical integrity prior to approving transfer of authority to inject.

(14) The division may revoke this injection permit after notice and hearing if the operator is in violation of 19.15.5.9 NMAC.

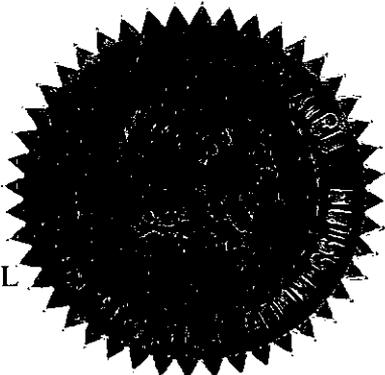
(15) In accordance with Division Rule No 26.12.C., the disposal authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request, mailed by the operator prior to the termination date, may grant an extension thereof for good cause. One year after disposal into the well has ceased, the authority to dispose will terminate *ipso facto*.

(16) 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.

(17) All provisions of this order may be revised or amended administratively after notice and an opportunity for hearing are provided to affected parties.

(18) Jurisdiction is retained by the Division for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh or protectable waters or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing, terminate the disposal authority granted herein.

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



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STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MARK E. FESMIRE, P.E.
Acting Director