



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

December 2, 2005

OIL AND GAS DOCKET NO. 09-0242576

THE APPLICATION OF PIONEER EXPLORATION LTD PURSUANT TO STATEWIDE RULE 46 FOR A COMMERCIAL APPLICATION TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS, DINWIDDIE, R.B. LEASE WELL NO. 1A, IN THE BOONSVILLE (BEND CONGL., GAS) FIELD, WISE COUNTY, TEXAS

HEARD BY: Thomas H. Richter, P.E., Technical Examiner
James M. Doherty, Hearings Examiner

APPLICANT:

David Gross, attorney
Ronald Wefelmeyer

REPRESENTING:

Pioneer Exploration LTD

PROTESTANTS:

David Frederick, attorney
Jackie V. Rhodes
James G. Popp, Jr.
Tracy A. & Coley E. Smith
Linda Sluder-Schertz
Cecile M. Carson
T.H. Schertz
Joseph Hoover
Christopher Petty
Joseph St. John

Texas Citizens For A Safe Future And Clean Water
Self
Self
Self
Self
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Self

OBSERVER:

David Cooney, attorney
Douglas Johnson

Railroad Commission of Texas



PROCEDURAL HISTORY

Date of Application:	April 12, 2005
Date of Notice:	April 15, 2005
Date of Hearing:	May 20, 2005
Date of Transcript Vol. I:	June 6, 2005
Date of Hearing:	October 6, 2005
Date of Transcript Vol. II:	October 17, 2005
Written Closing Statements Received:	October 27, 2005
Date PFD Issued:	December 2, 2005

EXAMINERS' REPORT AND PROPOSAL FOR DECISION
STATEMENT OF THE CASE

This is the application of Pioneer Exploration ("Pioneer") to convert an existing shut-in well for disposal of saltwater and operate a commercial disposal facility. The saltwater will come from operators drilling and completing wells in the Barnett Shale trend area. The Protestants live in the immediate area of the proposed commercial disposal facility and are opposed to the facility because of various environmental and safety concerns.

DISCUSSION OF THE EVIDENCE**APPLICANT'S EVIDENCE**

The proposed disposal well facility will be located in the ongoing Barnett Shale trend development play of the Wise County area which is undergoing extensive drilling activities. Water fracture stimulation is an essential part of a well's completion program. In the rapid flow-back period after fracture stimulation, large volumes of "frac water" must be recovered and properly disposed of. The proposed disposal zone, the Strawn Formation, is a thick, uniform interval covering a very large area and is used by numerous injection wells for disposal.

The proposed disposal well, the R.B. Dinwiddie Well No. 1-A, was completed by C.L Gage in November 1979 in the Boonsville (Bend Congl., Gas) Field with perforations from 6,718' to 7,010' subsurface depth and is completed as follows:

- Surface casing (8-5/8") set at 823' and cemented from the casing shoe to the ground surface.
- Longstring casing (4-1/2") set at 7,043' and cemented from the casing shoe to a depth of 5,250' with 450 sx of cement as verified with a cement bond log (CBL).
- In November 1987 the 4-1/2" casing was cement squeezed with 300 sx of cement at 4,899' (performed by Ensource, Inc. a prior operator) and the top of cement was 4,390' confirmed by CBL.

- In January 2005 the 4-½" casing was cement squeezed with 125 sx of cement at 4,310' (performed by Pioneer) and the top of cement was 3,690' confirmed by CBL.
- The producing perforations are plugged with a CIBP (cast iron bridge plug) set at 6,660' and 20' of cement.

Pioneer proposes setting the tubing (2-3/8") on packer at 4,310'. The proposed injection interval will be from 4,378' to 4,889' which is a Strawn Sand interval.¹ Usable quality water must be protected to a depth of 720'. *"The interval from the land surface to 20 feet below the base of the Cretaceous-age beds must be protected. The base of the Cretaceous is estimated to occur at a depth of 700 feet"* (TECQ Letter dated January 19, 2005). The proposed maximum injection volume is 5000 barrels per day (anticipated average 2000 BWPD) and the proposed maximum injection pressure is 2,189 psig.

The Strawn Sandstone interval has several sand members that will take fluid. According to the well's electric log, sufficient shale intervals extend above and below the interval of injection. The shale is an impermeable barrier to fluid migration. Cross section well log analysis shows the Strawn interval to be correlative, uniform and continuous across the area.

A step rate test (7 flow rates) was performed on the proposed disposal well to determine the permeability of the injection zone. Currently, only the perforations from 4889-99' are open. The step rate test determined the relative permeability to be ±15 md. The initial bottomhole pressure was 2,163 psia and the final pressure was 3,644 psia. The test was run only on 8' of the anticipated 44' section (proposed additional sections from 4378-94; 4410-22; 4626-34). The well will be subject to mechanical integrity testing as required by the Commission.

A review was made of all well completions, producing or plugged, within a one mile of the subject well. There is one well within ¼ mile of the proposed injection well (Donaldson Well No. 1) and one other well within ½ mile. There are 14 wells within one mile. All but one of the wells are either plugged properly or completed in such a manner to prevent fluid migration for the protection of usable quality water or to provide zonal confinement. Pioneer performed remedial work on the Donaldson Well No. 1, the only questionable well within ½ mile of the proposed disposal well to provide for zonal isolation.

The Pioneer, Donaldson Well No.1 (originally drilled by C.L. Gage) is currently producing and is located 1,180' from the proposed disposal well. The Water Board letter required 770' of surface casing and the subject well had 786' of surface casing set. The longstring was set to 6,997' and cemented with a calculated top of cement at 5,216'. As a result of the location of this well and because there was no cement across the correlative interval of injection, Pioneer performed a cement squeeze on July 13, 2005. The well was perforated at 4,834' and 500 sx of cement were pumped

¹ As there are a number of Strawn Sands throughout the interval, only the high porosity sands that are the lowest in the interval will be perforated first and Pioneer will work up the hole as capacity may be needed at later dates.

which results in a calculated cement top at 1956'. This cement squeeze will insure there will be no migration of injected fluids.

The well that is between 1/4 mile and 1/2 mile did not have sufficient surface casing set but was properly plugged in 1973 according to Commission requirements.²

It is in the public interest to safely produce hydrocarbon reserves in order to meet market demand. In the past the production came from the Boonsville Bend, Atoka and Caddo formations. Primarily, the production now comes from the Barnett Shale formation. The drilling activity continues to expand. Commercial disposal wells are needed in the area of the Barnett Shale play. Pioneer has on occasions been required to shut in its wells because the water hauler has not had access to a disposal facility.

The Commission requires additional special conditions for a commercial facility which include: catch basins made of concrete, steel or fiberglass; all fabricated waste storage and pretreatment facilities (tanks, separators, etc. must be constructed of concrete, steel or fiberglass; dikes around the tank battery; property must be sufficiently fenced and gated (attendant or key controlled access) to prevent unauthorized dumping. Pioneer will comply with all the commercial facility requirements as prescribed by the Commission.

The Commission's Environmental staff has reviewed the application and did not state any concerns or problem based on its administrative review.

The examiners have officially noticed Commission records showing that Pioneer Exploration LTD has a current approved Form P-5 and has posted financial assurance.

Notice was given to the surface owner, the County Clerk of Wise County, all surface owners of adjoining tracts and all operators within one-half mile. Notice of this application was published in the *Wise County Messenger*, a newspaper of general circulation in Wise County, on February 17, 2005.

PROTESTANT'S EVIDENCE³

Protestants assert that Pioneer failed to meet its burden of proof under §27.051(b) of the Water Code and the Commission's Rule 46. Protestants assert the application is incomplete. On Application Form H-1, there was no information/data entered for the bottomhole pressure of the formation, the porosity or the permeability. No calculation was made as to the volume of disposed water the reservoir will hold with a maximum injection pressure if 2189 psig.

² The depth of the freshwater was 650'. An open hole plug was set at 700' and tagged at 492'. The surface casing was set at 313' and a plug was set from 363' to 213' by the operator at that time.

³ Because of the number of protestants, the issues, concerns, evidence and testimony are presented collectively for report purposes.

Protestants argue further that Pioneer has not met the "public interest" standard. Protestants assert that Pioneer does not care about community values or community impact. They fear the commercial disposal facility will lower area property values. There was no prior communication with the area residents about what they thought of this facility. The protestants do not believe the facility is in the public interest. Area roads are small county gravel roads only about 16' wide and some have blind curves. Children play and residents walk/jog and ride ATV's on these county roads. Protestants state that Pioneer has made no study of the weight limits on the trucks or the roads and large, heavy trucks will severely damage gravel roads. According to the Protestants, these roads were not designed for industrial traffic and Pioneer has not performed any traffic studies or traffic impact analyses.

The purpose of the citizens group is "to protect that area against toxic waste and from polluting our water, both surface and our water wells" (Vol. 1 pg 118, lines 9-11). Pioneer has not investigated whether the well that was plugged in 1973 has leaked since that time. Protestants argue that Pioneer has searched the public records for wells, but did no ground search and Protestants believe there could be wells that were drilled and just covered up. Pioneer has not proposed monitor wells around the disposal well. Area residents rely solely on shallow water supply wells. Protestants are concerned about pollution of well water. It is down hill to the south from the proposed well, and Protestants believe that any surface spill will run into area surface tanks which spill into Denton Creek and Hearts Creek.

Texas Citizens for a Safe Future and Clean Water argue that the examiners should recommend denial of Pioneer's application as punishment for what Protestants believe was an intentional or reckless effort by Pioneer to obscure the location of the Donaldson #1 well, which is within 1/4 mile of the proposed disposal well. Protestants believe that Pioneer intentionally misrepresented material facts in identifying this well because the longstring of the well required a remedial cement squeeze job to prevent the possible migration of injected water from the intended disposal zone to fresh water bearing strata.

OBSERVER'S EVIDENCE

The Commission's criteria for disposal wells in the Barnett Shale Trend area is more stringent than the Statewide general criteria. Normally, all wells that penetrate the injection interval for up to 1/4 mile must be reviewed. For the Barnett Shale area, the radius of investigation is enlarged to 1/2 mile. If there are no wellbore penetrations or those wellbore penetrations are cased and cemented across the disposal interval, non-confinement is not an issue. By virtue of the cement squeeze on the Donaldson Well No. 1, the non-confinement problem has been eliminated. Environmental Services, Underground Injection Control Section has no concerns with the 5000 BWPD volume or the 2,189 psi pressure which is consistent with the .5 psi/ft default maximum pressure gradient because the step rate test was on a very limited portion of the overall disposal interval and inconclusive based on that data alone.

EXAMINERS' OPINION

The examiners recommend the application be approved, subject to conditions for commercial disposal well facilities pursuant to §27.051 of the Texas Water Code and Commission Statewide Rule 46. The proposed new commercial disposal well is completed in such a manner as to prevent the migration of injected fluids to zones other than the intended zone. Pioneer asserts that zone isolation has been affirmed by the subsequent cement squeeze jobs performed on the subject disposal well and the remedial cement squeeze job performed on the Donaldson Well No.1. There are no other wells within ½ mile. Commission guidelines for disposal wells in the area of North Central Texas or Barnett Shale Trend require an applicant to provide documentation of Zone Isolation for every producing/unplugged well and protection of the Usable Quality Water in plugged wells within ½ mile of the proposed injection well if the Maximum Pressure Gradient of .5 psi/ft is to be granted. Pioneer has presented evidence establishing that the usable quality water above and below the ground surface will not be placed at risk of pollution or contamination.

The production of hydrocarbons for use by the people of Texas and industry serves the public interest. Production from the Barnett Shale is obtained by fracing with large volumes of water and the frac water must then be recovered and disposed of. The safe and proper disposal of produced saltwater in disposal wells such as the one proposed by Pioneer meets this need and thereby serves the public interest. The Commission's Rules concerning underground injection are premised to assure the protection of fresh water above and below the ground surface (well completion technique, proper cementing, proper plugging and saltwater handling). It is in the public's interest to encourage the safe drilling and completion of more wells for the production of oil and gas. The Commission does not regulate the number of commercial disposal wells as the competitive nature of the system will dictate this.

The requirements and restrictions of a commercial disposal facility permit addresses concerns as to security and the surface handling of fluids. Indeed, the Commission District offices routinely inspect commercial disposal facilities. Finally, there is no persuasive evidence to indicate that the operation of the subject disposal well will adversely impact the water quality of any nearby surface water or subsurface usable quality water.

The protestant's concern over potential pollution of ground or surface waters is not lost on the examiners. No one desires to have any usable water contaminated through oil field waste disposal/injection operations. The Commission adopted Statewide Rules (specifically 8, 9, 13, and 46), and environmental policies, and established special permit requirements that specifically address these matters to minimize and mitigate the possibility of an adverse occurrence. The examiners believe that the subject well meets the regulatory requirements, and recommended special permit requirements will provide additional protection.

The Commission does not have jurisdiction to regulate truck traffic on the state's roads and highways. The examiners sympathize with the Protestants' concerns about property values and other quality of life issues, but conclude that Pioneer has met its burden of proof on the statutory issues

the Commission is required to consider, including the public interest issue.

Texas Citizens for a Safe Future and Clean Water argues that the examiners should recommend denial of Pioneer's application as punishment for what protestants believe was an intentional or reckless effort by Pioneer to obscure the location of the Donaldson #1 well. The examiners believe that Pioneer should have used considerably more care in identifying the location of this well on maps submitted for the Commission's consideration, but the evidence does not support protestants' contention that Pioneer intentionally made an effort to misrepresent material facts. The Donaldson #1 location is not correctly spotted on the Commission's own maps, apparently because a previous operator did not drill the well where permitted, and no succeeding operator sought to re-permit the well at the actual location until Pioneer took this step, after a question had been raised about the location at the initial hearing in this docket.

At the initial hearing, Pioneer disclosed the fact that the location of the Donaldson #1 was not correctly spotted on a Commission map which Pioneer submitted as evidence and was closer to the Dinwiddie #1A than indicated on the map, before any question about the well's location was raised by protestants. Pioneer's engineer believed that the Donaldson #1 was not within 1/4 mile of the Dinwiddie #1A, and testified to this effect at the initial hearing. Following the initial hearing, Pioneer caused a survey to be prepared of the location of the Donaldson #1, which Pioneer presented at the continued hearing, and this survey showed that the Donaldson #1 is 1,180 feet from the Dinwiddie #1A. Thus, the testimony of Pioneer's engineer at the initial hearing that there were no wells within 1/4 mile of the Dinwiddie #1A turned out to be wrong by 140 feet.

When a question arose as to the correct location of the Donaldson #1, the examiners recessed the initial hearing and directed Pioneer to furnish to Environmental Services such information as Environmental Services staff might require regarding the well. At the continued hearing, all parties were afforded an opportunity to present any evidence or argument they wished regarding any relevant issue, including any issue relating to the Donaldson #1. At the continued hearing Environmental Services confirmed that: (1) Pioneer had provided certain information relating to the Donaldson #1; (2) Pioneer had performed a workover of the Donaldson #1 to isolate the proposed injection interval; and (3) Environmental Services considered that the Pioneer application was administratively complete. As a result of the continued hearing, all material facts regarding the Donaldson #1 are disclosed in the record, and all parties have been afforded a fair opportunity to address any relevant issue relating to this well. In these circumstances, the mistake made by Pioneer at the initial hearing as to the location of the Donaldson #1 should not stand as a bar to approval of Pioneer's application.

PROPOSED SPECIAL CONDITIONS

The step rate testing was successful in determining the permeability of formation opposite the zone of testing (4889-99'). The step rate testing also determined the parting formation pressure for both the bottomhole and the corresponding surface pressure. The bottomhole parting pressure was determined to be 3,589 psia and the corresponding surface pressure was 1,513 psia (this would

be the deepest interval in the well).⁴ The Commission's statewide guideline default for the maximum permitted surface injection pressure is 0.5 psi/ft which in this case results in a maximum surface injection pressure of 2,189 psi [4,378' (the top of the proposed zone of injection) x 0.5 psi/ft]. The purpose of this 0.5 psi/ft guideline is to prevent formation fracturing. The step rate test determined that formation parting pressure to be a maximum surface injection pressure of 1,513 psi. Therefore the maximum allowed surface injection pressure should be something less. Though the step rate test was not performed over the entire proposed interval to be perforated, it was on the formation in the deepest part of the injection zone some 500' below the top of the zone. With the information of record, the examiners recommend that the maximum allowed surface injection pressure be reduced from the proposed 2,189 psig to 1500 psig. Pioneer stated that it would perforate intervals as lesser depths as needed, however, the perforated interval and the step rate test dictates that the maximum permitted injection pressure to be decreased.

FINDINGS OF FACT

1. Notice of this hearing was given to all persons required to be given notice by the provisions of Statewide Rule 46. Notice of this hearing was given to all affected persons, at least ten (10) days prior to the date of the hearing. Notice was given to the surface owner, the County Clerk of Wise County, all surface owners of adjoining tracts and all operators within one-half mile. Notice of this application was published in the *Wise County Messenger*, a newspaper of general circulation in Wise County, on February 17, 2005.
2. The proposed disposal well, the R.B. Dinwiddie Well No. 1-A, was completed by C.L Gage on November 1979 in the Boonsville (Bend Congl., Gas) Field and is completed as follows:
 - a. Surface casing (8-5/8") set at 823' and cemented from the casing shoe to the ground surface.
 - b. Longstring casing (4-1/2") set at 7,043' and cemented from the casing shoe to a depth of 5,250' with 450 sx of cement as verified with a cement bond log (CBL).
 - c. In November 1987 the 4-1/2" casing was cement squeezed with 300 sx of cement at 4,899' (performed by Ensource, Inc. a prior operator) and the top of cement was 4,390' confirmed by CBL.
 - d. In January 2005 the 4-1/2" casing was cement squeezed with 125 sx of cement at 4,310' (performed by Pioneer) and the top of cement was 3,690' confirmed by CBL.
 - e. The producing perforations are plugged with a cast iron bridge plug set at 6,660' and 20' of cement.

⁴ Testing and report by ARC Pressure Data, Inc.

- f. Pioneer proposes setting the tubing (2-3/8") on packer at 4,310'.
 - g. The proposed injection interval will be from 4,378' to 4,889' which is a Strawn Sand interval.
 - h. Usable quality water must be protected to a depth of 720' (TECQ Letter dated January 19, 2005).
 - i. The proposed maximum injection volume is 5000 barrels per day (anticipated average 2000 BWPD) and the proposed maximum injection pressure is 2,189 psig.
 - j. Sufficient shale intervals extend above and below the interval of injection. The shale is an impermeable barrier to fluid migration. Cross section well log analysis shows the Strawn interval to be correlative, uniform and continuous across the area.
 - k. Injected fluids will be confined to the proposed disposal interval.
3. A review was made of all well completions, producing or plugged, within a one mile of the subject well. There is one well within 1/4 mile of the proposed injection well and another well within 1/2 mile. All wells are either plugged properly or completed in such a manner to prevent fluid migration for the protection of usable quality water and to provide zonal confinement.
- a. The one well within 1/4 mile, the Pioneer, Donaldson Well No. 1 had remedial longstring casing cement work performed for zone isolation compliance.
4. The proposed method of operation and the requirements and restrictions of a commercial disposal facilities permit address concerns regarding the surface handling of fluids.
- a. The Commission District offices routinely inspect commercial disposal facilities.
 - b. The Commission adopted Statewide Rules (specifically 8, 9, 13, 46), and environmental policies, and established special permit requirements, minimize and mitigate the possibility of an adverse environmental impact on usable water.
 - c. The Commission requires additional special conditions for a commercial facility which include: catch basins made of concrete, steel or fiberglass; all fabricated waste storage and pretreatment facilities (tanks, separators, etc. constructed of concrete, steel or fiberglass; dikes around the tank battery; property sufficiently fenced and gated (attendant or key controlled access) to prevent unauthorized dumping.
5. A maximum permitted surface injection pressure of 1,500 psig will insure formation integrity for disposal zone isolation based on step rate testing which indicated the formation parting

pressure to be 1,513 psia.

6. The placement of a cast iron bridge plug topped with at least 10' cement at 4,899' will isolate the remainder of the longstring for disposal zone isolation.
7. Use of the proposed disposal well is in the public interest because it will provide needed additional disposal capacity and an economical means of disposing of produced salt water from completed wells in the rapidly expanding Barnett Shale Field Area, thereby increasing ultimate recovery from these wells and preventing waste. The safe and proper disposal of produced saltwater serves the public interest.
8. No existing rights will be impaired by operation of the proposed disposal well.
9. Pioneer Exploration LTD has a current approved Form P-5 and has posted the required financial assurance.

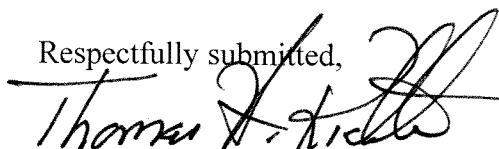
CONCLUSIONS OF LAW

1. Proper notice was timely given to all parties entitled to notice pursuant to applicable statutes and rules.
2. All things have occurred and have been accomplished to give the Commission jurisdiction in this case.
3. The use of the proposed disposal well will not endanger oil, gas, or geothermal resources or cause the pollution of surface water or fresh water strata.
4. The applicant has complied with the requirements for approval set forth in Statewide Rule 46 and the provisions of Sec. 27.051 of the Texas Water Code.
5. The use of the proposed disposal well is in the public interest pursuant to Sec 27.051 of the Texas Water Code.

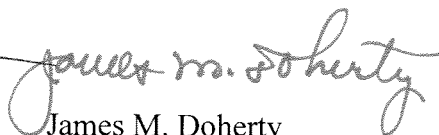
EXAMINERS' RECOMMENDATION

Based on the above findings and conclusions, the examiners recommend that the application of Pioneer Exploration LTD to operate a commercial facility to dispose of field produced saltwater into the R.B. Dinwiddie Well No. 1-A into a zone productive of oil and gas, the Boonsville (Bend Congl., Gas) Field, Wise County be approved subject to conditions as set out in the attached Final Order.

Respectfully submitted,



Thomas H. Richter, P.E.
Technical Hearings Examiner
Office of General Counsel



James M. Doherty
Hearings Examiner
Office of General Counsel