

**OIL AND GAS DOCKET NO. 7C-0266134**

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**THE APPLICATION OF ASPEN OPERATING COMPANY, LLC FOR A PERMIT TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS PURSUANT TO STATEWIDE RULE 46 IN THE M. A. SHANNON EST. -O- LEASE, WELL NO. 28, OLSON FIELD, CROCKETT COUNTY, TEXAS**

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**HEARD BY:** Richard D. Atkins, P.E. - Technical Examiner  
Marshall F. Enquist - Legal Examiner

**APPEARANCES:**

**APPLICANT:**

David Jackson  
John McBeath  
A. James Nuttall

**REPRESENTING:**

Aspen Operating Company, LLC

**PROTESTANTS:**

Brian R. Sullivan

Ranchero Esperanza, Ltd. and  
McClure Oil Company

**PROCEDURAL HISTORY**

Applications Filed:	March 25, 2010
Protest Received:	April 5, 2010
Request for Hearing:	May 19, 2010
Notice of Hearing:	June 10, 2010

Date of Hearing:	September 20, 2010
Transcript Received:	October 6, 2010
Late Filed Exhibit Admitted:	October 28, 2010

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Proposal For Decision Issued: November 19, 2010

### **EXAMINERS' REPORT AND PROPOSAL FOR DECISION**

#### **STATEMENT OF THE CASE**

Aspen Operating Company, LLC ("Aspen") requests authority pursuant to Statewide Rule 46 to inject salt water into the San Andres formation into the M. A. Shannon Est. -O- Lease, Well No. 28, and Shannon Estate -M-1- Lease, Well No. 21, in the Olson Field, Crockett County, Texas.

Notice of the subject applications was published in *The Ozona Stockman*, a newspaper of general circulation in Crockett County, on March 3, 2010. Notice of the applications was sent to the Crockett County Clerk, offset operators within ½ mile and the surface owner of the injection tracts on March 24, 2010.

These applications are protested by Rancho Esperanza, Ltd. and McClure Oil Company who are adjacent surface owners to the south of the Shannon Estate Leases.

#### **Matters Officially Noticed**

The applicant requested and the examiners have officially noticed the testimony and exhibits contained in Oil and Gas Docket No. 7C-0261666 - The Application of Aspen Operating Company, LLC for a Permit to Inject Fluid into a Reservoir Productive of Oil or Gas Pursuant to Statewide Rule 46 for the Noelke "20" Lease, Well No. 4, Olson Field, Crockett County, Texas. This hearing was held in 2009 and the Commission granted the injection application. The Noelke "20" Lease is in close proximity to the Shannon Estate Leases that are the subject of these applications. The same parties that were present at the prior hearing are represented in this hearing and the geologic and groundwater contamination evidence are still relevant.

The examiners have also officially noticed the Commission P-5 Financial Assurance and Docket databases that establishes that Aspen has an active P-5 Organization Report and a \$250,000 financial assurance bond on file with the Commission. Aspen operates 265 wells and has no past or pending enforcement dockets at the Commission in Crockett County. The examiners have also officially noticed a number of Commission records offered into evidence by Brian Sullivan, attorney for Rancho Esperanza, Ltd. and McClure Oil Company.

#### **DISCUSSION OF THE EVIDENCE**

##### **Applicant's Evidence**

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The Olson Field was discovered in 1940 and is located on the Ozona Arch in west central Crockett County, eleven miles southeast of the town of Iraan, Texas. The field contains approximately 2,400 acres and is located along a northwest plunging anticline with one degree of dip and two localized highs. The localized high to the northwest encompasses the Aspen operated Noelke "20", M. A. Shannon Est. -O- and Shannon Estate -M-1- Leases and produces under a strong water drive mechanism. The localized high to the southeast encompasses only the Aspen operated Olson Unit and produces under a depletion drive mechanism. The productive formation is a San Andres dolomite and the geologic and engineering evidence indicates that the two areas are not in communication, but are separate and distinct reservoirs.

Aspen seeks authority to inject produced salt water into the productive San Andres formation in the M. A. Shannon Est. -O- Lease, Well No. 28, and Shannon Estate -M-1- Lease, Well No. 21. The proposed injection interval is the San Andres formation between 2,050 feet and 2,900 feet. The proposed injection is for the purpose of disposing of lease produced salt water, which has increased substantially due to the drilling of both vertical and horizontal infill wells, sometimes over 10,000 BWPD per well. Aspen requests a maximum injection volume for each well of 20,000 BWPD and a maximum surface injection pressure of 1,020 psig.

The M. A. Shannon Est. -O- Lease, Well No. 28, was drilled and completed in May 1988 to a total depth of 2,315 feet. The well has 705 feet of 8 5/8" surface casing cemented to surface with 505 sacks and 2,304 feet of 5 1/2" production casing cemented with 900 sacks. Aspen submitted a Cement Bond Log that showed the top of cement behind the 5 1/2" production casing to be at 785 feet. Injection will be through 2 7/8" tubing set on a packer at 2,000 feet into perforations and open hole from 2,044 feet to 2,900 feet (See attached Aspen Exhibit No. 7 - Wellbore Diagram). The Texas Commission on Environmental Quality recommends that usable quality ground water be protected to a depth of 600 feet.

There are 12 wellbores located within a 1/4 mile radius of the proposed injection well No. 28. The 12 wells are classified as two producing, two injection, 4 shut-in and 4 plugged and abandoned. All of the wells are properly plugged or cased and cemented in such a manner to protect the fresh water resources and prevent the migration of fluids from the injection interval.

The Shannon Estate -M-1- Lease, Well No. 21, was drilled to a total depth of 5,880 feet and plugged as a dry hole in April 2002. The well has 632 feet of 11 3/4" surface casing cemented to surface with 535 sacks and 2,797 feet of 8 5/8" intermediate casing cemented with 715 sacks. Aspen submitted a Temperature Survey Log that showed the top of cement behind the 8 5/8" intermediate casing to be at 535 feet. At the time the well was plugged, 684 feet of the 8 5/8" intermediate casing was pulled and recovered.

Aspen proposes to re-enter the well down to the bottom of the 8 5/8" intermediate casing at 2,797 feet and tie the 8 5/8" intermediate casing back to surface with a casing patch. If this operation fails, Aspen will run and cement back to surface a new string of 5

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½" production casing. Injection will be through 3 ½" tubing set on a packer at 1,980 feet into perforations from 2,030 feet to 2,797 feet (See attached Aspen Exhibit No. 8A - Wellbore Diagram). The Texas Commission on Environmental Quality recommends that usable quality ground water be protected to a depth of 625 feet.

There are 8 wellbores located within a ¼ mile radius of the proposed injection well No. 21. The 8 wells are classified as two producing, 1 shut-in and 5 plugged and abandoned. All of the wells are properly plugged or cased and cemented in such a manner to protect the fresh water resources and prevent the migration of fluids from the injection interval.

### **Protestant's Evidence**

Attorney Brian Sullivan appeared at the hearing to represent the interests of Rancho Esperanza Ltd. and McClure Oil Company, the adjacent surface owners to the south of the Shannon Leases. Mr. Sullivan offered 138 pages of exhibits, made an opening statement and then stated that he was leaving the hearing as per the directions of his clients. Before Mr. Sullivan's departure, counsel for applicant, David Jackson, objected to a number of the exhibits as not being properly sponsored or as being hearsay. The examiners stated they would rule on the admissibility of the offered exhibits in the PFD. Mr. Jackson later submitted to the parties and examiners a copy of the 138 pages of protestant's exhibits with each page numbered in order to make his objections with specificity. Page 1, a map, was objected to based on the lack of any proof of the basis for the construction of the map. The objection is sustained and Page 1 is not admitted into the record of the hearing. Pages 4, 12, 13, 16, 25, 43, 44, 56, 61, 62, 71, 72, 82, 83, 85, 86, 96, 97, 98, 101, 102, 124, and 125, all scout tickets, were objected to on the basis that they are hearsay. The objection is sustained and the scout tickets are not admitted into the record of the hearing. Three pages, 54, 61 and 64, have attached post-it notes which were objected to based on lack of authentication and hearsay. The objection is sustained and the post-it notes on the three pages are not admitted into the record of the hearing. The remaining pages of the offered exhibit consist of Commission records and the examiners have taken Official Notice of those records and they are admitted into the record of the hearing.

The protestants were concerned that the injected fluids would not be contained within the injection interval and the groundwater would be contaminated. The protestants submitted Commission documents and third party scout tickets indicating that most of the wells within the two 1/4 mile radii were drilled in the 1940s or 1950s. The surface casing and sometimes the production casing were mudded in and no cement was used, which was typical of that time period. In addition, if the operators drilled a dry hole, they would remove the casing, fill the hole with mud and move on to the next well. The protestants felt that this procedure had been known historically for a long time and, as a result, injected fluids would not be contained and fresh water would not be protected in this area.

### **Applicant's Rebuttal Evidence**

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Aspen's engineering expert disputed the allegations that some of the wells had surface casing set with mud only. He stated that in fact this was not true. The practice at the time, which was actually a Field Rule, was that after the production string was set, the surface casing was pulled from the outside of the production string. Then, one-inch tubing was run behind the production string down to the base of the freshwater zones where 100 sacks of cement was pumped to protect the groundwater. The one-inch tubing was then pulled from the well. Using wells in the area that had a temperature survey, the expert calculated that, on average, every sack of cement provides about four feet of coverage. As a result, 100 sacks of cement would equate to about 400 feet of coverage behind the production string.

The expert referred to this procedure as a "spaghetti job" which is not referenced on any of the forms submitted by the protestants, but it is shown as a comment on the potential test forms. Although Aspen did not find this information on a few of the wells, the expert believed that this was the practice in the area at the time on all of the wells, since the procedure is referenced in a Field Rule.

Aspen submitted a tabulation of the cumulative injection into the injection wells located in the northwestern part of the Olson Field. Since January of '83, the date that the RRC H-10 Form was initiated, the total injection for all of the wells was over 157 million barrels of produced saltwater. One of the wells, the M. A. Shannon Est. -O- Lease, Well No. 25, had injected over 71 million barrels of produced saltwater. On the same well, Aspen's engineering expert used a recent fluid level and calculated a bottomhole pressure of 895 psi.

The expert opined that the bottomhole pressure was in line with the historical bottomhole pressure information and indicated that the reservoir contained a very large aquifer. He felt that the aquifer was connected up and down the hole and that injection into the aquifer didn't really affect the reservoir pressure. Since the reservoir pressure was unaffected, he didn't believe that the granting of these applications would change the risk that relates to the integrity of the old wellbores within the 1/4 mile radius.

The evidence submitted at the prior hearing in 2009, clearly showed that there was no groundwater contamination in the Olsen Field area. The expert stated that there was very little additional data and nothing had occurred for him to change his opinions about the normal range of salinity for groundwater in the area or the possibility of groundwater contamination. He related a couple of pieces of new information concerning the monitor well that was drilled as part of the ongoing efforts to clean up around the Olson Unit, Well No. 812, surface saltwater flow. At the time of the previous hearing, Aspen had only one sample from the monitor well that showed 99 milliliters per gram of salinity. Since the well is sampled every six months, Aspen now has two more additional samples from the monitor well and the salinity is now down in the range of 30 to 40 milliliters per gram. Based on this information, the expert believed that there was clearly no problem around the Olson Unit, Well No. 812, related to groundwater contamination.

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### EXAMINERS' OPINION

The examiners recommend that the applications be approved. The proposed injection wells are completed in a manner which will protect useable quality water resources and will confine the injected fluids to the injection interval. Use of the wells for injection will result in the recovery of additional oil reserves produced by the vertical and horizontal development wells on the Shannon Leases by providing an economic means of saltwater disposal. Therefore, the approval of the applications are in the public interest.

The examiners do not believe that there is any evidence of fresh water contamination caused by the applicant. Aspen presented sufficient evidence to establish that all of the wells within the 1/4 mile radii are properly plugged or cased and cemented in such a manner to protect the fresh water resources and prevent the migration of fluids from the injection interval.

### FINDINGS OF FACT

1. Notice of these applications and hearings was provided to all persons entitled to notice at least ten (10) days prior to the date of the hearing.
2. Notice of the subject applications was published in *The Ozona Stockman*, a newspaper of general circulation in Crockett County, on March 3, 2010. Notice of the applications was sent to the Crockett County Clerk, offset operators within 1/2 mile and the surface owner of the injection tracts on March 24, 2010.
3. The M. A. Shannon Est. -O- Lease, Well No. 28, is cased and cemented in a manner to protect usable quality water.
  - a. The Texas Commission on Environmental Quality recommends that usable-quality water be protected to 600 feet in the area of the proposed well.
  - b. The well has 705 feet of 8 5/8" surface casing cemented to surface with 505 sacks.
4. Fluids injected into the M. A. Shannon Est. -O- Lease, Well No. 28, will be confined to the injection interval.
  - a. The well has 2,304 feet of 5 1/2" production casing cemented with 900 sacks. A Cement Bond Log showed that the top of cement behind the 5 1/2" production casing to be at 785 feet.
  - b. Injection will be through 2 7/8" tubing set on a packer at 2,000 feet into

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perforations and open hole from 2,044 feet to 2,900 feet.

- c. There are 12 wellbores located within a  $\frac{1}{4}$  mile radius of the proposed injection well No. 28. All of the wells are properly plugged or cased and cemented in such a manner to protect the fresh water resources and prevent the migration of fluids from the injection interval.
5. The Shannon Estate -M-1- Lease, Well No. 21, is cased and cemented in a manner to protect usable quality water.
  - a. The Texas Commission on Environmental Quality recommends that usable-quality water be protected to 625 feet in the area of the proposed well.
  - b. The well has 632 feet of 11  $\frac{3}{4}$ " surface casing cemented to surface with 535 sacks.
6. Fluids injected into the Shannon Estate -M-1- Lease, Well No. 21, will be confined to the injection interval.
  - a. The well has 2,797 feet of 8  $\frac{5}{8}$ " intermediate casing cemented with 715 sacks. A Temperature Survey Log showed that the top of cement behind the 8  $\frac{5}{8}$ " intermediate casing to be at 535 feet.
  - b. Injection will be through 3  $\frac{1}{2}$ " tubing set on a packer at 1,980 feet into perforations from 2,030 feet to 2,797 feet.
  - c. There are 8 wellbores located within a  $\frac{1}{4}$  mile radius of the proposed injection well No. 21. All of the wells are properly plugged or cased and cemented in such a manner to protect the fresh water resources and prevent the migration of fluids from the injection interval.
7. Use of the M. A. Shannon Est. -O- Lease, Well No. 28, and Shannon Estate -M-1- Lease, Well No. 21, as injection wells is in the public interest.
  - a. The proposed injection is for the purpose of disposing of lease produced salt water, which has increased substantially due to the drilling of both vertical and horizontal infill wells, sometimes over 10,000 BWPD per well.
  - b. Aspen plans on drilling additional infill vertical and horizontal development wells on the subject leases.

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- c. Use of the wells will provide a safe and economic means of disposal of produced saltwater on the subject leases.
8. Aspen has an active P-5 Organization Report and a \$250,000 financial assurance bond on file with the Commission.
9. Aspen operates 265 wells and has no past or pending enforcement docket at the Commission in Crockett County.

### **CONCLUSIONS OF LAW**

1. Proper notice was issued in accordance with the applicable statutory and regulatory requirements.
2. All things have occurred to give the Railroad Commission jurisdiction to consider this matter.
3. The use or installation of the proposed injection wells is in the public interest.
4. Approval of the applications will not harm useable quality water resources, will not endanger oil, gas, or geothermal resources and will result in the further development and recovery of additional reserves from the Olson Field.
5. Aspen has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.
6. Aspen has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

### **EXAMINERS' RECOMMENDATION**

Based on the above findings of fact and conclusions of law, the examiners recommend that the applications be approved as set out in the attached Final Orders.

Respectfully submitted,

Richard D. Atkins, P.E.  
Technical Examiner

Marshall F. Enquist  
Legal Examiner