



# RAILROAD COMMISSION OF TEXAS

## HEARINGS DIVISION

### PROPOSAL FOR DECISION

**OIL AND GAS DOCKET NO. 08-0297983**

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**THE APPLICATION OF PROBITY SWD, LLC PURSUANT TO STATEWIDE RULE 9 FOR A COMMERCIAL DISPOSAL PERMIT TO DISPOSE OF OIL AND GAS WASTE BY INJECTION INTO A POROUS FORMATION NOT PRODUCTIVE OF OIL OR GAS, MARECEK SWD, WELL NO. 1, SPRABERRY (TREND AREA) FIELD, MIDLAND COUNTY, TEXAS**

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**HEARD BY:** Paul Dubois – Technical Examiner  
Marshall Enquist – Administrative Law Judge

**APPEARANCES:**

**REPRESENTING:**

**APPLICANT:**

Paul Tough  
James M. Clark, P. E.  
Steve Jeeter

Probity SWD, LLC

**PROTESTANT:**

Tim George  
Kerry Pollard, P. E.

Endeavor Energy Resources

### PROCEDURAL HISTORY

Application Filed:	July 13, 2015
Protest Received:	July 2, 2015
Request for Hearing:	August 24, 2015
Notice of Hearing:	November 24, 2015
Date of Hearing:	December 10, 2015
Transcript Received:	December 28, 2015
Proposal For Decision Issued:	March 28, 2016

### STATEMENT OF THE CASE

Pursuant to Statewide Rule 9 (16 Tex. Admin. Code § 3.9), Probity SWD, LLC (“Probity”) seeks a commercial permit to dispose of oil and gas waste by injection into a porous formation not productive of oil or gas, for the Marecek SWD, Well No. 1, in the Spraberry (Trend Area) Field, Midland County, Texas. Probity seeks authority to dispose of 15,000 barrels of water per day (“bwpd”) into the Grayburg and San Andres Formations in the depth interval from 4,000 feet to 5,650 feet. The application is protested by Endeavor Energy Resources, L. P. (“Endeavor”), an operator of wells within one-half mile of the proposed disposal well.

The Technical Examiner and Administrative Law Judge (collectively, “Examiners”) recommend the application be granted and the commercial disposal permit issued. Probity has met its burden of proof under Chapter 27 of the Texas Water Code and the Commission’s Statewide Rule 9.

### APPLICABLE LAW

The Railroad Commission may grant an application for a disposal well permit under Texas Water Code § 27.051(b) and may issue a permit if it finds:

1. The use or installation of the injection well is in the public interest;
2. The use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation;
3. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution; and
4. The applicant has made a satisfactory showing of financial responsibility as required by Section 27.073.

### DISCUSSION OF EVIDENCE

#### APPLICANT’S EVIDENCE

At the hearing, the Applicant offered evidence and testimony from James M. Clark, P. E., consulting engineer, and Steve Jeter, Probity’s President.

#### **Notice**

On June 21, 2015, notice of the application was published in the *Midland Reporter-Telegram*, a newspaper of general circulation in Midland County, Texas. On June 22, 2015 Probity notified the owner of the surface tract, owners of adjacent surface tracts, the

Midland County Clerk, and operators of wells within one-half mile of the proposed disposal well of the application.

At the beginning of the December 10, 2015 hearing, Probity revised its proposed injection interval by raising the top of the interval from 4,800 feet to 4,000 feet (the reasons for the change are discussed below under 'Groundwater, Geology and Hydrocarbon Resources'). Because the proposed change was beyond the facts noticed in the June 2015 notice, additional notice was required. On October 6, 2015 Probity notified the owner of the surface tract, owners of adjacent surface tracts, the Midland County Clerk, and operators of wells within one-half mile of the proposed disposal well of the amended application. On October 7, 2015, notice of the amended application was published in the *Midland Reporter-Telegram*, a newspaper of general circulation in Midland County, Texas.

Probity originally requested a maximum daily injection volume of 25,000 bwpd. However, in closing remarks at the hearing, Paul Tough, Probity's counsel, stated that Probity was reducing the requested maximum daily injection volume to 15,000 bwpd. The Examiners conclude no further notice was required as this revised maximum daily injection volume was less than the volume previously noticed.

### ***Facility Design and Operation***

The proposed Marecek SWD will be located on a 320-acre tract of land about 9.6 miles northwest of Midkiff, Texas. Probity has a land use agreement with the surface and mineral owner that will enable it to drill and operate the facility, as well as lay pipelines to connect the well to nearby production wells. Probity proposes to drill, complete, and operate the well as follows:

- Drilled to a total depth of 5,750 feet;
- Surface casing (13 3/8-inch) will be set at a depth of 425 feet and cemented to the surface;
- Long-string casing (8 5/8-inch) will be set to a depth of 5,750 feet and cemented to the surface;
- The long-string casing will be perforated for injection in the disposal interval from about 4,000 feet to 5,650 feet, into the Grayburg and San Andres Formations;
- Injection tubing (3 1/2-inch) will be set with a packer at a depth of 4,000 feet;
- The maximum daily injection volume will be 15,000 bwpd and the estimated average daily injection volume will be 8,000 bwpd;

- The maximum surface injection pressure will be 2,000 pounds per square inch gauge ("psig") and the average surface injection pressure will be 1,600 psig;
- Injected waste will be limited to produced salt water and non-hazardous oil and gas waste exempt from regulation under the Resource Conservation and Recovery Act.

Surface facility design details were not described at the hearing. The standard permit conditions for a commercial disposal facility include provisions for surface facility design and operation.

### ***Groundwater, Geology and Hydrocarbon Resources***

The Commission's Groundwater Advisory Unit (GAU) indicates the interval from the ground surface to a depth of 300 feet (the base of usable quality groundwater, "BUQW") must be protected. The base of the underground sources of drinking water ("USDW") is 350 feet. The GAU concludes that, if otherwise compliant with Commission rules and guidance, drilling and using this disposal well and injecting oil and gas waste into the subsurface stratum will not endanger freshwater strata in the area.

The top of the disposal interval is overlain by more than 1,000 feet of interbedded anhydrite, salt and shale in the Queen and Seven Rivers Formations. The injection interval from 4,000 feet to 5,650 feet will be in the Grayburg and San Andres Formations, which are composed of dolomite. Initially Probity requested a disposal interval from 4,800 feet to 5,650 feet, which would have placed the top of the disposal interval within the Grayburg or San Andres. By raising the top of the disposal interval to 4,000 feet, Probity can take advantage of all of the porosity development in the Grayburg and San Andres Formations, and, more importantly, it provides for the immediate location of the confining layer directly on top of the disposal interval. Good porosity on a nearby neutron log suggest that the interval from 4,630 feet to 4,810 feet will be the best injection interval.

The Grayburg and San Andres Formations are not productive in this area. However, there is significant production from the Spraberry (Trend Area) Field, which includes the Clear Fork, Dean, Spraberry and Wolfcamp Formations in the depth interval from about 6,600 feet to 12,500 feet. The Glorietta Formation intervenes between the San Andres and the Clear Fork Formations. Production from the Spraberry (Trend Area) Field has historically been through the use of vertical wells. However, in recent years horizontal wells with laterals up to two miles long have been used to further develop this field. The horizontal wells require multi-stage hydraulic fracture stimulation treatments, which require large quantities of water and produce large volumes of waste water requiring disposal.

A review of the records of the U. S. Geologic Survey did not identify any seismic events with a magnitude greater than 1.0 within a 9.08 kilometer radius (100 square miles) of the proposed disposal well between January 1, 1973 and July 13, 2015.

### ***Area of Review***

Two vertical wellbores penetrate the disposal interval within a one-quarter mile Area of Review around the proposed disposal wells. Both of the wells are operated by Endeavor and are completed in the Spraberry (Trend Area) Field:

- Benge Corner Well No. 2305 (API No. 42-329-34726) is located about 1,000 feet to the northeast. The well was completed in 2003, and perforated from 7,700 feet to 10,369 feet. The Form W-2 indicates cement was circulated to a depth of 3,000 feet based on calculation. The W-15 cementing reports for the production casing estimate sufficient slurry volume to circulate to the surface. A 50-sack top-out cement job was performed on the annulus between the surface casing and production casing.
- Midkiff "A" Well No. 2606 (API No. 42-329-35078) is located about 1,000 feet to the south. The well was completed in 2004 and perforated from 8,301 feet to 10,375 feet. The Form W-2 indicates cement was circulated to a depth of 3,000 feet. The W-15 cementing reports for the production casing estimate sufficient slurry volume to circulate to the surface. A 50-sack top-out cement job was performed on the annulus between the surface casing and production casing.

Mr. Clark stated that Endeavor's Benge Corner and Midkiff "A" wells are typical of Spraberry (Trend Area) Field vertical well completions in the area.<sup>1</sup> Mr. Clark also documented similar conditions—production wells that are not fully cemented through the San Andres Formation—within the one-quarter or one-half mile radii of three recently permitted Endeavor commercial disposal wells in the area.<sup>2</sup> Some of these wells have experienced casing leaks, which, according to Mr. Clark, are not unusual in the Spraberry (Trend Area) Field and are routinely repaired.<sup>3</sup>

In addition, three permitted locations for horizontal wellbores transect the one-quarter mile Area of Review. Those horizontal wells were permitted by XTO Energy, Inc. ("XTO") but have not yet been drilled. They are permitted for completion in the Spraberry (Trend Area) Field, which underlies the disposal interval. The surface locations (in which

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<sup>1</sup> Tr. 21: 19 - 22: 6.

<sup>2</sup> Probity Exh. Nos. 22 - 27.

<sup>3</sup> Tr. 24: 8 - 24.

the wellbores penetrate the Grayburg and San Andres Formations) are more than one mile to the south of the proposed disposal well.

***Public Interest and Need for Additional Disposal Capacity***

Mr. Jeter stated that Probity was approached by the surface and mineral owners of the Marecek tract, who asked Probity to consider placing a disposal well at that location because of XTO's activity in the area.<sup>4</sup> Mr. Jeter stated that XTO was looking to secure an additional 15,000 bwpd disposal capacity in the area.<sup>5</sup> On initial potential testing, XTO's Bradford Trust A Unit 4 Well No. 1508 BH, located about two miles to the west, produced 3,705 bwpd.<sup>6</sup> This area of the Spraberry (Trend Area) Field continues to see development despite the recent fall in commodity prices. Horizontal wells with laterals of up to two miles in length are being permitted and drilled in the area. Mr. Clark stated that 12 horizontal wells have been permitted in the area since Probity's application was submitted in June 2015.

There are 11 active commercial disposal wells within a 10 mile radius of the proposed well, and 5 more commercial disposal wells have been permitted. All of those commercial disposal wells are permitted to inject into the Grayburg and/or San Andres Formations. In addition, there are a number of non-commercial disposal wells in the area.

Probity asserts that Endeavor is a competitor in the commercial disposal business in Midland County.<sup>7</sup> Endeavor operates 13 disposal wells in Midland County, 6 of which are commercial. Endeavor operates one commercial disposal well within a 10-mile radius of the proposed Marecek well. In April and June 2015, Endeavor received commercial disposal well permits for three additional wells located from about 3 to 6 miles to the northwest of the proposed Marecek well. Endeavor's permitted commercial disposal capacity within a 10-mile radius is as follows:

- The Barrow SWD No. 1 is an active commercial disposal well located about 8 miles northwest of the proposed Probity Marecek well. The well is authorized to inject 7,500 bwpd into the San Andres Formation in the depth interval from 4,446 feet to 5,655 feet.
- The Bryant Ranch (now Perro Rojo) SWD 10 No. 1 (Permit No. 14971, issued on April 16, 2015), located about 2.5 miles to the northwest, is

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<sup>4</sup> Tr. 77: 9 - 22.

<sup>5</sup> Tr. 78: 24 - 79: 6.

<sup>6</sup> Probity Exh. No. 19.

<sup>7</sup> Tr. 74: 2 - 6.

authorized to inject 15,000 bwpd into the San Andres Formation in the depth interval from 5,060 feet to 5,650 feet. This well has not yet been completed.

- The Bryant Ranch SWD 44 No. 1 (Permit No. 15019, issued on June 22, 2015), located about 5.5 miles to the northwest, is authorized to inject 10,000 bwpd into the San Andres Formation in the depth interval from 5,060 feet to 5,650 feet. This well has not yet been completed.
- The Bryant Ranch SWD 37 No. 2 (Permit No. 14970, issued on April 16, 2015), located about 6 miles to the northwest, is authorized to inject 15,000 bwpd into the San Andres Formation in the depth interval from 5,060 feet to 5,650 feet. This well has not yet been completed.

Endeavor also operates 3 non-commercial disposal wells in the nearby area, including the following:

- The Benge Corner No. 1D (Permit No. 11510, originally issued to CMS Oil & Gas Company on July 10, 2001), located about 3,000 feet to the south, is authorized to inject 6,000 bwpd into the San Andres Formation in the depth interval from 4,800 feet to 5,400 feet.
- The Barrow No. 1D (Permit No. 11810, originally issued to Perenco LLC on October 16, 2003), located 2.5 miles to the north, is authorized to inject 7,000 bwpd into the San Andres Formation in the depth interval from 4,800 feet to 5,400 feet.
- The Moreland "30" No. 1SWD (Permit No. 11013, originally issued to Arco Permian on February 4, 1998), located 4 miles to the west-southwest, is authorized to inject 10,000 bwpd into the San Andres Formation in the depth interval from 4,650 feet to 6,000 feet, and has an open-hole completion below 4,600 feet.

Probity asserts that Endeavor's protest is not consistent with Endeavor's own permitting efforts in Midland County. Probity offered testimony and exhibits to show: (1) casing leaks occur in areas without active disposal wells; and (2) Endeavor's own disposal wells are located in close proximity to Spraberry (Trend Area) Field wells that have also have uncemented casing through the San Andres Formation or completion reports that indicate discrepancies between reported cement on Forms W-2 and W-15.<sup>8</sup>

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<sup>8</sup> Probity Exh. Nos. 25, 27, 30 and 31.

### ***Financial Assurance***

Probity has an active Organization Report (Form P-5, Operator No. 679304), and has filed a \$25,000 letter of credit for financial assurance. Mr. Jeter stated that Probity currently operates four commercial disposal wells in Texas.

### **PROTESTANT'S EVIDENCE**

Endeavor is protesting the proposed Marecek disposal well on one issue: Injection into the Grayburg and San Andres Formations may harm the production from Endeavor's nearby wells in the Spraberry (Trend Area) Field, which are not adequately cemented through the disposal interval to prevent corrosion of the production casing. Endeavor did not protest the application on the basis of public interest, protection of fresh water, or the operator's financial assurance. Kerry Pollard, P. E., testified on behalf of Endeavor.

Endeavor operates two wells within the one-quarter mile Area of Review around the proposed Marecek disposal well and four more wells within the one-half mile radius. All six of those Spraberry (Trend Area) Field oil wells were drilled in 2003 to 2004 by Perenco, Inc, and all of the wells were completed similarly. All were drilled to a depth of about 10,500 feet, and the W-2 forms indicate cement on the production casing was calculated to extend from a depth of 10,500 feet to 3,000 feet.<sup>9</sup> Endeavor provided evidence that three of the six wells had experienced casing leaks. Endeavor attributes the casing leaks to corrosion from San Andres Formation fluids, but on only one well did Endeavor document the depth of the casing leak to be in the Grayburg/San Andres Formation interval. In addition, Endeavor performed a cement bond log ("CBL") on its Midkiff "A" Well No. 2606, located about 1,000 feet south of the proposed disposal well. That CBL indicated the top of cement on the production casing in that well to be at a depth of 5,316 feet, in the lower part of the proposed disposal interval.

Endeavor asserts that CBL provides the best information regarding the quality of the cement on the production casing of all Spraberry (Trend Area) Field wells drilled by Perenco in the immediate area. That CBL reveals uncemented casing above 5,316 feet, indicating the calculated cement height on the Forms W-2 (to a depth of 3,000 feet) or Forms W-15 (about 5,500 feet above ground surface) to be significantly overestimated. Endeavor further contends the exposure of casing to corrosive San Andres Formation fluids has damaged its wellbores, caused casing leaks, and required Endeavor to take remedial action on the damaged wells. That is, the CBL finding that cement in the Midkiff

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<sup>9</sup> A calculated cement column height of 7,500 feet is sufficient to extend above the top of the Grayburg Formation and into the overlying anhydrite formations. Probity's evidence (Form W-15s) from the two wells within a one-quarter mile radius indicate the cementing contractor placed sufficient cement for a 16,000-foot column (5,500 feet above ground surface), although cement was not circulated to the surface.

"A" Well No. 2606 is at a height of 5,316 feet indicates that other Perenco-drilled wells in the area are likely not cemented through the entire Grayburg and San Andres Formations and have experienced corrosion to some degree.<sup>10</sup>

Mr. Pollard testified that adding the Marecek disposal well into the San Andres Formation would exacerbate the corrosion problems in this area. Mr. Pollard provided general testimony on the effect additional injection would have by increasing formation fluid pressure in the area. His testimony on this topic was general in nature and not accompanied by specific calculations.

Endeavor operates its Benge Corner No. 1D disposal well about 3,000 feet to the south of the subject well. Because of its concern regarding corrosion of uncemented casing through the San Andres Formation, Endeavor has voluntarily limited the volume of waste disposed at that well to about 2,000 bwpd; Endeavor has not requested a permit amendment to reflect this change as permanent. Mr. Pollard stated that Endeavor has built a pipeline to move water from the Benge Corner area to its Salt Lake commercial disposal well about 12 miles to the north. The Salt Lake SWD well is authorized to inject 8,000 bwpd into the San Andres Formation in the depth interval from 4,325 feet to 5,400 feet.

Mr. Pollard analyzed the manner in which Perenco, the operator who drilled a number of nearby Spraberry (Trend Area) Field wells, completed these wells in 2003-2004.<sup>11</sup> Mr. Pollard stated Perenco's incomplete cementing of the production casing left the wells vulnerable to corrosion. Mr. Pollard stated that Endeavor does not complete wells in that manner, but instead would have used a cemented intermediate casing string to ensure isolation from corrosive San Andres Formation fluids. Cementing records for 4 offset wells drilled in 2004 and later near Endeavor's Barrow 1D disposal well were offered as evidence of adequate casing and cementing through the San Andres Formation.<sup>12</sup>

On cross-examination, Mr. Pollard affirmed that he offers no opinion on whether or not there is a need for additional disposal capacity in the area or whether or not the proposed Marecek Well will have an impact on groundwater. Mr. Pollard raised no

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<sup>10</sup> Tr. 140: 7 - 10.

<sup>11</sup> At least one of the Perenco-drilled wells was permitted by CMS. CMS and Perenco share a mailing address and may be related entities.

<sup>12</sup> Endeavor Exh. No. 9. This exhibit included completion schematics for 4 wells showing casing and cement through the San Andres Formation. However, there are 4 additional wells drilled in 2004 and earlier located within a one-half mile radius of the Barrow 1D well for which completion details were not described.

challenge or issues with regard to Probity's financial assurance or Probity's proposed completion details for the Marecek well. Finally, when asked:<sup>13</sup>

*Mr. Tough: And you're not claiming that injection in the Probity well will actually endanger an oil and gas producing formation, are you?*

*Mr. Pollard: Not the actual formation.*

Mr. Pollard restated his concern that uncemented casing transecting the San Andres Formation could, however, result in casing leaks that may harm the production of hydrocarbons from other zones because of the corrosivity of fluid within the San Andres Formation.

### **EXAMINERS' ANALYSIS OF THE EVIDENCE**

The evidence in the record demonstrates Probity has met its burden of proof and that the proposed Marecek disposal well application meets the requirements of Chapter 27 of the Texas Water Code and Statewide Rule 9. There is no disagreement between the parties regarding Texas Water Code § 27.051(b)(1, 3, and 4)(i.e., public interest, protection of groundwater, and financial assurance). The dispute in this case centers on Endeavor's interpretation of Texas Water Code § 27.051(b)(2), which states:

*The use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation.*

The Examiners conclude the proposed Probity Marecek well will not endanger or injure any oil, gas, or other mineral formation. As a result, the Examiners recommend the subject disposal well application be approved and the permit issued. The required elements of the Texas Water Code § 27.051(b) will be taken in turn.

#### ***Public Interest***

This area of the Spraberry (Trend Area) Field continues to see development despite the recent fall in commodity prices. Horizontal wells with laterals of up to two miles in length are being permitted and drilled in the area. At least one recent well in the area produced 3,705 bwpd on initial potential testing, and 12 horizontal wells have been permitted in the area since Probity's application was submitted in June 2015. Probity's surface use agreement allows for pipeline access to wells and tank batteries reducing the need to haul waste water by truck and reducing disposal costs to operators. Endeavor, who has received commercial disposal permits in the area and thus competes with Probity

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<sup>13</sup> Tr. 145: 15 - 146: 8.

for the disposal market, presented no testimony or evidence with regard to public interest. The evidence in the record indicates the subject well is in the public interest pursuant to Texas Water Code § 27.051(b)(1).

### ***Endanger or Injure Any Oil, Gas, or Other Mineral Formation***

Endeavor contends that the injected fluids will contribute to the corrosion of uncemented production casing in its nearby wells, which, in turn, could harm the production of hydrocarbons from those wells. That is, Endeavor contends that a potentially adverse outcome of injection—corrosion on an uncemented wellbore—could result in premature well abandonment. The Examiners find Endeavor’s argument to be unpersuasive for several reasons described below. First, however, the Examiners recognize that Endeavor is an operator of commercial disposal wells in Midland County and has recently obtained permits for three additional commercial disposal wells in relatively close proximity to the proposed Probity Marecek Well. The Examiners conclude that Endeavor is a competitor to Probity. While this does not preclude Endeavor from making technical arguments against the Probity well, the existence of a competitive relationship does cause the Examiners to explore the consistency of Endeavor’s claims and to weigh the evidence accordingly.

### **Area of Review**

A permit application for a disposal well pursuant to Statewide Rule 9 includes a review of wellbores within a one-quarter mile area of review in which operators identify unplugged or improperly plugged wells. Notably, Statewide Rule 9 does not require operators to conduct an Area of Review analysis to identify nearby wells with uncemented casing through the injection interval. Effective November 17, 2014, the Commission most recently amended Statewide Rule 9, but left unchanged the Area of Review requirements.<sup>14</sup> To the Examiners’ knowledge, the presence of an offset producing or shut-in well with uncemented casing through the injection interval is not a basis for denial of a permit application by Commission rule or practice.

### **Commission Records**

This issue concerns two nearby Endeavor oil wells, the Benge Corner Well No. 2305 (API No. 42-329-34726) located about 1,000 feet to the northeast, and the Midkiff "A" Well No. 2606 (API No. 42-329-35078) located about 1,000 feet to the south. The two wells were completed by Perenco at depths of about 10,300 feet in the Spraberry (Trend Area) Field in 2003 and 2004, respectively. The wells were similarly completed as follows:

- The W-2 completion forms indicate cement was circulated to a depth of 3,000 feet.

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<sup>14</sup> See 16 Tex. Admin. Code § 3.9 (7).

- The W-15 cementing reports for the production casing estimate sufficient slurry volume to form a cement column extending about 5,000 feet above the ground surface, but the W-15 cementing reports indicate the production casing cement was not circulated to the surface.
- A 50-sack top-out cement job was performed on the annulus between the surface casing and production casing to contain the nitrified cement slurry placed behind the production casing.

However, in preparation for this hearing, Endeavor conducted a CBL on its Midkiff "A" Well No. 2606, which indicated top of cement behind the production casing at 5,316 feet. A casing leak has not been reported for the Midkiff well, but the CBL results indicate the cementing details reported on the Forms W-2 and W-15 are inaccurate. Therefore, Endeavor concludes that the CBL confirms the unreliability of the Perenco well completion records filed for both of these wells (and other wells in the broader area completed by the same operator at the same time). Specifically, the W-2 forms reporting top of cement at 3,000 feet and the W-15 forms reporting the possibility of higher cement are inconsistent with the CBL finding of 5,316 feet. Endeavor asserts that the cementing uncertainty is a matter of concern with regard to the integrity of existing wellbores in this location, and has voluntarily reduced the daily injection rate at its nearby Benge Corner 1D disposal well.

Commission records are relied upon by operators, the Commission and the public to be complete and correct. In this case, Endeavor has discovered that its own Midkiff "A" Well No. 2606 was—in actuality—not completed as was initially reported on Form W-2. Endeavor did not drill the well. Nonetheless it is the current operator of the well and is responsible for the well's integrity.

Mr. Clark stated that if the Commission denied saltwater disposal well applications simply based on the presence of wells with uncemented production casing, then it would be very difficult to permit a disposal well in Midland County.<sup>15</sup> The Examiners agree. While this standard may be one the Commission chooses to adopt in the future, to the Examiners' knowledge it has not done so yet, and a compelling argument for its application in this case has not been presented.

### Corrosive Formation Fluids

Corrosive San Andres Formation fluids are a fact of life in Midland County; to this there is no dispute. In 2003 and 2004, when the Benge Corner Well No. 2305 and the Midkiff "A" Well No. 2606, respectively, were drilled, Commission rules did not require full cement behind intermediate or production casing through the San Andres Formation. Nonetheless, Perenco, the operating company that drilled those two wells, believed it was

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<sup>15</sup> Tr. 22: 11 - 15.

cementing across that formation. The Commission has since modified its rules to protect well integrity, freshwater and hydrocarbon resources from corrosion risks. Effective January 1, 2014, the Commission amended Statewide Rule 13, requiring operators to cement production casing through corrosive formations such as the San Andres in Midland County.<sup>16</sup> This rule applied to new wells. The Commission did not require operators of existing wells to perform remedial work bringing older wells into compliance with the new standard.

Probity has demonstrated that casing leaks routinely occur in the Spraberry (Trend Area) Field area, that casing leaks have occurred in the absence of nearby injection activity, and that casing leaks are routinely repaired by operators of wells in the field. Within a one-half mile radius of the proposed Marecek Well, Endeavor has documented three wells with casing leaks out of a total of six wells in the area. Endeavor performed a cement squeeze on one of the wells to restore it to production; the other two have been shut-in since the casing leaks were discovered.

Endeavor offered general testimony regarding increased formation pressure as a result of injection, but the Examiners have given this testimony little weight. Endeavor did not provide specific calculations, but instead described general phenomena (i.e., "if you double the volume, you double the increase in pressure.")<sup>17</sup> As calculations were not offered, there was no consideration of well-specific information such as porosity or net pay, nor did Endeavor offer any insights regarding current formation pressure in the area despite its years of operating wells there. Endeavor's wells are already at risk of corrosion simply by being drilled through the San Andres Formation, and, possibly, insufficiently cemented through it.

### Weight of Evidence

Finally, Probity evidenced that nearly identical situations exist in wellbores nearby Endeavor's other existing and recently permitted disposal wells in the area. That evidence causes the Examiners to assign little weight to Endeavors' concerns about the proposed Marecek Well. The Examiners note Probity's evidence below:

- Near Endeavor's recently permitted Bryant Ranch (now Perro Rojo) SWD 10 No. 1, there are two Endeavor wells within a one-quarter mile, and Forms W-2 and W-15 for both of these wells indicate similar completion profiles to the wells offsetting the proposed Probity Marecek Well.<sup>18</sup>

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<sup>16</sup> See 16 Tex. Admin. Code §§ 3.13 (b)(3)(B) and 3.13 (b)(2)(A)(i).

<sup>17</sup> Tr. 134: 6 - 7.

<sup>18</sup> Probity Exh. No. 23; Tr. 56 - 58.

- Near Endeavor's recently permitted Bryant Ranch SWD 44 No. 1, there is one well located 1,700 feet away from the proposed injection well that is not cemented through the injection interval.<sup>19</sup>
- Near Endeavor's recently permitted Bryant Ranch SWD 37 No. 2, there is one well within the one-half mile radius that is not cemented through the injection interval.<sup>20</sup>

The Examiners conclude that Probity's proposed Marecek Well will be completed (i.e., drilled, cased, cemented, etc.) in a manner to protect oil, gas and mineral formations, as affirmed by Endeavor's own expert witness.<sup>21</sup> The Examiners conclude Probity has met its burden of proof with this element of the Texas Water Code. The evidence in the record demonstrates the proposed disposal well will not endanger or injure any oil, gas, or other mineral formation pursuant to Texas Water Code § 27.051(b)(2).

### ***Prevent Pollution of Ground and Surface Fresh Water***

The Commission's Groundwater Advisory Unit (GAU) indicates the interval from the ground surface to a depth of 300 feet (the base of usable quality groundwater, "BUQW") must be protected. The base of the underground sources of drinking water ("USDW") is 350 feet. The GAU concludes that, if otherwise compliant with Commission rules and guidance, drilling and using this disposal well and injecting oil and gas waste into the subsurface stratum will not endanger freshwater strata in the area. The well will be completed with 425 feet of surface casing that will be cemented to the surface. There are two producing wells within a one-quarter mile Area of Review. Both of these wells are completed with cemented surface casing that will protect the BUQW. In addition, the proposed draft permit includes standard conditions applicable to commercial disposal wells regarding surface facilities and operational requirements. Endeavor presented no testimony or evidence with regard to the pollution of ground and surface fresh water. The evidence in the record demonstrates that, with proper safeguards, both ground and surface fresh water can be adequately protected from pollution pursuant to Texas Water Code § 27.051(b)(3).

### ***Demonstrate Financial Responsibility***

Probity has an active Organization Report (Form P-5, Operator No. 679304), and has filed a \$25,000 letter of credit for financial assurance. Endeavor presented no testimony or evidence with regard to Probity's ability to meet its financial assurance

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<sup>19</sup> Probity Exh. No. 25.

<sup>20</sup> Probity Exh. No. 27.

<sup>21</sup> Tr. 146: 5-8.

obligations. The evidence in the record demonstrates the applicant has made a satisfactory showing of financial responsibility as required by Texas Water Code § 27.073 pursuant to Texas Water Code § 27.051(b)(4).

### FINDINGS OF FACT

1. Notice of this hearing was given to all parties entitled to notice at least ten days prior to the date of hearing.
2. Notice of the application was published in the *Midland Reporter-Telegram*, a newspaper of general circulation in Midland County, Texas, on June 21, 2015. On June 22, 2015 Probity notified the owner of the surface tract, owners of adjacent surface tracts, the Midland County Clerk, and operators of wells within one-half mile of the proposed disposal well of the application.
  - a. Probity revised its proposed injection interval by raising the top of the interval from 4,800 feet to 4,000 feet. On October 6, 2015 Probity notified the owner of the surface tract, owners of adjacent surface tracts, the Midland County Clerk, and operators of wells within one-half mile of the proposed disposal well of the amended application. On October 7, 2015, notice of the amended application was published in the *Midland Reporter-Telegram*, a newspaper of general circulation in Midland County, Texas.
  - b. Probity reduced the requested maximum daily injection volume to 15,000 bwpd. Additional notice was not required as this revised maximum daily injection volume was less than the volume previously noticed.
3. The proposed disposal well will be drilled, completed, and operated as follows:
  - a. Drilled to a total depth of 5,750 feet;
  - b. Surface casing (13 3/8-inch) will be set at a depth of 425 feet and cemented to the surface;
  - c. Long-string casing (8 5/8-inch) will be set to a depth of 5,750 feet and cemented to the surface;
  - d. The long-string casing will be perforated for injection in the disposal interval from about 4,000 feet to 5,650 feet, into the Grayburg and San Andres Formations;

- e. Injection tubing (3 ½-inch) will be set with a packer at a depth of 4,000 feet;
  - f. The maximum daily injection volume will be 15,000 barrels of water per day ("bwpd") and the estimated average daily injection volume will be 8,000 bwpd;
  - g. The maximum surface injection pressure will be 2,000 pounds per square inch gauge ("psig") and the average surface injection pressure will be 1,600 psig;
  - h. Injected waste will be limited to produced salt water and non-hazardous oil and gas waste exempt from regulation under the Resource Conservation and Recovery Act.
4. Formation fluids in the San Andres Formation are corrosive.
- a. Casing leaks routinely occur in the Spraberry (Trend Area) Field area.
  - b. Casing leaks have occurred in the absence of nearby injection activity.
  - c. Casing leaks are routinely repaired by operators of wells in the field.
5. The use or installation of the injection well is in the public interest.
- a. Horizontal wells with laterals of up to two miles in length are being permitted and drilled in the area.
  - b. One recent well in the area produced 3,705 bwpd on initial potential testing, and 12 horizontal wells have been permitted in the area since Probity's application was submitted in June 2015.
  - c. Probity's surface use agreement allows for pipeline access to wells and tank batteries reducing the need to haul waste water by truck and reducing disposal costs to operators.
6. The use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation.
- a. The Grayburg and San Andres Formations are not productive in this area.

- b. The nearest production is in the Spraberry (Trend Area) Field, and the injection interval is separated from the Spraberry (Trend Area) Field by the Glorietta Formation.
7. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution.
  - a. The base of usable quality groundwater (“BUQW”) occurs at a depth of 300 feet, and the base of the underground sources of drinking water (“USDW”) is 350 feet.
  - b. The well will be completed with 425 feet of surface casing that will be cemented to the surface.
  - c. There are two producing wells within a one-quarter mile Area of Review, both of which are completed with cemented surface casing that will protect the BUQW.
  - d. 1,100 feet of impermeable salt, anhydrite and shale directly overlay the injection interval.
8. The applicant has made a satisfactory showing of financial responsibility as required by Section 27.073.
  - a. Probity has an active Organization Report (Form P-5, Operator No. 679304), and has filed a \$25,000 letter of credit for financial assurance.

### **CONCLUSIONS OF LAW**

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051
2. Findings of fact may be based only on the evidence and on matters that are officially noticed. Tex. Gov't Code §2001.141 (b).
3. All notice requirements have been satisfied. 16 Tex. Admin. Code § 3.9
4. The use or installation of the proposed disposal well is in the public interest. Texas Water Code § 27.051(b)(1).
5. The use or installation of the proposed disposal wells will not endanger or injure any oil, gas, or other mineral formation. Texas Water Code § 27.051(b)(2).

6. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution. Texas Water Code § 27.051(b)(3).
7. Probity SWD, LLC has made a satisfactory showing of financial responsibility. Texas Water Code § 27.051(b)(4).
8. Probity SWD, LLC has met its burden of proof and its application satisfies the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 9.

**RECOMMENDATION**

Based on the above findings of fact and conclusions of law, the Examiners recommend the Commission enter an order granting the application of Probity SWD, LLC for commercial permit to dispose of oil and gas waste by injection into a porous formation not productive of oil or gas, for the Marecek SWD, Well No. 1, in the Spraberry (Trend Area) Field, Midland County, Texas.

Respectfully submitted,



Paul Dubois  
Technical Examiner



Marshall Enquist  
Administrative Law Judge