

CHRISTI CRADDICK, *CHAIRMAN*
RYAN SITTON, *COMMISSIONER*
WAYNE CHRISTIAN, *COMMISSIONER*



DANA AVANT LEWIS, *DIRECTOR*

RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 08-0316893

**APPLICATION OF WESTERN DISPOSAL SYSTEMS, INC PURSUANT TO
STATEWIDE RULE 9 TO AMEND A COMMERCIAL PERMIT TO DISPOSE OF OIL
AND GAS WASTE INTO A POROUS FORMATION NOT PRODUCTIVE OF OIL OR
GAS FOR THE MARION LEASE, WELL NO. 10, IN THE SPRABERRY (TREND AREA)
FIELD, MIDLAND COUNTY, TEXAS**

PROPOSAL FOR DECISION

ISSUED: May 17, 2019

HEARD BY: John Moore – Technical Examiner
Jennifer Cook – Administrative Law Judge

APPEARANCES:

APPLICANT: Western Disposal Systems, Inc.

David Gross, Attorney
Dale Miller, Consulting Petroleum Engineer
Israel Matta, Operations Director

PROTESTANT: CrownQuest Operating, LLC

Clay Nance, Attorney
Will Lane, Infrastructure Engineer

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I. Procedural History

July 16, 2018	Amended Form W-14 filed to increase Injection Permit No. 11199 from 2,000 to 5,000 barrels per day
July 26, 2018	Email protest filed by CrownQuest Operating, LLC
August 13, 2018	Second amended Form W-14 filed to correct line 17 from 350 to 3,500 Estimated Average Daily Injection Volume
September 24, 2018	Deficiency letter from Commission UIC sent to Western Disposal Systems, Inc.
October 9, 2018	Notification of protest to application sent from Commission UIC to Western Disposal Systems, Inc.
October 19, 2018	Request for hearing letter sent to Commission UIC from Western Disposal Systems, Inc.
December 11, 2018	Oil and Gas Division Memorandum sent to Docket Services requesting application be set for hearing
December 12, 2018	Docket No.08-0316893 established and Docket Services issues Hearing Request Form
December 19, 2018	Hearing date set
January 25, 2019	Notice of Prehearing Conference circulated to service list
February 28, 2019	Prehearing conference held
March 5, 2019	Order setting hearing on the merits issued by Commission's Hearings Division
March 8, 2019	Prehearing conference transcript received by Hearings Division
March 28, 2019	Hearing on the merits held
April 12, 2019	Hearing on the merits transcript received by Hearings Division

II. Case Summary

Western Disposal Systems, Inc. (Operator No. 911878) ("Western" or "Applicant") filed an application requesting to amend commercial disposal permit No. 11199, pursuant to Statewide Rule 9, to dispose of oil and gas waste by injection into a formation not productive of oil and gas on the Marion (36187) Lease, Well No. 10 (API No. 42-329-01293) ("SWD Well"), in the Spraberry (Trend Area) Field, in Midland County, Texas. The SWD Well is located on a forty-acre tract about 17 miles east of Midland, Texas. Western requests to amend the permit's maximum daily injection volume from 2,000 barrels per day ("bpd") to 5,000 bpd.

As part of reviewing a third party disposal application in 2015, the Commission recognized a plugged and abandoned wellbore approximately ¼ mile from the SWD Well as a potential conduit for the vertical migration of injected fluids to the base of useable-quality groundwater. Performing a cement squeeze and placing a cement plug in the wellbore's casing were special conditions of the approved third party's disposal permit. The third-party disposal well was never drilled and special condition permit work was never completed on the plugged and abandoned well.

The application was protested by CrownQuest Operating, LLC ("CrownQuest" or "Protestant"), a mineral interest owner in an offset tract, who is developing the recoverable hydrocarbons in their lease. Protestant claims that the requested permit amendment will over-pressure the San Andres Formation and thereby increase the operational costs and risks of their development program.

With proper safeguards, the installation and operation of the proposed SWD Well is in the public interest, the injected fluids will not endanger or injure any oil, gas or mineral formation, the injected fluids will be constrained to the injection interval and useable groundwater will be protected. Based on the evidence presented in the hearing, the Technical Examiner and Administrative Law Judge ("Examiners") recommend approval of the application with a special condition requiring Western to perform a cement squeeze and place a cement plug inside the casing of the nearby problem plugged and abandoned wellbore.

III. Jurisdiction and Notice

Sections 81.051 and 81.052 of the Texas Natural Resources Code provide the Railroad Commission of Texas ("Commission") with jurisdiction over all persons owning or engaged in drilling or operating oil or gas wells in Texas and the authority to adopt all necessary rules for governing and regulating persons and their operations under the jurisdiction of the Commission.

Section 27.031 of the Texas Water Code states that no person may continue using a disposal well or begin drilling a disposal well or converting an existing well into a disposal well to dispose of oil and gas waste without first obtaining a permit from the Commission.

Statewide Rule 9 ("SWR 9") requires that notice of the application to amend the commercial injection permit's injection volume be sent to the surface owner of the proposed SWD Well site and to operators of wells within a ½ mile radius of the SWD Well site. Notice of the application to amend the commercial injection was sent to the surface owner, Navitas Midstream Partners, LLC ("Navitas") and to the only offset operator, CrownQuest. The proposed application is protested by CrownQuest.¹

On January 25, 2019, the Hearings Division of the Commission sent a Notice of Prehearing Conference ("Notice") via first-class mail to Applicant and all affected persons setting a pre-hearing conference date of February 28, 2019.² The Notice contains (1) a statement of the time, place, and nature of the pre-hearing conference; (2) a statement of the legal authority and jurisdiction under which the hearing is to be held; (3) a reference to the particular sections of the statutes and rules involved; and (4) a short and plain

¹ Applicant's Exhibit 2.

² See Notice of Pre-Hearing Conference issued January 25, 2019.

statement of the matters asserted.³ The pre-hearing conference was held on February 28, 2019. Both Applicant and Protestant appeared and participated. At the pre-hearing conference, the parties agreed to commence the hearing on the merits on March 28, 2019. The hearing on the merits was held on March 28, 2019. Applicant and Protestant attended and participated in the hearing on the merits. Consequently, all parties received more than 10 days' notice of the hearings and an opportunity for hearing.

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

V. Discussion of the Evidence

A. The Application

1. Permit Background

Western currently operates the SWD Well pursuant to a previously issued commercial injection permit No. 11199, effective March 29, 1999. The maximum injection pressure and injection interval prescribed in the original commercial injection permit was amended effective August 10, 2007. Western proposes to amend the existing commercial injection permit to increase the maximum daily injection volume from 2,000 bpd to 5,000 bpd and the estimated average daily injection volume from 350 Bbpd to 3,500 Bbpd. (See following table.)

³ See Tex. Gov't Code §§ 2001.051, .052; 16 Tex. Admin. Code §§ 1.41, 1.42, 1.45, 3.46.

Permit History

Commercial Injection Permit No. 11199 Dates	Injection Interval (feet)	Maximum Injection Volume (Bpd)	Estimated Average Injection Volume (Bpd)	Maximum Surface Injection Pressure (psig)	Permit Special Conditions
March 29, 1999 Initial Permit	4,100 – 4,780	2,000	350	2,050	Casing/cement program to protect fresh groundwater
August 10, 2007 First Amendment	3,950 – 4,780	2,000	350	1,950	
Current Application for Second Amendment	3,950 – 4,780	5,000	3,500	1,950	

2. Seismic Information

A review of U.S. Geological Survey seismic data shows no earthquakes have been reported within 100 square miles (a 9.08 km radius circle) of the SDW well location.

3. Form W-14⁴

The following information is taken from Western's Form W-14, *Application to Dispose of Oil and Gas Waste by Injection into a Formation not Productive of Oil and Gas* ("W-14"), submitted to the Commission on August 13, 2018. The W-14 proposes to amend the maximum daily injection volumes from 2,000 to 5,000 bpd and the estimate average daily volume from 350 to 3,500 bpd. All other elements of commercial injection Permit No. 11199 remain unchanged including the maximum surface injection pressure of 1,950 pounds per square inch ('psig').

a. Field and Lease Name

The field name identified on line 6 is the Spraberry (Trend Area) Field (85280300). The lease name identified on line 8 is the Marion (36187).

b. Disposal Formation

The name of the disposal formation identified on line 34 is the San Andres.

⁴ Applicant's Exhibit 1.

c. Injection Project Data

The proposed injection is identified as a commercial disposal well on line 42. The type of injection fluid is stated to be saltwater with the source of fluids being oil and gas wastes from leases other than the Marion lease.

d. General Well Data

The SWD Well was drilled on September 28, 1951. The SWD Well's API number is 42-329-01293 and was drilled to a total depth of 7,264 feet.

e. Well casing and completion program

Line 26 states the base of deepest freshwater zone is 235 feet. The Texas Natural Resource Conservation Commission recommendation for the protection of useable-quality groundwater at the SWD Well site, dated February 18, 1999, states "The interval from the land surface to the a depth of 275 feet must be protected".⁵ The diagram representing the well completion program identifies the base of useable quality groundwater to be 325 feet.⁶ The SWD Well is completed with 9 5/8-inch surface casing to a depth of 239 feet with 175 sacks of cement circulated to surface. The 7-inch intermediate string of casing is set from surface to a depth of 6,979 feet with 350 sacks of cement circulated to a depth of 4,010 feet. The long string 4 1/2-inch casing is set from surface to a depth of 4,900 feet and a cement squeeze performed with 155 sacks from 4,900 to 3,361 feet. The 2 3/8-inch injection tubing is run from surface to a depth of 4,307 feet with a packet set at 4,309 feet.

f. Injection interval, volumes and pressures

Line 33 states the injection interval is from 3,950 to 4,780 feet. The proposed maximum injection volume per day is 5,000 barrels and the proposed average is 3,500 bpd. The maximum injection pressure is 1,950 psig.

B. Applicant's Case⁷

Western's expert witness, Mr. Dale Miller, testified regarding the history of the commercial disposal permit, the current application to increase the daily maximum injection volume, the SWD Well completion program, the status of the drilled wells and well locations within a 1/2-mile radius of the SWD Well, the status of water wells within a 1/2-mile radius of the SWD Well, the status of commercial disposal wells within a 10-mile radius of the SWD Well, the need for additional oil and gas waste injection capacity, the recent sources of disposal fluids being injected into the SWD Well, and the Commission's treatment of past violations of Western's commercial injection permit relating to the SWD Well.

⁵ Applicant's Exhibit 26.

⁶ Applicant's Exhibit 17

⁷ The hearing transcript in this case is referred to as "Page [pages], line [lines]."

Mr. Miller presented the Commission's file pertaining to the SWD Well.⁸ Mr. Miller referred to the most recently filed Commission Form W-14, dated August 10, 2018, wherein Western is applying to increase the maximum daily injection volume from 2,000 to 5,000 bpd. The Application was deemed administratively complete, by letter from the Commission dated October 9, 2018.⁹ The Application could not be administratively approved due to the protest filed by CrownQuest, received by the Commission on July 26, 2018.¹⁰ On behalf of Western, the Commission received a request for hearing on October 19, 2018, to consider approval of the application to amend the existing disposal permit.¹¹

Mr. Miller presented exhibits demonstrating the surface location of wells and status of wells within a ½ mile radius of the SWD.¹² Mr. Miller testified there are eighteen surface locations of wells within the ½ mile radius. Eight of the wells have been plugged and abandoned, four are locations only, four are permitted locations, one expired permit, and one is a producing well.¹³ Mr. Miller presented the plugging reports for each of the plugged and abandoned wells within the ½-radius of the SWD Well and testified "we have a plug between our injection interval of cement occurring in all these wells between the top of our injection interval and the base of usable quality water."¹⁴

Mr. Miller presented evidence relating to the permitted commercial disposal wells within a 10-mile radius of the SWD Well.¹⁵ Mr. Miller testified that there are twenty-six commercial disposal wells within the 10-mile radius, although not all are active. Of the twenty-six permitted commercial disposal wells, ten have not been drilled, one was spudded October 15, 2018, and a Commission Form W-2 (drilling permit) has been filed for one well. The injection interval for eleven of the fifteen active commercial disposal wells is predominately into the San Andres formation at depths ranging from 2,575 to 6,500 across the wells. The remaining four commercial disposal wells are injecting into deeper formations. Excluding the subject SWD Well, the permitted daily maximum injection volumes for the commercial disposal wells injecting predominately into the San Andreas formation range from 7, 000 to 35,000 bpd. For the commercial disposal wells having deeper injection intervals, the maximum daily injection volumes range from 15,000 to 50,000 bpd.

Mr. Miller testified that Western has contracted with the nearby Navitas gas plant "to dispose of the gas plant water that's being separated out."¹⁶ Mr. Miller stated as the gas production in the area increases, the gas plant's needs increase and there needs to be adequate disposal facilities in the area. Mr. Miller testified that his Exhibit 10

⁸ Applicant's Exhibit 1.

⁹ Applicant's Exhibit 3.

¹⁰ Applicant's Exhibit 2.

¹¹ Applicant's Exhibit 4.

¹² Applicant's Exhibits 6 and 7.

¹³ Page 32, lines 9-25, Page 33, lines 1-12.

¹⁴ Page 37, lines 17-20.

¹⁵ Applicant's Exhibits 10, 11.

¹⁶ Page 54, lines 6-8.

demonstrates there are no active commercial disposal wells in the vicinity of the Navitas gas plant. The separated water from the Navitas gas plant is transported to the SWD Well via an underground pipeline. The SWD Well facility can also accommodate trucked oil and gas waste liquids.¹⁷

Mr. Miller presented evidence relating to fresh-water wells drilled within a one-mile radius of the SWD Well.¹⁸ The proposed use of the fresh-water range include industrial, stock, domestic and rig use. The total depth of the wells is reported to be from 40 to 140 feet. Mr. Miller testified that the current recommendation of the Groundwater Advisory Unit for the base of usable groundwater is 325 feet.¹⁹

Mr. Miller testified regarding the SWD Well's completion program. The SWD Well was originally drilled in the 1950's and later plugged and abandoned and re-entered in 1999. Mr. Miller stated that the well has 239 feet of 8 3/4-inch casing set with cement back to surface. Although the base of the usable quality water is now at 325 feet, Mr. Miller testified that the Commission was aware of the surface casing and cement completion method and required an annual Commission Form H-5 testing requirement. When Western converted the well for disposal injection in 1999, they ran 4 1/2-inch casing from surface to a depth of 4,900 feet. The 4 1/2-inch casing was cemented from bottom up to 3,361 feet, approximately 600 feet above the top of the SWD Well's permitted injection interval. A long string of 2 3/8-inch tubing was run to 4,309 feet with a packer set at the bottom of the tubing. The commercial injection permit authorizes the injection interval to be from 4,309 to 4,780 feet, the actual perforations are from 4,350 to 4,500 feet. Mr. Miller asserts that the Form H-5 tests are being performed as required and annular pressures are being monitored on a daily basis.²⁰

Mr. Miller offered evidence and testimony regarding the need for additional injection capacity. He asserted that in the period from the years 2000 to 2018 in Glasscock County there has been a 4-fold increase in the number of producing wells and only a doubling in the number of injection wells. During this same period in Midland County, the number of producing wells has increased by 172% and the number of injection wells has increased by 21%. Mr. Miller opined that a large portion of the recent wells are horizontally drilled, which are usually being fracked "and there's a lot flow-back that needs to be accommodated and disposed of responsibly."²¹ Mr. Miller offered an example with the combined oil production in 2018 of 107 million barrels of oil from Glasscock and Midland Counties; "if you had said that you produced two barrels of water per barrel of oil, you're at 214 million barrels of water produced."²²

¹⁷ Applicant's Exhibit 13.

¹⁸ Applicant's Exhibits 14, 15, 16.

¹⁹ Page 57, lines 6, 7.

²⁰ Page 65, line 10.

²¹ Page 69, lines 2, 3.

²² Page 70, Lines 24, 25. Page 71, lines 1, 2.

Mr. Miller presented a tabulation of the Commission Form H-10 filings from February 2006 through January 2019.²³ The Form H-10 tabulation shows that 2,975,789 barrels of fluid have been injected into this well over this thirteen-year period. During the period from February 2018 through January 2019, the source of 276,930 barrels of injected fluids has come from the Protestant's operations. This represents 27.48% of the total fluids injected during this twelve-month period.²⁴ The Commission's Form P-18 (Skimwell Condensate Report) records the sources of injected fluids so that oil volumes separated from the oil and gas wastewater can be allocated back to the producing well. An operator may contract with a trucking company to carry off and dispose of the waste fluids, but not know the final disposition of the waste fluids. In this case, the trucker(s) drove to the disposal facility nearest to the Protestant's drilling and production operations. In effect, while CrownQuest filed its protest in July 2018 against Western's application to increase injection volumes, CrownQuest was contributing fluids to be injected into Western's SWD Well.

Applicant's Exhibit 21 shows that Western began to exceed their maximum daily injection volumes in January 2018 and continued to exceed their permitted injection volumes through January 2019. On February 25, 2019, a Notice of Violation was sent from the Commission's Oil and Gas Division to Western stating "Item 14, Volume BBLS exceeds authorized permitted volume. Reduce the maximum daily injection volume or apply for a permit amendment."²⁵ Mr. Miller offered a string of emails, dated March 11 – 28, 2019, between himself and the Commission's UIC department wherein it was confirmed that Western had filed an application to amend their maximum daily injection volumes on July 16, 2018, that Western would stay within the current maximum daily injection volumes pending the outcome of their permit amendment request, and that the Commission had administratively resolved the volume violation for UIC 89665.²⁶

Under cross-examination, Mr. Miller was questioned about Oil and Gas Docket No. 08-0291954, wherein Ruger Properties, LLC ("Ruger") applied for and received a commercial injection permit for the Peggy SWD lease, Well No. 1, to dispose of oil and gas waste into the San Andres formation.²⁷ In its application, Ruger proposed to drill and complete a new well for commercial injection operations. Ruger's Permit No. 15075, granted by a Commission Final Order, dated August 25, 2015, prescribed a daily maximum injection volume of 20,000 bpd and a maximum injection pressure of 2000 psig. The injection permit also included special conditions to perform a cement squeeze on the casing annulus of three plugged and abandoned wells and a 100 feet cement plug be placed inside the casing of two wells to eliminate potential conduits for the vertical migration of fluids to the base of usable groundwater. The three wells were the:

- Floyd H Lease, Well No. 1 (API No. 42-329-00479)

²³ Applicant's Exhibit 21.

²⁴ Applicant's Exhibit 23.

²⁵ Applicant's Exhibit 24.

²⁶ Applicant's Exhibit 25.

²⁷ Protestant's Exhibit 1.

- Marion Lease, Well No. 5 (API No. 432-329-01288)
- Marion Lease, Well No. 11 (API No. 42-329-01294)

Mr. Miller confirmed that the Marion Lease, Well No. 11 (API No. 42-329-01294) ("Marion Well 11") identified in Ruger's permit special conditions was within the ½-mile radius of Applicant's SWD Well. No evidence or testimony was offered to demonstrate that the cement squeeze or casing plugs were performed or that Ruger drilled and put its proposed commercial disposal well into operation. Mr. Miller acknowledged that he had not investigated the status of the Marion Well 11.²⁸

Mr. Miller was questioned regarding Western injecting more than its monthly permit volume over a thirteen-month period as reported on the annual Commission Form H-10 filing. Mr. Miller responded, "It is common practice (for the Commission) when an H-10 is filed and the Railroad Commission sees it, to tell the operator you either get in compliance with your permit or you file an application to amend your volume."²⁹ Mr. Miller referenced the email string wherein the Commission's staff stated it had administratively resolved the volume violation.³⁰

Mr. Matta, Western's Director of Operations, testified regarding the current and potential sources of injection fluids, the SWD Well's workover, the Form H-10 filings and the Commission's action to sever and seal the SWD Well due to a delinquent Form H-5 filing. Mr. Matta stated that Western has an agreement with Navitas to take wastewater from two of their operating gas plants, the Spraberry and Newberry gas plants, and from two future Navitas gas plants, the Taylor and the Trident. During the course of negotiations with Navitas, Western was not allowed on the property (of the SWD Well).³¹ Mr. Matta affirmed that Western could not get to the well to do the required Form H-5 test, and as a consequence the Commission issued a severance notice, dated October 16, 2017, to cease injections.³² Following the conclusion of negotiations with Navitas, Mr. Matta testified he submitted the Form H-5 to the Commission and resumed injection operations without receiving Commission authorization to resume injection operations. Consequently, the Commission shut-in the SWD Well and sealed it November 16, 2017, with Commission seal No. 18619.³³ There was no evidence regarding the actions by Western to file the required Form H-5 and the Commission lifting the seal; however a tabulation of the SWD Well's Form H-10 filings shows that injection operations recommenced in December 2017.

Mr. Matta testified that the day before the subject hearing, 360 barrels of CrownQuest wastewater from its leases was delivered to the SWD Well for injection.³⁴

²⁸ Page 127, lines 17 – 20.-

²⁹ Page 144, lines 14-17.

³⁰ Page 145, lines 13, 14.

³¹ Page 176, lines 7,8.

³² Page 176, line

³³ Protestant's Exhibit 2.

³⁴ Page 180, lines 13.

Mr. Matta affirmed that CrownQuest was one of the “best” and “biggest” customers for the SWD Well.³⁵ Under cross-examination, Mr. Matta affirmed that CrownQuest does not operate the trucks that haul water to the SWD Well, but that “they request where the water is taken to,” and not exclusively the SWD Well. Mr. Matta asserted “They use the closest facilities,”³⁶ and CrownQuest wells are “right across the street.”³⁷

C. Protestant's Case

Mr. Lane, CrownQuest's infrastructure engineer, testified regarding CrownQuest's drilling operations in the vicinity of the SWD Well, CrownQuest's infrastructure to pipe and dispose of its oil and gas waste fluids, the drilling complications and risks experienced by CrownQuest, and Western's commercial injection permit exceedance from January 2018 through January 2019.

Mr. Lane testified CrownQuest has plans to drill twenty-three (23) horizontal wells over the next three (3) years on their lease directly offsetting the SWD Well. The total cost of the drilling program is expected to be \$184MM with each of the wells costing approximately \$8MM.³⁸ Under Phase 1 of CrownQuest's drilling program, eleven (11) horizontal wells are planned on the West ½ of Section 26 (the furthest distance from the SWD Well). CrownQuest plans, under Phase 2, to drill an additional twelve (12) on the East ½ of Section 26. As of the hearing date, CrownQuest has drilled five (5) wells and is currently drilling two (2) wells under Phase 1.³⁹

Mr. Lane presented evidence pertaining to CrownQuest's operations and investment in pipelines and private injection disposal wells. CrownQuest operates 32 miles of pipeline dedicated to transporting oil and gas waste fluids. It also owns and operates two injection disposal wells for its own use, has a permit for an injection well that has not been drilled, and has a fourth injection permit being processed. Mr. Lane estimates that CrownQuest has invested \$4.5MM in the pipeline and \$2MM in each of the injection wells.⁴⁰ The operating injection wells dispose of oil and waste into the Ellenburger formation at a depth of approximately 13,000 feet. Mr. Lane stated “We drill Ellenburger wells in order to get as far away from our production interval as possible, and then we don't have to ever drill past where we are injecting,”⁴¹

Mr. Lane testified regarding the drilling problems CrownQuest experienced in August 2016, when vertically drilling its first well on its lease, the Iron FR 26 #2 Well, approximately 1,800 feet northwest of the SWD Well. Mr. Lane presented a wellbore diagram of the Iron FR 26 #2 well demonstrating how the well was completed. The

³⁵ Page 180, lines 4-8.

³⁶ Page 185, lines 10-20.

³⁷ Page 181, line 8-10.

³⁸ Protestant's Exhibit 4, Page 2.

³⁹ Protestant's Exhibit 4, Page 3.

⁴⁰ Protestant's Exhibit 4, page 4

⁴¹ Page 197, lines 4-7.

diagram has the notations "Stuck intermediate drill string at 4,500 ft", along with "CrownQuest got stuck drilling it's intermediate hole for 6 days in the Marion Disposal Interval 4,350 to 4,500 feet."⁴² A review of the drilling report for August 14, 2016, shows that the well had achieved a total depth of 5,440 feet and was pulling the drill string when the driller lost circulation and the drill string got stuck in the hole.⁴³ The drilling report does not indicate the actual formation into which the drilling mud flowed. Furthermore, the phrase "Stuck intermediate drill string at 4,500 feet," means that 4,500 feet of drill string had not been pulled from the wellbore; it does not indicate the actual depth at which the drill string was being impeded, squeezed or pinched. Incidentally, the drilling report of August 14, 2016, shows that just prior to the intermediate drill string getting stuck, the drilling rig was having problems with its electrical generator overloading and killing the engine, and presumably the drilling mud pump, requiring the driller to re-connect the rig to a rental generator.⁴⁴

Mr. Lane testified that when drilling "past the San Andres they're very prone to taking on flows, and when there's added volume into the San Andres it can make our problem even more difficult."⁴⁵ He further testified, "This is showing that back in 2016 we even had issues then."⁴⁶ Mr. Lane described that the well lost circulation and could not circulate the cuttings out of the hole. A review of the SWD Well annual Form H-10 filed with the Commission shows that in August 2016, when CrownQuest was experiencing these drilling complications, the SWD Well was injecting an average of approximately 570 bpd, a volume well below their permit limit of 2,000 bpd. The Form H-10 shows that during the year 2016, the SWD Well's monthly injection volumes were averaging from 714 to zero bpd, and during the year 2015 the monthly average injection volumes ranged from 536 to 121 bpd.

The Examiners questioned Mr. Lane regarding the typical problems experienced when drilling through the San Andres formation:

Examiner: "Would it be your opinion it's just problematic to drill through the San Andres wherever you are in the area?"

Mr. Lane: That would be my opinion, and in this place more than any other county or area that CrownQuest drills in, this is the worst."

Examiner: "What distinguishes this as being the worst?"

Mr. Lane: "The San Andres flow is the highest."

Examiner: "Okay."

⁴² Protestant's Exhibit 4, page 8.

⁴³ Protestant's Exhibit 5.

⁴⁴ Protestant's Exhibit 5.

⁴⁵ Page 206, lines 7-9.

⁴⁶ Page 206, lines 10,11.

Mr. Lane: "And, that's out of Midland, Martin and..."

Examiner: "So that's naturally occurring?"

Mr. Lane: "It's not helped by disposal wells, but it is natural there, as well."

Mr. Lane presented two separate Commission Form W-2s ('W-2s') for the Iron FR 26 #2 Well, dated May 22, 2018, and April 3, 2017, to demonstrate the well's casing and cement method. On the third page of each of the well's W-2, is the Formation Record. Under the heading "Formations" are geologic formations encountered during the drilling of the well. The formation list includes the "San Andres – High Flow, H₂S, Corrosive." Under the heading "Encountered" and referring to the previously referenced San Andres formation is the word "No," meaning that the San Andres formation was not encountered in the wellbore. Under the heading "Remarks" and referring to the San Andres formation are the words "Pinched Out," meaning that the stratigraphic geologic section named the San Andres was not encountered in the wellbore. These nomenclatures and remarks appear on both W-2's filed more than a year apart and contradict CrownQuest's testimony regarding their difficulties encountered in the San Andres formation and with their issues regarding the SWD Well.

Mr. Lane testified regarding the types of drilling mud and casing depths CrownQuest uses to drill through the various formations. When drilling a vertical well, CrownQuest will employ a 10 pounds per gallon ("ppg") brine drilling mud and set intermediate casing below the San Andres formation at approximately 5,350 feet. With the intermediate casing and cement isolating the San Andres zone, a lighter 8.5 to 9.0 ppg drilling mud is employed to drill through the Clearfork and Spraberry formations and avoid breaking down these respective formations. When drilling a horizontal well, CrownQuest uses a "three-string drilling program which has proven to be effective and provides excellent wellbore integrity."⁴⁷ Intermediate casing is set below the Spraberry formation at a depth of approximately 8,500 feet. Mr. Lane testified that CrownQuest's horizontal drilling program employs a lighter 8.5 to 9 ppg gel-type drilling mud to coat the salt formations, thereby reducing its solubility, and to mitigate the breakdown of the Clearfork and Spraberry formations. In effect, CrownQuest's horizontal drilling program addresses the respective formation issues of the salt formation and the Clearfork and Spraberry formations, while risking a compromise of the San Andres formation.

Mr. Lane testified about the problematic drilling issues CrownQuest has encountered. He testified that the halite formation overlying the San Andres formation, the San Andres formation itself, and the Clearfork and Spraberry formations each have unique solubility, fluid and fracture characteristics. During drilling, the halite formation around the wellbore dissolves into the drilling fluid making it heavier, which in turn makes it harder to contain the drilling mud from flowing into the porous San Andres formation.

⁴⁷ Protestant's Exhibit 7.

The mud engineer has to monitor and balance the drilling mud weight to keep it within the desired specifications to maintain circulation of the drilling mud. If the driller enters the Clearfork and/or Spraberry formations with over balanced drilling mud, these formations will break down and the driller will lose circulation and perhaps stick the drill stem in the hole. CrownQuest's Exhibit 5 shows that the driller successfully drilled through the salt and the San Andres formations, but while pulling the intermediate drill string and having electrical issues with the drilling rig, the driller lost circulation, indicating that the well's drilling fluids were flowing into an unspecified formation causing the drill stem to adhere to the surface of the wellbore or be otherwise impeded at an undefined depth.

Mr. Lane testified that based on its horizontal drilling complications experienced while drilling the first four (4) wells on their lease, CrownQuest has modified its well completion program from a three (3) string casing program to a four (4) string casing program. The incremental completion cost per well for the four (4) string casing program is estimated to be \$525,000.⁴⁸ Mr. Lane contends that "if additional injection volumes were approved for the SWD Well into the San Andres formation it would only increase the risk for CrownQuest to successfully develop this lease."⁴⁹

Mr. Lane stated that CrownQuest operates "Probably over a thousand wells,"⁵⁰ and conceded that CrownQuest has gotten stuck drilling wells other than those he described in his testimony.⁵¹ Mr. Lane testified "In our new drilling programs, we have come up with contingency plans for when we do see increases in flows in the San Andres."⁵² Mr. Lane described that CrownQuest has to use a lighter drilling mud in the horizontal wells with the foregone knowledge that fluids from the San Andres formation may flow into the wellbore. Mr. Lane agreed that CrownQuest had developed and employed workable horizontal contingency plans, but the incremental costs and risks make them less desirable or likeable.⁵³ Mr. Lane testified "We'll probably just go with the four-string contingency to prevent further issues and the cost is expected to be higher than the \$525,000."⁵⁴

Mr. Lane testified that CrownQuest came to the conclusion that the SWD Well was impacting their drilling operation in August 2016,⁵⁵ a time when the average monthly injection volumes were approximately 570 bpd. Mr. Lane contradicted himself in testimony when he stated "Well, we didn't have a problem with the 2,000 barrel a day injection volume."⁵⁶ When questioned if he had taken any actions to prevent CrownQuest's wastewater from being disposed in the SWD Well, Mr. Lane stated "I have

⁴⁸ Protestant Exhibit 8, page 1.

⁴⁹ Protestant's Exhibit 8, page 2.

⁵⁰ Page 226, line 4.

⁵¹ Page 226, lines 17-20.

⁵² Page 231, lines 23-25.

⁵³ Page 238, lines 21-25.

⁵⁴ Page 217, lines 16-18.

⁵⁵ Page 229, lines 1-6.

⁵⁶ Page 229, lines 16, 17.

asked them not to send water to the Marion [the SWD Well], and I believe that that request has not been carried out."⁵⁷

VI. Examiner's Analysis

The Examiners' recommendation is to approve Western's application to amend its commercial injection permit based on the evidence and testimony presented at the hearing. All statutory requirements will be met for the Commission to amend the existing commercial injection permit for the SWD Well.

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

The Examiners find that amending the permit to allow a maximum daily injection volume of 5,000 bpd will not endanger or injure any oil, gas, or other mineral formation. The SWD Well injects into the San Andres formation at a depth of 4,350 to 4,500 feet, and in this area the San Andres formation is not productive of oil and gas. The nearest production is the Spraberry (Trend Area) Field at depths of approximately 8,650 to 11,350 feet, nearly 4,000 feet below the permitted injection interval of the SWD Well. No testimony or evidence was presented to demonstrate or indicate that injected fluids endanger or injure any oil, gas, or other mineral formation. Protestant recognizes the inherent issues when drilling through the San Andres formation and has modified its drilling and completion programs to address these issues, albeit at an increased cost and operational risk per well. Employing its modified drilling and completion program, Protestant continues to drill and develop its mineral interests offset to the SWD Well.

For these reasons, the Examiners recommend the Commission find the use of the SWD Well as proposed by Western will not endanger or injure oil and/or gas bearing formations.

B. With a special condition regarding a nearby problem wellbore, ground and surface water can be adequately protected from pollution.

With proper safeguards, the Examiners find the injected fluids will not migrate from the permitted injection interval into strata containing useable groundwater.

The Commission reviewed Applicant's original application in 1999, the amended application in 2007, and once again an amended application in 2018 and found the applications to be compliant with the applicable statutes and Commission Statewide Rules. Given the age of the well and that the regulatory prescribed base of useable groundwater has deepened since the SWD Well was originally drilled and completed, special conditions that the H-5 annular pressure test be conducted every year rather than every five years, and the tubing-casing annulus pressure be monitored at least weekly

⁵⁷ Page 230, lines 23-25.

are already mandated in the existing SWD Well's disposal permit. To date, there is no record that the SWD Well's casing, cement, tubing or wellbore has been compromised. These two special conditions should be continued in the amended disposal permit.

In Commission Final Order No. 08-0291954, the Commission recognized the Marion Well 11 as a pollution threat to useable-quality groundwater. This plugged and abandoned wellbore is approximately 1,325 feet from the SWD Well and the annulus between the casing and the formation is uncemented from 237 feet to about 4,830 feet,⁵⁸ which includes the SWD Well's injection interval and the currently recognized base of useable quality groundwater. The Commission acknowledged the threat to ground and surface water, and in Final Order No. 08-0291954, the Commission approved Ruger's commercial disposal application for the Peggy SWD Well No. 1 with a special condition that a 100-sack cement squeeze be performed on the casing annulus of the Marion Well 11 at a depth of 375 feet and a cement plug placed from 325 to 425 feet inside the well's casing.⁵⁹

Ruger never drilled the Peggy SWD Well No. 1, and there is no record that it performed the special condition cement squeeze or placed the cement plug inside the casing of the Marion Well 11. The wellbore remains as a potential conduit for injected fluids to pollute ground and surface water. Applicant acknowledged that as part of its application to increase the permitted daily disposal volume, it had not investigated the status of the Marion Well II. Furthermore, Applicant did not establish that approving its application to increase the maximum daily volume from 2,000 bpd to 5,000 bpd would not pollute ground and fresh water via the Marion Well 11.

Given the Commission's previous determination that the Marion Well 11 is a problem well, and its proximity to the SWD Well, the Examiners recommend the same special condition regarding the Marion Well 11 that the Commission ordered in the Ruger case - that a 100-sack cement squeeze be performed on the casing annulus at a depth of 375 feet and a cement plug placed from 325 to 425 feet inside the well's casing.

The Examiners recommend the Commission find that with a special condition regarding the Marion Well 11, the use or installation of the proposed SWD Well will adequately protect ground and surface water from pollution.

C. The use or installation of the proposed SWD is in the public interest.

The Examiners find the proposed SWD Well is in the public interest.

Applicant and Protestant each provided evidence there is a need for injection disposal capacity at this SWD Well and in the area. Applicant has a contract with Navitas

⁵⁸ Oil & Gas Docket No. 08-0291954 Amended Proposal for Decision Issued May 5, 2015.

⁵⁹ Protestant's Exhibit 1.

to dispose of gas plant wastewater via pipeline and is currently turning away trucking customers at the SWD Well due to permit volume constraints.

Protestant was using the SWD Well to dispose of its wastewater, even though Protestant owns and operates a network of disposal pipelines and wells. Furthermore, Protestant's oil and gas waste fluids were being injected into the SWD after Protestant filed its protest against increasing the SWD Well's permitted injection volume, and while Protestant alleges the SWD Well was detrimentally affecting and risking its drilling and completion program.

With the implementation of Special Conditions to the commercial disposal permit amendment, injected fluids are contained to the injection interval and there is no evidence that injected fluids will migrate to productive mineral formations or useable groundwater. Protection of groundwater and other mineral formations is in the public interest. For these reasons, the Examiners recommend the Commission find the requested amendment to the injection permit is in the public interest.

D. Applicant has made a satisfactory showing of financial responsibility as required by Texas Natural Resources Code, § 91.142.

Except as may be specifically excluded, Statewide Rule 78 states that any person, including any firm, partnership, joint stock association, corporation, or other organization, is required by Texas Natural Resources Code, § 91.142, to file an organization report with the Commission must also file financial security. Applicant meets this requirement.

VII. Examiner's Recommendation, Proposed Findings of Fact and Proposed Conclusions of Law

Based on the evidence and testimony presented at the hearing, the Examiners recommend that the Commission approve Western Disposal System Inc.'s request to amend commercial disposal permit No. 11199, pursuant to Statewide Rule 9, to dispose of oil and gas waste by injection into a formation not productive of oil and gas on the SWD Well, and adopt the following findings of fact and conclusions of law.

Findings of Fact

1. Western Disposal Systems, Inc. (Operator No. 911878) filed an application requesting to amend commercial disposal permit No. 11199, pursuant to Statewide Rule 9, to dispose of oil and gas waste by injection into a formation not productive of oil and gas on the Marion (36187) Lease, Well No. 10 (API No. 42-32901293), in the Spraberry (Trend Area) Field, in Midland County, Texas.
2. A review of U.S. Geological Survey seismic data shows no earthquakes have been reported within 100 square miles (a 9.08 km radius circle) of the SWD Well.

3. SWR 9 requires that notice of the application to amend the commercial injection permit's injection volume be sent to the surface owner of the proposed SWD Well site and to operators of wells within a ½-mile radius of the SWD Well site. Notice of the application to amend the commercial injection was sent to the surface owner, Navitas Midstream Partners, LLC, and to the only offset operator, CrownQuest Operating, LLC.
4. The application is protested by CrownQuest Operating, LLC.
5. On January 25, 2019, the Hearings Division of the Commission sent a Notice of Prehearing Conference ("Notice") via first-class mail to Applicant and all affected parties setting a pre-hearing conference date of February 28, 2019.
 - a. The Notice contains (1) a statement of the time, place, and nature of the pre-hearing conference; (2) a statement of the legal authority and jurisdiction under which the hearing is to be held; (3) a reference to the particular sections of the statutes and rules involved; and (4) a short and plain statement of the matters asserted. All parties received more than 10 days' notice of hearing and opportunity for hearing.
 - b. The pre-hearing conference was held on February 28, 2019. Both Applicant and Protestant appeared and participated.
 - c. At the pre-hearing conference, the parties agreed to commence the hearing on the merits on March 28, 2019.
 - d. The hearing on the merits was held on March 28, 2019.
 - e. Applicant and Protestant attended and participated in the hearing on the merits.

All parties received more than 10 days' notice of hearing and opportunity for hearing.
6. Western Disposal Systems, Inc. currently operates the SWD Well pursuant to a previously issued commercial disposal permit No. 11199, effective March 29, 1999, as amended August 10, 2007.
 - a. The maximum injection pressure and injection interval prescribed in the original commercial injection permit was amended effective August 10, 2007.
 - b. Western proposes to amend the existing commercial injection permit to increase the maximum daily injection volume from 2,000 bpd to 5,000 bpd

and the estimated average daily injection volume from 350 bpd to 3,500 bpd.

7. The use or installation of the SWD Well will not endanger or injure any oil, gas, or other mineral formation.
 - a) The SWD Well's permitted injection interval is 3,950 to 4,780 feet into the San Andres Formation. The SWD Well's perforated injection interval is in the San Andres Formation from 4,350 to 4,500 feet.
 - b) CrownQuest's productive zones offsetting the SWD Well are in the Spraberry (Trend Area) Field, at an approximate depth of 8,650 to 11,350 feet.
 - c) CrownQuest continues to drill and develop their lease offset to the SWD Well. CrownQuest recognizes the naturally occurring formation characteristics of the San Andres formation underlying their lease and has modified their drilling and completion program to address these characteristics, albeit at increased costs and operational risks.
 - d) CrownQuest did not claim nor present evidence that the SWD Well has or will cause migration into the productive zones in the Spraberry (Trend Area) Field.
8. With proper safeguards, both groundwater and surface fresh water can be adequately protected from pollution.
 - a) The depth of useable-quality groundwater was established at 275 feet when the SWD Well was initially permitted in 1999. The base of useable-quality groundwater has subsequently been re-established by the Commission at 325 feet.
 - b) The SWD Well's current injection permit requires special conditons:
 - i) the casing annulus pressure be tested annually (Form H-5), and
 - ii) the tubing-casing pressure be monitored at least weekly and reported annually (Form H-5)
 - c) The Marion Lease, Well No. 11 (API No. 42-329-01294) approximately 1,325 feet northwest of the SWD Well penetrates the disposal interval of the SWD Well.
 - i) This plugged and abandoned wellbore was recognized in Commission Final Order No. 08-0291954, dated August 25, 2015, as a pollution threat to useable-quality ground and fresh water, in association with the application of Ruger Properties, LLC's Peggy SWD Lease, Well No. 1 for a commercial disposal permit into the San Andres Formation.

- ii) In Final Order No. 08-0291954, the Commission mandated that a 100-sack cement squeeze be performed on the casing annulus at a depth of 375 feet and a cement plug placed from 325 to 425 feet in the well's casing as a special condition to Ruger Properties, LLC's permit for a commercial disposal well.
 - iii) The Peggy SWD Lease, Well No. 1 was not drilled and there is no record that the cement squeeze and cement plug have been performed on the Marion Lease, Well No. 11.
 - iv) The Marion Lease, Well No. 11 remains as a potential conduit for the vertical migration of fluids to the base of useable-quality groundwater.
 - v) A special condition regarding the Marion Lease, Well No. 11 requiring a 100-sack cement squeeze be performed on the casing annulus at a depth of 375 feet and a cement plug placed from 325 to 425 feet in the well's casing will prevent the Marion Well No. 11 from being a conduit to useable-quality groundwater.
9. The use or installation of the proposed SWD Well is in the public interest.
- a) With proper safeguards, injected fluids are contained to the injection interval.
 - b) Western and CrownQuest demonstrated the commercial need for the additional commercial disposal capacity in the area.
 - i) Western has a contract with Navitas Midstream Partners, LLC to dispose of gas plant wastewater from two existing gas plants and two future gas plants. The wastewater is piped to the SWD Well.
 - ii) CrownQuest used the SWD Well to dispose of wastewater, even though CrownQuest owns and operates a network of disposal pipelines and wells.
10. Western Disposal Systems, Inc. has an active P-5 Organization Report, and a - \$25,000 bond as financial assurance.

Conclusions of Law

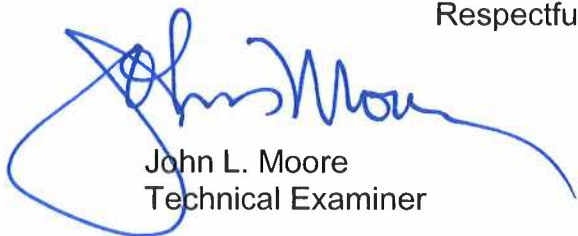
- 1. Proper notice of hearing was timely issued to persons entitled to notice. *See, e.g.,* Tex. Gov't Code § 2001.051; 16 Tex. Admin. Code §§ 1.41, 1.42, 1.45, 3.9.
- 2. The Commission has jurisdiction in this case. *See, e.g.,* Tex. Nat. Res. Code § 81.051; Tex. Water Code §§ 27.031, 27.051(b).

3. The proposed amended fluid disposal operations will not endanger oil, gas, or geothermal resources. Tex. Water Code § 27.051(b)(2); 16 Tex. Admin. Code § 3.46(a).
4. With a special condition regarding the Marion Well No. 11, groundwater and surface fresh water can be adequately protected from pollution.
5. Approval of the proposed amended injection well operation is in the public interest.
6. Western Disposal Systems, Inc. demonstrated the application to amend commercial disposal permit for the Marion Lease, Well No. 10 meets the requirements of chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 9 subject to a special condition regarding the Marion Well No. 11.

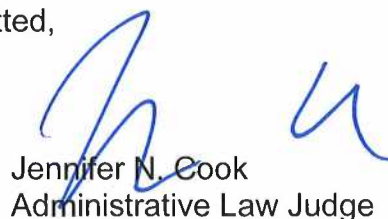
Recommendation

The Examiners recommend that the application Western Disposal Systems, Inc. requesting to amend commercial disposal permit No. 11199, to dispose of oil and gas waste by injection into a formation not productive of oil and gas on the Marion Lease, Well No. 10 be approved with a special condition regarding the Marion Well No. 11 requiring a 100-sack cement squeeze be performed on the casing annulus at a depth of 375 feet and a cement plug placed from 325 to 425 feet in the well's casing, as set out in the attached proposed Final Order.

Respectfully submitted,



John L. Moore
Technical Examiner



Jennifer N. Cook
Administrative Law Judge