June 13, 2023

VIA ELECTRONIC MAIL

Dylan Fuge
Director, Oil Conservation Division
New Mexico Department of Energy,
Minerals and Natural Resources
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Re: Andre Dawson SWD #1, Order No. R-22026/SWD-2403.

Dear Director Fuge:

Goodnight Midstream Permian, LLC ("Goodnight Midstream") respectfully submits this report regarding its **Andre Dawson SWD #1** (API No. 30-025-50634) to provide an explanation for the Division regarding an invalid formation water sample submitted pursuant to Order No. R-22026/SWD-2403.

Injection into the Andre Dawson SWD #1 has been suspended pending approval from the Division to resume injection. Based on its analysis and the foregoing report, Goodnight Midstream respectfully requests the Division authorize resumption of injection operations.

Executive Summary

Through its third-party contractor and four months after injection had already commenced, Goodnight Midstream inadvertently submitted an invalid formation water chemistry analysis pursuant to special conditions under Order No. R-22026/SWD-2403. The sample results were submitted to the Division before Goodnight Midstream was consulted as to their significance or validity. The results also were not timely submitted even though Goodnight Midstream received assurances from its contractor that they had been. Goodnight Midstream takes full responsibility for this serious oversight. The sample results incorrectly suggest the San Andres injection interval has a concentration of Total Dissolved Solids (TDS) that is less than 10,000 mg/L. In response, Goodnight Midstream suspended injection into the Andre Dawson SWD #1 on May 26, 2023, pending Division approval to resume injection.

The water chemistry sample Goodnight Midstream submitted is invalid because it was tainted by a substantial volume of freshwater lost to the San Andres formation during extended periods of lost returns experienced during primary and remedial cement job operations and after the well was perforated. Freshwater lost to the San Andres during these operations substantially reduced the TDS concentration to levels below 10,000 mg/L in the formation sample collected for analysis.

Nearby water samples collected from offsetting disposal wells confirm that the low TDS sample is not reflective of the true water chemistry in the San Andres in this area. Three San Andres water samples within a two-mile radius of the Andre Dawson SWD #1 show TDS concentrations from between 19,000 mg/L to 44,000 mg/L. The low-TDS Andre Dawson SWD #1 water sample is instead an artifact of freshwater lost to the San Andres during cement jobs and completion operations. Moreover, the San Andres formation in this area is already a confirmed produced water disposal zone with more than 60 million barrels of produced water injected through approved Class II disposal wells within a one-mile radius of the Andre Dawson SWD #1 over the last 60 years.

Goodnight Midstream acknowledges its failure to confirm before commencing injection that its sampling, notifications, and submissions to the Division were timely and proper. It has instituted internal training, improved coordination and communications with its third-party contractor, and hired additional vice-president-level management to help oversee its operations to avoid future Division reporting and notification issues going forward. The third-party contractor should have first consulted with Goodnight Midstream over the water sample results before submitting them to the Division, and Goodnight Midstream could have instituted a more robust and reliable water sampling protocol for use in circumstances where lost circulation is an issue.

Recognizing these shortcomings, the formation water chemistry sample submitted is nevertheless invalid and not representative of San Andres water chemistry in the vicinity of the Andre Dawson SWD #1. Offsetting water samples confirm the San Andres TDS concentrations are far above the 10,000 mg/L threshold in this area, which has long been recognized as an approved produced water disposal zone. Goodnight Midstream respectfully requests the Division authorize it to resume injection through the Andre Dawson SWD #1.

Background

After obtaining authority to inject and an approved APD, Goodnight Midstream drilled its Andre Dawson SWD #1 and commenced injection in the San Andres formation (SWD; San Andres 96121) on or around January 18, 2023. Order No. R-22026/SWD-2403 was issued on February 7, 2022. The Andre Dawson SWD #1 is located in Unit P of Section 17, Township 21 South, Range 36 East, Lea County, New Mexico.

After injecting for approximately three months, Goodnight Midstream filed an administrative application in April 2023 to increase the authorized rate of injection under Order No. R-22026/SWD-2403 from 25,000 bbl/day to 40,000 bbl/day. While reviewing that request, the Division notified Goodnight Midstream on May 22, 2023, that it had not received certain notifications or filings required under Order No. R-22026/SWD-2403 related to commencement of injection.

Upon notification by the Division of this issue, Goodnight Midstream contacted its third-party contractor, Octane Energy, to inquire whether the requested notifications and filings had been submitted. Goodnight contracts with Octane Energy to provide turnkey drilling, completion, and reporting services and to make filings required by the Division. Despite prior assurances that the forms had been timely filed, Octane Energy later confirmed that they had not been submitted. Octane Energy immediately prepared the requested materials for submission, including the C-115s, C-103 completion sundry, C-105 completion report, well logs, a remedial cement bond log, and the results of a formation water chemistry sample collected and analyzed pursuant to special

conditions under Order No. R-22026/SWD-2403. The notifications and filings were submitted to the Division through the electronic filing portal and by e-mail on May 25, 2023.

The water sample analyzed by Cardinal Laboratories reflected a TDS concentration of 7,650 mg/L, which is within the protectable limit of 10,000 mg/L. Accordingly, and under the provisions of Order No. R-22026/SWD-2403, Goodnight Midstream's authority to inject into the Andre Dawson SWD #1 was suspended. After confirming with the Division, Goodnight Midstream ceased injection on May 26, 2023, pending resolution of the formation water sample issue.

Upon review of the events and circumstances leading up to and including collection of the formation water sample, Goodnight Midstream has confirmed that the water chemistry sample submitted to Cardinal Laboratories is not valid and not representative of the water chemistry in the injection interval within the San Andres in this area.

Report and Analysis

A. Operational History of the San Andres in the Area

The San Andres formation is at a depth of approximately 4,300 feet in the area of the Goodnight Midstream saltwater disposal field, including the Andre Dawson SWD #1. The formation is a saline aquifer more than 1,000 feet thick with very high transmissivity. It was identified as the water source for the Eunice Monument South Unit (EMSU) Grayburg waterflood, which was formed in 1984 for the purpose of secondary oil recovery. The Eunice Monument South Grayburg field had been produced by depletion drive from 1936 to 1984. Very large volumes of oil, gas, and water had been extracted from the field. This voidage had to be replaced to perform the water flood.

Chevron drilled six San Andres water supply wells in the central part of the EMSU to provide the water to re-fill the voidage in the Grayburg. The wells are identified in the table below. Cumulatively they produced 348 million barrels of saltwater from the San Andres over a 35-year period.

EMSU Water Supply Well NAME	API		Location	Status	Start	End	Years Active WSW
Chevron WSW EMSU #457	025	29149	Q - 5 - 21S - 36E	T&A	1987	2004	17
Chevron WSW EMSU #458	025	29618	I - 4 - 21S - 36E	T&A	1987	2012	25
Chevron WSW EMSU #459	025	29826	B - 5 - 21S - 36E	Active	1987	2022	35
Chevron WSW EMSU #460	025	29620	C - 8 - 21S - 36E	P&A	1987	2002	15
Chevron WSW EMSU #461	025	29621	I - 9 - 21S - 36E	P&A	1987	2002	15
Chevron WSW EMSU #462	025	29622	L - 9 - 21S - 36E	Recomplete	1987	2005	18

There were already five San Andres [SWD; San Andres (Pool Code 96121)] SWDs in the area when Goodnight Midstream identified the massive de-pressured zone in the San Andres saline aquifer as a viable target for additional produced water disposal wells. The Andre Dawson SWD

#1 is the ninth San Andres well the company has drilled in the area. Goodnight Midstream also acquired an early San Andres SWD for a total of 11 operated SWD wells on the Goodnight Llano System.

B. Andre Dawson SWD #1 Drilling, Completion, and Swabbing

After receiving authority to inject and an approved APD, Goodnight Midstream's third-party contractor, Octane Energy, spud the Andre Dawson SWD #1 on November 30, 2022. Total depth was reached on December 7, 2022.

During the primary cement job and a subsequent remedial squeeze job within the San Andres, Octane Energy did not receive returns at the surface, which indicates fluid was being lost to the formation in this zone. It is necessary to use freshwater for cementing operations to allow the cement to properly cure and bond to the casing. During the first stage of cementing across the injection zone Octane Energy lost all returns. This stage consisted of a total of approximately 679 barrels of fresh water for displacement. Octane Energy did not have any returns until it activated the packer and DVT for the next stage, thereby sealing off the injection zone, which had absorbed all fluid.[1]

While perforating from between approximately 4,960 feet to 4,980 feet, the fluid column dropped from 100 feet from the surface to 1,000 feet inside the 3.5-inch tubing. This volume equates to approximately 8 barrels of additional freshwater lost to the formation:

Well Name:	Andre Dawson SWD #1			**Date:**	12/29/2022		**Day:**	13	**Report:**	13			
Project Start Date:	Wednesday, December 14, 2022			**Rig Name:**	Joe's		**Rig Manager / Number:**						
Present Ops:	Perforate well and TIH with packer plug				**Consultant:**		David Hines				**Deviation Surveys**		
Depth		**TMD:**		**Footage:**		**Consult. #**	575-631-4124				**Depth**	**Angle**	
Ops for Next 24hrs:						**Satellite #**							
Tubing Size (OD in	**Tubing ID**		**Vol/1000**										
2.875	2.441		5.79										
Casing size OD	**CSG ID**		**Vol/1000**	**Ann Vol/1000**									
5 1/2	4.892		23.25	16.82									
Notable Weather Conditions		50* windy and prtly cloudy											
From	**To**	**Hours**	**Activity for Previous 24 Hours**										
7:00	7:30	0.50	Hold PJSM with crew, check well for pressure, well is dead.										
7:30	15:30	8.00	We continued to peforate well.										
		0.00	We made 15 runs for today and 20 runs total, 20' guns 2 shots per foot, 800 holes total.										
		0.00	5,255 - 5,275', 5,200' - 5,220', 5,150' - 5,125', 5,055' - 5,075', 5,010' - 5,030', 4,960' = 4,980', 4,880' - 4,900', 4,830' - 4,850',										
		0.00	4,780' = 4,800', 4,652' - 4,672', 4,620' - 4,640', 4,550' - 4,570', 4,505' - 4,525', 4,375' - 4,395'										
		0.00	Rig down API wireline equipment and load out the same.										
15:30	18:30	3.00	We picked up 9 5/8" plug and packer from Mesquite Oil Tools and run in the hole with the same to 4,000' +-.										
		0.00	We installed tubing valve, closed BOPs and secure the well for the night.										
		0.00											
		0.00											
		0.00	When we shot 4,960 - 4,980' the well went on a vacuum and fluid level dropped from 100' to 1,000'.										
		0.00											
		0.00	We got off of location about 6:30 pm.										

After perforating, Octane Energy swabbed back over a two-day period about 129 barrels of water, substantially more than the 8 barrels of freshwater lost after perforating:

[1] Cement bond log interpretation indicates sufficient bonding to ensure a seal above the permitted interval.

Well Name:	Andre Dawson SWD #1			Date:	01/03/2023		Day:	17	Report:	17		
Project Start Date:	Wednesday, December 14, 2022			Rig Name:	Joe's		Rig Manager / Number:					
Present Ops:	Swab well for samples			Consultant:			David Hines				Deviation Surveys	
Depth		TMD:		Footage:		Consult. #	575-631-4124				Depth	Angle
Ops for Next 24hrs:						Satellite #						
Tubing Size (OD in	Tubing ID		Vol/1000									
2.875	2.441		5.79									
Casing size OD	CSG ID		Vol/1000	Ann Vol/1000								
5 1/2	4.892		23.25	16.82								
Notable Weather Conditions		50* prtly cloudy										
From	To	Hours	Activity for Previous 24 Hours									
7:00	7:30	0.50	Hold PJSM with crew, check well for pressure, well is on a slight vacumm.									
7:30	8:30	1.00	Remove tubing valve, open BOP's and continue in the hole with plug and packer. Set plug @ 5,590'.									
8:30	9:30	1.00	TOH and set packer around 4,300'									
9:30	10:30	1.00	Rig up swab equipment for 3 1/2" tubing.									
10:30	18:00	7.50	Swab well for samples for the OCD for formation fluids. We made 36 runs and got back 71 bbls. We are starting to see a little change									
		0.00	in fluids.									
		0.00	Close in tubing, close BOPs and secure the well for the night.									
		0.00										
		0.00										
		0.00	We got off of location about 6:00 pm.									

Well Name:	Andre Dawson SWD #1			Date:	01/04/2023		Day:	18	Report:	18		
Project Start Date:	Wednesday, December 14, 2022			Rig Name:	Joe's		Rig Manager / Number:					
Present Ops:	Swab well for samples			Consultant:			David Hines				Deviation Surveys	
Depth		TMD:		Footage:		Consult. #	575-631-4124				Depth	Angle
Ops for Next 24hrs:						Satellite #						
Tubing Size (OD in	Tubing ID		Vol/1000									
2.875	2.441		5.79									
Casing size OD	CSG ID		Vol/1000	Ann Vol/1000								
5 1/2	4.892		23.25	16.82								
Notable Weather Conditions		55* Prtly cloudy and windy										
From	To	Hours	Activity for Previous 24 Hours									
7:00	7:30	0.50	Hold PJSM with crew, check well for pressure, well is on a slight vacumm.									
7:30	14:30	7.00	Open up tubing valve and BOPs. Start swabbing well again. Fluid level stayed at 1,000' over night.									
		0.00	We swabbed fluid level down to 1,100' and fluid leve is now staying constant. We swabbed a total of 32 runs and 58 bbls of fluid									
		0.00	today before catching samples.									
		0.00	Total swab runs: 68									
		0.00	Total bbls swabbed: 129 bbls.									
14:30	15:30	1.00	Cindy Crain showed up on location, we swabbed fluid out of the well for her to catch and fill up sample jars to take to Cardnal Labs									
		0.00	for testing.									
15:30	16:30	1.00	Rig down swabbing equipment and break down the same.									
16:30	17:30	1.00	TOH to 4,100', instal 1 way valve and TIH 1std, close BOPs, intall tubing valve and shut down for the night.									
		0.00										
		0.00	We got off of location about 6:00 pm.									

After swabbing 129 barrels over a two-day period, the water samples turned black in sunlight, which is a typical indicator that the water is from the San Andres. A sample was collected and sent for analysis at the end of the second day of swabbing. Based on the characteristics of the water sample and the volumes swabbed back relative to what was lost to the formation after perforating, it appeared at the time that the sample collected was representative of the formation fluid. However, upon review, this assumption did not account for the substantial volume of freshwater water lost (679 barrels) during the primary and remedial cement jobs. The total volume swabbed back before collecting formation samples was only about 18 percent of the total volume of freshwater that was lost to the formation.[2]

[2] To swab all lost fluids would have required an additional five days of swabbing. When lost fluids mix with formation fluids, however, it may be necessary to swab back twice the lost volume before a representative formation sample can be obtained due to the mixing of fluids in the formation. Thus, it would have likely taken more than a week to swab back enough fluids to obtain a representative formation sample due to the mixing of freshwater fluids that occurred following the cement job and perforations.

C. Step Rate Test

Following the well's completion, Goodnight commenced injection in the Andre Dawson SWD #1 on January 18, 2023, and proceeded with normal injection operations. After a smooth start up with all leak and line checks complete, Goodnight prepared to step rate test the well. The test went as planned and confirmed that severe de-pressurization existed within the San Andres in this location. High-rate injection on vacuum is consistent and compatible with the loss of returns while drilling and the loss of cement while completing the well.

Rate-pressure testing began using Goodnight Midstream's Wrigley Facility flow system from January 22-25, 2023, using the built in pump system that has a maximum output of less than 200 psi. This configuration allowed water to be used from the system's main water tank for the step rate test. This approach was preferable because step rates tests could not be completed on previous wells using frac tanks, which could not be refilled fast enough.

Initial flows from the Wrigley tank went to 12.6 barrels of water per minute at -7.75 psi. These conditions held for several hours. The charge pump was turned on and the well went to 26.7 barrels of water per minute at 58 psi. The injection rate remained constant for 12 hours while the pressure decreased by 3 psi. After injection stopped, the well went on instantaneous vacuum. Goodnight Midstream terminated the test and returned the well to normal operation.

The well remained in service from January 18, 2023, to May 26, 2023, when Goodnight Midstream received the Division's order to shut the well in.

D. Offsetting Formation Water Chemistry Samples

While the formation water chemistry sample collected and analyzed from the Andre Dawson SWD #1 was tainted by freshwater used during completion operations and therefore invalid, Goodnight Midstream and Octane Energy have been able to obtain valid and representative water chemistry samples from the San Andres within a short distance of the Andre Dawson SWD #1, confirming that the San Andres in this location does not have a TDS concentration below 10,000 mg/L.

Attachment A is a map that depicts four Division-approved San Andres produced water disposal wells within a one-mile radius of the Andre Dawson SWD #1. Neither the Ryno SWD #1 (API No. 30-025-43901) nor the Rice Engineering EME L SWD #21 (API No. 30-025-21852) were required to collect and submit a formation water chemistry sample at the time they were approved or dilled. However, two wells have formation water chemistry samples far in excess of the 10,000 mg/L threshold.

The Sosa SWD #1 (API No. 30-025-47947), which is less than two-thirds of a mile to the west and within the same Section as the Andre Dawson SWD #1, reported a San Andres TDS concentration of 19,000 mg/L. Less than a mile to the north and also within the same Section, is Goodnight Midstream's Ernie Banks SWD#1 (API No. 30-025-50633). A successful water sample was collected from it shortly after the invalid sample was collected in the Andre Dawson SWD #1. It showed a San Andres TDS concentration of 26,300 mg/L. In addition, approximately 1.7 miles

to the east in Unit A of Section 28, Township 21 South, Range 36 East, is Goodnight Midstream's Yaz SWD #1 (API No. 30-025-46382). It reported a San Andres TDS concentration of 44,800 mg/L.

Within a two-mile radius of the Andre Dawson SWD #1, the average San Andres TDS concentration is above 30,000 mg/L, three times the protectable limit of 10,000 mg/L. Because the San Andres is so severely under-pressured and has a very high rate of transmissivity, it is very unlikely discrete pockets of anomalous freshwater have persisted in this area. Accordingly, these water sample test results confirm that the San Andres is not a protectable source of freshwater where the Andre Dawson SWD #1 is located.

E. San Andres is a Confirmed Produced Water Disposal Zone in this Area

In addition to the reported valid TDS samples discussed above, the 1.7-mile area immediately around the Andre Dawson SWD #1 has been designated a produced water disposal zone for more than six decades. **Attachment A** depicts four Division-approved San Andres produced water disposal wells within a one-mile radius of the Andre Dawson SWD #1 along with the date of approval for injection and the approximate cumulative volumes of injected water where injection has commenced.

The Rice Engineering EME L SWD #21 was approved for injection of produced water in 1966. Since then, it has injected more than 37 million barrels of produced water from the Grayburg formation with a TDS concentration of approximately 17,850 mg/L. The Ryno SWD #1, located a little more than half a mile to north, has injected more 12 million barrels of produced water since 2019. The Sosa SWD #1, just to the west, has injected approximately the same volume since 2021.

Attachment B is a cross-section depicting the geologic stratigraphy in the area from the Tansil formation down through the Glorieta and Blinebry with the injection intervals for each of the wells in this 1-mile radius superimposed. The cross-section shows that the injection intervals for each well are completed within the same intervals across the San Andres. As discussed above, the San Andres is an aquifer with characteristically high transmissivity. Accordingly, no geologic features or impediments exist to geographically contain the substantial volumes of produced water that have been injected into the formation over the last 60 years.

In addition, approximately 1.7 miles to the southeast of the Andre Dawson SWD #1, the Yaz SWD #1 has injected approximately 13 million barrels of produced water since 2019. In total, more than 74 million barrels of produced water have been injected into the San Andres within a 1.7-mile radius around the Andre Dawson SWD #1.

This area of the San Andres formation has been effectively designated a produced water disposal zone. That designation is justified given the average formation water TDS concentration reported for valid water samples in the area and because the zone—a highly transmissive aquifer—has been receiving produced water with elevated concentrations of TDS for more than six decades.

Conclusion

The water chemistry sample collected by Cardinal Laboratories and reported to the Division for the Andre Dawson SWD #1 is not valid and not representative of the water chemistry in the injection interval within the San Andres in this area. It was tainted by a substantial volume of freshwater that was lost to the San Andres formation during cementing and after the well was perforated. While Goodnight Midstream's contractor swabbed back a substantial volume of water in an effort to obtain a valid sample, it failed to account for the volume of freshwater lost to the formation immediately preceding collection of the sample. Significantly more swabbing would have been required to obtain a representative formation sample. That was not done.

Notwithstanding the invalid sample, Goodnight Midstream confirms that the San Andres formation water within a 1.7-mile radius of the Andre Dawson SWD #1 is substantially above the 10,000 mg/L TDS concentration threshold for protectable aquifers. Three wells within that radius report an average TDS concentration of 30,000 mg/L, which is three times higher than the protectable limit. Moreover, this 1.7-mile area has been effectively designated a produced water disposal zone for more than six decades. More than 74 million barrels of produced water have been injected into this interval over that period. Because the San Andres is severely under-pressured in this area and exhibits a characteristically high level of transmissivity, it is very unlikely an anomalous pocket of freshwater has persisted within this area.

Given the existing valid water sample data in the immediate vicinity, the substantial volumes of produced water that have been injected in the area, and the fact that the San Andres is severely under-pressured and exhibits high transmissivity, the Division should determine that the San Andres is not a protectable aquifer in this area. Goodnight Midstream respectfully requests the Division authorize it to resume injection through the Andre Dawson SWD #1.

Sincerely,

Grant Adams
Chief Executive Officer, Goodnight Midstream Permian, LLC

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CONDITIONS

Action 283542

CONDITIONS

Operator: GOODNIGHT MIDSTREAM PERMIAN, LLC 5910 North Central Expressway Dallas, TX 75206	OGRID: 372311
	Action Number: 283542
	Action Type: [IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

CONDITIONS

Created By	Condition	Condition Date
mgebremichael	None	11/7/2023