



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL & GAS DOCKET NO. 01-0285309

THE APPLICATION OF DISTRICT DISPOSAL, LLC, PURSUANT TO STATEWIDE RULE 9 FOR A COMMERCIAL PERMIT TO DISPOSE OF OIL AND GAS WASTE BY INJECTION INTO A POROUS FORMATION NOT PRODUCTIVE OF OIL OR GAS, DISTRICT SHINER SWD LEASE, WELL NO. 1, EAGLEVILLE (EAGLE FORD-1) FIELD, GONZALES COUNTY, TEXAS.

HEARD BY: Paul Dubois – Technical Examiner
Marshall Enquist – Hearings Examiner

APPEARANCES:

APPLICANT:

George Neale
Rick Johnston
Dustin Bailey

REPRESENTING:

District Disposal, LLC

PROTESTANTS:

Doug Dashiell
Nathan Stephenson
Majken Schimmel
Daniel Jones
William Prior

EOG Resources, Inc.

Scott Shaver

Betty Chumchal & Shirley
Nagelmueller

Betty Chumchal
Shirley Nagelmueller

Kenneth Kaspar

Self

OBSERVERS:

Ron Jurica

PROCEDURAL HISTORY

Application Filed:	May 17, 2013
Protest Received:	May 31, 2013
Request for Hearing:	October 17, 2013
Notice of Hearing:	November 12, 2013
Date of Hearing:	February 21, 2014
Transcript Received:	March 10, 2014
Proposal For Decision Issued:	June 2, 2014

EXAMINERS' REPORT AND PROPOSAL FOR DECISION

STATEMENT OF THE CASE

This is the Application of District Disposal, LLC (District), pursuant to Statewide Rule 9 for a commercial permit to dispose of oil and gas waste by injection into a porous formation not productive of oil or gas, District Shiner SWD Lease, Well No. 1, Eagleville (Eagle Ford-1) Field, Gonzales County, Texas. District proposes to drill and complete the subject disposal well that will inject salt water and oil and gas waste fluids into the Wilcox Formation.

Notice of the application was given to adjacent surface owners and the Gonzales County Clerk in Gonzales on May 20, 2013. Notice of the application was published in the *Gonzales Inquirer*, a newspaper of general circulation in Gonzales County, Texas, on May 21, 2013. The application is protested by EOG Resources, Inc., a nearby operator and owner of the mineral rights under the disposal site. The application is also protested by the owners of three adjacent surface tracts, Betty Chumchal, Shirley Nagelmueller, and Kenneth Kaspar.

DISCUSSION OF THE EVIDENCE

Applicant's Evidence

District proposes to drill a new commercial disposal well on a 29.949 acre tract 4.36 miles northwest of Shiner, Gonzales County, Texas. The well will be used to dispose of salt water and RCRA¹ exempt waste generated at oil and gas exploration

¹ Resource Conservation and Recovery Act: Examples of RCRA exempt oil and gas waste includes produced water, drilling fluids, frac flowback fluids, rigwash and workover wastes.

and production sites and trucked to the proposed facility. District asserts and provided evidence that there is a need for additional disposal capacity in the area and that the construction and operation of the disposal well will meet the requirements of Chapter 27 of the Texas Water Code and the Commission's Statewide Rule 9.

The District Shiner SWD No. 1 will be located on a 29.949 acre tract on the south side of U.S. Highway 90A. The well will be located 778 feet south of the highway. District does not currently own the land, but has a contract to purchase the surface property contingent on obtaining this disposal well permit. The well construction details as requested by District are as follows:

- The proposed well will be drilled to a depth of 8,400 feet. A drilling permit has not yet been issued for the proposed well.
- 13 3/8-inch surface casing will be set to a depth of 700 feet and cemented to the surface with 816 bags of cement.
- 8 5/8-inch long-string casing will be set to a depth of 8,400 feet, and cemented to a to the surface with 4,900 bags of cement.
- 6-inch tubing will be set with a packer at 4,010 feet.
- The injection interval will be in the Wilcox Formation (Upper and Lower) from a depth of 4,100 feet to 8,400 feet.
- The maximum daily injection volume will be 25,000 barrels per day (bpd).
- The average daily injection volume will be 10,000 bpd.
- The maximum surface injection pressure will be 2,050 psig.
- The average surface injection pressure will be 750 psig.

The Commission's Groundwater Advisory Unit (GAU) has indicated that the interval from the land surface to a depth of 600 feet, representing the base of usable-quality groundwater (BUQW), must be protected. The base of underground sources of drinking water (USDW) is estimated to occur at a depth of 1,000 feet. Further, the GAU has issued a 'no harm' letter stating that the proposed well disposing of oil and gas waste into the depth interval from 4,100 feet to 8,400 feet will not endanger fresh water in the area. The subject well will have surface casing set to 700 feet, covering the BUQW. Additionally, the cement in the long string will be circulated to the surface, providing full overlap with the surface casing.

There were no wellbores or other artificial penetrations into the disposal zone within the one-quarter mile area of review of the subject well. There is one dry hole located about 2,050 feet northeast of the proposed SWD. This borehole, the Kasper-Sestak Unit No. 1 (API No. 42-177-31099), was drilled in November 1981 to a depth of 4,512 feet, penetrating the top of the proposed disposal interval. The dry hole was immediately plugged in November 1981. The wellbore has a cement plug from 450 to 650 feet, across the BUQW. The lower portion of the dry hole wellbore appears to be open and exposed to the top of the injection interval.

EOG is the only operator of wells located within a one-half mile radius of the proposed disposal well. At the time District filed the application there was one permitted well location within a one-half mile area of review. The permitted location is for EOG's Annie Unit 11H (API No. 42-177-32632), a horizontal well to be completed in the Eagle Ford Formation (the well has been drilled and completed since the application was filed). Only the terminus was within the one-half mile radius; the surface location was further to the south. EOG has permitted, drilled and completed other wells in the area since the application was filed, but none of the surface locations are within a one-half mile radius of the proposed disposal well. The Eagle Ford Formation is generally encountered in the area at a depth of about 11,300 to 11,800 feet below ground surface, about 3,000 feet below the base of the proposed disposal interval. The vertical sections of horizontal Eagle Ford wells must traverse the proposed Wilcox disposal interval.

The surface locations for two EOG horizontal Eagle Ford wells are located about 4,500 feet northwest of the proposed SWD. These two wells, the Novosad Unit 12HR (API No. 42-177-33174) and the Kasper Unit 1H (API No. 42-177-33176) are completed with surface casing set at about 1,000 feet and intermediate casing set to about 9,300 feet. Both strings were cemented to surface. The intermediate casing strings on both wells fully penetrate and are cemented through the proposed Wilcox disposal interval.

District's expert engineering witness, Rick Johnston, P.E., expects the top of the proposed injection interval to occur near the base of a 400-foot thick shale interval that overlies the upper-most Wilcox sand. The base of the injection interval is underlain by shale of the Midway Formation. The cross sections presented at the hearing (Applicant's Exhibit Nos. 10, 11 and 12) were drawn from three well logs, each about one to 1.5 miles from the proposed well. This information indicated shale confinement above and below the proposed injection interval. Within the injection interval Mr. Johnson identified a number of sand porosity developments that he believed would accept disposal fluids quite well, particularly in the upper and lower portions of the Wilcox; less so in the middle members. Within the whole injection interval, and particularly the upper and lower zones, Mr. Johnston estimated 959 feet of sand with an average porosity of 24 percent, which he believes is a conservative underestimate of

the formation that will readily take fluids.

No current or historical production from the Wilcox Formation was identified within a two-mile radius of the proposed SWD. Mr. Johnston did not see anything on the logs he reviewed to suggest the Wilcox would be productive in the area, and he noted that there are three Wilcox dry holes surrounding the subject location.

Mr. Johnston performed volumetric plume area calculations based on maximum operating conditions of 25,000 bpd for 20 years, and formation conditions of 959 feet sand with a porosity of 24 percent. These calculations indicate that after 20 years the equivalent plume radius would be 1,190 feet. This radius exceeds the nearest property line (393.88 feet) and is within the 1/4 mile area of review, far short of the Kasper-Sestak Unit No. 1 (API No. 42-177-31099) dry hole 2,050 feet northeast of the proposed disposal well. Similarly, a pressure front calculation was performed. This calculation indicated that 10 years of maximum injection would result in a pressure increase in the dry hole wellbore of 25.3 psia, which Mr. Johnston considers to be *de minimis*.

District identified four (4) active commercial disposal wells within a 10-mile radius of the proposed District SWD. The 10-mile radius includes portions of Gonzales, Lavaca and De Witt Counties. Each of the four wells are about 10 miles from the proposed SWD, and three of the four wells inject into the Wilcox Formation. The fourth well, the Red Wolf SW No. 1, appears to inject into the Frio and Yegua Formations. In addition, there are two permitted commercial disposal wells located about 2 miles northwest of the proposed SWD on U.S. Highway 90A, the Heckman Water Resources (CVR) Inc., Alpha SWD Nos. 1 and 2. At the time of the hearing these wells were indicated on Commission records to be inactive and temporarily abandoned or shut-in, although some injection may have occurred in at least one of the wells. The wells have a combined permitted capacity of 30,000 bpd. Mr. Johnston indicated that the wells were not drilled in their permitted locations resulting in compliance problems. He did not know if the issues had been resolved.

The proposed SWD is located in an area experiencing rapid oil and gas development in the Eagle Ford Formation. The Eagle Ford play trends southwest to northeast through the area, and there is ongoing development particularly to the southwest, west, north, and northeast of the proposed SWD. The SWD is located on U.S. Highway 90A, a major roadway in the area. The horizontal development of the Eagle Ford has caused oil and gas production within 10-miles of the proposed SWD to increase significantly since 2010. From 1998 to 2010, about 25 wells with a 10-mile radius produced about 10,000 to 20,000 BO per month. By late 2013 there were about 300 producing wells in the area and the monthly oil production was about 1.5 million barrels. Drilling rig data from Baker Hughes indicates a 15 to 20 active drilling rigs in the area. Mr. Johnston indicated that Eagle Ford wells produce a lot of salt water and

flowback water which must be properly disposed.

District's application for the proposed SWD was initially protested by the Gonzales County Underground Water Conservation District (GCUWCD). The protest was withdrawn upon mutual agreement of the GCUWCD and District that (1) a cement bond log would be run on the long string casing, and (2) adequate secondary containment structures would be installed around the tank battery facilities. Mr. Johnston indicated that District would agree to a permit condition that a copy of the cement bond log be given to the Commission and to EOG.

District has a current active Form P-5 (Organization Report) and has posted a \$25,000 cash deposit as financial assurance.

District has obtained a Texas Department of Transportation (TXDOT) permit to construct access driveway facilities on highway right of way (Form 1058, rev. 11/10) for the proposed facility on U.S. Highway 90A. The permit indicates a projected ADT (assumed to be "average daily traffic") of 45-50 vehicles. The entire driveway will require a 550-foot modification to the highway shoulders along the right-of-way.

Protestants' Evidence

The application was protested at the hearing. Protestant EOG was represented by attorney Doug Dashiell. Two adjacent surface owners, Betty Chumchal and Shirley Nagelmueller, were represented by attorney Scott Shaver. Adjacent surface owner Kenneth Kasper represented himself.

EOG

EOG owns substantial mineral rights in the area, including rights to most of the subsurface within a one-mile radius of the subject well and the tract on which the proposed SWD is located. If the subject disposal permit is issued, District may purchase the surface of the disposal tract; under the contract the seller is not conveying any mineral rights or royalty rights to District. EOG's primary concerns are that injection into the Wilcox Formation may harm potential future production from the zone, and that the formation in the area may not be competent to withstand injection pressures.

EOG provided information on Wilcox Formation production within 20 miles of the proposed SWD. The nearest Wilcox well is located about 7 miles to the northwest. This well produced 672 BO and 373 MCFG before being plugged. The nearest active Wilcox production is from about 10 to 12 miles north of the proposed location, where there is a cluster of about a dozen wells, two of which have produced over 30,000 BO. There is a cluster of mostly Wilcox gas wells located 15 miles to the southeast. None of the identified Wilcox wells are operated by EOG. EOG's current development activity in

the area is oriented to the Eagle Ford Shale.

EOG's Novosad Unit No. 12H (API No. 42-177-33064) is located about 0.9 miles northwest of the proposed District SWD. This attempted Eagle Ford well was logged through the Wilcox formation and into the Midway Shale. However, EOG encountered technical problems with the well and it was not completed. During drilling of the Eagle Ford lateral, the well experienced about 900 bbl of mud losses into the Wilcox Formation. The losses occurred when mud weights were increased to about 12.2 lbs/gal to stabilize the horizontal wellbore. EOG believes the heavy mud fractured portions of the uncased Wilcox interval, causing loss of circulation to the formation.

The open hole log of the Novosad 12H provided EOG with a modern well log (EOG Exhibit No. 5; District Cross-examination Exhibit No. 1) that it used to correlate other productive sands in Wilcox wells within about 20 miles of the Novosad 12H well (and, thus, the subject SWD). EOG's geologist, Ms. Majken Schimmel, analyzed the producing zones of these various Wilcox wells and available 3D seismic data in the area. Based on her analysis, Ms. Schimmel determined that the Wilcox may be productive in the immediate area of the proposed SWD. In particular, Ms. Schimmel identified one "prospect sand" in the Novosad 12H well at a depth of 6,410 to 6,450 feet. Ms. Schimmel stated her opinion that this and some of the other sand intervals seen on the log have the potential to produce hydrocarbons, but that does not mean they will produce. Further, Ms. Schimmel stated that EOG's development attention is currently focused on the significant Eagle Ford Shale, but that does not mean EOG will not at some point in the future pursue evaluation and development of Wilcox potential. To date, however, she has made no recommendation and knows of no recommendation to pursue the Wilcox in this area.

On a seismic cross-sectional amplitude extraction through the proposed SWD location (EOG Exhibit No. 7), Ms. Majken interpreted the stratigraphic section from the Carrizo (upper Wilcox) to the Midway. The amplitude extraction exhibited characteristics suggestive of good reservoir and potential hydrocarbons in the prospect sand zone identified on the Novosad 12H well. These signals were strongest about 4,000 to 8,000 feet up-dip (northwest) from the proposed SWD. An amplitude extraction map of the top of the prospect sand identified the areal disposition of characteristics suggestive of good reservoir and potential hydrocarbons. Based on this evaluation, Ms. Schimmel concluded that the factors necessary for a potentially productive reservoir—a source, reservoir, trap and seal—are present in the area.

Ms. Schimmel also identified and tabulated 13 SWD wells within a 20-mile radius of the proposed SWD. This list was not limited to active commercial wells.

EOG's petroleum engineering witness, Mr. Daniel Jones, provided information regarding the lost circulation problem on the Novosad 12H well. The well was being

drilled with 12.2 lb/gal mud, a weight that was necessary to stabilize the horizontal lateral during drilling. At 7pm on September 19, 2013, a full return loss was experienced and noted on the daily drilling report. EOG began implementing several techniques to stabilize the hole and restore circulation. By 9am on September 20th, the mud weight had been reduced to 10.5 lb/gal, and losses were still being experienced. Mr. Jones stated that the 12.2 lb/gal mud was sufficient to initiate a fracture in the wellbore, and that the fracture was still propagating with a 10.5 lb/gal mud.

EOG performed a circumferential image log that identified tensile fractures in the wellbore at a depth of about 6,920 feet. Mr. Jones stated that such fractures are likely due to an increase in mud weight. Mr. Jones further stated that such fractures were observed specifically in the depth interval from 6,900 to 7,500 feet, within the lower portion of the Wilcox Formation.

Based on this information, Mr. Jones evaluated the effect waste fluids injected under pressure might have to the Wilcox Formation. Mr. Jones assumed a brine density of 8.5 lb/gal and varied the surface injection pressure to simulate the pressure conditions on the formation experienced in the Novosad 12H well. Mr. Jones concluded that injection of 8.5 lb/gal brine into the Wilcox Formation at surface injection pressures at or above 900 psi would result in pressures at the top of the injection interval equivalent to the pressures that caused the Novosad 12H well to fracture. Mr. Jones stated that fracturing the formation increases the risk that injected fluids will not be confined to the injection interval. Mr. Jones also stated that limiting the surface injection pressure to less than 900 pounds would be acceptable.

Ultimately, due to these difficulties the Novosad 12H wellbore was plugged and abandoned. EOG drilled the Novosad 12HR in its place. Because of the 12H issues, the 12HR was completed with about 9,300 feet of intermediate casing so the Wilcox would not be exposed to higher mud weights and possible damage. EOG has since adopted a similar intermediate casing program through the Wilcox for other wells in the area.

Chumchal, Nagelmueller & Kasper

Ms. Betty Chumchal is the adjacent surface owner to the northwest boundary of the proposed District SWD tract. She owns 1.887 acres. Both tracts have frontage on U.S. Highway 90A. To the east of her property the highway dips down a hill. The proposed driveway location for the District SWD is not visible from her own driveway because the proposed SWD driveway is obscured by the hillside or at the bottom of the hill. Ms. Chumchal is concerned that reduced vision due to the hill and potential SWD traffic entering and exiting the high way will pose a dangerous safety situation. She is aware that TXDOT has issued a driveway permit for the SWD, but she believes the applicant greatly underestimated the amount of traffic that would use the facility. The

TXDOT permit indicates 45 to 50 trucks per day would access the facility. A typical tanker truck holds 110 barrels of liquid. The facility's 25,000 bpd maximum capacity would require access by more than 200 trucks per day; the facility's 10,000 bpd average capacity would require access by more than 90 trucks per day.

According to records submitted by Ms. Chumchal for reportable motor vehicle traffic crashes on U.S. Highway 90A between County Road (CR) 532 and CR 443 in Gonzales County², in 2008 there were two reportable crashes on this highway segment. There were four crashes in each of 2009 and 2010, and six in 2011. In 2012 there were 12 crashes on this segment. And from January 1, 2013, to January 22, 2014, there were 18. The increase in reportable crashes corresponds to the increase in Eagle Ford production activity in the area during the same time.

Ms. Chumchal also expressed concern about a number of potential environmental factors associated with the proposed site, most notably the potential for contamination of her shallow groundwater, spills, odors, and impacts to her and her neighbors. She cited a recent explosion at a SWD facility in Karnes County.

Ms. Chumchal disputed the need for additional disposal capacity in the area. An online Commission records query of 2013 disposal volumes Gonzales County indicated a decreasing trend from about 1.1 million barrels per month in the first three months of 2013, to about 645,000 barrels per month in the last three months of the year. Further, she provided a printout from the Commission's online system indicating the Heckman wells two miles west of the proposed were active: Heckman's Alpha No. 1 was active through 2012, and the No. 2 well was active in 2013. She disputes the Applicant's statements that the Heckman facility is not active.

Ms. Shirley Nagelmueller and her husband own the adjacent 75-acre property west of the proposed District SWD facility. She shares all of Ms. Chumchal's concerns regarding the proposed facility. Ms. Nagelmueller believes the proposed facility will negatively impact her and her family's use of her land and the wildlife that lives on it. In addition, Ms. Nagelmueller is concerned about the 1,190-foot injection plume that would cross onto her property.

Mr. Kenneth Kasper owns the adjacent property on the north side of U.S. Highway 90A from the proposed District SWD. He shares the concerns raised by Ms. Chumchal and Ms. Nagelmueller. In addition, he stated that they live in a small community of a few houses along the highway. The proposed SWD will create an industrial zone in their community.

² The segment of U.S. Hwy 90A in Gonzales County between CR 532 and CR 443 is approximately 10 miles in length. The proposed District SWD is approximately 1.5 miles east of this segment.

Mr. Ron Jurica, a nearby—but not adjacent—landowner offered a statement in opposition to the proposed SWD.

EXAMINERS' OPINION

The Railroad Commission may grant an application for a permit under Chapter 27 of the Texas Water Code, Subchapter C in whole or part 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.

It is the examiners' recommendation that the application be approved with one modification:

- The maximum surface injection pressure should be reduced to 850 psi. The applicant may conduct a step rate test demonstrating that a higher pressure, not to exceed 2,050 psi, will not fracture the Wilcox Formation, and amend the permitted maximum surface injection pressure based on the results of said test.

Given this modification, the Applicant has met its burden of proof under Texas Water Code § 27.051(b)(1 through 4).

Public Interest

It is the examiners' opinion that the proposed injection well is in the public interest as there is a continuing need for fluid disposal options in the area. Generally, a disposal well applicant makes a *prima facie* case that a well is in the public interest by evidence that there is a need for the well and that it will provide a more efficient and economical disposal option for nearby operators of producing wells. A more economical disposal option allows producing wells to lower their operating expenses, produce longer and thus increase cumulative hydrocarbon production to the benefit of the public and the State. Generalized concerns about increased, traffic, noise, potential

devaluation of nearby property, and similar assertions, equally applicable to any disposal well at any location, are not sufficient to rebut the *prima facie* showing of public interest. Similarly, the legitimate concerns of adjacent private property owners regarding the adverse impact an adjacent disposal well might have on their private use of their own property are generally not sufficient. Further, the Railroad Commission does not have jurisdiction over road safety or road construction and specific traffic safety concerns are properly dealt with by the Texas Department of Transportation and/or local governmental entities that do have jurisdiction to directly address these issues. Such definition of the Commission's jurisdiction, and its limits, has been upheld by the Texas Supreme Court³.

The Applicant has identified significant ongoing development in the Eagle Ford Trend in the area, and development is growing towards the proposed SWD location. Within a 10-mile radius of the proposed location the Applicant identified four commercial disposal well facilities. An additional two wells exist at the Heckman facility two miles from the site. One of those wells may currently be operational; there was inconsistent testimony derived from Commission records on that subject.

Ms. Chumchal cited Commission data indicating declining injection volumes in Gonzales County during 2013, and the permitted future capacity that has not yet come online. There are many difficulties associated with attempts to forecast the demand for fluid disposal and the supply of fluid disposal capacity in a given area. First, operators are not required to report production of flow back and salt water from their wells, which is the source of most of the waste requiring disposal in commercial SWDs. This impairs any estimation of current or potential future demand for wastewater disposal. Second, a disposal permit issued by the Commission is no guarantee that the permitted capacity will become operational, either because the facility may not be built or the formation may not be able to accept the permitted volume of fluid. Thus there is no reasonably accurate means of quantifying the supply (available capacity) of fluid disposal in an area. With regard to Ms. Chumchal's evidence indicating declining disposal of saltwater in Gonzales County in 2013, the examiners note that certainly some waste originating in Gonzales County was destined for disposal in other counties, and vice versa.

The protestants are already very concerned about traffic safety on U.S. Highway 90A, and they are greatly concerned that the proposed facility will further degrade public safety in their community. The examiners note the striking correlation between the Applicant's Exhibit No. 24, which depicts the dramatic increase in Eagle Ford production in Gonzales County, with Ms. Chumchal's reportable highway crash data, which also shows an equally dramatic increase on a nearby segment of U.S. Highway 90A during the same time period (Shaver Exhibit No. 2). However, it is well established

³ Railroad Commission of Texas v. Texas Citizens for a Safe Future and Clean Water, 336 S.W.3d (Tex. 2011)

that the Commission has no jurisdiction over matters of highway traffic safety.

However, that being said, Applicant's Exhibit No. 31 suggests that TXDOT was not accurately appraised of the volume of traffic that the proposed SWD facility may generate on U.S. Highway 90A. The TXDOT permit to construct access driveway facilities on highway right of way states the projected average daily traffic to be 45-50 vehicles per day. The source of this traffic estimate is, presumably, the Applicant. As Ms. Chumchal indicated in her testimony, the estimate is not consistent with the requested maximum or average daily injection volumes of 25,000 and 10,000 bpd, respectively. An estimate of up to 200 trucks per day seems more reasonable. It is not known to the examiners what, if any, impact increasing the daily traffic from 50 to 200 vehicles per day would have on TXDOT's requirements for driveway access construction at this location. Given the safety concerns raised by the Protestants—Applicant's Exhibit No. 31 was submitted to address these concerns—the examiners believe the Applicant would be wise to revisit the matter with TXDOT and obtain an access construction permit that is consistent with the anticipated traffic volume generated by the SWD facility as proposed.

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

The examiners conclude that any oil, gas or other mineral formation will not be endangered or injured by the construction and operation of the proposed SWD facility. The Applicant has demonstrated that there is no Wilcox production within a two-mile radius of the proposed SWD. A two-mile area of review for current or historical production from the same or correlative interval is the current standard for review regarding determining whether a disposal well should be permitted under Statewide Rule 9 (injection into a non-productive formation) or Statewide Rule 46 (injection into a productive formation). EOG complemented the Applicant's evidence with its own analysis that the Wilcox has yielded no hydrocarbon production within a 7 mile radius of the proposed SWD, and a scant 672 BO and 373 MCFG within a 10 mile radius. Even beyond the 10-mile radius, the Wilcox production appears for the most part to occur in well clusters (EOG Exhibit No. 1), probably located around local structural or stratigraphic features.

The examiners conclude that there has been no current or historical production from the Wilcox Formation in the area, the application was correctly filed on Form W-14, and that the surface owner holds a good faith claim to inject fluids into the Wilcox.

The examiners are not convinced by EOG's arguments that the Wilcox is a potentially productive formation in the area. EOG presented an analysis of 3D seismic data, the Novosad 12H well log, and well records from other Wilcox wells within a 20-mile radius. The "prospect sand" identified on the Novosad 12H log appears to have porosity development that may make a quality reservoir, and this unit appears to be

mappable in the immediate area. However, characteristics indicative of the presence of hydrocarbons were lacking, and the presence of actual or potential reserves is unproven and the evidence unconvincing. EOG did not attempt to calculate the quantity or value of potential hydrocarbons in the Wilcox.

In its closing statements, EOG's attorney offered Oil & Gas Docket No. 06-0264337 as a similar case demonstrating a precedent in which the Commission denied an application to inject fluids into a producing zone. The situations between that case and the present case are in no way comparable. In the prior case, the applicant sought to convert an existing well bore that had produced almost 30,000 BO into an injection well. The protestants in that case were the mineral owners, and the Commission held that in the face of actual on-site historical production the applicant did not have a good faith claim.

EOG will continue to drill Eagle Ford wells in the area that necessarily traverse—and thus present opportunities for hydrocarbon potential testing in—the Wilcox Formation. If the District SWD is granted, EOG may be required to case and cement some of its wells through the Wilcox Formation to comply with Statewide Rule 13 (a)(4)(C), which states, "*Casing shall be cemented across and above all formations permitted for injection under §3.9 of this title (relating to Disposal Wells) at the time the well is completed*". EOG did not testify that such added costs for well casing and cementing were a component of its protest to the subject SWD. Indeed, based on its recent experience of circulation loss in the Wilcox in its Navosad 12H well, EOG has already amended its casing plans in the area to isolate the Wilcox with intermediate casing as a technical necessity due to formation conditions and drilling challenges.

The examiners do note, however, that the EOG's 3D seismic data interpretation discussed at the hearing does suggest that such information could be invaluable to safe and effective placement of disposal wells. That is, a large operator has such technology and resources available to it, but a typical commercial disposal well operator does not. 3D seismic interpretation could be very useful in identifying optimal disposal locations based on interpreted reservoir quality characteristics; such an interpretation could also identify potentially detrimental disposal locations, including the presence of faulting.

Protection of Ground and Surface Fresh Water

The examiners conclude that ground and surface fresh water will be protected if the maximum surface injection pressure is reduced to 850 psi. The circulation loss on EOG's Navosad 12H well indicates a localized weakness in at least a portion of the Wilcox Formation in the area. The root source of the weakness is not known, nor is its areal extent. EOG is concerned that injection may harm the formation. The Commission's own permitting guidelines recognize that injection pressures should not

equal or exceed formation fracturing pressures. Therefore the examiners believe a reduction in the requested maximum surface injection pressure is warranted. Based on EOG's experience in the Novosad well, and the testimony of its petroleum engineer, the examiners believe a maximum surface injection pressure of 850 psi is reasonable and appropriate.

The examiners recognize (1) this reduction may affect District's operation and economics of the well, and (2) the Wilcox Formation may be competent to withstand normal injection pressures at the location of the proposed SWD, as it apparently is at many other Eagle Ford well locations. Therefore, consistent with Commission guidelines, the Applicant may conduct a step rate test on the completed well to evaluate location-specific formation conditions and apply for a permit amendment to adjust the maximum surface injection pressure up to 2,050 psi based on the test results.

The applicant provided a three-well cross section, and EOG provided a well log of its Novosad 12H borehole. These data confirm that the proposed injection interval is bounded on the top and bottom by significant shale strata. These shale horizons should prevent the migration of injected fluids out of the interval. The proposed well will be cased and cemented in a manner to protect the usable quality groundwater, the base of which is at 600 feet. The Commission's GAU has indicated that the proposed well will not harm fresh groundwater resources. There are no artificial penetrations of the disposal interval within the one-quarter mile area of review, and there was one artificial penetration within the one-half mile area of review. That penetration, a dry hole, was plugged with cement from 450 to 650 feet, across the BUQW.

Standard permit conditions for a commercial disposal well include provisions for catch basins, dikes, and other facilities to contain potential spills and releases of waste into the environment.

Financial Responsibility

The examiners conclude that District has made a satisfactory showing of financial responsibility as required by Section 27.073 of the Texas Water Code. District has a current approved Form P-5 (Organization Report) and has posted a \$25,000 cash deposit as financial assurance.

FINDINGS OF FACT

1. Notice of the subject application was published in the *Gonzales Enquirer*, a newspaper of general circulation in Gonzales County, on May 20, 2013.
2. Notice of the application was sent to the Gonzales County Clerk and to

the surface owners of each tract which adjoins the disposal tract on May 21, 2013. At the time of the application, there were no wells within a one-half mile radius of the proposed location.

3. The proposed disposal well is in the public interest as there is a need for the disposal of produced salt water and liquid oil and gas waste generated in and around Gonzales County.
 - a. Oil production in Gonzales County has increased from about 20,000 BO per month to 1.5 million BO per month within the last four years.
 - b. The increase in oil production is from the Eagle Ford Formation, and current development is growing towards the proposed SWD location.
 - c. Current methods of estimating the demand for waste fluid disposal and supply of disposal capacity are of limited utility.
 - d. There are four or five commercial disposal wells within a 10-mile radius of the proposed location.
4. More than 200 truckloads of waste fluid will be brought to the facility daily for it to operate at its permitted capacity of 25,000 bpd.
 - a. The facility's TXDOT driveway access permit anticipated average daily traffic of 45-50 vehicles.
 - b. The Railroad Commission does not have jurisdiction over highway traffic safety matters.
5. The use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation
 - a. The proposed injection interval is the Wilcox Formation from 4,100 feet to 8,400 feet.
 - b. There is no current or historical production from the Wilcox Formation within seven miles of the proposed location, and within 10 miles only one well has produced 672 BO and 373 MCFG .
 - c. The Wilcox Formation is not productive in the area.

- d. EOG owns the mineral rights to the proposed injection tract and to much of the surrounding land.
 - e. EOG has not tested, attempted to produce, or developed plans to attempt to produce the Wilcox in the area.
 - f. EOG is actively developing the Eagle Ford Shale in the area.
 - g. The injection interval is bounded by thick shale formations that will confine injected fluids.
6. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution.
- a. The BUQW occurs at a depth of 600 feet.
 - b. The surface casing will be set below the BUQW and cemented to the surface,
 - c. The long-string casing will be set and cemented to the surface.
 - d. There are no artificial penetrations into the proposed injection interval within one-quarter mile of the proposed location.
 - e. The injection interval is bounded by thick shale formations that will confine injected fluids.
 - f. In the Wilcox Formation a weak zone of unknown areal extent was encountered 0.9 miles northwest of the proposed SWD location.
 - g. A maximum surface injection pressure of 850 psi will not harm the Wilcox Formation at the proposed location.
 - h. At the proposed SWD location the Wilcox Formation may be competent to withstand higher maximum surface injection pressures.
7. District Disposal has a current approved Form P-5 (Organization Report) and has posted a \$25,000 cash deposit as financial assurance.

CONCLUSIONS OF LAW

1. Proper notice was issued in accordance with the applicable statutory and

regulatory requirements.

2. All things have occurred to give the Railroad Commission jurisdiction to consider this matter.
3. The use or installation of the proposed injection well is in the public interest.
4. The use or installation of the proposed injection well will not endanger or injure any oil, gas, or other mineral formation.
5. With proper safeguards, as provided by terms and conditions in the attached final order, which are incorporated herein by reference, both ground and surface fresh water can be adequately protected from pollution.
6. District has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.
7. District has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 9.

EXAMINERS' RECOMMENDATION

The examiners recommend that District Disposal's application for its proposed District Shiner SWD No. 1 commercial disposal well be approved with the modification described above.

Respectfully Submitted,



Paul Dubois
Technical Examiner



Marshall Enquist
Hearing Examiner

District Shiner SWD # 1
(API # 42-177-_____)
District Disposal, LLC
Gonzales County, Texas

Proposed Disposal Configuration

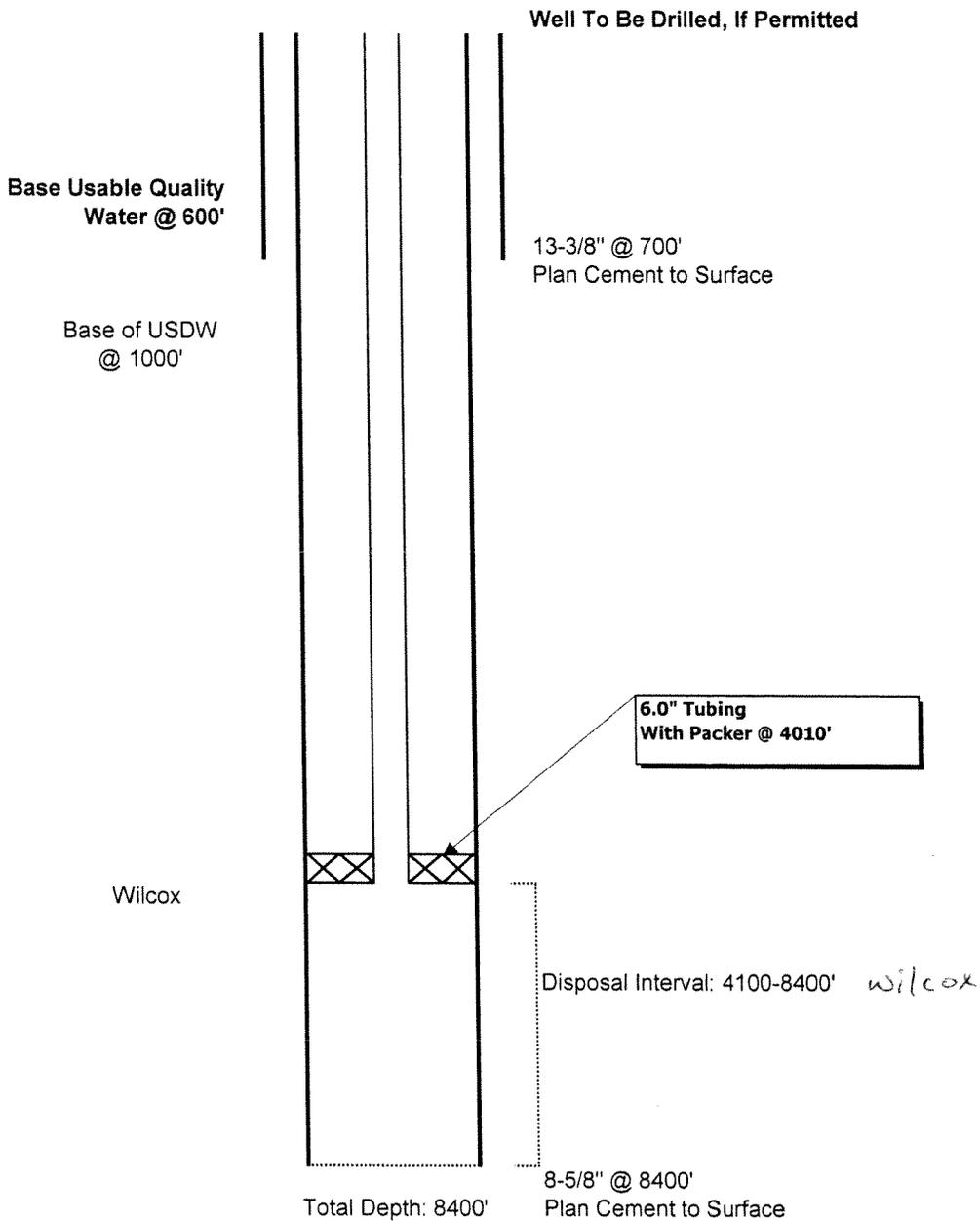


Exhibit No. 3
O&G Docket No. 01-0285309
Date: February 21, 2014
District Disposal, L.L.C.