WCS_CISFEISCEm Resource

From: Stephen Greiner <greinerpatent@live.com>
Sent: Tuesday, November 20, 2018 1:28 AM
To: WCS_CISFEIS Resource
Subject: [External_Sender] Docket ID NRC-2016-0231
Attachments: 18 11 19 interim storage partners remarks low res scan.pdf

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November 19, 2018

May Ma, Office of Administration
Mail Stop: TWFN-7-A60M
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001

RE: Docket ID NRC-2016-0231

Dear May Ma:

In its review of the application by Interim Storage Partners, LLC, (ISP) for a license to construct and operate a consolidated interim storage facility (CISF) for spent nuclear fuel in Andrews County, Texas, it is respectfully requested that the Nuclear Regulatory Commission (NRC) consider the remarks provided below.

1. LOCATION OF THE PROPOSED CISF

> The CISF site is situated within Andrews County and about 0.25 mile east of the Texas – New Mexico boundary. *Interim Storage Partners, LLC, License Application, Rev. 2, (hereinafter "ISP Application") Pg. 12-1.*

This remote location hard against the New Mexico state line calls out: Why there? The answer may be found in an article published in The American Surveyor (copy attached hereto as Exhibit 1) entitled "Perhaps the Most Incorrect of Any Land Line." The article describes how the New Mexico state line was incorrectly surveyed more than two miles too far west resulting in in a land grab of 603,485 acres by the state of Texas. Thus, the proposed CISF may prove to be in New Mexico.

The boundary issue between Texas and New Mexico is unresolved. There is, according to the article, interest in litigating this matter as shown by the New Mexico state senate

voting in 1991, 2003 and 2005 to sue the state of Texas for return of, and compensation for, the land. It does not appear that a lawsuit has yet been filed.

The boundary conflict does not appear to have been addressed in the *ISP Application*. The matter must be well known to ISP's management and attorneys and would have been well-documented in title opinions covering the proposed CISF site. One can imagine that should ISP find Texas regulatory or taxation burdens (perhaps resulting from authority being delegated to Texas by the NRC or other federal regulatory agency) too heavy at a future date, ISP might claim that the state of Texas has no authority over it as it has just determined that its operations are not in Texas. New Mexico, in turn, might seek to annex the proposed CISF site for taxation or other purposes. ISP could play the conflicted states and federal regulators against one another for time to make critical decisions regarding construction, operation, cleanup, remediation, etc. Resolution of the legal issues could prove costly for the federal government, take decades to resolve, and may even require decisions by the U.S. Supreme Court to bring to an end a conflict between the two states.

The seriousness of the problem is highlighted in the last paragraph of The American Surveyor article:

> It has been the experience of this reviewer that a lot of people laugh when learning about the antics of the folks in Santa Fe, and are quick to opine, that New Mexico's chances to reclaim the lost strip are zero. They are almost certainly correct, but in dismissing the claim to the 103rd meridian one must be careful not to get carried away. Boundary law not withstanding, the location of state boundaries is a political matter, and politics has been called "the science of how who gets what, when and why." Who knows? New Mexico's motto, *Crescit eundo* (It grows as it goes) may yet come true.

2. GROUNDWATER AT THE PROPOSED CISF

It is well known that potable water is scarce in the area surrounding the proposed CISF and that the principal water source, the Ogallala aquifer, has been drawn down to the point

that municipalities are actively seeking alternatives. In this regard, ISP and WCS have repeatedly downplayed the possibility that its operations could pollute the Ogallala aquifer or other groundwater resources making such unfit for human use or consumption. The following is a small sampling of the statements from ISP and WCS in the recent past:

> Water resources at the site are virtually nonexistent. *Interim Storage Partners, LLC, Environmental Report, Rev. 2 (hereinafter "ISP Environmental Report"), Pg. 4-29.*

> The geology, site characteristics, arid environment and other factors at WCS are ideal for storage of spent nuclear fuel. WCS is not sited over **ANY** [emphasis mine] drinking water source and is 10 miles south of, and not connected to the Ogallala Aquifer as confirmed by the Texas Water Development Board. *Rodney Baltzer, President of WCS, at a public hearing before the NRC in Andrews, Texas, reported in the Andrews County News (hereinafter "ACN"), 2-19-17, Pg. 5.*

> Pertaining to the aquifer issue, a WCS geologist said testing has proven there is nothing in close proximity to the WCS site. *ACN, 2-19-17, Pg. 5.*

The statements provided above appear to be false and those uttering them should have known of their falsity. The Texas Water Development Board (cited hereinabove by Mr. Baltzer as an authority on Texas groundwater) has for several years been conducting a "Brackish Resources Aquifer Characterization System (BRACS) Program." As part of BRACS Program, the Dockum aquifer, upon which there appears to be no dispute that the proposed CISF is located, is currently being studied. According to Mark Robinson, the Dockum Aquifer Study Manager for the Texas Water Development Board (TWDB), who I spoke with a few days ago, the Dockum aquifer study commenced during the spring of 2017 and is expected to be wrapped up in a few years. Further, according to Mr. Robinson, the TWDB has NOT issued a final opinion regarding drinking water resources near the proposed CISF. However, for the best available information from the TWDB, Mr. Robinson referred interested parties to a pair of TWDB documents available at the

gency s website: 1) a PowerPoint presentation: "Dockum Aquifer Brackish Groundwater Study" published on 11-15-17 for the Llano Estacado (Region O) Planning Group Stakeholder Meeting in Lubbock, Texas, and 2) Report 359 entitled: "The Groundwater Resources of the Dockum Aquifer" published December 2003. Both documents strongly suggest that enough brackish water is present in the Dockum aquifer at the proposed CISF to permit its production at useful flow rates from recovery wells drilled to a relatively shallow depth below the earth's surface. These particular documents in the public domain should have been known to ISP and its consultants yet they do not appear to have been addressed in the *ISP Environmental Report*.

Attached as Exhibits 2 thru 8 are PowerPoint slides from the first reference noted by Mr. Robinson and mentioned in the previous paragraph that when considered together flatly contradict the self-serving statements offered by ISP and its associates. Exhibit 2 shows a map on the left side of the page showing the lateral extent of the Dockum aquifer into Texas and three other states. The Dockum aquifer is shown to extend north-south along the Texas-New Mexico boundary where the proposed CISF is located. The aquifer surrounds the proposed CISF on all sides. Exhibit 3 shows that there are approximately 200-250' of net sand in the Lower Dockum at the proposed CISF. Exhibit 4 shows there is about 0-10' of net sand in the Upper Dockum at the proposed CISF site. Exhibits 3 and 4 together show that both upper and lower Dockum aquifer sands are regional features that are continuous and cover thousands of acres including the entirety of Andrews County, Texas, where I reside. Exhibit 5 illustrates that wells drilled into the Dockum aquifer in Andrews County are capable of producing water at a rate of 10-1000 gallons per minute. Exhibit 6 illustrates that total dissolved solids in the Dockum aquifer water in Andrews County can be expected in the 1000-5000 mg/L range – a range capable of treatment by conventional processes like reverse osmosis to produce potable water –

at the proposed CISF. Exhibit 7 backs up the data of Exhibit 6 showing Dockum test wells in Andrews County producing water with total dissolved solids ranging mostly from 1000-3000 mg/L. Exhibit 8 provides an overview of Dockum aquifer statistics. It is worth noting that with 27 million acre-feet of brackish water estimated to be in place according to Exhibit 8, the Dockum aquifer would provide the city of Andrews with water for 1200 years at its current rate of consumption of about two million gallons a day if the city merely recovered 10% of the brackish water in place. This suggests that the Dockum aquifer may be the "go to" water resource as the Ogallala aquifer plays out in the coming years.

For the long-term utility of the Dockum aquifer, protecting its recharge areas from contamination by radionuclides from the proposed CISF may be just as important as protecting areas where water can be extracted. In this regard, it would appear that the proposed CISF is sited in an aquifer recharge area and radionuclides emitted by the proposed CISF have a pathway for entry into the Dockum aquifer. According to Report 359 at pg. 28: "The Dockum aquifer is recharged by precipitation over areas where Dockum Group sediments are exposed at the land surface." Further, at pg. 28, "Downward leakage into the Dockum aquifer occurs from the overlying Ogallala Formation, Cretaceous rocks, and Cenozoic Pecos Alluvium as a result of hydraulic-head differences between aquifers." Exhibit 9 from pg. 29 of Report 359 illustrates how rainfall at the New Mexico–Texas boundary, where the proposed CIST is sited, penetrates surface sediments under the influence of gravity to enter the Dockum and flows eastward. The surface sediments may include the Ogallala Formation. Interestingly, the Dockum aquifer is shown in Exhibit 9 to communicate not only with the Ogallala above but Permian sediments below. Thus, radioactive pollutants originating, for example, at the proposed CISF have the potential to spread downwardly from near-surface sediments like the Ogallala into the Dockum and later into Permian formations thereby contaminating all.

"The primary sources of recharge to the Ogallala aquifer are playas, headwater creeks, and irrigation water return flows." *ISP Environmental Report, Pg. 3-25.* "Playas, or small, internally drained basins, occur on the Waste Control Specialists controlled property. The playas are dry most of the time. Some of the playas occasionally hold water after relatively large precipitation events; however, the ponded water rapidly dissipates through infiltration...." *ISP Environmental Report, Pg. 3-19.* Thus, ISP describes features at the proposed CISF for radioactive pollutants to penetrate near-surface sediments and enter and contaminate the Ogallala and/or Dockum aquifers. With the shallowest, water-bearing zone being about 225' deep at the site, *ISP Environmental Report Pg. 3-24,* pollutants need not penetrate far to reach porous and permeable Dockum sands of regional extent and importance.

The TWDB shows how brackish Dockum groundwater can be made potable using conventional technology. The TWDB has a webpage entitled "The City of Seminole: An Integrated Wind-Water Desalination Demonstration Project for an Inland Municipality." The final report on the Demonstration Project issued in 2015 indicates that reverse osmosis was effectively used to make potable Dockum water produced from a well in Seminole, Texas, a few tens of miles northeast of the proposed CISF. The same Dockum sands located beneath Seminole, Texas, extend continuously to the proposed CISF and to Andrews, Texas, and far beyond according to the TWDB. Right now, the city of Andrews is believed to use reverse osmosis to treat water delivered to the public at its "water station" adjacent its city hall. Using the same technology to treat Dockum water would not appear to be a technological leap. It is unclear, however, if reverse osmosis can be used to remove a sufficient quantity of contaminating radionuclides in groundwater that may flow from the proposed CISF to make such groundwater potable.

The city of Seminole is not alone in desalinating brackish water in Texas according to the TWDB. Exhibit 10 is a copy of a map from the TWDB website showing about forty active, desalination plants around the state of Texas. Some of these plants can be seen in West Texas not far from the proposed CISF. It would not be unreasonable for communities surrounding the proposed CISF to desalinate and consume groundwater flowing from the proposed CISF at some point in the near future. The entry of radionuclides into this water from the proposed CISF might render it unfit for human consumption.

Many of the cities in West Texas obtain their water through pipelines from remote locations. Andrews, Texas, obtains its water from the Florey Field 10 miles northeast of town via pipeline. Midland, Texas, on the other hand, gets much of its water from the T-bar Ranch in Winkler County, near the proposed CISF, through a 59 mile long pipeline. T. Boone Pickens has recently proposed piping Ogallala water from his ranch near Pampa, Texas, in the Panhandle, to El Paso or San Antonio hundreds of miles away for a fee. To this commentator, long-distance pipeline transport appears preferable to the processing of raw sewage into drinking water as is currently done in Wichita Falls and Big Spring, Texas. Thus, it would appear to be more than reasonable right now to pipe municipal water distances ranging from about 60 miles to several hundred miles from its source to a consumer. By extension, any resident of a municipality using water within several hundred miles of the proposed CISF would be affected by operations at the proposed CISF since he or she may require groundwater from a source proximate the proposed CISF. Thus, the environment affected by the proposed CISF is huge, covering many, many communities spread over thousands of square miles.

3. SURFACE SUBSIDENCE

The most prominent geological feature in Andrews County is the Shafter Lake Basin covering several square miles and being located about 25 miles east of the proposed

CISF. According multiple studies, Shafter Lake was formed by dissolution of subterranean rock resulting in a large sink: In commenting on these studies, one researcher wrote:

> The most recent studies of lake basins on the Southern High Plains, which are similar to the Shafter, Whalen, and Lazy X Ranch basins, suggest the basins could have originated from dissolution of deep-seated Permian salt beds ... from eluvation and carbonate solution in near-surface sediments ..or from progressive, long-term process of groundwater infiltration along fracture zones, leading to localized eluvation, structural subsidence and eventual dissolution of underlying Permian salt beds." *Origin of Shafter, Whalen, and Lazy X Ranch Lake Basins, Andrews County Texas by Roger M. Dockery in a Texas Tech University thesis dated 12/1989., a copy of which was previously supplied to the NRC by myself but is also available online, Pg. 25*

Whalen Lake is about 17 miles east of the proposed CISF. ISP fails to mention Whalen Lake, Shafter Lake and other well-known dissolution features around the proposed CISF in its *ISP Environmental Report*. Instead ISP reports: "Investigations showed that no features in the study area or around CISF and Waste Control Specialists site indicated any past dissolution...." *ISP Environmental Report, Pg. 3-5.* ISP clearly has not made a full report of geologic hazards to the NRC.

4. ABILITY OF ISP TO CONSTRUCT AND OPERATE THE PROPOSED CISF

The CISF project proposed by ISP seems to be a pipe dream. First, in its request to the NRC to suspend the prosecution of its initial application for a CISF license, WCS is quoted as stating: **"WCS has faced significant operating losses in each of its operating years** [emphasis mine]." *ACN, 4-20-17, Pg. 3.* Further, WCS is reported to have written: "**WCS also is faced with a magnitude of financial burdens** [emphasis mine] that currently make pursuit of licensing unsupportable." *ACN 4-20-17, Pg. 3.* Still further in its request, WCS stated: "As one of its initiatives intended to **help WCS eventually become profitable** [emphasis mine]... WCS leaders began considering the possibility of siting the CISF at its Andrews County facility." *ACN, 4-20-17, Pg. 3.* In total, these statements to

the NRC indicate that WCS is losing money on its "bread and butter" waste disposal business and now finds itself with mounting financial problems. To resolve them, instead of focusing on reducing costs or increasing efficiency in ongoing operations to generate profits, ISP and WSC wish to gamble on an unproven and dangerous business of handling the most toxic materials on the planet – high-level radioactive waste. This is speculative nonsense of the highest order considering that the proposed operator cannot, by its own admission, profitably conduct its current business and the NRC should not support it now. (It is like an unprofitable maker of model airplane kits seeking a contract to build 747s.) The unprecedented plea by WCS for the suspension of prosecution of its original, license application for lack of funds should be a big enough red flag for the NRC that the proposed CISF is seriously flawed. The original license application should have been ruled abandoned by the NRC when the request for an indefinite suspension of prosecution was made by WCS merely to reduce the applicant's cost.

In a preemptive defense, ISP asserts: "The members of ISP, Orano and Waste Control Specialists are well capitalized going concerns in the U.S. nuclear power business." *ISP License Application, Pgs. 1-4 and 1-5.* Sears too was a "going concern" as a retailer of consumer goods until a few weeks ago when it filed for bankruptcy. Sears was simply not profitable. Its demise, however, was foreseen years ago as its management struggled with issues like those revealed to the NRC by WCS.

ISP states that it has made a significant investment in Andrews County, presumably to demonstrate a strong commitment to current and future facilities:

> WCS has invested over $300 million in licenses, buildings, equipment and improvements at the current radioactive waste disposal facility in Andrews County, Texas. *ISP License Application, Pg. 1-5.*

A review of the online records (see Exhibit 11) of the Andrews County Appraisal District shows that Waste Control Specialists, LLC, currently owns tangible property in Andrews County valued at only $27 million ($18 million real property + $9 million personal property). Thus, 91% of the purported $300 million investment by WCS into its facility is not now seen on the tax rolls. This bookkeeping discrepancy calls for an explanation.

The $300 million boast noted above is accompanied by a statement that WCS is currently leveraged by "$63 million of secured debt" and "$27 million of invested funds." This information was not in WCS's original application and shows that WCS is now heavily indebted especially in comparison to the valve of its property known to be in Andrews County per the tax assessor. It raises the question of how WCS, an admittedly unprofitable business entity, can possibly sustain a wholly unproven, speculative, and dangerous enterprise of high-level nuclear waste storage AND repay tens of millions of dollars of borrowed funds without cutting corners in its operations to the point where public health, safety and welfare are not jeopardized. Since WCS has sold assets and borrowed heavily during the last year just to remain in business, it is foreseeable that the federal government, as the insurer of last resort for completion and operation of the proposed CISF, will be required to bail out the prospective licensee at some point in the future.

5. COMMUNITY SUPPORT

In its original application transmittal letter to the NRC, dated 4-18-16, WCS characterized Andrews as "a community that has expressed its willingness to host such a facility [the CISF]." To bolster the impression of willingness, WCS attached to its application a resolution of the commissioners court of Andrews County, Texas. The pending *ISP Application* includes this resolution as part of *Appendix A Socioeconomic Impact Analysis.* A review of the resolution's language indicates that the commissioners court suffers from a conflict of interest. The court makes money off of WCS.

As is outlined in the resolution, Andrews County receives a five percent surcharge on WCS' gross receipts through quarterly checks and the funds are to be disbursed by the commissioners court for public-oriented projects. By the time the resolution was passed, the court already had received millions of dollars to spend under the arrangement. So, if the proposed CISF project falls through, the commissioners court may have less money to spend and less power to wield in Andrews in the future. It is no wonder that the court wants the proposed CISF constructed. Newspaper reports suggest that others may have helped the court.

The *Andrews County News,* on 2-19-17 at pg. 5, reported that members of the commissioners court, who endorsed WCS submitting its application for a CISF, were in attendance at the NRC scoping hearing in Andrews, Texas, on 2-15-17. Also reported to be in attendance was Andrews County Chamber of Commerce Executive Director Julia Wallace who provided remarks in favor of the proposed CISF. Subsequently, the chamber of commerce may have been rewarded by the court for its efforts on behalf of WCS.

> "Earlier this month the [commissioners] court approved $177,000 in Waste Control Specialists tax funding for the project. The project will involve two separate efforts – including expanding the facility and work on the parking lot, former Andrews Chamber of Commerce Executive Director Julia Wallace said earlier this month." *ACN*, 8-31-17, pg. 5.

The reward to the chamber also offered a benefit to WCS.

> "The addition of a workroom will also enable the present board room to be cleared of clutter when the veteran board and WCS stage meetings there," according to Andrews Chamber of Commerce Executive Director Julia Wallace. *ACN*, 8-3-17, pg. 5.

It is unclear whether this sequence of events represents: a coincidence, a matter of small town politics, or a criminal act under Texas law. Regardless, there is an appearance of impropriety.

It is also noteworthy that the Andrews County Chamber of Commerce is not entirely independent of WCS. It is understood that WCS is currently a member of the chamber. Also, at least one WCS employee, Joyce Orsak, sat on the board of directors of the chamber for several years and was also the chamber president. *ACN* reports that Ms. Orsak served in human resources and public relations roles at WCS. Thus, it might be imagined that the chamber of commerce and WCS speak with one highly professional voice.

6. AMERICA'S ACHILLES HEEL

This commentator's first, law school exam included a question involving a daisy chain of improbable, negligent acts with multiple parties and resulting in catastrophic harm from the release of radioactive material into the environment. Test takers were simply asked to discuss the duties and potential liabilities of all the parties involved. Of course, the question was a trick since only one, unmentioned party, the federal government, had the resources to restore the United States to a position approaching the one occupied before a nuclear catastrophe. Furthermore, only the federal government could have prevented the unintended release of radioactive in the first place through appropriate rule making.

The proposed CISF poses a philosophical problem for forward-thinking regulators like the question on my law school exam: What's the worst thing that can happen and how can that be prevented? This commentator can think of only one "worst thing" in this particular case which, although improbable, could happen over the lifespan of the proposed CISF. That thing is a ballistic missile strike by a foreign adversary. (The crash of a commercial airliner into the CISF brought about by a suicidal, flight crew member seems another possibility in view of reported events of a similar nature in the past.) If a strike was launched when prevailing winds were right, it may be possible for an adversary to deprive the United States of real wealth and one of its crown jewels: the hydrocarbons of the Southwest with catastrophic consequences for the national economy.

The proposed CIS having 40,000 tons of high-level radioactive material sitting outside on a large, concrete slab for decades, could prove to be an easy target and the principal component of the world's largest dirty bomb. A foreign adversary might not need nuclear warheads to widely disperse the material stored at the proposed CISF. Perhaps, conventional warheads perched atop ICBMs acquired by purchase or gift from another nation could do the trick. Thus, the proposed CISF might substantially lower the barriers to entry for regimes, like North Korea's, wishing to credibly threaten harm upon the United States.

Because of the high potential for harm to the strategic interests of the United States, it seems imperative for the Pentagon, and president as commander in chief, to pass judgment on the proposed CISF. Never before in the history of the United States has it attempted to gather together, in a location accessible to adversaries, quantities of high-level radioactive material apparently sufficient to assure its own self-destruction. The proposed CISF would be seem to be America's most vulnerable spot, or Achilles Heel, for the entirety of the operating life of the proposed CISF.

7. CONCLUSION

A fair reading of the comments above suggests that ISP misleads with its verbal and written communications. Considering future regulatory needs, the proposed CISF should not be sited adjacent a vague, state boundary unmentioned by ISP. Further, the proposed CISF appears, according to the TWDB and contrary to ISP's own statements, to be situated atop a source of potable water that could be piped to communities hundreds of miles away. Also, the area near the proposed CISF is known for its subsidence features like the Shafter Lake Basin; so, the formation of large sinks by natural processes at the proposed CISF is not an impossibility contrary to ISP's statements. Additionally, the operations of WCS are: admittedly unprofitable, appear on local tax rolls to be about ten

times smaller in scale than suggested in the *ISP License Application*, and are burdened by substantial debt such that public health and safety may be jeopardized during future operations of the proposed CISF. Finally, the proposed CISF may pose a national security threat outweighing any benefit that may come from it. For these reasons, the NRC should deny a license to ISP. Perhaps a better site should be chosen and the federal government should operate it for the public benefit without regard to monetary gain.

Speaking of monetary gain, ISP has never stated how much it plans to compensate local communities like mine for taking on the stigma of associating itself with the proposed CISF. Without this information, no meaningful cost-benefit analysis can be conducted by community residents. As things stand, the only benefit offered to Andrews County, Texas, by ISP seems to be a few jobs – not much considering the downside potential for harm to the entire United States.

Thank you for your consideration.

Sincerely,

Stephen R. Greiner

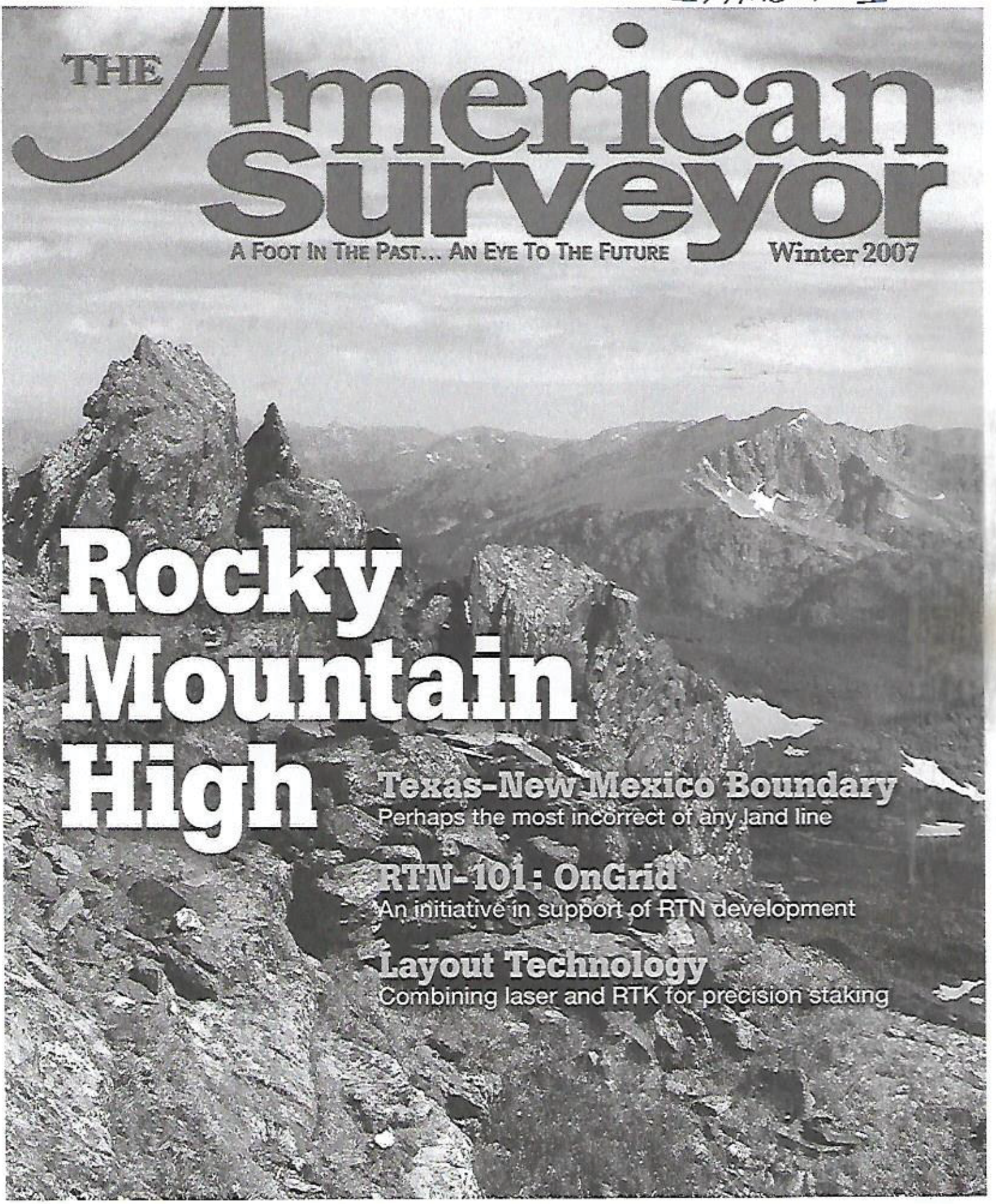
Attachments

EXHIBIT 1

THE American Surveyor

A FOOT IN THE PAST... AN EYE TO THE FUTURE

Winter 2007



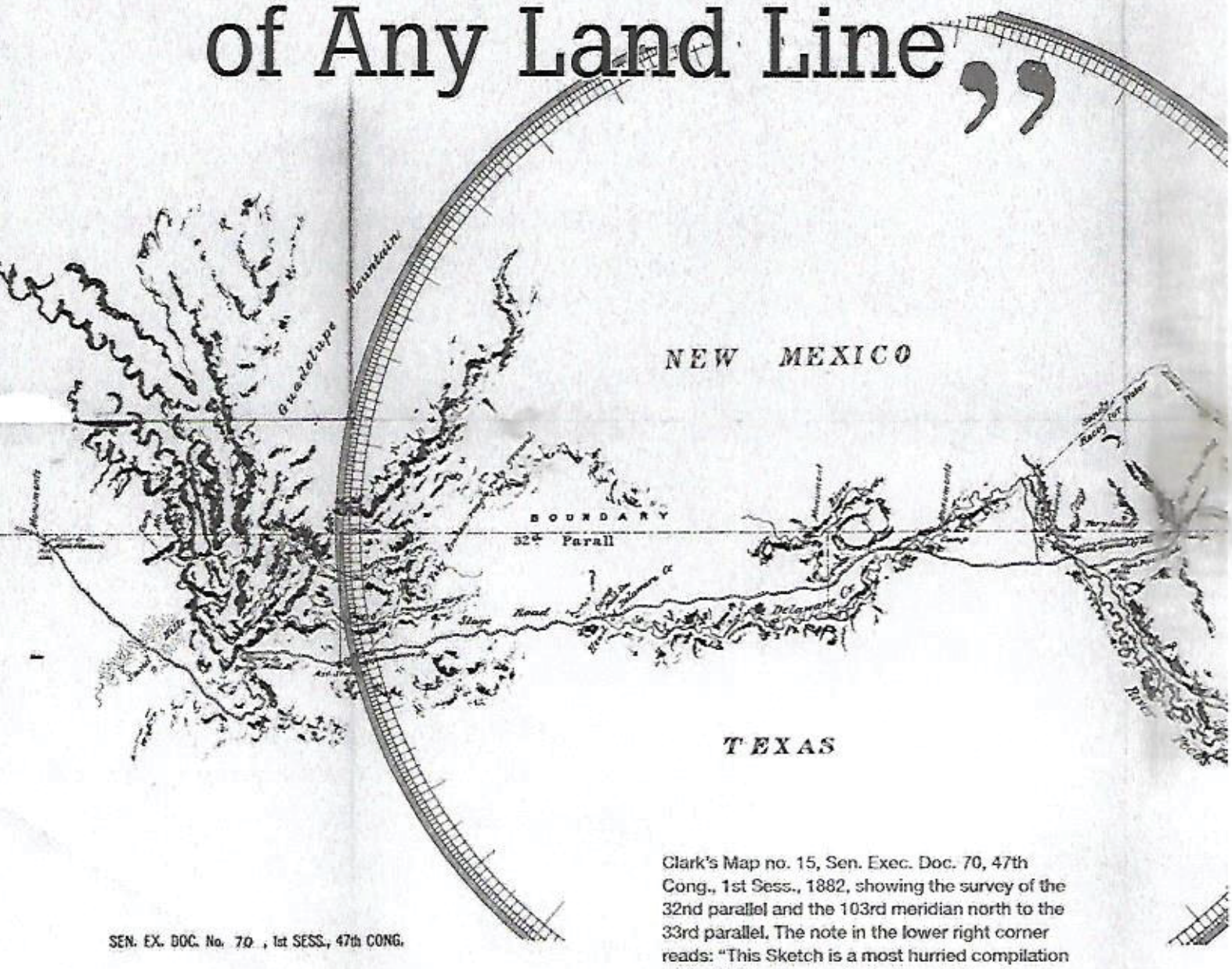
Rocky Mountain High

Texas-New Mexico Boundary
Perhaps the most incorrect of any land line

RTN-101: OnGrid
An initiative in support of RTN development

Layout Technology
Combining laser and RTK for precision staking

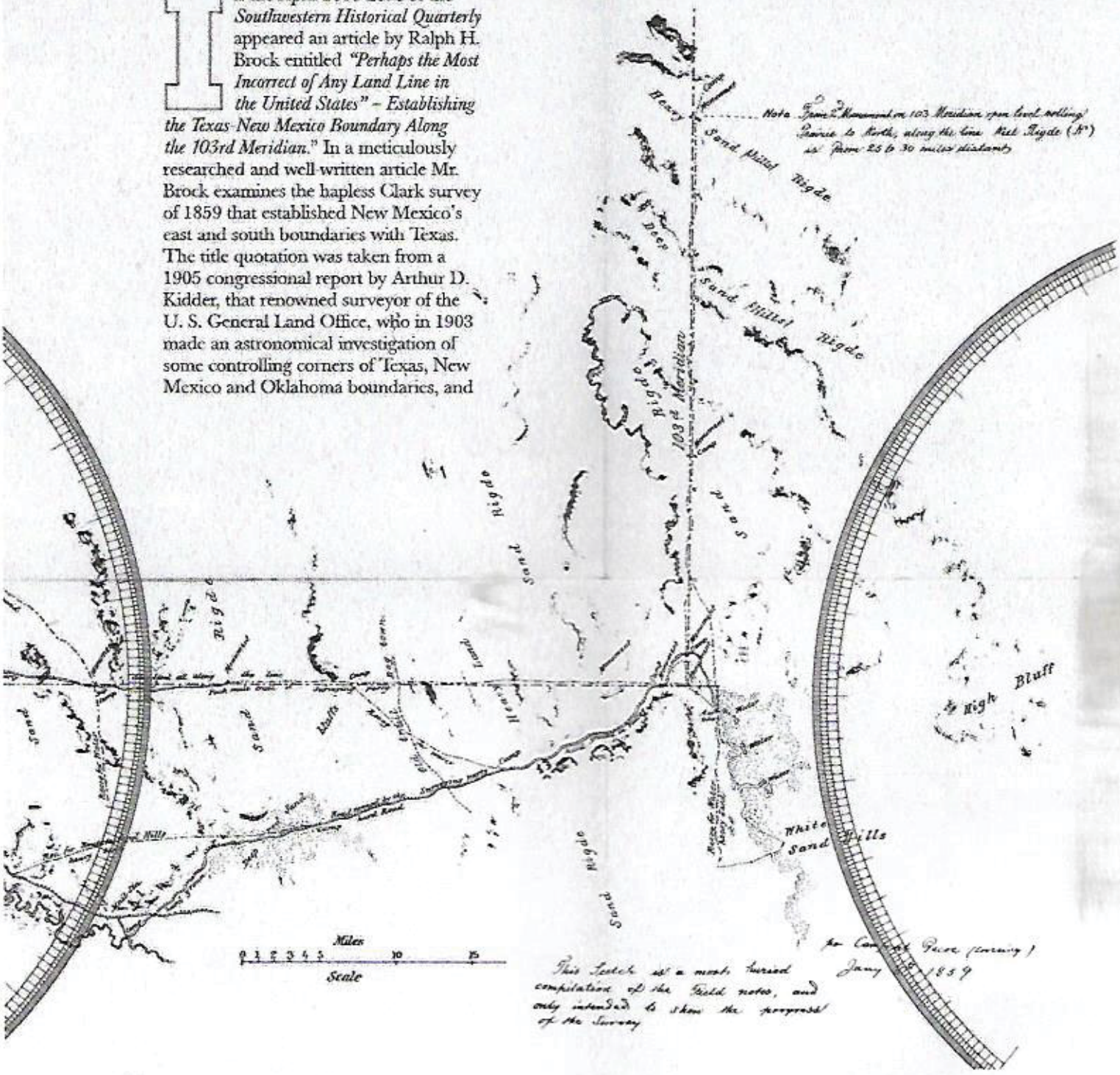
“Perhaps the Most INCORRECT of Any Land Line”



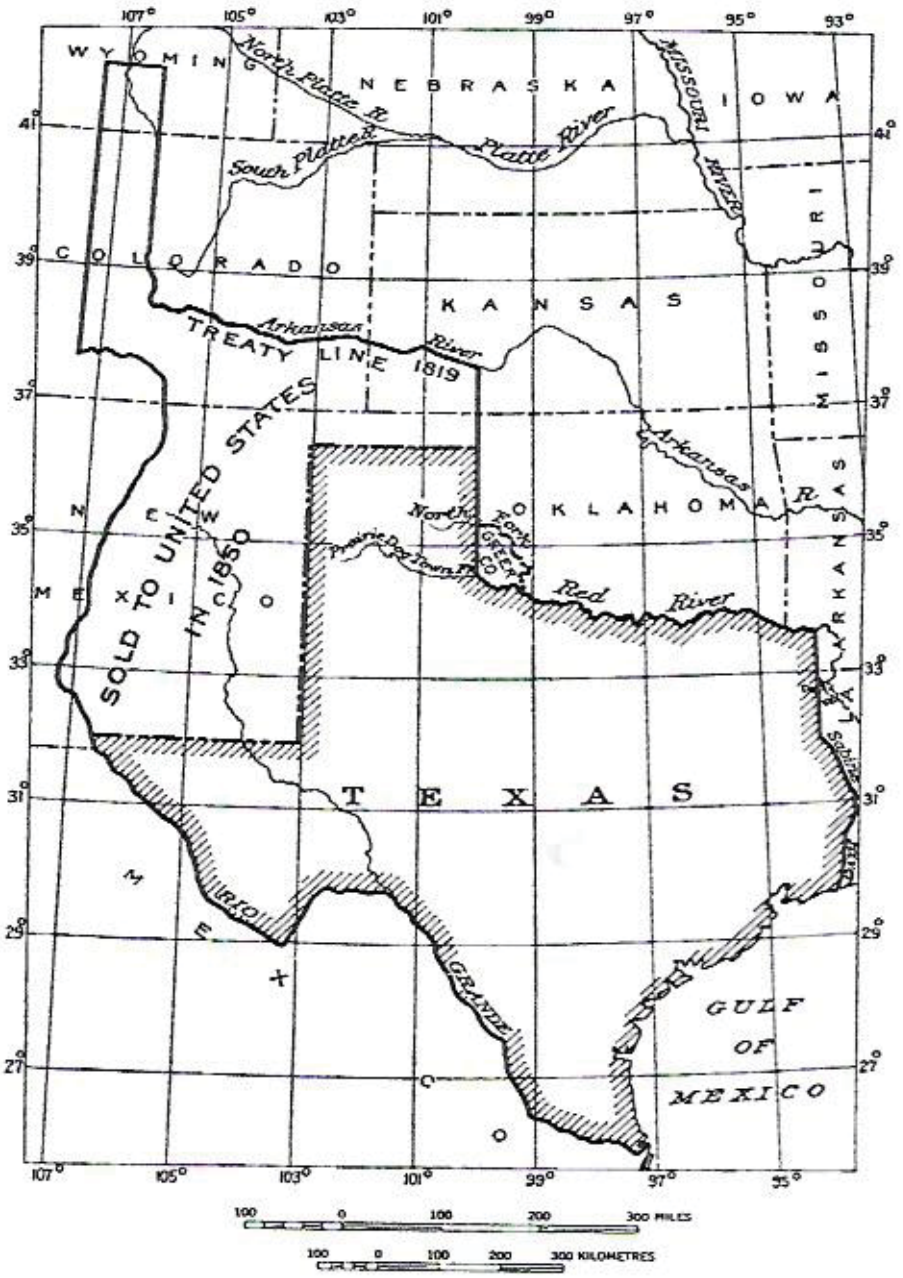
SEN. EX. DOC. No. 70 , 1st SESS., 47th CONG.

Clark's Map no. 15, Sen. Exec. Doc. 70, 47th Cong., 1st Sess., 1882, showing the survey of the 32nd parallel and the 103rd meridian north to the 33rd parallel. The note in the lower right corner reads: "This Sketch is a most hurried compilation of the Field notes, and only intended to show the progress of the survey."

In the April 2006 issue of the *Southwestern Historical Quarterly* appeared an article by Ralph H. Brock entitled *"Perhaps the Most Incorrect of Any Land Line in the United States" – Establishing the Texas-New Mexico Boundary Along the 103rd Meridian."* In a meticulously researched and well-written article Mr. Brock examines the hapless Clark survey of 1859 that established New Mexico's east and south boundaries with Texas. The title quotation was taken from a 1905 congressional report by Arthur D. Kidder, that renowned surveyor of the U. S. General Land Office, who in 1903 made an astronomical investigation of some controlling corners of Texas, New Mexico and Oklahoma boundaries, and



>> By Fred Roeder, LS



"Historical Diagram of Texas," Franklin K. Van Zandt, *Boundaries of the United States and the Several States*, Geological Survey Professional Papers no. 909 (Washington, D.C.: Government Printing Office, 1976)

who referred to the 103rd meridian as quoted above.

The error in Clark's location of the 103rd meridian, that was to cost New Mexico about two thirds of a million acres of its territory, has been known since at least 1882 when the owners of the giant XIT Ranch in the Texas panhandle employed surveyors to locate their western boundary, 150 miles of which ran along the state line. Congress approved the Clark survey in 1891 and the error became an issue when New Mexico applied for statehood in 1910 and attempted to recover the lost land. A year later Congress again, this time by joint resolution, reaffirmed the Clark line and made its acceptance by New Mexico Territory a condition for granting statehood. The Clark survey was officially restored in 1911, and in 1912 New Mexico became a state with a boundary defined by it, and all lived happily ever after?

Well, not quite. Hurt feelings caused by real or imagined injustices in the division of real estate have a penchant for immortality. Thirty-two days shy of a hundred years after the 1891 approval by Congress, the New Mexico State Senate voted unanimously to ask the attorney general to negotiate to redraw the line. In 2003 and in 2005 that same body voted again unanimously, this time to sue the State of Texas for the return or compensation for 603,485 acres that were, in the words of the 1991 bill: *"summarily taken from the territory of New Mexico by the powerful state of Texas"* [emphasis added].

Newspaper columnists on both sides of the line are having a field day with this. "We think this perennial question about the 'land grab' fits nicely with Gov. Richardson's demand that the hot air balloon be declared New Mexico's official aircraft," writes the *Las Cruces Sun-News*. The general public is fed a few sketchy and misunderstood facts, and too many surveyors are only superficially familiar with the details of the problem. A scholarly examination and dispassionate treatment of the events leading to the survey and its acceptance is long overdue and author Brock has eminently succeeded in providing it.

Ralph H. Brock, an attorney, a resident of Lubbock and self-described amateur historian, practices civil, criminal and appellate law in Texas State and Federal Courts. With a Texan's love for the history of his native state and a lawyer's expertise at research, Mr. Brock begins his narrative at the source of Texas's boundaries, the second (secret) Treaty of Velasco, where the victor of San Jacinto, Sam Houston, handed captured Mexican President Santa Anna a boundary description of the new and independent Texas Republic. Mexican protests, a war with Mexico, and annexation by the United States notwithstanding, Texas made her boundary claims stick. To avoid further unpleasantness and also to get some badly needed cash, she sold her claims north of the 32nd parallel and west of 103 longitude to Uncle Sam for 10 million dollars in a deal

dubbed "the Compromise of 1850", an act of Congress that also created the boundaries of the newly established Territory of New Mexico. In fascinating detail, Ralph Brock describes the bickering and haggling in Washington and in Austin that led to the creation and acceptance of what are essentially today's state lines.

Eight years after the Act of September 9, 1850, Congress appropriated up to $80,000 to pay for a survey of the boundaries of Texas from the Rio Grande to the Red River and appointed John H. Clark to serve as commissioner, astronomer and surveyor for the United States. It had become fashionable for surveyors who had taken some readings on the sun, Polaris, and a few selected stars to call themselves astronomers and Clark was no exception. Educated as a naturalist, Clark was turned into a surveyor by William H. Emory on the international boundary survey, and one suspects that politics had much to do with his appointment. Unfortunately, the same was true on the Texas side where the appointment as commissioner went to William R. Scurry, a lawyer and military man, who was joined by surveyor Chas. A. Snowdon, and later by Anson Mills, "a surveyor and West Point dropout from Indiana."

In describing the survey operations Ralph Brock relies heavily on official and private correspondence by all parties involved. Harmonious cooperation between the two commissions was absent from the start and soon degenerated into finger-pointing and name-calling that led to the resignation of the Texas commission, with the southeast corner of New Mexico not yet established. Brock's skillful presentation of the chain of events combined with the many excerpts from letters of the principal players, allow the reader to reach an understanding of how this important state boundary survey turned into "Perhaps the Most Incorrect of Any Land Line in the United States."

To locate the intersection of the 103rd meridian with the 32nd parallel, Clark was instructed to project the meridian of *Frontera*, a point established in 1855 by Emory on the Mexican boundary survey near what is today the Sunland Park Mall in El Paso. Thus the location of the south end of the 103rd meridian became a matter of measuring the computed length of the 32nd parallel, and the error may well have occurred in the chaining. After monumenting New Mexico's southeast corner almost four miles west of where it should have been located, Clark turned north, but after reaching the 33rd parallel discontinued the line for of lack of water. He then proceeded to run the meridian south from a point on the 37th parallel that was established in 1857 by Col. Joseph E. Johnston of the First Cavalry, a survey on which Clark had been "chief astronomer". The point was intended to mark the 103rd meridian, but in a review of Clark's computations in the Washington office an error of 11,582 feet had been discovered, showing that the monument was too far west. Even though Clark corrected the error, later examination showed that the corrected point was still more than two miles too far west.

Running the meridian south, Clark discontinued the line after reaching the 34th parallel, concluding that the survey was "for all practical purposes" completed, even though he had left a gap of about 69 miles. He never knew that the lines he had run from the south and the north would not meet. Author Brock examines the entire episode in engaging detail. In January 1862, with the Civil War well underway and Clark's field work as well as his office work still incomplete, Secretary of the Interior Smith ordered the Commission to terminate at once. Clark complied. Historian Brock does not leave us here, but continues to trace the road to New Mexico's statehood with the Clark line as her eastern boundary. That, too, is not the end of the story, nor is it the end of Brock's excellent narrative, for he takes us all the way past the numerous attempts by the New Mexico legislatures to force the attorneys general to sue Texas, and their (the N.M. attorneys general) consistent refusal to do so, down to the present day. It is a well-told and carefully documented journey.

It has been the experience of this reviewer that a lot of people laugh when learning about the antics by the folks in Santa Fe, and are quick to opine, that New Mexico's chances to reclaim the lost strip are zero. They are almost certainly correct, but in dismissing the claim to the 103rd meridian one must be careful not to get carried away. Boundary law notwithstanding, the location of state boundaries is a political matter, and politics has been called "the science of how who gets what, when and why". Who knows? New Mexico's motto, *Crescit eundo* (It grows as it goes) may yet come true.

> "THE ERROR IN CLARK'S LOCATION OF THE 103RD MERIDIAN... COST NEW MEXICO ABOUT TWO-THIRDS OF A MILLION ACRES OF ITS TERRITORY."

Author's Note: *Southwestern Historical Quarterly* is published by the University of Texas Press, Journals Division, Austin, TX.

Fred Roeder graduated as a structural engineer in 1955 from Blankenburg Engineering School in what was then East-Germany. He came to the U.S. in 1957, served in the U.S. Army from 1958-60, then as a geodetic surveyor for an aerial mapping firm in Albuquerque from 1961-69. Roeder became a registered land surveyor in New Mexico, Arizona, Arkansas and Oklahoma. From 1969 to 1994 he served as a cadastral surveyor and lands staff officer for the U.S. Forest Service in those four states. Roeder has written extensively on historic and current land matters, and is a frequent contributor to the New Mexico Professional Surveyors (NMPS) *Benchmarks* newsletter. Many of his survey tales can be found in his book *Antepasados*, published by NMPS.

EXHIBIT 2

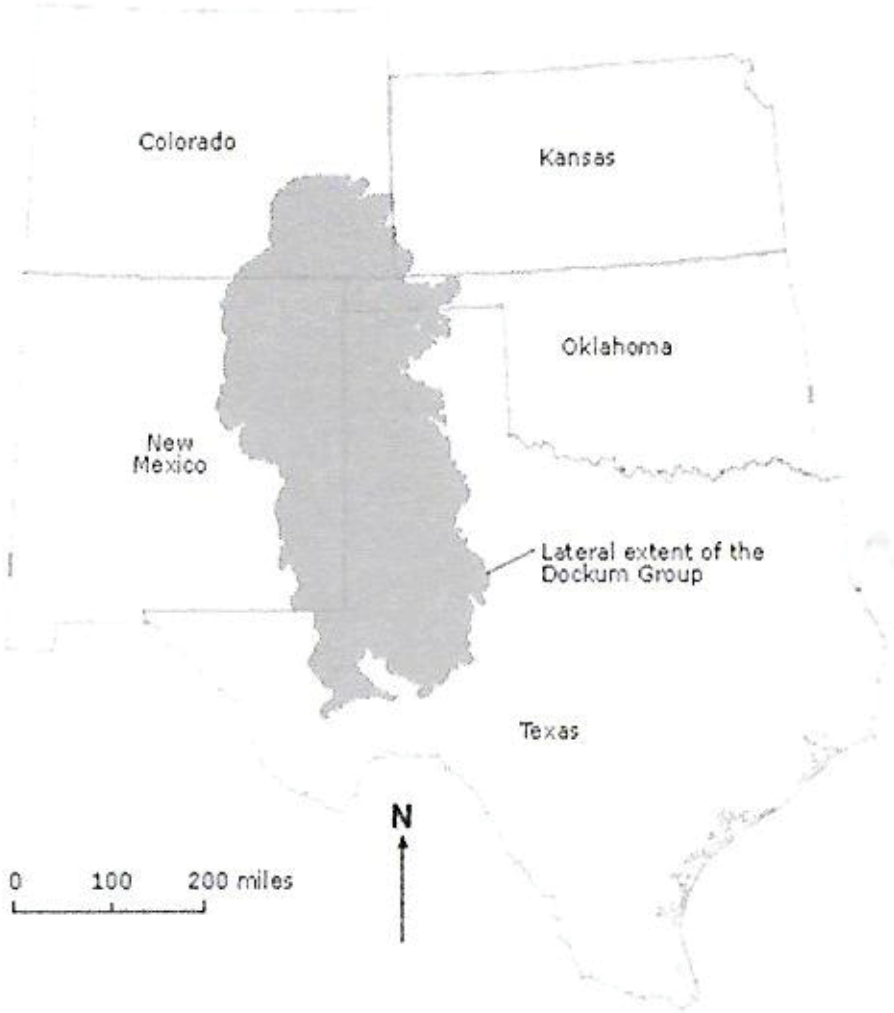


Figure 2-1 Lateral extent of the Dockum Group in southwestern United States (modified from McKee and others, 1959; Bureau of Economic Geology, 1967, 1968, 1969, 1974, and 1983; McGowen and others, 1977).

- Dockum Group extends into four States

EXHIBIT 3

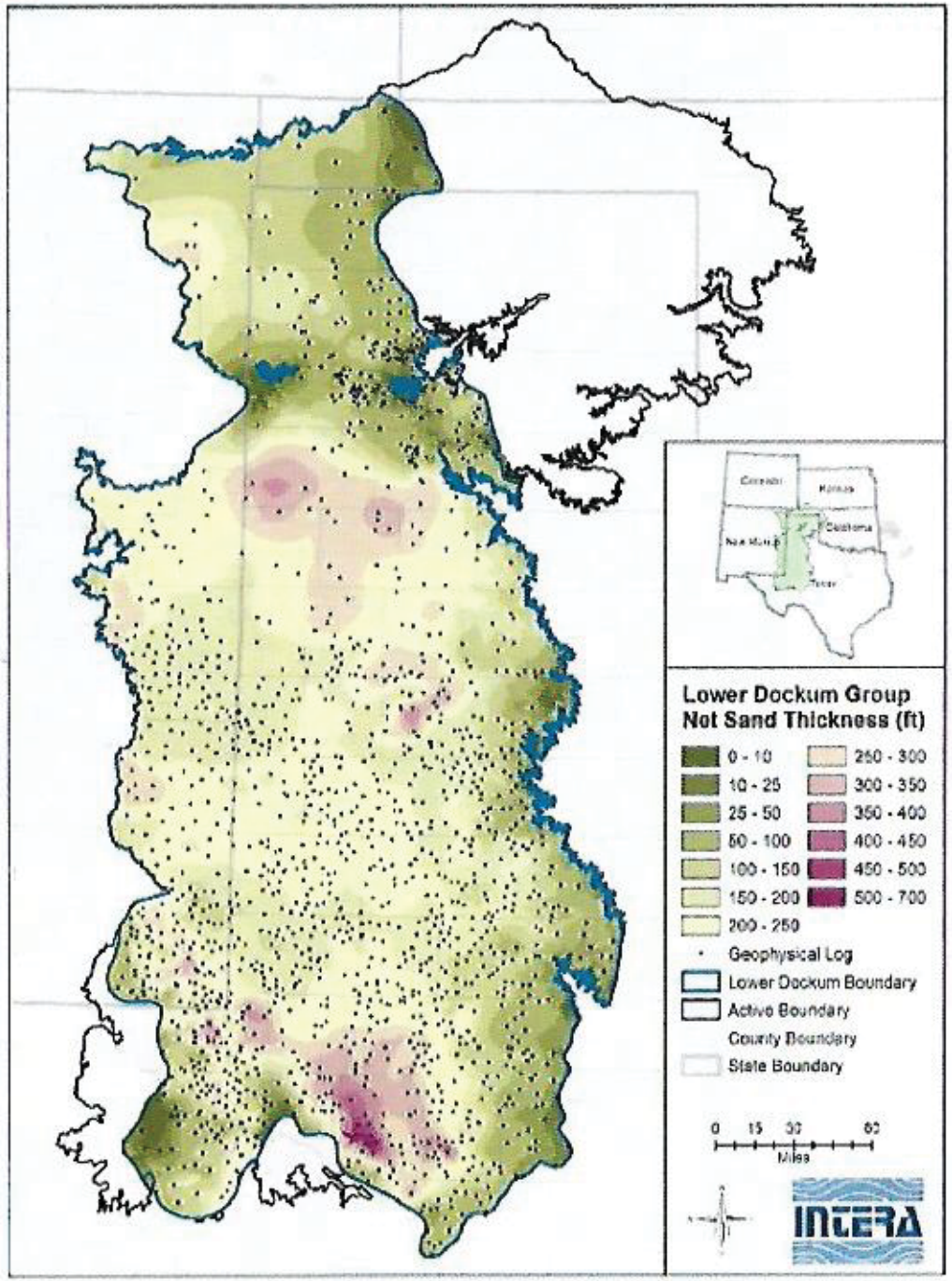


Figure 4.2.29 Net sand thickness of the lower Dockum Group in feet.

- Net sand map of "Lower Dockum"

Deeds, N. E., and others, 2015, Final Conceptual Model Report for the High Plains Aquifer System Groundwater Availability Model: report prepared for the TWDB.

EXHIBIT 4

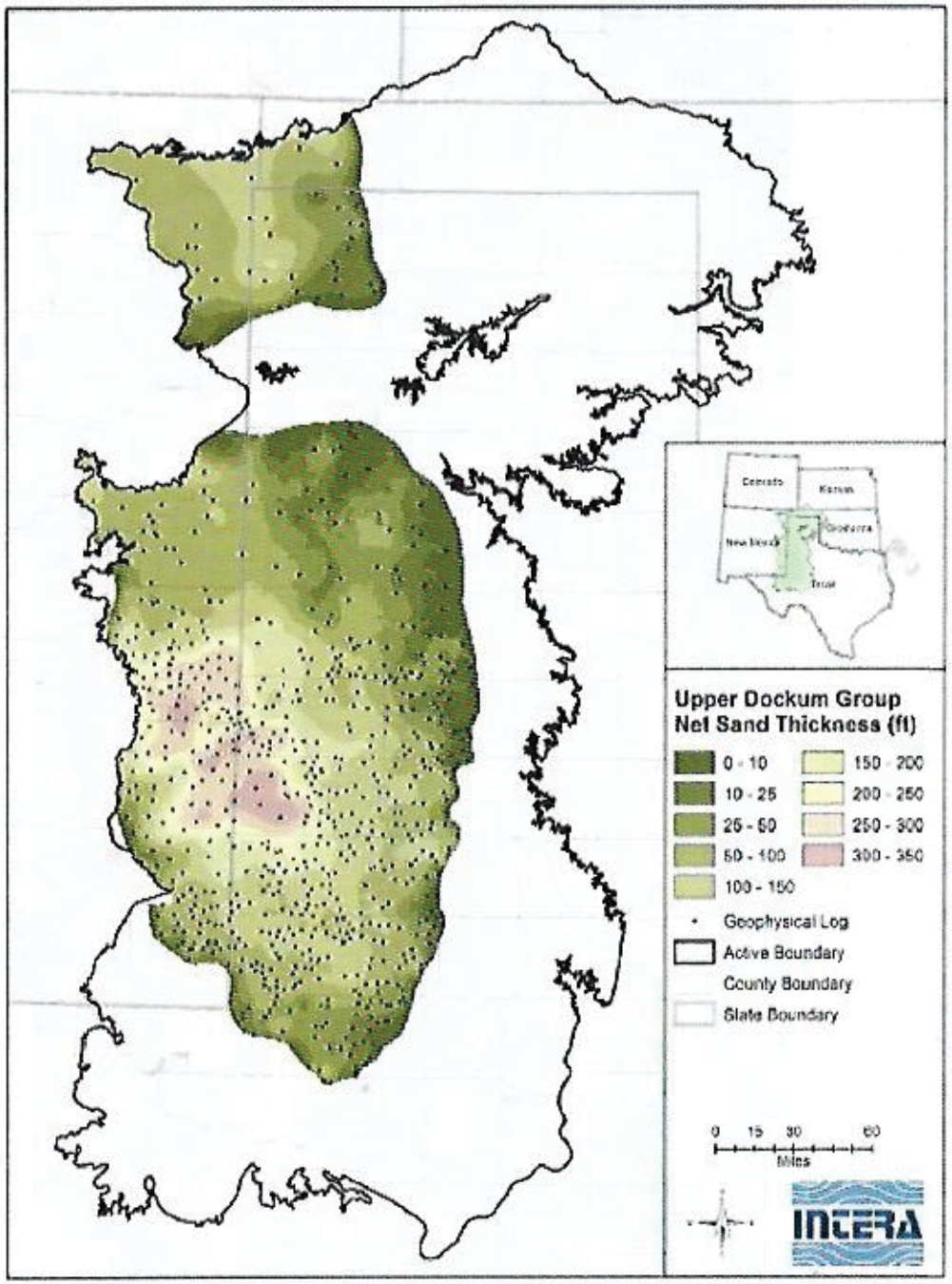
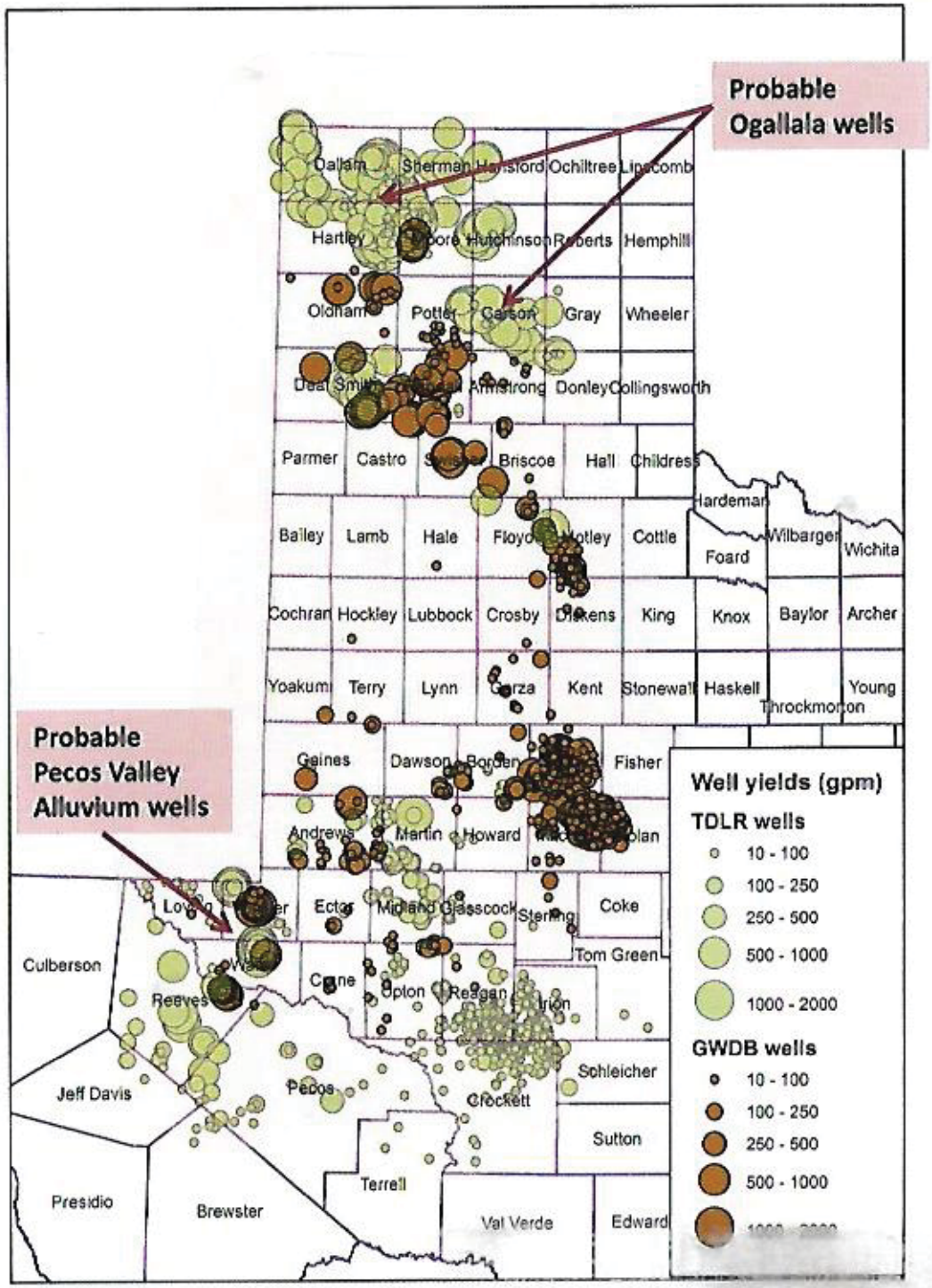


Figure 4.2.28 Net sand thickness of the upper Dockum Group in feet.

- Net sand map of "Upper Dockum"

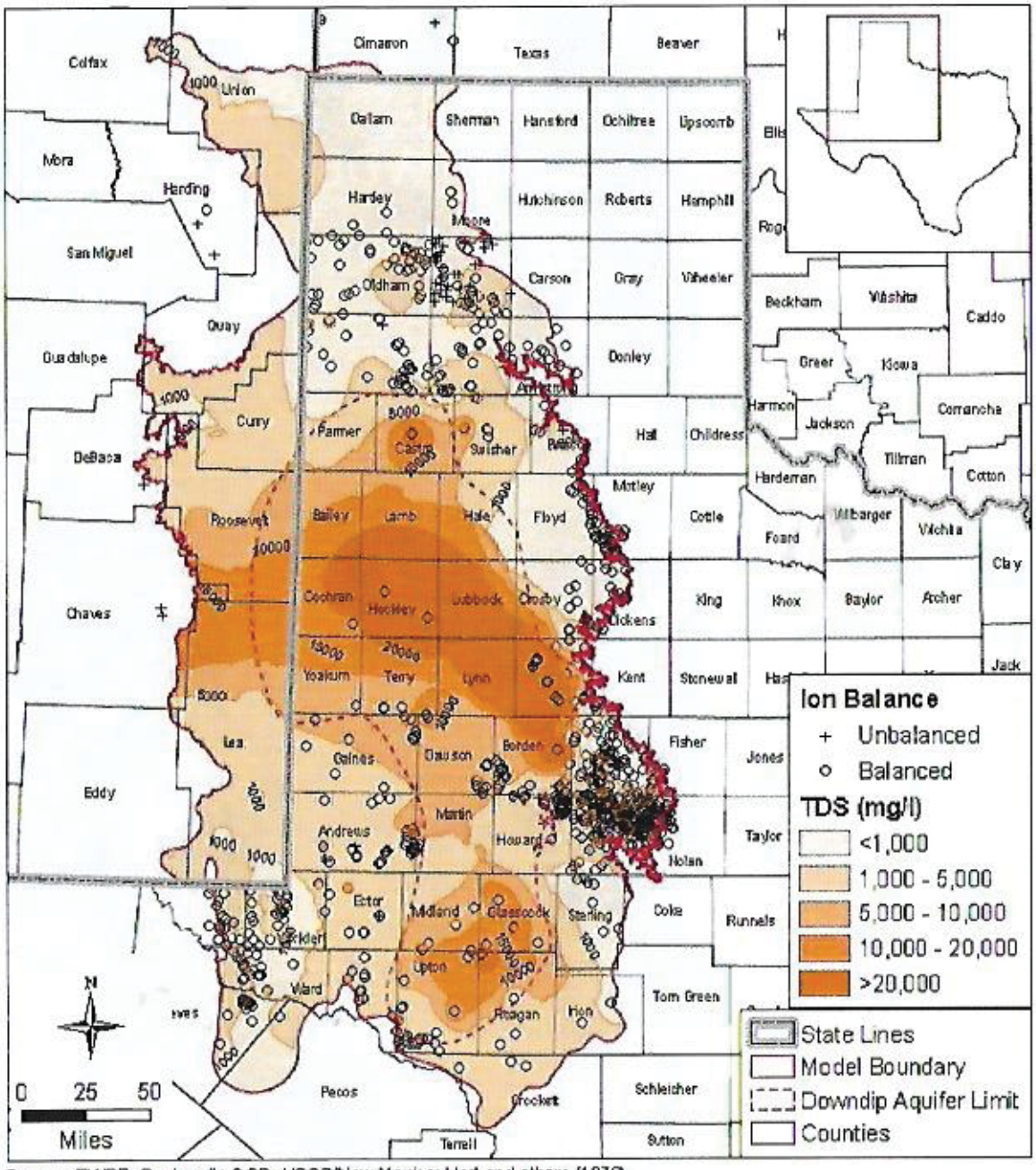
Deeds, N. E., and others, 2015, Final Conceptual Model Report for the High Plains Aquifer System Groundwater Availability Model: report prepared for the TWDB.

EXHIBIT 5



- Yields derived from aquifer tests in the TWDB Groundwater Database

EXHIBIT 6

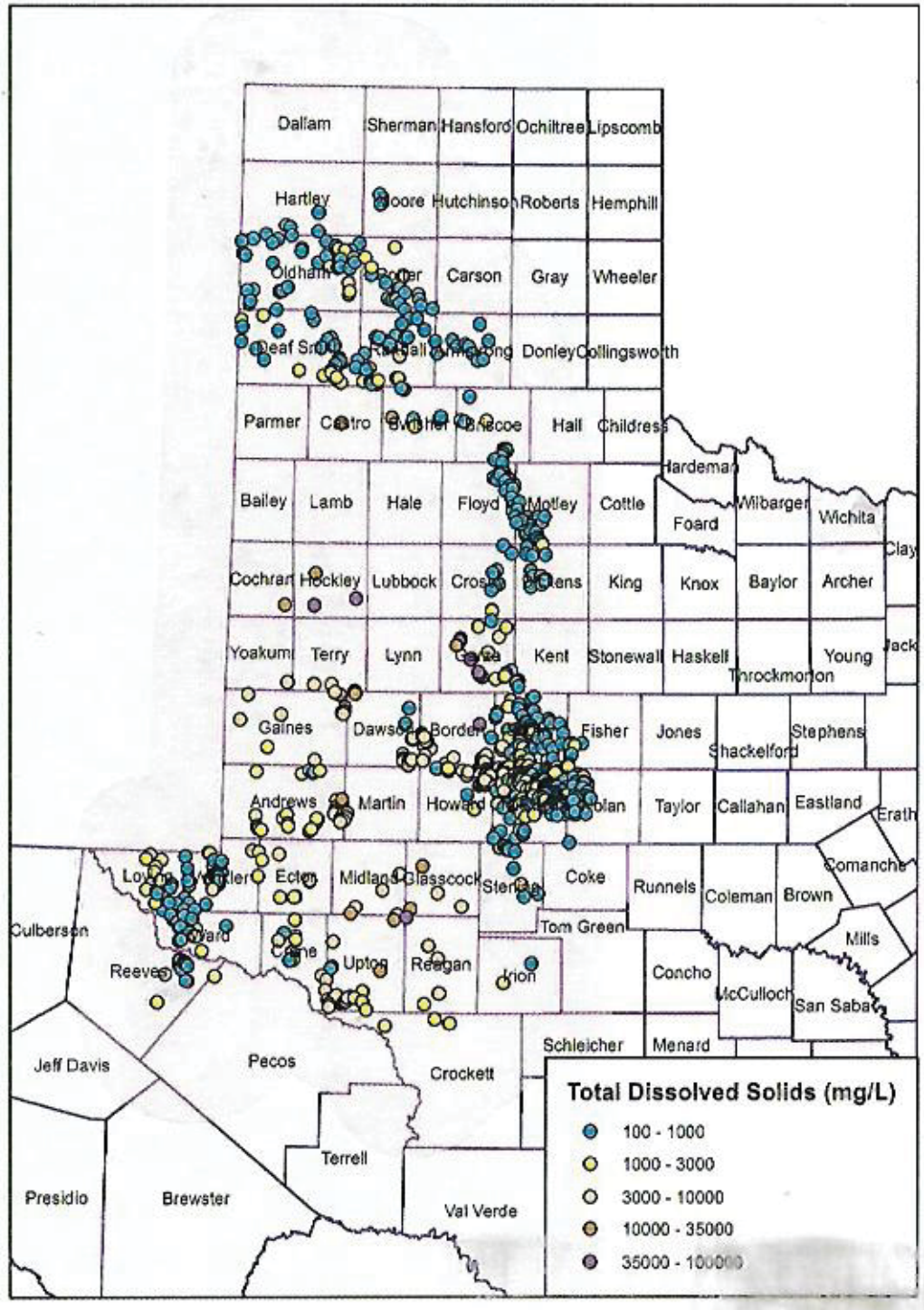


Source: TWDB, Panhandle GCD; USGS/New Mexico; Hart and others (1976)

Figure 4.8.1 **Total dissolved solids concentrations in milligrams per liter in groundwater in the Dockum Aquifer.**

- Total dissolved solids from GAM study

EXHIBIT 7



- Total dissolved solids from TWDB Groundwater Database

EXHIBIT 8

Previous Study Results

- Dockum is classified as a minor aquifer
- Covers approximately 26,000 square miles of Texas
- 109 million acre-feet of brackish groundwater with total dissolved solids from 0 to 5,000 milligrams per liter.
- 27 million acre-feet of brackish groundwater with total dissolved solids from 5,000 to 10,000 milligrams per liter.

EXHIBIT 9

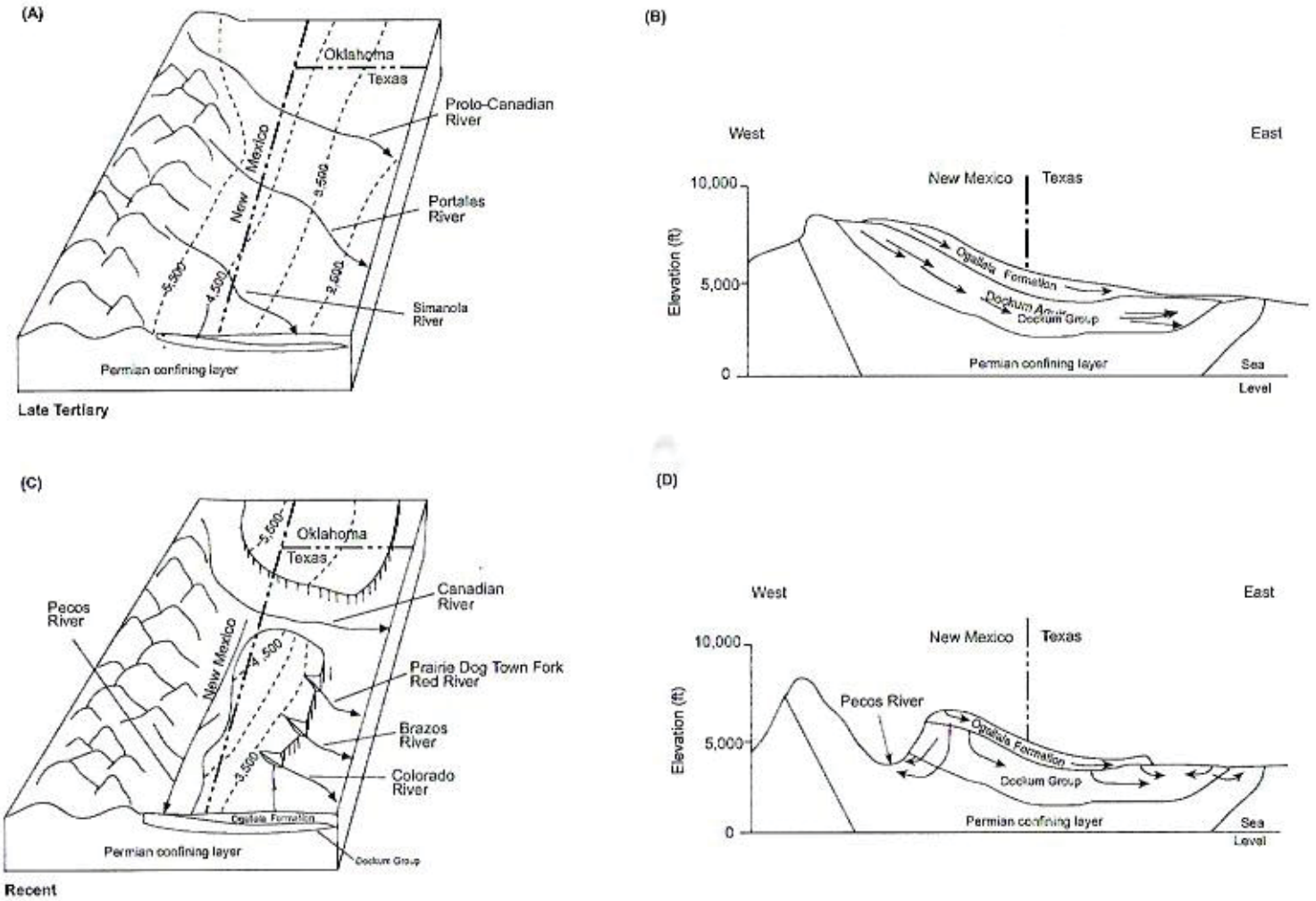
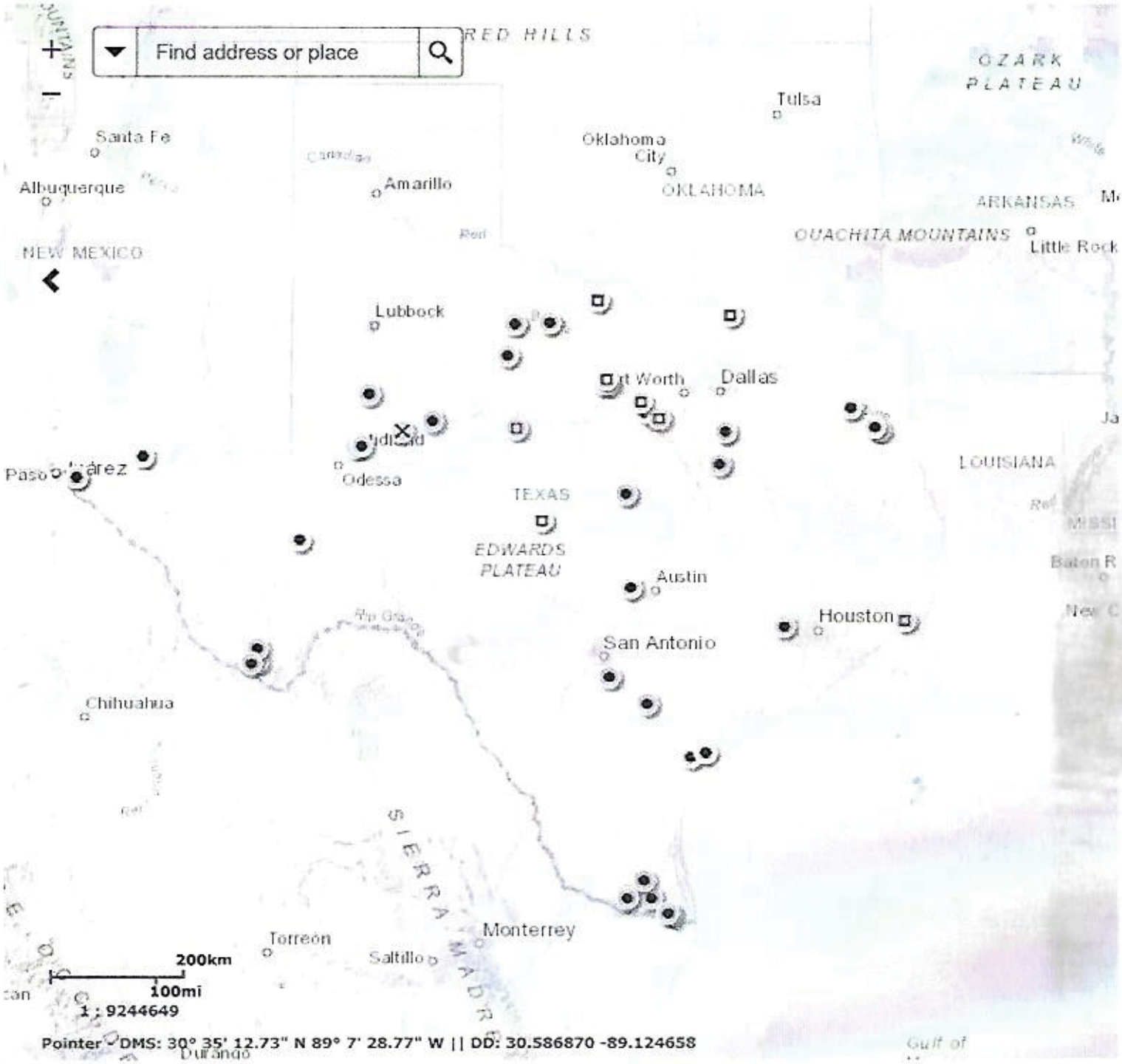


Figure 5-5. Hypothetical regional flow paths of groundwater in the Dockum aquifer. Before hydrologic divides developed, groundwater flowed from an area in eastern New Mexico downdip into the confined portions of the aquifer in Texas (A and B). After divides formed by incision of rivers (C and D), groundwater flow into Texas from New Mexico was essentially cut off(modified from Gustavson and Finley, 1985; Dutton and Simpkins, 1986). Contours are in feet above mean sea level.

EXHIBIT 10



TEXAS WATER DEVELOPMENT BOARD

EXHIBIT 11

Andrews CAD

Property Search | Map Search

New Search

Property Search Results > 1 - 25 of 36 for Year 2018

Click the "Details" or "Map" link to view more information about the property or click the checkbox next to each property and click "View Selected on Map" to view the properties on a single map.

Property Address | Legal Description

Property ID	Geographic ID	Type	Property Address	Owner Name	Appraised Value		
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6834	07700-00180-0000	Real		WASTE CONTROL SPECIALISTS LLC	$119,815	View Details	View Map
6835	07700-00190-0000	Real		WASTE CONTROL SPECIALISTS LLC	$110,978	View Details	View Map
6836	07700-00190-0100	Real		WASTE CONTROL SPECIALISTS LLC	$36,602	View Details	View Map
6837	07700-00200-0000	Real		WASTE CONTROL SPECIALISTS LLC	$120,179	View Details	View Map
6838	07700-00200-0100	Real		WASTE CONTROL SPECIALISTS LLC	$20,400	View Details	View Map
6839	07700-00210-0000	Real		WASTE CONTROL SPECIALISTS LLC	$147,199	View Details	View Map
6840	07700-00220-0000	Real		WASTE CONTROL SPECIALISTS LLC	$153,850	View Details	View Map
6843	07700-00250-0000	Real		WASTE CONTROL SPECIALISTS LLC	$139,797	View Details	View Map
6844	07700-00260-0000	Real		WASTE CONTROL SPECIALISTS LLC	$141,297	View Details	View Map
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6847	07700-00280-0000	Real		WASTE CONTROL SPECIALISTS LLC	$122,937	View Details	View Map
7330	08700-00020-0000	Real	0 W 176 SH TX	WASTE CONTROL SPECIALISTS LLC	$147,099	View Details	View Map
7331	08700-00030-0000	Real	0 W 176 SH TX	WASTE CONTROL SPECIALISTS LLC	$156,800	View Details	View Map
7332	08700-00040-0000	Real	8601 NW 9701 P TX	WASTE CONTROL SPECIALISTS LLC	$126,348	View Details	View Map
7333	08700-00040-0100	Real	0 NW 9701 P TX	WASTE CONTROL SPECIALISTS LLC	$41,885	View Details	View Map
7334	08700-00050-0000	Real	0 W 176 SH TX	WASTE CONTROL SPECIALISTS LLC	$79,337	View Details	View Map
7335	08700-00050-	Real	0 W 176 SH TX	WASTE CONTROL	$74,621	View Details	View Map

Andrews CAD

Property Search Results > 26 - 36 of 36 for Year 2018

New Search

Click the "Details" or "Map" link to view more information about the property or click the checkbox next to each property and click "View Selected on Map" to view the properties on a single map.

◉ Property Address ○ Legal Description

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7345	08700-00150-0000	Real		WASTE CONTROL SPECIALISTS LLC	$143,459	View Details	View Map
84190	99030-05720-0000	Personal	8601 NW 9701 P ANDREWS, TX	WASTE CONTROL SPECIALISTS LLC	$6,142,880	View Details	
92295	N07-022000-010-2-010271-0	Real		WASTE CONTROL SPECIALISTS LLC	$14,407,022	View Details	View Map
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269456	N07022000020707022	Personal		WASTE CONTROL SPECIALISTS LLC	$458,810	View Details	
269458	N07022000040707022	Personal		WASTE CONTROL SPECIALISTS LLC	$422,076	View Details	
269460	N07022000070707022	Personal		WASTE CONTROL SPECIALISTS LLC	$1,741,524	View Details	
275460	N80-033106-000-1-010271-1	Mineral		WASTE CONTROL SPECIALISTS LLC	$62	View Details	
403943	08700-00050-0300	Real		WASTE CONTROL SPECIALISTS LLC	$23,481	View Details	View Map
411714	N07022000080707022	Personal		WASTE CONTROL SPECIALISTS LLC	$178,500	View Details	

Questions Please Call (432) 523-9111

	0100			SPECIALISTS LLC		
7336	08700-00060-0000	Real		WASTE CONTROL SPECIALISTS LLC	$125,915	View Details View Map
7337	08700-00070-0000	Real		WASTE CONTROL SPECIALISTS LLC	$136,797	View Details View Map
7338	08700-00080-0000	Real		WASTE CONTROL SPECIALISTS LLC	$154,500	View Details View Map
7339	08700-00090-0000	Real	0 W 176 SH TX	WASTE CONTROL SPECIALISTS LLC	$156,050	View Details View Map
7342	08700-00120-0000	Real		WASTE CONTROL SPECIALISTS LLC	$148,299	View Details View Map
7343	08700-00130-0000	Real		WASTE CONTROL SPECIALISTS LLC	$143,098	View Details View Map