

The Proven Presence of The Ogallala Aquifer at WCS:

Site-Specific Geologic Cross-Sections and Soil Boring Analysis Examples

Excerpted From

***Geological Survey
AM Environmental-Terra Dynamics Inc.
Project Number 92-152
Conducted January, 1993 for TNRCC -
RCRA License Suitability of Waste Control Specialists LLC
Andrews County Landfill Site
from Texas Department of Health, Bureau of Radiation
Control (TDH-BRC), License #L04971***

Additionally includes:

***Maps of the Ogallala Aquifer
State Well Locations and Drilling Data
from United States Geological Survey and Texas Water Development Board***

***WCS Site Diagram b/w Topo and Details
custom composite map from USGS, TDH-BRC records.***

Compiled 2003

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<http://www.TexasRadiation.org/>***

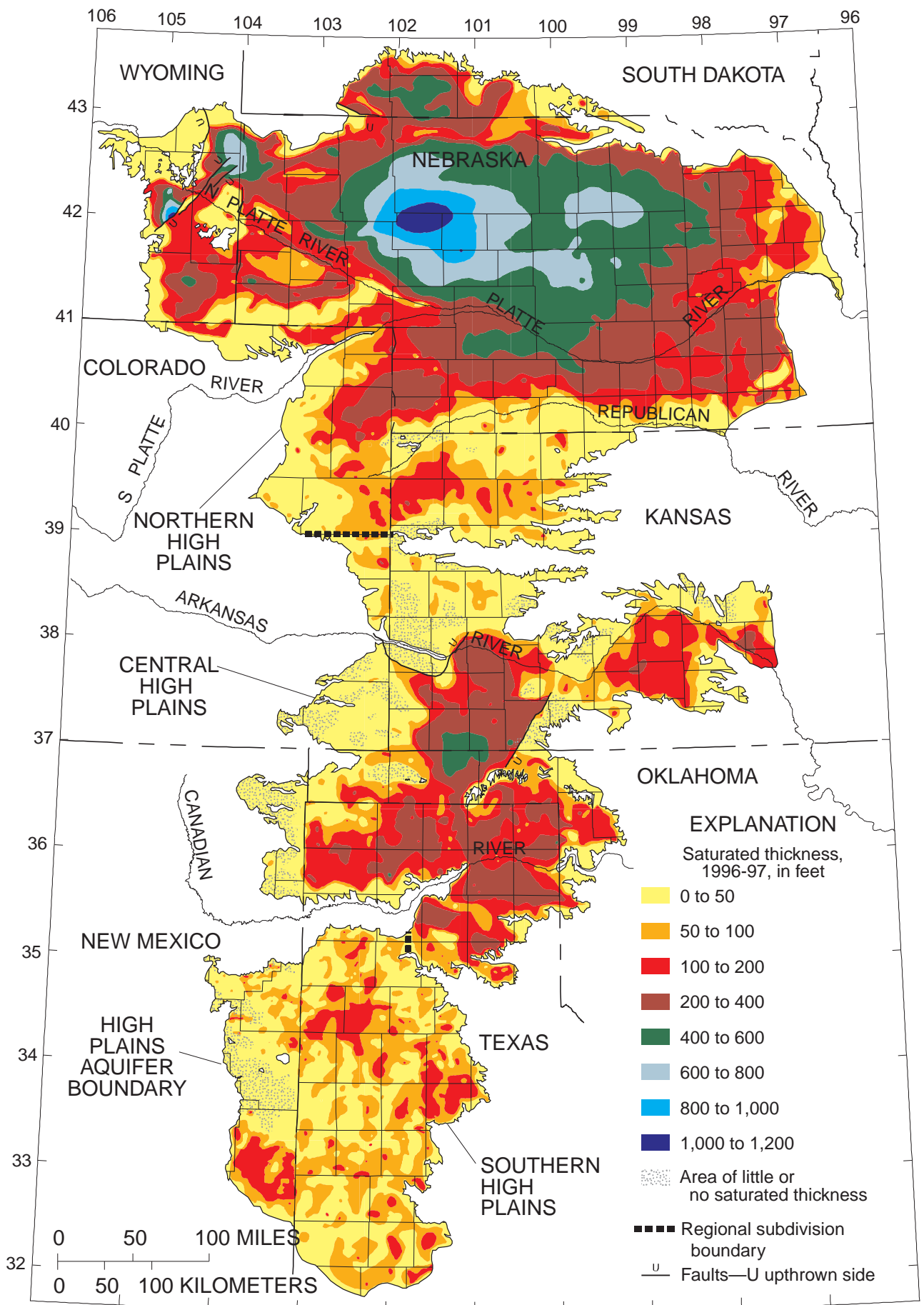
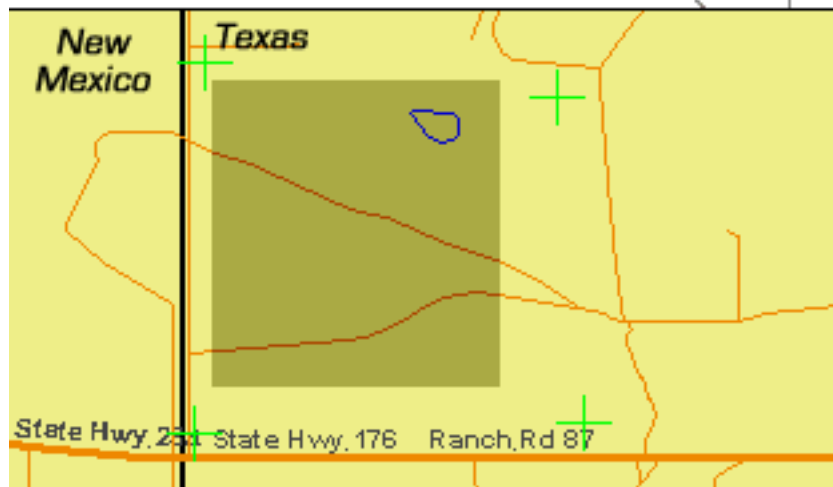
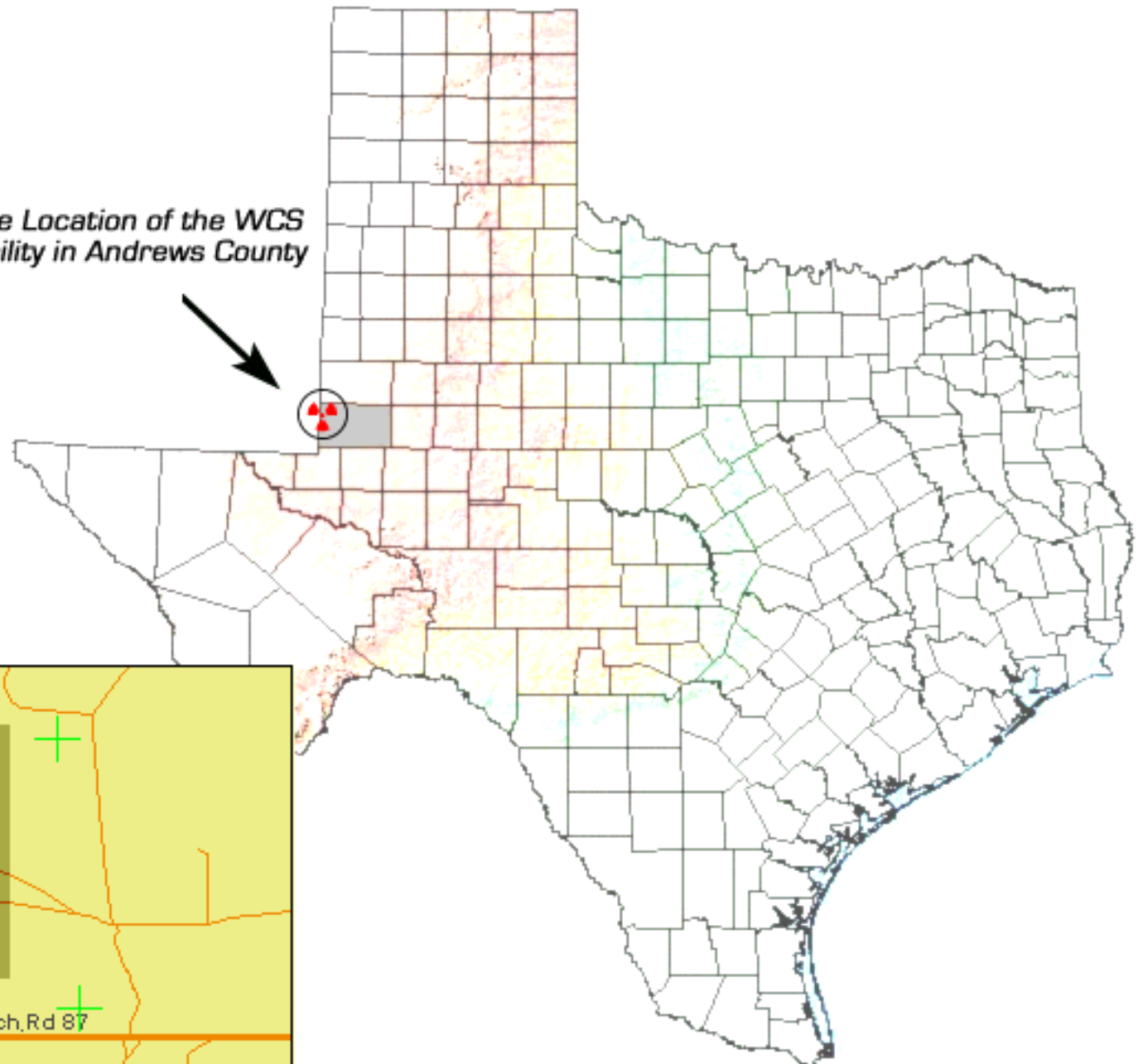
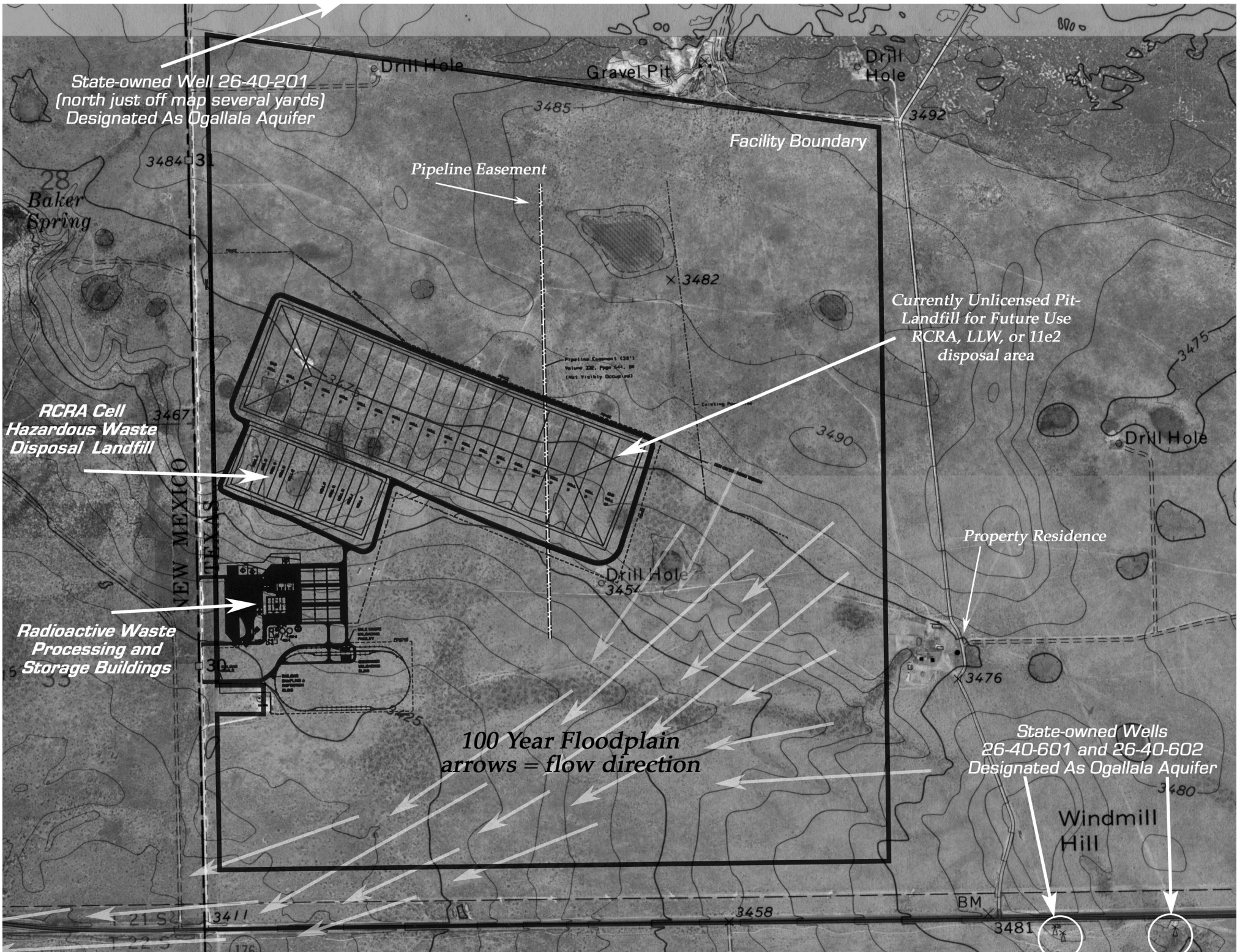


FIGURE 4. Saturated thickness of the High Plains aquifer, 1996-97.

*The Location of the WCS
facility in Andrews County*





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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE	Project No.: 92-152	Date Drilled: 01/11/93	Boring No.: B-35	Grid No.: 11-C
Log By: A. WEEGAR/R. M ^c GOWEN	Drilling Method & Bit Sizes: 0-31.7 MUD ROTARY (HOLT) 31.7- AIR ROTARY (SCARBOROUGH)	Survey Data: Northing: 8496.1842 Easting: 10483.4609 Ground Surface Elev. (MSL): 3,474.91		
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): CORE BARREL; SPLIT SPOON			
Driller:	Total Depth: 100'			
Remarks:				

Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft. / Ft. Sampled	Stratigraphic Intervals
0'-0.1' <u>TOP SOIL</u> ; brown silty sand; organic material; loose; moist.	0			
0.1'-5.5' <u>SILT (ML)</u> ; yellow to light tan caliche cemented silt; mod. soft; dry.	5	NR (GRAB)	DRILL OUT WITH AUGER	
5.5'-12.5' <u>Gravelly Silty SAND (SM)</u> ; yellow to light tan calcium cemented silt (same as above); overlying light tan/pink caliche cemented silty sand; overlying caliche cemented pink sand with dark and red gravel; mod. soft with increasing hardness towards base.	10	NR	0.5 CB 5.5-11.5 6	
12.5'-19.3' <u>CALICHE</u> ; pinkish brown calcium carb./dolomitic cemented sand, silt, gravel with concentric growth clasts; appears as growth clasts floating in matrix of silty sandy gravel; sand is vfg-fg quartz and feldspar; gravel is dark and red; v. hard; non-fractured.	15	NR	3.8 CB 11.5-16.5 5	
19.3'-23.8' <u>CALICHE</u> ; whitish tan calc. carb./dolomitic cemented silty sand with clasts of pink gravelly sand; whitish tan silty sand is vfg qtz. and feldspar with trace dark gravel; pink clasts are granitic vfg sand and gravel; partially healed vertical fracture; v. hard.	20	NR	5.2 CB 16.5-21.7 5.2	
23.8'-28.7' <u>CALICHE</u> ; pinkish tan sand with gravel; sand is vfg-fg qtz. and feldspar; sub rounded; gravel is angular red, black and opaque; trace vugs (<2 mm) and diagonal fractures; reduced cementation in basal 0.5'; v. hard; basal contact from drill-break.	25	NR	4.1 CB 21.7-26.7 5	
28.7'-30.7' <u>Sandy GRAVEL (GW)</u> ; pink sand with opaque, white, dark and red gravel and cobbles; sand is vfg; gravel and cobbles angular to well rounded; v. loose; basal contact from drill break; red clay below 30.7'.	30	NR	1.1 CB 26.7-31.7 5	OGALLALA TRIASSIC
30.7'-42' <u>CLAY (CL)</u> ; dusky red; hard; dense; with white calc. carb. inclusions; moist; yellow and purple mottling below 38'.	35	NR	1.85 SS 32-34 2 SS 34-36 2 SS 36-38 2 SS 38-40 2	

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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE	Project No.: 92-152	Date Drilled: 12-9-92	Boring No.: B-13	Grid No.: 9-C
Log By: A. WEEGAR	Drilling Method & Bit Sizes: AIR ROTARY; MUD ROTARY 21.8'-32'		Survey Data: Northing: 8073.4781 Easting: 11389.9571	
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): SPLIT SPOON; CORE BARREL		Ground Surface Elev. (MSL): 3,476.22	
Driller: LANE SCARBOROUGH	Total Depth: 100'			
Remarks: MUD ROTARY BOREHOLE DRILLED ON 1/8/93 NEXT TO ORIGINAL BOREHOLE. LOG IS COMPOSITE OF BOTH BOREHOLES.				

Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft. Ft. Sampled	Stratigraphic Interval
0' - 1' TOP SOIL; brown sandy silt; loose; root material; moist.	0		DRILL OUT	
1' - 16.5' CALICHE; white and v. light gray calcium carb. cemented silty sand/sandy silt; trace vfg sand-sized pink min. frags. and lg sand and round gravel size dk. min. frags.; hard; crumbly; dry; natural fractures. Increasing sand and dk. gravel content below 7'.	1	NR	CB 1-4	
	3	NR	CB 4-7	
	5	NR	CB 7-10	
	7	NR	CB 10-13	
	10	NR	CB 13-18	
16.5' - 28.5' CALICHE; pink and gray calcium carb. cemented silt; v. hard; blocky fracture; concentric growth rings and apparent nodules; calcite crystal growth in vugs; trace subrounded dk. gravel clast; natural fractures; moist along fractures; basal contact from driller.	15	NR	CB 18-21	
	20	NR	DRILL OUT	
	25	NR	CB 21.8-26.8	
24' - 32' Gravelly SAND (SP); vfg to cg pink gravel w/ red, tan, olive and black/brown gravel; loose; sand and gravel is supr. to round; gravel is quartzite; basal contact from driller.	27	NR	CB 26.8-32	
	30	NR	DRILL OUT	
32' - 33' CLAY (CL); gray; mod. soft; sl. plastic; soapy; moist.	32	NR	DRILL OUT	
33' - 80' CLAY (CL); maroon clay; mod. plastic; sticky; soapy; very thin light gray, yellow and black laminations; moist to wet down to about 45'.	35	NR	CB 33.5-37	
	37	NR	SS 37-39	
	40	NR	CB 39-41	

OGALLALA
TRIASSIC

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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE	Project No.: 92-152	Date Drilled: 12/10/92	Boring No.: B-15	Grid No.: 6-H
Log By: A. WEEGAR	Drilling Method & Bit Sizes: AIR ROTARY		Survey Data: Northing: 5174.0479 Easting: 11692.9915 Ground Surface Elev.(MSL): 3,433.46	
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): CORE BARREL; SPLIT SPOON			
Driller: LANE SCARBOROUGH	Total Depth: 100'			
Remarks:				

Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft. / Ft. Sampled	Stratigraphic Intervals
0' - 2' <u>TOP SOIL</u> ; brown Silty sand; soft	0			
2' - 19' <u>CALICHE</u> ; pinkish white calcium carbonate cemented silt; trace pink & dk. min. frags.; v. hard; dry.	0.8	NR	SS 1-2	1
	1.5	NR	CB	3
	3	NR (GRAB)	CB	3
	5	NR (GRAB)	CB	3
	7	NR (GRAB)	CB	3
	9	NR (GRAB)	CB	3
	11	NR (GRAB)	CB	3
	13	NR (GRAB)	CB	3
	15	NR (GRAB)	CB	3
	17	NR (GRAB)	CB	3
19' - 29' <u>CALICHE</u> ; pinkish white calc. carb. cemented and relatively uncemented qtz. sand & silt w/ gravel; sand is vfg, rd; gravel is sup. red, white, pink, black quartzite; hard; dry; trace pelecypod shells; basal contact from driller. Unable to remove gravel w/ air - rotary drilling; abandon original hole at 36' (6-H), move 5', and drill mud - rotary to top of Triassic at 29' at location 6-H(a); begin continuous coring.	20	NR (GRAB)	CB 20-22	2
	25		DRILL OUT w/ ROCK BIT	
29' - 38.9' <u>Silty CLAY (CL)</u> ; dusky red w/ lt. gray & yellow mottling; silty claystone w/ thin interbeds of clayey siltstone; trace vfg mica frags.; carb. plant material; mod. hard; blocky fracture; non-plastic; slightly soapy; dry.	30	NR (GRAB)	CB 29-31	2
	31	NR (GRAB)	CB 31-34	3
	34		CB 34-38	4
	38		CB 38-42	4
38.9' - 40.5' <u>Very Clayey SILT (ML)</u> ; see description next page.	40			

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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE		Project No.: 92-152	Date Drilled: 12/22/92	Boring No.: B-33	Grid No.: 8-F
Log By: P. GRANT	Drilling Method & Bit Sizes: AIR ROTARY		Survey Data: Northing: 6502.8105 Easting: 11209.2032 Ground Surface Elev. (MSL): 3,466.96		
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): SPLIT SPOON; CORE BARREL				
Driller: LANE SCARBOROUGH	Total Depth: 100'				
Remarks:					

Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft. Ft. Sampled	Stratigraphic Interval
0'-1' <u>TOP SOIL</u> : brown; silty sand; moist.	0		- DRILL OUT TO 25' WITH ROCK BIT.	
1'-24' <u>CALICHE</u> : white sandy silt; calcium carb. cement; hard; dry. - Ogallala gravels at 5' are white, pink, black quartzite; mod. hard. - more gravels below 10'; looser below 10'. - gravel and coarse sand strata at 18'; drills easily; light tan cuttings; sl. moist. - yellow silty clay in bottom foot of Ogallala with some small rounded gravels.	5 10 15 20		- LITH. LOG FROM CUTTINGS.	
24'-34' <u>CLAY (CL)</u> : dark reddish-brown claystone; sl. plastic; crumbly; dense; sl. moist; yellow mottling; white burrow(?) infillings present; sl. reactive to HCl.	25			OGALLALA TRIASSIC
		NR (GRAB)	0	SS 25-27
		NR (GRAB)	0	CB 27-30
	30		2.8	CB 30-33
		NR	3.3	
34'-42' <u>Silty CLAY (CL)</u> : reddish-brown silty claystone; green- gray, yellow & white mottling; crumbly; appears slightly bioturbated; not reactive with HCl; dense; dry; sl. soapy; hard.	35			
		NR		CB 33-36
		NR	7	
	40			CB 39-40

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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE	Project No.: 92-152	Date Drilled: 01/14/93	Boring No.: B-38	Grid No.: 6-C
Log By: R. MCGOWEN	Drilling Method & Bit Sizes: AIR ROTARY		Survey Data: Northing: 7439.5530 Easting: 12749.4139	
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): SPLIT SPOON; CORE BARREL		Ground Surface Elev. (MSL): 3,478.65	
Driller:	Total Depth: 100'			
Remarks:				

Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft.		Stratigraphic Intervals
			Ft.	Sampled	
- gray clay with red clay angular wafers.	40			DRLG	
- siltstone-white over whitish and red (very little) clay & river pea gravel.	42-44	NR ?	1	SS	
44'-48'	45	NR	0	SS	
CLAY (CL): white with pebbles and iron mineralized nodules, minor amount of silt.	46-48	NR	0	SS	
	48-50	NR	1.1	SS	OGALLALA TRIASSIC
48'-100'	50		4	CB	
CLAY (CL): red with yellow mottling; soft; plastic; moist.	50-54		4	CB	
	55	NR ?	2.1	CB	
- purple and yellow mottling.	54-62		8	CB	
	60	NR ?	2.1	CB	
- dry and brittle	62-71		9	CB	
- orange-red	70	NR ?	7.15	CB	
	75		10	CB	
- orange-red with yellow-green mottling, green-whitish clay nodules, some purplish color in mottling.	71-81			CB	
	80				

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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE	Project No.: 92-152	Date Drilled: 12/12-12/13/92	Boring No.: B-17	Grid No.: 5-D
Log By: P. GRANT	Drilling Method & Bit Sizes: AIR ROTARY	Survey Data: Northing: 6775.0974 Easting: 12991.3313 Ground Surface Elev. (MSL): 3,467.79		
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): CORE BARREL			
Driller: LANE SCARBOROUGH	Total Depth: 126'			
Remarks: CORE DESCRIBED FROM CORE SAMPLES ON 12/28/92 AT HOLT OFFICE				

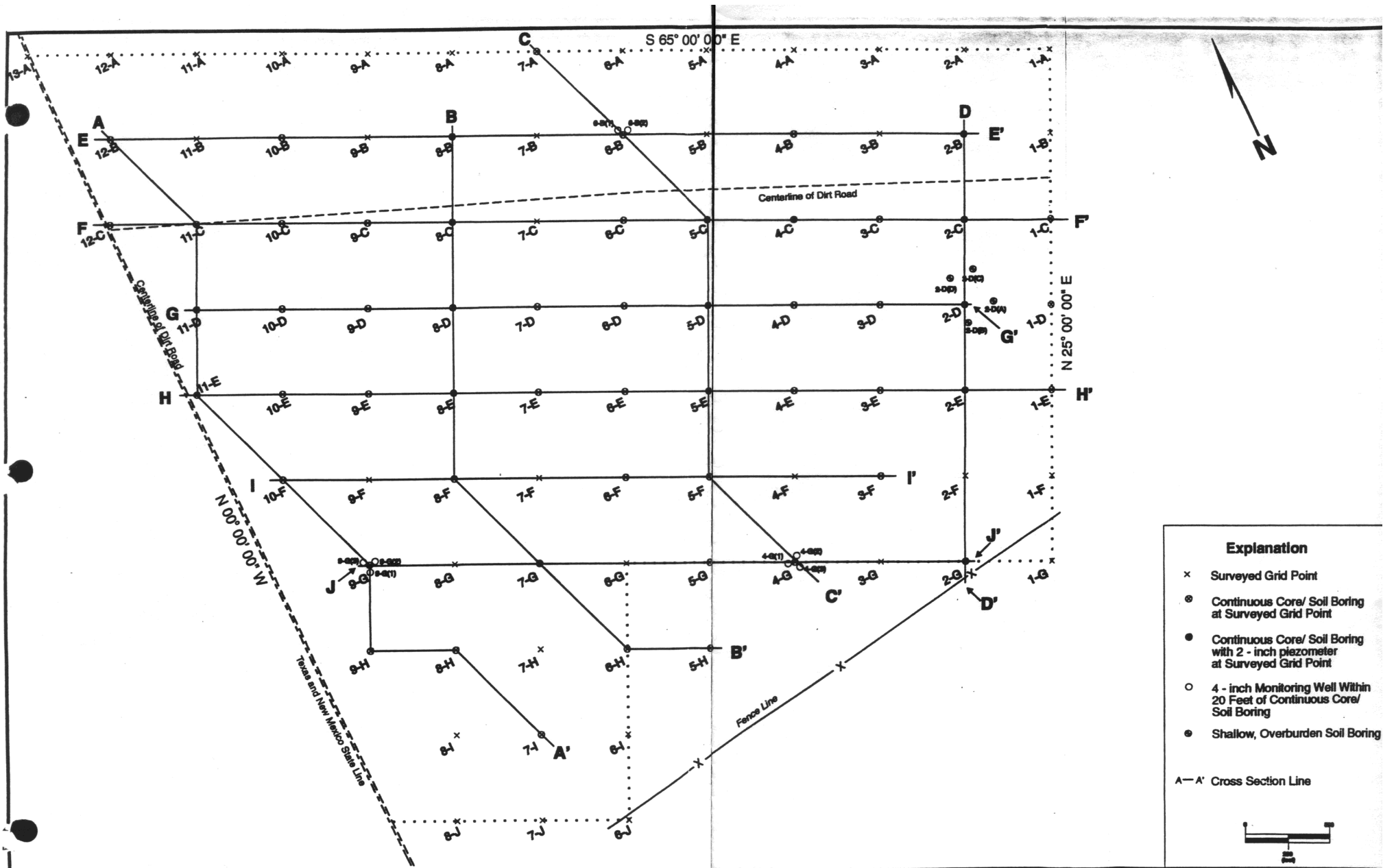
Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft. Ft. Sampled	Stratigraphic Interval
0' - 17' <u>CALICHE</u> : white to tan; sandy silt; hard; dry; calcite cemented. - quartzite gravels appear at approx. 5'; white, red, & black; subrounded to angular.	0 5 10 15			
17' - 25' <u>Clayey SILTSTONE (ML)</u> : reddish-purple; weathered; hard; blocky fract.; dry; dense.	20			
25' - 36' <u>Silty CLAY (CL)</u> : whitish - brown to red; extensive white mottling (burrowing remnants (?)); mod. hard; sl. crumbly; dry.	25	NR	1.3	OGALLALA TRIASSIC
	25-28	CB	22-28	
	28	NR	6	
	28-32	CB	28-32	
36' - 99' <u>Slightly Silty CLAY (CL)</u> : reddish-brown; yellow and brown mottling; hard; sl. plastic; dense; sl. soapy; dry.	30	NR	1.3	
	32-36	CB	32-36	
	35	NR	4	
	36-40	CB	36-40	
	40			

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SOIL BORING LOG

Location: ANDREWS CO. LANDFILL SITE	Project No.: 92-152	Date Drilled: 11/23-24/92	Boring No.: B-6	Grid No.: 4-E
Log By: P. GRANT	Drilling Method & Bit Sizes: AIR ROTARY	Survey Data: Northing: 6110.5469 Easting: 13233.0975 Ground Surface Elev. (MSL): 3,450.38		
Drilling Company: SCARBOROUGH DRILLING, INC. LAMESA, TEXAS	Sample Method(s): CORE BARREL; SPLIT SPOON			
Driller: LANE SCARBOROUGH	Total Depth: 100'			
Remarks: CORE DESCRIPTION FROM CORE SAMPLES VIEWED ON 12/28/92 AT HOLT OFFICE				

Unified Soil Classification/Description (Color, Texture, Structure, Grain Size)	Depth (feet)	Graphic Log	Recovered Ft. Ft. Sampled	Stratigraphic Intervals
<p>0'-12'</p> <p><u>CALICHE</u>: white to tan to pink siltstone with some sand; calcite cemented; v. hard to crumbly; dry.</p> <p>- below 6' depth Ogallala gravels appear; red to white to black quartzite clasts; subrounded to angular; dry.</p>	0		<p>DRILLED OUT TO 6' W/BIT DESCRIPTION FROM CUTTINGS</p>	
	5	NR	1	CB 6-9
		NR		3
	10	NR	1	CB 9-12
		NR		3
	12'-15'		1.5	CB 12-15
<p><u>SAND and GRAVEL (GW)</u>: reddish brown; fg-vfg quartz sand; quartz pebbles; subrounded to subangular; hard; dry.</p>	15	NR	0.5	SS 15-17
		NR		3
			0.8	SS 17-18
				2
	15'-74'		0	
<p><u>Silty CLAY (CL)</u>: reddish brown to reddish purple; mottled white dendritic pattern; mod. hard; sl. crumbly above 25'; silty interbeds; white borings(?) uncommon; dry.</p> <p>- yellow mottling below 40'</p>	20	NR		CB 18-22
			1.5	CB 22-25
		NR		3
	25		0.8	CB 25-28
		NR		3
			1.3	CB 28-31
	30	NR		3
			1.5	CB 31-34
		NR		3
	35		3	CB 34-40
		NR		3
	40			E

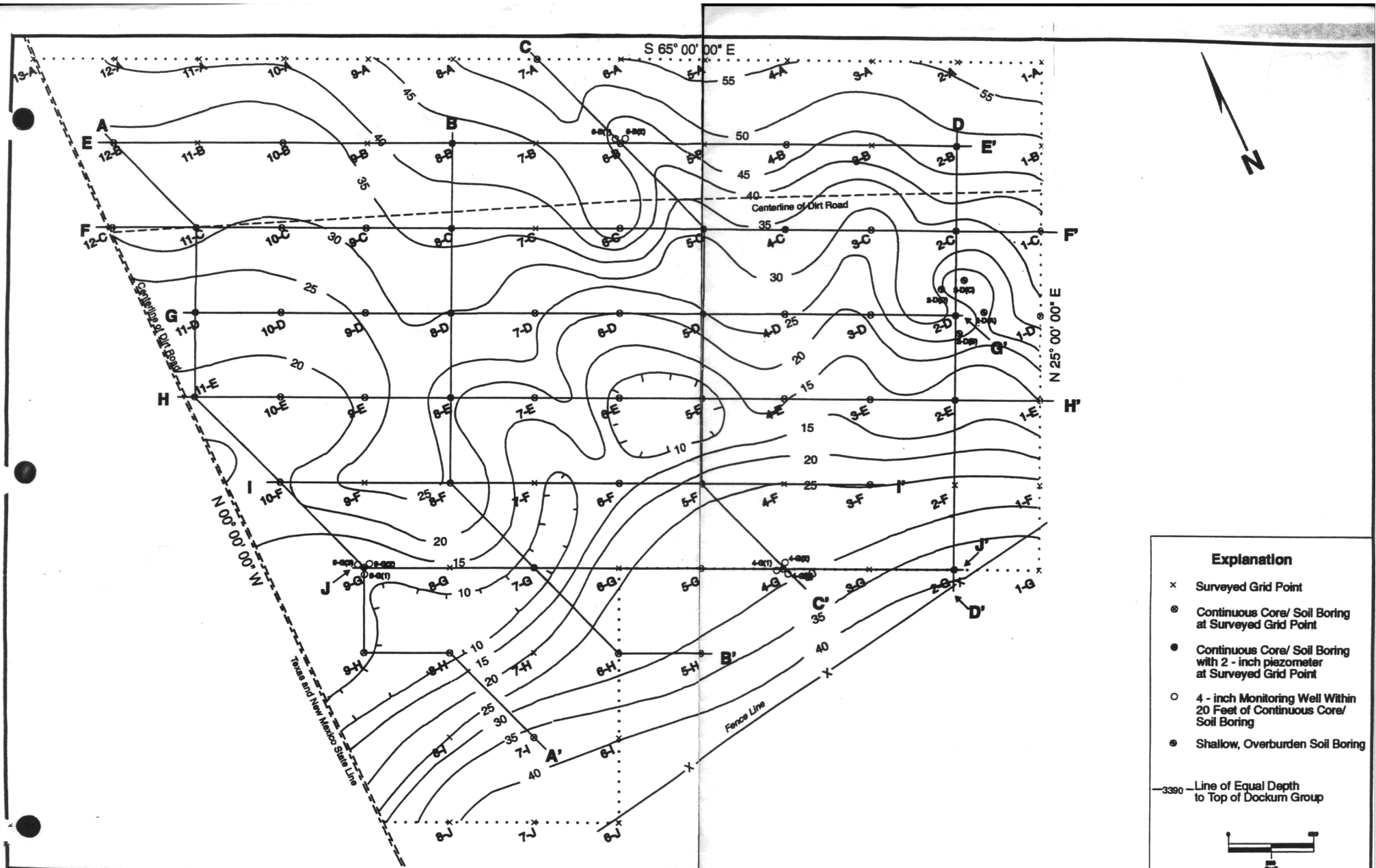


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Figure VI.A.23

Location of Site Investigation Cross Sections

Drawn By: RM	Date: 2/24/93
Checked By: ACW	Job No.: 92-152
Drawing #: 92-152.M.1	



Explanation

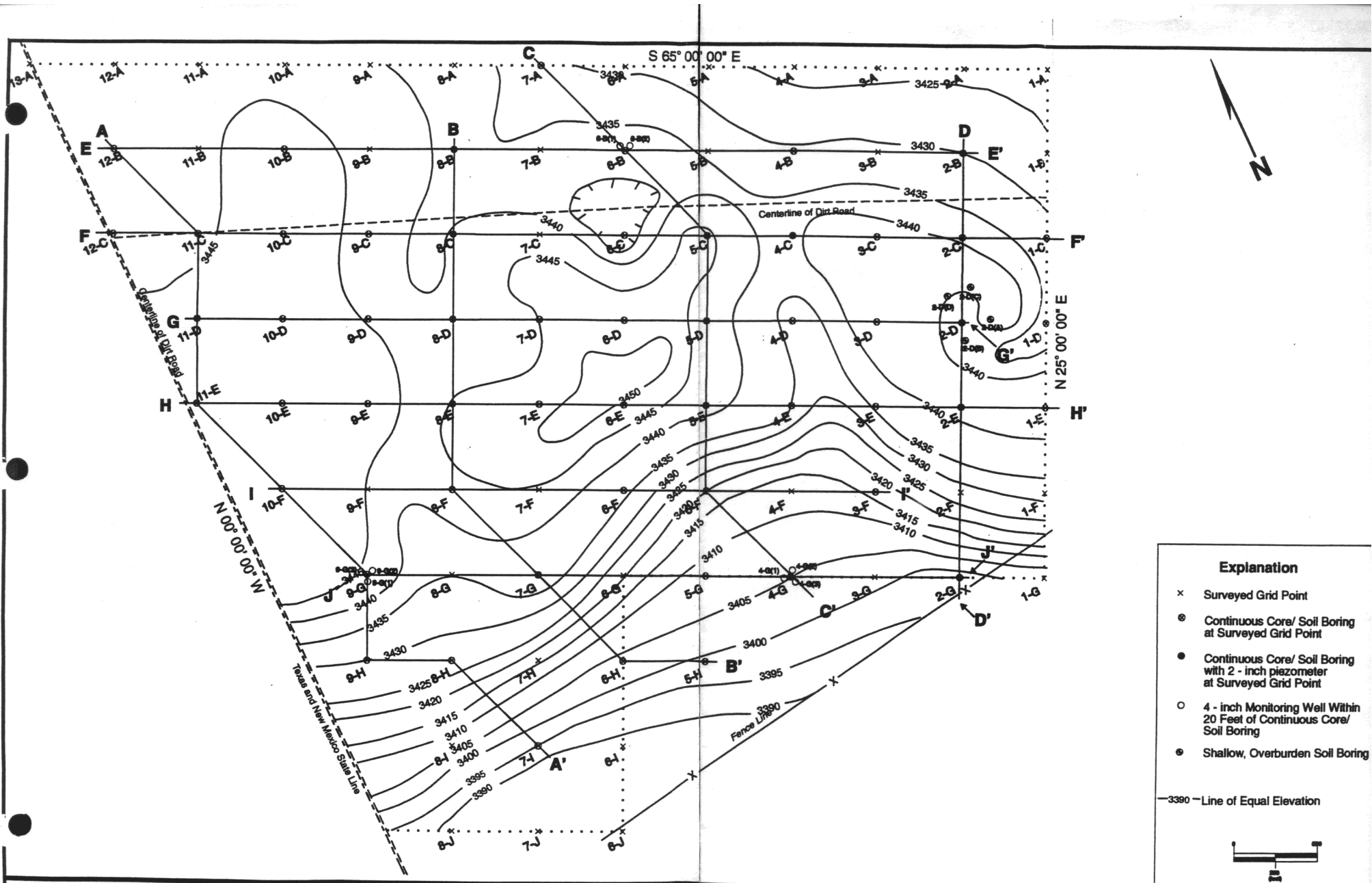
- × Surveyed Grid Point
- ⊙ Continuous Core/ Soil Boring at Surveyed Grid Point
- Continuous Core/ Soil Boring with 2 - inch piezometer at Surveyed Grid Point
- 4 - inch Monitoring Well Within 20 Feet of Continuous Core/ Soil Boring
- ⊙ Shallow, Overburden Soil Boring

—3390— Line of Equal Depth to Top of Dockum Group

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Figure VI.A.37 Depth to Top of Dockum Group

Drawn By: A. Weegar	Date: 2/24/93
Checked By: AGAJ	Job No.: 92-152
Drawing #: 92-152.M.1	



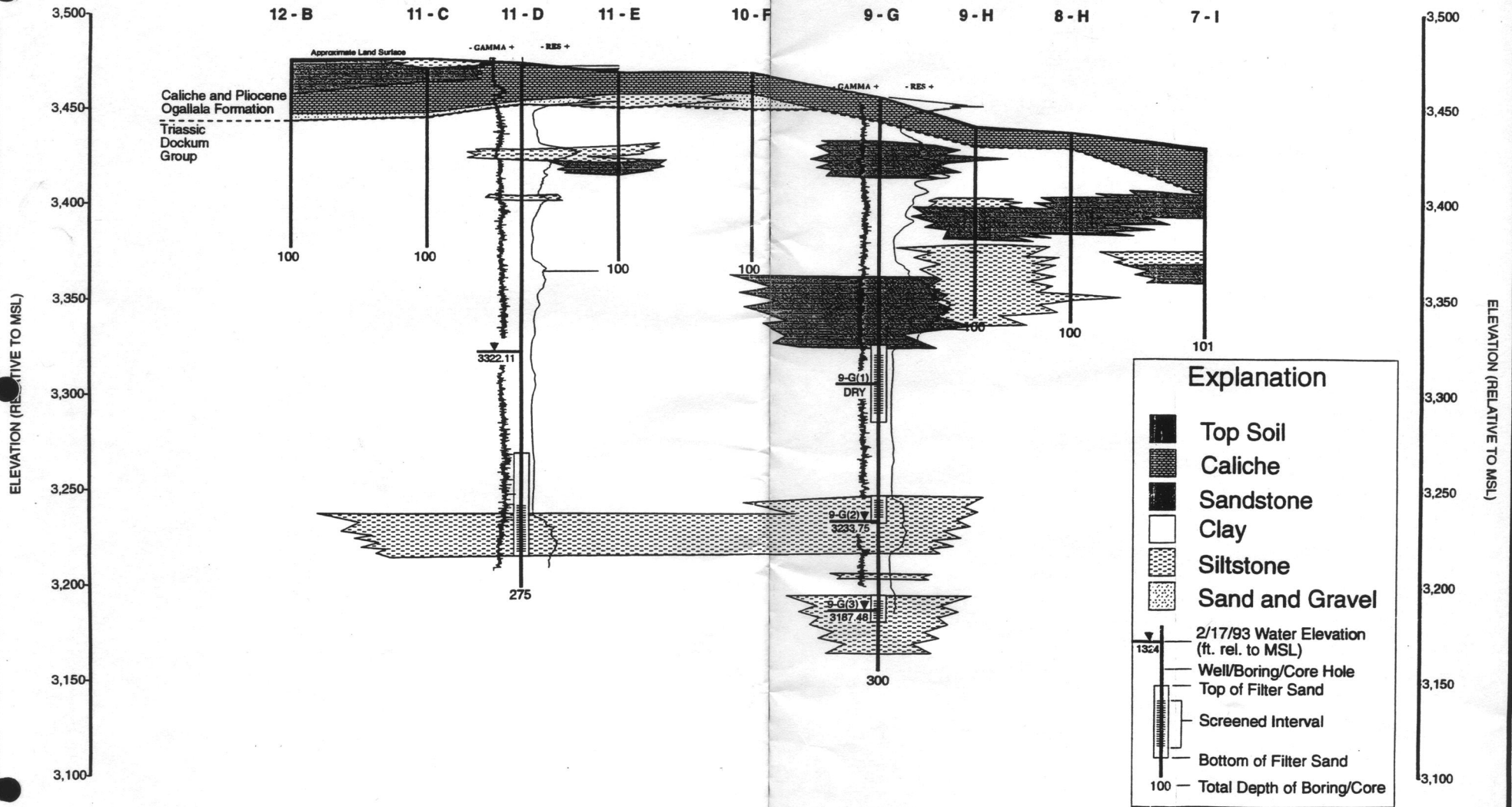
Explanation

- × Surveyed Grid Point
- ⊙ Continuous Core/ Soil Boring at Surveyed Grid Point
- Continuous Core/ Soil Boring with 2 - inch piezometer at Surveyed Grid Point
- 4 - inch Monitoring Well Within 20 Feet of Continuous Core/ Soil Boring
- ⊙ Shallow, Overburden Soil Boring

—3390— Line of Equal Elevation

A North

South A'

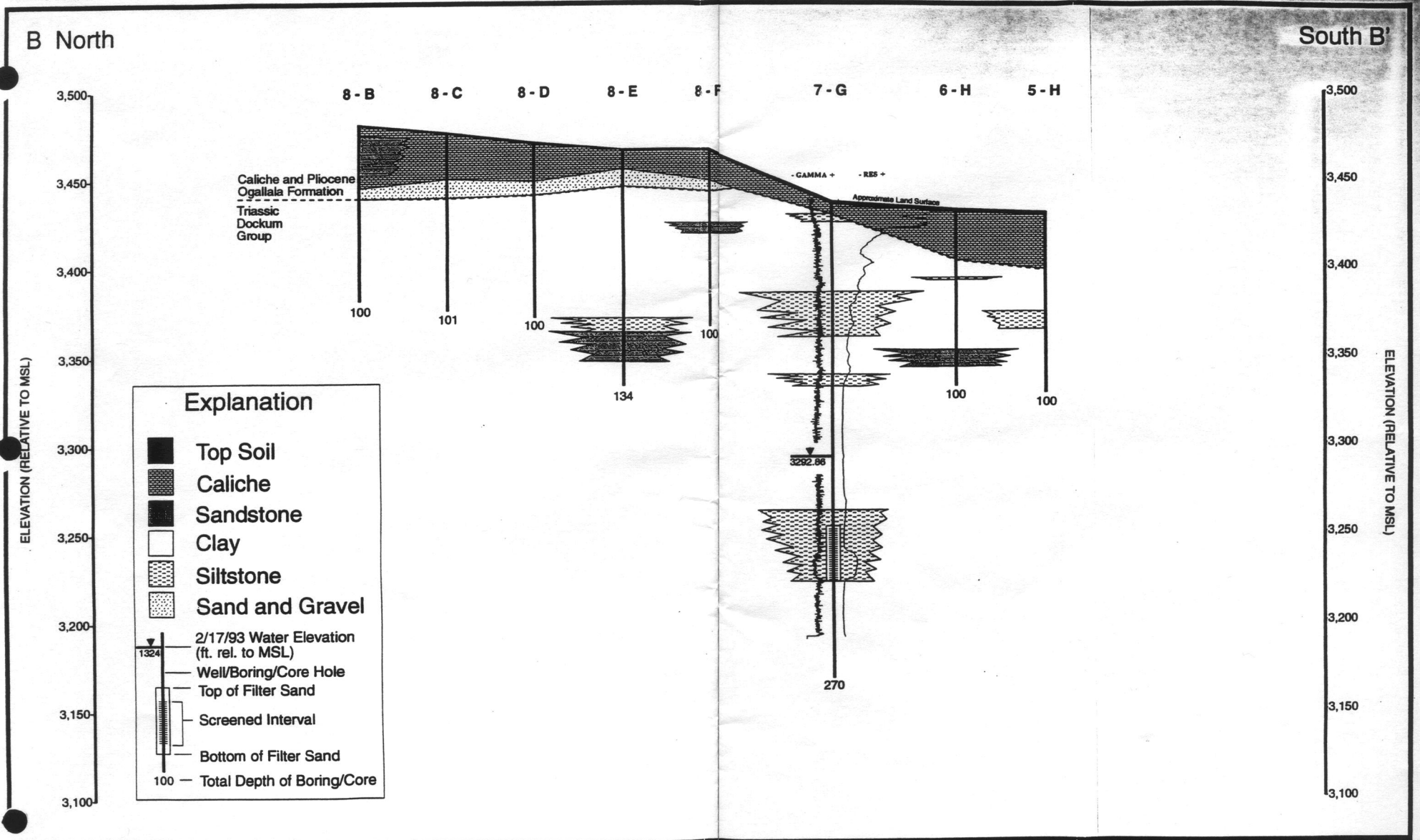


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Figure VI.A.24

CROSS-SECTION A-A'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: AGW	SCALE: 0 FEET 400
DRAWING #: 92-152.X.1	JOB NO: 92-152



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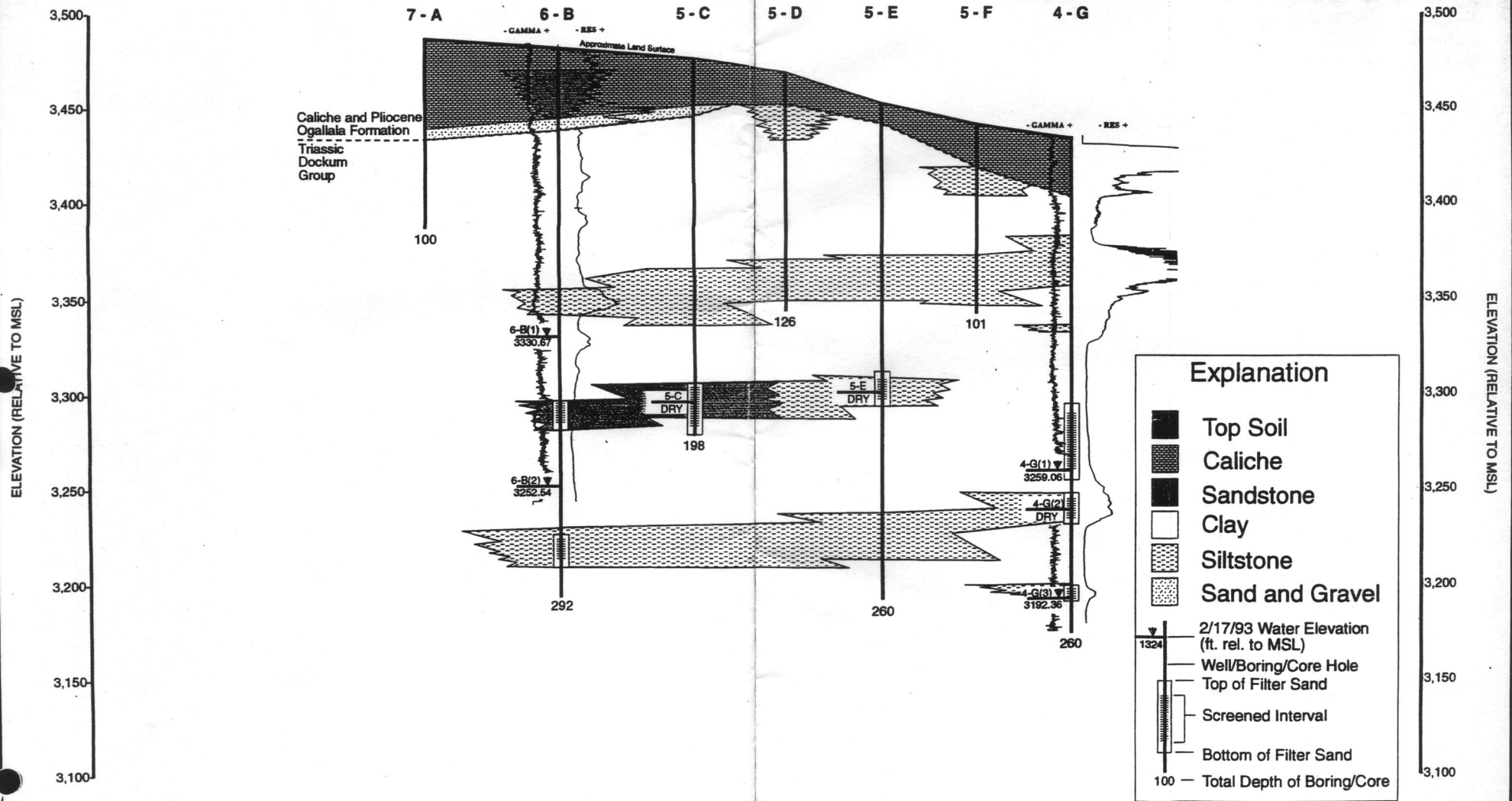
Figure VI.A.25

CROSS-SECTION B-B'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: AGW	SCALE: 0 FEET 400
DRAWING #: 92-152.X.2	JOB NO: 92-152

C North

South C'



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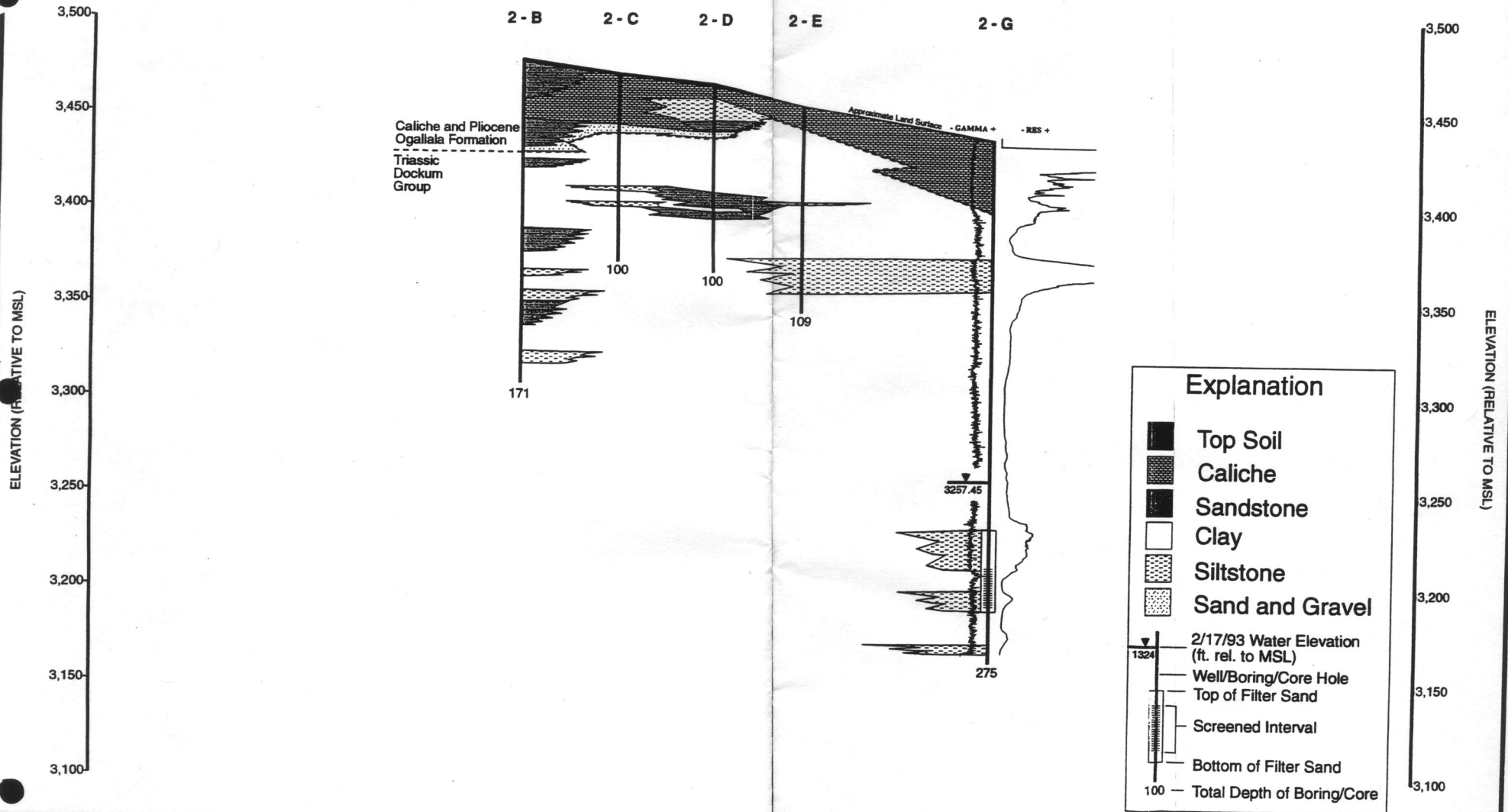
Figure VI.A.26

CROSS-SECTION C-C'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: <i>AGW</i>	SCALE: 0 FEET 400
DRAWING #: 92-152.X.3	JOB NO: 92-152

D North

South D'

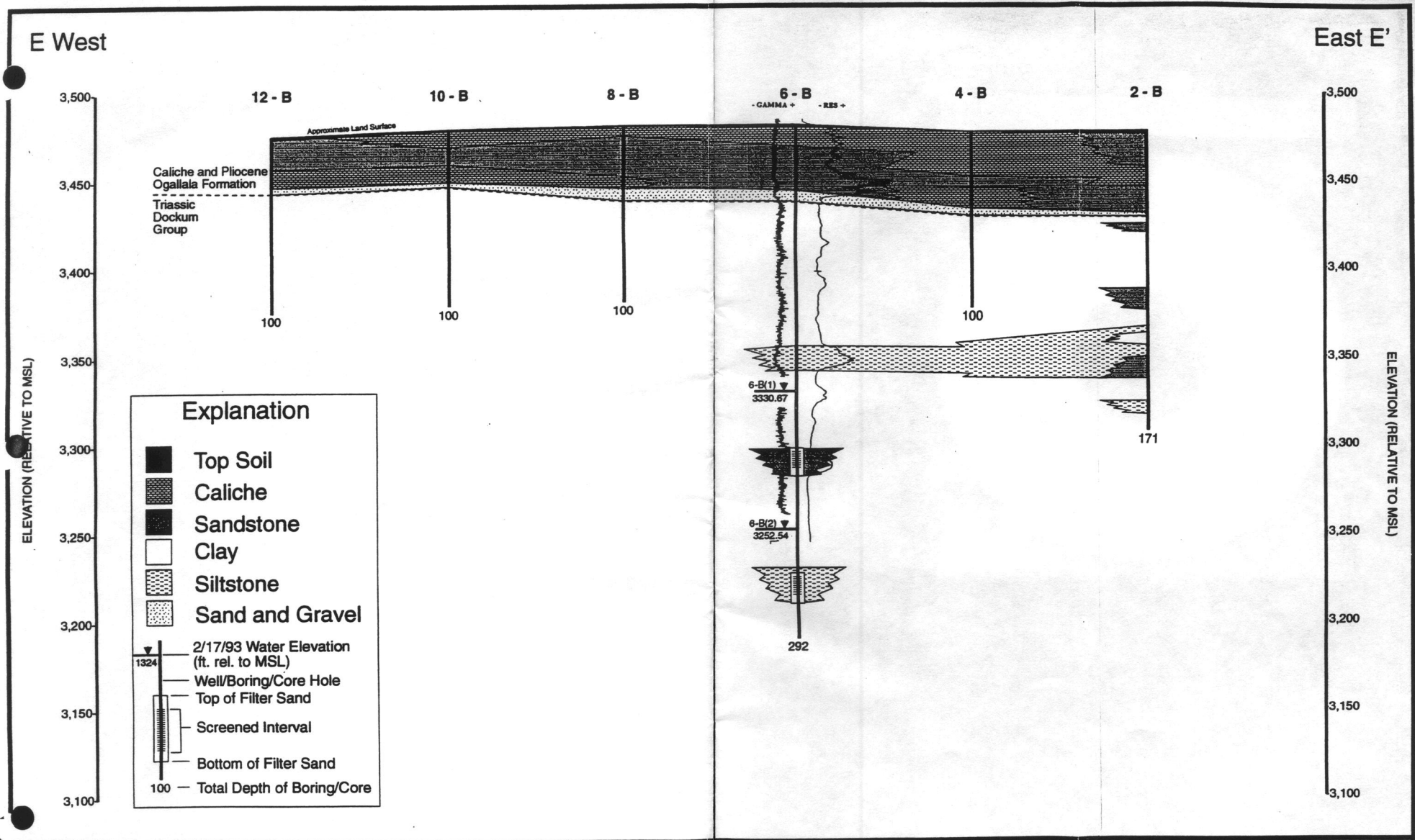


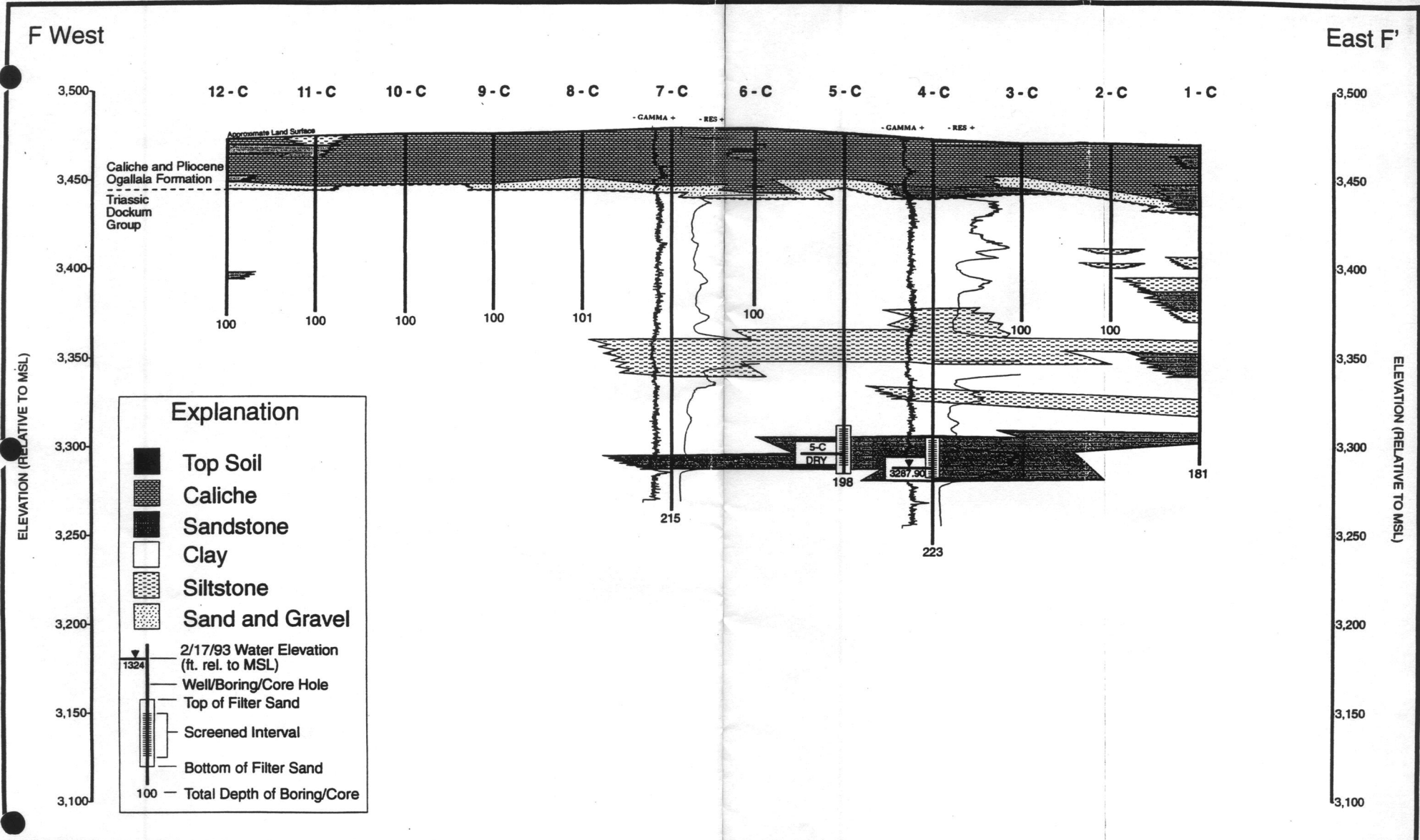
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Figure VI.A.27

CROSS-SECTION D-D'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: [Signature]	SCALE: 0 FEET
DRAWING #: 92-152.X.4	JOB NO: 92-152



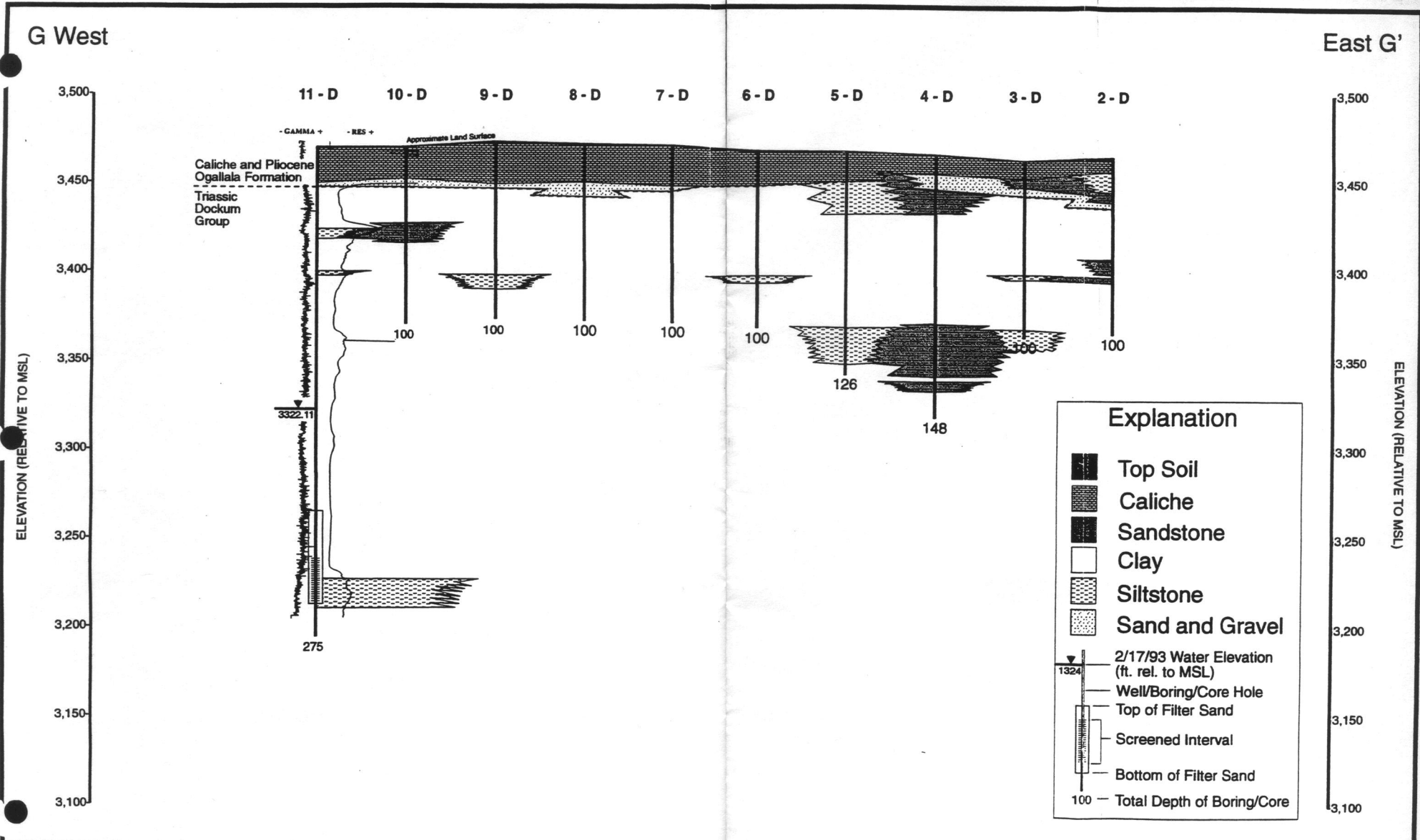


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Figure VI.A.29

CROSS-SECTION F-F'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: ALW	SCALE: 0 FEET 100
DRAWING #: 92-152.X.6	JOB NO: 92-152



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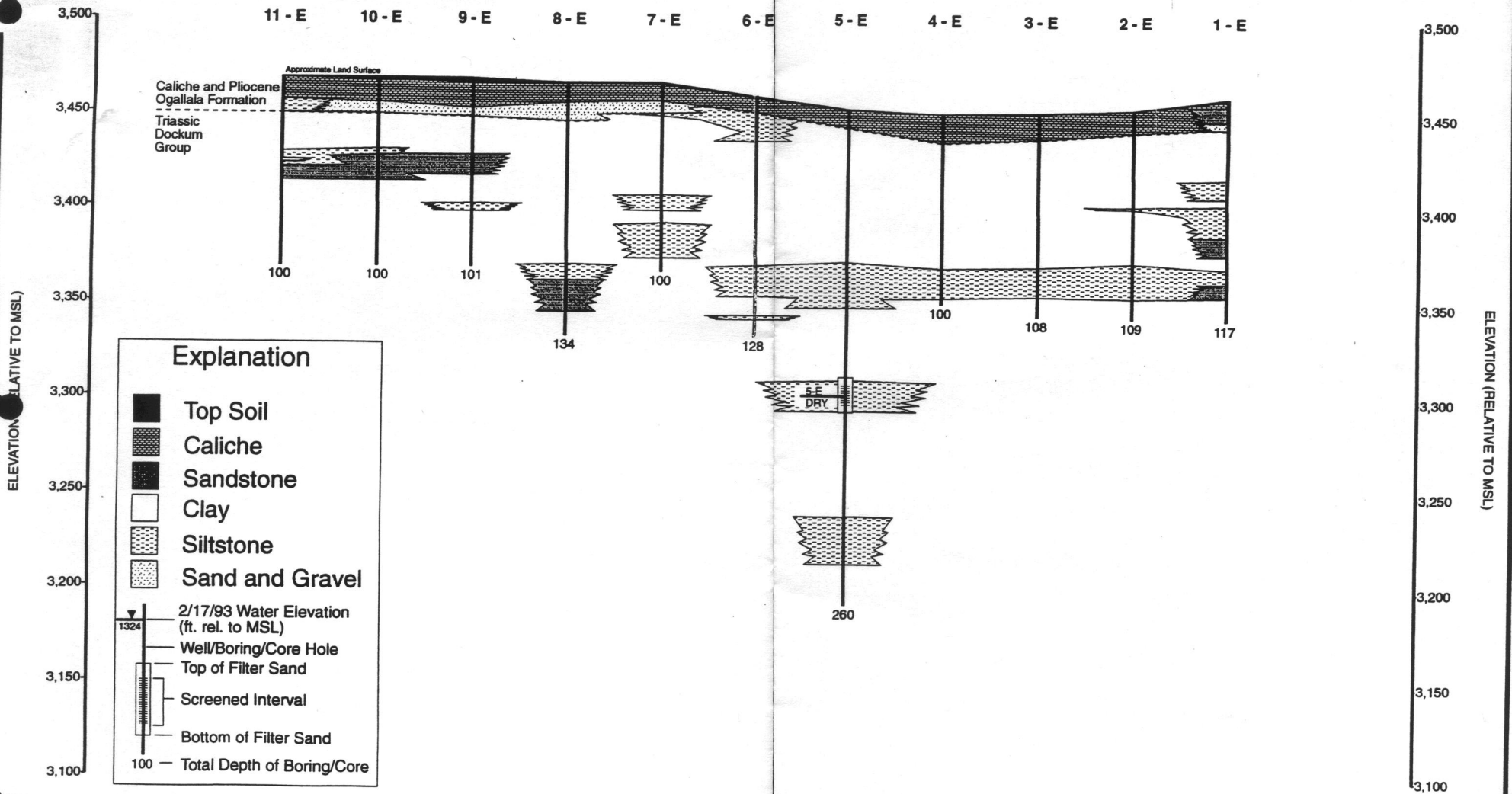
Figure VI.A.30

CROSS-SECTION G-G'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: AGW	SCALE: 0 FEET
DRAWING #: 92-152.X.7	JOB NO: 92-152

H West

East H'



Explanation

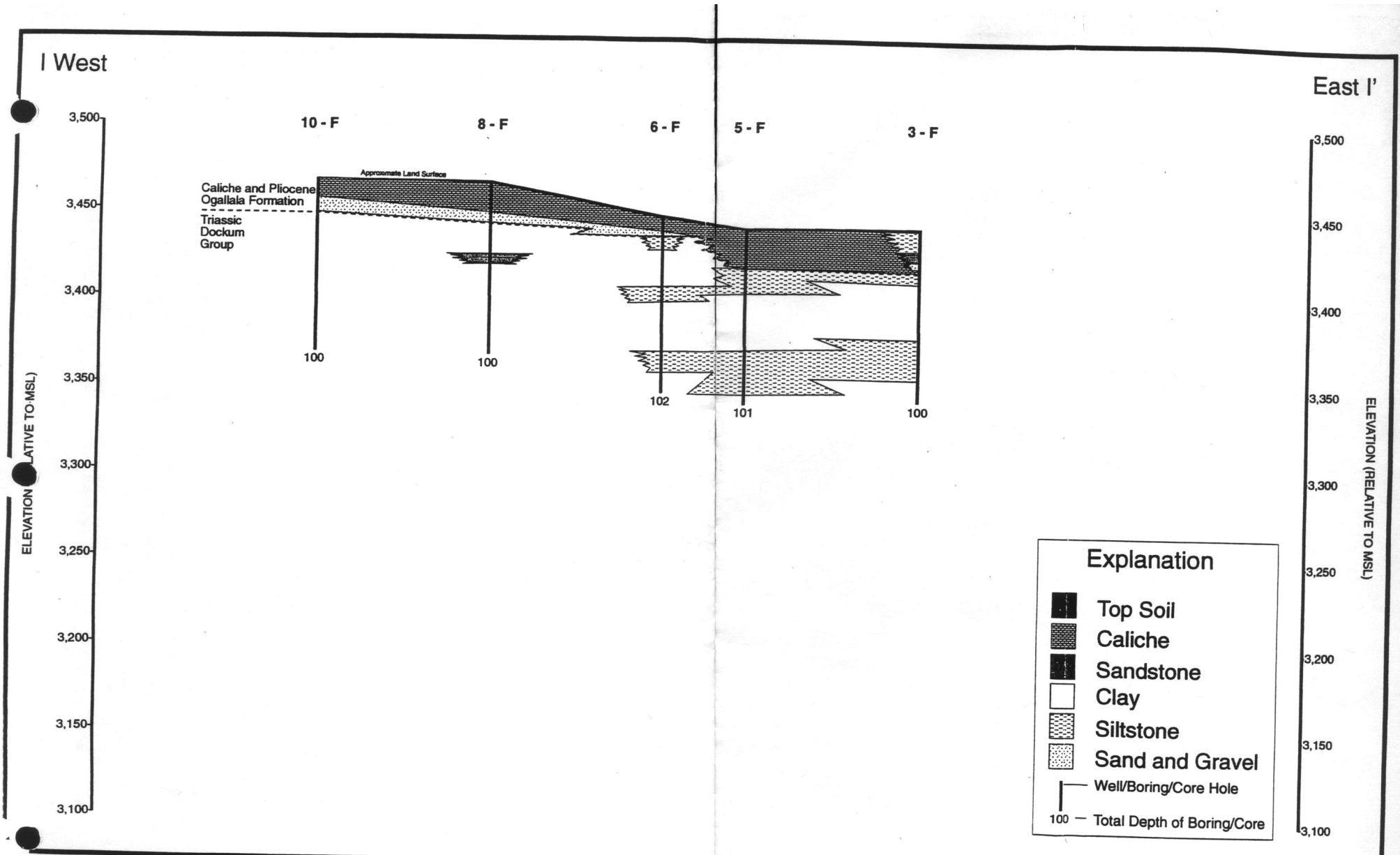
- Top Soil
- Caliche
- Sandstone
- Clay
- Siltstone
- Sand and Gravel
- 2/17/93 Water Elevation (ft. rel. to MSL)
- Well/Boring/Core Hole
- Top of Filter Sand
- Screened Interval
- Bottom of Filter Sand
- Total Depth of Boring/Core

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Figure VI.A.31

CROSS-SECTION H-H'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: <i>AGW</i>	SCALE: 0 FEET 400
DRAWING #: 92-152.x.8	JOB NO: 92-152



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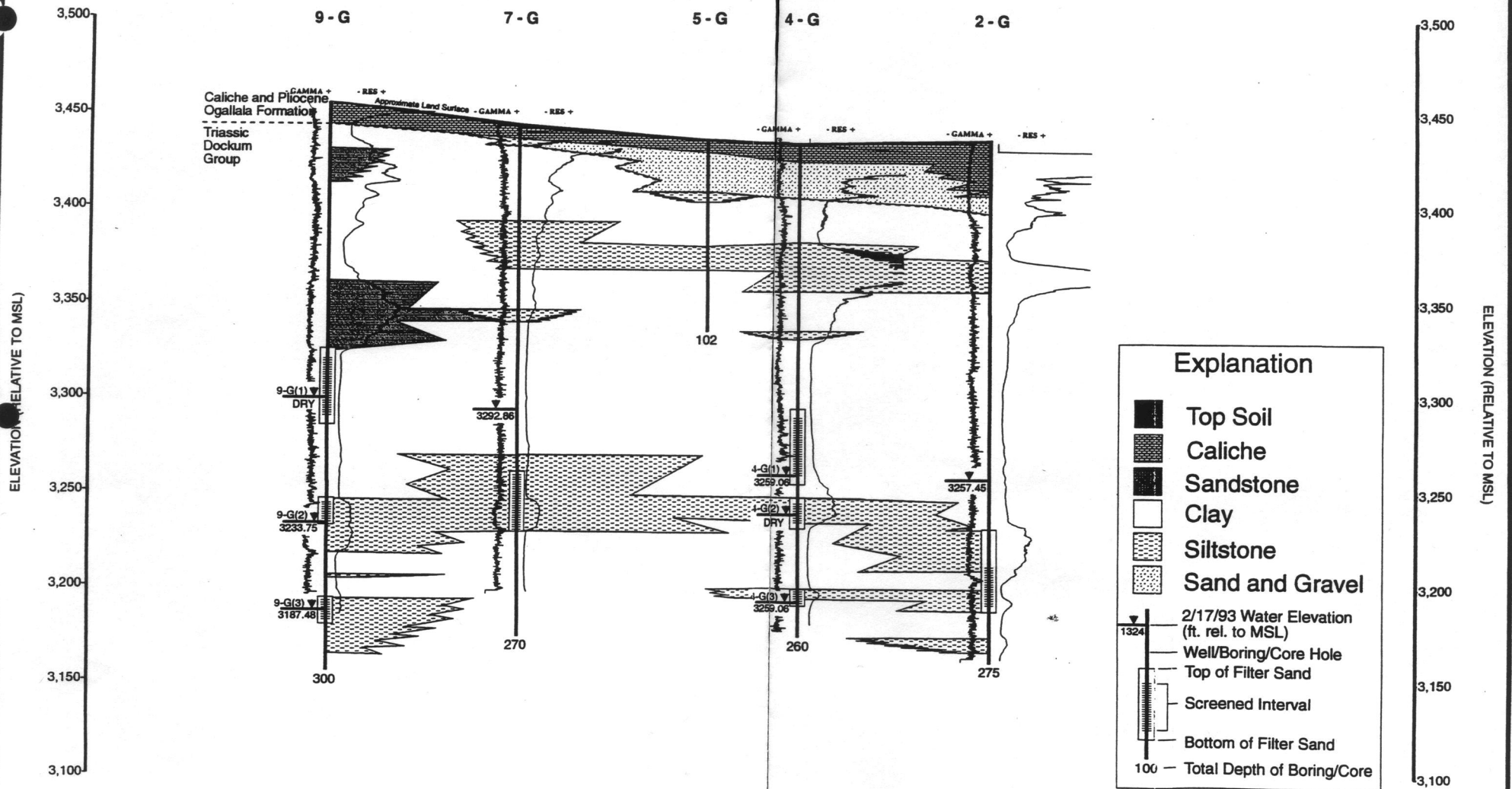
Figure VI.A.32

CROSS-SECTION I-I'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: <i>RM</i>	SCALE: 0 FEET 40'
DRAWING #: 92-152.X.9	JOB NO: 92-152

J West

East J'

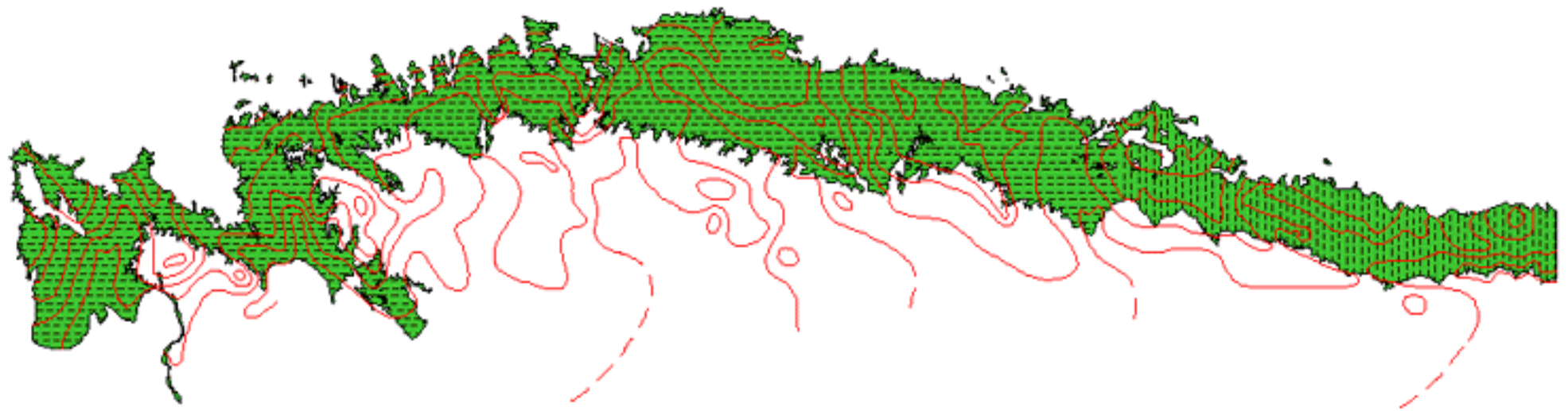


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Figure VI.A.33







CROSS-SECTION J-J'

DRAWN BY: RM	DATE: 3-8-93
CHECKED BY: <i>RM</i>	SCALE: 0 FEET 400
DRAWING #: 92-152.X.10	JOB NO: 92-152



Antlers Aquifer

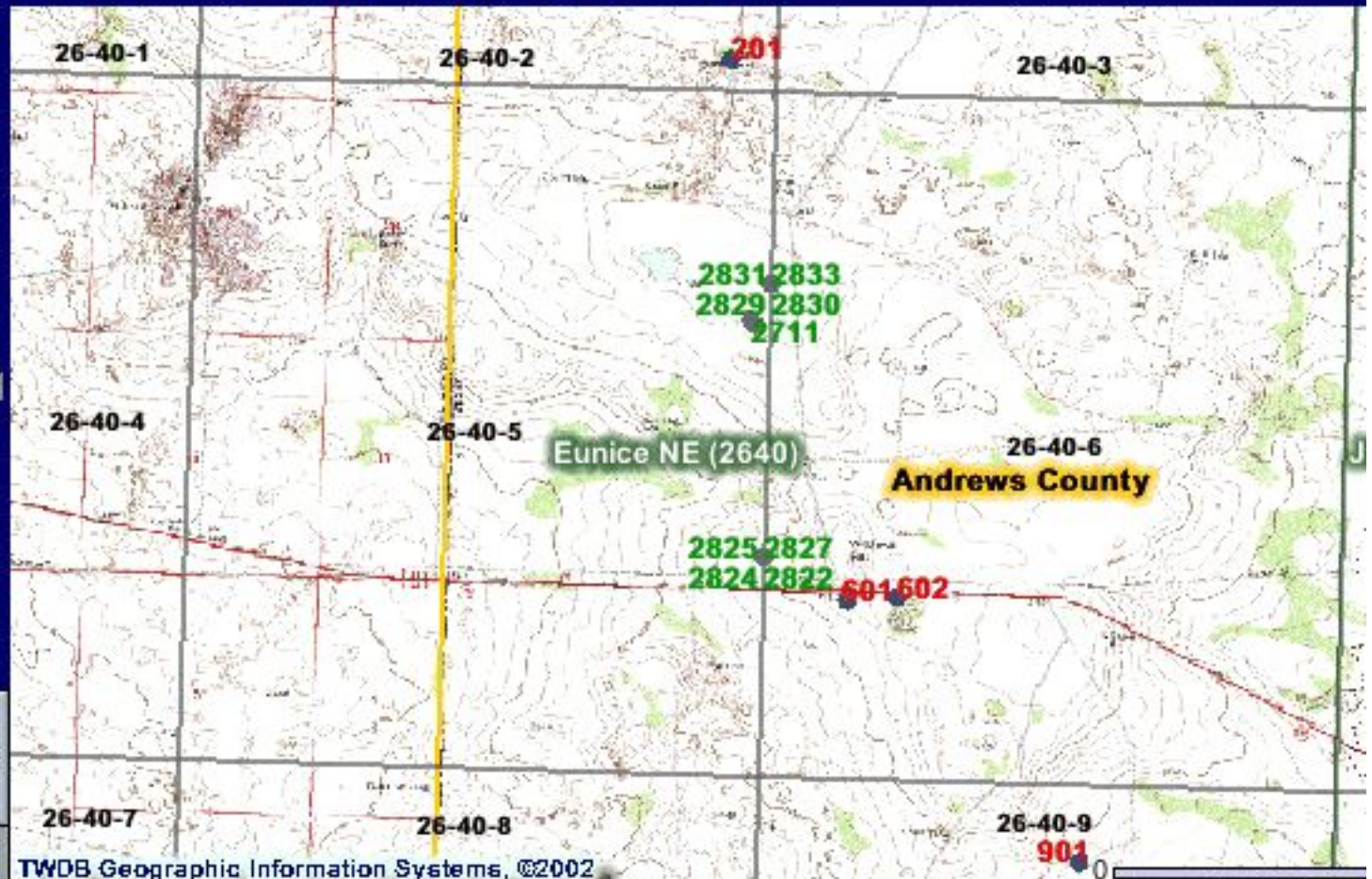
EXPLANATION

-  Water-level elevation contours in feet above sea level. Dashed where approximate. Contour interval is 50 feet. (Elevations not shown here)
-  Aquifer outcrop boundary
-  Hydraulic conductivity and recharge are not known
-  Hydraulic conductivity is 5.7 feet/day
-  Recharge of 0.32 inches/year
-  Recharge of 0.98 inches/year



Without a detailed geological survey, WCS has made the claim that the Ogallala found at their Andrews site has been misidentified by both the Terra Dynamics study, and every other State and Federal body (USGS and TWDB well data).

In this claim, they state that what was determined to be Ogallala is "Antler Sandstone". Antler Sandstone is part of the Antler formation (above) more than 300 miles away from the Andrews facility. The Antler formation does not reside anywhere near the Andrews facility, the New Mexico border, or west Texas. Despite this, the Bureau did not question this claim, and granted WCS a radioactive materials processing and storage license.



MAP TOOLS

Show Help on Tools



[Layers]

Visible Active

- TWDB
- Groundwater Data
- Submitted Driller's Reports
- Submitted Drillers Reports - D.I.M.s
- 7.5' USGS Grid
- 2.5' State Grid

TWDB Geographic Information Systems, ©2002

This graphic shows area wells around the WCS site in Andrews County. The facility resides under the word "Eunice" on the map. Red numbers indicate state-owned wells, while green numbers represent private wells which are recorded. From drilling records to present day, each state-owned well records being tapped into the Ogallala. In order to maintain its wild claims about the absence of the Ogallala, WCS purposely records that its wells do not tap into the Ogallala.

Typewrite (Black ribbon) or Print Plainly
(soft pencil or black ink)
Do not use ball point pen

Texas Department of Health Laboratories
1100 West 49th Street
Austin, Texas 78756

TDWR ONLY	
Organization No. <u>410</u>	Lab No. <u>01</u>
S. R. S.	
Work No. <u>6040</u>	

NOV 6 1980

CHEMICAL WATER ANALYSIS REPORT

County 002 Andrews
State Well No. 26-40-601
Well No. _____
Date Collected 10-09-80

Send report to:

Data Collection and Evaluation Section
Texas Department of Water Resources
P.O. Box 13087
Austin, Texas 78711

Location _____ Sample No. By F. Silberry
Source (type of well) Windmill Owner _____
Date Drilled _____ Depth _____ ft. WBF Ogallala
Producing intervals _____ Water level _____ ft. Sample depth _____ ft.
Sampled after pumping POA hrs. Yield _____ GPM ^{meas.}/_{est.} Temperature 069°F _____°C
Point of collection Disch. Pipe Appearance clear turbid colored other
Use Stock Remarks _____

(FOR LABOR)

CE1- 1768

CHEMICAL ANALYSIS
OCT 16 1980

NOV 05 '80

Laboratory No. _____ Date Received _____ Date Reported _____

	MG/L	ME/L
Silica . . . 00955 . . .	<u>44</u>	
Calcium . . . 00915 . . .	<u>62</u>	<u>3.12</u>
Magnesium . . . 00925 . . .	<u>8</u>	<u>0.66</u>
Sodium . . . 00929 . . .	<u>20</u>	<u>0.87</u>
Total		<u>4.65</u>
<input type="checkbox"/> Potassium . 00937 . . .	<u>3</u>	<u>0.108</u>
<input checked="" type="checkbox"/> Manganese . 01055 . . .		<u>4.73</u>
<input type="checkbox"/> Boron . . . 01022 . . .		%Na _____
<input checked="" type="checkbox"/> Total Iron . 01045 . . .		SAR _____
<input type="checkbox"/> (other) _____	MG/L	RSC _____
Specific Conductance (micromhos/cm ³) . 00095 .	<u>415</u>	
Diluted Conductance (micromhos/cm ³)	<u>4 x 118</u>	
		<u>472</u>

	MG/L	ME/L
Carbonate . . . 00445 . . .	<u>0</u>	
¹¹⁵ Bicarbonate . . . 00440 . . .	<u>233</u>	<u>3.82</u>
Sulfate . . . 00945 . . .	<u>19</u>	<u>0.40</u>
Chloride . . . 00940 . . .	<u>8</u>	<u>0.24</u>
Fluoride . . . 00951 . . .	<u>0.8</u>	
Nitrate . . . 71850 . . .	<u>23.2</u>	<u>0.37</u>
pH 00403 . . .	<u>8.0</u>	Total <u>4.83</u>
¹ Dissolved Solids (residue at 180°C) . . . 70300 . . .		<u>3.08</u>
Phenolphthalein Alkalinity as CaCO ₃ . . . 00415 . . .		<u>0</u>
Total Alkalinity as CaCO ₃ (3.84) . . . 00410 . . .		<u>1.91</u>
Total Hardness as CaCO ₃ (3.78) . . . 00900 . . .		<u>1.89</u>
² Nitrogen Cycle		
Ammonia - N 00610 . . .		
Nitrite - N RECEIVED . . . 00615 . . .		
Nitrate - N APR 13 1981 . . . 00620 . . .		
Organic Nitrogen . . . GRABDWR . . . 00605 . . .		

¹ The bicarbonate reported in this analysis can be converted by computation (multiplying by 0.4917) to an equivalent amount of carbonate, and the carbonate figure used in the computation of dissolved solids.
² Nitrogen cycle requires separate sample.
³ Total Iron and Manganese require separate sample.

Analyst _____ Checked By _____

TEXAS DEPARTMENT OF WATER RESOURCES

WELL SCHEDULE

Aquifer(s) Ogallala Project No. _____ State Well No. 26-40-201
(136) Field No./Owner's Well No. "WATER TANK" County Andrews (002)

1. Location: _____, Section _____, Block _____, Survey _____, Lat. 32-27-47, Long. 103-02-39

2. Owner: Ed Tinsley Address: Lamesa, Texas
Buddy Blawden
 Tenant (other): Kenneth Pike, Barman Address: Furness, New Mexico
 Driller: _____ Address: _____

3. Land Surface Elevation: 3491 ft. above msl determined by Topo

4. Drilled: _____ 19 _____; Dug, Cable Tool, Rotary, Air, _____

5. Depth: Rept. _____ ft. Meas. _____ ft.

6. Borehole Completion: Open Hole, Straight Wall, Underreamed, Gravel Packed

7. Pump: Mfr. _____ Type Cylinder
 No. Stages _____, Bowls Diam. _____ in., Setting _____ ft.
 Column Diam. _____ in., Length Tailpipe _____ ft.

8. Motor: Mfr. _____ Fuel Wind HP. _____

9. Yield: Flow _____ gpm, Pump _____ gpm, Meas., Rept., Est. _____ Date _____

10. Performance Test: Date _____ Length of Test _____ Made by _____
 Static Level _____ ft. Pumping Level _____ ft. Drawdown _____ ft.
 Production _____ gpm Specific Capacity _____ gpm/ft.

11. Quality: (Remarks on taste, odor, color, etc.) _____
 Analyses
 Date _____ Laboratory _____ TDS _____ Sp Cond _____
 Date _____ Laboratory _____ TDS _____ Sp Cond _____

12. Other data available (as circled): Pumping Test, Power & Yield Test, Drillers Log,
 Formation Samples, Geophysical Log(s) _____ (type)

13. Water Level(s): 82.97 ft. rept. 11-15-1979 above Edge Casing which is 0.5 ft. above Land Surface
meas. below
 _____ ft. rept. _____ 19 _____ above _____ ft. above Land Surface
meas. below

14. Use: Dom., Stock Public Supply, Ind., Irr., Observation, Other (Test Hole, Oil Test, etc.) _____

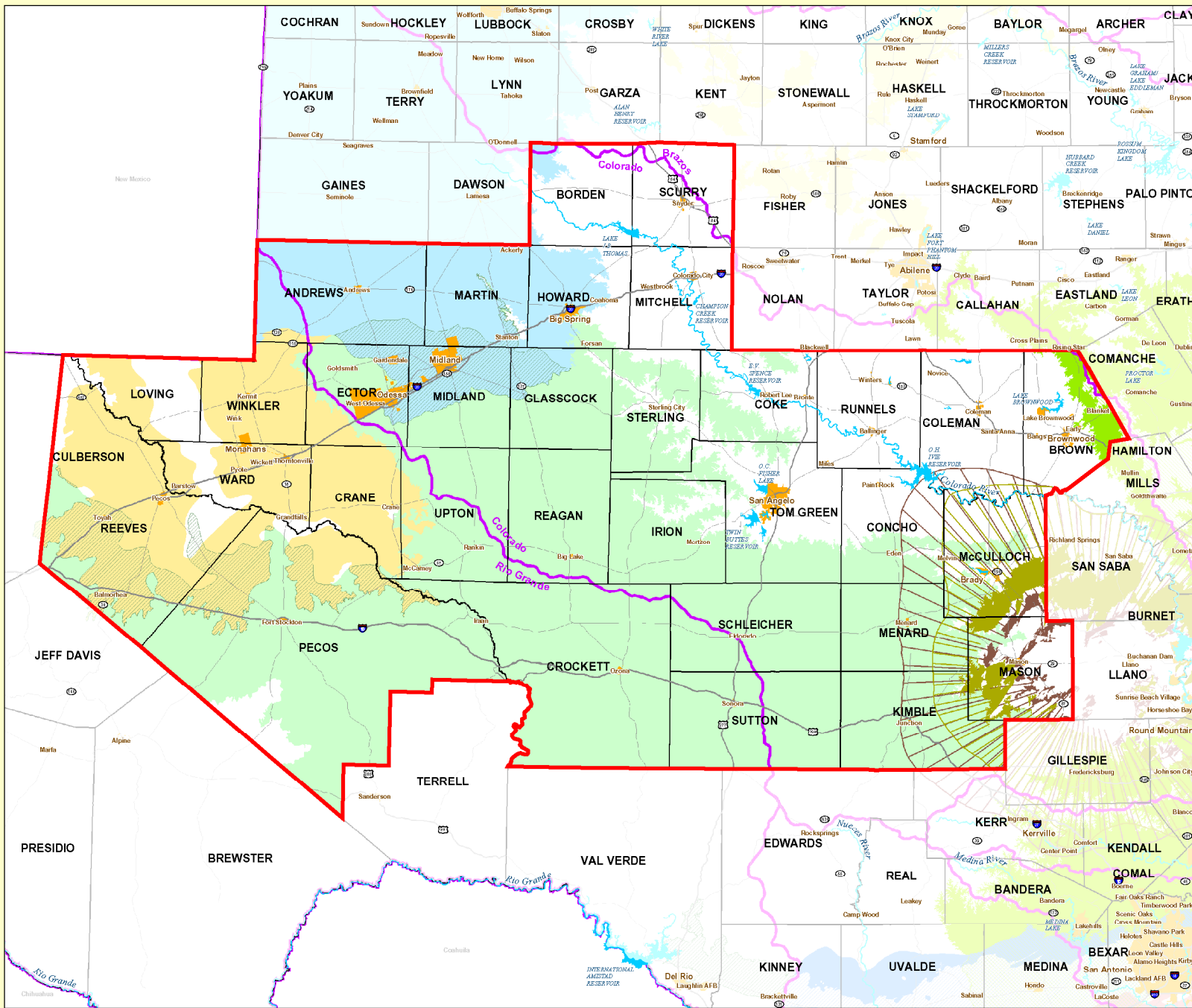
15. Recorded by: Crim Source of data: Field Obs. Date: 11-15-79

16. Remarks: "Water Tank" Windmill on top!

17. Location or Sketch: M.P. = 0.5 Edge of Casing

CASING, BLANK PIPE & WELL SCREEN Cemented From _____ ft. to _____ ft.			
Diam. (in.)	Type	Setting (feet)	
		From	to
10"	Steel		

Regional Water Planning Group - Region F



Map Legend

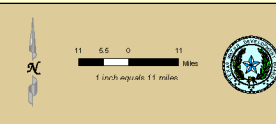
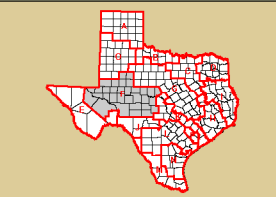
- Region F
- River
- Reservoir
- County
- River Basin
- City
- Hickory Outcrop
- Hickory Downip
- Ellenburger San Saba Outcrop
- Ellenburger San Saba Downip

Major Aquifers

- Ogallala Outcrop
- Gulf Coast Outcrop
- Edwards Balcones Fault Zone Outcrop
- Edwards Balcones Fault Zone Downip
- Carrizo Outcrop
- Carrizo Downip
- Trinity Outcrop
- Trinity Downip
- Edwards-Trinity (Plateau) Outcrop
- Edwards-Trinity (Plateau) Downip
- Seymour Outcrop
- Hueco-Mesilla Bolson Outcrop
- Cenozoic Peecos Alluvium Outcrop

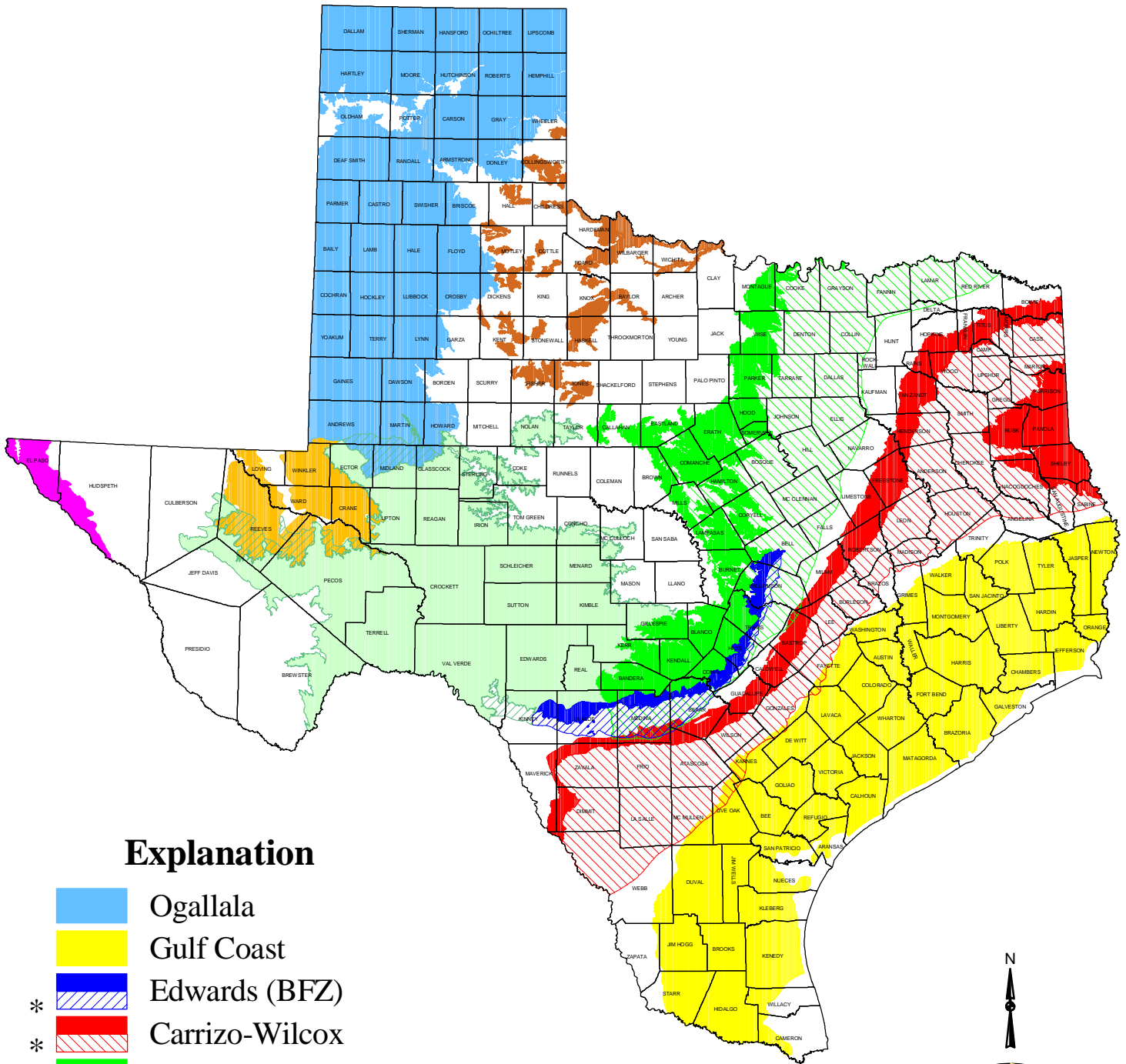
Major Aquifers

- Interstate
- US Highway
- State Highway




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Major Aquifers of Texas



Explanation

-  Ogallala
-  Gulf Coast
-  Edwards (BFZ)
- *  Carrizo-Wilcox
- *  Trinity
- *  Edwards-Trinity (Plateau)
-  Seymour
-  Hueco-Mesilla Bolson
-  Cenozoic Pecos Alluvium



OUTCROP (That part of a water-bearing rock layer which appears at the land surface)

* DOWNDIP (That part of a water-bearing rock layer which dips below other rock layers)