[redacted]

M-d

DUVAL CORPORATION #31 SANTA FE NO PERMIT
NW NW Sec. 17-T18N-R24E APACHE COUNTY 1-37

1-37

County Apache

Area Holbrook Basin

Lease No. _____

Well Name Duval Corporation #31 Santa Fe

Location NW NW ~~XX~~ Sec 17 Twp 18N Range 24E Footage 39' FNL - 311' FWL

Elev 5300' Gr _____ KB Spud Date 4-14-64 ~~Completed~~ Abandon 4-25-64 Total Depth 955'

Contractor _____

Drilled by Rotary _____
Cable Tool _____

Casing Size	Depth	Cement
7"	300'	
4-1/2"	802'	

Production Horizon _____

Initial Production _____

REMARKS This hole drilled as a potash test.

See file for Core Lithology. (Footage 792' - 955.5')

Elec Logs Sonic Log; Induction-Electrical Log; Gamma Ray-Neutron;

Applic. to Plug ___ Plugging Record x Completion Report x

Sample Log _____
Sample Descript. _____
Sample Set P-1309
Core Analysis _____
DSTs _____

Water well accepted by _____

Bond Co. & No. None

Bond Am't $ _____ Cancelled _____ Date Organization Report None

Filing Receipt None Dated _____ Well Book x Plat Book x

API No. 02-001-05034 ~~None~~ Loc. Plat ___ Dedication None (Strat)

Permit Number None Date Issued _____

1-37

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

New Well ☐ Work-Over ☒ Deepen ☐ Plug Back ☐ Same Reservoir ☐ Different Reservoir ☐ Oil ☐ Gas ☐ Dry ☐

DESCRIPTION OF WELL AND LEASE

Operator	Address
Duval Corporation	4715 E Ft. Lowell Rd Tucson, Arizona

Lease Name	Well Number	Field & Reservoir
	31	

Location: 341' S65° 54'E of NW Corner Sec 17 T18N R24E (Sec.—TWP-Range or Block & Survey)

County	Permit number	Date Issued	Previous permit number	Date Issued
Apache				

Date spudded	Date total depth reached	Date completed, ~~ready to produce~~	Elevation (DF, RKB, RT or Gr.) feet	Elevation of casing hd. flange feet
		4/25/64		

Total depth	P.B.T.D.	Single, dual or triple completion?	If this is a dual or triple completion, furnish separate report for each completion.
955'			

Producing interval (s) for this completion	Rotary tools used (interval)	Cable tools used (interval)

Was this well directionally drilled?	Was directional survey made?	Was copy of directional survey filed?	Date filed

Type of electrical or other logs run (check logs filed with the commission): Gamma Ray-Neutron, Induction Electric Log - Sonic Log — Date filed:

CASING RECORD

Casing (report all strings set in well—conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amt. pulled

TUBING RECORD			LINER RECORD				
Size in.	Depth set ft.	Packer set at ft.	Size in.	Top ft.	Bottom ft.	Sacks cement	Screen (ft.)

PERFORATION RECORD			ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD	
Number per ft.	Size & type	Depth Interval	Am't. & kind of material used	Depth Interval

INITIAL PRODUCTION

Date of first production	Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:)

Date of test	Hrs. tested	Choke size	Oil prod. during test bbls.	Gas prod. during test MCF	Water prod. during test bbls.	Oil gravity ° API (Corr)

Tubing pressure	Casing pressure	Cal'ted rate of Production per 24 hrs.	Oil bbls.	Gas MCF	Water bbls.	Gas—oil ratio

Disposition of gas (state whether vented, used for fuel or sold):

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the.....of the .....(company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

.....
Date

.....
Signature

STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION
Well Completion or Recompletion Report and Well Log
Form No. P-7 File two copies

Hole No.	Interval (feet)	Formation or Member
29	Ground elevation 5410'	
	0-	Lower Petrified Forest
	256-	Top of greenish-grey unit
	376-	Shinarump
	400-711	Lower Wupatki
	711-1165	Coconino
	1165-	Supai
	1245	Top of 1st marker Anhydrite
30	Ground elevation 6040'	
	0-19	Dune Sand
	19-196	Bidahochi
	196-	Upper Petrified Forest
	560-	Lower Petrified Forest
	833-	Top of greenish-grey unit
	1149-	Shinarump
	1224-1347	Lower Wupaiki
	1347-1672	Coconino
	1672-	Supai
	1746	Top of 1st marker Anhydrite
31	Ground elevation 5300'	
	0-52	Dune Sand
	52-90	Moqui
	90-130	Upper Wuptki
	130-291	Lower Wuptki
	291-700	Coconino
	700-	Supai
	787	Top of 1st marker Anhydrite
32	Ground elevation 6140'	
	0-185	Bidahochi
	185-	Upper Petrified Forest
	452-	Lower Petrified Forest
	840-	Top of greenish-grey unit
	1020-	Shinarump
	1110-1242	Lower Wupatki
	1242-1540	Coconino
	1540-	Supai
	1656	Top of 1st marker Anhydrite

PLUGGING RECORD

Operator: Duval Corporation	Address: 4715 E FT Lowell Rd Tucson, Arizona
Name of Lease	Well No.: 31 — Field & Reservoir
Location of Well: 341' S 65° 54' E of NW Corner Sec 17 T18N R24E	Sec-Twp-Rge or Block & Survey — County: Apache
Application to drill this well was filed in name of	Has this well ever produced oil or gas — Character of well at completion (initial production): Oil (bbls/day) / Gas (MCF/day) / Dry?
Date plugged:	Total depth: 955' — Amount well producing when plugged: Oil (bbls/day) / Gas (MCF/day) / Water (bbls./day)

Name of each formation containing oil or gas. Indicate which formation open to wellbore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used Indicate zones squeeze cemented, giving amount cement.

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped etc)	Packers and shoes

Was well filled with mud-laden fluid, according to regulations?

Indicate deepest formation containing fresh water.

NAMES AND ADDRESSES OF ADJACENT LEASE OPERATORS OR OWNERS OF THE SURFACE

Name	Address	Direction from this well:

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

Use reverse side for additional detail
File this form in duplicate with the State of Arizona Oil & Gas Conservation Commission

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the.....of the .....(company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date ..... Signature .....

STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION

Plugging Record File two copies

Form No. P-15

1-37

FORM 159

DUVAL CORPORATION

INTER-OFFICE MEMORANDUM

FROM Navajo, Arizona DATE April 29, 1964

TO Esperanza ATTENTION B.G. Messer

SUBJECT: Duval # 31 Santa Fe

Location: 341' S65°54'E of NW cor., sec.17, T.18N., R.24E.
Date Started: 4/14/64
Date Completed: 4/25/64
Elevation, G.L.: 5300
Casing Point: 300
Depth, Top Coconino: 291 (5009)
Depth, Top Halite: 817 (4483)
Depth, Top Sylvite: 845 (4455)
T.D.: 955

Form 3
2M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

WHILE WE BELIEVE THIS INFORMATION TO BE CORRECT, WE MAKE NO REPRESENTATION WITH RESPECT TO, AND DO NOT ASSUME ANY RESPONSIBILITY FOR, THE CORRECTNESS THEREOF.
DUVAL CORPORATION

CORE LITHOLOGY

WELL NO. 31

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	ESTIM. % SA	DESCRIPTION	
				Abbreviations:				H - Halite	O - Gypsum
								A - Anhydrite	C-S - Clay-Silt
								P - Polyhalite	Med.g. - medium grained
								S - Sylvite	clr - clear
								C - Carnallite	occ - occasional
								f.g. - fine grained	V - Very
								c.g. - coarse grained	incr - increasing
								incl - inclusions	decr - decreasing
								irreg - irregular	brn - brown
792	0							STARTED CORING	
792	0	801	4	9	4	-	100	A, lt. gray, some A/G in top 0.6 ft.	
801	4	811	9	10	5	96	4	C-S, red-brn, med soft; few irreg small-med lt. gray A blebs & zones grading out down.	
811	9	815	9	4	0	-	100	A, lt. gray, few small selenite zones.	
815	9	827	0	11	1	97	3	C-S, red-brn, soft-med hard; few small white A blebs, 0.3' 60% zone at top. (Recovered 2.3' core)	
827	0							TOP OF SALT (?)	
827	0	829	6	2	6	85	-	C-S, red-brn, med hd.-soft; few f.g. H incls & zones; occ white A bleb.	
829	6	832	1	2	5	75	-	C-S, red-brn, med hd.; some H, f.g., as irreg veinlets & zones; occ white A bleb.	
832	1	833	5	1	4	10	1	H, med.g.; some small-med red-brn C-S incls, grading out down; V few white A blebs.	
833	5	833	9	0	4	25	-	H, c.g.; some lg. red-brn C-S zones.	
833	9	834	5	0	6	2	1	H, clr, med-c.g.; few small red-brn C-S incls in top half; V few white A stringers.	
834	5	836	4	1	9	40	2	H, med, & C-S, red-brn, 0.2' bands at 835.0' & 835.6'; few small white A blebs.	
836	4	840	5	4	1	1	3	H, clr, med-c.g.; few small white A stringers; V few small brn C-S incls, grading out down.	

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DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

CORE LITHOLOGY

WELL NO. 33

DEPTH (Feet) From	DEPTH (Feet) To	INTERVAL Feet	ESTIM. % Shale	ESTIM. % K A	DESCRIPTION
840 5	844 6	4 1	5	4	H, med-c.g.; few small-med red-brn C-S incls, 0.1' band at top; few small-med white-lt gray A stringers, 0.2' 40% zone at base, thin parting at 844.3'.
844 6	844 9	0 3	-	70	A, lt. gray; some H, clr, med, as irreg intergrowths.
844 9	846 45	1 55	8	1	H, med-c.g.; some small-med brn C-S incls, incr down from 4% at top to 12% at base; V few white A stringers, thin parting at 845.0'.
846 45	846 95	0 50	10	-	H, f.g.-med; some small-med brn C-S incls; occ V small white A bleb. Est. K_2O/S - 0%
846 95	848 15	1 20	2	2	H, med-c.g.; some red-rimmed milky S blebs, f.g.-c.g., grading in down; few small white A stringers & brn C-S incls. Est. K_2O/S - 12%
848 15	849 15	1 00	-	3	H, pink-clr, f.g.-med; few small red-rimmed milky S blebs; few small white A stringers. Est. K_2O/S - 5%
849 15	849 55	0 40	-	4	H, clr, med, & S, med-c.g. milky-red-rimmed; few small white A stringers. Est. K_2O/S - 22%
849 55	849 90	0 35	70	6	C-S, lt. brn, some H, med-f.g., & white A blebs; occ small red S bleb. Est. K_2O/S - 1%
849 90	853 4	3 5	40	2	H, med-c.g., & C-S, lt. brn, hd.; few small white A blebs; occ small red S bleb. Est. K_2O/S - 1%
853 4	855 8	2 4	60	2	C-S, lt. red-brn, decr down from 90% at top to 30% at base; some H, f.g.-med; few small white A blebs.
855 8	860 2	4 4	7	2	H, med-c.g.; several small-lg. brn C-S incls, decr down from 10% at top to 4% at base; few small white A stringers; occ V small red S blebs. Est. K_2O/S - 0%
860 2	862 15	1 95	2	2	H, c.g.; few small brn C-S incls & white A stringers; occ small red S bleb. Est K_2O/S - 1%
862 15	862 85	0 70	2	2	H, med-c.g.; few small brn C-S incls & white A stringers; few small red-rimmed milky S blebs, grading in down. Est. K_2O/S - 3%

sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

CORE LITHOLOGY

WELL NO. 31

DEPTH (Feet) From	DEPTH (Feet) To	INTERVAL Feet	ESTIM. % Shale	ESTIM. % FA	DESCRIPTION
862 85	863 50	0 65	1	1	H, clr, c.g.; few red-rimmed milky S blebs; V few sm small white A stringers & brn -green C-S incls. Est. K_2O/S - 5%
863 50	864 20	0 70	1	1	H, clr, c.g.; few small-med red-rimmed milky S blebs; V few brn C-S incls & white A stringers. Est. K_2O/S - 3%
864 20	864 80	0 60	-	3	H, clr-tan, med., few white A stringers & tan A/P zones; occ ben C-S incls & red S blebs. Est. K_2O/S - 0%
864 80	866 6	1 8	2	4	H, fairly clr, f.g.-med; few small-med white-gray A stringers; few small brn C-S incls.
866 6	869 2	2 6	50	4	H, med-c.g., & C-S, lt. red-brn, little green, decr down from 60% at top to 40% at base; few small-med lt. gray A blebs & stringers.
869 2	871 3	2 1	35	30	C-S to siltstone, V hard, lt. brn, & A, lt. gray-white; some H, f.g. to med, as irreg intergrown zones.
871 3	872 4	1 1	95	-	C-S, red-brn, med soft; few small H, f.g., incls; occ white A bleb.
872 4	878 0	5 6	4	3	H, clr in lower half, med-c.g.; few small brn C-S incls, decr down from 6% at top to 2% 0.2' above base, 0.2' 80% zone at base; few small white A stringers.
878 0	884 1	6 1	3	1	H, med-c.g.; few small red-brn C-S incls & stringers; V few small white A stringers.
884 1	885 6	1 5	-	-	H, V clr, c.g.; occ V small brn C-S incl.
885 6	888 0	2 4	35	1	H, med-c.g.; 0.7' 80% C-S at 886.1', few other brn C-S incls; few white A stringers in bottom 0.3'.
888 0	890 9	2 9	2	2	H, fairly clr, c.g.; few brn C-S incls & white A stringers, grading out down, thin A parting at 890.7'.
890 9	895 9	5 0	-	3	H, V clr, c.g.; few lt. gray-white A stringers, thin partings at 892.4' & 893.2'.

Form 3
2M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

CORE LITHOLOGY

WELL NO. 31 Page 4

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	Ⱥ	DESCRIPTION
895	9	897	0	1	1	-	85	A, lt. gray; some H, f.g., as intergrowths between 896.1' & 896.7'.
897	0	898	9	1	9	95	-	C-S, red-brn, med soft-hd.; few small H, f.g., incls.
898	9	902	2	3	3	4	2	H, med-c.g.; few small brn C-S incls; few small white A stringers, grading out down.
902	2	905	8	3	6	1	10	H, clr-V clr in lower half, med-c.g.; several ½" white A bands, at 903.1', 903.4', 903.9', 904.7', & 905.5', few other stringers; few small brn C-S incls, grading out in top half.
905	8	906	3	0	5	5	75	A, lt. gray-white; few H, f.g., intergrowths; thin brn C-S parting at 906.1'
906	3	911	2	4	9	3	5	H, med-c.g.; few small-med white A stringers & brn C-S incls, both decr down from 4% at top to 2% at base; 0.2' 35% white A zone at 907.3'.
911	2	916	8	5	6	-	4	H, clr, med-c.g.; few small-med lt. gray A stringers & blebs; occ V small brn C-S incls.
916	8	917	2	0	4	5	60	A, lt. gray, decr down from 90% at top to 30% at base; some H, f.g., intergrowths; few small brn C-S incls.
917	2	917	8	0	6	-	25	H, tan, med; numerous small-lg. lt. gray A stringers & tan A/P zones.
917	8	920	7	2	4	70	6	C-S, brn, soft; some H, f.g.-med, as irreg zones; few small-med lt gray A zones & blebs.
920	7	923	5	2	8	35	1	H, med-c.g.; some small-V lg. red-brn C-S incls & zones; V few small white A blebs.
923	5	927	0	3	5	2	3	H, fairly clr, med.g.; few small brn C-S incls & lt. gray A stringers.
927	0	928	6	1	6	20	2	H, med-c.g.; some med-lg. dk. brn C-S incls & zones; few small white A stringers.
928	6	933	5	4	9	40	2	H, c.g., & C-S, dk. red-brn, med hd.; 0.2' C-S bands at 929.0' & 931.0'; few small white A stringers.
933	5	934	0	0	5	1	1	H, clr, c.g.; V few small white A stringers & brn C-S incls.

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Form 3
2M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

WELL NO._____

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	P	DESCRIPTION
934	0	934	9	0	9	45	-	H, c.g.; many lg. brn C-S incls, decr down from 80% at top to 10% at base.
934	9	941	6	6	7	85	4	C-S, lt. red-brn, med soft; few H, med, zones & irreg blebs; few white A blebs, 0.3' 80% zone at 938.5'.
941	6	943	6	2	0	12	3	H, c.g.; many lg. brn C-S zones & incls, decr down from 20% at top to 4% at base; few small white A stringers; thin parting at base.
943	6	945	9	2	3	25	2	H, med-c.g., some lg. brn brn C-S incls, decr down from 40% at top to 10% at base; few small white A stringers.
945	9	946	3	0	4	95	-	C-S, red-brn, soft; few small H, med, blebs.
946	3	948	3	2	0	30	3	H, c.g.; many lg. brn C-S incls, decr. down from 40% at top to 20% at base; some white A zones & stringers in bottom 0.4'.
948	3	951	4	3	1	5	2	H, fairly clr, c.g.; few small-lg. brn C-S incls, 0.1' band at 949.5', 0.6' 15% zone at 950.4'; few small white A stringers, thin parting at base.
951	4	951	7	0	3	5	85	A, lt. gray-white; few H, med, blebs & lt. brn C-S incls.
951	7	954	9	3	2	25	3	H, med-c.g.; numerous med-lg. red-brn C-S incls., decr down from 30% at top to 20% at base; 0.1' white A band at 951.9'.
954	9	955	5	0	6	3	3	H, fairly clr, med; few small brn C-S incls & white A blebs & stringers.
955	5							TOTAL DEPTH

LOGGED BY: Karl E. Elers
Karl E. Elers

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JVAL SULPHUR & POTASH COMPA(
POTASH DIVISION
CARLSBAD, NEW MEXICO

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CORE LITHOLOGY

WELL NO. 33 Page 2

DEPTH (Feet) From	DEPTH (Feet) To	INTERVAL Feet	ESTIM. % Shale	ESTIM. % K A	DESCRIPTION
840 5	844 6	4 1	5	4	H, med-c.g.; few small-med red-brn C-S incls, 0.3' band at top; few small-med white-lt gray A stringers, 0.2' 40% zone at base, thin parting at 844.3'.
844 6	844 9	0 3	-	70	A, lt. gray; some H, clr, med, as irreg intergrowths.
844 9	846 45	1 55	8	1	H, med-c.g.; some small-med brn C-S incls, incr down from 4% at top to 12% at base; V few white A stringers, thin parting at 845.0'.
846 45	846 95	0 50	10	-	H, f.g.-med; some small-med brn C-S incls; occ V small white A bleb. Est. K_2O/S = 0%
846 95	848 15	1 20	2	2	H, med-c.g.; some red-rimmed milky S blebs, f.g.-c.g., grading in dom; few small white A stringers & brn C-S incls. Est. K_2O/S = 12%
848 15	849 15	1 00	-	3	H, pink-clr, f.g.-med; few small red-rimmed milky S blebs; few small white A stringers. Est. K_2O/S = 5%
849 15	849 55	0 40	-	4	H, clr, med, & S, med-c.g. milky-red-rimmed; few small white A stringers. Est. K_2O/S = 22%
849 55	849 90	0 35	70	6	C-S, lt. brn, some H, med-f.g., & white A blebs; occ small red S bleb. Est. K_2O/S = ~1%
849 90	853 4	3 5	40	2	H, med-c.g., & C-S, lt. brn, hd.; few small white A blebs; occ small red S bleb. Est. K_2O/S = ~1%
853 4	855 8	2 4	60	2	C-S, lt. red-brn, decr down from 50% at top to 30% at base; some H, f.g.-med; few small white A blebs.
855 8	860 2	4 4	7	2	H, med-c.g.; several-small-lg. brn C-S incls, decr down from 10% at top to 4% at base; few small white A stringers; occ V small red S blebs. Est. K_2O/S = 0%
860 2	862 15	1 95	2	2	H, c.g.; few small brn C-S incls & white A stringers; occ small red S bleb. Est K_2O/S = ~1%
862 15	862 85	0 70	2	2	H, med-c.g.; few small brn C-S incls & white A stringers; few small red-rimmed milky S blebs, grading in dom. Est. K_2O/S = 3%

Form 3
2M Sheets 5-54

DEL AL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

CORE LITHOLOGY

WELL NO. 31

1-37

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	ESTIM. % P.A	DESCRIPTION	
				Abbreviations:				H = Halite	G = Gypsum
								A = Anhydrite	C-S = Clay-Silt
								P = Polyhalite	f.g. = medium grained
								S = Sylvite	clr = clear
								C = Carnallite	occ = occasional
								f.g. = fine grained	V = Very
								c.g. = coarse grained	incr = increasing
								incl = inclusions	decr = decreasing
								irreg = irregular	brn = brown
792	0							STARTED CORING	
792	0	801	4	9	4	-	100	A, lt. gray, some A/G in top 0.6 ft.	
801	4	811	9	10	5	96	4	C-S, red-brn, med soft; few irreg small-med lt. gray A blebs & zones grading out down.	
811	9	815	9	4	0	-	100	A, lt. gray, few small selenite zones.	
815	9	827	0	11	1	97	3	C-S, red-brn, soft-med hard; few small white A blebs, 0.3' G/A zone at top. (Recovered 2.3' core)	
827	0							TOP OF SALT (?)	
827	0	829	6	2	6	85	-	C-S, red-brn, med hd.-soft; few f.g. H incls & zones; occ white A bleb.	
829	6	832	1	2	5	75	-	C-S, red-brn, med hd.; some H, f.g., as irreg veinlets & zones; occ white A bleb.	
832	1	833	5	1	4	10	1	H, med. c.g.; some small-med red-brn C-S incls, grading out down; V few white A blebs.	
833	5	833	9	0	4	25	-	H, c.g.; some lg. red-brn C-S zones.	
833	9	834	5	0	6	2	1	H, clr, med-c.g.; few small red-brn C-S incls in top half; V few white A stringers.	
834	5	836	4	1	9	40	2	H, med. & C-S, red-brn, 0.2' bands at 835.0' & 835.6'; few small white A blebs.	
836	4	840	5	4	1	1	3	H, clr, med-c.g.; few small white A stringers; V few small brn C-S incls, grading out down.	

Form 3
2M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

CORE LITHOLOGY

WELL NO. 31

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	Ft	DESCRIPTION
895	9	897	0	1	1	-	85	A, lt. gray; some H, f.g., as intergrowths between 896.1' & 896.7'.
897	0	898	9	1	9	95	-	C-S, red-brn, med soft-hd.; few small H, f.g., incls.
898	9	902	2	3	3	4	2	H, med-c.g.; few small brn C-S incls; few small white A stringers, grading out down.
902	2	905	8	3	6	1	10	H, clr-V clr in lower half, med-c.g.; several ½" white A bands, at 903.1', 903.4', 903.9', 904.7', & 905.5', few other stringers; few small brn C-S incls, grading out in top half.
905	8	906	3	0	5	5	75	A, lt. gray-white; few H, f.g., intergrowths; thin brn C-S parting at 906.1'
906	3	911	2	4	9	3	5	H, med-c.g.; few small-med white A stringers & brn C-S incls, both decr down from 4% at top to 2% at base; 0.2' 35% white A zone at 907.3'.
911	2	916	8	5	6	-	4	H, clr, med-c.g.; few small-med lt. gray A stringers & blebs; occ V small brn C-S incls.
916	8	917	2	0	4	5	60	A, lt. gray, decr down from 90% at top to 30% at base; some H, f.g., intergrowths; few small brn C-S incls.
917	2	917	8	0	6	-	25	H, tan, med-c.g.; numerous small-lg. lt. gray A stringers & tan A/P zones.
917	8	920	7	2	4	70	6	C-S, brn, soft; some H, f.g.-med, as irreg zones; few small-med lt gray A zones & blebs.
920	7	923	5	2	8	35	1	H, med-c.g.; some small-V lg. red-brn C-S incls & zones; V few small white A blebs.
923	5	927	0	3	5	2	3	H, fairly clr, med.g.; few small brn C-S incls & lt. gray A stringers.
927	0	923	6	1	6	20	2	H, med-c.g.; some med-lg. dk. brn C-S incls & zones; few small white A stringers.
928	6	933	5	4	9	40	2	H, c.g., A as -, dk. red-brn, med hd.; 0.2' C-S bands at 929.0' & 931.0'; few small white A stringers.
933	5	934	0	0	5	1	1	H, clr, c.g.; few small white A stringers & brn C-S incls.

sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

CORE LITHOLOGY

WELL NO. 31

DEPTH (Feet) From	DEPTH (Feet) To	INTERVAL Feet	ESTIM. % Shale	ESTIM. % FA	DESCRIPTION
862 85	863 50	0 65	1	1	H, clr, c.g.; few red-rimmed milky S blebs; V few sm small white A stringers & brn -green C-S incls. Est. K_2O/S - 5%
863 50	864 20	0 70	1	1	H, clr, c.g.; few small-med red-rimmed milky S blebs; V few brn C-S incls & white A stringers. Est. K_2O/S - 3%
864 20	864 80	0 60	-	3	H, clr-tan, med., few white A stringers & tan A/P zones; occ brn C-S incls & red S blebs. Est. K_2O/S - 0%
864 80	866 6	1 8	2	4	H, fairly clr, f.g.-med; few small-med white-gray A stringers; few small brn C-S incls.
866 6	869 2	2 6	50	4	H, med-c.g., & C-S, lt. red-brn, little green, decr down from 60% at top to 40% at base; few small-med lt. gray A blebs & stringers.
869 2	871 3	2 1	35	30	C-S to siltstone, V hard, lt. brn, & A, lt. gray-white; some H, f.g. to med, as irreg intergrown zones.
871 3	872 4	1 1	95	-	C-S, red-brn, med soft; few small H, f.g., incls; occ white A bleb.
872 4	873 0	5 6	4	3	H, clr in lower half, med-c.g.; few small brn C-S incls, decr down from 6% at top to 2% 0.2' above base, 0.2' 80% zone at base; few small white A stringers.
873 0	884 1	6 1	3	1	H, med-c.g.; few small red-brn C-S incls & stringers; V few small white A stringers.
884 1	885 6	1 5	-	-	H, V clr, c.g.; occ V small brn C-S incl.
885 6	888 0	2 4	35	1	H, med-c.g.; 0.7' 80% C-S at 886.1', few other brn C-S incls; few white A stringers in bottom 0.3'.
888 0	890 9	2 9	2	2	H, fairly clr, c.g.; few brn C-S incls & white A stringers, grading out down, thin A parting at 890.7'.
890 9	895 9	5 0	-	3	H, V clr, c.g.; few lt. gray-white A stringers, thin partings at 892.4' & 893.2'.

Form 3
2M Sheets 5-54

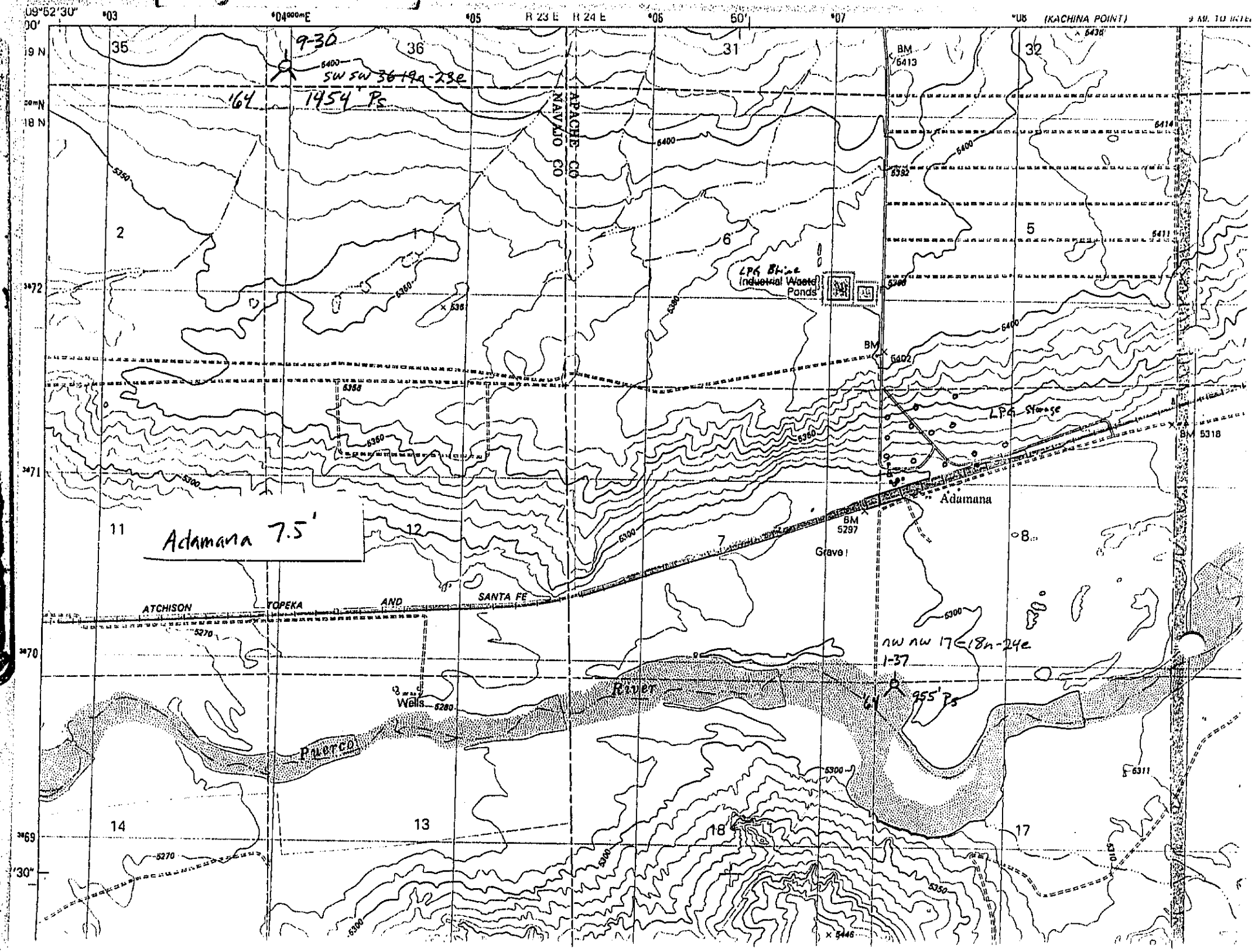
D[illegible]AL SULPHUR & POTASH COMPANY

POTASH DIVISION
CARLSBAD, NEW MEXICO

WELL NO._____

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	P	DESCRIPTION
934	0	934	9	0	9	45	-	H, c.g.; many lt. brn C-S incls, decr down from 30% at top to 10% at base.
934	9	941	6	6	7	85	4	C-S, lt. red-brn, med soft; few H, med, zones & irreg blebs; few white A blebs, 0.3' 80% zone at 933.5'.
941	6	943	6	2	0	12	3	H, c.g.; many lg. brn C-S zones & incls, decr down from 20% at top to 4% at base; few small white A stringers; thin parting at base.
943	6	945	9	2	3	25	2	H, med-c.g., some lg. brn brn C-S incls, decr down from 40% at top to 10% at base; few small white A stringers.
945	9	946	3	0	4	95	-	C-S, red-brn, soft; few small H, med, blebs.
946	3	948	3	2	0	30	3	H, c.g.; many lg. brn C-S incls, decr. down from 40% at top to 20% at base; some white A zones & stringers in bottom 0.4'.
948	3	951	4	3	1	5	2	H, fairly clr, c.g.; few small-lg. brn C-S incls, 0.1' band at 949.5', 0.6' 15% zone at 950.4'; few small white A stringers, thin parting at base.
951	4	951	7	0	3	5	85	A, lt. gray-white; few H, med, blebs & lt. brn C-S incls.
951	7	954	9	3	2	25	3	H, med-c.g.; nu-brown med-lg. red-brn C-S incls., decr down from 30% at top to 20% at base; 0.1' white A band at 951.9'.
954	9	955	5	0	6	3	3	H, fairly clr, med; few small brn C-S incls & white A blebs & stringers.
955	5							TOTAL DEPTH

LOGGED BY: Karl E. Ehrs
Karl E. Ehrs



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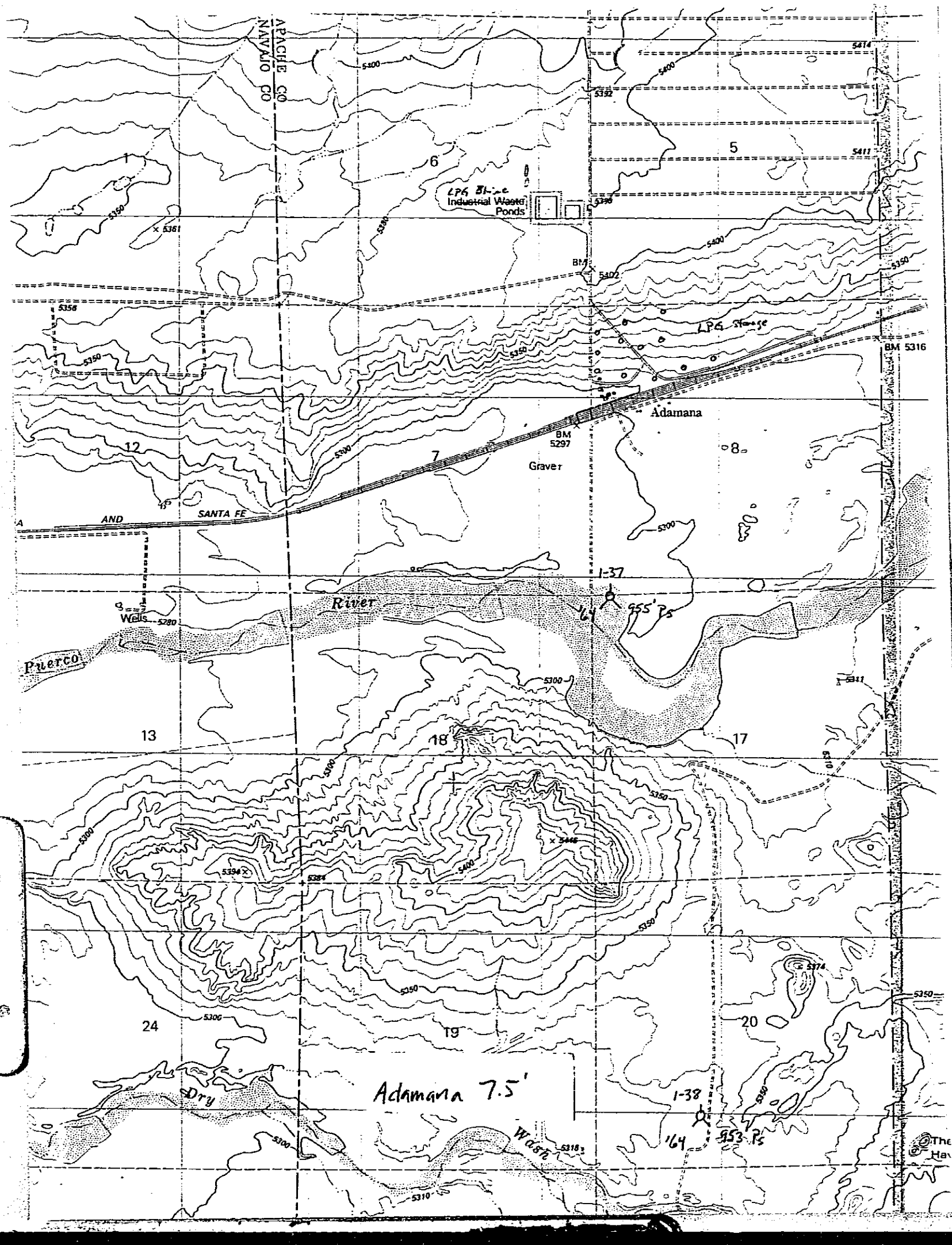
SW SW 36-19n-23e
'64 1454' Ps
APACHE CO
NAVAJO CO
LPG Brine
Industrial Waste
Ponds
LPG Storage
Adamana
Adamana 7.5'
ATCHISON TOPEKA AND SANTA FE
Wells
Puerco River
Grave
nw nw 17-18n-24e
1-37
'64 955' Ps
(KACHINA POINT)
R 23 E
R 24 E


APACHE CO
NAVAJO CO
LPG Blaine
Industrial Waste
Ponds
LPG Storage
BM 5316
Adamana
BM
5297
Graver
AND SANTA FE
I-37
River
Wells
Pierco
I-38
Adamana 7.5'
Dry
Wash