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U.S.G.S.

O.F.R.  
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UNITED STATES DEPARTMENT OF INTERIOR  
GEOLOGICAL SURVEY

Lithologic Descriptions, Core and Cutting Samples,  
Mariano Lake-Lake Valley Drilling Project,  
McKinley County, New Mexico, Hole Number 3

by

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This report is preliminary and has not been reviewed  
for conformity with U.S. Geological Survey editorial  
standards and stratigraphic nomenclature.

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## INTRODUCTION

In the fall of 1980, the U.S. Geological Survey contracted with Longman Drilling Company of Albuquerque, New Mexico to rotary drill and core twelve holes along a north-south line from Mariano Lake to the vicinity of Lake Valley, New Mexico. This report contains the lithologic descriptions of core and cutting samples from drill hole no. 3.

The drilling project was funded under a reimbursable interagency agreement between the U.S. Bureau of Indian Affairs (BIA) and the U.S. Geological Survey (USGS). The program was designed by representatives of the BIA, USGS, and the Minerals Department of the Navajo Tribe.

## PURPOSE

The principal objective of this project was to provide core samples and geophysical logs for petrologic, sedimentologic, geophysical, and geochemical studies of the Upper Jurassic Morrison Formation. Other objectives included the following: stratigraphic and coal studies of Upper Cretaceous rocks; hydrologic and water monitoring of well no. 2; control for a proposed seismic study of the same geographic area; and development of water wells by the Navajo Tribal Water and Sanitation Department.

## GENERAL DRILLING PLAN

The locations of all twelve drill holes are shown on figure 1, which is a portion of the Gallup 1° x 2° Quadrangle. The general drilling plan called for most holes to be rotary drilled into the Upper Cretaceous Dakota Sandstone and then cored into or through the Recapture Member of the Morrison Formation. The interval to be cored in each hole was about 600 ft.

Exceptions to the general drilling plan were as follows: Hole no. 2, rotary drilled, surface to Jurassic Entrada Sandstone; Hole no. 4A, cored 21-218 ft, to test an observed near surface I.P. anomaly; Hole no. 6, deepened



after coring by rotary drilling into the Jurassic Entrada Sandstone; Hole no. 7A, cored only the Westwater Canyon Member of the Morrison Formation; Hole no. 8, abandoned in lower part of Westwater Canyon Member of the Morrison Formation; and Hole nos. 9 and 10, abandoned in Upper Cretaceous rocks.

Chip samples were collected at 10-ft or 20-ft intervals throughout each hole and sludge samples collected at 20-ft intervals throughout the cored interval.

The following suite of geophysical logs were included in the general drilling project: natural gamma, self potential, neutron-neutron porosity, resistance, resistivity, temperature, deviation, gamma-gamma density, caliper, magnetic susceptibility, gamma ray spectrometer (KUT), sonic, induced polarization, conductivity, and high-resolution 4-arm digital dipmeter.



Figure 1. - Location of USGS Drill Holes, Gallup 1° x 2° Quadrangle.

DRILL HOLE NO. S-3

The location of this well is shown on figure 2.

The vital statistics on this well include:

Spud date: November 2, 1980

Location: T. 17 N., R. 13 W., SE/4 sec. 29.

Lat.  $35^{\circ}40'17''$  Long.  $108^{\circ}14'36''$

Collar Elevation: 6965 feet Gibson Coal Mbr.

Crevasse Canyon Fm. (Cretaceous)

Core Point Top: 1560 feet (depth) Dakota Sandstone (Cretaceous)

Bottom Cored Interval 2158 feet (depth) Recapture Mbr.

Morrison Fm. (Jurassic)

Total Depth: 2158 feet (depth) Recapture Mbr.

Morrison Fm. (Jurassic)

Core Recovery: 85 percent

Completion of well: Abandoned, November 18, 1980

The following suite of geophysical logs were run on this hole and have been published by the U.S. Geological Survey (1981): natural gamma, self potential, resistance, neutron-neutron porosity, deviation, caliper, gamma-gamma density, resistivity, KUT (2), prompt fission neutron (2), and magnetic susceptibility.

Uranium mineralization was encountered at approximately 1765, 1805, and 1855 feet, with a 7-foot ore-zone (>0.05 percent) intercept at 1858 feet. A 25-foot zone of coal and carbonaceous shale was penetrated at 450 feet and a 3-foot bed of coal was cut at 1572 feet.

Cutting samples from rotary drilling were collected and described on ten (10) foot intervals to the core point at 1560 ft (table 1). Cutting samples were collected through the cored interval 1560-2158 feet but were not described.







Core samples were collected in 20 and 40 ft core runs and are 3 inches in diameter. The core samples were described in the field (table 2), taped, boxed and shipped to the USGS Core Library in Denver where they were frozen, split, photographed and sampled (for petrography, geochemistry, heavy mineral suites, clay mineralogy and paleomagnetic studies). A split of the core has been archived for reference and future study.

The following core and cutting sample descriptions (tables 1, 2) were described in the field. The abbreviations and graphic symbols used in the core description are defined in Reynolds and others (1975).

REFERENCES CITED

- Reynolds, M. W., Ahlbrandt, T. S., Fox, J. E., and Lambert, P. W., 1975,  
Description of selected drill cores from Paleozoic rocks, Lost Soldier Oil  
Field, South Central Wyoming, Part 1: U.S. Geological Survey Open-File  
Report 75-662, 34 p.
- USGS, 1981, Geophysical log suite from drill hole no 3, Mariano Lake-Lake  
Valley drilling project, McKinley County, New Mexico, USGS Open-File  
Report 81-439, 5 p.

CHIP SAMPLE 106  
FORM

Location: S. 29 - T. 17N R. 13W Quadrangle (9.5) Crown Point  
Hole No: S-3 State: N.M. Date: 11/2/80  
Company: U.S.G.S. County: McKinley Geologist: Zach, Franciszyk  
Lat/Long: 35° 40' 17" N Sheet 1 of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
Lake Valley Drilling Project, Hole No. 3, New Mexico

Lake Valley Drilling Project, Hole No. 3, New Mexico										Sandstones										Formation / member										COMMENTS
Depth to base of sample interval		Sample Number	Grain Size	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Rhyolite	Floccul.	Sandstone Color	Kcg											
10		80-53-10	80/75		90		10	N-3			UVF -UF	M	SA	5%	Frag.			dk. marl.	5YR8/7	Kcg	Collared in bedrock									
20			85/75		90	7	3	N-5			UVF -LF	M	SA -SR	2-3%	TR?			dk. marl.	10YR6/4	Kcg	Limonite cemented siltstone Trace of green shale									
30			85/75		95	3	2	N-5			UF -UVF	M	SA	4%	Frag.			white Rd. det.	5Y7/2	Kcg										
40			80/75		95	2	2	greenish shale			UF -LVF	M	SA -SR	4%	dism.			white bk. marl.	5Y7/2	Kcg	Ironstone chips									
50			80/75		90	4	3	N-5 green			LVF -UF	P	SA -SR	3%	abnt. Frags.	TR		micaceous (drilling mud?)	5Y6/2	Kcg	Ironstone chips									
60			95/75		98	2					LF -UF	M-W	SR -SA	3%	TR	fairly abnt.		bk. marl.	N-6 (noting color change)	Keda	Lithified rock fragments, comprise ca 60% of sample; Non-carbonate cemented									
70			90/75		100						LVF -LF	MW	SR -SA	2-3%	Fine Frags.			bk. marl. white	N-6	Keda	Well indurated rock chips Carbonate cement									
80			95/75		100						LVF -LF	MW	SR -SA	2-3%	Fine Frags.			bk. marl. white	N-6	Keda	Carbonaceous material, slightly more abundant than previous sample									
90			85/75		100			N-6			LVF -LF	MW	SR -SA	2-3%	Fine Frags.			small white	N-6	Keda	Carbonate cement									
100		80-53-100	80/75		100						LVF -LF	MW	SR -SA	2-3%	Fine Frags.			white	N-5	Keda	Chert grains larger than previous sample uvf grains limonite coated									



CHIP SAMPLE 106  
FORM

Location: Sec. 29 T. 17N R. 13W Quadrangle (9.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/2/80  
 Company: U.S.G.S. County: McKinley Geologist: Zech, Francis K  
 Lat/Long: 35° 40' 17" N Sheet 2 of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Valley Drilling Project, Hole No. 3, New Mexico  
 Estimated % of Lithologies

Lake Valley Drilling Project, Hole No. 3, New Mexico										Sandstones										Fossils / marks	COMMENTS
Estimated % of Lithologies						Core/sec				Sample Number											
Dip to Rim of Sample Interval	Sample Number	Congl.	Sandst.	Siltst	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Fossils	Sandstone Color					
110	80-53-110	90/75	100						LVF -LF	F	SR -SA	3%	dism.	TR	chert	N-6	Kida Dalton ss mbr. Crescent Canyon Formation	Silt? matrix calcite cementing			
120		90/75	93		7	N-3			UVF -UF	M	SR	2-3%	dism.	TR	silicified plant fossils	N-6	Kida / (Kmm?) Mariano Tongue Manos shale	Light green stain on quartz silt Calcite cementing			
130		85/75	100						LVF -UF	M	SR -SA	2-3%	TR		chert	N-6	Kmm (?)	Green stain on quartz silt Calcite cementing			
140		85/75	100						UVF -UF	M-F	SR	2-3%	dism.		pyrite silicified plant fossils	N-6	Kmm (?)	? pale green minerals Calcite cementing			
150		85/75	95		5	N-3			LVF -UF	F	SR	2-3%	frag.		tar- get plant fossils	N-6	Kmm (?)	Carbonaceous fragments in shale; Green stain on quartz Some silt in matrix; yellow stain on quartz; white cement			
160		90/75	97		3				LVF -LF	M	SR	1-2%	frag.		silicified plant fossils	N-6	Kmm (?)	Calcite cementing			
170		85/75	95		5				UVF -UF	M	SR -R	3%	frag.		min? plant fossils	N-6	Kmm (?)	Calcite cementing Iron staining			
180		85/75	95		5	N-3			VF -LF	M	SR	?	frag.		plant fossils	N-6	Kmm (?)	Loose calcite grains Thin chert calcite rock chips			
190		80/75	95		5				UVF -UF (LM?)	F-P	SR	2%	frag.		silicified plant fossils	N-6	Kmm (?)	Calcite rock fragments			
200	80-53-200	85/75	95		5				LVF -LF	M	SR	2%	frag.		chert	N-6	Kmm (?)	Calcite rock fragments			



CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
Hole No: S-3 State: N.M. Date: 11/2/80  
Company: U.S.G.S. County: McKinley Geologist: Hammond, Mark  
Lat/Long: \_\_\_\_\_ Sheet 3 of 16.

Table 1. Descriptions of cuttings samples from Mariano Lake -  
Lake Valley Drilling Project, Hole No. 3, New Mexico

Depth to base of sample interval	Sample Number	Core/Loss	Estimated % of Lithologies								Sandstones							Remarks / Notes	COMMENTS
			Congl.	Sandst.	Siltst.	Shale	Shale	Shale	Coal	Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Recess.	Sandstone Color	
210	80-53-210	85/15	95	5							LF	W	SR		TR			N-5	Trace hematite staining
220		"	95	5							"	"	"	TR	TR			N-5	Trace hematite staining
230		"	90	10							"	"	"	TR	TR		chc. frags.	N-5	
240		"	85	15							"	"	"	TR	TR			N-5	
250		"	95	5							"	"	"	TR	TR			5Y4/1	
260		"	95	5					TR		"	"	"	TR	TR			N-4	Trace hematite staining
270		"	98	2							"	"	"	TR	TR			N-4	"
280		"	95	5							"	"	"	TR	TR			N-4	"
290		"	92	8					TR		"	"	"	TR	TR			N-4	
300	80-53-300	"	92	8					TR		"	"	"	TR	TR		gr. frags.	5Y4/1	Trace hematite staining

CHIP SAMPLE 106  
FAM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
Hole No: S-3 State: N.M. Date: 11/2/80  
Company: U.S.G.S. County: McKinley Geologist: Mruka, Hammond  
Lat/Long: \_\_\_\_\_ Sheet 4 of 16

Table 1. Descriptions of cuttings samples from Mariano Lake -  
Lake Valley Drilling Project, Hole No. 3, New Mexico  
Estimated % of Lithologies

Lake Valley Drilling Project, Hole No. 3, New Mexico															Sandstones										Fossils / Remarks	Comments
Depth to base of Sample Interval	Sample Number	Grain Size	Estimated % of Lithologies					Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Alcates.	Sandstone Color	Remarks	Fossils	Sandstone Color	Remarks	Fossils	Comments				
			Congl.	Sandst.	Siltst.	Shale	Shale Color																Bed			
310	80-33-310	90/75			5			TR		LF	W	SR	TR	TR					5Y4/1		Kmm (?) Mudatto Tongue Mucos Shale	Hematite staining				
320		85/75			20				UF	W	SA-SR		abnt						5Y4/1		Kmm (?)	Hematite staining				
330		80/75			60				UF	W	SA-SR	TR							5Y4/1		Kmm (?)					
340		90/75			30	10		TR	UF	W	SA-SR	TR	abnt						5Y4/1		Kmm (?)	Trace of light green mud chips				
350		85/75			80	14		TR	UF	W	SR	TR									Kmm (?)	Limonite stained quartz				
360		85/75			25	5		5	LF-LM	M	SR-SA	TR						ndnt			Kmm (?) Strong Sandstone Mucos Shale	One 3mm quartz pebble				
370		85/75			30			5	UF-LF	W	SR	TR	TR						5Y4/1		Kmm (?)	One 3mm quartz pebble				
380		90/75			20			5	LF	M	SR-SA	TR	TR						5Y4/1		Kmm (?)					
390		90/75			5			5	UVC ML-LF	P	SA-SR	TR	TR						5Y4/1		Kmm (?)					
400	80-33-400	90/75			5			5	LF-LM	M	SR-SA	TR	TR						5Y4/1		Kmm (?)	Hematite staining				

CHIP SAMPLE 106  
FORM

Location: Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/3/80  
 Company: USGS County: McKinley Geologist: Kirk, Franciszyk  
 Lat/Long: 35°40'17"N Sheet 5 of 16  
108°14'36"W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico  
 Estimated % of Lithologies

Lake Valley Drilling Project, Hole No. 3, New Mexico															Sandstones										Remarks / Notes		Comments
Depth to base of sample (feet)	Sample Number	Grain Size	Congl.	Sand%	Silt%	Shale	Shale Color	Coal	Lithology	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Flattens	Sandstone Color										
410	80-53-410	90/75	85	15						LF -UF TR M	M	SR -SA	3-4	TR			Tan chert	N-5	Kcdi Dilco Coal Mbr Grease Canyon Formation	Sandstone disaggregated Amber quartz grains Limonite staining							
420		80/75	90	10				TR		UF	MW	SR -SA	2	TR			Red chert (P)	N-5	Kcdi	Sandstone disaggregated Amber quartz grains Limonite staining							
430		85/75	80	20						VF -UF TR M	M -F	SR	1	TR			TR Tan chert	N-5	Kcdi	Sandstone disaggregated Amber quartz grains							
440		85/75	75	15				10		VF -um	F -P	SR -SA	3	TR			Red chert	N-6 10YR6/2	Kcdi	Igneous/granitic rock fragments; Amber in coal Amber quartz grains							
450		80/75	81	15				4		uvf -um	F -P	SA -SR	2	TR			Tan chert	N-6 10YR6/2	Kcdi	Yellow quartz							
460		80/75	70	15				15		uvf -LC	F -P	SA -SR	2	TR			Tan chert	N-6 10YR6/2	Kcdi	Coarse grains of Feldspar Amber quartz grains							
470		80/75	92	3				5		LF -um TR C	F -P	SR -SA	2	TR			Tan chert	N-6 10YR6/2	Kcdi	Sandstone disaggregated							
480		80/75	94	3				3		uvf -um TR M	M	SR	2	TR			TR Tan chert	N-7 -N-8	Kcdi	Limonite stained sandstone fragments							
490		85/75	93	5				2		uvf Fragt	MW	SR	2	TR			Tan chert	N-8 -10YR8/2	Kcdi	Limonite stained sandstone Trace undissolved Feldspar chips Rose of amber quartz							
500	80-53-500	80/75	88	10				2		UF TR M TR C	MW	SR	2	TR			Tan chert Red chert	N-8 -N-8	Kcdi	Red clay chips							



CHIP SAMPLE 106  
Folkm

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
Hole No: S-3 State: N.M. Date: 11/3/80  
Company: U.S.G.S County: McKinley Geologist: Zech, Franczyk  
Lat/Long: 35° 40' 17" N 108° 14' 36" W Sheet 6 of 16

Table 1. Descriptions of cuttings samples from Mariano Lake -  
Lake Valley Drilling Project, Hole No. 3, New Mexico  
Estimated % of Lithologies

Depth to Sample Interval	Sample Number	Core/Loss	Congl.	Sandst.	Siltst.	Shale	Shale Color	Grain Size	Sorting	Roundness	Foliation	Carbonates	Pyrite	Fluores.	Sandst. Color	Formation / Member	Comments
510	80-53-510	90/75		90	6	2	N-4	UVF -LF TR M	MW	SA -SR	2	Frag.		blk. gr. white	N-6	Kcdi Dilco Coal Mbr. Crevasse Canyon Formation	
520		85/75		92	2	5	N-3	UVF -LVF TR M	M	SR -SA	2	disint. mat.		white fine gr.	10YR7/4 - N-7	Kcdi	
530		80/75		92	2	5	N-3	UVF -UF TR UC	M	SR -SA	1	disint. mat.		white blk. gr.	10YR7/4 - N-7	Kcdi	
540		85/75		93	2	4	N-3	UVF -UF	M	SR -SA	1	disint. mat.		small blk. marl. tag. etc.	10YR8/2	Kcdi	Light green coating on quartz grains
550		85/75		97	3	1		UVF -UF	MW	SR	<1	disint. mat.		small blk. marl. tag. etc.	5Y8/2	Kcdi(?)	Hematite coating on some quartz grains
560		85/75		95	4			UVF -LVC	P	SA -SR	2-3	disint. mat.		white fine blk. marl.	5Y8/1	Kcdi/Kgc Torrinso Ss Mbr. Gallup Sandstone	
570		85/75		92	7			UVF -UM TR UC	M -P	SA -SR	1	disint. mat.	TR	blk. gr. etc.	5Y8/1	Kgc	
580		75/75		97	3			UVF -UF TR UC	M	SR -SA	2	disint. mat.		blk. gr. tag. etc.	5Y6/1	Kg Main body Gallup Sandstone	Light greenish shale (?) and/or glauconite (?)
590		80/75		98	1-2			UVF -LF TR UC	MW	SR -SA	<1	disint. mat.		glau. fr. tag. etc.	5YR6/2	Kg	
600	80-53-600	75/75		97	2-3			UVF -UF TR UC	MW	SR -SA	<1	disint. mat.		glau.	10YR7/2, N-5	Kg	



CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/3/80  
 Company: U.S.G.S County: McKinley Geologist: Zech, Franczyk  
 Lat/Long: 35° 40' 17" N Sheet I of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico

Lake Valley Drilling Project, Hole No. 3, New Mexico										Sandstones										Formation / member										COMMENTS
Estimated % of Lithologies										Sandstones										Formation / member										
Dip to direction of Sample Interval	Sample Number	Core/Less	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Roundness	Fidelpar	Carbonates	Pyrite	Access.	Sandstone Color													
610	80-53-610	85/75		97	3					UVF -UF	MW	SR (SA)	1-2	TR Frags		Tan ch. glauc	N-6	Kg		Limonite staining on quartz grains										
620		85/75		97	3			?		UVF -UF	MW	SR	>1	TR Frags		White? glauc Ambite	N-6	Kg												
630		85/75		96	3			<1		UVF -UF TRC	MW	SR	1	TR Frags		White glauc	N-6	Kg		Limonite staining on quartz grains										
640		85/75		97	3					UVF -UF	MW	SR	1	TR Frags	TR	Tan ch.	N-6	Kg		Limonite staining on quartz grains										
650		85/75		90	10					LVF -UF TR.M	M	SR -SA	1	TR Frags			N-5	Kg		← Maybe Transitional Zone Limonite staining on quartz grains										
660		85/75		80	20					LVF -LF TR.UF TR.LM	F	SR -SA	1P	Dis		White	N-4	Kg		Transitional zone Abundant silt in sandstone fragments										
670		85/75		75-80	25-30					LVF -LF	F	SR	<1	Dis	TR	Tan ch. (?)	N-4	Kg/Km	Mancos Shale	Trace iron staining Sandstone disaggregated Possible mudstone										
680		85/75		50	(50)					VF -UF	F	SR -SA	<1	Dis Frags	TR	X qtz	N-4	Km		Silty sandstone fragments										
690		85/75		(25)	(75)					VF TR.M	M	SR -SA	<1P	scat.	TR	glauc.	N-4	Km		Trace iron staining										
700	80-53-700	90/75		(25)	(75)					VF -UF	F	SR -SA		TR	TR		N-3	Km		Sandy siltstone Disaggregated sand grains Iron stained quartz grains										

CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17 R. 13W Quadrangle (9.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/3/80  
 Company: U.S.G.S. County: McKinley Geologist: Kirk, Francis  
 Lat/Long: 35° 40' 17" N Sheet 8 of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico

Lake Valley Drilling Project, Hole No. 3, New Mexico										Sandstones										Form thin / make thin	COMMENTS
Depth to base of sample interval	Sample Number	Core/sec	Estimated % of Lithologies						Limestone	Grain size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Fluores.	Sandstone Color				
			Congl.	Sandst.	Siltst.	Shale	Shale color	Col													
710	80-53-710	85/75	30		70	N-3			LF	W	SR				TR	Reddish glauc	5Y6/1	Km	Manco Shale		
720		83/75	10	10	80				WF	W	SR		TR Frag		TR			Km			
730		85/75	5	5	90				IF		SR				TR			Km	Small calcite crystals		
740		80/75	50		50				uvF	W	SR		dism		fairly abn.	glauc blk. gr.	5YR6/2	Km			
750		80/75	<1	10	90										TR			Km	Small calcite crystals		
760		80/75	80		20				LF -UF	MW	SR	<1	dism		TR	glauc tan chc	5Y5/1	Km			
770		80/75	17	3	80				uvF -LF	MW	SR				TR	tan chc		Km	Small calcite crystals Limonite stained grains		
780		78/75	15	5	80				LF -UF TR, MW		SR -SA	<1	dism		TR	glauc	N-5	Km			
790		85/75	2		98										TR			Km	Small calcite crystals?		
800	80-53-800	80/75	20		80		Y	<1	LF -UF	M -MW	SR							Km	Trace limonite stained L.M. quartz grains. Very small limestone chips		

CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
Hole No: S-3 State: N.M. Date: 11/3/80  
Company: U.S.G.S. County: McKinley Geologist: Kirk, Hammond  
Lat/Long: 35° 40' 17" N Sheet 9 of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
Lake Valley Drilling Project, Hole No. 3, New Mexico  
Estimated % of Lithologies

Dep. to Bottom of Sample Interval	Sample Number	Core #/in	Sandstones						Limestone	Cal	Shale Color	Shale	Siltst	Sandst.	Congl.	Grain Size	Sorting	Roundness	Foliation	Carbonates	Pyrite	Foliation	Sediment Color	Remarks / from box	Comments
			Coarse	Med	Fine	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse	Very Fine	Very Coarse
810	80-53-810	80/75									N-3	90		10		LF	W	SR			TR			Kim	Small calcite crystals Gypsum?
820		75/75									N-3	95		5		LF	W	SR		VF	TR			Kim	Calcite and/or gypsum Limonite stained sand grains
830		75/75									N-3	95		5		LF-LM	M	SA-SR			TR			Kim	Limonite stained sand
840		80/75									N-3	95		5		LF-WF	M	SR			TR			Kim	Disaggregated quartz grains
850		90/75									N-4	40	40	20		VF	M	SR	<1	sat.	TR?			Kim	
860		85/75									N-4	95	(5)							scat.	?			Kim	
870		75/75									N-4	30	70											Kim	
880		70/75									N-4	93		7		VF	MW	SR						Kim	Sand is in chips
890		80/75									N-4	97		3						dis. FIK.	TR			Kim	Iron stained quartz
900	80-53-900	80/75									N-3	100												Kim	Trace calcite crystals



CHIP SAMPLE 106  
FORM

Location: Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/4/80  
 Company: U.S.G.S. County: McKinley Geologist: Kirk, Hammond  
 Lat/Long: 35° 40' 17" N Sheet 10 of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico  
 Estimated % of lithologies

Depth to base of sample interval	Sample Number	Core/Sec	Estimated % of lithologies								Sandstones							Fossils thin / number	Comments
			Long.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Alteest.	Sandstone Color		
910	80-53-910	85/80		2		98	N-3			VF						calc.		Minors Shale	Calcite may be inoceramus
920		80/80		see comments		98													2% calcite fragments (Shell fragments?)
930		80/80				100									TR	TR calc. frags			
940		80/80				100									TR	TR calc. frags			Hematite staining
950		90/80				100										TR calc. frags			Hematite staining
960		80/80				100										TR calc. frags			Hematite staining
970		80/80				100													
980		80/80				100									TR				
990		85/80				100									TR				
1000	80-53-1000	80/80				100									TR				



CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/4/80  
 Company: U.S.G.S. County: McKinley Geologist: Kirk, Hammond  
 Lat/Long: 35° 40' 17" N Sheet 11 of 16  
108° 14' 36" W

Depth to bottom of sample interval	Sample Number	Grain Size	Sedimentology						Lithology	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Fossils	Sandstone Color	Remarks / Notes	Comments
			Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal											
1010	80-53-100	80/80		10		90	N-3			uF	NW	SR						Kmj	Calcite crystals Disaggregated sand grains
1020		80/80		30	20	50	N-3			LF	M	SA				Rd. chc?	5Y8/4	Kmj	Calcite crystals Inoceramus shell fragments? Hematite stained sand grains
1030		80/80		40		60	N-3			LF	F	SA	<1				5Y8/4	Kmj	Calcite crystals
1040		80/80		20		80	N-3			LF	F	SA	<1		TR		5Y8/4	Kmj	Calcite crystals = shell fragments? Trace hematite stained sand
1050		85/80		5		95	N-4			uF		SA			?		5Y8/4	Kmj	Completely disaggregated
1060		80/80		5		95	N-4			LM		SA					5Y8/4	Kmj	Calcite crystals
1070		80/80		2		98	N-4								?			Kmj	Calcite crystals
1080		80/80		1		99	N-3											Kmj	Calcite crystals
1090		75/80		1		99	N-3											Kmj	
1100	80-53-100	80/80		3		97	N-3			uF		SA			?			Kmj	Trace calcite crystals

Table 1. Descriptions of cuttings samples from Mariano Lake - Lake Valley Drilling Project, Hole No. 3, New Mexico Estimated % of lithologies

CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/4/80  
 Company: U.S.G.S. County: McKinley Geologist: Kirk, Franczyk  
 Lat/Long: 35° 40' 17" N Sheet 12 of 16  
108° 14' 36" W

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico  
 Estimated % of Lithologies

Dip to base of sample interval	Sample Number	Grain Size	Estimated % at Lithologies								Sandstones							Formation / member	COMMENTS	
			Congl.	Sandst.	Siltst	Shale	Shale color	Coal	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pelite	Flaccid.	Sandstone Color			
1110	80-53-1110	70/80				100	N-3				UF -LF	M	SA -SR			?			km Mancos Shale	Trace sand grains calcite crystals
1120		80/80		10		90					UF -LF						Ean ch?	N-7	km	Calcite crystals
1130		85/80		2		98									?				km	Small calcite fragments probably Inoceramus
1140		80/80		2		98													km	
1150		80/80				100										TR			km	Very rare sand grains
1160		80/80				100										TR			km	Trace sand grains Trace calcite crystals
1170		85/80		5		95					UF MW		SA -SR						km	sandstone disaggregated
1180		80/80		1		99													km	
1190		80/80		5		95					LF		SR						km	calcite crystals
1200	80-53-1200	80/80		5		95					TR LC								km	calcite crystals

CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/4/80  
 Company: U.S.G.S. County: McKinley Geologist: Kirk, Franciszyk  
 Lat/Long: \_\_\_\_\_ Sheet 13 of 16.

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico

Depth to bottom of sample (feet)	Sample Number	Core/Loss	Estimated % of Lithologies								Sandstones							Form thin / number	Comments
			Coarl.	Sandst.	Siltst.	Shale	Shale color	Coal	Limestone	Grain size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Flint	Sandstone color		
1210	80-53-1210	80/80		TR		100	N-4											km	Manos Shale
1220		80/80		TR		100												km	
1230		85/80		TR		100												km	
1240		80/80		TR		100												km	
1250		80/80		TR		100			TR (chip)									km	
1260		80/80				100												km	
1270		80/80				100												km	
1280		80/80				100												km	
1290		85/80				100			TR									km	Greenhorn LS Mbr. Manos Shale
1300	80-53-1300	80/80				100								TR				km	Manos Shale



CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (7.5') Crown Point  
 Hole No: S-3 State: N.M. Date: 11/5/80  
 Company: U.S.G.S. County: McKinley Geologist: Hammond, Francis K  
 Lat/Long: \_\_\_\_\_ Sheet 14 of 16.

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico  
 Estimated % of Lithologies

Lake Valley Drilling Project, Hole No. 3, New Mexico										Sandstones							Form. Unit / member	COMMENTS		
Estimated % of Lithologies										Grain Size	Sorting	Roundness	Feldspar	Carbonate	Pyrite	Floccs.			Sandstone Color	
Core/bits	Sample Number	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone												
1310	80/75				100	N-3		TR										TR	Km Manos Shale	
1320	78/75				100			TR (1 dip)											Km	
1330	80/75		30		70			TR	M TRIVE	M	SR								Kdc Two Wells Tongue Dk. ls. ss	
1340	85/75		40		60				UF -LM TRIVE	M -F	SA -SR								Kdc	
1350	78/75		40		60			TR	UF -LM TRIVE	M -F	SA -SR								Kdc	
1360	85/75		50		50				UF -LM	MW	SA -SR								Kdc	
1370	82/75		30		70			TR	UF -LM	MW	SR -SA								Kmw White water Average Tongue Manos Shale	
1380	78/75		30		70			TR	UF	W	SR -R								Kmw	
1390	80/75		30		70			TR	UF	W	SR							TR gr. f.	Kmw	
1400	82/75		25		75				UF	W	SR							TR gr. f.	Kmw	

CHIP SAMPLE 106  
FORM

Location: Sec. 29 T. 17N R. 13W Quadrangle (p.s.) Crown Point  
 Hole No: S-3 State: N.M. Date: 11/5/80  
 Company: U.S.G.S. County: McKinley Geologist: Hammend, Franciszyk  
 Lat/Long: \_\_\_\_\_ Sheet 15 of 16.

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Late Valley Drilling Project, Hole No. 3, New Mexico

Depth to base of sample interval	Sample Number	Core/Sec	Estimated % of Lithologies								Sandstones							Remarks / Notes	Comments
			Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Floccs.	Sandstone Color		
1410	80-53-1410	75/75		5		95	N-4			VF	W	SR		TR		Calc.	N-8	Kmw	
1420		78/75		TR		100								TR		Calc.		Kmw	White water Arroyo Tongue Mancos Shale
1430		80/75		TR		100								TR	TR	Calc.		Kmw	
1440		78/75		3		97				VF	M	SR					N-8	Kmw	
1450		77/75		3		97				VF	M	SR					N-8	Kmw	Samples not washed very well covered with drillers mud.
1460		80/75		60	40					UVF -UF	M	SR	TR	TR		tan ch. Calc.	N-9/N-8	Kd	" " "
1470		77/75		40	60					UVF -UF	M	SR	TR	TR			N-9/N-8	Kd	Scattered grains of amber quartz
1480		79/75		25	75					UVF -UF	M	SR	TR	TR		tan ch. Calc.	N-9/N-8	Kd	
1490		74/75		60	40					UVF -UF	M	SR -SA	TR	TR			N-9/N-8	Kd	
1500	80-53-1500	75/75		80	20					LVF -UF TR M	M	SR -SA	TR	TR		ch.?	N-9/N-8	Kd	

CHIP SAMPLE 106  
FORM

Location: \_\_\_\_\_ Sec. 29 T. 17N R. 13W Quadrangle (p.s.) Crown Point  
 Hole No: S-3 State: N.M. Date: 11/5/80  
 Company: U.S.G.S. County: McKinley Geologist: Hammond, Franciszek  
 Lat/Long: \_\_\_\_\_ Sheet 16 of 16.

Table 1. Descriptions of cuttings samples from Mariano Lake -  
 Lake Valley Drilling Project, Hole No. 3, New Mexico  
 Estimated % of lithologies

Depth to base of sample interval	Sample Number	Gravel	Congl.	Sandst.	Siltst.	Shale	Shale color	Coal	Limestone	Sandstones						Formation/Member	Comments
										Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Flint	
1510	80-53-1510			40		60	N-5			uvf	MW	SR		Dis. Frgs	TR		Kd Dakota SS
1520				40		60				uvf -LF	M	SR -SA	TR	Frgs	TR		Kd
1530				50		50				LF	MW	SR -SA		Frgs	TR		Kd
1540	80-53-1540			60		40				uvf -uF	M	SR -SA		dism	TR		Kd
1540-2138 TD.																	



Table 2 Descriptions of core from Mariano Lake - Lake Valley  
Drilling Project Hole No. 3, New Mexico

THICKNESS	SAMPLE NO.	UNIT NO.	FM/MBR.	RADIOACT.	CPS	VISUAL POROSITY	CORE ESTIMATE	ROCK TYPE	FOOTNOTES	COLOR	GRAIN SIZE	BEDDING	SEDIMENTARY STRUCTURES	BIOLOGY/ORGANICS	SORTING/ROUNDNESS	CEMENT	PERCENT FELDSPAR	ACCESSORY MINERALS OR FRAGMENTS	NOTES: (ALTERATION, ATTITUDE, CLASTS, MINERALIZATION, & MISC. INFO.)	INFERRED ENVIRONMENT OF DEPOSITION	TRANSPORT DIRECTION (NO. OF MEASUREMENTS)
1567			61	62		Exc	Good			N-8	Med to coarse sand	Massive	Flip	carb. stringers, bioturb. (local)	MW or W	NC	0%	Pyrite	carb. stringers, bioturb. stringers, pyrite scattered	FLV sd	
1572				32	28					N-1	Med to coarse sand	Massive		Coal	W	—	0		coal & silty clay	FLV sd, low energy	
1582				70	74					N-5	Med to coarse sand	Vertical		Coal stringers	MW SR	sl. calc	0		scour base, finer & more carb. at top, mottled		
1592				70	78					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		carb. mat throughout, decreasing toward top		
1592				84	87					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		mottled, some distinguishable burrows but dom. bioturb. stringers of carb. mat, dom. vertical, strong root		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		coal frags, stringers of carb. mat, siltstone filling burrows		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		irregular base, coal frags, burrowed bioturb.		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		no discernible structures, some burrowing		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		poss root casts		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		coal frags / disseminated coal frags.		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		silty matrix		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		carb. frags and small stringers of carb. mat, more strongly bioturb. toward base, distinct basal contact w/ underlying more carb. muddy unit		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		abnt pyrite in carb. stringers		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		more sand at base w/ tr. med. sd.		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		well cemented, coal frags		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—		hematite staining, glt overgrowths, clay matrix		
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand	Horizontal		carb. mat	—	—	—				
1592				82	85					N-7	Med to coarse sand										

Table 2 Descriptions of core from Mariano Lake - Lake Valley  
Drilling Project Hole No. 3, New Mexico

LOCATION <u>hole 5-3</u> Sec. <u>24</u> T. <u>17 N</u> R. <u>12 W</u>		STATE <u>N.Mex</u> COUNTY <u>McKinley</u>		U.S.G.S. CORE LIBRARY NUMBER _____ API WELL NUMBER _____	
1647	76				lt frags? poss carb mat.
1647	74				pyrite
1647	72				lg fragment (blebby?) cont. vesicles? filled w/ white mat (zeolite?)
1647	70				80-53-1645 p green zeolite & clayey
1647	68				mottled clay & sand, loading?
1647	66				80-53-1648 g silty claystone
1647	64				mottled 5/16/11, 5/8 x 1/1
1657	62				
1657	60				and. ch. bluish green
1657	58				angleline? mottled, burrowed
1657	56				angleline
1657	54				silty clayst. mottled (burrowed?)
1667	52				
1667	50				80-53-1679 p bright green sand size gr. - angleline?
1667	48				mottled burrowed 5/8 s/1, 5/16/11 in lower ft.
1667	46				concretions 80-53-1687 p very muddy sandstone
1667	44				pyrite
1667	42				pyrite
1667	40				pyrite
1667	38				pyrite
1667	36				pyrite
1667	34				pyrite
1667	32				pyrite
1667	30				pyrite
1667	28				pyrite
1667	26				pyrite
1667	24				pyrite
1667	22				pyrite
1667	20				pyrite
1667	18				pyrite
1667	16				pyrite
1667	14				pyrite
1667	12				pyrite
1667	10				pyrite
1667	8				pyrite
1667	6				pyrite
1667	4				pyrite
1667	2				pyrite
1667	0				pyrite



9

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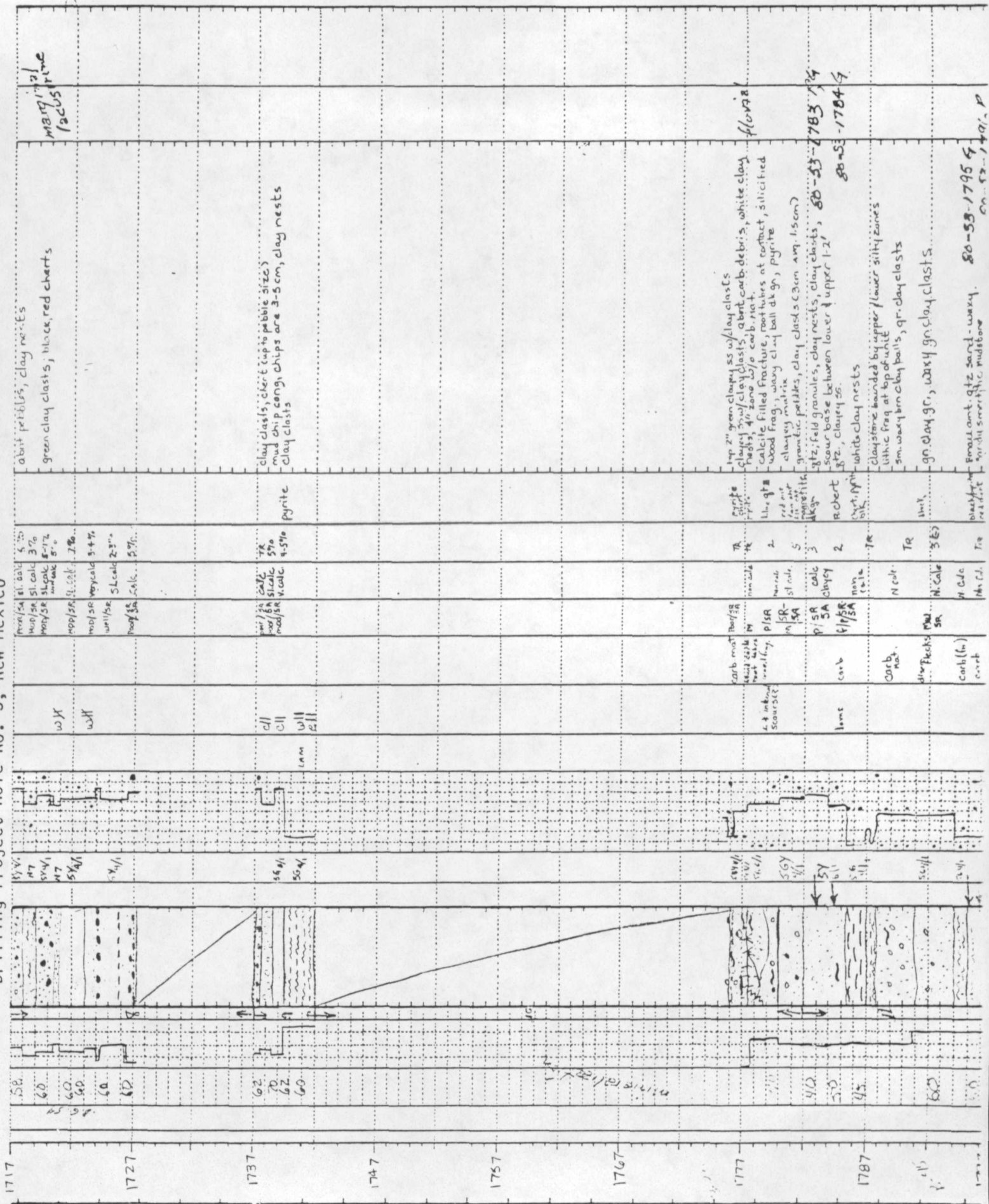




Table 2 Descriptions of core from Mariano Lake - Lake Valley

[illegible]

Table 2 Descriptions of core from Mariano Lake - Lake Valley  
Drilling Project Hole No. 3, New Mexico

LOCATION S 3		Sec. 29	T. 17N	R. 15W		
STATE New Mexico		COUNTY McKinley				
U.S.G.S. CORE LIBRARY NUMBER		API WELL NUMBER				
1880	125			7	blt ch 10 gm tan ch	San, field granules 80-53-1882 P <sub>5</sub>
				12	blt ch 10 gm tan ch	Very clayey towards top, upper foot of interval has dark zones (may be mineralized) qtz, feldspar granules, bluish qtz grains.
1890	140 135 130 120					80-53-1892 P <sub>5</sub> Kashin nests epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests
1900	65 55					Feldspar granules, medium Kashin nests epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests
1910	50 55					epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests
1920	50 55					epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests
1930	50 55					epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests
1940	50 55					epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests
1950	50 55					epidemic clast, 2cm! pyrite, quartzite, granitic pebbles 80-53-1892 P <sub>5</sub> Kashin nests



Table 2 Descriptions of core from Mariano Lake - Lake Valley Drilling Project Hole No. 3, New Mexico

LOCATION 2-3 Sec. 54 T. 17N R. 13W  
 STATE N. Mex. COUNTY McKinley  
 U.S.G.S. CORE LIBRARY NUMBER \_\_\_\_\_ API WELL NUMBER \_\_\_\_\_

**Core Description:**

- 50-55 ft: clay clasts 5" large, 20mm's F.L.D. pebbles
- 55-60 ft: clay nests
- 60-65 ft: clay nests
- 65-70 ft: clay nests
- 70-75 ft: clay nests
- 75-80 ft: clay nests
- 80-85 ft: clay nests
- 85-90 ft: clay nests
- 90-95 ft: clay nests
- 95-100 ft: clay nests
- 100-105 ft: clay nests
- 105-110 ft: clay nests
- 110-115 ft: clay nests
- 115-120 ft: clay nests
- 120-125 ft: clay nests
- 125-130 ft: clay nests
- 130-135 ft: clay nests
- 135-140 ft: clay nests
- 140-145 ft: clay nests
- 145-150 ft: clay nests
- 150-155 ft: clay nests
- 155-160 ft: clay nests

**Core Type:**

- 50-55 ft: red blk chert
- 55-60 ft: blk chert
- 60-65 ft: blk chert
- 65-70 ft: blk chert
- 70-75 ft: blk chert
- 75-80 ft: blk chert
- 80-85 ft: blk chert
- 85-90 ft: blk chert
- 90-95 ft: blk chert
- 95-100 ft: blk chert
- 100-105 ft: blk chert
- 105-110 ft: blk chert
- 110-115 ft: blk chert
- 115-120 ft: blk chert
- 120-125 ft: blk chert
- 125-130 ft: blk chert
- 130-135 ft: blk chert
- 135-140 ft: blk chert
- 140-145 ft: blk chert
- 145-150 ft: blk chert
- 150-155 ft: blk chert
- 155-160 ft: blk chert

**Lithology:**

- 50-55 ft: red blk chert
- 55-60 ft: blk chert
- 60-65 ft: blk chert
- 65-70 ft: blk chert
- 70-75 ft: blk chert
- 75-80 ft: blk chert
- 80-85 ft: blk chert
- 85-90 ft: blk chert
- 90-95 ft: blk chert
- 95-100 ft: blk chert
- 100-105 ft: blk chert
- 105-110 ft: blk chert
- 110-115 ft: blk chert
- 115-120 ft: blk chert
- 120-125 ft: blk chert
- 125-130 ft: blk chert
- 130-135 ft: blk chert
- 135-140 ft: blk chert
- 140-145 ft: blk chert
- 145-150 ft: blk chert
- 150-155 ft: blk chert
- 155-160 ft: blk chert

**Other Notes:**

- 50-55 ft: high energy fluvial
- 55-60 ft: high energy fluvial
- 60-65 ft: high energy fluvial
- 65-70 ft: high energy fluvial
- 70-75 ft: high energy fluvial
- 75-80 ft: high energy fluvial
- 80-85 ft: high energy fluvial
- 85-90 ft: high energy fluvial
- 90-95 ft: high energy fluvial
- 95-100 ft: high energy fluvial
- 100-105 ft: high energy fluvial
- 105-110 ft: high energy fluvial
- 110-115 ft: high energy fluvial
- 115-120 ft: high energy fluvial
- 120-125 ft: high energy fluvial
- 125-130 ft: high energy fluvial
- 130-135 ft: high energy fluvial
- 135-140 ft: high energy fluvial
- 140-145 ft: high energy fluvial
- 145-150 ft: high energy fluvial
- 150-155 ft: high energy fluvial
- 155-160 ft: high energy fluvial



Table 2 Descriptions of core from Mariano Lake - Lake Valley  
Drilling Project Hole No. 3, New Mexico

LOCATION S-3 Sec. 29 T. 17 N R. 15 W  
STATE N.M. COUNTY McKinley  
U.S.G.S. CORE LIBRARY NUMBER \_\_\_\_\_ API WELL NUMBER \_\_\_\_\_

Depth (m)	Depth (ft)	Core Description	Grain Size	Color	Texture	Notes
2040	67	54	sl. calc.	light	mod.	80-53-2042, organic debris, blk chert on lams
2050	66	55	mod. calc.	light	mod.	Chert matrix (green)
2060	65	56	mod. calc.	light	mod.	Chert matrix (green)
2070	64	57	mod. calc.	light	mod.	Chert matrix (green)
2080	63	58	mod. calc.	light	mod.	Chert matrix (green)
2090	62	59	mod. calc.	light	mod.	Chert matrix (green)
2100	61	60	mod. calc.	light	mod.	Chert matrix (green)
2110	60	61	mod. calc.	light	mod.	Chert matrix (green)
2120	59	62	mod. calc.	light	mod.	Chert matrix (green)
2130	58	63	mod. calc.	light	mod.	Chert matrix (green)
2140	57	64	mod. calc.	light	mod.	Chert matrix (green)
2150	56	65	mod. calc.	light	mod.	Chert matrix (green)
2160	55	66	mod. calc.	light	mod.	Chert matrix (green)
2170	54	67	mod. calc.	light	mod.	Chert matrix (green)
2180	53	68	mod. calc.	light	mod.	Chert matrix (green)
2190	52	69	mod. calc.	light	mod.	Chert matrix (green)
2200	51	70	mod. calc.	light	mod.	Chert matrix (green)
2210	50	71	mod. calc.	light	mod.	Chert matrix (green)
2220	49	72	mod. calc.	light	mod.	Chert matrix (green)
2230	48	73	mod. calc.	light	mod.	Chert matrix (green)
2240	47	74	mod. calc.	light	mod.	Chert matrix (green)
2250	46	75	mod. calc.	light	mod.	Chert matrix (green)
2260	45	76	mod. calc.	light	mod.	Chert matrix (green)
2270	44	77	mod. calc.	light	mod.	Chert matrix (green)
2280	43	78	mod. calc.	light	mod.	Chert matrix (green)
2290	42	79	mod. calc.	light	mod.	Chert matrix (green)
2300	41	80	mod. calc.	light	mod.	Chert matrix (green)
2310	40	81	mod. calc.	light	mod.	Chert matrix (green)
2320	39	82	mod. calc.	light	mod.	Chert matrix (green)
2330	38	83	mod. calc.	light	mod.	Chert matrix (green)
2340	37	84	mod. calc.	light	mod.	Chert matrix (green)
2350	36	85	mod. calc.	light	mod.	Chert matrix (green)
2360	35	86	mod. calc.	light	mod.	Chert matrix (green)
2370	34	87	mod. calc.	light	mod.	Chert matrix (green)
2380	33	88	mod. calc.	light	mod.	Chert matrix (green)
2390	32	89	mod. calc.	light	mod.	Chert matrix (green)
2400	31	90	mod. calc.	light	mod.	Chert matrix (green)
2410	30	91	mod. calc.	light	mod.	Chert matrix (green)
2420	29	92	mod. calc.	light	mod.	Chert matrix (green)
2430	28	93	mod. calc.	light	mod.	Chert matrix (green)
2440	27	94	mod. calc.	light	mod.	Chert matrix (green)
2450	26	95	mod. calc.	light	mod.	Chert matrix (green)
2460	25	96	mod. calc.	light	mod.	Chert matrix (green)
2470	24	97	mod. calc.	light	mod.	Chert matrix (green)
2480	23	98	mod. calc.	light	mod.	Chert matrix (green)
2490	22	99	mod. calc.	light	mod.	Chert matrix (green)
2500	21	100	mod. calc.	light	mod.	Chert matrix (green)

Table 2. Descriptions of core from Mariano Lake - Lake Valley

LOCATION S-3 Sec. 6 T. 17N R. 13W  
STATE N. Mexico COUNTY Ch. Haley  
U.S.G.S. CORE LIBRARY NUMBER \_\_\_\_\_ API WELL NUMBER \_\_\_\_\_

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