

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GROUND-WATER DATA FOR 1974-75 IN
JOSHUA TREE NATIONAL MONUMENT, CALIFORNIA

Open-File Report 77-80

Prepared in cooperation with the
National Park Service

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By D. J. Downing

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Menlo Park, California

January 1977



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CONVERSION FACTORS

Factors for converting English units to metric units are shown to four significant figures. In the text the metric equivalents are shown only to the number of significant figures consistent with the values for the English units.

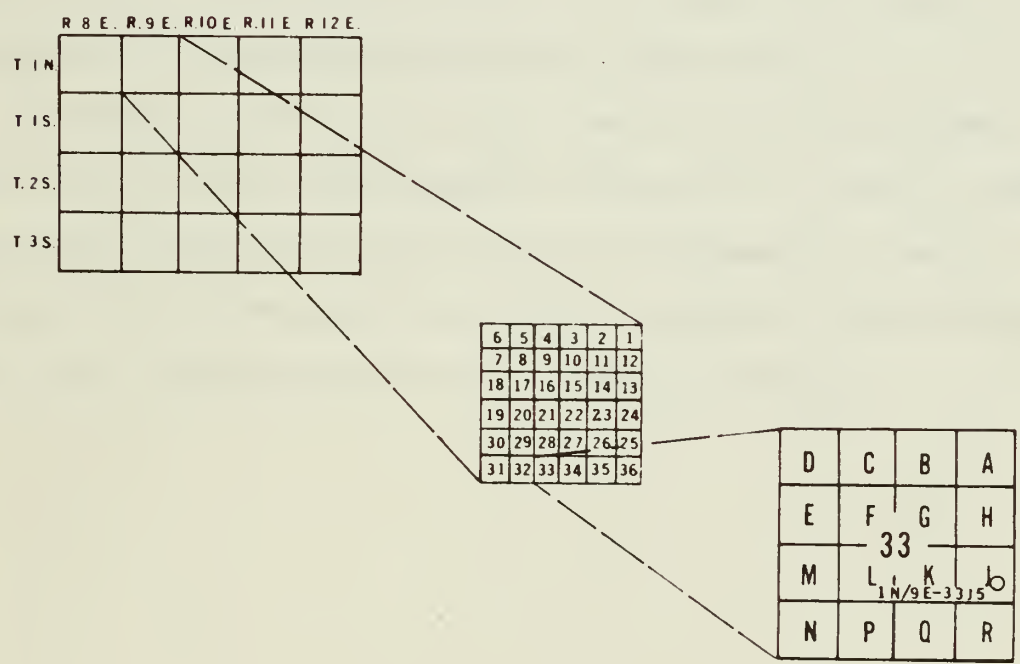
<u>English</u>	<u>Multiply by</u>	<u>Metric</u>
acres	4.047×10^{-3}	ha (hectares)
acre-ft (acre-feet)	1.233×10^{-3}	hm ³ (cubic hectometers)
ft (feet)	3.048×10^{-1}	m (meters)
gal (gallons)	3.785	l (liters)
in (inches)	2.540	cm (centimeters)
mi (miles)	1.609	km (kilometers)

GROUND-WATER DATA FOR 1974-75 IN
JOSHUA TREE NATIONAL MONUMENT, CALIFORNIA

By D. J. Downing

This report, prepared at the request of the National Park Service, is part of a continuing inventory by the U.S. Geological Survey of general geohydrologic conditions at Joshua Tree National Monument (fig. 1). The report includes chemical analyses of ground water from selected wells (table 1), pumpage by Kaiser Steel Corp. from Pinto Basin (table 2), yearly pumpage totals by Kaiser Steel Corp. (table 3), and water-level measurements in observation wells in the monument (table 4). Data on pumpage and on water levels before the period of this report are published in Geological Survey Water-Supply Paper 1475-0 and in previous annual reports to the National Park Service.

The well-numbering system used by the Geological Survey in California indicates the location of wells according to the rectangular system for the subdivision of public land. For example, in the well number 1N/9E-33J5 that part of the number preceding the slash indicates the township (T. 1 N.); the number following the slash indicates the range (R. 9 E.); the number following the hyphen indicates the section (sec. 33); and the letter following the section number indicates the 40-acre (16-ha) subdivision of the section according to the lettered diagram below. The final number is a serial number for wells in each 40-acre (16-ha) subdivision.



Water samples were collected during October 1974 and November 1975 from wells 2S/8E-21G1 (NPS Lost Horse No. 1), which is currently unused, and well 4S/11E-27Q1 (NPS Cottonwood well), which provides water for public supply in the Cottonwood Spring area. The water samples were analyzed by the Geological Survey laboratory in Salt Lake City, Utah, and the results are tabulated in table 1. In general, the water from these two wells is a calcium sodium bicarbonate type; the concentration of dissolved solids is low--less than 300 mg/l (milligrams per liter). The chemical quality of the water from these wells is good except for the fluoride concentration of 2.6 mg/l in well 4S/11E-27Q1. That concentration exceeds the recommended upper control limit for drinking water (Environmental Protection Agency, 1972, p. 66) by about 1.2 mg/l. This high concentration of fluoride was also noted by Weir and Bader, 1963, p. 45).

The pumpage by Kaiser Steel Corp. from Pinto Basin for calendar years 1974 and 1975 was approximately 2,500 acre-ft (3.1 hm^3) per year. Since 1960, 43,600 acre-ft (53.8 hm^3) has been pumped for a yearly average of about 2,700 acre-ft (3.3 hm^3). The pumpage totals for the past 5 years (1971-75) have been below this yearly average.

During 1974, 2 wells were discontinued from the observation-well network and 15 wells were added. The discontinued wells (3S/9E-14C1 in Pleasant Valley and 2S/12E-36F1 in Pinto Basin) are in areas of the monument now classified as wilderness. Fourteen of the added wells are in the Oasis of Mara (fig. 2), west of the visitor center. These wells were augered during the winter of 1973-74 by the Geological Survey. The other well (2S/8E-21G1, NPS Lost Horse No. 1) added to the observation-well network is in Lost Horse Valley east of Ryan campground.

In the Oasis of Mara (fig. 2), water-level measurements of wells show seasonal fluctuations during the last 2 years. The general trend, however, is a slight decline in water level on both sides of the Pinto Mountain fault. In other areas of the monument (fig. 1), water levels have shown a steady decline during the last 10 years. The largest decline was 42 ft (13 m) which occurred in well 1S/7E-27R1 (Willetts Well). A 12-ft (3.7-m) decline occurred in well 2S/8E-7K1 (Stokes No. 2). Well 2S/8E-21G1 (Lost Horse No. 1) has declined 25 ft (7.6 m) since it was first measured by the Survey in 1958. The rest of the monitored wells have had small or insignificant water-level changes during the last decade.

REFERENCES CITED

- Environmental Protection Agency, Environmental Studies Board, 1972,
Water quality criteria 1972--a report of the Committee on Water
Quality Criteria: Washington, U.S. Government Printing Office,
594 p.
- Kunkel, Fred, 1963, Hydrologic and geologic reconnaissance of Pinto Basin,
Joshua Tree National Monument, Riverside County, California:
U.S. Geol. Survey Water-Supply Paper 1475-0, p. 537-561.
- Weir, J. E., Jr., and Bader, J. S., 1963, Ground water and related
geology of Joshua Tree National Monument, California: U.S. Geol.
Survey open-file rept., 123 p.

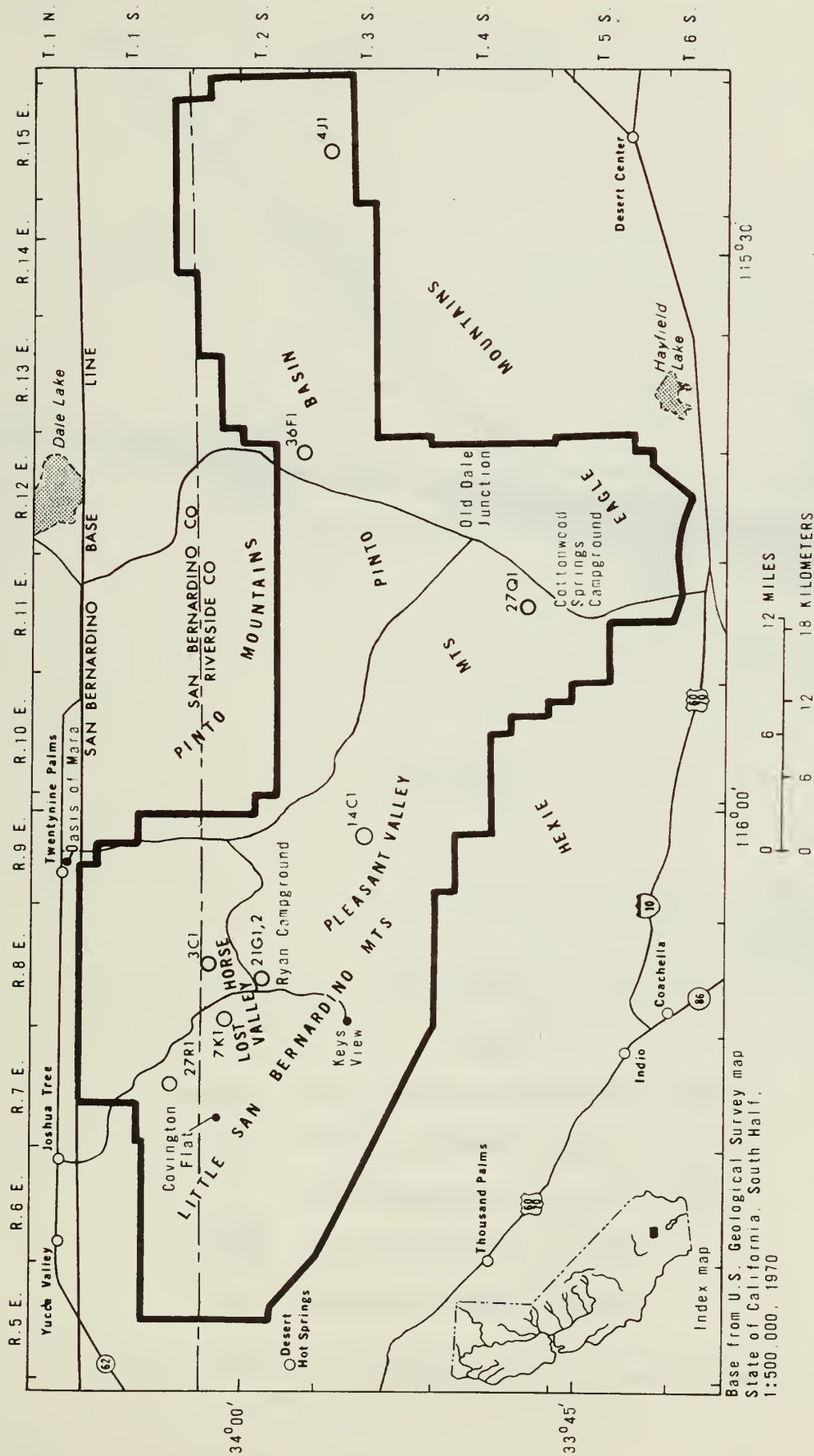


FIGURE 1.--Map of Joshua Tree National Monument showing location of observation wells

Twentynine Palms Highway

Palm Vista Drive

PINTO MTN.

FAULT

Twentynine Palms Inn

Joshua Tree National Monument

Headquarters

Utah Trail

Dirt road Maintenance building

SECTION 33

N

0 1/4 1/2 MILE
0 1/4 1/2 KILOMETER

Baseline Road

EXPLANATION

--- FAULT--Dotted where concealed or inferred

⊙^{K1} TEST WELL AND NUMBER--Augered in 1973-74○^{J1} WELL AND NUMBER--Existing prior to 1973

AREA OF PHREATOPHYTIC VEGETATION

--- NATURE TRAIL THROUGH THE OASIS

FIGURE 2.--Map of the Oasis of Mara, Joshua Tree National Monument, showing location of observation wells.

TABLE 1.--Chemical analyses of ground water

[Constituents reported in milligrams per liter except
iron and boron in micrograms per liter]

Well number 2S/8E-21G1 (NPS Lost Horse No. 1) ¹		
Constituents	Date of collection	
	Oct. 18, 1974	Nov. 13, 1975
Silica (SiO ₂)	31	26
Iron (Fe)	50	40
Calcium (Ca)	42	42
Magnesium (Mg)	11	9.8
Sodium (Na)	37	32
Potassium (K)	1.1	1.1
Bicarbonate (HCO ₃)	190	190
Carbonate (CO ₃)	0	0
Sulfate (SO ₄)	29	29
Chloride (Cl)	23	24
Fluoride (F)	.8	.8
Nitrate (NO ₃)	.18	.21
Dissolved solids		
calculated sum	269	261
Hardness as CaCO ₃	150	150
Boron (B)	130	160
Percent sodium	35	32
Sodium-adsorption-ratio (SAR)	1.3	1.2
Specific conductance		
(micromhos at 25°C)	430	440
pH	7.8	--
Temperature (°C)	19.5	18.5

See footnote at end of table.

TABLE 1.--Chemical analyses of ground water--Continued

Well number 4S/11E-27Q1 (NPS Cottonwood well) ²		
Constituents	Date of collection	
	Oct. 17, 1974	Nov. 12, 1975
Silica (SiO ₂)	33	21
Iron (Fe)	40	50
Calcium (Ca)	38	33
Magnesium (Mg)	8.3	7.0
Sodium (Na)	42	38
Potassium (K)	2.0	1.5
Bicarbonate (HCO ₃)	140	140
Carbonate (CO ₃)	0	0
Sulfate (SO ₄)	25	24
Chloride (Cl)	39	39
Fluoride (F)	2.6	2.3
Nitrate (NO ₃)	1.4	1.4
Dissolved solids		
calculated sum	268	235
Hardness as CaCO ₃	130	110
Boron (B)	150	120
Percent sodium	41	42
Sodium-adsorption-ratio (SAR)	1.6	1.6
Specific conductance		
(micromhos at 25°C)	445	400
pH	8.0	--
Temperature (°C)	26.5	21.0

¹Analyses by U.S. Geological Survey laboratory, Salt Lake City, Utah; samples obtained with a thief sampler.

²Analyses by U.S. Geological Survey laboratory, Salt Lake City, Utah; samples obtained when well was pumping.

TABLE 2.--Pumpage from wells in Pinto Basin by Kaiser Steel Corp.for calendar years 1974-75

[Metered in thousands of gallons, data furnished by Kaiser Steel Corp.

(to convert from thousands of gallons to acre-feet divide by 325.8)]

	1974	1975	Totals
January	53,760	63,098	116,858
February	60,948	50,370	111,318
March	68,135	57,293	125,428
April	67,189	76,540	143,729
May	82,302	84,815	167,117
June	86,339	71,144	157,483
July	88,721	88,900	177,621
August	77,015	58,430	135,445
September	65,309	73,555	138,864
October	69,652	66,834	136,486
November	64,488	72,428	136,916
December	42,977	55,731	98,708
Total ¹ (thousands of gallons)	827,000	819,000	1,650,000
Total ² (acre-feet)	2,500	2,500	5,000

¹Rounded to three significant figures.²Rounded to two significant figures.

TABLE 3.--Yearly totals of pumpage from wells in Pinto Basin by
Kaiser Corp. for calendar years 1960-75¹

[Metered in thousands of gallons, data furnished by Kaiser Steel Corp.
 (to convert from thousands of gallons to acre-feet divide by 325.8)]

Year	Thousands of gallons ²	Acre-feet ³
1960	569,000	1,700
1961	630,000	1,900
1962	749,000	2,300
1963	1,190,000	3,600
1964	1,140,000	3,500
1965	969,000	3,000
1966	1,020,000	3,100
1967	1,090,000	3,300
1968	891,000	2,700
1969	949,000	2,900
1970	967,000	3,000
1971	846,000	2,600
1972	792,000	2,400
1973	833,000	2,600
1974	827,000	2,500
1975	819,000	2,500
Total	14,300,000	44,000

¹For pumpage prior to 1960 see Kunkel, 1963, p. 558.

²Rounded to three significant figures.

³Rounded to two significant figures.

TABLE 4.--Ground-water levels in observation wells

[Depths of wells given in whole feet were reported by owners, drillers, or others; depths given in feet and tenths of a foot were measured below land-surface datum by the U.S. Geological Survey. Measurements are in feet below or above (+) the described point of reference]

Standardized footnotes

- a. Well being pumped.
 - b. Well pumped recently.
 - c. Nearby well being pumped.
 - d. Nearby well pumped recently.
 - e. Estimated.
 - f. Dry.
 - g. Measurement by outside agency or person.
 - h. Tape measurement.
 - i. Affected by outside influence (wind, atmospheric pressure, ocean tides, railroad trains).
 - j. Water level below sea level.
 - k. Measurement from recorder chart.
 - m. Obstruction in well above water surface.
 - n. No measurement.
-

CALIFORNIA COUNTY San Bernardino

AREA OR BASIN Copper Mountain Hydro Subunit (X-8.B0)

State number 1S/7E-27R1 S

Depth of well 182.0 ft.

Altitude of land-surface datum $\frac{3,770}{(1,149 \text{ m})}$ feet above

Well-code number 340302N1161406.1

Description of well: National Park Service (Willetts Well). In Quail Wash south of Joshua Tree (village) and west of Lost Horse Valley. Drilled unused well in alluvium, diameter 5 in (13 cm).

(25.17 m) (52.37 m)

(52.37 m)

Records available 1958, 1961-

Highest water level 82.59 ft.

May 2, 1958

171.83 ft.

12.

12.

All water levels are referenced to land-surface datum

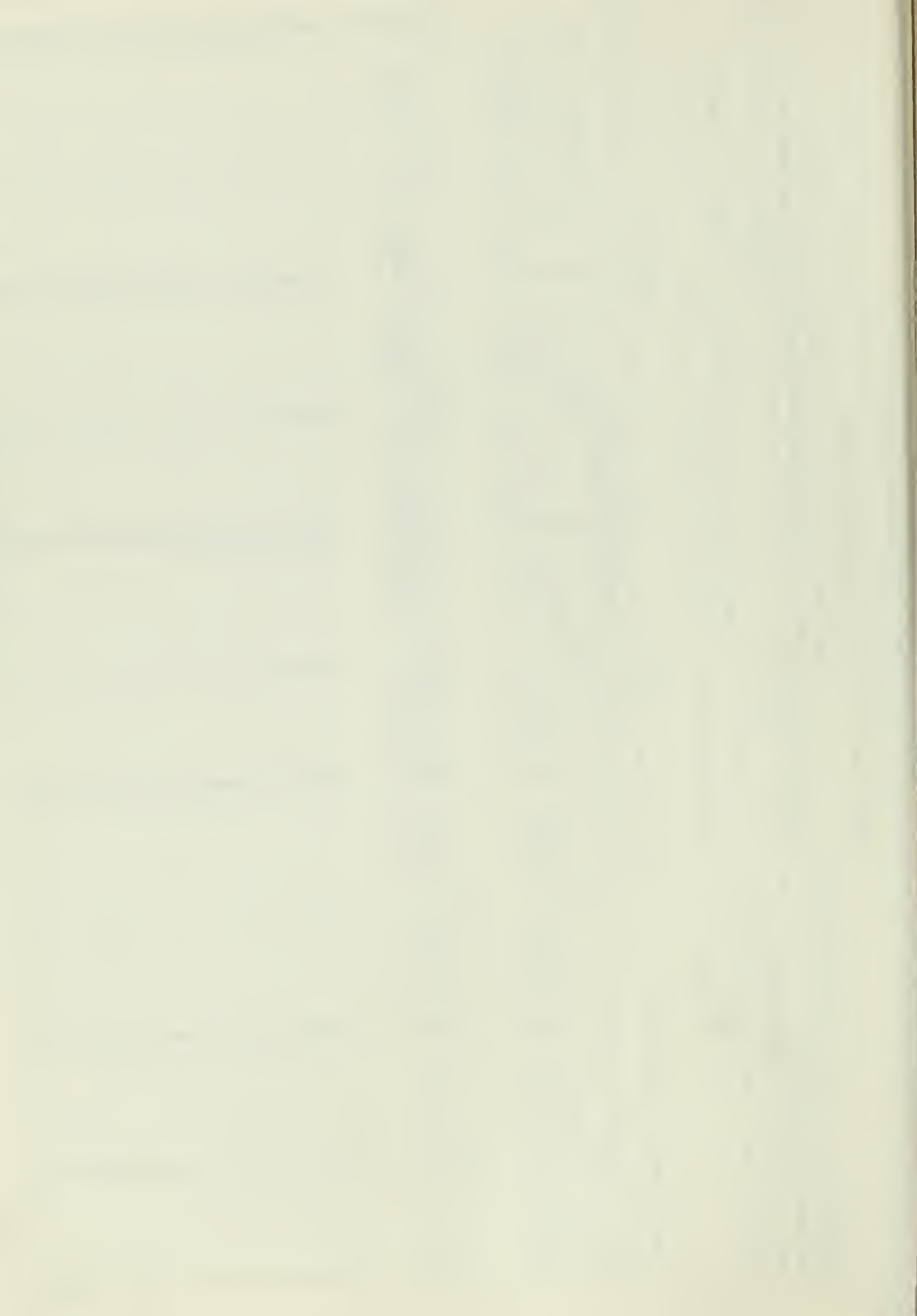
1966		1967		1968		1969		1970	
Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 1	129.75	Mar. 15	136.83	Apr. 4	(m)	Apr. 22	(m)	Apr. 8	160.98
Oct. 26	134.70	Oct. 25	(m)	Oct. 29	(m)	Oct. 24	159.4	Oct. 30	162.15

1971		1972		1973		1974		1975	
Apr. 1	166.50	Jan. 28	164.80	Mar. 17	169.80	Feb. 26	169.12	Apr. 7	170.85
		Jun. 15	165.74	Sep. 25	168.40	Oct. 18	170.20	Nov. 13	171.83

State number

1S/7E-27R1 S

[illegible]



Copper Mountain Hydro Subunit (X-8.B0)

CALIFORNIA
COUNTY
Riverside

State number 2S/8E-3C1 S

$$\text{Depth of well} = \frac{108 \text{ ft.}}{(33 \text{ m})}$$
$$\frac{\text{Altitude of land-surface datum}}{(1,311 \text{ m})} = 4,300$$

feet above mean sea level

Well-code number 340149N1160800.1

Description of well: National Park Service (Queen well). South of the Wonderland of Rocks and about 2 mi (3 km) north of Sheep Pass. Dug unused well in residuum, diameter 6 ft (2 m).

(28.04 m) (30.84 m)

Records available	1961, 1965-	Highest water level	ft.	Oct. 25, 1967	Lowest	ft.	Jun. 15, 1972
		91.99			101.18		

All water levels are referenced to land-surface datum

1966		1967		1968		1969		1970	
Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 1	95.74	Mar. 15	92.06	Apr. 5	94.60	Apr. 22	92.01	Apr. 8	92.50
Oct. 26	93.25	Oct. 25	91.99	Oct. 30	92.17	Oct. 24	92.28	Oct. 29	93.70

1971		1972		1973		1974		1975	
Apr. 1	92.99	Jan. 28	93.38	Mar. 17	98.61	Feb. 26	94.08	Apr. 8	94.44
		Jun. 15	101.18	Sep. 25	94.07	Oct. 18	94.30	Nov. 13	94.63

State number

2S/8E-3C1-S

[illegible]

CALIFORNIA	COUNTY	Riverside	AREA OR BASIN	Copper Mountain Hydro Subunit (S-8.B0)

State number 2S/8E-7K1 S Depth of well 290 ft. Altitude of land-surface datum 4,100 feet above mean sea level
Well-code number 340042N161031.1 (88 m) (1,250 m)

Description of well: National Park Service (Stokes No. 2). In narrow valley west of Hidden Valley at west side of Lost Horse Valley. Drilled unused well in residuum, diameter 8 in (20 cm).

Records available	1961-	(61.73 m)
	Highest water level	(68.75 m)
	<u>ft.</u> Sep. 10, 19 <u>62</u> Lowest <u>ft.</u> Nov. 13, 19 <u>75</u>	
	All water levels are referenced to land-surface datum	

1966			1967			1968			1969			1970		
Date	Water level		Date	Water level		Date	Water level		Date	Water level		Date	Water level	
Mar. 1	213.69		Mar. 15	214.93		Apr. 4	215.81		Apr. 22	216.65		Apr. 8	217.84	
Oct. 26	214.50		Oct. 25	215.46		Oct. 29	216.15		Oct. 24	216.80		Oct. 29	218.59	

1971		1972		1973		1974		1975	
Apr. 1	219.06	Jan. 27	220.31	Mar. 17	221.75	Feb. 26	223.18	Apr. 7	224.66
		Jun. 15	220.80	Sep. 25	222.54	Oct. 18	224.09	Nov. 13	225.56

[illegible]

CALIFORNIA COUNTY Riverside

Copper Mountain Hydro Subunit (X-8.B0)

State number	2S/8E-21G1 S	Depth of well	72.3 (22.0 m)	Altitude of land-surface datum	4,400 (1,341 m)	feet above mean sea level
Well-code number	335903116084901					

Description of well: National Park Service (Lost Horse No. 1). East side of Lost Horse Valley near Ryan Campground.
Dug public supply well in residuum, diameter 72 in (183 cm).

(11.80 m) (19.51 m)

Records available 1958, 1961, 1974- (11.80 m)
 Highest water level 38.71 ft. May 6, 1958 (19.51 m)
 Lowest 64.00 ft. Nov. 13, 1975
 All water levels are referenced to land-surface datum

1958		1961		1974		1975	
Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 6	38.71	Nov. 29	40.23	Oct. 18	63.96	Apr. 8	63.48
						Nov. 13	64.00

[illegible]

CALIFORNIA COUNTY Riverside

Riverside

AREA OR BASIN

Copper Mountain Hydro Subunit (X-8.B0)

State number 2S/8E-21G2 S

1000

$$\text{Depth of well} \quad \frac{43.0 \text{ ft.}}{(13.1 \text{ m})}$$

Altitude of land-surface datum -

$$\frac{4,480}{(1,366 \text{ m})}$$

feet above mean sea level

Description of well:

National Park Service

Lost Horse No. 2). East side of Lost Horse Valley near Ryan Campground.

Dug public supply well in residuum, diameter 48 in (122 cm).

Records available 1961-

961-

Highest water level	32.54	(9.92 m)
---------------------	-------	----------

Nov. 29, 1961

(12.50 m)
41.00 ft

1961-

1961-

32.54 n.

Nov. 29, 1961

41.00 ft.

1999

100

erenced to land.

face datum

100

100

7	1968	
---	------	--

1966			1967			1968			1969			1970		
Date	Water level		Date	Water level		Date	Water level		Date	Water level		Date	Water level	
Mar. 1	38.71		Mar. 15	39.72		Apr. 4	41.00		Apr. 22	40.74		Apr. 8	39.33	
Oct. 26	36.04		Oct. 25	b38.32		Oct. 29	39.14		Oct. 24	40.53		Oct. 29	38.80	

1971		1972		1973		1974		1975	
Apr. 1	38.24	Jan. 27	38.38	Mar. 17	38.67	Feb. 26	38.28	Apr. 8	38.67
		Jun. 15	38.52	Sep. 25	37.81	Oct. 18	38.30	Nov. 13	39.17

State number

2S/8E-21G2 S

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA **COUNTY** **Riverside**

AREA OR BASIN Pinto Hydro Subunit (X-17.CO)

State number 2S/12E-36F1 S

Depth of well	444	R.
10	10	10
20	20	20
30	30	30
40	40	40
50	50	50
60	60	60
70	70	70
80	80	80
90	90	90
100	100	100
110	110	110
120	120	120
130	130	130
140	140	140
150	150	150
160	160	160
170	170	170
180	180	180
190	190	190
200	200	200
210	210	210
220	220	220
230	230	230
240	240	240
250	250	250
260	260	260
270	270	270
280	280	280
290	290	290
300	300	300
310	310	310
320	320	320
330	330	330
340	340	340
350	350	350
360	360	360
370	370	370
380	380	380
390	390	390
400	400	400
410	410	410
420	420	420
430	430	430
440	440	440
450	450	450
460	460	460
470	470	470
480	480	480
490	490	490
500	500	500
510	510	510
520	520	520
530	530	530
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750	750	750
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770	770	770
780	780	780
790	790	790
800	800	800
810	810	810
820	820	820
830	830	830
840	840	840
850	850	850
860	860	860
870	870	870
880	880	880
890	890	890
900	900	900
910	910	910
920	920	920
930	930	930
940	940	940
950	950	950
960	960	960
970	970	970
980	980	980
990	990	990
1000	1000	1000

Altitude of land-surface datum 1.347

$$\frac{1.347}{(411 \text{ m})}$$

Well-code number 335718N1154034.1

Description of well: National Park Service (Dale Holmes well, Gold Rose well). In Pinto Basin, 1 mi (1.6 km) east of Gold Crown Road from Mission well. Drilled unused well in alluvium.

(125.0 m)

(122.03 m)

Records available
1961-

Highest water level

400.36

Lowest 410.2

Mar. 18 1965

All water levels are referenced to land-surface datum

1966			1967			1968			1969			1970		
Date	Water level		Date	Water level		Date	Water level		Date	Water level		Date	Water level	
Mar. 3	400.91		Mar. 17	400.51		Apr. 5	400.61		Apr. 23	402.51		Apr. 8	403.47	
Oct. 28	400.51		Oct. 26	400.37		Nov. 7	(n)		Oct. 24	(n)		Oct. 29	(n)	

1971		1972		1973		1974		State number
Mar. 31	400.93	Jan. 27	403.06	Apr. 26	401.31	Feb. 25	400.67	
		Jun. 15	402.05	Sen. 24	400.39			

18

State number

2S/12E-36F1 S

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA COUNTY Riverside

AREA OR BASIN
Pinto Hydro Subunit (X-17.CO)

State number 3S/15E-4J1 S

Depth of well	$\frac{575}{(175 \text{ m})}$ ft.	Altitude of land-surface datum	$\frac{1,080.6}{(329.4 \text{ m})}$ feet above mean sea level
---------------	-----------------------------------	--------------------------------	---

Well-code number 335612N1152433.1

Description of well: National Park Service (Kaiser No. 2). At east end of Pinto Basin near Kaiser Steel Company's

Eagle Mountain wells. Drilled well in alluvium, diameter 16 in (41 cm).

	(46 m)				(51.21 m)
Highest water level	8150	f.	Dec. 4,	1954	Lowest
Records available	1954-				Nov. 12, 1975
					\$168.00 f.

All water levels are referenced to land-surface datum

1966		1967		1968		1969		1970	
Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 2	c161.95	Mar. 17	c163.38	Apr. 8	(n)	Apr. 23	(n)	May 2	c164.86
Oct. 27	c162.94	Oct. 26	c163.78	Nov. 7	(n)	Oct. 23	165.06	Oct. 28	c166.17

1971		1972		1973		1974		1975	
Mar. 31	c166.54	Jan. 27	c165.04	Mar. 17	c166.31	Feb. 25	c167.72	Apr. 7	c167.88
		Jun. 15	c165.37	Sep. 24	c167.72	Oct. 17	c167.48	Nov. 12	c168.00

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA COUNTY Riverside

AREA OR BASIN Pinto Hydro Subunit (X-17.CO)

State number 4S/11E-27Q1 S

Depth of well 402 ft.
(123 m)Altitude of land-surface datum 2,957 feet above mean sea level
(901 m)

Well-code number 334712N1154856.1

Description of well: National Park Service (Cottonwood well). In Smoketree Wash 3.5 mi (5.6 km) north of Cottonwood Spring. Drilled public supply well in alluvium, diameter 12 in (30 cm).

(51.90 m)

(58.49 m)

Records available 1958-61, 1963-

Highest water level 170.29 ft.

Mar. 12 1959 Lowest 191.89 ft.

Jun. 15, 1972

All water levels are referenced to land-surface datum

1966		1967		1968		1969		1970	
Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 3	179.44	Mar. 17	180.59	Apr. 5	183.04	Apr. 23	191.48	Apr. 8	188.87
Oct. 28	179.49	Oct. 26	181.84	Nov. 7	182.22	Oct. 23	187.26	Oct. 28	189.40

1971		1972		1973		1974		1975	
Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 31	188.87	Jan. 27	188.02	Mar. 15	188.62	Feb. 25	186.16	Apr. 8	191.15
		Jun. 15	191.89	Sep. 24	187.79	Oct. 17	188.49	Nov. 12	186.26

State number

4S/11E-27Q1 S

CALIFORNIA
COUNTY San Bernardino

AREA OR BASIN
Twentynine Palms Hydro Subunit (X-9.A0)

State number 1N/9E-33F4 S

Depth of well	ft.
42	

Altitude of land-surface datum $\frac{1,981}{(604 \text{ m})}$ feet above mean sea level

Well-code number 340743N1160255.1

Description of well: At Twentynine Palms Inn. Approximately 792 ft (241 m) inside entrance to Inn. Past office on dirt road and 20 ft (6 m) north of road on south edge of oasis sump. Augured 1-16-74.

Records available 1974-

Highest water level 8.75 ft. Apr. 8, 1975 Lowest 9.1 ft. Jan. 17, 1974
All water levels are referenced to land-surface datum

1974			1975			1976		
Date	Water level		Date	Water level		Date	Water level	
Jan. 17	9.1		Apr. 8	8.75				
Mar. 20	8.75		Nov. 13	8.76				
Sep. 27	8.82							

State number 1N/9E-33F4 S

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA **COUNTY** **San Bernardino**

AREA OR BASIN

State number 1N/9E-33F5 S

Depth of well

22 n.

$$\frac{1,981}{(604 \text{ m})}$$

Well-code number 340743N1160255.2

Description of well: At Twentynine Palms Inn. Approximately 792 ft (241 m) inside entrance to Inn. Past office on dirt road and 20 ft (6 m) north of road on south edge of oasis sump. Augured 1-16-74.

(2.75 m)

(2.83 m)

Records available
1974-

Highest water level

Mar. 20 1974

Re. Sep. 27, 1974

All water levels are referenced to land-surface datum

1974		1975					
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	9.08	Apr. 8	9.06				
Mar. 20	9.01	Nov. 13	9.06				
Sep. 27	9.28						

State number 1N/9E-33F5 S

[illegible]

COUNTY	SAN BERNARDINO	AREA OR BASIN	TWENTYNINE PALMS HYDRO SUBUNIT (X-9.A0)

State number 1N/9E-33G1 S Depth of well 48 ft. Altitude of land-surface datum 1,961.91 feet above mean sea level
Well-code number 340742N1160230.1 (15 m) (597.99 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 1,700 ft (518 m) west of Park headquarters along paved path on north side of oasis, approximately 2 ft (0.6 m) north of this path. Augured 12-5-73.

Records available 1974- (9.54 m) ft. Nov. 13, 1975 Lowest 38.53 ft. Sep. 27, 1974 (11.74 m)

All water levels are referenced to land-surface datum

1974		1975					
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	32.8	Apr. 8	32.09				
Mar. 20	32.25	Nov. 13	31.29				
Apr. 30	32.35						
Sep. 27	38.53						

State number 1N/9E-33G1 S

[illegible]

CALIFORNIA **COUNTY** San Bernardino

AREA OR BASIN

State number 1N/9E-33H1 S

State number 1N/9E-33H1 S
Well-code number 340741N1160220.1

Depth of well $\frac{77}{(23 \text{ m})}$ ft.

Altitude of land-surface datum 1,960.75
(597.64 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 650 ft (198 m) west of office, 78 ft (24 m) north of BM1 and 30 ft (9 m) west of large cottonwood tree at observation point. Augured 1-15-74.

(15.89 m) (16.01 m)

Records available

Highest water level 52.14 ft. Mar. 20, 1974 Lowest

All water levels are referenced to land-surface datum

State number

1N/9E-33H1 S

1974		1975		1976		1977	
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 17	52.15	Apr. 8	52.33				
Mar. 20	52.14	Nov. 13	52.52				
Apr. 30	52.19						
Sep. 27	52.23						

[illegible]

CALIFORNIA COUNTY San Bernardino

AREA OR BASIN Twentynine Palms Hydro Subunit (X-9.A0)

State number	1N/9E-33H2 S
Well-code number	340741N1160220.2

IN/9E-33H2 S

$$\text{Depth of well } \frac{55.6}{(16.9 \text{ m})} \text{ ft.}$$
$$\frac{\text{Altitude of land-surface datum}}{1,960.75} \\ (597.64 \text{ m})$$

feet above mean sea level

Description of well: At Joshua Tree National Monument headquarters. Approximately 650 ft (198 m) west of office, 78 ft (24 m) north of BM1 and 30 ft (9 m) west of large cottonwood tree at observation point. Augured 1-15-74.

(15.55 m) (15.70 m)

Records available

Highest water level 51.01

Mar. 20, 1974

51.51 4

Apr. 30, 1974

All water levels are referenced to land-surface datum

1974		1975					
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Mar. 20	51.01	Apr. 8	51.10				
Apr. 30	51.51	Nov. 13	51.33				
Sep. 27	51.14						

State number 1N/9E-33H2 S

[illegible]

Twentynine Palms Hydro Subunit (X-9.A0)

Altitude of land-surface datum	1,973.27
	(601.45 m)

At Joshua Tree National Monument headquarters. Approximately 500 ft (152 m) west of maintenance building, 75 ft (23 m) south of southern paved path at oasis, 63 ft (19 m) south of wells J3 and J4. Augured 12-5-73.

Year	Mar.	20	74	(5.05 m)
(4.77 m)				

Subject matter	Apr. 8	Apr. 8	Apr. 8
15.64	75	75	16.57

All water levels are referenced to land-surface datum

1974		1975					
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 15	15.94	Apr. 8	15.64				
Mar. 20	15.64	Nov. 13	16.57				
Apr. 30	15.70						
Sep. 27	16.17						

State number IN 79E-5514-5[illegible]

CALIFORNIA COUNTY San Bernardino

State number 1N/9E-33J3 S Depth of well 35 ft. Altitude of land-surface datum 1,972.02 feet above mean sea level
Well-code number 340739N1160217.1 (11 m) (601.07 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 500 ft (152 m) west of maintenance building, approximately 10 ft (3 m) south of southern paved path around oasis.
Augured 12-5-73.

Records available 1974- _____

(4.75 m)

Highest water level 15.59 ft. Apr. 8, 1975 Lowest 16.91 ft. Nov. 13, 1975

(5.15 m)

All water levels are referenced to land-surface datum

[illegible]

State number 1N/9E-33J3 S

CALIFORNIA
COUNTY San Bernardino

AREA OR BASIN
Twentynine Palms Hydro Subunit (X-9.A0)

State number IN/9E-33J4 S

Depth of well $\frac{26.5}{(8.1 \text{ m})}$ ft.

Altitude of land-surface datum $\frac{1,972.02}{(601.07 \text{ m})}$ feet above mean sea level

Well-code number	340739N1160217.2
------------------	------------------

Description of well: At Joshua Tree National Monument headquarters. Approximately 500 ft (152 m) west of maintenance building, approximately 10 ft (3 m) south of southern paved path around oasis. Augured 12-5-73.

Records available
1974-

Highest water level
15.36
(4.68 m)

ft. _____ Apr. 8, 1975 _____ Lowest _____ Nov. 13, 1975 _____

All water levels are referenced to land-surface datum

1974			1975					
Date	Water level		Date	Water level		Date	Water level	
Jan. 15	16.24		Apr. 8	15.36				
Mar. 20	15.86		Nov. 13	17.08				
Apr. 30	15.84							
Sep. 27	16.86							

State number 1N/9E-33J4 S

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA COUNTY San Bernardino

AREA OR BASIN Twentynine Palms Hydro Subunit (X-9.40)

State number 1N/9E-33J5 S

Well-code number 340741N1160220.3

Depth of well 8.6 ft.
(2.6 m)Altitude of land-surface datum 1,960.48 feet above mean sea level
(597.55 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 650 ft (198 m) west of office,
11 ft (3 m) northeast of BM1, and approximately 4 ft (1 m) east of oasis spring well 1N/9E-33J1.
Hand augered with 4-in (10-cm) auger 4-29-74.

(1.54 m)

Records available 1974-

Highest water level 5.05 ft.

All water levels are referenced to land-surface datum ft. Apr. 8, 1975 Lowest (f) Sep. 27, 1974

1974		1975	
Date	Water level	Date	Water level
Apr. 30	6.19	Apr. 8	5.05
Sep. 27	(f)	Nov. 13	(n)

State number										1N/9E-33J5 S																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

CALIFORNIA	COUNTY	San Bernardino	AREA OR BASIN	Twentynine Palms Hydro Subunit (X-9.A0)

State number 1N/9E-33K1 S Depth of well 29.4 ft. Altitude of land-surface datum 1,970.58 feet above mean sea level
Well-code number 340740N1160230.1 (9.0 m) (600.63 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 1,700 ft (518 m) west of northwest corner of maintenance building, and approximately 160 ft (49 m) north of dry wash just south of oasis. Northernmost of three test holes 50 ft (15 m) apart. Augured 12-4-73.

Records available 1973- _____ (6.21 m)
Highest water level 20.38 ft. Apr. 8, 1975 Lowest 28.35 ft. Dec. 4, 1973
(8.64 m)

All water levels are referenced to land-surface datum

1973		1974		1975	
Date	Water level	Date	Water level	Date	Water level
Dec. 4	28.35	Jan. 15	21.37	Apr. 8	20.38
		Mar. 20	20.63	Nov. 13	22.49
		Apr. 30	20.44		
		Sep. 27	23.20		

State number 1N/9E-33K1 S

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA **COUNTY** **San Bernardino**

AREA OR BASIN

Twentynine Palms Hydro Subunit (X-9.A0)

State number 1N/9E-33K2 S

1N/9E-33K2 S

Depth of well	ft.
37	

Altitude of land-surface datum 1,972.09

Woll-code number 340739N1160230.1

(11 m)

(601.09 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 1,700 ft (518 m) west of northwest corner of maintenance building, approximately 110 ft (34 m) north of dry wash, south of oasis; middle of three wells 50 ft (15 m) apart. Augured 12-4-73.

(9.61 m)

Records available
1973-

Year	Highest water level	Lowest water level
1997	21.55	19.55

Apr. 8 1975

Lowest	31.52	4	Dec. 4	1973
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[illegible]

CALIFORNIA COUNTY San Bernardino

AREA OR BASIN
Twentynine Palms Hydro Subunit (X-9.A0)

State number IN/9E-33K3 S

1N/9E-33K3 S

State number 1N/9E-33K3 S
Well-code number 340739N1160230.2

Depth of well $\frac{25}{(8 \text{ m})}$ ft.

$$\text{Altitude of land-surface datum} \frac{1,972.09}{(601.09 \text{ m})} \text{ feet above}$$

Description of well: At Joshua Tree National Monument headquarters. Approximately 1,700 ft (518 m) west of northwest corner of maintenance building, approximately 110 ft (34 m) north of dry wash, south of oasis; middle of three wells 50 ft (15 m) apart. Augured 12-4-73.

(6.41 m) (7.37 m)

Records available 1973-

Highest water level 21.02

Highest water level 21.02 ft. Dec. 4, 19 73
All water levels are referenced to land-surface datum

1973		1974		1975			
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 4	21.02	Jan. 15	22.4	Apr. 8	21.53		
		Jan. 17	22.41	Nov. 13	21.43		
		Mar. 20	21.67				
		Apr. 30	21.61				
		Sep. 27	24.18				

State number 1N/9E-33K3 S

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA **COUNTY** **San Bernardino**

AREA OR BASIN

Twentynine Palms Hydro Subunit (X-9.A0)

State number 1N/9E-33K4 S
Well-code number 340739N1160230.3

$$\text{Depth of well} \quad \frac{36.3}{(11.1 \text{ m})} \text{ ft.}$$

Altitude of land-surface datum $\frac{1,973.13}{(601.41 \text{ m})}$ feet above mean sea level

Description of well: At Joshua Tree National Monument headquarters. Approximately 1,700 ft (518 m) west of northwest corner of maintenance building, approximately 60 ft (18 m) north of dry wash, south of oasis. Southernmost of three wells 50 ft (15 m) apart. Augured 12-4-73.

(6.86 m)

(7.62 m)

1974-
Records available

Height	Frequency	Relative Frequency	Cumulative Frequency
150	1	0.02	0.02
155	1	0.02	0.04
160	2	0.04	0.08
165	3	0.06	0.14
170	4	0.08	0.22
175	5	0.10	0.32
180	6	0.12	0.44
185	7	0.14	0.58
190	8	0.16	0.74
195	9	0.18	0.92
200	10	0.20	1.00

Apr. 8 1975

Forecast	24.99	4
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All water levels are referenced to land-surface datum

1974			1975								
Date	Water level		Date	Water level		Date	Water level		Date	Water level	
Jan. 15	23.48		Apr. 8	22.50							
Mar. 20	22.77		Nov. 13	24.49							
Apr. 30	22.59										
Sep. 27	24.99										

State number 1N/9E-33K4 S

[illegible]

GROUND-WATER LEVELS IN OBSERVATION WELLS

CALIFORNIA
COUNTY San Bernardino

AREA OR BASIN Twentynine Palms Hydro Subunit (X-9.A0)

State number IN/9E-33K5 S
Well-code number 340739N1160230.4

Altitude of land-surface datum 1,973.13 feet above mean sea level
(601.41 m)

Description of well: At Joshua Tree National Monument headquarters. Approximately 1,700 ft (518 m) west of northwest corner of maintenance building, approximately 60 ft (18 m) north of dry wash, south of oasis. Southernmost of three wells 50 ft (15 m) apart. Augured 12-4-73.

(6.85 m) (7.62 m)

Records available 1973- _____ Highest water level 22.48 ft. Apr. 8, 1975 Lowest 24.99 ft. Sep. 27, 1974
All water levels are referenced to land-surface datum

1973		1974		1975			
Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 4	22.53	Jan. 15	23.47	Apr. 8	22.48		
		Mar. 20	22.74	Nov. 13	24.48		
		Apr. 30	22.55				
		Sep. 27	24.99				

[illegible]



United States Department of the Interior

NATIONAL PARK SERVICE

WESTERN REGION

450 GOLDEN GATE AVENUE, BOX 36063
SAN FRANCISCO, CALIFORNIA 94102

IN REPLY REFER TO:

L54
JOTR/USGS
(WR)RW

April 11, 1977

*MAKE FOLDER
with title of report
& file in U.S.G.S.
Joshua Tree report file*

Memorandum

To: Superintendent, Joshua Tree

From: Chief, Division of Water Resources, Western Region

Subject: U.S. Geological Survey Report: Ground Water Data for
1974-75, Joshua Tree National Monument, California,
Open-File Report 77-80

Enclosed for your information and files are two (2) copies of the USGS final report on the above subject. These data are collected annually to provide a monitoring of the area's water resources. Data pertains to both the park proper and the Oasis of Mara.

Declining water levels at the Oasis of Mara were suspected during the early 1970's due to dying vegetation. To substantiate the suspected cause, the Division contracted a study with the USGS (reference: Swain, Lindsay A., 1944, Hydrology of the Oasis of Mara, Twentynine Palms, California, U.S. Geological Survey Administrative Report). The present monitoring program emphasizes the Oasis of Mara and changing water levels on each side of the Pinto Mountain Fault.

Page 4 of the report lists three wells where water levels have declined over the past 10 years. The 42 foot decline in Well 1S/7E - 27 R1 is believed due to lack of recharge to the aquifer because of the diversion of natural water flow by Barker and Keys Dams. This well may be dry by 1980. The 12 foot decline in Well 2S/8E - 7K1 is believed due to lowering of the water table by nearby park pumpage and may be partly attributable to a long term drought condition which is believed to have started in the late 1940's. The 25 foot decline in Well 2S/8E - 21G1 is believed due to a minor earthquake which occurred in 1973. Prior to 1973 the well was utilized by the Service for a water supply. Due to the reduced yield of the well after the earthquake, an aquifer test (pump test) was performed on the well by the Division on April 28, 1974. Apparently the quake closed or restricted some of the granite fractures which allow water to enter and/or through the immediate area, thus the decline in water level.

