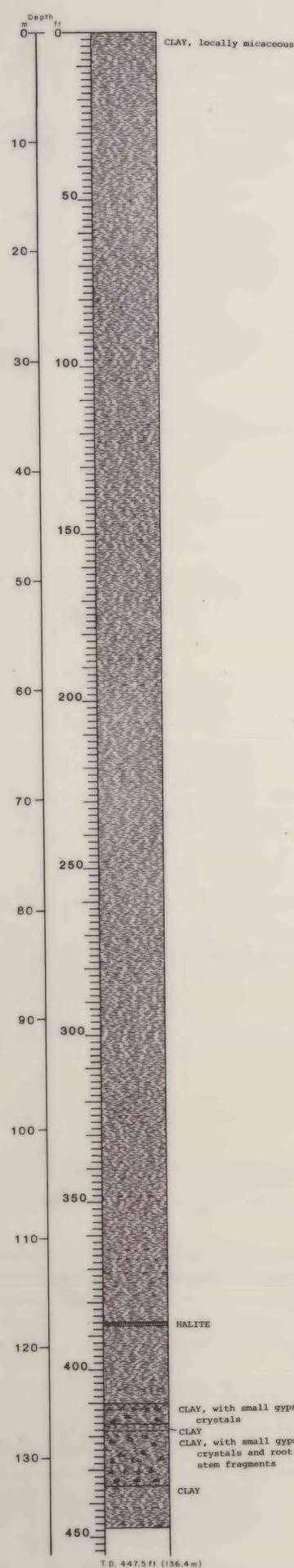


LITHOLOGIC LOGS FROM KOEHN DRY LAKE TEST WELL NO. 2



Depth (Feet)	Depth (Meters)	Description	357 - 359	108.8 - 109.4	CLAY, grayish-olive (10Y 4/2), calcareous. Clays oxidize moderate-olive-brown (5Y 4/3), with dark-red (2.5YR 3/6) iron stain on fracture surfaces
0 - 40	0 - 12.2	CLAY, moderate-yellowish-brown (10YR 5/4), calcareous, with scattered mica plates as much as 0.5 mm (0.02 in.) across. Unit gradually changes color to moderate-olive-brown (5Y 4/4) from 9.1 m to 12.2 m (30 ft to 40 ft). Clay oxidizes pale-brown (10YR 5/3)	359 - 360	109.4 - 109.7	CLAY, olive-gray (5Y 4/1), calcareous. Clays oxidize moderate-olive-brown (5Y 4/3), with dark-red (2.5YR 3/6) iron stain on fracture surfaces
40 - 68	12.2 - 20.7	CLAY, moderate-olive-brown (5Y 4/4) to light-olive-brown (5Y 5/6), calcareous. Unit changes to moderate-yellowish-brown (10YR 5/4) in lower 1.2 m (4 ft). Clay oxidizes pale-brown (10YR 5/3)	360 - 374	109.7 - 114.0	CLAY, interlaminated, black (N 1) and grayish-olive (10Y 4/2), calcareous. Laminae are 1.6 mm (0.06 in.) thick increasing to 6.4 mm (0.25 in.) thick below 111.3 m (365 ft). Clays oxidize moderate-olive-brown (5Y 4/3), with dark-red (2.5YR 3/6) iron stain on fracture surfaces
68 - 71	20.7 - 21.6	CLAY, olive-gray (5Y 4/1), calcareous. Clay oxidizes light-olive-gray (5Y 5/2)	374 - 386	114.0 - 117.7	CLAY, black (N 1), calcareous. Clay oxidizes moderate-olive-brown (5Y 4/4)
71 - 73	21.6 - 22.3	CLAY, dark-gray (N 3), calcareous. Clay oxidizes light-olive-gray (5Y 5/2)	386 - 387	117.7 - 118.0	SALT
73 - 75	22.3 - 22.9	CLAY, dark-greenish-gray, (5GY 4/1), calcareous, with scattered chloritized biotite plates as much as 0.5 mm across. Clay oxidizes light-olive-gray (5Y 5/2)	387 - 395	118.0 - 120.4	CLAY, black (N 1), calcareous. Clay oxidizes moderate-olive-brown (5Y 4/4)
75 - 87	22.9 - 26.5	CLAY, interlaminated, greenish-gray (5GY 6/1), light-olive-brown (5Y 5/6), and light-olive-gray (5Y 6/1), calcareous. Clays oxidize light-olive-gray (5Y 5/2) and light-olive-brown (5Y 5/3)	395 - 397	120.4 - 121.0	CLAY, interlaminated, black (N 1) and grayish-olive (10Y 4/2), calcareous. Clay oxidizes moderate-olive-brown (5Y 4/4)
87 - 88	26.5 - 26.8	CLAY, dark-gray (N 3), calcareous. Clay oxidizes light-olive-gray (5Y 5/2)	397 - 400	121.0 - 121.9	CLAY, interlaminated, pale-olive (10Y 6/2) and grayish-olive (10Y 4/2), calcareous. Clay oxidizes moderate-olive-brown (5Y 4/4)
88 - 163	26.8 - 49.7	CLAY, black (N 1), calcareous, with scattered biotite plates as much as 1 mm (0.04 in.) across. Small amounts of H <sub>2</sub> S gas noted at 29.3 m (96 ft), 33.8 m (111 ft), and 37.8 m (124 ft). Clays taste slightly salty below 40.8 m (134 ft). Clays oxidize light-olive-gray (5Y 5/2) between 26.8 - 29.0 m (88 - 95 ft) and moderate-olive-brown (5Y 4/3) between 29.0 - 49.7 m (95 - 163 ft)	400 - 403	121.9 - 122.8	CLAY, grayish-olive (10Y 4/2), calcareous. Clay oxidizes light-olive-gray (5Y 4/2)
163 - 165	49.7 - 50.3	CLAY, interlaminated, black (N 1) and dark-greenish-gray (5GY 4/1), calcareous, with scattered mica plates as much as 0.5 mm (0.02 in.) across. Clays oxidize moderate-olive-brown (5Y 4/3)	403 - 408	122.8 - 124.3	CLAY, dark-greenish-gray (5GY 4/1), calcareous. Clay oxidizes light-olive-gray (5Y 4/2)
165 - 202	50.3 - 61.6	CLAY, black (N 1), calcareous, with scattered biotite plates as much as 0.5 mm (0.02 in.) across. Clay oxidizes moderate-olive-brown (5Y 4/3)	408 - 410	124.3 - 125.0	CLAY, interlaminated, dusky-yellow (5Y 6/4) and olive-gray (5Y 3/2), calcareous. Laminae as much as 1.6 mm (0.06 in.) thick. Clay oxidizes light-olive-gray (5Y 4/2)
202 - 205	61.6 - 62.5	CLAY, interlaminated, greenish-gray (5GY 6/1), with thin laminae of black (N 1) clay. Black laminae are less than 6.4 mm (0.25 in.) thick. Clays oxidize moderate-olive-brown (5Y 4/3)	410 - 416	125.0 - 126.8	CLAY, grayish-olive (10Y 4/2), calcareous, gritty, (gypsum). Clay oxidizes light-olive-gray (5Y 4/2)
205 - 348	62.5 - 106.1	CLAY, black (N 1), calcareous. Clays contain saline mineralization in solution noted from 71.6 m (235 ft) to base of unit. Clay oxidizes moderate-olive-brown (5Y 4/3)	416 - 418	126.8 - 127.4	CLAY, light-olive-gray (5Y 5/2), calcareous. Clay oxidizes dark-grayish-brown (2.5Y 4/2)
348 - 349	106.1 - 106.4	CLAY, interlaminated, black (N 1), with thin pale-olive (10Y 6/2) clay laminae that are less than 1.6 mm (0.06 in.) thick. Unit is calcareous. Clays oxidize moderate-olive-brown (5Y 4/3) with dark-red (2.5YR 3/6) iron stain on fracture surfaces	418 - 435	127.4 - 132.6	CLAY, grayish-olive (10Y 4/2), calcareous, micaceous, gritty (gypsum?). Unit contains woody root or stem fragments at 130.8 m (429 ft). Clay oxidizes dark-grayish-brown (2.5Y 4/2)
349 - 357	106.4 - 108.8	CLAY, interlaminated black (N 1), calcareous, with thin laminae of pale-olive (10Y 6/2) clay less than 1.6 mm (0.06 in.) thick. Clays oxidize moderate-olive-brown (5Y 4/3), with dark-red (2.5YR 3/6) iron stain on fracture surfaces	435 - 447.5	132.6 - 136.4	CLAY, interlaminated, dark-greenish-gray (5GY 4/1), with thin black (N 1) clay laminae less than 0.8 mm (0.03 in.) thick. Clays oxidize light-olive-gray (5Y 4/2)

EXPLANATION  
INTRODUCTION

This report presents lithologic and water quality data from Koehn Dry Lake, California. These data provided leaseable mineral resource input to the Bureau of Land Management's comprehensive long-range plan for the management, use, development, and protection of public lands within the California Desert Conservation Area (index map). This plan was authorized by the Federal Land Policy and Management Act of October 21, 1976 (Public Law 94-579).

TEST WELL NO. 2  
DRILLING AND LITHOLOGIC LOGGING TECHNIQUES

The test well was completed in December 1978 using the reverse circulation drilling technique. During drilling, either air or water or both, were pumped between the outer and inner walls of the dual-wall drill pipe to an open-face insert bit. The drilling fluids and cuttings were then forced up the inner opening of the drill pipe to the surface. This technique allows recovery of uncontaminated sediment and water samples. In situ ground water was used as a drilling fluid as much as possible; when this was not possible a fine mist of imported fresh water and air was used.

Lithologic characteristics of the sampled drill cuttings were described in the field. Field descriptions were later supplemented during laboratory examination. The rock color chart (Goddard and others, 1948) was used to describe sample color. All color classifications were made on damp to wet cuttings. Sediment names were described using the classification scheme of Wentworth (1922). The term "clay" is used only in the sense of particle size (less than 4 microns) and does not infer mineralogical content. Percentages of lithologic constituents listed in the description are approximate.

WATER QUALITY

A water sample was collected from a clay layer at 395 feet, however brine may have flowed into the hole from a salt layer at 386 feet. The water sample was collected after drilling fluids and foreign matter were pumped from the hole. Water temperature and pH of raw untreated samples and specific gravity of filtered samples were measured in the field.

ACKNOWLEDGMENTS

G. Thomas Server provided oxidation color descriptions.

REFERENCES

Goddard, E. N., chm., and others, 1948, Rock-color chart: National Research Council; reprinted by Geological Society of America, 1951, 1963, 1970, 6 p.

Wentworth, C. K., 1922, A scale of grade and class terms for clastic sediments: Journal of Geology, v. 30, p. 377-392.

WATER QUALITY DATA FROM KOEHN DRY LAKE TEST WELL NO. 2  
(Analyses by U.S. Geological Survey, Water Resources Division, Denver, Colorado)

Sample number	Date of collection	Depth of water sample (m(ft))	Water temperature (°C)	pH		Specific gravity	Specific conductance (microhms/cm at 25°C)	Percent sodium	SAR* (sodium adsorption ratio)
				lab	field				
K-2-1	12/10/78	120.4 (395)	21.7	8.5	7.5	1.138	120,600	100	5,510

Sample number	mg/l										
	Silica (SiO <sub>2</sub> )	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Phosphorus (P)	Sulphate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Total Nitrate (NO <sub>2</sub> +NO <sub>3</sub> )	Iodide
K-2-1	5.6	6.3	3.6	70,000	340	12	40,000	81,000	7.3	0.23	0.08

Sample number	µg/l									
	Manganese (Mn)	Iron (Fe)	Boron (B)	Lithium (Li)	Strontium (Sr)	Uranium (U)	Solids, residue on evaporation at 180°C (TDS)	Total Alkalinity Calcium Carbonate (CaCO <sub>3</sub> )	Bicarbonate# (HCO <sub>3</sub> )	Total hardness
K-2-1	260	2,000	210,000	30	1,200	6.4	215,000	2,500	3,050	32

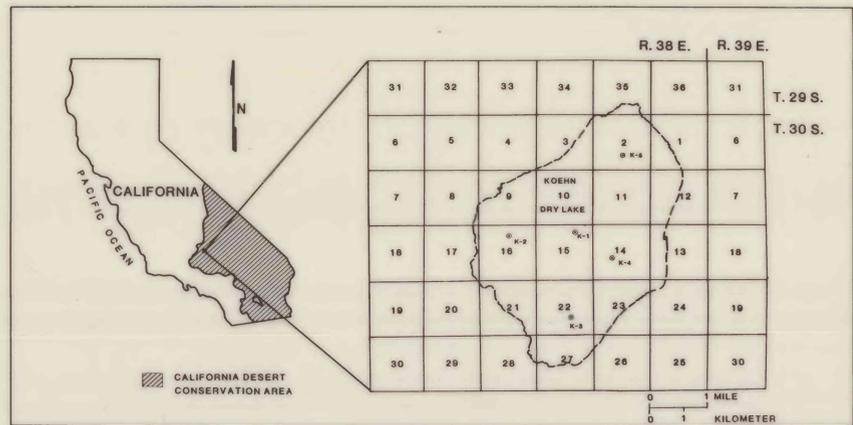
Sodium-adsorption-ratio -- predicts degree to which irrigation water tends to enter into cation exchange reactions in soil. High values imply hazard of sodium replacing adsorbed calcium and magnesium, this replacement is damaging to soil structure.

\* SAR Water Classification

<10	Excellent
10 - 18	Good
18 - 26	Fair
>26	Poor

# Calculated

INDEX MAP



TEST WELL LOCATION

K-2 Latitude: 35° 19' 46" N.  
Longitude: 117° 54' 18" W.  
NW1/4 NW1/4 NE1/4 sec. 16, T. 30 S., R. 38 E.  
Mount Diablo Meridian

This report has not been edited for conformity with Geological Survey editorial standards

PRELIMINARY  
LITHOLOGIC AND WATER QUALITY DATA FROM TEST WELLS ON  
KOEHN DRY LAKE, KERN COUNTY, CALIFORNIA

By Roger D. Dockter