

**OILWELL RESEARCH, INC.**  
**HORNKOHL LABORATORIES DIVISION**

GL04421

CHEMICAL AND TESTING ENGINEERS  
 714 TRUXTUN AVENUE  
 BAKERSFIELD, CALIFORNIA 93302  
 January 23, 1978

Laboratory No 258845 Marked Jefferson Water Well #1  
 Sample Water  
 Received January 17, 1978  
 Submitted by Getty Oil Company  
Route 1, Box 197-X  
Bakersfield, CA 93308  
ATTN: Frank Lawrence

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INDUSTRIAL WATER ANALYSIS

<u>Constituents</u>	<u>Parts per Million</u>
Carbonates, CO <sub>3</sub>	0.0
Bicarbonates, HCO <sub>3</sub>	213.5
Chlorides, Cl	606.4
Sulfates, SO <sub>4</sub>	19.7
Sulfides, S	0.0
Nitrates, NO <sub>3</sub>	1.6
Silica, SiO <sub>2</sub>	55.8
Boron, B	2.3
Calcium, Ca	150.4
Magnesium, Mg	27.8
Sodium, Na	258.2
Iron, Fe	under 0.1
Hardness as CaCO <sub>3</sub>	490.0
Total Dissolved Solids	1356.0

pH Value @ 25°C. 8.1  
 Conductivity: Micromhos/cm @ 25°C. 2145  
 Resistivity: Ohm Meters @ 25°C. 4.66

Color : Water White  
 Odor : None  
 Turbidity: Clear (sediment)

Theoretical Analysis

Calcium Bicarbonate	283.7
Calcium Sulfate	27.2
Calcium Chloride	200.9
Magnesium Chloride	108.6
Sodium Chloride	654.8
Sodium Nitrate	2.6

Respectfully submitted,  
 HORNKOHL LABORATORIES



Submitted By: **Getty Oil Company**  
 P. O. Box 5237  
 Exploration Department  
 Bakersfield, California 93308  
 Attention Mr. Wayne Shaw

Date Reported: **5/22/78**  
 Date Received: **5/5/78**  
 Laboratory No.: **2470**

Marked: **Getty KGRA 52-21 Milford, Utah 5/2/78 6:40 AM 203°F**

**WATER ANALYSIS**

**Sample Description**

pH ----- **8.1**  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- **250.**  
 Resistivity, Ohm M<sup>2</sup>/M ----- **40.0**

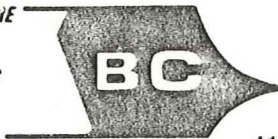
**Constituents, P.P.M. (parts per million)**

Boron, (B)	-----	<b>0.58</b>
Calcium, (Ca)	-----	<b>18.6</b>
Magnesium, (Mg)	-----	<b>0.61</b>
Sodium, (Na)	-----	<b>28.</b>
Potassium, (K)	-----	<b>3.7</b>
Carbonates, (CO <sub>3</sub> )	-----	<b>0.</b>
Bicarbonates, (HCO <sub>3</sub> )	-----	<b>48.5</b>
Chlorides, (Cl)	-----	<b>43.5</b>
Sulphates, (SO <sub>4</sub> )	-----	<b>12.</b>
Nitrate, (NO <sub>3</sub> )	<del>less-than</del> -----	<b>0.5</b>
Fluoride, (F)	-----	<b>0.28</b>
Total Iron, (Fe)	-----	<b>1.2</b>
Copper, (Cu)	<del>less-than</del> -----	<b>0.01</b>
Manganese, (Mn)	-----	<b>0.06</b>
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	<b>0.02</b>
Aluminum (Al)	<del>less-than</del> -----	<b>0.1</b>
Silica, (SiO <sub>2</sub> )	-----	<b>34.</b>
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	<b>49.1 (2.9 gr/gal)</b>
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	<b>167.</b>
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	<del>less-than</del> -----	<b>0.1</b>

AGRICULTURE

CHEMICAL ANALYSIS

PETROLEUM



# LABORATORIES, INC.

4100 PIERCE ROAD, 93308

BAKERSFIELD, CALIFORNIA 93308

PHONE 327-4911

Submitted By: Getty Oil Company  
 P. O. Box 5237  
 Bakersfield, California 93308  
 Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
 Date Received: 5/5/78  
 Laboratory No.: 2471

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 5:45 AM 200°F

## WATER ANALYSIS

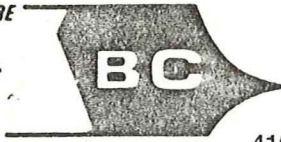
### Sample Description

pH	-----	7.6
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	2040.
Resistivity, Ohm M <sup>2</sup> /M	-----	4.90

### Constituents, P.P.M. (parts per million)

Boron, (B)	-----	2.2
Calcium, (Ca)	-----	82.
Magnesium, (Mg)	-----	9.4
Sodium, (Na)	-----	345.
Potassium, (K)	-----	28.
Carbonates, (CO <sub>3</sub> )	-----	0.
Bicarbonates, (HCO <sub>3</sub> )	-----	126.5
Chlorides, (Cl)	-----	616.0
Sulphates, (SO <sub>4</sub> )	-----	52.
Nitrate, (NO <sub>3</sub> )	-----	0.9
Fluoride, (F)	-----	0.70
Total Iron, (Fe)	-----	4.7
Copper, (Cu)	less-than---	0.01
Manganese, (Mn)	-----	0.26
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.27
Aluminum (Al)	less-than---	0.1
Silica, (SiO <sub>2</sub> )	-----	118.
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	243.9 (14.2 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	1322.
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	less-than	0.1

B C LABORATORIES, INC.



Submitted By: Getty Oil Company  
 P. O. Box 5237  
 Bakersfield, California 93308  
 Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
 Date Received: 5/5/78  
 Laboratory No.: 2472

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 7:45 160°F

WATER ANALYSIS

Sample Description:

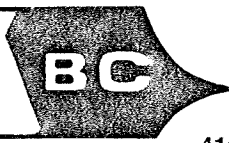
pH ----- 8.0  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 3250.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 3.08

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 5.0  
 Calcium, (Ca) ----- 106.  
 Magnesium, (Mg) ----- 3.5  
 Sodium, (Na) ----- 565.  
 Potassium, (K) ----- 47.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 256.4  
 Chlorides, (Cl) ----- 867.3  
 Sulphates, (SO<sub>4</sub>) ----- 124.  
 Nitrate, (NO<sub>3</sub>) ----- 2.7  
 Fluoride, (F) ----- 1.6  
 Total Iron, (Fe) ----- 0.47  
 Copper, (Cu) ~~less-than~~----- 0.01  
 Manganese, (Mn) ----- 0.05  
 Chromium, (Cr)  
 Zinc, (Zn) ----- 0.02  
 Aluminum (Al) ~~less-than~~----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 153.  
 Lithium, (Li)  
 Lead, (Pb)  
 Phenol  
 Sulfides as H<sub>2</sub>S  
 Total Hardness as CaCO<sub>3</sub> ----- 279.6 (16.3 gr/gal)  
 Oil (chloroform extractable)  
 Total Dissolved Solids ----- 2004.  
 Total Suspended Solids  
 Phosphate (PO<sub>4</sub>) ~~less-than~~----- 0.1

B C LABORATORIES, INC.

*J. J. Egan*



Submitted By: Getty Oil Company  
P. O. Box 5237  
Bakersfield, California 93308  
Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
Date Received: 5/5/78  
Laboratory No.: 2473

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 8:00 AM 199<sup>0</sup>F

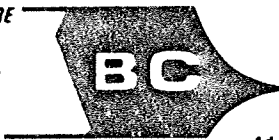
WATER ANALYSIS

Sample Description

pH ----- 8.6  
E.C. Micromhos/cm (K x 10<sup>6</sup>)  
@ 25°C (salinity) ----- 150.  
Resistivity, Ohm M<sup>2</sup>/M ----- 66.67

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 0.69  
Calcium, (Ca) ----- 10.4  
Magnesium, (Mg) ----- 0.34  
Sodium, (Na) ----- 20.  
Potassium, (K) ----- 3.1  
Carbonates, (CO<sub>3</sub>) ----- 7.7  
Bicarbonates, (HCO<sub>3</sub>) ----- 31.2  
Chlorides, (Cl) ----- 20.9  
Sulphates, (SO<sub>4</sub>) ----- 5.  
Nitrate, (NO<sub>3</sub>) ----- 1.8  
Fluoride, (F) ----- 0.38  
Total Iron, (Fe) ----- 0.74  
Copper, (Cu) ----- 0.01  
Manganese, (Mn) ----- 0.05  
Chromium, (Cr) -----  
Zinc, (Zn) ----- 0.02  
Aluminum (Al) ~~less-than~~----- 0.1  
Silica, (SiO<sub>2</sub>) ----- 50.  
Lithium, (Li)  
Lead, (Pb)  
Phenol  
Sulfides as H<sub>2</sub>S  
Total Hardness as CaCO<sub>3</sub> ----- 27.4 (1.6 gr/gal)  
Oil (chloroform extractable)  
Total Dissolved Solids ----- 136.  
Total Suspended Solids  
Phosphate (PO<sub>4</sub>) ~~less-than~~ 0.1



Submitted By: Getty Oil Company  
 P. O. Box 5237  
 Bakersfield, California 93309  
 Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
 Date Received: 5/5/78  
 Laboratory No.: 2474

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 Initial Fluid 5:03 AM 105°F

WATER ANALYSIS

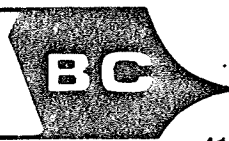
Sample Description

pH ----- 7.1  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 2000.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 5.0

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 2.2  
 Calcium, (Ca) ----- 92.  
 Magnesium, (Mg) ----- 15.6  
 Sodium, (Na) ----- 316.  
 Potassium, (K) ----- 23.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 137.7  
 Chlorides, (Cl) ----- 601.8  
 Sulphates, (SO<sub>4</sub>) ----- 45.  
 Nitrate, (NO<sub>3</sub>) less-than----- 0.5  
 Fluoride, (F) ----- 0.64  
 Total Iron, (Fe) ----- 0.18  
 Copper, (Cu) less-than----- 0.01  
 Manganese, (Mn) ----- 0.59  
 Chromium, (Cr)  
 Zinc, (Zn) ----- 0.47  
 Aluminum (Al) less-than----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 28.  
 Lithium, (Li)  
 Lead, (Pb)  
 Phenol  
 Sulfides as H<sub>2</sub>S  
 Total Hardness as CaCO<sub>3</sub> ----- 294.4 (17.2 gr/gal)  
 Oil (chloroform extractable)  
 Total Dissolved Solids ----- 1194.  
 Total Suspended Solids  
 Phosphate (PO<sub>4</sub>) less-than 0.1

B C LABORATORIES, INC.



Submitted By: Getty Oil Company  
 P. O. Box 5237  
 Bakersfield, California 93308  
 Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
 Date Received: 5/5/78  
 Laboratory No.: 2476

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 7:00 AM 168°F

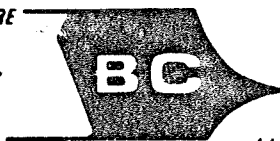
WATER ANALYSIS

Sample Description

pH ----- 8.2  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 3600.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 2.78

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 5.5  
 Calcium, (Ca) ----- 67.  
 Magnesium, (Mg) ----- 2.2  
 Sodium, (Na) ----- 710.  
 Potassium, (K) ----- 38.  
 Carbonates, (CO<sub>3</sub>) ----- 8.5  
 Bicarbonates, (HCO<sub>3</sub>) ----- 149.0  
 Chlorides, (Cl) ----- 998.3  
 Sulphates, (SO<sub>4</sub>) ----- 211.  
 Nitrate, (NO<sub>3</sub>) ----- 1.8  
 Fluoride, (F) ----- 1.1  
 Total Iron, (Fe) ----- 4.6  
 Copper, (Cu) ----- 0.02  
 Manganese, (Mn) ----- 0.17  
 Chromium, (Cr) -----  
 Zinc, (Zn) ----- 0.10  
 Aluminum (Al) ~~less-than~~ ----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 55.  
 Lithium, (Li)  
 Lead, (Pb)  
 Phenol  
 Sulfides as H<sub>2</sub>S  
 Total Hardness as CaCO<sub>3</sub> ----- 176.7 (10.3 gr/gal)  
 Oil (chloroform extractable)  
 Total Dissolved Solids ----- 2177.  
 Total Suspended Solids  
 Phosphate (PO<sub>4</sub>) ~~less-than~~ ----- 0.1



Submitted By: Getty Oil Company  
 P. O. Box 5237  
 Bakersfield, California 93308  
 Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
 Date Received: 5/5/78  
 Laboratory No.: 2477

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 5:40 AM 175

WATER ANALYSIS

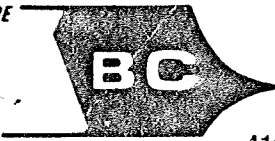
Sample Description

pH ----- 7.7  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 2160.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 4.63

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 2.4  
 Calcium, (Ca) ----- 70.  
 Magnesium, (Mg) ----- 9.0  
 Sodium, (Na) ----- 368.  
 Potassium, (K) ----- 29.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 133.4  
 Chlorides, (Cl) ----- 619.5  
 Sulphates, (SO<sub>4</sub>) ----- 60.  
 Nitrate, (NO<sub>3</sub>) ----- 1.8  
 Fluoride, (F) ----- 0.74  
 Total Iron, (Fe) ----- 0.24  
 Copper, (Cu) ~~less-than~~----- 0.01  
 Manganese, (Mn) ----- 0.11  
 Chromium, (Cr) ----- 0.01  
 Zinc, (Zn) ----- 0.1  
 Aluminum (Al) ~~less-than~~----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 66.  
 Lithium, (Li)  
 Lead, (Pb)  
 Phenol  
 Sulfides as H<sub>2</sub>S  
 Total Hardness as CaCO<sub>3</sub> ----- 212.2 (12.4 gr/gal)  
 Oil (chloroform extractable)  
 Total Dissolved Solids ----- 1293.  
 Total Suspended Solids  
 Phosphate (PO<sub>4</sub>) ~~less-than~~ 0.1





Submitted By: Getty Oil Company  
P. O. Box 5237  
Bakersfield, California 93308  
Attention Mr. Wayne Shaw

Date Reported: 5/22/78  
Date Received: 5/5/78  
Laboratory No.: 2478

Marked: Getty KGRA 52-21 Milford, Utah 5/2/78 Swabbing sample 124°F 3:00 PM  
Fluid Level @ 433'

WATER ANALYSIS

Sample Description

pH ----- 6.9  
E.C. Micromhos/cm (K x 10<sup>6</sup>)  
@ 25°C (salinity) ----- 9200.  
Resistivity, Ohm M<sup>2</sup>/M ----- 1.09

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 24.4  
Calcium, (Ca) ----- 62.  
Magnesium, (Mg) ----- 11.1  
Sodium, (Na) ----- 1980.  
Potassium, (K) ----- 260.  
Carbonates, (CO<sub>3</sub>) ----- 0.  
Bicarbonates, (HCO<sub>3</sub>) ----- 693.  
Chlorides, (Cl) ----- 2878.  
Sulphates, (SO<sub>4</sub>) ----- 190.  
Nitrate, (NO<sub>3</sub>) ~~less-than~~----- 0.5  
Fluoride, (F) ----- 1.5  
Total Iron, (Fe) ----- 0.16  
Copper, (Cu) ----- 0.01  
Manganese, (Mn) ----- 3.0  
Chromium, (Cr)  
Zinc, (Zn) ----- 0.01  
Aluminum (Al) ~~less-than~~----- 0.1  
Silica, (SiO<sub>2</sub>) ----- 38.  
Lithium, (Li)  
Lead, (Pb)  
Phenol  
Sulfides as H<sub>2</sub>S  
Total Hardness as CaCO<sub>3</sub> ----- 200.8 (11.7 gr/gal)  
Oil (chloroform extractable)  
Total Dissolved Solids ----- 5794.  
Total Suspended Solids  
Phosphate (PO<sub>4</sub>) ~~less-than~~ 0.1



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308  
 Attention Mr. W. A. Shaw

Date Reported: 8/14/78  
 Date Received: 7/17/78  
 Laboratory No.: 5962

Marked: Well #KGRA 52-21 Sample #1 2165' 7/13/78

WATER ANALYSIS

Sample Description

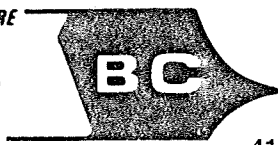
pH ----- 6.3  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 8000.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 1.25

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 21.0  
 Calcium, (Ca) ----- 100.  
 Magnesium, (Mg) ----- 6.2  
 Sodium, (Na) ----- 1700.  
 Potassium, (K) ----- 222.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 580.4  
 Chlorides, (Cl) ----- 2545.3  
 Sulphates, (SO<sub>4</sub>) ----- 169.  
 Nitrate, (NO<sub>3</sub>) ----- 3.1  
 Fluoride, (F) ----- 3.0  
 Total Iron, (Fe) ----- 6.6  
 Copper, (Cu) ----- 0.03  
 Manganese, (Mn) ----- 0.47  
 Chromium, (Cr) -----  
 Zinc, (Zn) ----- 0.81  
 Aluminum (Al) ~~less-than~~ ----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 270.  
 Lithium, (Li) -----  
 Lead, (Pb) -----  
 Phenol -----  
 Sulfides as H<sub>2</sub>S -----  
 Total Hardness as CaCO<sub>3</sub> ----- 275.7 (16.1 gr/gal)  
 Oil (chloroform extractable) -----  
 Total Dissolved Solids ----- 5337.  
 Total Suspended Solids -----  
 Phosphate (PO<sub>4</sub>) ----- 0.7

B C LABORATORIES, INC.

*J. J. Eglar*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308  
 Attention Mr. W. A. Shaw

Date Reported: 8/14/78  
 Date Received: 7/17/78  
 Laboratory No.: 5963

Marked: Well #KGRA 52-21 Sample #2 2665' 7/13/78

WATER ANALYSIS

Sample Description

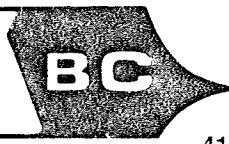
pH ----- 6.5  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 8000.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 1.25

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	19.0
Calcium, (Ca)	-----	86.
Magnesium, (Mg)	-----	4.6
Sodium, (Na)	-----	1700.
Potassium, (K)	-----	226.
Carbonates, (CO <sub>3</sub> )	-----	0.
Bicarbonates, (HCO <sub>3</sub> )	-----	524.9
Chlorides, (Cl)	-----	2559.4
Sulphates, (SO <sub>4</sub> )	-----	160.
Nitrate, (NO <sub>3</sub> )	-----	2.2
Fluoride, (F)	-----	2.8
Total Iron, (Fe)	-----	6.0
Copper, (Cu)	-----	0.05
Manganese, (Mn)	-----	0.30
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.32
Aluminum (Al)	less-than-----	0.1
Silica, (SiO <sub>2</sub> )	-----	260.
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	234.1 (13.7 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5288.
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.6

B C LABORATORIES, INC.

*J. J. Oglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308  
 Attention Mr. W. A. Shaw

Date Reported: 8/14/78  
 Date Received: 7/17/78  
 Laboratory No.: 5964

Marked: Well #KGRA 52-21 Sample #3 @ 3430' 7/13/78

WATER ANALYSIS

Sample Description

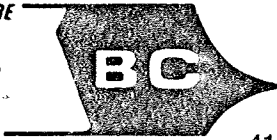
pH ----- 6.4  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 8000.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 1.25

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 19.0  
 Calcium, (Ca) ----- 67.  
 Magnesium, (Mg) ----- 2.2  
 Sodium, (Na) ----- 1700.  
 Potassium, (K) ----- 228.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 520.3  
 Chlorides, (Cl) ----- 2495.7  
 Sulphates, (SO<sub>4</sub>) ----- 202.  
 Nitrate, (NO<sub>3</sub>) ----- 1.3  
 Fluoride, (F) ----- 3.2  
 Total Iron, (Fe) ----- 3.5  
 Copper, (Cu) ----- 0.01  
 Manganese, (Mn) ----- 0.30  
 Chromium, (Cr)  
 Zinc, (Zn) ----- 0.30  
 Aluminum (Al) ~~less than~~ ----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 240.  
 Lithium, (Li)  
 Lead, (Pb)  
 Phenol  
 Sulfides as H<sub>2</sub>S  
 Total Hardness as CaCO<sub>3</sub> ----- 176.7 (10.3 gr/gal)  
 Oil (chloroform extractable)  
 Total Dissolved Solids ----- 5219.  
 Total Suspended Solids  
 Phosphate (PO<sub>4</sub>) ----- 1.0

B C LABORATORIES, INC.

*J. J. Eglar*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308  
 Attention Mr. W. A. Shaw

Date Reported: 8/14/78  
 Date Received: 7/17/78  
 Laboratory No.: 5965

Marked: Well #KGRA 52-21 Sample #4 @ 4080' 7/13/78

WATER ANALYSIS

Sample Description

pH ----- 6.3  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 8000.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 1.25

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 19.0  
 Calcium, (Ca) ----- 62.  
 Magnesium, (Mg) ----- 2.0  
 Sodium, (Na) ----- 1750.  
 Potassium, (K) ----- 228.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 469.5  
 Chlorides, (Cl) ----- 2594.8  
 Sulphates, (SO<sub>4</sub>) ----- 194.  
 Nitrate, (NO<sub>3</sub>) ----- 1.3  
 Fluoride, (F) ----- 3.0  
 Total Iron, (Fe) ----- 4.0  
 Copper, (Cu) ----- 0.02  
 Manganese, (Mn) ----- 0.29  
 Chromium, (Cr) -----  
 Zinc, (Zn) ----- 0.34  
 Aluminum (Al) ~~less-than~~ ----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 270.  
 Lithium, (Li) -----  
 Lead, (Pb) -----  
 Phenol -----  
 Sulfides as H<sub>2</sub>S -----  
 Total Hardness as CaCO<sub>3</sub> ----- 163.4 (9.5 gr/gal)  
 Oil (chloroform extractable) -----  
 Total Dissolved Solids ----- 5363.  
 Total Suspended Solids -----  
 Phosphate (PO<sub>4</sub>) ----- 1.0

*J. J. Eglin*



Submitted By: Getty Oil Company  
Route 1, Box 197-X  
Bakersfield, California 93308  
Attention Mr. W. A. Shaw

Date Reported: 8/14/78  
Date Received: 7/17/78  
Laboratory No.: 5966

Marked: Well #KGRA 52-21 Sample #5 @ 4750' 7/13/78

WATER ANALYSIS

Sample Description

pH	-----	6.3
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	8400.
Resistivity, Ohm M <sup>2</sup> /M	-----	1.19

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	21.0
Calcium, (Ca)	-----	58.
Magnesium, (Mg)	-----	1.9
Sodium, (Na)	-----	1800.
Potassium, (K)	-----	244.
Carbonates, (CO <sub>3</sub> )	-----	0.
Bicarbonates, (HCO <sub>3</sub> )	-----	460.8
Chlorides, (Cl)	-----	2693.9
Sulphates, (SO <sub>4</sub> )	-----	180.
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.2
Total Iron, (Fe)	-----	3.6
Copper, (Cu)	-----	0.05
Manganese, (Mn)	-----	0.24
Chromium, (Cr)	-----	0.38
Zinc, (Zn)	-----	0.1
Aluminum (Al)	less-than	0.1
Silica, (SiO <sub>2</sub> )	-----	250.
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	152.9 (8.9 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5488.
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.8

B C LABORATORIES, INC.

*J. J. Eglar*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308  
 Attention Mr. W. A. Shaw

Date Reported: 8/14/78  
 Date Received: 7/17/78  
 Laboratory No.: 5967

Marked: Well #KGRA 52-21 Sample #6 @ 6210' 7/13/78

WATER ANALYSIS

Sample Description

pH ----- 6.1  
 E.C. Micromhos/cm (K x 10<sup>6</sup>)  
 @ 25°C (salinity) ----- 8400.  
 Resistivity, Ohm M<sup>2</sup>/M ----- 1.19

Constituents, P.P.M. (parts per million)

Boron, (B) ----- 19.0  
 Calcium, (Ca) ----- 59.  
 Magnesium, (Mg) ----- 1.95  
 Sodium, (Na) ----- 1800.  
 Potassium, (K) ----- 246.  
 Carbonates, (CO<sub>3</sub>) ----- 0.  
 Bicarbonates, (HCO<sub>3</sub>) ----- 460.8  
 Chlorides, (Cl) ----- 2701.  
 Sulphates, (SO<sub>4</sub>) ----- 176.  
 Nitrate, (NO<sub>3</sub>) ----- 1.3  
 Fluoride, (F) ----- 3.0  
 Total Iron, (Fe) ----- 5.0  
 Copper, (Cu) ----- 0.17  
 Manganese, (Mn) ----- 0.30  
 Chromium, (Cr)  
 Zinc, (Zn) ----- 0.64  
 Aluminum (Al) ~~less than~~ ----- 0.1  
 Silica, (SiO<sub>2</sub>) ----- 250.  
 Lithium, (Li)  
 Lead, (Pb)  
 Phenol  
 Sulfides as H<sub>2</sub>S  
 Total Hardness as CaCO<sub>3</sub> ----- 155.6 (9.1 gr/gal)  
 Oil (chloroform extractable)  
 Total Dissolved Solids ----- 5493.  
 Total Suspended Solids  
 Phosphate (PO<sub>4</sub>) ----- 0.4

B C LABORATORIES, INC.

*J. J. Eglar*

Submitted By: Getty Oil Company  
 P. O. Box 5237  
 Bakersfield, California 93308  
 Attention Mr. Wayne Shaw

Date Reported: 8/7/78  
 Date Received: 7/3/78  
 Laboratory No.: 5483

Marked: Jefferson Water Well, Beaver Co. Utah

### WATER ANALYSIS

**Sample Description**

pH	-----	7.6
E.C. Micromhos/cm (K x 10 <sup>6</sup> )	-----	
@ 25°C (salinity)	-----	1760.
Resistivity, Ohm M <sup>2</sup> /M	-----	5.68

**Constituents, P.P.M. (parts per million)**

Boron, (B)	-----	3.1	Phosphate, PO <sub>4</sub>	less-than-	0.1 ppm
Calcium, (Ca)	-----	95.0			
Magnesium, (Mg)	-----	33.			
Sodium, (Na)	-----	245.0			
Potassium, (K)	-----	10.0			
Carbonates, (CO <sub>3</sub> )	-----	0.			
Bicarbonates, (HCO <sub>3</sub> )	-----	142.1			
Chlorides, (Cl)	-----	548.0			
Sulphates, (SO <sub>4</sub> )	-----	26.0			
Nitrate, (NO <sub>3</sub> )	-----	1.3			
Fluoride, (F)	-----	0.26			
Total Iron, (Fe)	-----	72.0*			
Copper, (Cu)	less-than	0.01			
Manganese, (Mn)	-----	0.44			
Chromium, (Cr)	-----				
Zinc, (Zn)	-----	0.07			
Aluminum (Al)	less-than	0.1			
Silica, (SiO <sub>2</sub> )	-----	39.			
Lithium, (Li)	-----				
Lead, (Pb)	-----				
Phenol	-----				
Sulfides as H <sub>2</sub> S	-----				
Total Hardness as CaCO <sub>3</sub>	-----	373.5 (21.8 gr/gal)			
Oil (chloroform extractable)	-----				
Total Dissolved Solids	-----	1143.			
Total Suspended Solids	-----				

\*Note: The inside of can appears rusted.

B C LABORATORIES, INC.

*J. J. Eglar*





Submitted By: Getty Oil Company  
 Route 1, Box-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9767

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #1 12:45 3rd Swab Run 110° 60005'

WATER ANALYSIS

Sample Description

pH	-----	7.9
E.C. Micromhos/cm (K x 10 <sup>6</sup> )	-----	4090
@ 25°C (salinity)		
Resistivity, Ohm M <sup>2</sup> /M	-----	2.44

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	5.6
Calcium, (Ca)	-----	103
Magnesium, (Mg)	-----	26
Sodium, (Na)	-----	645
Potassium, (K)	-----	38
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	226.9
Chlorides, (Cl)	-----	1161.1
Sulphates, (SO <sub>4</sub> )	-----	37
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	0.83
Total Iron, (Fe)	-----	0.74
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.49
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.12
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	71
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	364.7 (21.3 gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	2155
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9768

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec., T27S, R9W  
 Beaver Co., Utah Sample #2 12:45 4th Swab Run 130° 6005'

WATER ANALYSIS

Sample Description

pH	-----	8.0
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	4140
Resistivity, Ohm M <sup>2</sup> /M	-----	2.42

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	5.4
Calcium, (Ca)	-----	108
Magnesium, (Mg)	-----	29
Sodium, (Na)	-----	650
Potassium, (K)	-----	38
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	244.3
Chlorides, (Cl)	-----	1164.7
Sulphates, (SO <sub>4</sub> )	-----	37
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	0.81
Total Iron, (Fe)	-----	2.8
Copper, (Cu)	-----	0.02
Manganese, (Mn)	-----	1.0
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.26
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	84
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	389.6 (22.7 gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	2212
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglar*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9769

Marked: GOCO #52-51 Roosevelt Hat Springs KGRA Sec.21,T27S, R9W  
 Beaver Co., Utah Sampel#3 13:05 135° -7500 5th Run

WATER ANALYSIS

Sample Description

pH	-----	7.9
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	3850
Resistivity, Ohm M <sup>2</sup> /M	-----	2.60

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	5.6
Calcium, (Ca)	-----	65
Magnesium, (Mg)	-----	15.8
Sodium, (Na)	-----	650
Potassium, (K)	-----	38
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	175.0
Chlorides, (Cl)	-----	1100.9
Sulphates, (SO <sub>4</sub> )	-----	30
Nitrate, (NO <sub>3</sub> )	-----	0.5
Fluoride, (F)	-----	0.72
Total Iron, (Fe)	-----	0.08
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.68
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.04
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	30
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	227.7 (13.3 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	1985
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9770

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Sample #4 13:20 155° 6th Swab 6005'-7500'

WATER ANALYSIS

Sample Description

pH	-----	7.0
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	7550
Resistivity, Ohm M <sup>2</sup> /M	-----	1.32

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	19.4
Calcium, (Ca)	-----	125
Magnesium, (Mg)	-----	3.1
Sodium, (Na)	-----	1440
Potassium, (K)	-----	182
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	574.3
Chlorides, (Cl)	-----	2279.8
Sulphates, (SO <sub>4</sub> )	-----	79
Nitrate, (NO <sub>3</sub> )	-----	0.5
Fluoride, (F)	-----	3.2
Total Iron, (Fe)	-----	2.1
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.32
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.13
Aluminum (Al)	-----	1.6
Silica, (SiO <sub>2</sub> )	-----	238
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	325.5 (19.0 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	4578
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.7

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9771

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #5 13:35 6005'

WATER ANALYSIS

Sample Description

pH	-----	7.4
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	8770
Resistivity, Ohm M <sup>2</sup> /M	-----	1.14

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	26.2
Calcium, (Ca)	-----	71
Magnesium, (Mg)	-----	1.5
Sodium, (Na)	-----	1700
Potassium, (K)	-----	242
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	439.2
Chlorides, (Cl)	-----	2701.0
Sulphates, (SO <sub>4</sub> )	-----	84
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.8
Total Iron, (Fe)	-----	16.0
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.49
Chromium, (Cr)		
Zinc, (Zn)	-----	0.57
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	388
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	183.8 (10.7 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5379
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.3

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1. Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9772

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #6 13:50 6005'

WATER ANALYSIS

Sample Description

pH	-----	7.3
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	8130
Resistivity, Ohm M <sup>2</sup> /M	-----	1.23

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	23.8
Calcium, (Ca)	-----	60
Magnesium, (Mg)	-----	0.9
Sodium, (Na)	-----	1635
Potassium, (K)	-----	225
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	403.7
Chlorides, (Cl)	-----	2563.0
Sulphates, (SO <sub>4</sub> )	-----	71
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.6
Total Iron, (Fe)	-----	4.8
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.30
Chromium, (Cr)		
Zinc, (Zn)	-----	0.34
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	354
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	153.8 (9.0 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5168
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.2

B C LABORATORIES, INC.

*J. J. Eshin*



Submitted By: Getty Oil Company  
Route 1, Box 197-X  
Bakersfield, California 93308

Date Reported: 12/7/78  
Date Received: 11/6/78  
Laboratory No.: 9773

Marked: GOCO #52-21 Roosevelt Hst Springs KGRA Sec. 21, T27S, R9W  
Beaver Co., Utah Sample #7 6005'-TD

WATER ANALYSIS

Sample Description

pH	-----	7.9
E.C. Micromhos/cm (K x 10 <sup>6</sup> )	-----	
@ 25°C (salinity)	-----	8770
Resistivity, Ohm M <sup>2</sup> /M	-----	1.14

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	27.0
Calcium, (Ca)	-----	49
Magnesium, (Mg)	-----	0.46
Sodium, (Na)	-----	1815
Potassium, (K)	-----	257
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	443.5
Chlorides, (Cl)	-----	2775.4
Sulphates, (SO <sub>4</sub> )	-----	71
Nitrate, (NO <sub>3</sub> )	-----	0.5
Fluoride, (F)	-----	4.0
Total Iron, (Fe)	-----	2.0
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.12
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.10
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	425
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	124.5 (7.3 gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	5648
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	0.3

B C LABORATORIES, INC.



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9774

Marked: GOCO #52-21 Roosevelt Hat Spring KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #8 6005'-TD 201<sup>0</sup>F

WATER ANALYSIS

Sample Description

pH	-----	7.6
E.C. Micromhos/cm (K x 10 <sup>6</sup> )	-----	
@ 25°C (salinity)	-----	9250
Resistivity, Ohm M <sup>2</sup> /M	-----	1.08

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	28.8
Calcium, (Ca)	-----	46
Magnesium, (Mg)	-----	0.44
Sodium, (Na)	-----	1890
Potassium, (K)	-----	273
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	422.7
Chlorides, (Cl)	-----	2906.3
Sulphates, (SO <sub>4</sub> )	-----	70
Nitrate, (NO <sub>3</sub> )	-----	2.7
Fluoride, (F)	-----	4.1
Total Iron, (Fe)	-----	3.9
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.09
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.06
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	405
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	116.9 (6.8 gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	5887
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	0.9

B C LABORATORIES, INC.

*J. J. Eglar*





Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9775

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #9 15:50 6005'-6350'

WATER ANALYSIS

Sample Description

pH	-----	7.1
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	2680
Resistivity, Ohm M <sup>2</sup> /M	-----	3.73

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	2.9
Calcium, (Ca)	-----	67
Magnesium, (Mg)	-----	25
Sodium, (Na)	-----	407
Potassium, (K)	-----	22
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	110.9
Chlorides, (Cl)	-----	789.4
Sulphates, (SO <sub>4</sub> )	-----	30
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	0.64
Total Iron, (Fe)	-----	0.14
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	1.3
Chromium, (Cr)		
Zinc, (Zn)	-----	1.3
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	65
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	270.5 (15.8 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	1428
Total Suspended Solids		
Phosphite (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9776

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #10 16:35 6005-6350'

WATER ANALYSIS

Sample Description

pH	-----	6.5
E.C. Micromhos/cm (K x 10 <sup>6</sup> )	-----	
@ 25°C (salinity)	-----	3110
Resistivity, Ohm M <sup>2</sup> /M	-----	3.22

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	3.7
Calcium, (Ca)	-----	101
Magnesium, (Mg)	-----	24
Sodium, (Na)	-----	485
Potassium, (K)	-----	29
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	166.3
Chlorides, (Cl)	-----	874.4
Sulphates, (SO <sub>4</sub> )	-----	32
Nitrate, (NO <sub>3</sub> )	-----	0.5
Fluoride, (F)	-----	0.94
Total Iron, (Fe)	-----	0.44
Copper, (Cu)	-----	0.02
Manganese, (Mn)	-----	2.6
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	3.8
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	73
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	351.5 (20.5 gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	1746
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*

Submitted By: Getty Oil Company  
Route 1, Box 197-X  
Bakersfield, California 93308

Date Reported: 12/7/78  
Date Received: 11/6/78  
Laboratory No.: 9777

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
Beaver Co., Utah Sample #1 3320-2742'

## WATER ANALYSIS

Sample Description

pH	-----	7.7
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	4720
Resistivity, Ohm M <sup>2</sup> /M	-----	2.12

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	5.9
Calcium, (Ca)	-----	95
Magnesium, (Mg)	-----	25
Sodium, (Na)	-----	830
Potassium, (K)	-----	61
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	272.9
Chlorides, (Cl)	-----	1313.3
Sulphates, (SO <sub>4</sub> )	-----	43
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	1.2
Total Iron, (Fe)	-----	4.0
Copper, (Cu)	-----	0.03
Manganese, (Mn)	-----	0.74
Chromium, (Cr)		
Zinc, (Zn)	-----	0.08
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	126
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	340.6 (1.9 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	2691
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/7/78  
 Date Received: 11/6/78  
 Laboratory No.: 9778

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #1 2750- Shoe

WATER ANALYSIS

Sample Description

pH	-----	7.7
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	3360
Resistivity, Ohm M <sup>2</sup> /M	-----	2.98

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	1.7
Calcium, (Ca)	-----	110
Magnesium, (Mg)	-----	30
Sodium, (Na)	-----	510
Potassium, (K)	-----	12
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	166.3
Chlorides, (Cl)	-----	973.5
Sulphates, (SO <sub>4</sub> )	-----	36
Nitrate, (NO <sub>3</sub> )	-----	4.4
Fluoride, (F)	-----	0.38
Total Iron, (Fe)	-----	0.34
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.26
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.03
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	66
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	398.7 (32.3 gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	1799
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9779

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Flow Sample #1 7170-7500'

WATER ANALYSIS

<u>Sample Description</u>		
pH	-----	6.4
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	9010
Resistivity, Ohm M <sup>2</sup> /M	-----	1.11
<u>Constituents, P.P.M. (parts per million)</u>		
Boron, (B)	-----	24.4
Calcium, (Ca)	-----	106
Magnesium, (Mg)	-----	5.2
Sodium, (Na)	-----	1845
Potassium, (K)	-----	237
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	602.9
Chlorides, (Cl)	-----	2810.8
Sulphates, (SO <sub>4</sub> )	-----	78
Nitrate, (NO <sub>3</sub> )	-----	0.5
Fluoride, (F)	-----	2.8
Total Iron, (Fe)	-----	0.31
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	1.0
Chromium, (Cr)		
Zinc, (Zn)	-----	0.16
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	500
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	286.6 (16.7 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5940
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9780

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #2 3310-2750'

WATER ANALYSIS

Sample Description

pH	-----	7.9
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	4630
Resistivity, Ohm M <sup>2</sup> /M	-----	2.16

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	5.6
Calcium, (Ca)	-----	79
Magnesium, (Mg)	-----	23
Sodium, (Na)	-----	805
Potassium, (K)	-----	61
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	201.8
Chlorides, (Cl)	-----	1362.9
Sulphates, (SO <sub>4</sub> )	-----	45
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	1.2
Total Iron, (Fe)	-----	0.31
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.54
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.05
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	176
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	292.3 (17.1 gr.gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	2645
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9781

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #2 2750'-Shoe

WATER ANALYSIS

Sample Description

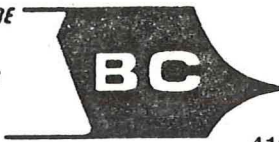
pH	-----	6.5
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	8280
Resistivity, Ohm M <sup>2</sup> /M	-----	1.2

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	23.0
Calcium, (Ca)	-----	89
Magnesium, (Mg)	-----	5.3
Sodium, (Na)	-----	1700
Potassium, (K)	-----	213
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	524.9
Chlorides, (Cl)	-----	2506.3
Sulphates, (SO <sub>4</sub> )	-----	103
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.8
Total Iron, (Fe)	-----	8.8
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.29
Chromium, (Cr)		
Zinc, (Zn)	-----	0.48
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	272
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	244.5 (14.3 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5293
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.4

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9782

Marked: GOCO #52-21 roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Flow Sample #2 7170-7500'

WATER ANALYSIS

Sample Description

pH	-----	7.3
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	9250
Resistivity, Ohm M <sup>2</sup> /M	-----	1.08

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	27.0
Calcium, (Ca)	-----	114
Magnesium, (Mg)	-----	3.9
Sodium, (Na)	-----	1900
Potassium, (K)	-----	218
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	550.0
Chlorides, (Cl)	-----	2885.1
Sulphates, (SO <sub>4</sub> )	-----	86
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.4
Total Iron, (Fe)	-----	6.9
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.73
Chromium, (Cr)		
Zinc, (Zn)	-----	0.05
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	143
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	301.3 (17.6 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5727
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.2

B C LABORATORIES, INC.

*J. J. E. [Signature]*





Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9783

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #3 3310-2750'

WATER ANALYSIS

Sample Description

pH	-----	8.0
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	4680
Resistivity, Ohm M <sup>2</sup> /M	-----	2.14

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	3.3
Calcium, (Ca)	-----	69
Magnesium, (Mg)	-----	25
Sodium, (Na)	-----	840
Potassium, (K)	-----	62
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	188.8
Chlorides, (Cl)	-----	1405.4
Sulphates, (SO <sub>4</sub> )	-----	44
Nitrate, (NO <sub>3</sub> )	-----	3.1
Fluoride, (F)	-----	1.2
Total Iron, (Fe)	-----	3.0
Copper, (Cu)	-----	0.02
Manganese, (Mn)	-----	0.80
Chromium, (Cr)		
Zinc, (Zn)	-----	0.16
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	157
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	275.5 (16.1 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	2701
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9784

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #3 2750'-Shoe

WATER ANALYSIS

Sample Description

pH	-----	7.1
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	8520
Resistivity, Ohm M <sup>2</sup> /M	-----	1.17

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	17.8
Calcium, (Ca)	-----	86
Magnesium, (Mg)	-----	4.9
Sodium, (Na)	-----	1700
Potassium, (K)	-----	213
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	518.0
Chlorides, (Cl)	-----	2538.2
Sulphates, (SO <sub>4</sub> )	-----	103
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.8
Total Iron, (Fe)	-----	4.8
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.30
Chromium, (Cr)		
Zinc, (Zn)	-----	0.16
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	241
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	235.3 (13.7 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5237
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.5

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9785

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #3 7170-7500'

WATER ANALYSIS

Sample Description

pH	-----	6.8
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	9250
Resistivity, Ohm M <sup>2</sup> /M	-----	1.08

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	27.0
Calcium, (Ca)	-----	107
Magnesium, (Mg)	-----	4.0
Sodium, (Na)	-----	1900
Potassium, (K)	-----	216
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	615.0
Chlorides, (Cl)	-----	2881.6
Sulphates, (SO <sub>4</sub> )	-----	85
Nitrate, (NO <sub>3</sub> )	-----	1.3
Fluoride, (F)	-----	3.6
Total Iron, (Fe)	-----	6.3
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.40
Chromium, (Cr)		
Zinc, (Zn)	-----	0.03
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	139
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	284.2 (16.6 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5677
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9786

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S. R9W  
 Beaver Co., Utah Sample #11 10:12 4193-4997' 11/4/78

WATER ANALYSIS

Sample Description

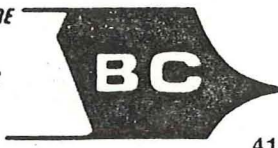
pH	-----	7.9
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	2630
Resistivity, Ohm M <sup>2</sup> /M	-----	3.80

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	3.1
Calcium, (Ca)	-----	105
Magnesium, (Mg)	-----	30
Sodium, (Na)	-----	380
Potassium, (K)	-----	19
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	187.1
Chlorides, (Cl)	-----	708.0
Sulphates, (SO <sub>4</sub> )	-----	30
Nitrate, (NO <sub>3</sub> )	-----	1.8
Fluoride, (F)	-----	0.58
Total Iron, (Fe)	-----	2.9
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.52
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.05
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	66
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	386.2 (22.5 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	1489
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	(-) 0.1

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
Route 1, Box 197-X  
Bakersfield, California 93308

Date Reported: 12/8/78  
Date Received: 11/6/78  
Laboratory No.: 9787

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
Beaver Co., Utah Sample #2 10:45 4193-4997'

WATER ANALYSIS

Sample Description

pH	-----	6.8
E.C. Micromhos/cm (K x 10 <sup>6</sup> )		
@ 25°C (salinity)	-----	9010
Resistivity, Ohm M <sup>2</sup> /M	-----	1.11

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	19.2
Calcium, (Ca)	-----	86
Magnesium, (Mg)	-----	6.5
Sodium, (Na)	-----	1850
Potassium, (K)	-----	231
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	461.7
Chlorides, (Cl)	-----	2867.4
Sulphates, (SO <sub>4</sub> )	-----	99
Nitrate, (NO <sub>3</sub> )	-----	1.8
Fluoride, (F)	-----	4.0
Total Iron, (Fe)	-----	3.4
Copper, (Cu)	-----	0.01
Manganese, (Mn)	-----	0.80
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	1.4
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	214
Lithium, (Li)		
Lead, (Pb)		
Phenol		
Sulfides as H <sub>2</sub> S		
Total Hardness as CaCO <sub>3</sub>	-----	241.9 (14.1 gr/gal)
Oil (chloroform extractable)		
Total Dissolved Solids	-----	5617
Total Suspended Solids		
Phosphate (PO <sub>4</sub> )	-----	0.2

B C LABORATORIES, INC.

*J. J. Eglin*



Submitted By: Getty Oil Company  
 Route 1, Box 197-X  
 Bakersfield, California 93308

Date Reported: 12/8/78  
 Date Received: 11/6/78  
 Laboratory No.: 9788

Marked: GOCO #52-21 Roosevelt Hat Springs KGRA Sec. 21, T27S, R9W  
 Beaver Co., Utah Sample #13 11:20 am 4193-4997' 11/4/78

WATER ANALYSIS

Sample Description

pH	-----	7.0
E.C. Micromhos/cm (K x 10 <sup>6</sup> )	-----	
@ 25°C (salinity)	-----	8770
Resistivity, Ohm M <sup>2</sup> /M	-----	1.14

Constituents, P.P.M. (parts per million)

Boron, (B)	-----	23.4
Calcium, (Ca)	-----	82
Magnesium, (Mg)	-----	3.0
Sodium, (Na)	-----	1800
Potassium, (K)	-----	237
Carbonates, (CO <sub>3</sub> )	-----	-
Bicarbonates, (HCO <sub>3</sub> )	-----	534.5
Chlorides, (Cl)	-----	2732.9
Sulphates, (SO <sub>4</sub> )	-----	96
Nitrate, (NO <sub>3</sub> )	-----	1.8
Fluoride, (F)	-----	3.9
Total Iron, (Fe)	-----	6.6
Copper, (Cu)	-----	(-) 0.01
Manganese, (Mn)	-----	0.52
Chromium, (Cr)	-----	
Zinc, (Zn)	-----	0.85
Aluminum (Al)	-----	(-) 0.1
Silica, (SiO <sub>2</sub> )	-----	280
Lithium, (Li)	-----	
Lead, (Pb)	-----	
Phenol	-----	
Sulfides as H <sub>2</sub> S	-----	
Total Hardness as CaCO <sub>3</sub>	-----	217.5 (12.7gr/gal)
Oil (chloroform extractable)	-----	
Total Dissolved Solids	-----	5542
Total Suspended Solids	-----	
Phosphate (PO <sub>4</sub> )	-----	0.4

B C LABORATORIES, INC.

Rework of GOCO #52-21

Sec 21-T27S-RSW

Beaver County, California

10-18-78 Colorado Well Service moved workover rig onto location, rigged up and prep to "fish" junk.

10-19-78 Rigging up

10-20-78 Ran in with fishing tools and recovered "fish"

10-21-78 Made bit run to bottom cleaned out hole

10-22-78 Pruett Wireline Services rigged up and ran temperature survey, maximum temperature on bottom 402.7°F

10-23-78 Rigged up packer and swab equipment, ran in hole, set packer 7,710'; made swab runs and swabbed fluid to 3,000' maximum temperature 145°F. Took water samples.

10-24-78 Resumed swabbing. Hole full. Slight heading blow after each swabbing run. Very minor and mostly due to fluid movement after swab run stopped. Pulled pkr 10:45 AM. Out of hole, rigged up stradle pkr's, ran in hole to test interval 6599' - 7170'

10-25-78 Running in hole with pkrs. Insufficient time to test 6,599' - 7,170'. Will test first zone below shoe. 2,750' to shoe (2,040') pkr's would not go. Pulled out of hole. Lost pkr elements. Made bit run. Ran in hole with pkrs level down each run 200'+; swabbed fluid to 1,900'. Took water samples. Rigged down lubricator and swab, pulled pkrs. Started out of hole. Maximum temperature 125°F.

10-26-78 Finished coming out of hole, left pkr elements in hole; picked up D.C. and bit. Hit obstruction at 3,180' could not push to bottom. Picked up power swivel, milled on junk. Finally worked to 3,200'. Shut down at dark.

10-27-78 Ran to bottom chasing junk ahead. Reached T.D. Layed down power swivel. Changed elevators. Ran in hole with stradle packers 3,320' - 2,742'. Expanded pkr's, picked up swab and lubricator, started swabbing first run 1,500' (100°F)

Second run 2,600' (120°F) Top of tool

Very muddy rust colored fluid with brackish taste. Dark streaked H<sub>2</sub>O probably due to pipe dope and old asphaltum in pipe. Swabbed fluid down as far as top of tool (packer tool) Pulled out of hole. Left bottom pkr element in hole. Made up bit, ran in hole, chased element to bottom (7400't) Pulled out of hole. Secured rig; crew off for Sunday.

10-29-78 Sunday - Crew off.

10-30-78 Rigged up stradle packers, ran in hole to test 7,150' - 6,575'. Could not seat packers. Test failed. Pulled out of hole. Left packer element in hole, made bit run, pushed obstruction to bottom.

10-31-78 Pulled bit out of hole, rigged up single packer assembly. Set packer at 6,005'. Pressured up, set packer at 12:20 PM, rigged up swab, and ran in hole at 12:30 PM. Swabbed fluid with temperatures ranging from 150°F to 204°F. Light heading blow after each swab run. White plume of hot H<sub>2</sub>O and steam develops with receding heads as pressure diminishes. Maximum pressure 12 PSI.

11-1-78 Continued testing from 10-31-78. Continued to swab and flow by heads. Could not deplete fluid head or increase heat flow. At 14:20 broke off swabbing and pulled packers. Left pkr elements in hole. Picked up DC and bit, chased obstruction to bottom.

11-2-78 Rigged up, finished pushing pkr element to bottom (7412') Pulled out of hole at 11:15. Picked up bottom pkr assembly to run in and test interval 6,005' - 6,350'. Set pkr's at 14:45. Started swabbing 15:08. Swabbed dry with maximum temperature 185°F. Unseated pkr's, pulled out of hole 1700 hours. Corkscrewed 12 joints of tubing.

11-3-78 Finished pulling pkr's, both elements gone. Out of hole at 10:00 AM. Tripped to bottom with bit and out of hole at 15:20 PM. Pick up pkr's to stradle interval 4,193' - 4,997'. Started in hole.

11-4-78 Rigged up, finished running in hole. Set pkr's 09:20 AM. Started swabbing 09:50 AM. Swabbed fluid down with no entry after four swab runs. Waited 30 minutes, reran swab, no fluid. Pulled pkr's with difficulty. Made trip to bottom with bit pushing pkr elements to bottom. Rigged down equipment, secured for day.

11-5-78 Laid down D.P., mast, and secured lease and equipment. Loaded out D.P. Tubing and BOP Head. Installed flange on master gate valve. Released rig and cleaned location.

W. A. SHAW