

WATER ANALYSIS REPORT

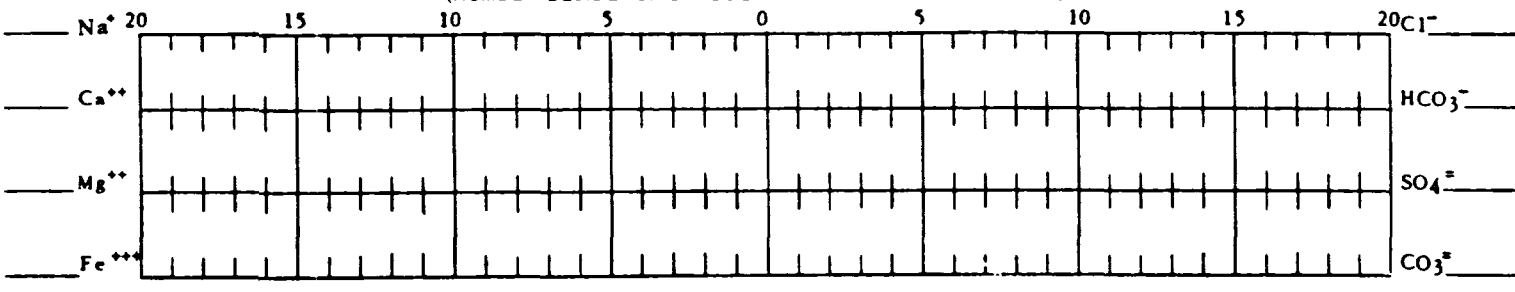


NL Treating Chemicals / NL Industries, Inc.
P. O. Box 4305 Houston, Texas 77210

SHEET NUMBER						
DATE						
COMPANY TEXACO PRODUCING INC.						
FIELD EUNICE AREA				COUNTY OR PARISH LEA		STATE NM
LEASE OR UNIT HORSE TROUGH		WELL(S) NAME OR NO.		WATER SOURCE (FORMATION)		
DEPTH, FT.	BHT, F	SAMPLE SOURCE	TEMP, F	WATER, BBL/DAY	OIL, BBL/DAY	GAS, MMCF/DAY
DATE SAMPLED 8-7-85		TYPE OF WATER ☐ PRODUCED ☒ SUPPLY ☐ WATERFLOOD ☐ SALT WATER DISPOSAL				

WATER ANALYSIS PATTERN

(NUMBER BESIDE ION SYMBOL INDICATES me/l* SCALE UNIT)



DISSOLVED SOLIDS

CATIONS	me/l*	mg/l*
Total Hardness	<u>5.6</u>	
Calcium, Ca ⁺⁺	<u>3.8</u>	<u>76</u>
Magnesium, Mg ⁺⁺	<u>1.8</u>	<u>22</u>
Iron (Total) Fe ⁺⁺⁺		<u>0.6</u>
Barium, Ba ⁺⁺		
Sodium, Na ⁺ (calc.)	<u>14.0</u>	<u>322</u>
ANIONS		
Chloride, Cl ⁻	<u>11.3</u>	<u>400</u>
Sulfate, SO ₄ ⁼	<u>4.3</u>	<u>205</u>
Carbonate, CO ₃ ⁼		
Bicarbonate, HCO ₃ ⁼	<u>4.0</u>	<u>244</u>
Hydroxyl, OH ⁻		
Sulfide, S ⁼	<u>4</u>	<u>4</u>

DISSOLVED GASES

Hydrogen Sulfide, H ₂ S	mg/l*
Carbon Dioxide, CO ₂	mg/l*
Oxygen, O ₂	mg/l*

PHYSICAL PROPERTIES

pH	<u>7.3</u>
Eh (Redox Potential)	_____ MV
Specific Gravity	_____
Turbidity, JTU Units	_____
Total Dissolved Solids (calc.)	<u>1,269.6</u> mg/l*
Stability Index @ _____ F	_____
CaSO ₄ Solubility @ _____ F	_____ mg/l*
Max. CaSO ₄ Possible (calc.)	_____ mg/l*
Max. BaSO ₄ Possible (calc.)	_____ mg/l*
Residual Hydrocarbons	_____ ppm(Vol/Vol)

SUSPENDED SOLIDS (QUALITATIVE)

Iron Sulfide ☐ Iron Oxide ☐ Calcium Carbonate ☐ Acid Insoluble ☐

REMARKS AND RECOMMENDATIONS:

Complete Water Analysis plus Fe

* NOTE: me/l and mg/l are commonly used interchangeably for epm and ppm respectively. Where epm and ppm are used, corrections should be made for specific gravity.

BTC ENGINEER FRANK WONES	DIST. NO. 821	ADDRESS Box 1697 Hobbs, NM	OFFICE PHONE 392-1518	HOME PHONE 392-4616
ANALYZED 8/12/85	DATE	DIST Exhibit	☐ AREA OR BTC LAB ☐ DISTRICT OFFICE ☐ BTC SALES SUPERVISOR	

NL TREATING CHEMICALS
NL INDUSTRIES, INC.

SCALING TENDENCIES OF WATERS

COMPANY: TEXACO PRODUCING INC.

SAMPLE POINT: HORSE TROUGH

LOCATION: EUNICE AREA

DATE: 8/12/85

WATER ANALYSIS (MG/L):

SODIUM: 322.0
CALCIUM: 76.0
MAGNESIUM: 22.0
CHLORIDE: 400.0
SULFATE: 205.0
BICARBONATE: 244.0
IRON: 0.6
BARIUM: 0.

PH: 7.3

IONIC STRENGTH = 0.0246

INDEX VALUES GREATER THAN ZERO INDICATE SCALING CONDITIONS
INDEX VALUES OF ZERO OR LESS INDICATE A STABLE WATER

TEMP.	CALCITE INDEX	GYPHUM INDEX	ANHYDRITE INDEX	BARITE INDEX
60	-0.25	-1.46	-1.71	-40.63
80	-0.13	-1.50	-1.65	-40.78
100	-0.02	-1.52	-1.57	-40.89
120	0.11	-1.52	-1.48	-40.98
140	0.23	-1.51	-1.38	-41.05
160	0.35	-1.48	-1.27	-41.10
180	0.48	-1.45	-1.15	-41.13
200	0.62	-1.41	-1.01	-41.14
220	0.76	-1.37	-0.86	-41.14
240	0.91	-1.32	-0.70	-41.13
260	1.07	-1.27	-0.53	-41.11

NL TREATING CHEMICALS
NL INDUSTRIES, INC.

SCALING TENDENCIES OF WATERS

COMPANY: TEXACO PRODUCING INC.

SAMPLE POINT: OLD SIMS HOUSE

LOCATION: EUNICE AREA

DATE: 8/12/85

WATER ANALYSIS (MG/L):

SODIUM: 374.9
CALCIUM: 52.0
MAGNESIUM: 34.2
CHLORIDE: 500.0
SULFATE: 155.0
BICARBONATE: 274.5
IRON: 1.3
BARIUM: 0.

PH: 7.6

IONIC STRENGTH = 0.0262

INDEX VALUES GREATER THAN ZERO INDICATE SCALING CONDITIONS

INDEX VALUES OF ZERO OR LESS INDICATE A STABLE WATER

TEMP.	CALCITE INDEX	GYP SUM INDEX	ANHYDRITE INDEX	BARITE INDEX
60	-0.08	-1.76	-2.01	-40.65
80	0.05	-1.80	-1.94	-40.79
100	0.17	-1.82	-1.87	-40.91
120	0.28	-1.82	-1.78	-41.00
140	0.40	-1.81	-1.68	-41.07
160	0.53	-1.78	-1.57	-41.11
180	0.66	-1.75	-1.45	-41.14
200	0.80	-1.71	-1.31	-41.16
220	0.95	-1.67	-1.17	-41.16
240	1.10	-1.63	-1.01	-41.15
260	1.27	-1.58	-0.84	-41.13