

JOB REPORT

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Project No. MP-1-R-1. Date: July 29, 1959

Name of Project: Industrial Waste Control in Region MP-1

Period Covered: July 15, 1958 through July 15, 1959. Job No: F-34

Bio-assay and Chemical Analysis of Eastern States Petroleum
Company's Waste Waters, Houston, Texas

Abstract: Waste waters proved toxic to fish life in concentrations as low as 8%. Wastes were also high in temperatures, sulfides, phenols and oxygen consuming materials.

Findings: Eastern States discharges approximately 500 gallons per minute of waste waters. Since most plants periodically dump large amounts of objectionable waste materials, it was decided to collect a composite sample to obtain a representative sample. (REFER TO ATTACHED DATA SHEETS ON TOXICITY AND CHEMICAL ANALYSIS).

Temperatures ran as high as 120°F with an average of around 115° F.

The plant has a standard A.P.I. separator which appears to be adequate for removing waste oils.

A pH control unit maintained the pH level within a safe range according to the readings from our composite sampling.

Results: Company representatives advised they would investigate means to correct the phenols and sulfides present in the waste stream.

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Marine Chemist. Date Approved: 7 August 1959

Chemical Analysis Eastern States Petroleum Co.'s Waste Waters
Pasadena, Texas

	<u>Phenols</u>	<u>pH</u>	<u>Oil</u>	<u>Temperature</u>	<u>Oxygen Consumed</u>
Plant No. 1 Waste Waters	0.0 ppm	7.6	70 ppm	126° F 52° C	
Plant No. 2 Waste Waters	25.0 ppm	10.0	85 ppm	126° F 52° C	427 ppm

Table I

Chemical Analysis of Eastern States Pet. and Chem. Corp.'s Waste Waters

Houston, Texas

September 23, 1958

8:30 A M	pH	8.5
	Temp.	95°F
	Sulfides	35 ppm
9:00 A M	pH	8.6
	Temp.	110°F
	Sulfides	35 ppm
9:30 A M	pH	8.9
	Temp.	118°F
	Sulfides	35 ppm
10:00 A M	pH	8.7
	Temp.	118°F
	Sulfides	35 ppm
10:30 A M	pH	8.7
	Temp.	119°F
	Sulfides	15 ppm
11:00 A M	pH	8.8
	Temp.	118°F
	Sulfides	18.5 ppm
11:30 A M	pH	8.7
	Temp.	119°F
	Sulfides	15 ppm
12 Noon	pH	7.8
	Temp.	120°F
	Sulfides	15 ppm

3½ Hour Composite Sample (Collected at 30 minute intervals)

Oxygen Consumed _____ 552 ppm
(Dichromate Reflux Method)Phenols _____ 11.5 ppm
(4-aminoantipyrine method)

pH _____ 8.6

Table II

Toxicity Data on Eastern States Petroleum and Chemical Corporation's
Waste Waters

Houston, Texas

September 23, 1958

Species	Conc. of Waste	Physiological Observations
5 Killifish <u>Adinia xenica</u>	Control	All alive and O K after 24 hours.
5 Killifish <u>Adinia xenica</u>	8%	Fish appeared nervous. After 15 minutes increased respiration. 1 dead after 23 hours. Others alive after 24 hours.
5 Killifish <u>Adinia xenica</u>	16%	Fish became nervous after 10 minutes. Increased respiration. Muscle spasms after 35 minutes. Loss of equilibrium noticed after 4 hours. 2 dead within 18 hours. All dead after 24 hours.
5 Killifish <u>Adinia xenica</u>	25%	Discomfort noted almost immediately. Increased respiration. Nervousness and muscle spasms after 30 minutes. Loss of equilibrium after 1 hour. 3 dead within three hours. All dead within 6 hours.
5 Killifish <u>Adinia xenica</u>	33%	Discomfort noted immediately. Extreme nervousness and muscle spasm after 5 minutes. Loss of equilibrium after 20 minutes. 3 dead within 1 hour. All dead within 2 hours.