

JOB REPORT

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Project No. MP-2R-1 Date: 9 August 1960

Name of Project: Pollution Abatement in Regions M-4 through M-9.

Period Covered: September 1, 1959 through March 1, 1960. Job No. F-4

Bio-assay of Columbia-Southern Final Effluent and its Potential Effects
on the Aquatic Life in Nueces Bay

Abstract: The Columbia Southern Chemical Corporation has reduced the chlorine content of their waste water by agitation through an open culvert. At the present there is no physical or chemical damage being done to aquatic life in the Corpus Christi harbor by this waste.

The Navigation District has granted permission to Columbia Southern to fill in a designated area in Nueces Bay with the sandy waste from another waste line.

Objective: To determine the damage done to aquatic life in Nueces Bay and the presence and concentration of toxic materials in the effluent.

Procedure: Three stations were established previously to detect any pollutant in the effluent emptying into Corpus Christi harbor.
Station 1 - effluent emptying into culvert;
Station 2 - effluent emptying into harbor;
Station 3 - 50 feet from outfall in harbor.

A forty-eight (48) hour median tolerance limit was taken monthly to determine the per cent by volume of waste in which 50% of the indices (pin perch) could survive.

One station was set up at the outfall of the effluent emptying into Nueces Bay to check on the concentration of toxic materials.

Findings: Columbia Southern Chemical Corporation produces solid carbon dioxide, chlorine, drilling mud additives, sodium carbonate, and sodium hydroxide.

Water originally taken from the harbor by means of large pumps is used both as a coolant and as a source for disposing of chemical and sewage wastes. There are about 120 cubic feet per second of waste water emptying into Corpus Christi harbor through an open ditch approximately 300 feet long. Chlorine is the main constituent subject to polluting the harbor and the concentration in the effluent is sufficient to cause physical harm to aquatic life (Table 1). However, the agitation of the waste water through the open culvert prior to reaching the harbor has reduced the chlorine content from a mean of 41.0 ppm at station 1 to 1.0 ppm at station 3 rendering the effluent non-toxic to aquatic life. Toxicity tests at station 1 and 3 have indicated the water has no pollution effects on aquatic life. Possibly some good is accomplished by the chlorine reducing the phenolic load from another industrial waste emptying into the same area. The application of chlorine for post-dephenolization has proven satisfactory in some industrial areas.

Another waste line, this one emptying into Nueces Bay, presents a problem by filling in parts of the bay. This residue results when CO_2 is passed through the waste to dissolve the ammonia (NH_3). Ammonium chloride (NH_4Cl) is the result and lime is added to recover the ammonia. The residue contains .8 of a pound of calcium chloride (CaCl_2) and .5 of a pound of sodium chloride (NaCl) per gallon of waste. Two per cent of the total volume is a sandy precipitate and the total volume deposited is 2.3 cubic yards every 24 hours.

Future plans of The Nueces County Navigation District calls for submerged lands in the area of disposal to be filled to usable height (8 feet) to a distance of 2000 to 2500 feet north of the road. The disposal lines are moved down the west shore. This fill area, granted by the Navigation District, provides Columbia Southern with a disposal area and will provide land for future development.

Comments: The sandy waste is causing no chemical damage to Nueces Bay at the present. However, a continuous check should be made to see that the area prescribed is not filled beyond the limit granted by The Nueces County Navigation Board.

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Accepted by: Howard T. Lee
 Date 4 November 1960

Table 1

Chemical Analysis of Columbia Southern Effluent

Date	Station 1 Cl_2	Station 2 Cl_2	Station 3 Cl_2	pH
9-3	45.0 ppm	4.0 ppm	.8 ppm	8.1
10-7	31.0 ppm	3.0 ppm	.7 ppm	7.5
11-24	52.0 ppm	4.5 ppm	.9 ppm	8.3
12-7	42.0 ppm	3.5 ppm	1.1 ppm	7.8
2-15	35.0 ppm	5.0 ppm	.3 ppm	8.1