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PROGRESS REPORT
TECHNICAL SERVICES DEPARTMENT
ANNISTON, ALABAMA PLANT

JOB NO. 370-740 REPORT NO. 1 DATE February 24, 1969

TITLE: ANNISTON PLANT DEPARTMENTAL WASTE AUDITS

OBJECTIVE: To identify the major waste components from all the operating departments and to provide reliable flow data so that waste losses can be accurately calculated.

PERSONNEL: E. G. Wright (W. F. Taffee)

REPORTED BY: E. G. Wright

SUMMARY: At the present time both the waste treatment plant and the neutralization pits are operating at near capacity. During certain periods these systems are overloaded. These audits will provide data to show where these losses actually are and provide some insight as to how these losses can be reduced. The reduction of some of these losses will provide for better operation of the waste treatment plant as well as the neutralization pits.

The test period will last for two weeks in each operating department. Flow measurement will be made a minimum of three times in each department so that a good average flow rate can be determined. The sampling will be done in the same manner in which it is now done. Accurate data will be collected on production rates so that the losses can be related to this. Sample data sheets and drawings showing sampling points are attached at the end of this report.

FUTURE WORK:
1. After identifying these waste materials, efforts will be made to determine methods by which these losses can be reduced.
2. After completion of all of the audits, a comprehensive report will be issued.

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Technical Services Dept.

bmr

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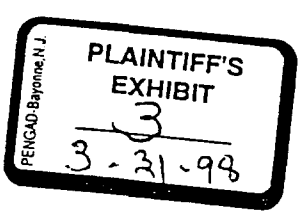

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Details

1. Sampling Procedures:

The sampling program will continue to operate as it is operating presently (ie. samples will be taken at the same points at which they are presently collected). These samples will be 24 hour composite samples in most cases, however 4 hour composites will be collected at the hold tanks in the Miran department. These samples will be collected using the small Randolph Peristaltic pumps which are now being used. A detailed account of where the samples will be collected and what they will be analyzed for is included in the description of each departmental audit.

2. Flow Measurements:

Flow measurements will be taken using a method developed at the WGK Plant. A known concentration of Lithium Chloride solution will be metered into the desired sewer. At some point downstream samples will be collected from the sewer. These samples will be collected using a high speed Randolph Peristaltic pump. The flow measurements will be made a minimum of three times in each department to insure that an accurate average flow is determined. Lithium Chloride was chosen for these flow measurements because it is not normally found in the plant sewer system and because it can be detected using readily available analytical methods and instrumentation.

Departmental Audits

1. Chlorine Department:

The chlorine department will not be audited because of the shutdown of the facility. However, samples from the east limestone pit will be analyzed for mercury because of the toxicity of this material.

2. HCl Department:

Background:
The primary waste products from this department are HCl and organic (Aroclor) material. Presently, the HCl department is severing approximately one-third of the production or 30 M pounds per day (based on theory). This causes problems with the operation of the east limestone pit. These losses are intentional because the department is trying to purge organic material from the HCl system in an attempt to produce Staley Grade (organic free) HCl. Programs are now underway looking for a better method to remove these organics.

Sampling Points: (See attached drawing)

	Analysis
A. Influent to Limestone Pit	ph, % HCl, Hg, % organics
B. Effluent from Limestone Pit	ph, % HCl, Hg, % organics
C. By-pass Ditch	ph, % HCl, Hg
D. Total Plant Effluent	ph, % HCl, Hg, % organics, PO_4

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2. HCl Department: (continued)

Flow Measurement:
The Lithium Chloride solution will be metered into the acid sewer as close to the HCl department as possible. The diluted samples will be collected at the manhole located just southwest of gate No. 6 (see attached drawing). The Biphenyl department probably will contribute some of this flow, but it won't affect the calculations of HCl losses from the department. Accurate records will be kept on production rates so that losses can be correlated to production rates.

3. Paranitrophenol Department:

Background:
The major waste products from the PNP department are PNP, NaCl, PNCB, ONCB, MNCB and NaOH. These materials account for approximately 15-20% of the total loading to the waste treatment plant. This amount varies with the efficiencies of the carbon adsorption towers. By doing this audit and carefully noting the operating conditions, it is possible that some of the variables in carbon tower operations can be defined.

Sampling Points: (See attached drawing)

	Analysis
A. Toxic Sewer from PNP	PNP, PNCB, ONCB, MNCB, NaCl, C.O.D., ph

Flow Measurement:
The Lithium Chloride solution will be metered into the toxic sewer (southwest corner of PNP structure) at the same point at which the samples are collected. The diluted samples will be taken downstream in the toxic sewer above where the Niran department ties into the sewer (see attached drawing). The flow in this sewer is maintained at a relatively constant rate so the three flow measurements which are planned should give a reliable average flow.

4. Aroclor Department:

The primary wastes from the Aroclor department are organic materials and HCl. These wastes originate from spills, pump leaks, or when the department is being cleaned up. Due to the recent concern over chlorinated Biphenyl (Aroclor) compounds being found in the tissue of some animals and the effects of these compounds on the palatability of fishes, it is necessary that the quantities of this material being lost is determined.

Sampling Points: (See attached drawing)

	Analysis
A. Manhole adjacent to Porocel Column	Organics, % HCl

Flow Measurement:
The Lithium Chloride solution will be metered into the manhole immediately north of the south maintenance shop. This will include the flow from the Chlorine department as well as the phosphoric acid neutralization pit. The flow from the phosphoric acid pit is known. The flow from the Chlorine department can be measured by the Lithium Chloride dilution method, and then the flow from the Aroclor department can be calculated.

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5. Parathion Department:

Background:
The primary waste products from the Parathion department are Ethyl and Methyl Parathion, Ethyl and Methyl Intermediate, acetone, Paranitrophenol and inorganic salts (ie. NaCl, Na_2CO_3, $NaHCO_3$). Acetone is the largest C.O.D. contributor in the department. A program is underway at the present time experimenting with ways of reducing these losses. This program consists of applying a lower vacuum on the condensation reactor. If this program is successful, there should be a large reduction in C.O.D. loading to the waste treatment plant. The reduction in C.O.D. loading will result in more efficient and easier operation of the waste treatment plant.

Sampling Points: (See attached drawing)

		Analysis
A.	Still Jet Header	% HCl, Intermediate, C.O.D. ph
B.	Cone Tank Overflow	PNP, C.O.D., Parathion, Acetone
C.	Feed to Basins	PNP, C.O.D., Parathion, Acetone, ph, Sus. Solid
D.	Incinerator Scrubber Water	% H_3PO_4

Flow Measurement:
The flows at the cone tank, still jet headers, and the incinerator scrubber are metered by rotometers. These readings will be noted carefully during the waste audit period. However, Lithium Chloride will be used to check on these valves by measuring the total flow from the Parathion department. The actual flow to the aeration basins will be measured using the magnetic flow meter located in the influent feed line from the hold tanks to the basins.

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Attach.

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WASTE AUDIT DATA SHEET

Department _____ Sampling Point _____

Date									Flow	Prod Rate	Comments

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