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PPG INDUSTRIES
INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

ORGANICS DISPOSAL PLANT

OPERATING MANUAL

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Subject to Protective Order
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INTRODUCTION

The Organics Disposal Plant Manual has been compiled to serve the following purposes:

1. As a training guide for operating personnel.
2. As a reference source for Operations and Maintenance.
3. As a place where current data, information, and procedures are compiled.

This manual was written to serve as a basis for startup and initial operation of the incinerators. As experience is gained during startup and during operation of the plant, many or all of the startup and operating procedures will be revised. This manual should be revised and kept current as new procedures are developed. The operators can help keep the manual current by calling attention to new operating techniques which differ from those described in the manual.

The information contained in this manual is confidential. This manual is the property of PPG and may be recalled at any time.

SAFETY FOR THE ORGANICS DISPOSAL PLANT

I. Introduction

This section covers the safety rules and precautions which must be followed while working in the Organics Disposal Plant.

Safety is a vital part of everyone's job. Working safely is equal in importance to the quantity and quality of work performed. An employee who has a good attitude toward the safety program will continually look for safer ways to do his job. He will be concerned about the safety of his fellow employees and will correct or properly warn all other personnel of a safety problem he observes. Everyone must have a positive attitude toward safety and take part in the safety program.

II. General Safety Rules

The following list of general safety rules are applicable to Area B and the Organics Disposal Plant. These rules do not replace rules presented in the Employees' Manual of Accident Prevention, but are to be used in conjunction with them. Everyone should read and study the Employees' Manual of 'ccident Prevention in addition to the following list.

1. Personnel entering the organics area are required to deposit lighters, matches and other sparking devices at the Area B gate.
2. Smoking is permitted in the control rooms only (labs excluded). Permanent lighters are provided in areas where smoking is allowed.
3. Vehicles are allowed to travel without a permit only on the roads to the control rooms. A permit signed by the lead operator or an operating supervisor is required before vehicles are allowed in permit areas.

4. An equipment permit signed by the operating supervisor is required before the following can be carried into the permit areas:
   a. Welding machines.
   b. Cutting torches.
   c. Electrical equipment (motors, lights, heaters).
   d. Sparking devices (grinders, chipping devices, gasoline engines, etc.).
5. Only explosion-proof flashlights are permitted in the Organics Area.
6. In case of an emergency warning, all permits are immediately revoked and equipment must be shut off. New permits must be obtained before restarting. Personnel not required for operating plant should evacuate on foot.
7. Anyone not assigned to the area should check with operating personnel before entering.
8. Vessel entry permits signed by the operating supervisor must be obtained before entering a vessel. A safety belt is required for top entering tanks.
9. The use of instrument air for breathing is not permitted.
10. The established plant tagging and locking procedures will apply in Area B.
11. All light circuits outside the control room must be off and tagged before relamping.
12. All steam-out and nitrogen purge equipment must be grounded to prevent sparking caused by discharge of static electricity.
13. Never allow air to enter a vessel containing organic vapors.

14. Do not dump flammable organics into trapped sewers where hazardous vapors could be evolved.

15. Do not leave open sample containers of organics sitting around giving off vapors.

16. Use a Full-Face or Scott Air-Pak mask for protection against organic vapors.

17. Clothing that has been wet with organics must be removed immediately and the body thoroughly washed with soap and water. The clothes must be laundered before using again.

18. The laboratory hood fan is to operate continuously. Do not attempt to run flammable samples if the fan is not in service.

III. Chemicals in Area

Properties and hazards associated with chemicals present in the Organics Disposal Plant are described on the following pages.

None of the chlorinated organics described occur in a pure state, but as a mixture either in the liquid waste or vent gas waste. Most compounds, including perchloroethylene and those lighter will be in the vent gases. VC, EC, MC, EDC, and heavies compounds are present in the liquid waste.

Some of the terms used to describe the properties of chemicals are defined below:

1. Flash Point: The flash point of a solvent is the lowest temperature at which a vapor is given off in sufficient quantities so that the vapor-air mixture above the surface of the solvent will propagate a flame away from the source of ignition. It is the temperature below which a solvent may be used or stored in open containers without formation of an explosive vapor-air mixture.

2. Explosive Limits: When combustible vapor is mixed with air in the proper proportions, ignition will produce an explosion. The vapor-air mixture which will form this proper proportion is called the explosive range. The explosive range includes all concentrations of a mixture of flammable vapor or gas in air in which a flash will occur or a flame will travel if the mixture is ignited. The lowest percentage at which this occurs is the lower explosive limit and the highest percentage is the upper explosive limit. Explosive limits are expressed in percent by volume of vapor in air.

3. Maximum Allowable Concentration (MAC): The maximum allowable concentration for a material is the maximum concentration of that material that can be tolerated by personnel for a continuous 8-hour exposure with no ill effects.

INDEX OF CHEMICALS IN THE ORGANICS DISPOSAL PLANT

NAME: Carbon Tetrachloride

OCCURRENCE: Per-Tri Vent Gas

FORMULA: CCl_4

MOLECULAR WEIGHT: 154

BOILING POINT: 170.2°F

FREEZING POINT: -9°F

VAPOR PRESSURE: 90.9 mm Hg @ 68°F

VAPOR DENSITY: 5.32 (air = 1.0)

LIQUID DENSITY: 98.9 lbs. per Ft @ 77°F

FLASH POINT: None

EXPLOSIVE LIMITS: Nonflammable and non-explosive in air at ordinary temperatures and pressures.

MAXIMUM ALLOWABLE CONCENTRATION: 10 ppm for 8 hours

DETECTION ODOR CONCENTRATION: Carbon tetrachloride has a distinctive odor but, unfortunately, can be detected only in concentrations exceeding the maximum allowable concentration.

HAZARDOUS PROPERTIES: The principal hazard in the industrial use of this chemical is from inhalation of the vapor. The effects of excessive exposure to carbon tetrachloride may be both immediate and delayed. The immediate effects may include headache, symptoms resembling inebriation or drowsiness, and abdominal discomfort. The delayed effects may include severe damage to the heart, liver, and kidneys which may not be evident until 1-10 days after the exposure.

TREATMENT: In extensive skin contact the patient should get under the shower immediately, if such is available.

Clothing and shoes should be removed under the shower.

If liquid carbon tetrachloride has entered the eyes, irrigate immediately with water. This can be done with an eye bath, if available, a gentle stream of water from a hose, or by pouring water from a clean container. The eyelids should be held apart during the irrigation to insure contact of water with all the tissues of the surface of the eye and lids.

NAME: Chloroform

OCCURRENCE: Per-Tri Vent Gas

FORMULA: $CHCl_3$

MOLECULAR WEIGHT: 119.5

BOILING POINT: 143°F

FREEZING POINT: -82°F

VAPOR PRESSURE: 160 mm Hg @ 68°F

VAPOR DENSITY: 4.13 (air = 1.0)

LIQUID DENSITY: 93 lbs per Ft^3 @ 68°F

FLASH POINT: None

EXPLOSIVE LIMITS: Will not burn in air.

MAXIMUM ALLOWABLE CONCENTRATION: 50 ppm for 8 hours

DETECTION ODOR CONCENTRATION: 200 ppm (NOTE THAT THIS IS HIGHER THAN THE MAXIMUM ALLOWABLE CONCENTRATION)

HAZARDOUS PROPERTIES: The most important hazard of chloroform arises from the fact that repeated exposure to low atmospheric concentrations may result in damage to the liver and kidneys. In high concentrations it has narcotic properties and is an effective surgical anesthetic. Contact with skin and mucus membranes may produce irritation.

TREATMENT: If substantial quantities are spilled upon a person, the contaminated clothing should be removed promptly and the affected skin area should be flushed with plenty of water. The contaminated clothing should not be worn until free of the material.

If the eyes are contaminated, they should be flushed with plenty of flowing water. Medical attention should be obtained if any irritation persists.

If chloroform has been swallowed, vomiting should be induced as soon as possible by tickling the throat with a finger or by giving an emetic, such as two tablespoonfuls of common salt in a glass of warm water. CALL A PHYSICIAN.

Anyone showing signs of ill effects from breathing the vapor of chloroform should be removed to fresh air, kept warm and quiet and be made to rest. If breathing stops, artificial resuscitation should be given. Get medical attention promptly.

NAME: Cis 1,2-Dichloroethylene

OCCURRENCE:
OHC Vent Gas
Per-Tri Vent Gas

FORMULA: $C_2H_2Cl_2$

MOLECULAR WEIGHT: 96.95

BOILING POINT: 140.2°F

VAPOR PRESSURE: 400 mm at 41.0°C

FREEZING POINT: -80.5°C

LIQUID DENSITY: 1.2743 at 25 /4°C

VAPOR DENSITY: 3.34

FLASH POINT: 43°F

EXPLOSIVE LIMITS: 9.7 to 12.8% by volume

MAXIMUM ALLOWABLE CONCENTRATION (OR THRESHOLD LIMIT): 200 ppm

DETECTABLE ODOR CONCENTRATION: Pleasant odor

HAZARDOUS PROPERTIES: Dangerous fire hazard. Moderate explosive hazard. Dangerous disaster control. When heated to decomposition, it emits highly toxic fumes of chlorides; can react vigorously with oxidizing materials.

TREATMENT:

Skin: Remove contaminated clothing and wash thoroughly with water.

Eyes: Flush with water.

Swallowing: Report to First Aid immediately.

Inhalation: Remove patient from contaminated area. Give artificial respiration and oxygen if necessary. Report to First Aid.

Fire: Use water, foam, carbon dioxide, dry chemical, or carbon tetrachloride.

NAME: Ethyl Chloride

OCCURRENCE:
Liquid Waste
EDC Vent Gas
OHC Vent Gas

FORMULA: C_2H_5Cl

MOLECULAR WEIGHT: 64.52

BOILING POINT: 54°F (gas under normal conditions)

VAPOR PRESSURE @ 75°F: 1130 mm

FREEZING POINT: -228°F

LIQUID DENSITY @ 68°F: 0.893

RELATIVE VAPOR DENSITY (air = 1.0): 2.22

FLASH POINT: Open Cup -45°F. Closed Cup -58°F

AUTOIGNITION: 966°F

EXPLOSIVE LIMITS: 3.6 - 12.0%

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MAXIMUM ALLOWABLE CONCENTRATION: 1000 ppm

ODOR: Pungent

HAZARDOUS PROPERTIES: The liquid is harmful to the eyes, and if spilled on the skin will cause frostbite. The vapor gives some warning of its presence because it is irritating, but it is possible to tolerate exposure to it until one becomes unconscious. EC is the least toxic of all the chlorinated hydrocarbons. It can cause narcosis, but the effects are usually transient. Continued exposures may cause some kidney deterioration. Inhalation of EC vapor in concentrations of 1% (by volume) produces narcotic and anesthetic effects; concentrations of 4% or greater may produce deep or even fatal anesthesia.

Although EC is not extremely poisonous, any exposure is very dangerous, because of the extreme flammability of the material. When EC is burned, phosgene and HCl are formed, so never approach burning EC without a gas mask.

Any spill of EC will result in an explosive mixture being formed; and because of the high density of the EC gas, the mixture will tend to stay near the ground. It will take very little to explode EC vapors. Static electricity spark, friction spark or an arcing device are all dangerous when EC is spilled.

TREATMENT: Remove the injured person from the contaminated area. If breathing has stopped, perform artificial respiration. In any case make sure the person injured is reported to First Aid immediately. If any liquid enters the eye, wash the eye continuously with a large amount of water for at least 15 minutes. If at the end of 15 minutes eye damage is still apparent, continue washing until the doctor arrives or gives new instructions.

NAME: Ethylene

OCCURRENCE:
EDC Vent Gas
OHC Vent Gas

FORMULA: C_2H_4

MOLECULAR WEIGHT: 28.05

BOILING POINT: -155°F

FREEZING POINT: -273°F

RELATIVE VAPOR DENSITY: (air = 1.0) 0.98

AUTOIGNITION: 1009°F

EXPLOSIVE LIMITS: 3-34%

ODOR: Sweet

HAZARDOUS PROPERTIES: Ethylene is a flammable gas. It is a very dangerous explosion hazard upon exposure to heat or flame. It can react vigorously with oxidizing materials. Ethylene is moderately toxic, but the slight effects disappear as soon as the patient is removed from the exposure. The main danger with C_2H_4 is asphyxiation. The ethylene will displace the oxygen of the air, causing the victim to suffocate. (See Methane treatment)

TREATMENT: Remove the patient from the area, perform artificial respiration if breathing has stopped. Report to First Aid.

NAME: Ethylene Dichloride (EDC)

FORMULA: CH_2ClCH_2Cl

MOLECULAR WEIGHT: 98.97

BOILING POINT: 182.3°F

VAPOR PRESSURE @ 75°F: 75 mm

FREEZING POINT: -31.8°F

LIQUID DENSITY @ 68°F: 10.45 #/gal., 1.253 gm/mls

FLASH POINT: 65°F Open Cup; 55°F Closed Cup

EXPLOSIVE LIMITS: 6.2 to 15.9% by vol. in air

MAXIMUM ALLOWABLE CONC: 75 to 100 ppm

DETECTABLE ODOR CONC: Unknown

OCCURRENCE:
EDC Vent Gas
OHC Vent Gas

HAZARDOUS PROPERTIES: Ethylene dichloride is a flammable liquid and a dangerous fire hazard. It is toxic by inhalation, by prolonged or repeated contact with the skin or mucous membranes, and by ingestion. Excessive contact gives rise to symptoms such as headache, depression, mental confusion, fatigue, loss of appetite, nausea, vomiting, cough, loss of sense of balance, and visual disturbances. It has an anesthetic effect, and, in high concentrations, is immediately irritating to the eyes, skin, nose, and throat. It can cause dermatitis upon prolonged or repeated contact with the skin. Ethylene dichloride can cause serious eye damage.

TREATMENT: Quick removal from exposure is important. Ethylene dichloride should be removed from the patient's person, his respiratory tract, skin, or gastrointestinal tract as quickly as possible. If breathing has ceased, start artificial respiration. If material gets in the eyes, wash promptly with copious quantities of water. If ingested, the patient should be made to vomit. Notify a physician.

NAME: Hexachloroethane

OCCURRENCE: Bottoms Plant Liquid Waste

FORMULA: C_2Cl_6

BOILING POINT: 367°F

VAPOR PRESSURE: 1 mm at 32.7°C

FREEZING POINT: 186.6°C (sublimes)

LIQUID DENSITY: 2.091

VAPOR DENSITY:

FLASH POINT:

EXPLOSIVE LIMITS:

MAXIMUM ALLOWABLE CONCENTRATION:

DETECTABLE ODOR CONCENTRATION: Camphor-like odor

HAZARDOUS PROPERTIES: Dangerous disaster hazard. Slight explosive hazard by spontaneous chemical reaction with alkalies, metals, etc., When heated to decomposition, it emits highly toxic fumes of phosgene.

TREATMENT:

Skin: Remove contaminated clothing. Wash with soap and water.

Eyes: Flush with copious quantities of water for at least 15 minutes.

Inhalation: Remove patient from contaminated area. Give artificial respiration. Give oxygen if necessary. Keep quiet and warm. Report to First Aid.

NAME: Hydrogen Chloride

FORMULA: HCl

MOLECULAR WEIGHT: 36.47

BOILING POINT: -121°F

VAPOR PRESSURE @ 75°F: 36,000 mm

FREEZING POINT: -174°F

LIQUID DENSITY: Normally a gas

RELATIVE VAPOR DENSITY: 1.26 (air = 1.0)

FLASH POINT: None

EXPLOSIVE LIMITS: None

MAXIMUM ALLOWABLE CONCENTRATION: 10 ppm for 8 hour working day

DETECTABLE ODOR CONCENTRATION: Unknown

OCCURRENCE:
EDC Vent Gas
Per-Tri Vent Gas
Incinerator Scrubber Effluent

HAZARDOUS PROPERTIES: Anhydrous hydrogen chloride is a gas which has a corrosive action upon the skin or mucous membranes. In this form, it will cause rapid and severe burns. It is particularly dangerous to the eyes. It is not flammable; however, the gas is highly soluble in water, forming hydrochloric acid, which attacks most metals with the evolution of explosive hydrogen.

TREATMENT: Immediate removal from the toxic area and thorough flushing of the patient's body and/or eyes with large quantities of water is of primary importance. Contaminated clothing should be removed from patient while he is being showered with water. It is essential that all affected body surfaces be washed with copious quantities of water for a sufficient time to remove all hydrochloric acid. No attempt should be made to neutralize the acid with alkaline solutions. Medical assistance should be summoned at the earliest possible moment.

NAME: Methane (marsh gas) (Natural Gas)

OCCURRENCE:
EDC Vent Gas
For Auxiliary Fuel

FORMULA: CH_4

MOLECULAR WEIGHT: 16.04

BOILING POINT: -258.7°F

FREEZING POINT: -297.8°F

VAPOR PRESSURE: @ -115.8°F, 34,900 mm Hg

LIQUID DENSITY: @ -263.2°F, 25.91 lbs per Ft^3

RELATIVE VAPOR DENSITY: 0.555 (air = 1.0)

FLASH POINT: None

EXPLOSIVE LIMITS: 5.3% to 14.0% by volume

DETECTABLE ODOR CONCENTRATION: Odorless

AUTOIGNITION TEMPERATURE: 1000°F

HAZARDOUS PROPERTIES: A simple asphyxiant. A dangerous fire and explosion hazard.

TREATMENT: Fire should be fought with carbon dioxide or dry chemicals.

NAME: Methyl Chloroform (MC also known as 1,1,1 Trichloroethane

OCCURRENCE: Tri-Ethane Liquid Waste

FORMULA: CCl_3CH_3

MOLECULAR WEIGHT: 133.42

BOILING POINT: 165°F

VAPOR PRESSURE @ 77°F: 125 mm

FREEZING POINT: -22.7°F

LIQUID DENSITY @ 77°F: 11.1 #/gal., 1.3314 gm/ml

RELATIVE VAPOR DENSITY: 4.60 (air =1.0)

FLASH POINT: None

MAXIMUM ALLOWABLE CONCENTRATION: 500 ppm for 8 hour exposure

DETECTABLE ODOR CONC: 20-100 ppm

HAZARDOUS PROPERTIES: Methyl chloroform is not as toxic as other chlorinated hydrocarbons such as carbon tetrachloride; however, it can still cause damage to the body upon repeated or continuous exposure to large quantities of vapor or liquid. Moderate exposure is unlikely to produce injury. Methyl chloroform is readily absorbed through the lungs. In acute exposure, the most important toxic action is a functional depression of the central nervous system leading ultimately to respiratory failure. As with most solvents, dermatitis may result from repeated skin contact, but methyl chloroform is only poorly absorbed through the skin. Eye contact may result in pain and discomfort, but no impairment of vision is likely.

TREATMENT: As with other materials of this nature, remove the victim to an uncontaminated atmosphere and apply artificial respiration if breathing has stopped. Remove wet clothing and do not allow it to be reworn until it is thoroughly dry. If eyes are contaminated, they should be flushed with large amounts of water. Notify a physician immediately.

NAME: Monochloroacetylene (MCA)

OCCURRENCE: Per-Tri Vent

FORMULA: C_2HCl

MOLECULAR WEIGHT: 60.483

BOILING POINT: -31°C (-23.8°F)

VAPOR PRESSURE:

FREEZING POINT:

LIQUID DENSITY:

RELATIVE VAPOR DENSITY:

EXPLOSIVE LIMITS: Unknown

MAXIMUM ALLOWABLE CONCENTRATION: Unknown

DETECTABLE ODOR CONCENTRATION: Unknown

HAZARDOUS PROPERTIES: MCA is an explosive gas which is spontaneously flammable in air. Monochloroacetylene forms an explosive yellowish-red salt with ammonical cuprous solution. Aqueous solutions in contact with air display luminescence. MCA gas is colorless, has a nauseating odor, is irritating to the respiratory tract and is highly toxic.

TREATMENT: Remove patient from the area and consult a physician immediately.

NAME: Nitrogen

OCCURRENCE:
Utility Lines
All Vent Gases

FORMULA: N_2

MOLECULAR WEIGHT: 28.02

PHYSICAL APPEARANCE: Colorless, odorless, inert gas

SPECIFIC GRAVITY: 1.0 with relation to air. (air is 78% N_2)

HAZARDOUS PROPERTIES: Even though nitrogen is an inactive gas, it has some inherent dangers since it is used so universally throughout the plant. Its prime use is for padding and sweeping of equipment that has, or has had, flammables in it. The hazard involved is that a vessel may have insufficient oxygen or that nitrogen is used to purge the vessel instead of air, before man-entry.

Therefore, every vessel that is entered must not only be first checked for flammability, etc., it must also be checked for sufficient oxygen. Not only that, nitrogen lines, as well as other toxic lines, must be isolated from the vessel before entry and a clean air sweep provided.

TREATMENT: Remove person from the oxygen deficient area. Administer artificial respiration if necessary. See Methane for symptoms.

NAME: Pentachloroethane (PCE)

OCCURRENCE: Liquid Wastes

FORMULA: CCl_3CHCl_2

MOLECULAR WEIGHT: 202.31

BOILING POINT: 321°F

VAPOR PRESSURE @ 75°F: 4 mm

FREEZING POINT: -20°F

LIQUID DENSITY @ 77°C: 14.0 #/gal., 1.681 gm/ml

RELATIVE VAPOR DENSITY: 6.98 (air = 1.0)

FLASH POINT: None

EXPLOSIVE LIMITS: None

MAXIMUM ALLOWABLE CONCENTRATION: Below 121 ppm

DETECTABLE ODOR CONCENTRATION: Unknown

HAZARDOUS PROPERTIES: Pentachloroethane is a nonflammable and toxic liquid. It has a chloroform-like odor and can cause chronic intoxication. It is considered a stronger narcotic than chloroform and is about as poisonous as tetrachloroethane, which it resembles in its action as a metabolic poison. It has a pronounced irritating effect upon the mucous membranes, causing an inflammation of the nose, throat, and respiratory passages. Chronic poisoning causes fatty degeneration of the liver, inflammation of the kidneys, bronchitis, pronounced hyperemia of the lungs, and purulent pneumonia.

TREATMENT: As described under tetrachloroethanes. Notify a physician.

NAME: Perchloroethylene

OCCURRENCE:
Per-Tri Vent Gas
Liquid Waste

FORMULA: C_2Cl_4

MOLECULAR WEIGHT: 165.85

BOILING POINT: 121.20°C

VAPOR PRESSURE: 15.8 mm at 22°C

FREEZING POINT: -23.3°C

LIQUID DENSITY: 1.6311 at 15°/4°C

VAPOR DENSITY: 5.83

FLASH POINT: None

EXPLOSIVE LIMITS: Non-explosive

MAXIMUM ALLOWABLE CONCENTRATION (OR THRESHOLD LIMIT): 200 ppm

DETECTABLE ODOR CONCENTRATION: Chloroform-like odor

HAZARDOUS PROPERTIES: Perchloroethylene affects the nervous system, lungs, and mucous membranes. Dangerous disaster hazard. Non-flammable and non-explosive. It will not support combustion. When heated to decomposition, it emits highly toxic fumes of chlorides.

TREATMENT:

Skin:	Remove contaminated clothing and wash with soap and water. Apply lanolin ointment.
Eyes:	Flush with water for at least 15 minutes. Call a specialist. Report to First Aid.
Swallowing:	Induce vomiting by drinking soapy or salt water. Induce vomiting three times. Follow with a tablespoon of epsom salt in a glass of water. Call a physician. Report to First Aid.
Inhalation:	Remove patient from contaminated area. Keep quiet and warm. Give artificial respiration. Give oxygen if necessary. If conscious, give tea or coffee. Call a physician. Report to First Aid.

NAME: Phosgene

FORMULA: $COCl_2$

MOLECULAR WEIGHT: 98.92

BOILING POINT: 46°F

VAPOR PRESSURE: 23.4 psia @ 20°C

FREEZING POINT: -198°F

LIQUID DENSITY: 11.39#/gal; 1.37 gm/ml

VAPOR DENSITY:

FLASH POINT:

EXPLOSIVE LIMITS:

MAXIMUM ALLOWABLE CONCENTRATION: 1 ppm

DETECTABLE ODOR CONCENTRATION:

HAZARDOUS PROPERTIES: Poisonous gas. (Present in very dilute concentrations only in main vent stream.)

TREATMENT:

Skin:	Remove contaminated clothing. Wash thoroughly with an abundance of water.
Eyes:	Flush eyes with copious quantities of water.
Breathing:	Odor of new mown hay or green corn. Remove patient from contaminated area. Give artificial respiration and oxygen treatment, if necessary.

In all cases, report to First Aid.

NAME: Symmetrical and Assymmetrical Tetrachloroethane (S.TeCE & A.TeCE)

OCCURRENCE: Per-Tri Vent Gas Liquid Wastes

FORMULA: $CHCl_2CHCl_2$ and CCl_3CH_2Cl

MOLECULAR WEIGHT: 167.86

BOILING POINT: S.TeCE 295°F; A.TeCE 267°F

VAPOR PRESSURE @ 75°F: S.TeCE 4mm; A.TeCE 13 mm

FREEZING POINT: S.TeCE -47°F; A.TeCE -97°F

LIQUID DENSITY @ 77°F: S.TeCE 1.588 gm/ml; A.TeCE 1.533 gm/ml

RELATIVE VAPOR DENSITY: 5.78 (air = 1.0)

FLASH POINT: None

EXPLOSIVE LIMITS: None

MAXIMUM ALLOWABLE CONCENTRATION: 5 ppm for 8 hour exposure

DETECTABLE ODOR CONCENTRATION: Approximately 5 ppm

HAZARDOUS PROPERTIES: The tetrachloroethanes are not flammable or explosive but are the most toxic of the chlorinated ethanes that will be handled in the plant.

The tetrachloroethanes are toxic by inhalation, by prolonged and repeated contact with skin or mucous membranes or by oral intake. Although toxic, tetrachloroethanes may be handled safely if proper precautions are constantly observed. Prolonged or repeated exposures to the product in any form are hazardous.

The signs and symptoms of excessive absorption usually appear gradually and only after repeated exposures. In order of appearance they commonly are unusual fatigue, loss of appetite and weight, sick stomach and vomiting, constipation, abdominal pain, jaundice, drowsiness, going on in severe cases to unconsciousness and death. Some cases show marked involvement of the nervous system with headache, numbness and tingling in fingers and toes, trembling and twitching of muscles and even paralysis of some muscles.

The signs and symptoms of tetrachloroethane poisoning given above are due to systematic poisoning characterized by marked damage to the liver, kidneys, heart, blood cells, and nervous system.

TREATMENT: Most important in the case of any poisoning is quick removal from exposure. In the case of tetrachloroethane poisoning, this means first removing the patient from the contaminated atmosphere and, insofar as possible, removing the tetrachloroethane from the patient's skin, or gastrointestinal tract, if those areas are involved.

The patient should be kept quiet and comfortably warm, but not hot.

A physician should be called immediately. He should be told briefly and clearly what has happened and the exact location of the patient.

NAME: 1,1,2-Trichloroethane (TCE)

OCCURRENCE: Liquid Wastes

FORMULA: $CHCl_2CH_2Cl$

MOLECULAR WEIGHT: 133.41

BOILING POINT: 237°F

VAPOR PRESSURE @ 75°F: 22 mm

FREEZING POINT: -34°F

LIQUID DENSITY @ 77°F: 11.93 #/gal., 1.4319 gm/ml

RELATIVE VAPOR DENSITY: 4.6 (air = 1.0)

FLASH POINT: None

EXPLOSIVE LIMITS: None

MAXIMUM ALLOWABLE CONCENTRATION: 25 to 100 ppm

DETECTABLE ODOR CONCENTRATION: Unknown

HAZARDOUS PROPERTIES: Trichloroethane can cause burns of the eyes and has a seriously harmful effect upon the liver. It has a local irritating effect upon the mucous membranes, particularly of the eyes and nose. All contact with the eyes and skin should be avoided. This material should generally be handled with caution, because its toxicological properties have not as yet been adequately evaluated.

TREATMENT: Remove patient from toxic area. Remove all contaminated clothing and wash all exposed skin surfaces thoroughly with soap and water. Flush eyes with copious quantities of water. Notify a physician.

NAME: Trichloroethylene

OCCURRENCE: Per-Tri Vent Gas

FORMULA: C_2HCl_3

MOLECULAR WEIGHT: 131.4

BOILING POINT: 87°C (188.6°F)

VAPOR PRESSURE: 2.5 psia at 100°F

FREEZING POINT: -99°F

LIQUID DENSITY: 11.9 lbs/gal at 100°F

VAPOR DENSITY: 4.54 (air = 1)

FLASH POINT: Practically non-flammable

EXPLOSIVE LIMITS: Not flammable or explosive at ordinary room temperatures but moderately flammable at higher temperatures.

MAXIMUM ALLOWABLE CONCENTRATION (OR THRESHOLD LIMIT): 200 ppm

DETECTABLE ODOR CONCENTRATION: Not known.

HAZARDOUS PROPERTIES: Reacts with strong alkalies, such as caustic soda, to form highly flammable and toxic dichloroacetylene.

Trichloroethylene may be harmful by inhalation, by prolonged or repeated contact with skin or mucous membranes, or when taken by mouth.

TREATMENT: Skin areas affected by a spill should be washed thoroughly with soap and water (except the eyes). A 15-minute eye wash should be used for a spill in the eyes.

In general, remove the patient from the contaminated atmosphere and insofar as possible, remove the trichloroethylene from the patient's respiratory tract, skin, or gastrointestinal tract. Vomiting may be induced if taken internally.

NAME: Vinyl Chloride (Chloroethylene)

OCCURRENCE:
Per-Tri Vent Gas
Liquid Waste

FORMULA: C_2H_3Cl

MOLECULAR WEIGHT: 62.50

BOILING POINT: 8°F

VAPOR PRESSURE @ 75°F: 2700 mm (gas under normal conditions)

FREEZING POINT: -244°F

LIQUID DENSITY @ 68°F: 0.0908

RELATIVE VAPOR DENSITY: (air = 1.0) 2.15

FLASH POINT: Open Cut -107°F. Closed Cup -162°F

EXPLOSIVE LIMITS: 4-22%

MAXIMUM ALLOWABLE CONCENTRATION: 500 ppm for 8 hours

ODOR: Faintly sweet (smells like phenol when inhibited)

HAZARDOUS PROPERTIES: Vinyl chloride is very much like ethyl chloride. It is not very poisonous, it is extremely flammable and it has a narcotic effect. Continued exposures may cause some kidney deterioration. Inhalation of vapors greater than 500 ppm may produce a slight narcotic effect. At concentrations of 4% or greater, VC vapors may produce a deep or fatal anesthesia.

The main danger with VC is the extreme flammability of the vapors. VC when burning will form phosgene and HCl, so never approach a fire without a gas mask.

Any spill of VC will result in an explosive mixture being formed and because of the high density of the VC gas, the mixture will tend to stay near the ground. It will take very little to explode the VC vapors-static electricity spark, friction spark or an arcing device are all dangerous when VC is spilled.

TREATMENT: Remove the injured person from the contaminated area; if breathing has stopped, perform artificial respiration. In any case, make sure the person injured is reported to First Aid immediately. If any liquid enters the eye, wash the eye continuously with a large amount of water for at least 15 minutes; then get the person to First Aid.

NAME: Vinylidene Chloride (VDC)

OCCURRENCE: Per-Tri Vent Gas

FORMULA: CCl_2CH_2

MOLECULAR WEIGHT: 96.95

BOILING POINT: 89°F

VAPOR PRESSURE @ 75°F: 560 mm

FREEZING POINT: -187.6°F

LIQUID DENSITY @ 68°F: 10.15 #/gal., 1.218 gm/ml

RELATIVE VAPOR DENSITY: 3.35 (air = 1.0)

FLASH POINT: 5°F Open Cup, 55°F Closed Cup

EXPLOSIVE LIMITS: 7.3% to 16.0% by volume in air

MAXIMUM ALLOWABLE CONCENTRATION: 25 ppm

DETECTABLE ODOR CONCENTRATION: 500 to 1,000 ppm

HAZARDOUS PROPERTIES: Vinylidene chloride is a flammable and toxic material which is moderately irritating to the eyes and to the skin. The greatest danger from vinylidene chloride is inhalation. A single exposure for a few minutes to a high concentration of vinylidene chloride vapor rapidly produces a "drunkenness" which may progress to unconsciousness if exposure is continued. Even concentrations too low to cause an anesthetic effect, may produce organic injury to the liver and kidneys.

A secondary danger from vinylidene chloride exists. Unstablized vinylidene chloride in contact with air will form explosive peroxides. These peroxides are evident by the presence of a white solid.

TREATMENT: When the skin is contacted by vinylidene chloride it should be thoroughly washed with soap and water and all contaminated clothing removed and washed. If the eyes become contaminated, they should be flushed with water for 15 minutes or more. If a person is affected or overcome from breathing vinylidene chloride vapors, he should be removed to fresh air at once. Medical attention should be obtained immediately. Artificial respiration should be administered if breathing stops.

IV. Fire Protection

Fire protection equipment for the Organics Disposal Plant consists of:

1. A monitor nozzle to cover tar trailer dump area and waste storage tanks.
2. A sprinkler system to cover the air intakes for the incinerators.
3. An equipment spray system to cover the front of the incinerators.

The monitor nozzle was installed to protect the tar trailers during unloading and to provide water for cooling the waste storage tanks in case of fire.

The purpose of the sprinkler system is to prevent the incinerator from being an ignition source for a vapor cloud. Assuming a vapor cloud originates in existing plants or storage areas and the wind moves the cloud to the incinerator, the vapor detectors will trip the sprinkler system. Since chlorinated hydrocarbon vapors are heavier than air, the cloud is more likely to be near the ground. The sprinkler system will create a downdraft around the combustion air intakes and supply fresh air to the incinerators. This will provide some protection against vapor cloud ignition by flashback.

The purpose of the equipment spray system is to cool any hot spots on the incinerator which could ignite a vapor cloud. The front section of the incinerator where the primary and secondary combustion chambers join is the most likely area to be hot enough to ignite a vapor cloud.

One air-operated ball valve, which fails open, supplies water to both incinerators. This valve supplies water for the sprinklers over the air intakes and for the incinerator spray nozzles.

This valve can be actuated either from the control room or from a switch in front of the incinerators. The valve is also actuated by the vapor detector system.

V. Vapor Detector System

There are three vapor detectors in the Organics Disposal Plant. They are located along the north side of the east-west road beside the salt pond. They are positioned to monitor explosive vapors originating in the OHC plant, in the EC-VC day tank storage area, or from any location between these two.

The vapor detectors alarm when they detect a mixture at 20 percent of the lower explosive limit. They will trip the sprinklers and equipment spray nozzles for both incinerators when a mixture at 40 percent of the lower explosive limit is detected.

VI. Fire Extinguishers

There are three 30-pound dry chemical and one CO_2 fire extinguishers in the Organics Disposal Plant. The dry chemical units are located:

1. At the waste storage tanks.
2. In front of No. 1 incinerator.
3. In front of No. 2 incinerator.

The CO_2 extinguisher is located at the substation which provides power for the incinerators and auxiliary equipment. This extinguisher is for electrical fires only.

VII. Control Room

The OHC-Tetra-Incinerator control building is pressurized to prevent accumulation of organic or acidic vapors inside the building. Since the

building is pressurized, non-explosion proof equipment is used and smoking is permitted inside the building. Positive pressure is maintained by a fan which draws its intake air across an activated carbon filter.

Should a vapor cloud from a major break engulf the control room, the filter would be unable to remove all the contaminates. To prevent undesirable gases from entering the building when the fan is off, instrument air bleeds should be opened. Care should be taken not to bleed the instrument air system pressure down too low.

Should enough vapors get into the building to prevent breathing, an emergency air system is provided. This system can be used to work in the control room and shut the plant down if conditions are not too severe. These masks can also be used for escape if the conditions warrant it.

There are also three Scott Air-Paks in the control to be used outside in the plants when breathing air is needed for periods up to 30 minutes.

VIII. Clearing of Tanks and Process Vessels

The area supervisor and maintenance supervisor will see that all vessels of tanks are cleaned and checked with an explosion meter before declaring them suitable for maintenance.

Clearing Procedure:

1. The tank or vessel will be emptied and all valves will be closed and tagged.
2. The vapor contents of the tank will be purged with an inert gas.
3. Blinds will be inserted in all connecting lines.
4. The equipment will be steam-purged where possible to vaporize and remove all flammable materials. If steam cannot be utilized, an inert gas will be used.

5. Purge the equipment with plenty of air.

6. The equipment will then be checked with an explosion meter before work is begun. If entry into the vessel is required, the vessel must be also checked with an oxygen meter.

IX. Emergency Exits

The locations of Area B emergency exits are given below:

North - West of ethylene metering station. Northwest of VCM Plant.
- North of EC Plant.

East - Main Area B entrance. Midway between Per-Tri and TCE South of the OHC-Tetra. Northeast of EDC day tanks.

West - West of tank car loading rack. West of railroad gate on Parish Road.

South - South of organics recovery trap.

X. Safety Inspections

Once per week an inspection of all safety equipment in each plant shall be made. This includes fire extinguishers, fire protection system, protective masks, safety showers, etc. A form has been provided for use as a check-off list. This has a two-fold purpose: 1. To ascertain that required equipment is in good operating condition; and 2. to familiarize Operations personnel with the location of safety equipment for quick use in an emergency.

XI. Emergency Horns

There are two distinct emergency horns in each area: the plant or Area B evacuation horn and the local area evacuation siren.

The Area B evacuation horn is the regular plant horn blown in short blasts. It may be activated from every Area B control room or the guard house. The sounding of this horn will shut down all non-process equipment in Area B and will cause all non-essential personnel to leave the area. Area B include all the Organics Area--east of Columbia Southern Road and

south of Parish Road. The Area B evacuation horn should be sounded in case of a major break or if there is some reason to expect a major break. Whenever the evacuation horn is sounded, the guard should be notified of the nature of the emergency if at all possible. If it is desired to evacuate the whole plant, the guards will have to be notified and they will sound the plant evacuation. The guards are the only people able to sound the all-clear signal.

The area evacuation siren is used to evacuate all non-essential personnel from the operating area and to have all arcing devices in the operating area shut down. This siren is controlled by a switch on the wall in each control room. The area siren should be used in case of a spill involving release of flammable vapors.

GENERAL DESCRIPTION

The incinerators are designed to oxidize chlorinated organic wastes to carbon dioxide, water, and hydrogen chloride; and to scrub the hydrogen chloride from the combustion gases before the combustion gases are emitted to the atmosphere.

The chlorinated organic wastes are oxidized according to the following chemical reactions:

(1) $C_2H_5Cl + 3O_2 \longrightarrow 2CO_2 + HCl + 2H_2O$
Ethyl Chloride

(2) $C_2H_3Cl_3 + 2O_2 \longrightarrow 2CO_2 + 3HCl$
TCE

(3) $C_2Cl_4 + 2H_2O + O_2 \longrightarrow 2CO_2 + 4HCl$
Per (steam)

When light chlorinated compounds are burned as shown in reaction 1, a large amount of heat is released. Heat is consumed when heavier chlorinated compounds are burned as shown in reactions 2 and 3. This heat must be supplied by burning light chlorinated compounds such as ethyl and vinyl chloride, or by burning hydrocarbons such as methane, ethane and ethylene.

When chlorinated hydrocarbons which contain fewer hydrogen atoms than chlorine atoms are burned, hydrogen must be supplied from some other source in order for the chlorine to form HCl. Steam is normally used to supply hydrogen for this type reaction, as indicated by reaction 3.

Oxygen for the reaction is supplied by air. An excess of oxygen should be maintained at all times. Insufficient oxygen will cause carbon, smoke

and carbon monoxide to be formed as combustion products. However, too much oxygen causes free chlorine and oxides of nitrogen to be formed. Oxygen in the combustion gases should be maintained between 2 percent and 4 percent to minimize undesirable products of combustion.

The temperature at which the above reactions are carried out is also important. If these reactions are attempted below 1800°F, the chlorinated organics will not burn completely. It is possible to form phosgene below 1800°F when there is no excess oxygen present.

Liquid waste from the bottoms plant, the EDC plant, the Tri-Ethane plant, the EC plant and the VCM plant will be collected and incinerated.

Liquid waste from the bottoms plant is pumped to one of two waste storage tanks. Bottoms from the VCM quench tower will be hauled in a tar trailer and dumped into the same tank with the bottoms plant waste.

Liquid waste from the EDC plants and waste from the MC Dopp kettles will be hauled in separate tar trailers and dumped into a second waste storage tank. The EC tar trailer will be dumped in this same storage tank.

Liquid waste which has not been processed with ferric chloride (waste from bottoms plant and VCM quench tower) must be stored separately from waste which may contain active ferric chloride. It is possible that ferric chloride could catalize the decomposition of bottoms plant and VCM quench tower wastes.

Liquid waste will be pumped alternately from the storage tanks into either of the incinerators.

The liquid and gaseous wastes will be burned in the incinerator to form carbon dioxide and hydrogen chloride.

Waste chlorinated vent gases are collected from the two liquid phase EDC plants, from the Per-Tri plant, and from the OHC plant for incineration. Vent gases are piped from each area to the incinerator area in individual piping. The vent gases are combined in the incinerator area and sent through flame arrestors into either of two incinerators.

The liquid and gaseous wastes will be burned in the incinerators to form carbon dioxide, hydrogen chloride, and water vapor as described in reactions 1, 2 and 3. Scrubbers at the end of the combustion chambers will utilize lake water to scrub hydrogen chloride from the combustion gases before they are discharged through the stacks. Lake water is supplied to the scrubbers by pumps located on a platform in Sportsman's Lake.

DETAILED PROCESS AND EQUIPMENT DESCRIPTION

I. Collection and Storage of Liquid Wastes

A. Equipment

1. Nos. 1 and 2 Bottoms Waste Transfer Pumps (68A-55-1783 and 1784) and Incinerator Feed Pumps (68A-55-1785 and 1786). These pumps are Warren Model J-10-X screw pumps. Pumps are designed to deliver 5 GPM at 100 psig discharge pressure, 350°F, and a viscosity of 8 cps. The pumps are driven by a Carter Model F-14-5-SFRD constant torque hydrostatic variable speed drive and a Model 5-SFRD parallel shaft speed reducer (68A-52-362, 363). The drive is rated for 4 hp and has an infinitely variable speed between 25 and 600 rpm. The drive is powered by a Reliance 5 hp, 1730 rpm, 460 volt motor (68A-50-3302, 3303). These pumps are equipped with 1" FEP-Monel-FEP rupture discs which relieve at 100 psig and 350°F.

2. Nos. 1 and 2 Bottoms Waste Transfer Pump Suction Screens and Incinerator Feed Pump Suction Screens (68A-92-288, 289, 290 and 291). These screens are Haywood Model 72, 2 inch, 150# flanged cast steel strainers with Monel baskets.

3. EDC and Tri-Ethane Tar Trailers (60A-60-1194 and 61A-60-1195). Both tar trailer tanks are 42" dia. by 84" long. The vessels are designed for 100 psig pressure and full vacuum at 400°F with 1/16" corrosion allowance. The bottom of the vessel is equipped with "Dean Panel Coils" 12 on 12 pattern 301, style 3-H. Panel coils are constructed of carbon steel and are designed for 150 psig at 450°F. The trailer is constructed with two 5000# prior coil spring axles. Heavy duty wheels with 15" x 7.50 8 ply tires are used. Tanks are equipped with 8" RD's which rupture at 100 psig and 120°F.

4. Nos. 1 and 2 Waste Storage Tanks (68A-1187 and 1188). The waste storage tanks are 17'3" dia. x 17'3" TL to TL and are designed for 29 psig pressure and full vacuum at 350°F. Each tank will hold 33,100 gallons. These tanks are equipped with two 24" FEP-Monel-FEP rupture discs each which relieve at 29 psig and 200°F. These discs are supplied with vacuum supports. The 24" rupture discs are designed to relieve products of a decomposition or polymerization reaction.

   The tanks also have one 6" x 8" Farris 26RA10 safety relief valve each set at 24 psig and 200°F with 6" FEP-Monel-FEP RD's.

5. Waste Storage Tank Agitators (68A-61-156 and 157). The waste storage tank agitators and gearboxes (68A-52-360 and 361) are Philadelphia Gear Model PTERO, size 12 mixers with Allis-Chalmers 15 hp, Type RGZZ, 460 volt, explosion proof, TEFC induction motors (68A-50-3298 and 3299). The motors are 1740 rpm and the agitators are 25 rpm.

B. Operation

1. Segregation of Liquid Wastes

Liquid waste from Area B has been segregated into two types; those wastes which are processed with ferric chloride and those that are processed in the absence of ferric chloride. It has been demonstrated that active ferric chloride can catalize reactions in VC and bottoms plant waste material. Since EC, EDC and MC Dopp kettle wastes contain ferric chloride, a separate storage tank must be provided for these materials.

2. Bottoms Plant Waste

Bottoms plant waste is continuously drawn off the side of the small kettle through a 1" line. The waste material then goes through one of two screens. The screens are basket type, designed to remove welding slag, nuts, or other hard material, 1/8" dia. or larger, that could damage the bottoms waste transfer pumps. The top can be opened easily and the screens will have to be cleaned frequently during operation.

Waste from the screens will flow into the suction of the bottoms transfer pumps. These are screw pumps and are classed as positive displacement. However, since definite clearances are established between all internal parts, some slippage does occur when low viscosity fluids are pumped against a high head. These pumps have a rupture disc on the discharge that relieves at 100 psig. The bottoms waste transfer pumps also have cooling water for the oil reservoirs at each end of the pumps.

There is not a flow meter for the bottoms plant waste flow due to the difficulty in metering such a stream. Flow is regulated by the speed of the positive displacement screw pumps. There are handwheel indicators on the variable speed drives which indicate percent of maximum speed for the pumps. This handwheel indicator reading will have to be correlated to flow during startup and must be used instead of a metered flow.

Bottoms plant waste is pumped into the No. 1 waste storage tank. This waste could be pumped into the No. 2 waste storage tank by switching a spoolpiece. However, bottoms plant material should not be put in a tank used to store waste containing ferric chloride, or vice versa, unless the tank has been cleaned.

3. VCM Waste and Dumping of Tar Trailer

VCM quench tower bottoms are transported to the incinerator area in the tar trailer. The tar trailer will hold about 500 gallons of waste and should be weighed before delivery to the incinerator area. The VCM tar trailer has a SRV set for 90 psig.

VCM waste is unloaded into the same tank used for bottoms plant waste, the No. 1 waste storage tank. The tar trailer is connected to the tank with a 2" hammer union and is unloaded through a 2" Teflon-lined hose.

The tar trailer is unloaded by pressurizing with nitrogen. The buggy should be pressurized to about 50 psig and then the nitrogen should be blocked off. Then liquid waste lines into the tank should be opened. This process may have to be repeated

one or more times to empty the tar buggy. There is no way to observe the level in the tar trailer, but a rapid decrease of tar trailer pressure and excessive vibration of the unloading hose caused by slugs of liquid and nitrogen are reliable indications of an empty tar trailer.

The waste storage tanks are vented into the EDC waste gas line to the incinerator. Excessive nitrogen should not be purged into the storage tanks while unloading the tar trailers since this nitrogen will go to the incinerator and could cause an upset in incinerator operation.

4. Tri-Ethane and EDC Wastes

The Tri-Ethane and EDC tar trailers also hold about 500 gallons. These trailers have 100 psig rupture discs. The Tri-Ethane and EDC trailers are dumped into the No. 2 waste storage tank. Quick-connect couplings are used to connect the tar trailers to the tanks. Connections for dumping into the tanks are different so that waste containing ferric chloride cannot be dumped into the wrong tank. The same procedure as described for dumping the VCM tar trailer should be used for the Tri-Ethane and EDC trailers.

5. EC Waste

The liquid phase from the EC tar trailer is stored in the No. 2 waste storage tank. The EC tar trailer has the same capacity as the other trailers; however, the design pressure and SRV setting is 75 psig.

Only the liquid phase from the EC trailer is dumped into the tank. This is done as described for the VCM tar trailer. After the liquid phase is dumped, the EC trailer is vented into the vent line provided until most of the volatile compounds have evaporated. A small nitrogen purge will hasten the evaporation process. After the tar trailer has been purged it can be returned to the EC plant; and on Monday, Wednesday, and Friday it should be washed at the dump in the usual manner.

6. Storage of Waste

The waste storage tanks will hold about 33,100 gallons. (See Innage Table in Appendix) The tanks are designed for 29 psig pressure and full vacuum at 350°F. Each tank has two 24" rupture discs which relieve at 29 psig and 350°F. These larger discs are designed to empty the tank very quickly in case a decomposition reaction occurs in the tank.

Each tank also has one 6" RD and SRV set for 24 psig at 350°F. The SRV setting is lower than the rupture pressure for the large rupture disc to prevent unnecessary blowing of the large discs.

The waste storage tanks are agitated by 15 horsepower Philadelphia Gear agitators which rotate at 25 rpm. The agitator shaft is 4-inches in diameter and 228 inches long. The impeller is 84 inches in diameter and 62 inches from the bottom of the tank or 1.5 feet above the bottom level indicator nozzle. There is a 4 inch diameter stub shaft from the agitator to a foot bearing about 1 foot above the tank bottom.

The waste storage tanks are also jacketed with Tranter platecoils designed for 145 psig pressure. The platecoils are designed to keep waste material from cooling when cooling would cause solidification. If waste material is fluid at ambient temperatures, then heat input from the platecoils will not be required. Steam is supplied to the platecoils from the disposal plant steam header which operates at 125 psig. Steam to the coils is regulated by PCV's.

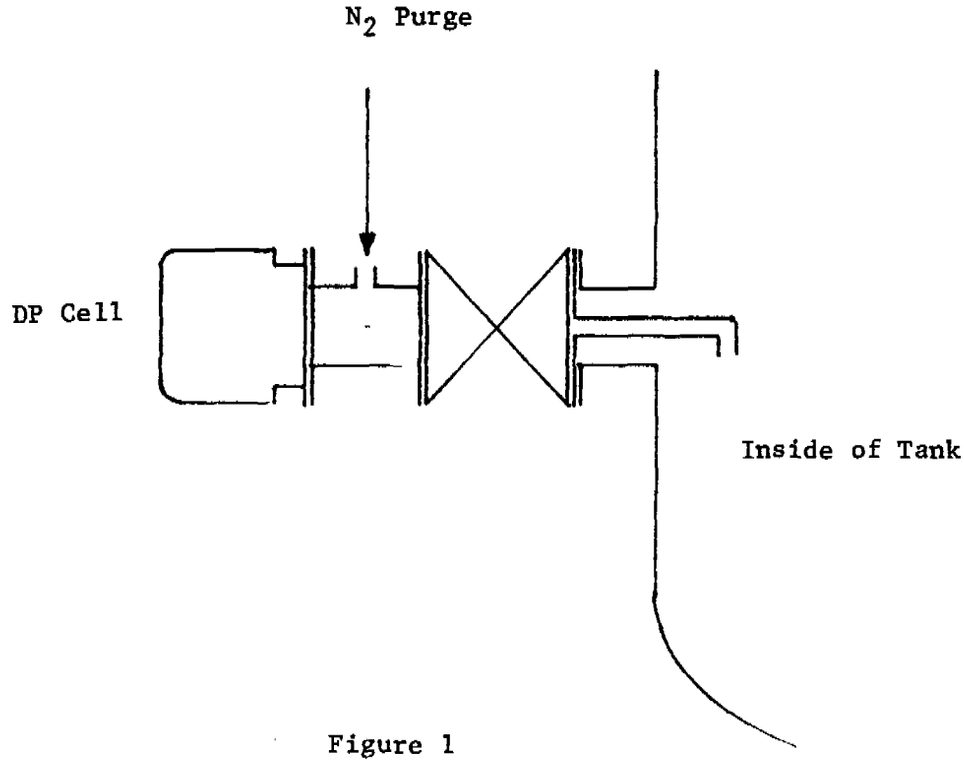


Figure 1

The nitrogen injected at the level indicator, HCl and organic vapors generated by waste decomposition, and nitrogen blown into the tank during tar trailer unloading is vented to the incinerator through the EDC vent gas line. The EDC vent

contain oxygen when the chlorine to the EDC reactors contains air. A positive nitrogen flow through the tank vent line into the EDC header must be maintained at all times to prevent oxygen from backing up into the vapor space of the storage tanks. Nitrogen to the level transmitters provides this flow. Nitrogen flow must be kept above 30 ft^3/hr to each tank anytime the EDC vent header is in service. An alarm indicates low nitrogen flow to the tanks.

When the EDC vent is not being incinerated the storage tanks must still be vented. This is accomplished through a 4-inch line and PCV located in the bottoms plant. This valve will open when pressure in the EDC vent line exceeds 10 psig and will vent material to the bottoms plant scrubber.

7. Incinerator Feed System

Liquid waste is drawn off the bottom of the waste storage tanks through 2-inch Strahman valves and 2-inch lines. Liquid waste flows through the pump suction screens into the suction of the incinerator feed pumps. The incinerator feed pumps and the screens are identical to those used in the bottoms plant. The incinerator feed pumps will pump directly to the burner nozzles on each incinerator through two 3/4-inch lines. The incinerator feed lines are not tied together at the discharge of the feed pumps, but they are tied together in the incinerator area. Therefore, either pump can feed either incinerator. The pump suctions are not tied together. The suctions are separated

so that liquid from one tank cannot be accidentally transferred to the other tank. The suctions could be tied together by installing a spoolpiece; but this should not be done unless blinds have been installed.

The incinerator feed pumps have RD's which relieve at 100 psig. The pumps have a high discharge pressure shutdown at 90 psig to shut the pumps down before the rupture discs are blown. The pumps are also shut down anytime liquid feed to the incinerator is blocked. A selector switch at the pump starter pushbutton must be set so that the pump shuts down only when the incinerator it feeds shuts down.

Normal waste feed flowrate is about 2.3 gpm. The maximum is 3.0 gpm and the minimum is 1.8 gpm. The waste will not be adequately atomized if the flow is not kept within these limits.

The existing atomizers could be replaced and up to 6 gpm of waste burned if necessary.

Flowrate to the incinerators will be determined by the handwheel indicators, as described for the bottoms plant waste transfer pumps. (See Correlation Chart in Appendix)

II. Vent Gas Collection

A. Equipment

There is no major equipment involved with the vent gas collection systems.

B. Operation

Vent gases from both EDC plants, from Per-Tri, and from OHC will be burned in the incinerators. The vent gases are collected upstream of the plant vent scrubbers and are transported to the incinerators in Chemtite and Haveg pipe.

1. EDC Vent Collection

The collection systems for both EDC plants are identical. Vent gas flow is diverted from the plant scrubbers to the incinerators by two automatic valves operated from the EDC control room. The valve in the line to the incinerator is an open or closed type valve with no intermediate positions. This is a Teflon-lined butterfly valve with an air operator. This valve will fail closed in case air or power is lost.

The second valve is a flow control valve in the line to the plant scrubber. This valve has a controller located on the EDC control panel. This valve fails open when air or power is lost.

A FCV was used in the line to the scrubber so the incinerator would not be overloaded when the EDC plant receives slugs of air from the cell building.

The FCV in the line to the scrubber does not operate as FCV's normally do. It controls the flow in the line to the incinerator by allowing excessive vent flow to go to the scrubber rather than to the incinerator.

During normal operation the setting on the FCV would be higher than the vent flow so the valve to the scrubber would

stay closed. Then when the vent flow increases, as with an air slug, the FCV will open and allow part of the vent gas to go to the scrubber.

Even though these valves are set up to take an air slug, the vent should never be sent to the incinerator when it is in the explosive range. Anytime there is a possibility of the vent being explosive, or when other problems exist, all of the vent flow can be sent to the scrubber by operating a shutdown switch on the control panel. This switch will close the valve in the line to the incinerator and open the valve in the line to the scrubber. The vent gas can also be directed from the incinerator to the scrubber by a shutdown switch on the incinerator control panel. Vent gas cannot be sent to the incinerator unless both of these switches are in the correct position.

EDC plant vent gas will also be diverted from the incinerator to the scrubber by a high pressure shutdown switch anytime the pressure in the vent gas header exceeds 10 psig. Since this switch is located on the header which is common to both Nos. 1 and 2 plants, the valves in both plants are activated simultaneously.

The vent gas collection piping is 4-inch inside the plants. The two 4-inch lines join and the pipe size is 6-inch to the incinerator area. The waste storage tank vents tie into the 6-inch EDC line and the unloading of tar trailers could cause pressure fluctuation in the EDC vent header. There is also a

4-inch PCV on the EDC vent line in the bottoms plant which will open and vent material to the bottoms plant scrubber when the line pressure exceeds 10 psig.

Vent gas from EDC can be sent to either incinerator, but there are no controls to split the vent to burn in both incinerators at the same time.

The 6-inch line to the incinerator has several risers in the EDC plant, one at the southeast corner of the Per-Tri control room, and one where the piperack turns south near the Per-Tri acid pit. If liquid is present in the vent, or if condensation occurs in the vent pipe, it could cause excessive pressure drop or pressure surges in the header which would shut down vent gas flow to the incinerator.

2. Per-Tri Vent Collection

Per-Tri vent gases are sent to the incinerator by a valving arrangement similar to that in EDC. The valve to the scrubber is not an FCV since the Per-Tri vent gas flow is not subject to rapid increases as is the case in EDC. However the valve can be manually opened or closed from the control board for startup. The valve in the line to the scrubber fails open on loss of air or power.

The valve in the line to the incinerator is an open or closed valve with no intermediate positions. This valve fails closed when air or power is lost. Vent gas flows through this valve, through a flow meter, and to the incinerator area.

These two valves can be operated by a switch on the Per-Tri control board or a switch on the incinerator control board. Both switches must be in the correct position for startup.

The vent gas header in Per-Tri has a 10 psig RD. This is to keep pressure in the header from getting high enough to back up into another plant. The vent header also has a high pressure shutdown switch which diverts the vent gas to the scrubber if the vent gas pressure gets above 7.5 psig.

If the Per-Tri vent flow is high, as when there are a lot of dead tubes, one incinerator may not be able to handle all of the Per-Tri vent. There are FCV's at the incinerators to split the Per-Tri vent. Flow to one incinerator would be set and controlled by the FCV. The FCV to the second incinerator should be manually set so that excess flow will go to that incinerator.

The Per-Tri vent header will always be under some pressure (2.0-3.5 psig) when the vent is being incinerated. Therefore, the original vent header could not be used to run a reactor at atmospheric rates to perform maintenance. A reactor could not be started up without sending an excessive amount of nitrogen to the incinerator unless the total Per-Tri vent was sent to the scrubbers. Rather than put the total plant vent to the scrubber every time a reactor had to be run at atmospheric rates, or every time a reactor had to be started up or shut down, a

startup header was installed. Any single reactor can be put directly to the scrubber (at atmospheric rates only) without interfering with the other reactor vents.

Liquid could collect at the riser in piping near the Per-Tri acid pit; however, a drain line which has a 1/4" orifice will drain pipe continuously.

The Per-Tri vent contains oxygen and VDC. There are records of violent explosions of peroxides of VDC. Barberton Research has made VDC peroxides from pure VDC, air, and initiators and has verified its explosive potential. Chemists at Barberton could not make the peroxide without initiators and they could not make the peroxide by a gas phase reaction even with initiators. For this reason, liquid must not be allowed to accumulate in the Per-Tri line to the incinerator.

The only low point in the piping to the incinerators is west of the Per-Tri acid pit. A 1-inch line with a 1/4-inch orifice will continually drain the low point to the acid pit.

3. OHC Vent Gas Collection

OHC vent gases are diverted from the scrubber and sent to the incinerator in the same manner as Per-Tri vent gases. The valve in the line to the scrubber fails open and the valve in the line to the incinerator fails closed. The valves can be operated by a switch on the incinerator control panel. The valves will divert OHC vent gas to the scrubber if the header pressure exceeds 7.5 psig.

The valve in the line to the OHC scrubber is below the vent header; therefore, any liquid in the header will collect above the valve. There is a 1/2-inch Kynar line bypassing the valve which will continuously drain liquid from above the valve.

OHC vents can be burned in either incinerator but no controls were provided to split the OHC vent.

The OHC vent header has a 10 psig RD to prevent vent gas from reaching sufficient pressure to back up into another plant in case of a valve malfunction.

III. Incineration of Waste Liquids and Gases

A. Equipment

1. Flame Arrestors (68A-72-286 and 287). The flame arrestors have 8-inch 125 pound inlet and outlet flanges and are constructed of Hastelloy C with a nickel bank assembly. Design pressure drop is 10 inches of water at a flow rate of 100,000 SCFH. The flame arrestors are designed to stop propagation of a flame without any flow through the bank assembly.

2. Incinerators (68A-58-1 and 2). The incinerators were built by Thermal Research and have LV-48 (48 million BTU per hour) burners with a 48 3/4" long by 48-inch inside diameter cylindrical primary combustion chamber and a 10 foot long by 6'7" ID cylindrical secondary combustion chamber. The incinerator has an external steel shell lined with H.E.S. cement, HW-26 insulating brick and Kroundal XD brick. The incinerator is designed to burn 21.2 TPD of liquid chlorinated waste and 180 TPD of chlorinated vent gases.

3. Scrubbers (68A-67-91 and 92). The scrubbers were built by M. A. Knight and have a 10'8 1/2" high by 10'0" diameter quench section, a 7'6" high by 10'0" diameter packed section, and a 9-inch by 10'0" diameter mist elimination section. The towers are packed with 1 1/2" Berl saddles. The towers have a steel shell lined with pyroflex and acid-proof brick. They are designed to scrub 99.9% of the HCl fed to the tower using only well water as a scrubbing liquid. Materials of construction will allow the use of a weak caustic stream for scrubbing.

4. Combustion Air Blowers (68A-57-551 and 552). The combustion air blowers are New York Blower HPE-262 blowers driven by 75 HP, 1770 RPM, 460 volt Type GZ Allis Chambers motors. The fans will deliver 8000 CFM of air at 34.8 inches of water pressure and 70°F. The blower rotates at 3100 RPM.

5. Incinerator Lake Pumps (68A-55-1779 and 1780). The lake pumps are Goulds 10 x 14 HMO/256, 2 stage, vertical Centrifugal pumps designed to deliver 2500 GPM of water at 120 feet of head. The pump is cast iron, bronze trim, with a 316 S.S. shaft. They are driven by Westinghouse, 100 H.P., 1775 RPM, 460 volt TEFC motors.

B. Operation

Both incinerators and the auxiliary equipment are exactly alike. Only one will be described here.

1. Feed Piping

Liquid waste is pumped from the storage area through two 3/4" lines to the incinerator. Liquid waste will flow through a solenoid valve, which is part of the shutdown system, through a flexible Teflon-lined hose, into the burner atomizing gun, and on into the incinerator.

The burner nozzle assembly is merely a set of concentric pipes. Liquid waste flows through the central pipe, with atomizing steam, natural gas, and vent gas waste flowing through the outermost pipes. (See drawing 68A-50057 in Appendix)

Steam in the second pipe is used to atomize the liquid waste. Steam is supplied to the disposal plant area from the 250 pound steam header in the bottoms plant. Steam pressure is reduced to 125 psig at the reducing station near the waste storage tanks. The safety relief valve for the steam header is set at 145 psig.

The liquid waste must be atomized with steam before the waste can be burned. Low steam pressure, plugged steam orifices in the atomizing tip, and high or low liquid waste flow will prevent proper atomization. Liquid waste flow must be kept between 1.8 and 3.0 GPM for adequate atomization. The atomizing tip must be adjusted in the horizontal direction to get a good flame pattern inside the primary combustion chamber. This is the reason for the flexible hoses on the atomizing steam and liquid waste lines.

The atomizing tip is exposed to an extreme amount of radiant heat. Liquid waste and atomizing steam will keep the tip from overheating during normal operation. Atomizing steam must be kept on the atomizer when the incinerator is running even though no liquid waste is being burned. 10 to 20 psig steam pressure is enough to keep the tip cool.

Natural gas is supplied to the disposal plant from the 90 psig header that runs from the VCM to the EDC plant. The pressure is reduced to 1.5 psig at the control station in front of the incinerator. Natural gas flows through the three automatic double block and bleed valves, through a temperature control valve, and into the incinerator through the burner nozzle assembly.

The double block and bleed valves are activated by the shutdown system. The temperature control valve controls the amount of natural gas fed to the incinerator so that a temperature of 2600°F is maintained. The amount of natural gas will vary depending upon which plant vents are being incinerated. The EDC and OHC

vents will not normally require natural gas to burn. Per-Tri vent and liquid waste will require some natural gas to burn.

Vent gases from the plants are metered after they combine to go to an incinerator. Vent gases like the natural gas, have a double block and bleed arrangement for the shutdown system. However, the block valves on the vent line in the plants serve as the first block valve. There are 4-inch vent lines with automatic valves which fail open and vent the header to the bottoms plant scrubber. The second block valve, located in front of the incinerator, fails closed when the incinerator shuts down.

The waste gas also goes through the flame arrestor before going into the burner. The flame arrestor is designed to keep a flame from propagating back into the vent header should an explosive mixture get into the vent headers. If the flame arrestor is to work properly the bank assembly must be kept clean. The bank assembly should be inspected monthly until a fouling frequency is determined.

2. Combustion Air System

Combustion air is supplied by a 75 HP blower. It will develop 38 inches of water pressure at the rated capacity. A high speed impeller, which makes an excessive amount of noise, is necessary to develop the required air pressure. Silencers have been installed at the blower inlet to reduce the noise.

Combustion air flow is measured by a Taylor pitot venturi flow element. Straightening vanes reduce any turbulence in front of the pitot venturi flow element. Combustion air flow is

regulated by a butterfly flow control valve. This control valve has a stop which prevents closing. Minimum air flow is 160,000 SCFH.

Waste vent gas flow and composition, natural gas flow, and liquid waste flow determine the air requirement for the incinerator. Signals from the waste gas and natural gas flowmeters, along with a manually set signal representing waste liquid flow, are added and sent through a ratio controller to the combustion air flow controller.

The control system is necessary to provide immediate air adjustments anytime there is a change in natural gas or waste gas flow. But, since a composition for the waste gas had to be assumed to calibrate the instruments, additional corrections will have to be made as the composition varies. The oxygen analyzer will indicate trends toward an oxygen excess or deficiency and adjustments can be made on the ratio controller.

Oxygen should be controlled to get 2 to 4 percent O_2 in the stack gases. It is important to maintain this oxygen excess since the carbon, smoke, carbon monoxide, nitrogen oxides and chlorine emitted from the top of the stack are directly related to the oxygen excess.

Air enters the incinerators at the windboxes, then goes through a set of directional vanes which impart a strong rotational motion or vortex to the air. The vortex goes through a restriction at the inlet to the primary combustion chamber. The natural gas, waste gas, and liquid waste are introduced at this point

into the center of the vortex. After the gases go through the restricted area, they enter the primary combustion chamber where they slow down and burning begins.

3. Combustion Chambers

The degree of completion of the combustion reactions is governed by three variables. They are (1) the temperature at which the material burns, (2) the length of time at which the material to be burned is kept at the burning temperature, and (3) the turbulence or the efficiency of mixing the combustible material and the air.

The maximum temperature at which wastes can be burned is determined by the type refractories installed in the combustion chambers and is 2600°F.

Retention time inside the combustion chambers is established by the size of the incinerator and the feed flowrate.

The vortex formed by the combustion air is the major factor in creating turbulence inside the combustion chamber. The higher the combustion air flow, the greater the turbulence inside the combustion chamber. The differential pressure gauge at the windbox gives an indication of the drop across the air vanes and therefore is an indication of the turbulence inside the burner.

The temperature inside the combustion chamber is measured by two instruments, a radiamatic pyrometer and a thermocouple. The radiamatic provides a signal for the natural gas temperature control valve. The thermocouple provides the signal for the shutdown system.

The combustion chamber is constructed of 3/8" carbon steel. The steel shell is lined with 1 inch of Penwalt's H.E.S. acid proof cement. The H.E.S. cement is covered by a course of 2600°F Harbison-Walker insulating firebrick. The last course of brick is Harbison-Walker Kroundel-XD firebrick.

4. Scrubbers

The Knight scrubbers are designed to remove 99.9 percent (leaving 100 ppm HCl in stack gas) of the HCl fed to the scrubber using 90°F lake water. Although the scrubber can operate without cell liquor, it is desirable to use some in order to control sewer pH. Cell liquor will also reduce the amount of HCl and Cl_2 released from the stack. Cell liquor flow to the scrubber should be limited so that the pH of the water out of the scrubber is always acidic. If too much cell liquor is used, the hot, high pH water will dissolve silica in the acid proof brick and the vitrified clay sewer pipe.

Combustion gases are quenched from 2600°F to about 200°F by the water leaving the packed section. The water also cools the walls of the quench section, the brick arches supporting the packing support, and the graphite packing support. The weak acid solution leaving the packed section is heated to about 160°F in the quench section.

After the combustion gases are cooled, HCl is scrubbed out in 7 1/2 feet of 1 1/2"Berl saddles.

The scrubbed combustion gases go through a 9 inch mist elimination section packed with 1 1/2" Berl Saddles.

The scrubber shell is made from 3/8" carbon steel. The steel is lined with 3/8" of pyroflex. Pyroflex is an organic, asphalt-like compound which melts above 250°F. It is acid-proof and will protect the steel as long as it is not overheated. The pyroflex is protected by a 4 1/2" thick course of acid proof brick. The nozzle faces and the conical section in the top are rubber lined.

The brick mortar used is a furan resin. It is resistant to acid and weak caustic solutions up to 212°F. The water distribution parts are made of the same resin.

The box beam which supports the water distribution parts and the box beam and packing support for the mist elimination section are FRP with a polyester resin.

The stacks on top of the scrubbers are three feet I.D. by 37'2 1/4" long. The top of the stacks are 65 feet above grade. The top of the stacks have a four-foot by seven-foot long expanded section to reduce mist out of the stacks. This mist eliminator also has a one-inch drain back to the scrubber. The stack is FRP with a polyester resin and is designed for 125 MPH winds.

5. Lake Water for Scrubbers

Scrubbing water for the incinerator scrubbers is supplied from Sportsman's Lake by either of two 100 HP, 2 stage pumps. Lake water is pumped through a check valve and underground into a 12 inch transite line. The lake water line comes out of the ground west of the scrubbers, goes through a FCV, a flow meter, and into the water distributors in the top of the scrubber. About 1250 GPM of water will be required per scrubber.

The lake level will be maintained by reused well water intially. In 1975, Sportsman's Lake will become a reservoir for Toledo Bend water. A section of the distribution piping for Toledo Bend water is being installed now. This section of piping between Sportsman's Lake and the mercury cell plant will be used to get used well water into the lake.

6. Neutralization of Scrubber Effluent

Effluent from the incinerator scrubbers would be about 1.0 percent HCl. This much HCl would cause low pH in the total plant effluent, so it must be neutralized.

Cell liquor will be used to neutralize some of this HCl in the scrubber before it reaches the sewer. Sulphate blowdown from the caustic area is now being sewered to neutralize HCl from Area B. This practice will be continued after incinerator startup. Cell liquor on the scrubbers should be kept between 20 and 40 GPM and can be adjusted within these limits to maintain the plant effluent pH.

Cell liquor should never be allowed to go to the incinerator scrubbers unless lake water is also on the scrubber. Cell liquor will dissolve silica in the acid-proof brick and in the vitrified clay sewer if it is above 130°F.

7. Oxygen Analyzer

The oxygen analyzer will continuously monitor the oxygen content of one of the incinerator stacks. The analyzer can be switched from one stack to the other by a valving arrangement inside the oxygen analyzer cabinet.

The oxygen analyzer is to be used to maintain the oxygen content of the stack gases between 2 and 4 percent oxygen. This will correspond to about 10 to 20 percent excess air.

The amount of chlorine, carbon monoxide, nitrogen oxides, smoke, and other unburned compounds emitted from the stacks is determined in part by the oxygen excess. Smoke, unburned compounds, and carbon monoxide will decrease as excess air is added. Nitrogen oxides and chlorine will increase as excess oxygen is added.

Emissions will be minimized if the oxygen excess is kept between 2 and 4 percent.

Samples are moved from the stack through the oxygen analyzers by steam ejectors inside the stack. These ejectors must have 70 psig steam to work. The samples are cooled inside the oxygen analyzer cabinets and scrubbed with well water to remove the steam added at the ejector and trace quantities of HCl and chlorine. A sample from each stack can be drawn through individual scrubbers continuously.

STARTUP AND SHUTDOWN

I. General Startup Sequence

The first step in the incinerator startup is starting the combustion air blowers. Combustion air flow into the scrubber will keep scrubber water from splashing into the combustion chamber. The next step is to establish scrubbing water flow.

An explosion meter check is made to assure that there is not an explosive mixture inside the combustion chamber before the ignition sequence is started. After the explosion meter check, the pilot and burner are started on natural gas. The combustion chamber can be heated at a rate of 300°F per hour once refractory has been cured. This is about as fast as the burner will heat the combustion chamber.

Steam must be put on the atomizer before the combustion chamber temperature reaches 1000°F. Chlorinated wastes cannot be fed to the incinerator until combustion chamber temperature exceeds 2200°F.

Steam pressure to atomizers must be above 40 psig before the incinerator feed pumps can be started or before the shutdown valve in the liquid waste line can be opened.

Vent lines must be purged with nitrogen and checked with an oxygen meter before attempting to put vent gases to the incinerators. When starting vent gas to an incinerator, the 10-inch shutdown valve in front of the incinerator is opened and the 4-inch vent valve is closed. The valve to the incinerator in the plant whose vent is being put to the incinerator is opened and the valve to the scrubber is slowly closed.

Liquid waste and vent gas waste from the plants can be put to the incinerator in any order. However; natural gas flow plus vent gas flow

to the incinerator should exceed 250 SCFM at all times. The flame pattern becomes unstable when the burner is fired at rates less than 250 SCFM.

II. General Shutdown Sequence

Vent gases and liquid wastes can be taken out of the incinerator in any order desired.

Vent gas flow should be gradually decreased by slowly opening the vent gas valves to the individual plant scrubbers. When flow from the plant is low, shutdown is completed by closing the valve in the line to the incinerator with the shutdown switch. After all plant vent flows have been sent to the plant scrubbers, the shutdown valve at the incinerator is closed and the vent valve to the bottoms plant scrubber is opened by pushing the "Fume Waste-Stop" button on the control cabinet at the incinerator.

A blind must be installed just upstream of the orifice meter in the waste gas line anytime the incinerator is shut down and not restarted immediately.

Liquid waste is shut down by slowly decreasing the flow to zero by reducing pump speed, blocking the pump suction valve, and then blowing liquid waste through the pumps and into the incinerator. The solenoid valve is then closed by pushing the waste liquid flow stop button at the incinerator.

After liquid and gaseous wastes to the incinerator have been shut down, the burner switch is turned to "off" to close the natural gas valves. The combustion air blowers are allowed to run until the combustion chamber is cool. Minimum purging time is two hours.

Steam is left on the atomizing tip until the combustion chamber temperature is below 1000°F. Steam should not be left on the atomizer until the combustion chamber is cold because the refractory will absorb moisture.

If an emergency situation exists, the incinerator can be shutdown using the emergency shutdown button in the control room or using the "burner off" switch at the incinerator.

If the incinerators shut down due to loss of scrubbing water, cell liquor and combustion air blowers should be shut down as soon as possible to keep from overheating the pyroflex scrubber lining and fiberglass reinforced plastic parts in the top of the scrubber. Scrubber water flow should be re-established as soon as possible and combustion air flow restarted just prior to starting scrubber water flow.

III. Shutdown Systems

A. Incinerators

The incinerators shut down from any of the following conditions.

1. Low combustion air pressure - 0.75 psig.
2. High or low natural gas pressure - 2.5 and 1.0 psig.
3. Loss of flame.
4. High incinerator temperature - 2750°F.
5. High scrubber temperature - 220°F.
6. Low scrubber water flow - 300 GPM.

B. Liquid Feed System

1. Shutdown of incinerator.
2. Loss of atomizing steam pressure - 40 psig.
3. Low combustion chamber temperature - 2200°F.

C. Waste Gas Feed System

1. Shutdown of incinerator.

2. Low combustion chamber temperature - 2200°F.

3. High pressure in the vent headers.

a. Per-Tri - 7.5 psig

b. OHC - 7.5 psig

c. EDC - 10 psig

d. Inc. - 4 psig

IV. Detailed Startup Procedures

A. Lake Water Pumps

1. If both pumps are down.

a. Close pump discharge valve (10 inch).

b. Open 4-inch recirculation valve to lake.

c. Start pump.

d. Open water FCV to one incinerator scrubber. (Combustion air blower to that scrubber must be running.)

e. Open 10-inch valve to scrubbers slowly to prevent water hammer in underground transite line.

2. If one pump is running.

a. Open 4-inch recirculation valve to lake.

b. Ten-inch discharge valve may be opened before or after pump is started.

c. Start pump.

d. Close 4-inch recirculation valve.

B. Incinerator Startup

1. Start combustion air blowers.
2. Establish at least 1.5 psig natural gas pressure up to the double block and bleed valves.
3. Set natural gas TCV at the startup position. Burner is started with natural valve in the open position.
4. Set the combustion air valve at the startup position (as far closed as possible).
5. Start a lake water pump and establish water flow to the scrubber.
6. Put burner "on-off" switch in "on" position. A two minute purge time delay is started when switch is turned on. Purge complete light will glow when two minutes expires.
7. Remove sight window on south side of incinerator and block off purge air to nozzle. Make an explosion meter check on contents of the incinerator. If contents of the incinerator are not explosive, replace the sight window and turn on purge air.
8. Depress burner start pushbutton and hold button in for 5 to 10 seconds. The solenoid valve in the pilot gas line will open and the ignition transformer is energized. The "pilot on" light also glows. When the pilot lights, the "flame on" light will glow and the "burner start" pushbutton should be released. Ten seconds after the "burner start" button is depressed, power to the ignition transformer and the pilot gas solenoid is lost if a flame has not been established and startup should be resumed at step 6.

9. If the pilot lights, the natural gas double block valves open and the bleed valve closes when the "burner start" button is released. Flame from fuel gas is established. Ten seconds after the "burner start" button is released, the pilot gas solenoid closes. If the fire-eye does not detect a flame, all the gas valves close and startup must be resumed at step 6.
10. Put 10 to 20 psig atomizing steam pressure on the atomizing gun while combustion chamber temperature is between 600°F and 1000°F.
11. Start up liquid waste or vent gas after combustion chamber temperature exceeds 2200°F.

C. Waste Liquid Startup

1. Check valving on liquid waste lines to be sure liquid waste will be fed to correct incinerator.
2. Put 90 psig steam on atomizing nozzle.
3. Push liquid waste flow "start" button to open solenoid in liquid waste line.
4. Set shutdown switch on pump to be used so that correct incinerator shutdown will shut pump down.
5. Open block valves in liquid waste line and set variable speed drive to "zero."
6. Start pump.
7. Increase variable speed drive speed until desired flow is obtained.

D. Waste Gas Startup

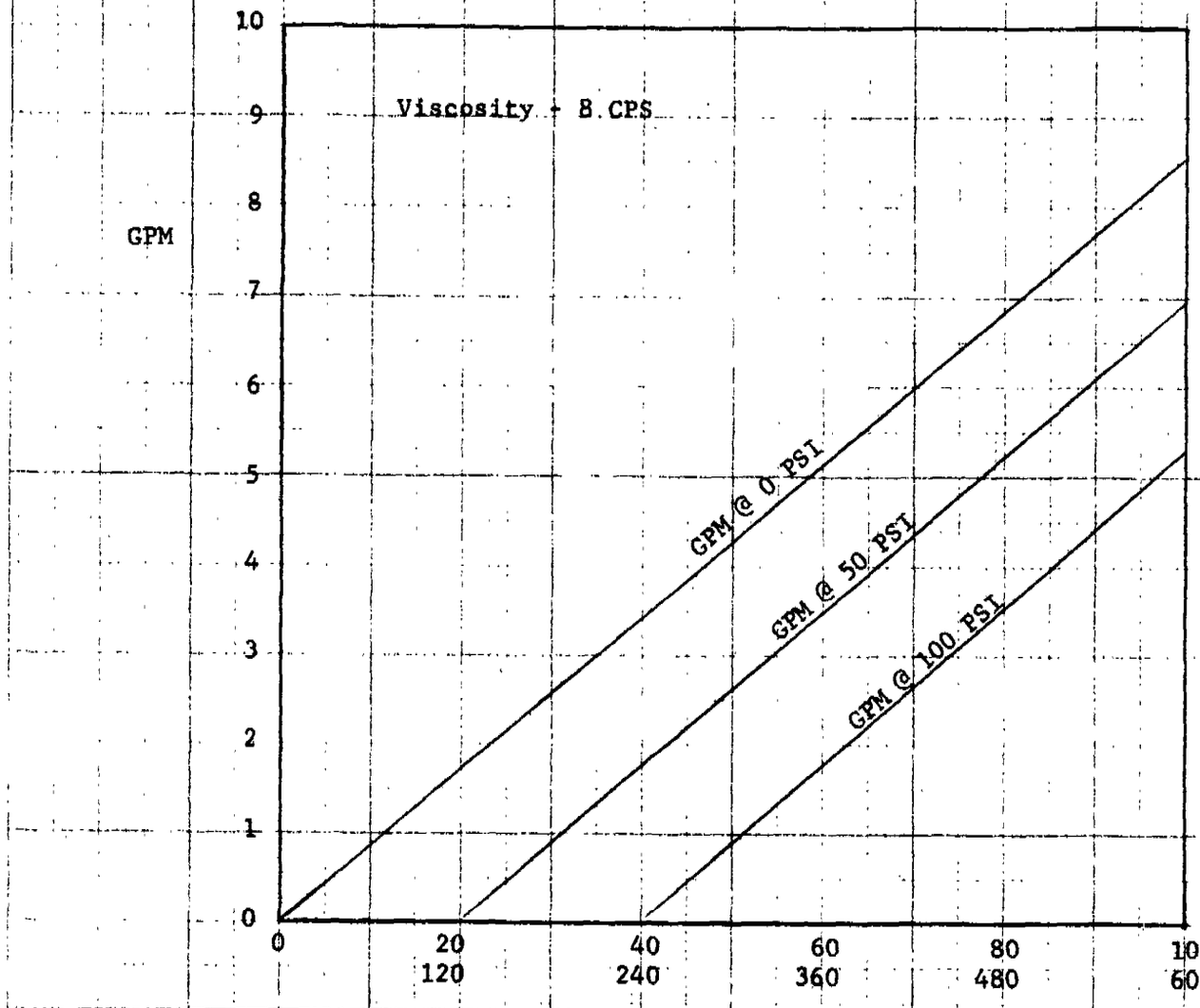
1. Remove the blind in front of the waste gas flow orifices at the incinerators.
2. Use N_2 to purge line from plant whose vent will be put to the incinerator. After 15 minutes purging check the line with an oxygen meter to be sure no oxygen remains in the vent piping.
3. Set 4-way shutdown switch on the incinerator control board so correct vent header or headers will be shut down if an incinerator shuts down.
4. Contact control room whose vent is being started to incinerator and have the plant's shutdown switch put in "on" position. Also have air to the scrubber valve cut off with manual loader so scrubber valve will stay open when the valve to the incinerator is opened. Put plant shutdown switch on the incinerator control board in the "on" position.
5. Push the waste gas flow "start" button at the incinerator to open the 10" waste gas shutdown valve in front of the incinerator and to close the 4-inch vent valve to the bottoms plant scrubber. The start button must be held in until 1.0 psig waste gas pressure is established or the shutdown valves will go to the fail position.
6. Have the plant's control room push the reset button to open the valve from the plant to the incinerator.
7. Have the plant's control room slowly close their valve to the scrubber until it is closed completely.

8. The waste gas flow "start" button can be released when waste gas pressure reaches 1.0 psig at the incinerator.
9. Valves to the bottoms plant scrubber and to the plant's scrubber should be checked to see that they are fully closed. Valves to the incinerator should be fully open.
10. Low point drains in the plant's vent line should be checked to see if liquid is being sent to the incinerator through the gas line.

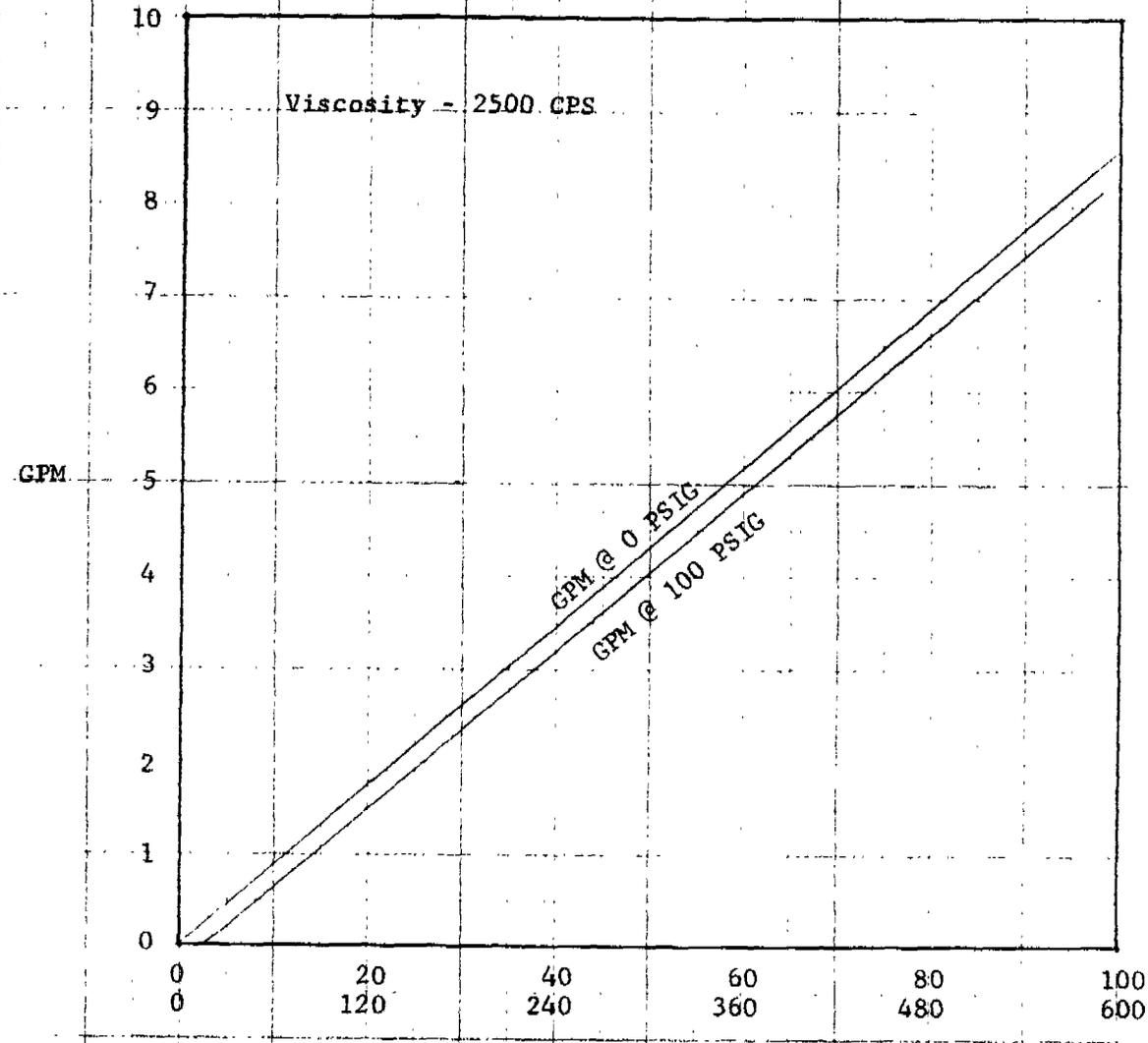
WASTE STORAGE TANKS INNAGE TABLE

Liquid Level Inches	Volume in Gal.	Liquid Level Inches	Volume in Gal.
0	5,169	99	19,349
3	5,599	102	19,779
6	6,029	105	20,209
9	6,458	109	20,639
12	6,888	111	21,068
15	7,318	114	21,498
18	7,748	117	21,928
21	8,177	120	22,357
24	8,607	123	22,787
27	9,037	126	23,217
30	9,466	129	23,646
33	9,896	132	24,076
36	10,326	135	24,506
39	10,755	138	24,936
42	11,185	141	25,365
45	11,615	144	25,795
48	12,045	147	26,225
51	12,474	150	26,654
54	12,904	153	27,084
57	13,334	156	27,514
60	13,763	159	27,943
63	14,193	162	28,373
66	14,623	165	28,803
69	15,052	168	29,233
72	15,482	171	29,662
75	15,912	174	30,092
78	16,342	177	30,522
81	16,771	180	30,951
84	17,201	183	31,381
87	17,631	186	31,811
90	18,060	185	32,240
93	18,490	192	32,670
96	18,920	195	33,100

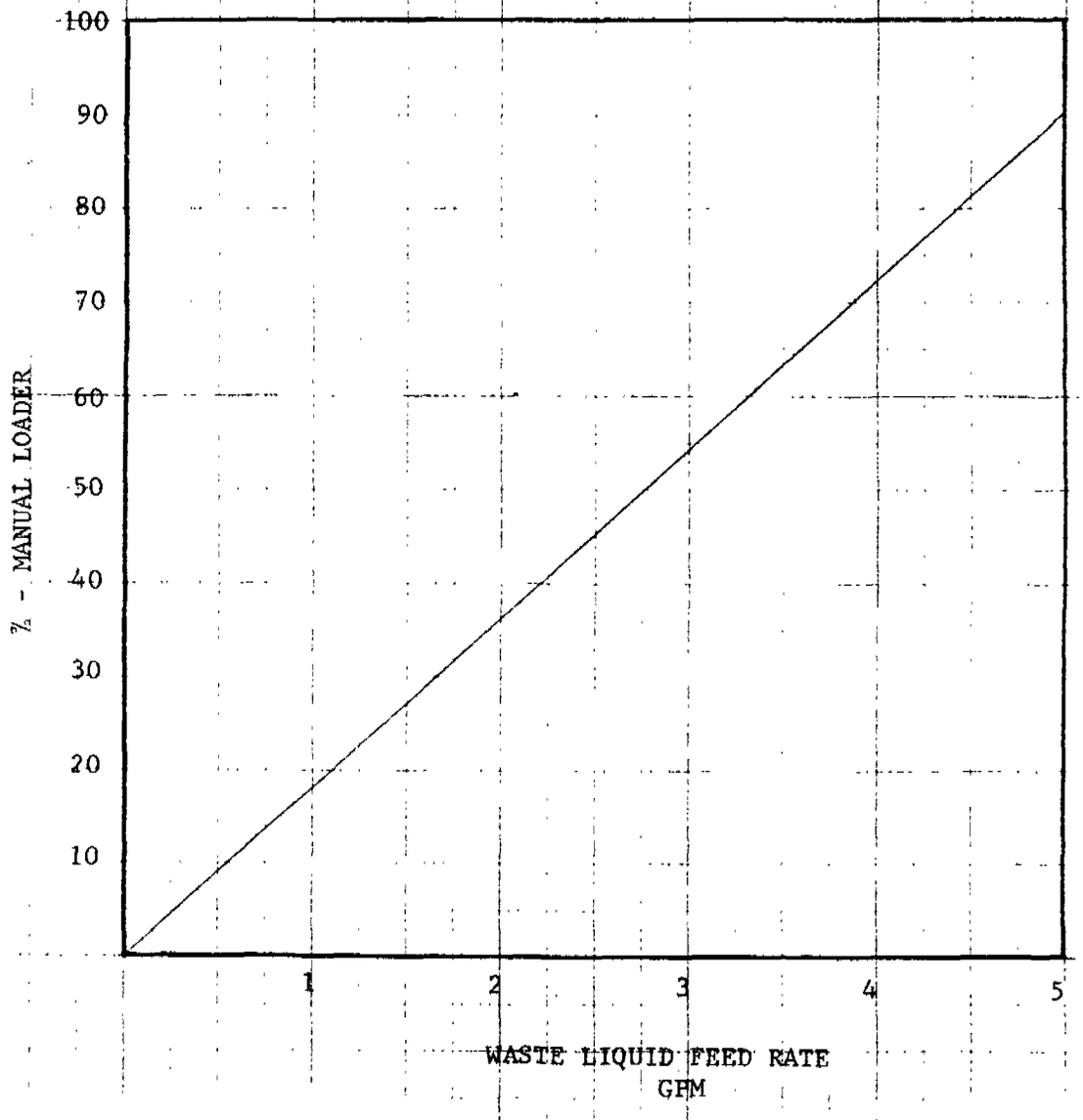
BOTTOMS WASTE TRANSFER AND
INCINERATOR FEED PUMP CURVES



BOTTOMS WASTE TRANSFER AND
INCINERATOR FEED PUMP CURVES



WASTE LIQUID FLOW VS COMBUSTION AIR VALVE LOADING



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SAFETY RELIEF VALVE LIST

Service	Size	Set Press.	Temp.	Plant SRV No.
No. 1 EDC Plant Vent Headers	3 x 4	30 PSIG	120°F	EDC - 162
No. 2 EDC Plant Vent Header	3 x 4	30 PSIG	120°F	EDC - 161
Organics Disposal Plant Steam Header	2 x 3	145 PSIG	650°F	OHC - 324
Waste Storage Tank No. 1	6 x 8	24 PSIG	200°F	OHC - 325
Waste Storage Tank No. 2	6 x 8	24 PSIG	200°F	OHC - 326

RUPTURE DISC LIST

Service	Size	Rupture Pressure PSIG	Temperature °F	Group and Comm. No.
Bottoms Waste Transfer Pumps and Incinerator Feed Pumps	1"	100	350	18-699
Waste Storage Tanks (Primary)	6"	24	200	18-744
Waste Storage Tanks (Secondary)	24"	29	200	18-757
Tri-Ethane and EDC Tar Trailers	8"	100	120	18-755-1
Per-Tri Vent Header	8"	10	120	18-658-2
OHC Vent Header	4"	10	120	18-643-1
OHC Vent Scrubber	6"	5	120	18-651

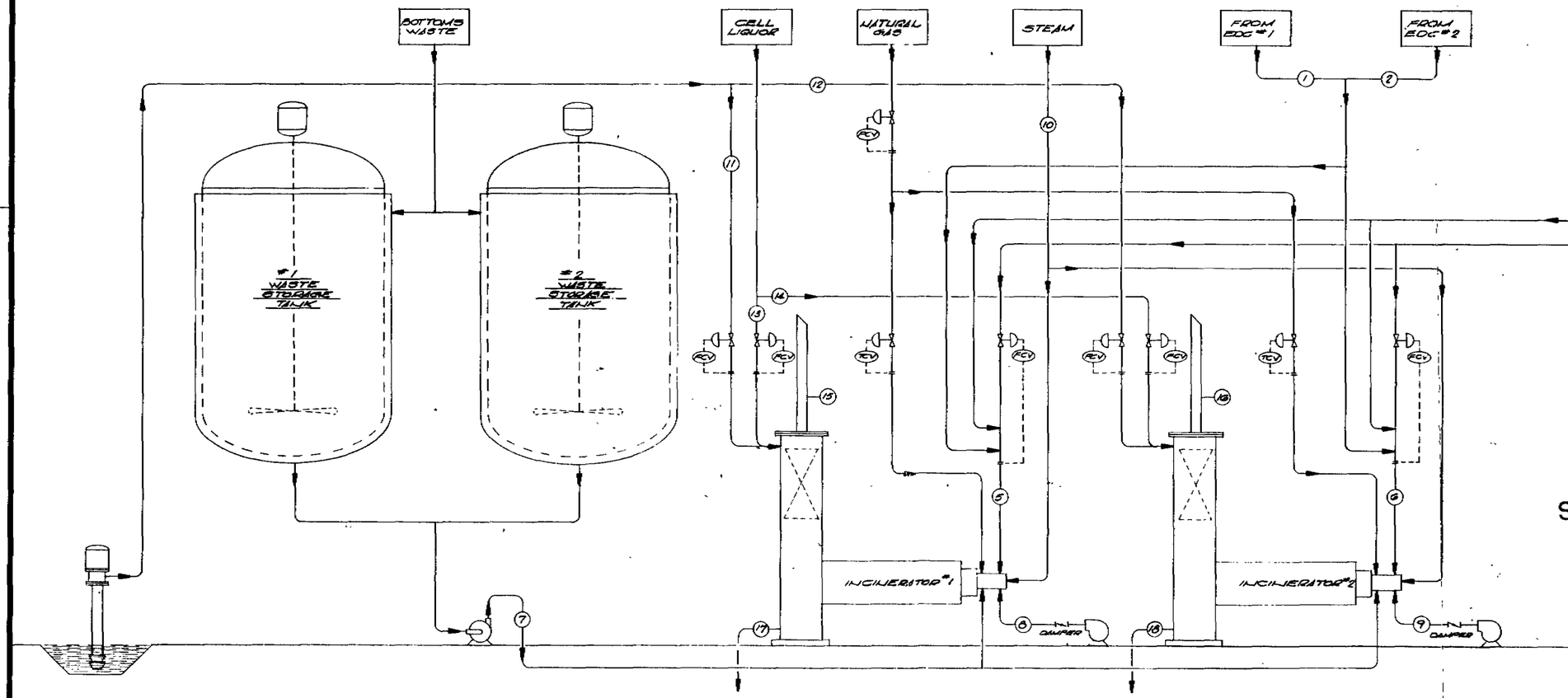
LUBRICATION SCHEDULE FOR
ORGANICS DISPOSAL PLANT

Machine	Part to Lubricate	Lubricant	Method of Application	Service Frequency	Change Frequency
1 & 2 Incinerator Feed Pumps and Bottoms Waste Transfer Pumps - Warren	Pump Bearings - 2	Mobil Compound BB	Bath	1 Week	6 Months
	Vari-Speed Hydraulic System	Mobil DTE 26	Bath	1 Week	6 Months
	Vari-Speed Gear	Mobil Compound DD	Bath	1 Month	1 Year
	Coupling	Mobilux EP-1	Gun	6 Months	1 Year
	Motor Bearings	Mobilux EP-1	Gun	6 Months	1 Year
1 & 2 Incinerator Feed Tank Agitators - Phila.	Gear Box	Mobil DTE Oil BB	Splash	1 Month	1 Year
	Gear Bearings	Mobilux EP-1	Gun	1 Month	-
	Coupling	Mobilux EP-1	Gun	6 Months	1 Year
	Motor Bearings	Mobilux EP-1	Gun	6 Months	1 Year
1 & 2 F.D. Incinerator Blowers	Fan Bearings	Mobilux EP-1	Gun	6 Months	1 Year
	Motor Bearings	Mobilux EP-1	Gun	6 Months	1 Year
1 & 2 Lake Water Pumps Goulds	Pump Bearings	Non-Lube	-	-	-
	Coupling	Mobilux EP-1	Gun	6 Months	1 Year
	Motor Bearings	Mobil DTE 797	Bath	1 Week	6 Months

	① FLOW LBS/HR	WT %	② FLOW LBS/HR	WT %	③ FLOW LBS/HR	WT %	④ FLOW LBS/HR	WT %	⑤ FLOW LBS/HR	WT %	⑥ FLOW LBS/HR	WT %	⑦ FLOW LBS/HR	WT %
N_2	338	23.5	437	24.3	862	31.3	3354	21.6	2496	23.2	2496	23.2		
O_2	117	8.2	158	8.8					138	1.2	138	1.2		
CO_2	238	16.6	237	13.1	617	22.4	5550	35.7	3321	31.0	3321	31.0		
CH_4	258	18.0	404	22.4					332	3.1	332	3.1		
HCl	100	7.0	108	6.0			3104	20.0	1656	15.5	1656	15.5		
C_2H_4	200	14.0	204	11.4	658	23.9			532	5.0	532	5.0		
C_2H_6					8	.3			4	0.0	4	0.0		
EC					171	6.2			86	0.7	86	0.7	6	0.3
VDC							588	3.8	294	2.7	294	2.7		
CIS					4	0.1	600	3.9	302	2.8	302	2.8		
TRANS					8	0.3	754	4.9	382	3.5	382	3.5		
EDC	146	10.0	145	8.0	325	11.8			308	2.9	308	2.9	62	3.4
MC													110	6.1
TCE													7	0.4
TRI							692	4.4	346	3.3	346	3.3		
PER							117	0.8	58	0.5	58	0.5		
TETRA													140	7.7
PENTA													142	7.8
HEXA													40	2.2
C_4HCl_5													208	11.5
C_4Cl_6													472	26.1
TARS AND UNK													565	31.2
H_2O					33	1.2	150	1.0	92	0.7	92	0.7		
$FECl_3$													64	3.4
OTHER	38	2.7	108	6.0	67	2.4	617	4.0	414	3.8	414	3.8		
TOTAL FLOW	1440 LBS/HR 264 SCFM		1800 LBS/HR 330 SCFM		2750 LBS/HR 411 SCFM		15520 LBS/HR 1875 SCFM		10760 LBS/HR 1441 SCFM		10760 LBS/HR 1440 SCFM		1816 LBS/HR 2.6 GPM	

	⑧ FLOW LBS/HR	WT %	⑨ FLOW LBS/HR	WT %	⑩ FLOW LBS/HR	WT %	⑪ FLOW LBS/HR	WT %	⑫ FLOW LBS/HR	WT %	⑬ FLOW LBS/HR	WT %	⑭ FLOW LBS/HR	WT %
N_2	17,600	75.5	17,600	75.5										
O_2	5,300	22.7	5,300	22.7										
H_2O	410	1.8	410	1.8	1,200	100.0	581,400	100.0	581,400	100.0	19,850	73.0	19,850	73.0
NaOH											2,990	11.0	2,990	11.0
NaCl											4,350	16.0	4,350	16.0
TOTAL FLOW	23,300 LBS/HR 4550 CFM		23,300 LBS/HR 4550 CFM		1,200 LBS/HR 45 CFM		581,400 LBS/HR 1167 GPM		581,400 LBS/HR 1167 GPM		27,200 LBS/HR 46 GPM		27,200 LBS/HR 46 GPM	

	⑮ FLOW LBS/HR	WT %	⑯ FLOW LBS/HR	WT %	⑰ FLOW LBS/HR	WT %	⑱ FLOW LBS/HR	WT %
N_2	20,100	64.0	20,100	64.0				
O_2	320	1.0	320	1.0				
H_2O	2,430	7.8	2,430	7.8	600,300	98.4	600,300	98.4
CO_2	8,500	27.1	8,500	27.1				
NaCl					8,720	1.4	8,720	1.4
HCl	3.8	0.0	3.8	0.0	1,250	0.2	1,250	0.2
Cl_2	.4	0.0	.4	0.0				
NO	7.3	0.0	7.3	0.0				
CO	1.8	0.0	1.8	0.0				
TOTAL FLOW	31,400 LBS/HR 7500 CFM		31,400 LBS/HR 7500 CFM		610,300 LBS/HR 1220 GPM		610,300 LBS/HR 1220 GPM	



SL 000833

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of 14th Judicial District Court
No. 91-1145

REVISIONS

⚠ REMOVED GAS BLOWERS CHG. NO P-751
R KOBER 6-13-73

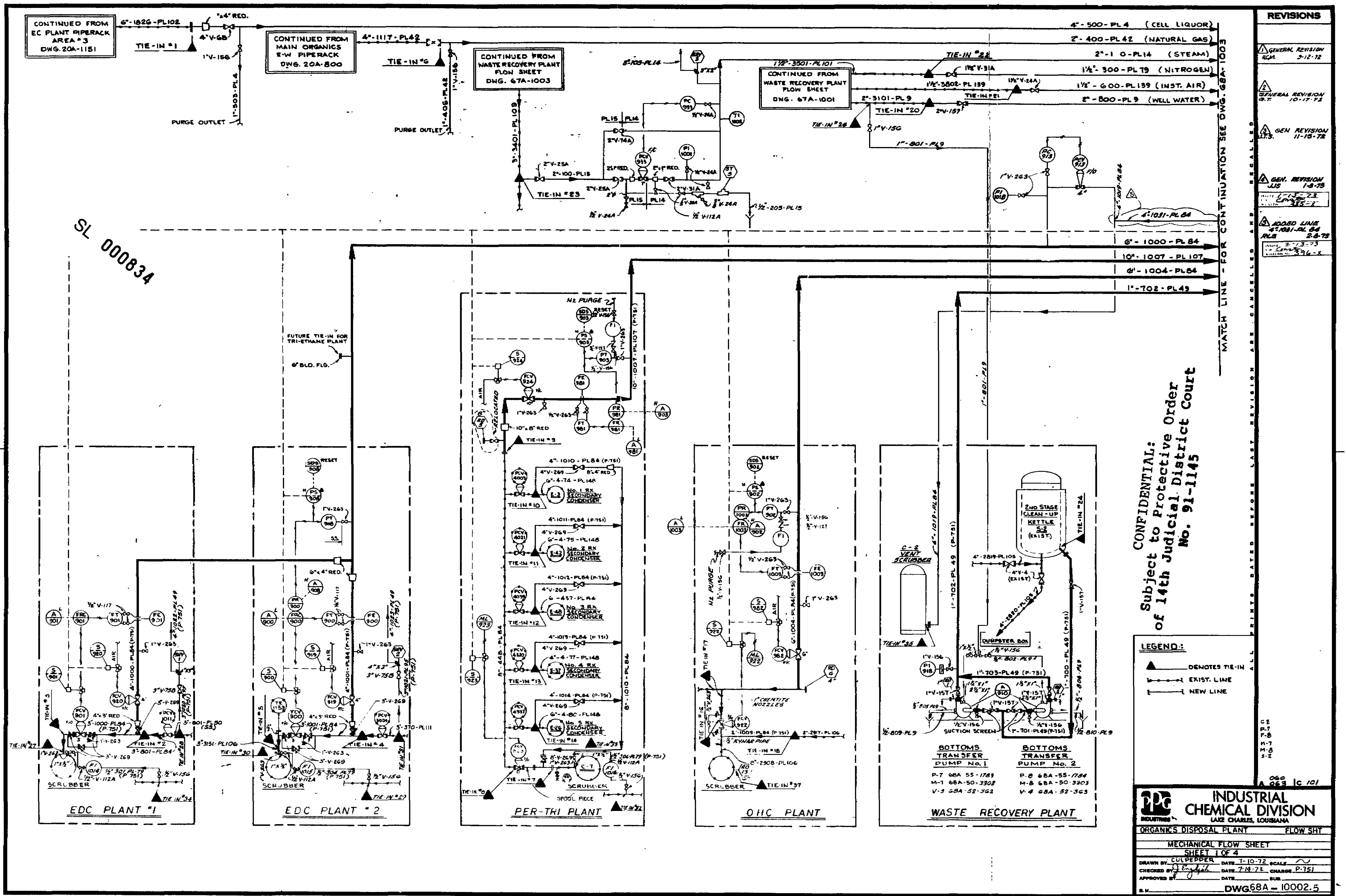
ALL PRINTS DATED BEFORE LAST REVISION ARE CANCELLED AND RECALLED

PPG INDUSTRIES — INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

CHLORALKALI DISTRICT PLANT
PROCESS FLOW SHEET

DRAWN BY M. LEBLANC DATE 4-21-72 SCALE NONE
CHECKED BY [illegible] DATE 5-1-72 CHARGE P-751
APPROVED BY ____ DATE ____ SUB ____
B.M. ____ DWG 68A-10001-1

SL 000834



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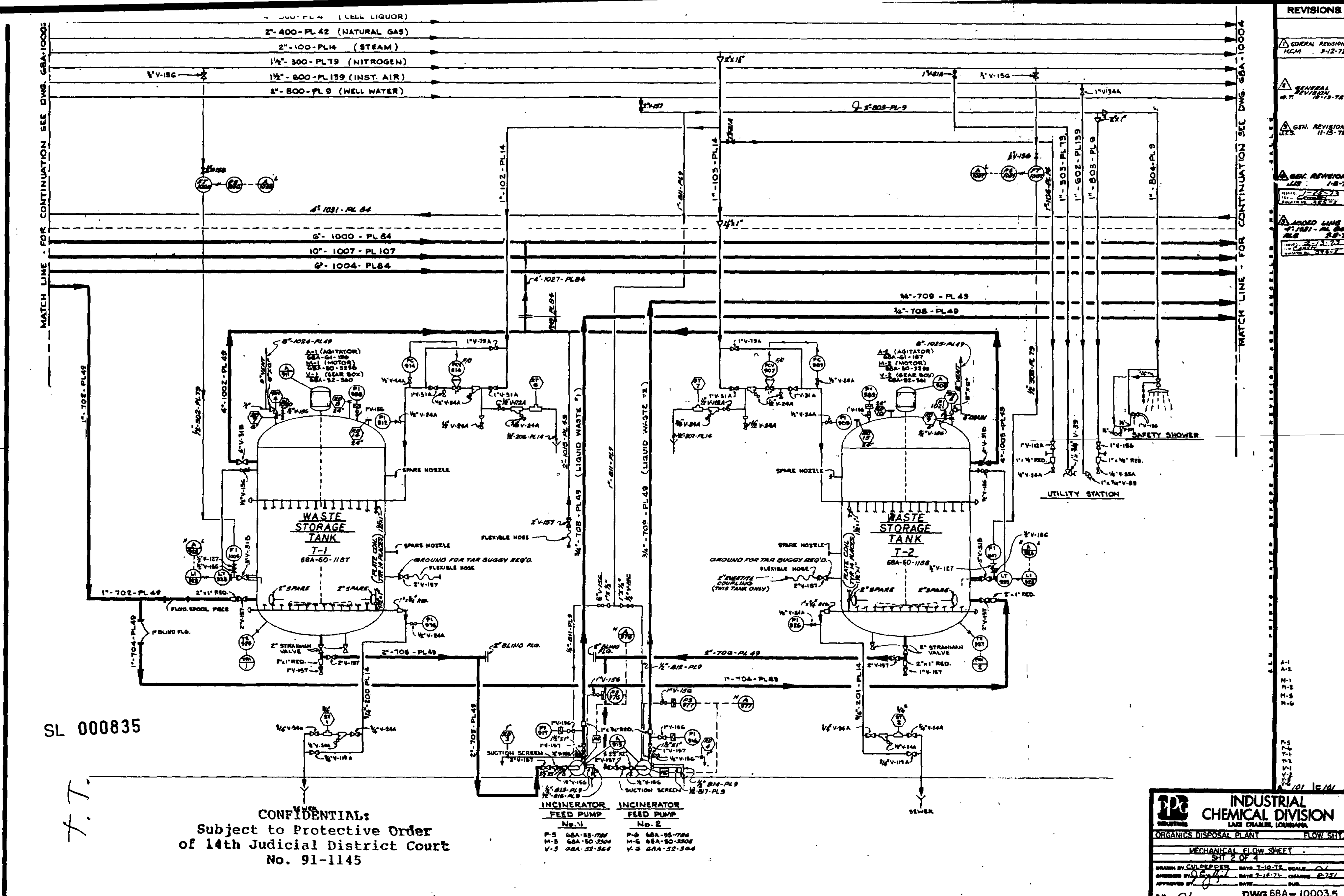

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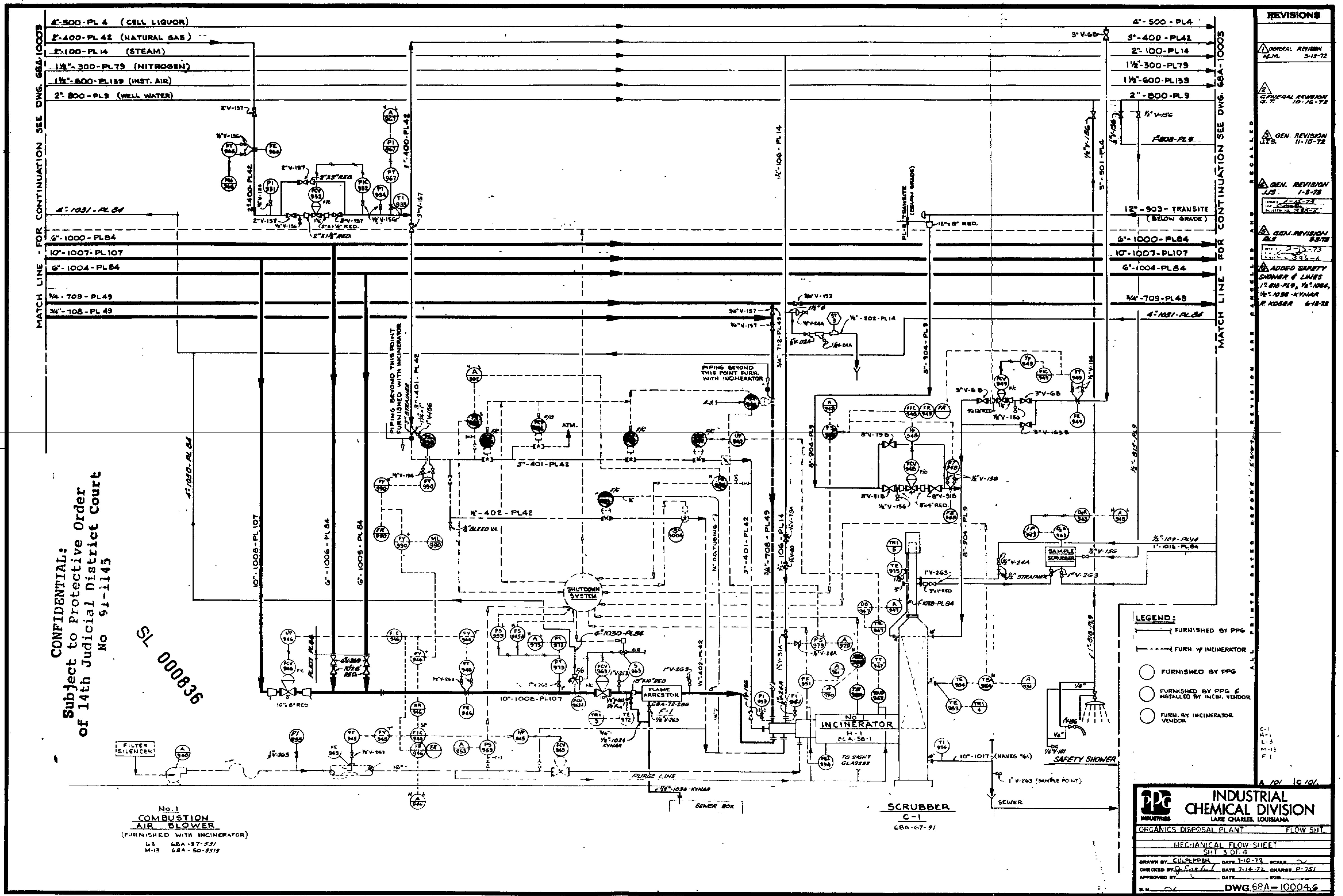

4"-500-PL 4 (CELL LIQUOR)
2"-400-PL 42 (NATURAL GAS)
2"-100-PL 14 (STEAM)
1½"-300-PL79 (NITROGEN)
1½"-600-PL139 (INST. AIR)
2"-800-PL9 (WELL WATER)
4"-1031-PL 84
6"-1000-PL84
10"-1007-PL107
6"-1004-PL84
¾-709-PL49
¾"-708-PL 49
MATCH LINE - FOR CONTINUATION SEE DWG. 68A-10003
12"-903-TRANSITE (BELOW GRADE)
3"-401-PL42
½"-402-PL42
10"-1008-PL107
6"-1006-PL84
6"-1005-PL84
PIPING BEYOND THIS POINT FURNISHED WITH INCINERATOR
SHUTDOWN SYSTEM
FLAME ARRESTOR
F-1
PURGE LINE
SEWER BOX
FILTER SILENCER
No.1 COMBUSTION AIR BLOWER
(FURNISHED WITH INCINERATOR)
No. INCINERATOR
H-1
SCRUBBER
C-1
68A-67-91
SAMPLE SCRUBBER
SAFETY SHOWER
SEWER
TO SIGHT GLASSES
LEGEND:
FURNISHED BY PPG
FURN. W/ INCINERATOR
FURNISHED BY PPG
FURNISHED BY PPG & INSTALLED BY INCIN. VENDOR
FURN. BY INCINERATOR VENDOR
REVISIONS
GENERAL REVISION
GEN. REVISION
ADDED SAFETY SHOWER & LINES

INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

ORGANICS DISPOSAL PLANT — FLOW SHT.

MECHANICAL FLOW SHEET
SHT. 3 OF 4

DRAWN BY CULPEPPER DATE 1-10-72
CHECKED BY DATE 2-14-72 CHARGE P-751
APPROVED BY
DWG. 68A-10004.6

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Subject to Protective Order
of 14th Judicial District Court
No 91-1145

SL 000836

4"-800-PL 4 (CELL LIQUOR)
3"-400-PL 42 (NATURAL GAS)
2"-100-PL 14 (STEAM)
1½"-300-PL 79 (NITROGEN)
1½"-600-PL 139 (INST. AIR)
2"-800-PL 9 (WELL WATER)
12"-903-TRANSITE (BELOW GRADE)
6"-1000-PL 84
10"-1007-PL 107
6"-1004-PL 84
¾"-709-PL 49

MATCH LINE - FOR CONTINUATION SEE DWG. 68A-10004

1"-905-PL 79
1"-108-PL 14
1"-808-PL 9
3"-502-PL 4
1"-807-PL 9
1"-604-PL 139
1"-305-PL 79
1"-108-PL 14

SAFETY SHOWER
UTILITY STATION
SHUTDOWN SYSTEM
FLAME ARRESTOR
No. 2 INCINERATOR
M-2 68A-56-2
PIPING BEYOND THIS POINT FURN. WITH INCINERATOR
TO SIGHT GLASSES
PURGE LINE
2"- V.C. SEWER
SEWER
SCRUBBER C-2 68A-67-92
No. 2 COMBUSTION AIR BLOWER (FURNISHED WITH INCINERATOR) L-4 68A-57-552 M-14 68A-50-3320
LAKE WATCH PUMPS
PUMP No. 1 P & M 68A-55-1779 M-5 68A-50-3291
PUMP No. 2 P & M 68A-55-1780 M-4 68A-50-3292

LEGEND:
- FURNISHED BY PPG
- FURN. BY INCINERATOR
- FURNISHED BY PPG
- FURNISHED BY PPG & INSTALLED BY INCIN. VENDOR
- FURN. BY INCINERATOR VENDOR

SL 000837

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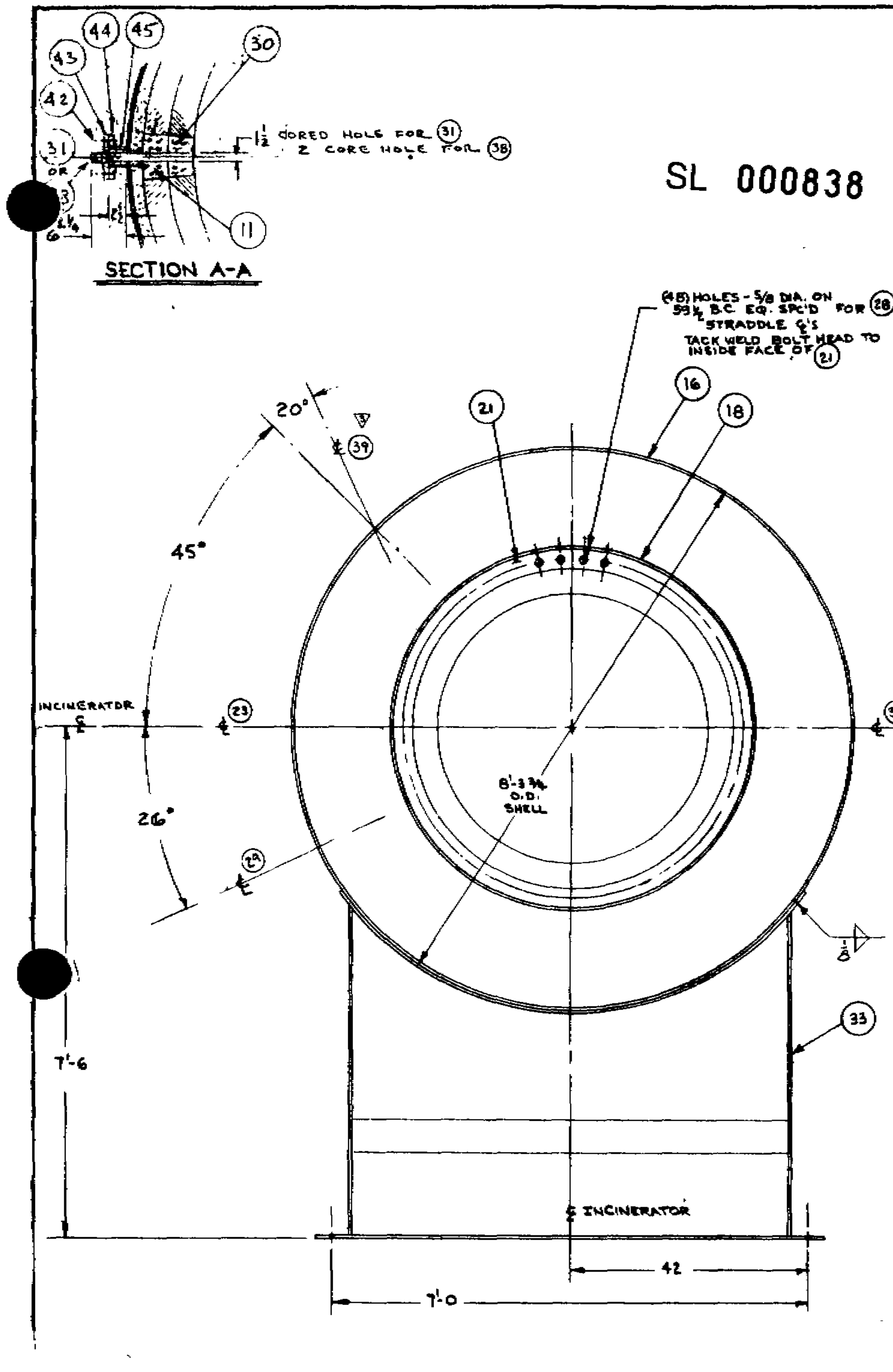
No. 91-1145

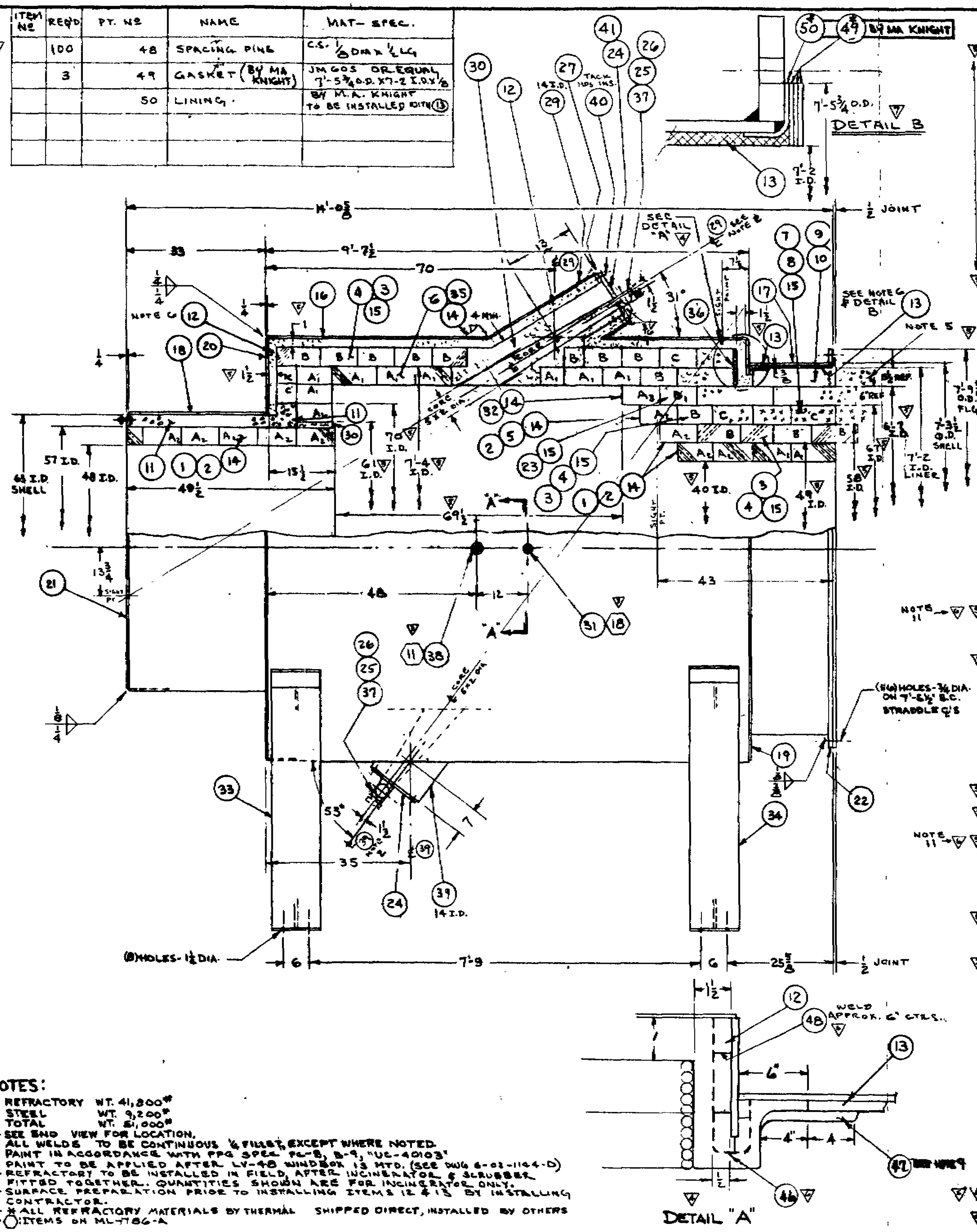
ALL PRINTS DATED BEFORE LAST REVISION ARE CANCELLED AND REGALLED

REVISIONS
1 GENERAL REVISION 9-14-72 N.S., HCM & ST. GL
2 GENERAL REVISION G.T. 10-18-72
3 GEN. REVISION JJS. 11-15-72
4 GEN. REVISION JJS 1-8-73
5 GEN. REVISION BLS 2-8-73
6 ADDED SAFETY SHOWER @ 1"B19-PL9 ½"-1038, ¾"-#33-KYNAR P-751 R.KOBER 6-18-73

INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA
ORGANICS DISPOSAL PLANT FLOW SHT.
MECHANICAL FLOW SHEET
SHT. 4 OF 4
DRAWN BY C.V.PELTIER DATE 7-10-72 SCALE ~
CHECKED BY [illegible] DATE 7-14-72 CHARGE P-751
APPROVED BY DATE SUB.
B.M. ~ DWG. 68A-10005.6



ITEM Nº	REQ'D	PT. Nº	NAME	MAT - SPEC.
	100	48	SPACING PINS	C.S. 1/8 DIA x ½ LG
	3	49	GASKET (BY MA KNIGHT)	JM 605 OR EQUAL 7'-5¾ O.D. x 7-2 I.D. x 1/8
		50	LINING	BY M.A. KNIGHT TO BE INSTALLED WITH (13)



ITEM NO.	No. REQ'D PER UNIT	PART NO.	NAME	MATERIAL-SPECIFICATIONS
*	81	1	BRICK	H.W. KORUNDAL "X-D" No.2 ARCH 9x4½x2½
*	988	2		H.W. KORUNDAL "X-D" No.1 ARCH 9x4½x2½
*	366	3		H.W. -26 OR EQUAL No.2 ARCH 9x4½x3
*	1032	4		H.W. -26 OR EQUAL No.1 ARCH 9x4½x3
*	22	5		H.W. KORUNDAL "X-D" STRAIGHT 9x4½x2½
*	231	6		H.W. KORUNDAL "X-D" No.2 ARCH 9x4½x3
*	236	7		H.W. -23 OR EQUAL No.1 ARCH 9x4½x3
*	167	8		H.W. -23 OR EQUAL No.2 ARCH 9x4½x3
*	200	9	BLOCK	GLASSROCK FORM BLOCK #30, 12x18x4½
*	750#	10	CEMENT	GLASSROCK CEMENT
*	800#	11	CASTABLE	J.H. FRANCE HYDRECON SG-2700
NOTE 6	3600#	12	ACID PROOF CEMENT	PENN WALT HES ACID PROOF CEMENT
NOTE 6		13	LINING	M.A. KNIGHT 3/8 PYROFLEX
*	1300	14	MORTAR	H.W. CORALBOND
*	1050#	15		H.W. CORALITE BOND
	1	16	SHELL	C.S. 3/8" x 9'-7" x 26'-0 5/16 ROLL TO 8'-3¾" O.D.
	1	17		3/8" x 19 [illegible] x 22'-9 11/16 ROLL TO 7'-3½ O.D.
	1	18		3/8" x 33" x 16'-1⅞" ROLL TO 58" I.D.
	1	19	RING	8'-2 13/16 O.D. x 6'-9" I.D. x [illegible]
	1	20		8'-2 13/16" O.D. x 63 [illegible]
	1	21		62 13/16" O.D. x 57 [illegible]
	1	22	FLANGE	7'-9 11/16 O.D. x 7'-3 [illegible]
*	68 #2 15 #1	23	BRICK	HW -26 OR EQ. 9x6x3 ARCH SHAPE FOR ONE RING 6" LINING 67 I.D. x 79 O.D.
	2	24	COVER	C.S. 15⅝ DIA x ¼ THK. (8) ¾ DIA HOLES [illegible]
	2	25	TEE	P.S. 2-200# SCR'D
	2	26	SIGHT GLASS	1-10-004-[illegible]-2
*	AS REQ'D	27	CEMENT	C.E. R&I SUPER 3000
	48	28	BOLTS & NUTS	C.S. 5/8-11 x 2¼ LG. H.H. H.N.
	1	29	SHELL	C.S. ¼ x 24½ x 44½
*	1000	30	CASTABLE	H.W. CASTOLAST
	1	31	TEE	P.S. 1¼-2000#, SCR'D
*	68 #2 15 #1	32	BRICK	H.W. KORUNDAL X-D 9x6x3 ARCH SHAPE FOR ONE RING 6" LINING 67 I.D. x 79 O.D.
	1	33	FRONT STAND	6-02-1147-B
	1	34	BACK STAND	6-02-1148-B
*	736	35	BRICK	H.W. KORUNDAL "X-D" No.1 ARCH 9x4½x3
*	350 FT.	36	PACKING	ASBESTOS ROPE ⅝ DIA.
	2	37	BUSHING	C.I. 2 x ½ - 150#
	1	38	PIPE	C.S. 2 SCH 40 x 3 T.O.E. 2⅜-12
	1	39	SHELL	C.S. ¼ x 13 x 44½
	16	40	BOLTS & NUTS	C.S. 3/8-16 x 1½ H.H. H.N.
	2	41	FLANGE	C.S. 13⅛ O.D. x 10 I.D. x ⅜ (8) ¾ DIA HOLES, 12 B.C.
	8	42	BOLTS & NUTS	C.S. 5/8 - 11 x 2¾ LG.
	2	43	BLIND FLANGE	C.S. 3"-150# R.F.
	2	44	FLANGE SLIP ON	C.S. 3"-150# R.F.
	2	45	PIPE	C.S. 3" SCH 40 x 2¼
	30 SQ.FT.	46	WELDED WIRE FABRIC	C.S. 12 GA. 2x2
		47	LINING (NOTE 9)	M.A. KNIGHT 3/8 PYROFLEX

BRICK SCHEDULE

ITEM NO.	I.D.	STD SIZE	MISC. (NUMBER REQ'D PER RING)	No.2 ARCH	No.1 ARCH	STRAIGHT	TOTAL PER RING	NUMBER OF RINGS	MATERIAL	SYMBOL
8,7,15	70"	9x4½x3		31	52		83	½	H.W. -23	C
8,7,15	6'-7	9x4½x3		21	72		93	½	H.W. -23	C
8,7,15	7'-4	9x4½x3		12	90		102	1	H.W. -23	C
3,4,15	7'-4	9x4½x3		12	90		102	10	H.W. -26	B
2,5,14	61"	9x4½x2½			76	13	89	1	KORUNDAL "X-D"	A_2
3,4,15	6'-7"	9x4½x3		21	72		93	1	H.W. -26	B
6,35,14	6'-7"	9x4½x3		21	72		93	9½	KORUNDAL "X-D"	A_1
6,35,14	70"	9x4½x3		31	52		83	1	KORUNDAL "X-D"	A_1
23,15	67"	9x6x3	SEE MAT. SPEC.					1	H.W. -26	B_1
32,14	67"	9x6x3	SEE MAT. SPEC.					1	KORUNDAL "X-D"	A_3
3,7,15	58"	9x4½x3		43	28		71	3	H.W. -23	C
3,4,15	58"	9x4½x3		43	28		71	1	H.W. -26	B
[illegible]	58"	9x4½x2½			76	9	85	1	KORUNDAL "X-D"	A_2
[illegible]	49"	9x4½x3		52	9		61	3½	H.W. -26	B
1,2,14	49"	9x4½x2½		3	70		73	1	KORUNDAL "X-D"	A_2
1,2,14	48"	9x4½x2½		4	68		72	5½	KORUNDAL "X-D"	A_2
1,2,14	40"	9x4½x2½		14	48		62	4	KORUNDAL "X-D"	A_2

NOTES:

1. REFRACTORY WT. 41,800#
   STEEL WT. 9,200#
   TOTAL WT. 51,000#
2. SEE END VIEW FOR LOCATION.
3. ALL WELDS TO BE CONTINUOUS ¼ FILLET, EXCEPT WHERE NOTED.
4. PAINT IN ACCORDANCE WITH PPG SPEC PC-8, B-9, "UC-40103" PAINT TO BE APPLIED AFTER LV-48 WINDBOX IS MTD. (SEE DWG 6-02-1144-D)
5. REFRACTORY TO BE INSTALLED IN FIELD, AFTER INCINERATOR & SCRUBBER FITTED TOGETHER. QUANTITIES SHOWN ARE FOR INCINERATOR ONLY.
6. SURFACE PREPARATION PRIOR TO INSTALLING ITEMS 12 & 13 BY INSTALLING CONTRACTOR.
7. * ALL REFRACTORY MATERIALS BY THERMAL SHIPPED DIRECT, INSTALLED BY OTHERS
8. ◯: ITEMS ON ML-7786-A
9. THIS PORTION OF PYROFLEX LINER TO BE FIELD INSTALLED AFTER H.E.S. (ITEM 12) IS INSTALLED & CURED. BLOCK (ITEM 9) MAY HAVE TO BE CUT TO ALLOW PROPER I.D. DIMENSIONS IN THIS PORTION OF INCINERATOR.
10. GLASS ROCK BLOCK (IT. 9) TO BE CUT ARCH SHAPE IN FIELD TO MAKE UP DIAMETERS SHOWN.
11. ITEMS 23 & 32 TO MARKED FOR IDENTIFICATION BY SUPPLIER.
12. REMOVE ALL SHARP EDGES WHICH ITEM 12 WILL COME IN CONTACT WITH. (BY THERMAL)

	REVISIONS	BY	DATE	APP.
7	REVISED PICTURE AT SCRUBBER-INCINERATOR INTERFACE. ADDED DETAIL B & ITEMS 49 & 50.	[illegible]	11-21-72	D.R.
6	ADDED QTYS TO IT. 23 & IT. 32. ITEM 46 WAS MESH. ADDED IT. 48 ADDED NOTE 12	[illegible]	11-[illegible]-72	DCR
5	1" & 1½" THK. OF IT. 12 WERE 2". 7'-4 I.D. WAS 7'-2, 6'-7 I.D. WAS 6'-5, 70 I.D. WAS 68, 61 I.D. WAS 59, 58 I.D. WAS 57, 40 I.D. WAS 41, 69½ DIM. WAS 70. BRICK SCHED REV. TO SUIT. ADDED NOTE 10. IT 1 THRU 10 QTYS WERE [illegible]	DR	11-10-72	DCR
4	ADDED NOTE 9, DETAIL "A" AND ITEM 46	[illegible]	11-7-72	[illegible]
3	RELOCATED ITEM 39, ADDED (18) & (38) & NOTE 8, [illegible]	DR	10-19-72	D.R.
2	ADDED NOTE 7, ITEM 31 WAS 1½" [illegible] ITEMS [illegible] ADDED: OR EQUAL	RB	9-26-72	[illegible]
1	IT. 31 WAS COUPLING. REV. SECT. A-A, ADD 42 THRU 45, DEL. CIC 32, IT. 10 WAS 1000#	DR	9-25-72	[illegible]

DRAWN	A.R.	[illegible]
CHECKED	D.R.	[illegible]-72
PROJ. ENGR.	ETG	8-15-72
PROJ. MGR.		
PLT. MGR.		
RELEASED	[illegible]	[illegible]

DO NOT SCALE. WORK TO DIMENSIONS

UNLESS OTHERWISE SPECIFIED TOLERANCES ON FRACTIONS ± DECIMALS ± .010 ANGLES ± 1/2° FINISHES f- 125

THERMAL RESEARCH AND ENGINEERING CORP.
CONSHOHOCKEN, PENNSYLVANIA

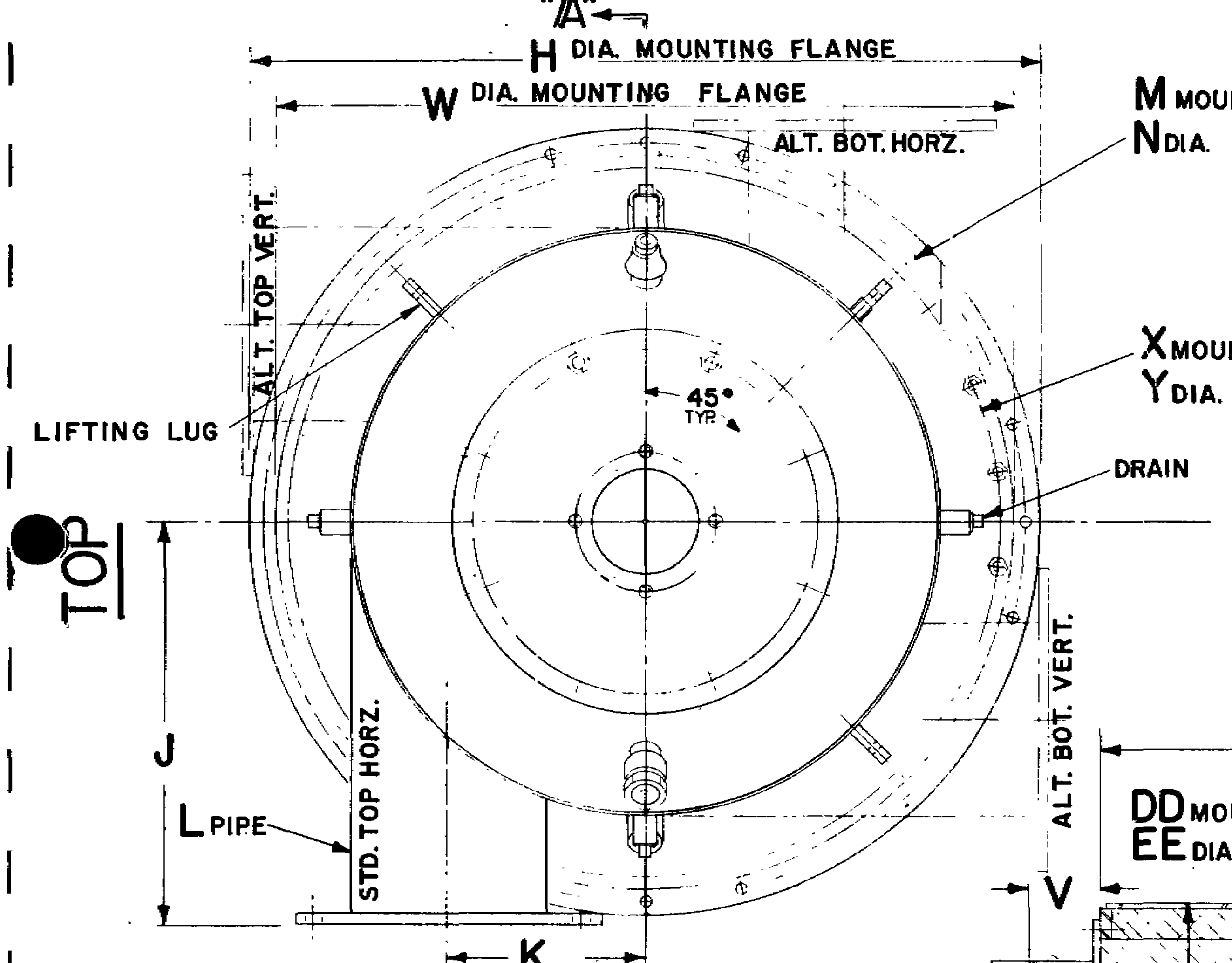
STEEL AND REFRACTORY DETAILS AND ASS'Y INCINERATOR

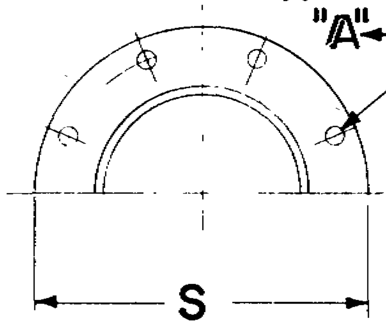
68A-50052

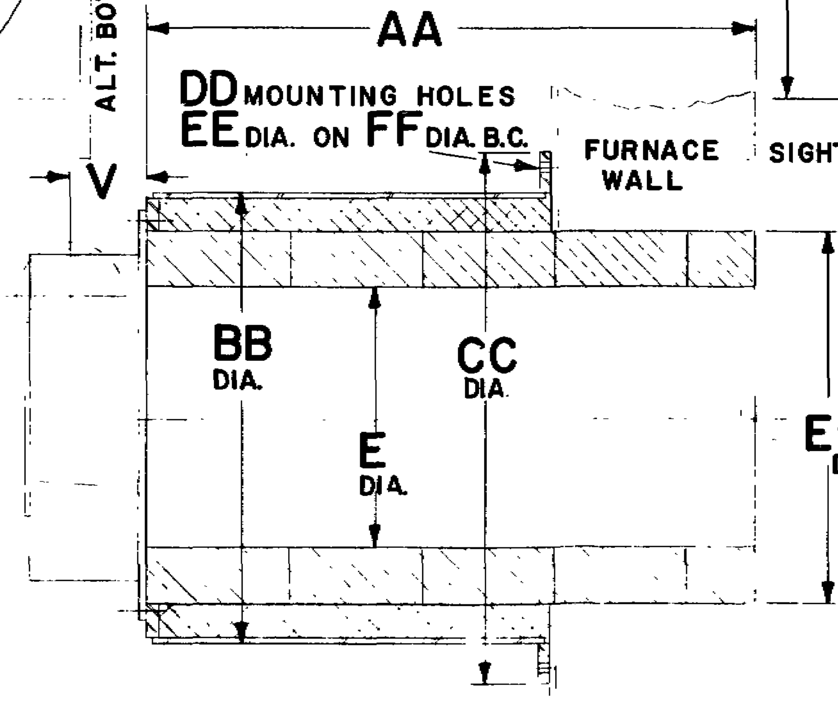
JOB NO. 7115 | SCALE ⅜"=1'-0 | DWG. NO. 6-02-1143 -D | REV. 7

	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
LV-14	50	19⅛	30⅞	39	32	41¼	12¼	47⅜	26½	12⅛	12	40	¾	41	12	1	17	19	25	2121		44¾	40	⅝	43¼						
LV-18	50⅞	19¼	30⅞	39	32	41¼	12¼	49⅜	26½	12⅛	12	40	¾	47	12	1	17	19	25	2322	11 9/16	44¾	40	⅝	43¼	31½	47⅜	53½	40	¾	50
LV-24	55¾	20⅜	35⅝	44½	36	45¼	12¾	51⅜	29	14¼	14	40	⅞	51½	12	1⅛	18¾	21		3800	12 1/16	48⅝	40	¾	47¼	36	51⅜	57½	40	⅞	54
LV-30	[illegible]	[illegible]	40	50	42	51¼	13	60½	32	16	16	40	⅞	57½	16	1⅛	21¼	23¼	31	4250	13¼	55	40	¾	63½	40½	57½	63⅝	40	⅞	60½
LV-48	72½	25¾	48¾	57	48	57⅜	15¾	66½	34	17½	20	48	⅞	64	20	1¼	25	27½		7130	14 13/16	61⅝	48	¾	59½	49½	63⅝	69¾	48	⅞	67
LV-60																															

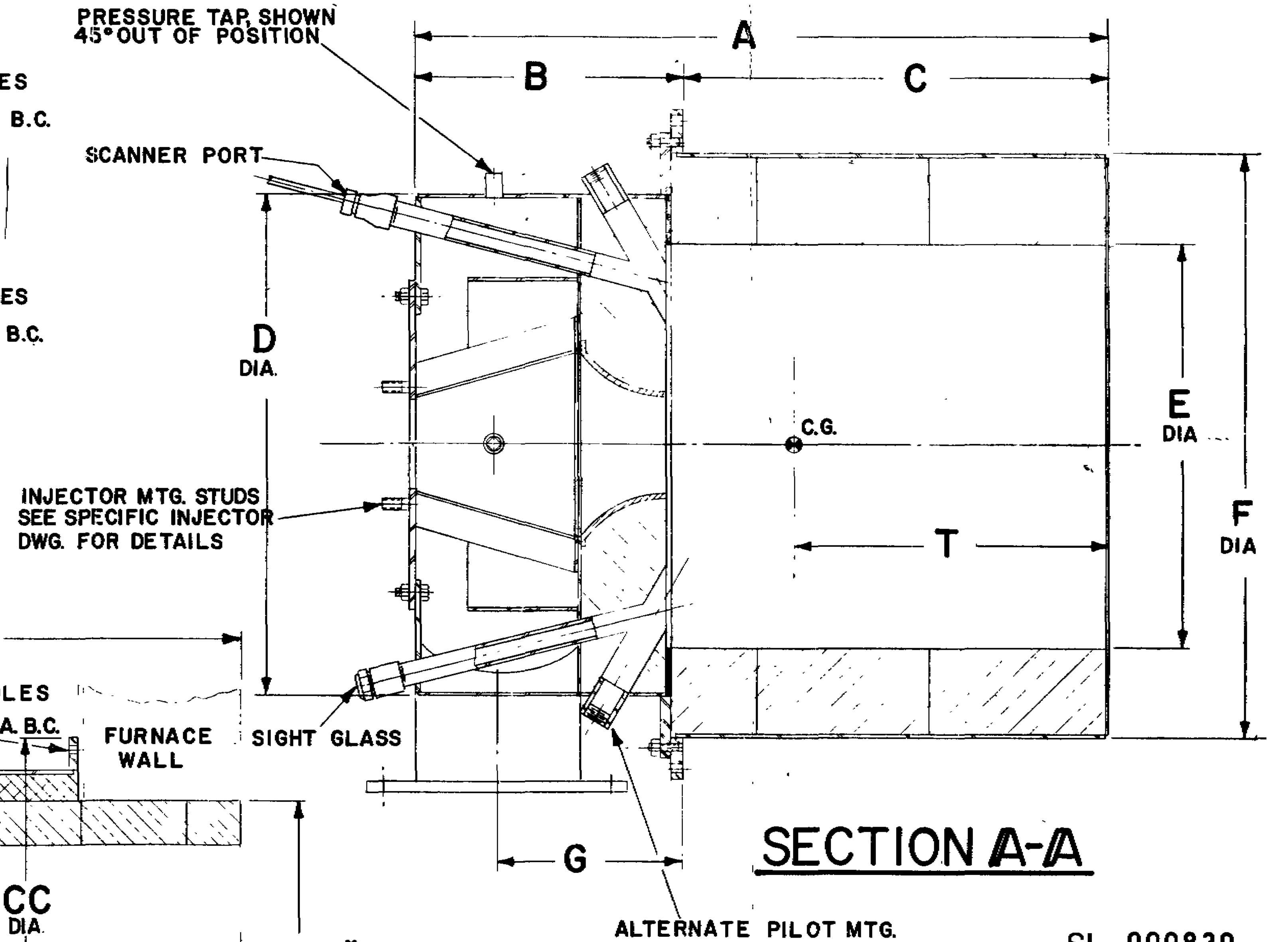
OIL-GAS INJECTOR	OIL INJECTOR	GAS INJECTOR
17-00-014-C	17-00-012-C	17-00-013-C







FURNACE MOUNTING ARRANGEMENT



SECTION A-A

SL 000839

U= WEIGHT

CONFIDENTIAL:
Subject to Protectiv Order
of 14th Judicial District Court
No. 91-1145

	REVISIONS	BY	DATE	APP.
8	DIM "O" FOR LV-48 WAS 63½ DIM "F" FOR LV-48 WAS 57¼	[illegible]	12-6-69	DC
7	ADDED THREE DRAINS, RELOCATED LIFTING LUGS @ 45°	[illegible]	[illegible]	[illegible]
6	OIL INJECTOR DWG. NO. WAS 17-00-013-C, GAS INJ. DWG. NO. WAS 17-00-012-C	[illegible]	2-10-69	[illegible]
5	LV-24 DIM'S "G" WAS 12, "H" WAS 54¼"	[illegible]	9/7/67	[illegible]
4	[illegible] AND ADDED LV-14 [illegible]	[illegible]	[illegible]	[illegible]

DL

DRAWN	Speaker 10/4/66
CHECKED	
PROJ ENGR	
PROJ MGR	
PLT MGR	
RELEASED	

DO NOT SCALE WORK TO DIMENSIONS

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON
FRACTIONS ±
DECIMALS ± .010
ANGLES ± 1/2°
FINISHES
f = 125

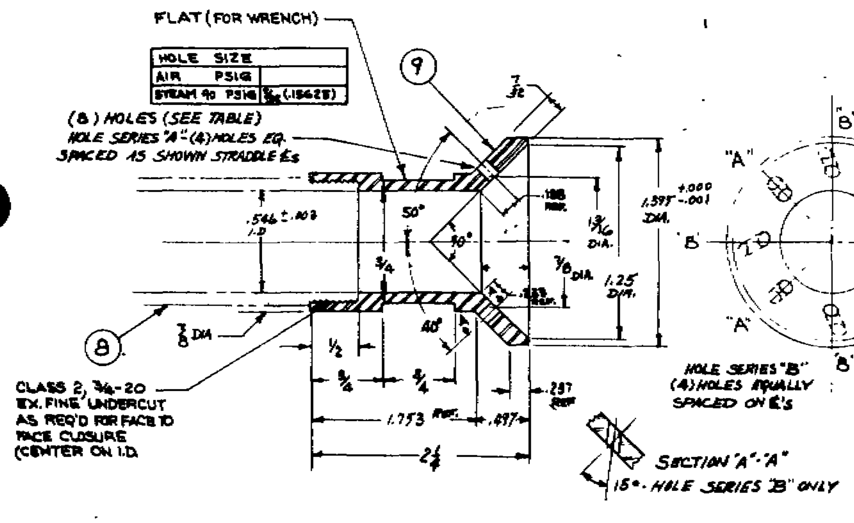
THERMAL RESEARCH AND ENGINEERING CORP.
CONSHOHOCKEN, PENNSYLVANIA

F

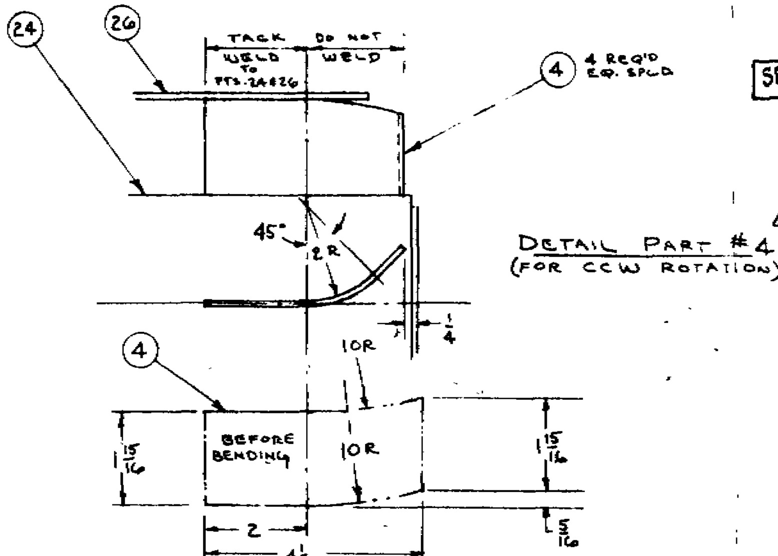
OUTLINE DIMENSIONS LV-14,18,24,30,48,60 BURNERS

JOB NO. | SCALE | DWG. NO. 17-00-006-D | REV.

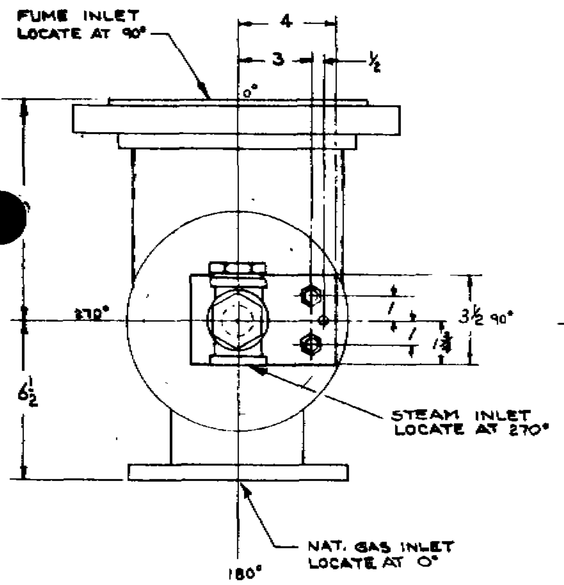
68A-50055

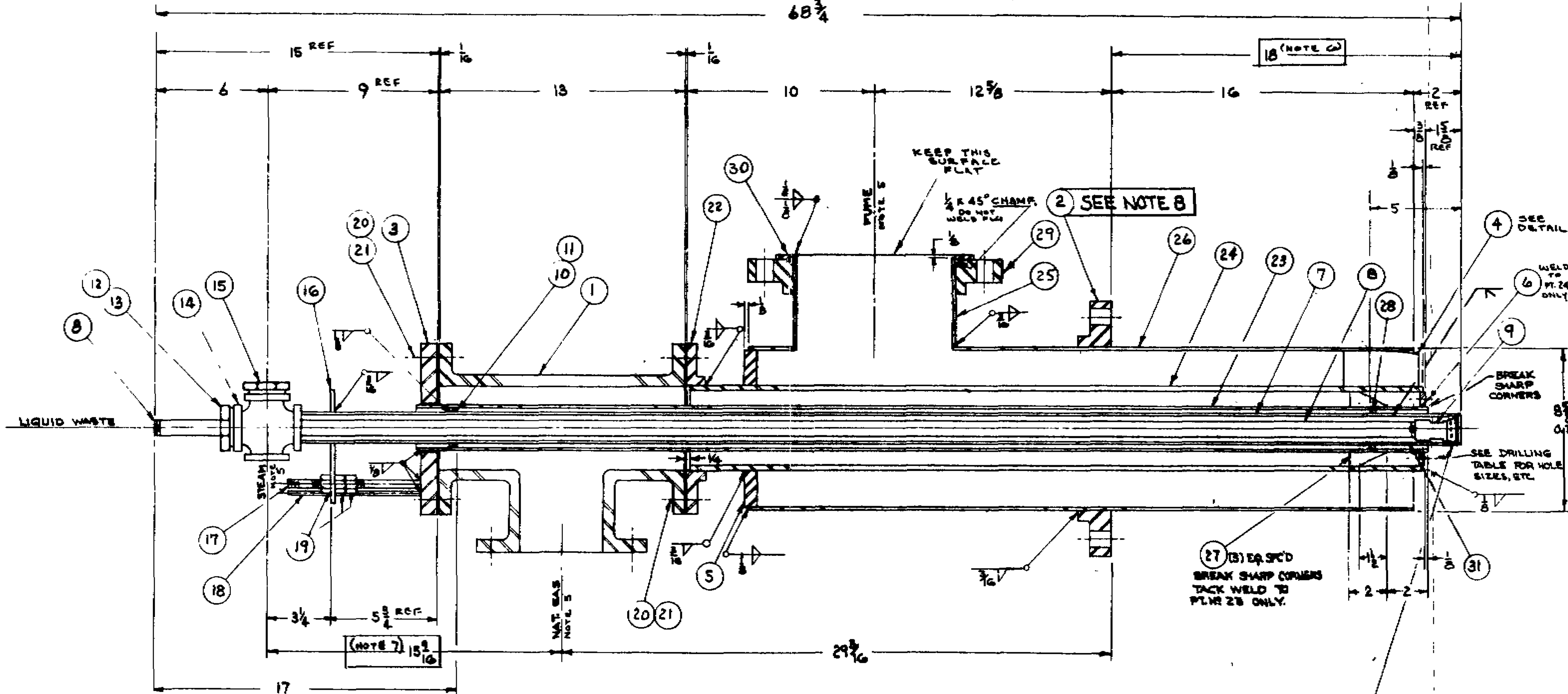


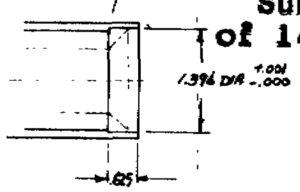
DETAIL PART #9
(FOR CCW ROTATION)



DETAIL PART #4
(FOR CCW ROTATION)







ITEM NO.	NO. REQ'D PER UNIT	PART NO.	NAME	MATERIAL-SPECIFICATIONS
	1	1	TEE	C.S. 4×4×4-125# FLGD
SEE NOTE 8	1	2	FLANGE (SLIP ON)	C.S. 8"-150# F.F.
	1	3	FLANGE (BLIND)	C.S. 4"-150# F.F.
	4	4	CENTERING VANES	HASTELLOY-C 11GA × 2¼ × 4½
	1	5	PLATE	HASTELLOY-C 8 5/16 O.D. × 4⅝ I.D. × 5/16
SEE DRILLING TABLE	1	6	PLATE	HASTELLOY-C 3⅛ O.D. × 2.387 I.D. × ¼
▽	1	7	PIPE T.O.E	316 SS 1¼ SCH 40 × 57¾ LG.
	1	8	PIPE (SEE NOTE 4)	316 SS ½" SCH. 80 × 67 LG.
△	1	* 9	INJECTOR TIP	HASTELLOY-C 1.375 DIA. × 2¼
	1	10	SEALING RING	DWG. 17-00-040-A-4
	1	11	O-RING	PARKER 2-134-77545
	1	12	HEX PLUG	DWG. 17-00-053-A
	1	13	O-RING	PARKER 2-019-77545
	1	14	CROSS	M.I. 1¼"-150#
	1	15	REDUCING BUSHING	M.I. 1¼ × ¼-125# HEX.
	1	16	ADJUSTING PLATE	C.S. ¼ × 3½ × 6
	2	17	THREADED STOCK	C.S. ½-13 NC × 7½
	1	18	CALIBRATION BAR	C.S. ¼ DIA. × 7½
	6	19	HEX. NUT	C.S. ½-13 N.C.
	16	20	BOLT & NUT	C.S. ⅝-11 × 3 HH & HN.
	2	21	GASKET	JM 9" O.D. × 4½ I.D. × 1/16 60S (8) ¾" DIA. HOLES ON 7½ B.C.
	1	22	FLANGE	CS 4"-150# R.F. SLIP ON
	1	23	PIPE	C.S. COLD DRAWN SEAMLESS MECH. TUBING, [illegible]
	1	24	PIPE	HASTELLOY-C 4" SCH. 40 × 38[illegible]
	1	25	PIPE	HAST'Y 11 GA. × [illegible] "C" ROLL TO [illegible] O.D.
	1	26	PIPE	HAST'Y 11 GA × 26 [illegible] "C" ROLL TO [illegible] O.D.
	3	27	CENTERING GUIDES	C.S. 11 GA. × ⅜ × 2"
	1	28	CENTERING BUSHING	DWG. 17-00-029-A-4
	1	29	FLANGE (SLIP ON)	C.S. 8"-150# F.F. (WITH MACHINED CHAMF.)
	1	30	RING	HASTALLOY "C" 10⅝ O.D. × 8 [illegible] I.D. × [illegible]
	1 ▽	31	PIPE (EXT.)	HASTALLOY-C 1¼ SCH. 40 × 4" LG.

* DIMS. OF FINISHED PIECE

SL 000840

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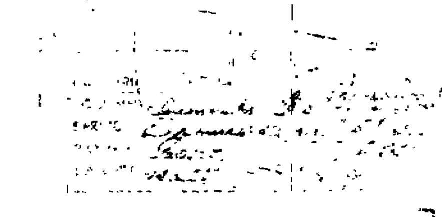
of 14th Judicial District Court
No. 91-1145



NOTES:
1. ALL MACHINED SURFACES TO HAVE 125 FINISH.
2. COAT MACHINED SURFACES OF C.S. PARTS WITH RUST PREVENTATIVE.
3. APPROX. WT.
4. PART NO 8 TO BE THREADED BOTH ENDS. ONE END STD. PIPE THD., ONE END PER SPECIFICATION IN DETAIL OF PART NO 9.
5. PART NOS 16, 17, 18 & 19 SHOWN OUT OF POSITION SEE END VIEW.
6. THIS DIM. IS ADJUSTABLE BETWEEN 16"-19"
7. THIS DIM. IS ADJUSTABLE BETWEEN 17 7/16 - 14 9/16

(20 7113) 8. FLANGE (ITEM 2) TO BE WELDED TO ITEM 26 WITH BOLT HOLES ROTATED 7½° CCW OF STRADDLING ℄.

DRILLING TABLE	
NAT GAS	14 DIA. 9/16 HOLES ON 3 1/16 B.C.

	REVISIONS	BY	DATE	APP.
3	ITEM 7 WAS 61 7/8 LG., ADDED IT. 31. MAT. SPEC. IN IT. 6 WAS C.S., NOTE SIZE IN IT 9 WAS 316 SS.		11-17-72	
2	ADDED NOTE 8.		9-29-72	
1	IT. 2 WAS [illegible], ADDED 29 & 30, IT. 25 [illegible]		9-20-72	

DRAWN		8/30/72
CHECKED	D.C.R.	9-11-72
PROJ. ENGR.	R.G.	9-11-72
PROJ. MGR.		
PLT. MGR.		
RELEASED		9/11/72

DO NOT SCALE WORK TO DIMENSIONS

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON
FRACTIONS ±
DECIMALS ± .010
ANGLES ± 1/2°
FINISHES

THERMAL RESEARCH AND ENGINEERIN CORP.
CONSHOHOCKEN, PENNSYLVANIA

BURNER INJECTOR
FUME - NAT. GAS
STEAM ATOMIZED LIQUID WASTE
FOR L.V. 48 BURNER
CCW AIR & FUEL ROTATION

JOB NO. 7113 | SCALE 3"=1'-0" | DWG. NO. 17-48-055 -D | REV. 3

681-50059

INSTRUMENTS & WIRING IN INCINERATORS FLAME SAFETY CABINETS, SEE THERMAL RESEARCH DWG. #31-03-357

SHUTDOWN CONTACT IN INCINERATOR H-1 FLAME SAFETY SYSTEM

SCR-2

SCR-2

SHUTDOWN CONTACT IN INCINERATOR H-2 FLAME SAFETY SYSTEM

SW-9

SW-3

SW-4

SW-10

4 POSITION, MAINTAINED CONTACT, GENERAL ELEC. 18M SWITCH. CONTACT OPERATION AS INDICATED IN CHART BELOW.

NOTE:
SW-9, SW-4 & SW-9 ARE 2 POSITION, MAINTAINED CONTACT SELECTOR SWITCHES.

HOLD FOR SWANSON

115V, GDNZ, CKT. #1 INORGANICS DISPOSAL PLANT CONTROL PANEL (ONC PLANT SHUTDOWN SYSTEM)

SC-902 (STATIC CONTROL)

SC-902

BDS-902

2-POS. MOMENTARY CONTACT, SPRING RETURN

CR-902

CR-902

PB-902

S-922

S-982

INSTRUMENTS & WIRING IN ORGANICS DISPOSAL PLANT CONTROL PANEL IN ONC CONTROL ROOM. SEE DWG'S. G8A-

* HOLD FOR SWANSON

115V, GDNZ, CKT. #9, EDC #2 CONTROL PANEL (EDC #1 PLANT SHUTDOWN SYSTEM)

115V, GDNZ, CKT. #10, EDC #2 CONTROL PANEL (EDC #2 PLANT SHUTDOWN SYSTEM)

L9

L10

N9

N10

SC-900 (STATIC CONTROL)

SW-6

SW-6 - 2-POS. MAINTAINED CONTACT

SC-900

BDS-908

2-POS. MOMENTARY CONTACT, SPRING RETURN

CR-908A

CR-908A

PB-908

S-900

S-910

SC-901 (STATIC CONTROL)

SW-5

SW-5 - 2-POS. MAINTAINED CONTACT

CR-908A

CR-908B

SC-901

S-901

S-902

INSTRUMENTS & WIRING IN EDC PLANT SEE DWG'S. G0A-5024 & G0A-TG47

115V, GDNZ, CKT. #8, RACK #7 PNL (PER-TRI PLANT SHUTDOWN SYSTEM)

L8

N8

SC-903 (STATIC CONTROL)

SW-8

SW-8 - 2-POS. MAINTAINED CONTACT

SC-903

BDS-903

CR-903

CR-903

PB-903

S-923

S-924

INSTRUMENTS & WIRING IN RACKS G & T IN PER-TRI PLANT CONTROL ROOM. SEE DWG'S G3A-5356 & G3A-5357.

SWITCH OPERATION

CONTACT	SWITCH POSITION 1	2	3	4
a	O	X	O	X
b	O	X	X	O
c	O	X	O	O
d	O	X	O	O
e	O	X	X	O
f	O	X	O	X

O - CONTACT AS SHOWN
X - CONTACT SWITCHED

SW-10 SWITCH FUNCTION

POS. #1 — #1 INCINERATOR TRIP - EDC-ONC VENT TO SCRUBBER
#2 INCINERATOR TRIP - PER-TRI VENT TO SCRUBBER

POS. #2 — #1 INCINERATOR TRIP - PER-TRI VENT TO SCRUBBER
#2 INCINERATOR TRIP - EDC-ONC VENT TO SCRUBBER

POS. #3 — #1 INCINERATOR TRIP - EDC-ONC PER-TRI VENT TO SCRUBBER
#2 INCINERATOR DOWN

POS. #4 — #1 INCINERATOR DOWN
#2 INCINERATOR TRIP - EDC, ONC, PER-TRI VENT TO SCRUBBER

REFERENCE DRAWINGS

G0A-TG47	EDC PLANT - ELEC. INSTR. - ORGANICS DISPOSAL PLANT-EDC SHUTDOWN SYSTEM WIRING DIAGRAM & JUNCT. BOX DETAILS
G0A-5024	EDC PLANT #2 CONTROL PANEL WIRING
G3A-5356	"I PER-TRI EXPANSION - INSTRUMENTATION, PER-TRI CONTROL PANEL ELECTRICAL WIRING, SHT 3
G3A-5357	"I PER-TRI EXPANSION - INSTRUMENTATION, PER-TRI CONTROL PANEL ELECTRICAL WIRING, SHT 4
G3A-5359	"I PER-TRI EXPANSION - INSTRUMENTATION PER-TRI CONTROL PANEL ELECTRICAL WIRING, SHT 6

REVISIONS

ISSUED 12-29-72 FOR CONSTR. BULLETIN NO. 377-2

ALL PRINTS DATED BEFORE LAST REVISION ARE CANCELLED AND RECALLED

SL 000841

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of 14th Judicial District Court
No. 91-1145

Ford, Bacon & Davis Construction Corporation
NEW YORK

063 A 060 C 502

PPG INDUSTRIES
INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

ORGANICS DISPOSAL PLANT EQUIPMENT

E.D.C., O.H.C. & PER-TRI SHUTDOWN ELEMENTARY

DRAWN BY: S. THOMAS DATE 9-12-72 SCALE NONE
CHECKED BY: J.W.S. DATE 9-15-72 CHARGE P-751
APPROVED BY: DATE SUB
B. M. NONE

DWG. 68A-51004.0

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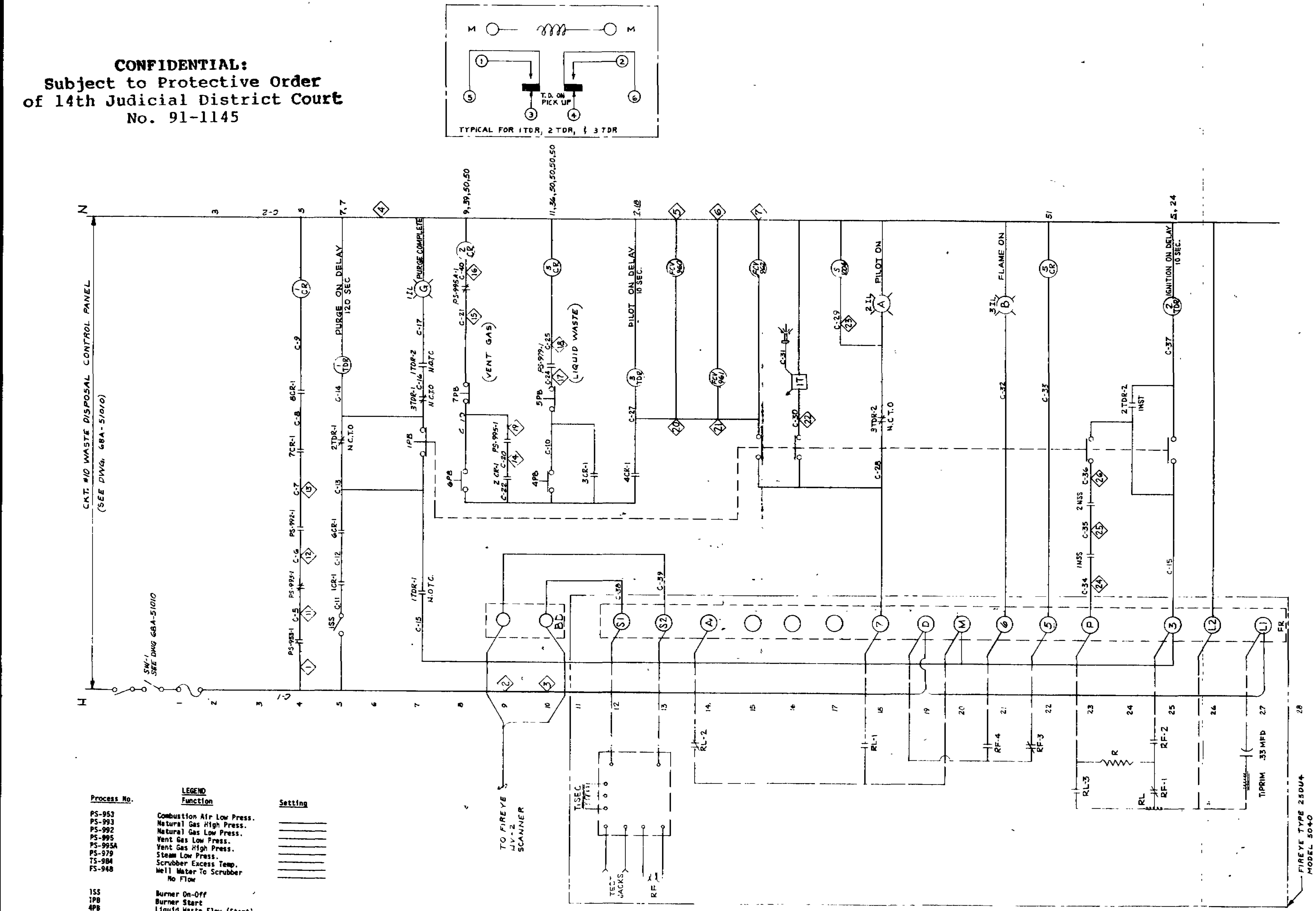
No. 91-1145



REVISIONS

ADDED 37-42 TO TERMS. NOT USED. D.L.L. 5-25-73 CHG. P 751

General Notes

1. All external wiring to be in conduit (weather proof).
2. Spark plug high voltage lead to be GTO-15.
3. All control wire to be type TW- standard 600 volt, 16 ga. min.
4. All external equipment, except spark plug, thermocouple leads, radiamatic pyrometer and flame scanner to be wired thru terminal strip.
5. Jumper all common terminals of panel mounted equipment.
6. Number all conductors at both ends.
7. Equipment terminal No's (where shown) appear on equipment.
8. Symbols refer to 4.L.
9. For sequence of operation see Sheet 2.
10. Scanner leads to be 600 volts max. wire length is 50 ft.
11. ◇ indicates terminals in control enclosure and purchaser's panel.
12. ◇ indicates terminals in control enclosure only.
13. Last terminal number used - 65.
14. Last conductor number used - 40,84.
15. Terminals not used - 9,10, 45,46,47,48,51,52,58,59,56, 37-42
17. All wiring connected to terminal strip to have insulated pressure type lugs.
18. ----indicates field wiring by purchaser.
16. Conductors not used - C-3,4,26, 65,66,67,68,71,72,73,74.

SL 000842

LEGEND

Process No.	Function	Setting
PS-953	Combustion Air Low Press.	
PS-993	Natural Gas High Press.	
PS-992	Natural Gas Low Press.	
PS-995	Vent Gas Low Press.	
PS-995A	Vent Gas High Press.	
PS-979	Steam Low Press.	
TS-984	Scrubber Excess Temp.	
FS-948	Well Water To Scrubber No Flow	
1SS	Burner On-Off	
1PB	Burner Start	
4PB	Liquid Waste Flow (Start)	
5PB	Liquid Waste Flow (Stop)	
6PB	Vent Gas Flow (Start)	
7PB	Vent Gas Flow (Stop)	
FCV-960	Gas Safety Valve	
FCV-961	Gas Safety Valve Vent	
FCV-962	Gas Safety Valve	
FCV-976	Liquid Waste Shut-Off Valve	
FCV-963	Vent Gas Shut-Off Valve	

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of 14th Judicial District Court

REFERENCE DWG.
1. PANEL LOCATION
2. PANEL LAYOUT
3. CONTROL PANEL WIRING (INCL. CONT. BOD.)

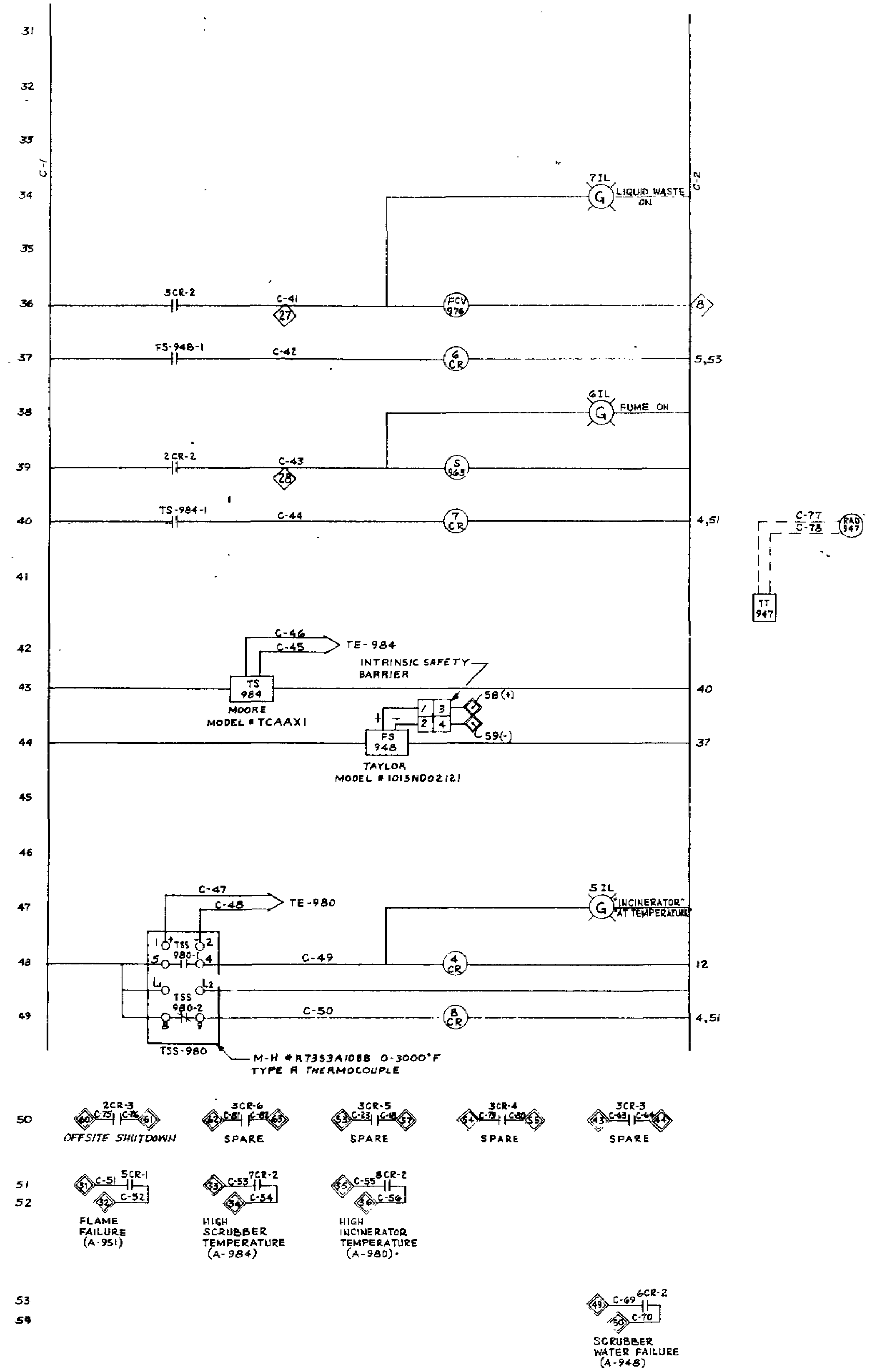
Ford, Bacon & Davis
Construction Corporation
NEW YORK 2-5-73 MONROE

A 101 | C 707

PPG INDUSTRIES
INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

ORGANICS DISPOSAL PLANT — ELEC. INSTR
NO. 1 INCINERATOR
FIELD CONTROL PANEL-WIRING DIAGRAM
SHEET 1 OF 2

DRAWN BY E. SHARBONO DATE 11-28-72 SCALE NONE
CHECKED BY DATE 11-27-72 CHARGE P-751
APPROVED BY DATE SUB.
B.M. NONE DWG. 68A-76020.1



SEQUENCE OF OPERATIONS

Start-Up

1. Close switch, SW-1.
2. Depress "Blower" pushbutton (located at blower). Starter is energized and latched in. "PS-953" will make.
3. Establish natural gas supply pressure. "PS-992" will make, energizing "1CR".
4. With "manual" of "TIC-947", (ML Item 79), move natural gas control valve to low fire position. "2NSS" will make.
5. Move combustion air valve to low fire position by "manual on," "FIC-945", (Item 97), "Combustion Air Flow Indicating Controller". "1NSS" will make.
6. Close Burner "Off-On" selector switch, "1SS".
   a. Establish scrubber water flow, "FS-948-1" will make, energizing "6CR", "6CR-1" will close.
   b. Purge time delay relay, "1TDR" is energized.
   c. After pre-purge period "1TDR-1" and "1TDR-2" close "1TDR-2" close "1FR" (pin 3) is powered. "Purge Complete" indicator lamp, "1IL", will glow.
7. Depress burner start button "1PB".
   a. Ignition time delay relay "2TDR" energized, "2TDR-2" (inst.) closes sealing in "2TDR", pilot gas safety shut-off valve "S-1004" opens, "Pilot On", light, "2IL" glows, ignition transformer, "IT" energized.
   b. Pilot flame is established, "Flame On", light, "3IL" glows.
   c. Ten seconds after "1PB" is depressed, "2TDR-1" opens. If flame is not established by this time, sequence must be repeated from Step 6, since "2TDR-1" will open.
8. Release "1PB".
   a. "IT" de-energized, pilot time delay relay "3TDR" energized, gas vent valve "FCV-961" closes, gas safety shut-off valves, "FCV-962" and "FCV-960" open.
   b. Flame from fuel gas is established. Ten seconds after "1PB" is released "3TDR-2" opens, "S-1004" closes, "2IL" is extinguished, "3TDR-1" opens, "1IL" is extinguished, "3IL" stays lighted. If flame is not established by this time, sequence must be repeated from Step 6.
   c. Fuel control valve moves to "TIC-947" demand position.
9. When incinerator reaches operating temperature "TSS-980-1" contacts close, energizing "4CR", and causing "5IL" "Incinerator at Temperature", indicator light to glow.
10. To start Liquid Waste Flow.
    a. Open atomizing steam manual valves. Steam low pressure switch, "PS-979", will make.
    b. Establish liquid waste pressure.
    c. Depress "Liquid Waste Flow Start" pushbutton, "4PB". "3CR" is energized, and Latched in by "3CR-1". "3CR-2" contacts close, energizing "FCV-976" "Liquid Waste Safety Shut-Off Valve". "7IL", "Liquid Waste On" indicator light will glow.
    d. By controlling pump output, slowly bring on Liquid Waste flow.
    e. Increase combustion air flow during step 10d through "ML-990".
11. To start Waste Fume Flow.
    a. Establish waste fume pressure. "PS-995", waste fume low pressure switch, will not make, until vent valve closes.
    b. Depress "6PB". "2CR" will be energized and be latched in by "2CR-1".
    c. "2CR-2" contacts close, energizing "S-963", waste fume control valve station instrument air solenoid valve. "6IL" "Fume On" indicator light glows.
12. Slowly increase waste fume flow.

Note: As increasing flow is sensed at "FE-946", the combustion air control valve will automatically modulate to supply combustion air, in a pre-selected ratio to fume. This ratio may be altered by resetting, "Ratio Relay", "RR-945".

Incinerator Temperature is sensed by the "Radiamatic Pyrometer", "RAD", and controlled by "TIC-947" which modulates the "Natural Gas Control Valve".

Shut-Down

1. Stop Waste Flows As Follows:
   a. Slowly decrease flow of liquid waste by decreasing pump output.

Note: Steam flow may be decreased but should be allowed to flow to prevent over heating of injector tip.
Depress "5PB", Liquid Waste Flow Stop pushbutton causing the liquid waste flow valve to close.

   b. Slowly decrease flow of waste fume. When flow of fume is stopped, depress "7PB" de-energizing "S-963", closing flow valve and opening vent valve.
2. Position burner "Off-On" selector switch "1SS" at off.

2. Emergency Shut-Down (Omit Step 1) Position burner "Off-On" selector switch "1SS" at "Off".

3. Allow the air blower to purge until refractory is cool. When cool, shut-down the air blower by depressing "Stop" pushbutton (located at blower). Minimum purging time 2 hours.
4. Shut-off steam and water flow.

Note: In the event of low or high natural gas pressure, low combustion air pressure (flow), low scrubber water flow, high scrubber or incinerator temperature, the burner will shut-down closing all safety shut-off valves. Combustion air and steam will continue to flow.

In the event of low steam pressure, the liquid waste flow valve will close.

In the event of low or high fume pressure, the fume flow control valve will close, and the vent valve will open.

In the event of low incinerator temperature both the Liquid Waste, and Waste Fume, flows will be shut-off.

All the above mentioned failures are acknowledged by the "Annunciator System".

See Operating Manual For More Complete Description Of Operation Of Incinerators.

SL 000843

REVISIONS

Ford, Bacon & Davis
Construction Corporation
NEW YORK MONROE

A 101 | C 502

PPG INDUSTRIES
INDUSTRIAL CHEMICAL DIVISION
LAKE CHARLES, LOUISIANA

ORGANICS DISPOSAL PLANT — ELEC. INSTR.
NO. 1 INCINERATOR
FIELD CONTROL PANEL - WIRING DIAGRAM
SHEET 2 OF 2

DRAWN BY E. SHARBONO DATE 11-29-72 SCALE NONE
CHECKED BY DATE 11-27-72 CHARGE P-751
APPROVED BY DATE SUB.
B.M. NONE DWG. 68A-76021.2