for PCB incineration ENSCO

MIDWEST RESEARCH INSTITUTE

MRI REPORT

EVALUATION OF POLLUTION CONTROLS, INC. (ENSCO)
FACILITY AT EL DORADO, ARKANSAS

FINAL REPORT
September 29, 1978

MRI Project No. 4393-L

For

Mayor's Committee to Investigate the
Operation of Pollution Controls, Inc.
Chamber of Commerce Building
201 North Jackson Street
El Dorado, Arkansas 71730

Attn: Mr. Paul Harvel, Acting Chairman

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PREFACE

This report is the Final Report prepared on MRI Project No. 4393-L. The report presents an evaluation of ENSCO (Energy Systems Company) formerly named Pollution Controls, Inc.

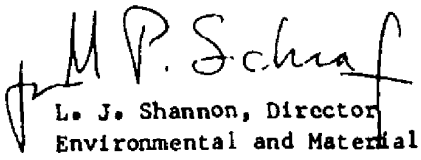
The report presents a review and evaluation of each phase of ENSCO's operations as specified in MRI Proposal No. L-1104, which was accepted by the City of El Dorado on May 19, 1977.

The report was prepared by Mr. Fred Bergman who served as program manager. The evaluations were conducted by MRI staff including Messrs. Tom Ferguson, Ralph Wilkinson, Harold Owens, and Paul Gorman.

The work was conducted in the Field Programs Section under the direction of Mr. Doug Fiscus, Head, and supervised by Dr. L. J. Shannon, Director, Environmental and Materials Sciences Division.

Approved for:

MIDWEST RESEARCH INSTITUTE



L. J. Shannon, Director
Environmental and Materials
Sciences Division

September 29, 1978

TABLE OF CONTENTS

		page
Summary.		1
I.	Introduction	3
II.	ENSCO Equipment and Procedures	4
	A. Transportation Facilities	4
	B. Inventory Control	5
	C. Feed Analysis	6
	D. Storage Facilities.	7
	E. Disposal Facilities	8
	F. Decision Levels	11
	G. Qualifications of Personnel	11
	H. Monitoring Program.	12
	I. Spill Prevention and Cleanup.	14
	J. Fire Protection	16
	K. Safety Regulations.	17
	L. Environmental Impact Statement.	18
	M. Insurance	18
	N. Operating Permits	19
III.	Evaluation of Current Status	19
	A. Transportation Facilities	19
	B. Inventory Control	21
	C. Feed Analysis	21
	D. Storage Facilities.	22
	E. Disposal Facilities	22
	F. Decision Levels	23
	G. Qualifications of Personnel	24
	H. Monitoring Program.	24
	I. Spill Prevention and Cleanup.	26
	J. Fire Protection	26
	K. Safety Regulations.	27
	L. Environmental Impact Statement.	28
	M. Insurance	28
	N. Operating Permits	28

TABLE OF CONTENTS (concluded)

		Page
IV.	Proposed Regulations.	29
V.	Recommendations	29
Appendix -	Proposed Regulations	30

SUMMARY

This report presents the results of a review and evaluation of the operations of ENSCO, formerly named Pollution Controls, Inc. The information reviewed has been obtained from ENSCO documents, interviews, and visits at the ENSCO facilities. The evaluations were prepared by Midwest Research Institute staff members and consultants with the aid of governmental agencies and documents.

ENSCO employs a well-trained experienced, and knowledgeable supervisory staff. The production staff members, under close supervision, are being trained to perform their duties in a safe and responsible manner. The entire ENSCO staff has an exceptional attitude towards keeping themselves knowledgeable and operating in a conscientious manner.

The tractor tankers are being operated in a safe and responsible manner by well-trained drivers. The procedures for screening and accepting waste material for disposal and inventory control are well developed and are followed even when it is to the financial detriment of ENSCO.

The laboratory staff are capable and are performing feed analyses and technical directions in a competent manner. Outside assistance is being obtained in the few areas where specific capabilities do not exist at ENSCO.

The storage facilities are adequate for the present operation but are being improved.

The present disposal facilities consisting of the rotary kiln, the thermal oxidation unit, and the scrubber are probably the finest available in the United States.

Decisionmaking procedures are well established and coordinated with appropriate personnel.

The monitoring program, although minimal, should be sufficient to protect the health and welfare of the community.

Spill prevention and cleanup is well developed and should prove adequate to protect the environment. Some improvement would be desirable in the area of rapid cleanup and/or neutralization to minimize odors.

The fire prevention program is well developed, and the fire protection system appears acceptable and is being improved.

Safety regulations are satisfactory and are being improved.

The insurance coverage is felt to be sufficient to cover any potential losses. Financial responsibility is below a desirable level. This statement applies primarily to the lack of sufficient capital reserve to complete the disposal of existing inventory should ENSCO fail. In all fairness, it should be pointed out that such a condition is not unusual for such a young organization, and it will probably be corrected as soon as possible. In addition, federal regulations are now being considered which, if passed, will make a sufficient capital reserve mandatory.

ENSCO has obtained all required operating permits and approvals to cover their present operation. They have on file a request for Environmental Protection Agency approval for the incineration of PCBs. With the completion of current modifications, there appears to be no reason why the safe distruction of PCBs cannot be accomplished.

I. INTRODUCTION

Modern technology produces numerous undesirable by-product wastes which require safe and satisfactory disposal. Experts working in the area of waste disposal are gradually arriving at a consensus that the only satisfactory method of disposal, for materials which cannot be economically recycled, is incineration. The only exception to this consensus are materials which will not degrade thermally and radioactive waste and metal-containing compounds for which suitable emission control technology does not presently exist.

Based on this premise, Pollution Controls was incorporated as a division of Graco Chemical Corporation. The organization has since been changed to Energy Systems Company (ENSCO).

A permit for the construction of a chemical waste disposal facility was requested from the State of Arkansas, Department of Pollution Control and Ecology, and was granted on July 26, 1974. Since that time ENSCO has completed the construction of the facilities and has proceeded with the disposal of chemical waste.

To comply with federal regulations, a test burn was conducted on polychlorinated organic liquid waste containing hexachlorocyclopentadiene and octachlorocyclopentene. The tests were conducted during the week of June 4, 1977, by Acurex Corporation under the direction of the Surveillance and Analysis Division of the Environmental Protection Agency (EPA), Region VI.

During the initial phases of ENSCO's operation, a committee to investigate the operation of Pollution Controls, Inc. (ENSCO) was appointed by the Honorable W. M. Rodman, Mayor of the City of El Dorado, Arkansas. The charge of the committee was to conduct a complete evaluation of Pollution Controls, Inc. To assist the committee in their evaluation, the services of Midwest Research Institute (MRI) were acquired on May 19, 1977.

With the cooperation of the Mayor's Committee and the staff of ENSCO, MRI has collected information on ENSCO's operation. The information has been evaluated and condensed to determine if any areas of concern exist in ENSCO's present operation.

In compliance with a secrecy agreement executed between MRI and ENSCO, specific details of a proprietary nature contained in the ENSCO documents have been omitted from this report. However, in no case has information pertinent to the evaluation been suppressed or allowed to alter the conclusions.

This report presents the evaluation and conclusions developed from a review of the operation of ENSCO. The report is presented in five parts. The first part presents an introduction to the program, the second part describes the ENSCO equipment and procedures, and the third part presents an evaluation of the ENSCO operation. The fourth part presents a brief review of pending and proposed regulations which, if adopted, will change some aspects of the ENSCO operation. In the fifth and final section, MRI presents recommendations which should improve the facility's operations.

II. ENSCO EQUIPMENT AND PROCEDURES

Information on ENSCO's equipment and procedures were obtained from site visits, staff interviews, and ENSCO documents. A brief description of each area of interest is presented in the following section.

A. Transportation Facilities

Waste will be transported from the client by three means. It is expected that the bulk of the material will be transported by ENSCO. Large volumes will be shipped by rail to the ENSCO siding. Small packaged shipments will be handled by contract carrier or ENSCO.

1. Organization responsible: Shipments moved by contract carrier are the responsibility of the carrier upon leaving the client's plant. The only exception would be in the case when proper labeling and identification rules are not followed. In this event, the client (shipper) is responsible. Shipments carried by ENSCO, primarily by tractor-trailer, are the responsibility of ENSCO once they are accepted by the driver. To reiterate, this is the case only if the material is properly identified and classified.

2. Responsibility of transporter: Current legislation requires that the trasporter and/or his agent is responsible for following the Federal Motor Carrier Safety Regulations, Parts 390 to 397. These regulations include qualification for drivers, inspection of equipment, labeling requirements, and reporting procedures in the case of an accident. In addition, EPA regulations require the trasporter to clean up hazardous spills. Liability is normally established by determining the degree of negligence through due process of law. Under the Federal Water Pollution Control Act, penalties of $5,000 per discharge can be imposed. Criminal penalties of up to $10,000 and/or a year in jail may be imposed for failure to report a spill.

3. Transportation equipment: ENSCO has four 1977 Kenworth tractors and MC306 Freuhauf tankers made in 1977. Relying on information from the material data sheets and analysis where required, only materials which are compatible with MC306 carbon steel tankers are accepted for transportation.

Each tractor is equipped with two shovels, and each driver carries a pair of rubber boots, a hard hat with full face shield, a pair of safety goggles, a pair of rubber gloves, a respirator, and a rain suit. Each tractor unit contains a CB radio.

4. Liability: Provided that the shipment is properly identified, ENSCO assumes responsibility when the tractor-transport leaves the client's property.

In the event of a spill, ENSCO is responsible for clean-up costs and any penalties. In the case of property damage or death, liability is established by due process of law.

5. Safety procedures: Primary safety regulations are stated in the Federal Motor Carrier Safety Regulations Pocketbook. Each driver is supplied a copy of this handbook. Each tractor and trailer receives safety inspections as specified, and each tractor is equipped with fire extinguishers and safety road markers as specified. The drivers have taken both driving and physical examinations. Each unit is manned by two professional drivers, and attendance at bimonthly safety meetings is required. Copies of Hazardous Materials Guidelines for Shippers, Hazardous Materials Checklist for Drivers, Hazardous Materials Shipping Containers, and Hazardous Shipping and Hazardous Materials Questionnaires are available to the drivers.

ENSCO has prepared a document for their drivers which sets out in outline form specific procedures to be followed. This document spells out equipment checks, required paper work, reporting procedures, loading procedure, safety rules for loading and during travel, and trip completion procedures. The document also tells the procedures to be followed for handling accidents, spills and leakage, and requiremnts for product information.

6. Clean-up procedures: The trucks are provided with protective equipment for the drivers, plus shovels, and emergency equipment.

Clear and specific information is contained in the ENSCO transportation document for handling accidents and spills during transport. Directions include where to stop the tractor trailer, how to set out proper warning devices, the notification of authorities, prevention of fires, methods of containing and cleaning up the spill, provision for giving authorities the proper information required for their assistance, and reporting requirements. Provisions have been made for coordinating the clean-up procedures and obtaining outside contractors when assistance is required. Rules pertaining to the transfer of material to a second trailer are given.

B. Inventory Control

The following procedures are currently employed by ENSCO to control and maintain an inventory of materials received for disposal.

1. Waste material acceptance: Prior to accepting material for disposal, an ENSCO waste material data sheet is completed by the waste client. If the data indicate acceptable disposal can be performed, arrangements are made to accept the material. When the material is received at ENSCO, it is held in the shipping container or transferred to temporary storage until confirmatory analysis has been completed.

2. Material classification: After analysis and evaluation, a work order is issued to the materials movement department. The work order designates the type of waste and the tank in which the material will be stored and/or blended prior to disposal. The work order is not signed off until the material has been transferred.

3. Blending: New material being blended with existing tankage is mixed by air stirring or circulation by pumping.

4. Inventory: A running inventory is maintained on materials movement into and out of tankage for each product and client. All tanks and basins are gauged on a monthly basis. A running inventory for total product received and tank and basin volume is maintained on standardized forms. Tanks containing a multiple blend are normally fed to the oxidation unit to permit removal of the material from inventory.

5. Special waste: Material in this category will be identified prior to acceptance for disposal. Based on information supplied by the client through the data sheet, the technical department will decide if acceptable disposal will be possible. Decisions on hazardous materials will be made in consultation with state and federal agencies and other authorities. Samples will be obtained and analyzed where necessary prior to accepting the waste for shipment.

A second sample analysis will be performed on waste accepted when it is received at the facility for disposal. The analysis will be performed and the material must be found acceptable prior to the issuance of the work order to transfer the waste to storage.

C. Feed Analysis

The analysis of waste materials can be very complex and is related to the nature of the material. However, a number of general purpose tests are performed, and these are described in this section.

1. Sampling: As described in the previous section under "Inventory Control," samples are collected and analyzed prior to their being transferred from shipping containers and/or stored.

A grab sample technique is normally employed. Multiple samples are collected (one from each phase) when more than one phase is present. The existence of multi-phases is determined from the waste material data sheet.

2. Blending and storage compatibility: Samples which are considered for blending are checked for compatibility by mixing in the laboratory and noting any reaction such as heating, off-gassing, precipitation, etc. Compatibility with storage tanks and piping, which is mild steel, is checked by contact with mild steel coupons when required.

3. Chemical analysis: Hydrocarbon analysis is performed by gas chromatography. Normal hydrocarbons are measured using flame ionization detection, and chlorinated hydrocarbons are measured by electron-capture detection. A gas chromatograph with flame photometric detection is available for sulfur- and phosphorus-containing hydrocarbons. Gas chromatography-conductivity detection is available and is employed primarily for the analysis of gases. Atomic absorption is available for metal analysis, and the important anions are determined using selective ion electrodes or standard volumetric analysis. A Parr oxygen bomb calorimeter is available for determining the heats of combustion. Sulfur, chloride, and phosphorus are determined on the calorimeter residue using standard procedures. A laboratory is available for volumetric and calorimetric analysis when required.

D. Storage Facilities

The storage facilities currently consist of the tanks and lines remaining from the refinery which was previously located at the site.

1. Materials of construction: The storage tanks and piping consist primarily of mild carbon steel. Pressure tanks for volatile materials and cone roof tanks are available. A few floating roof tanks are used for storing aqueous waste. The dikes are of earthen construction, and dike capacity is adequate to contain the tank contents and a 24-hr, 25-year rainfall. At the present time, the dikes are in fair condition.

Future plans call for the installation of impervious linings in the diked area and the installation of fiberglass linings in all tanks in service, on a one per month basis. At the same time, the tanks will be refinished on the outside.

2. Emission control: Emissions from the tanks are being controlled by Ventsorb activated charcoal units. Installation of new overhead pipelines is planned with a concentric carrier under negative pressure. The collected vapor will be fed to the thermal oxidation unit or a flare.

3. Transfer facilities: Waste streams are currently being pumped using portable air-driven, reinforced fiberglass and cast-iron centrifugal

pumps. Three units are available. Aqueous streams are pumped with portable gasoline driven centrifugal pumps. All new pumps purchased will be stainless steel air-driven units located at permanent pump stations.

4. Safety: The atmospheric pressure storage tanks are vented to the atmosphere through Ventsorb units. The pressure tanks are fitted with pressure relief valves which vent directly to the atmosphere. Contents of the cone roof tanks are gauged manually, but plans have been made to install automatic gauging as the tanks are refurbished. At the same time, automatic foam and water fire protection will be added to replace fighting a fire by hand. There are no provisions for monitoring the tanks to detect temperature or pressure buildup produced by a possible reaction within the tank.

The high pressure tank currently used to store volatile material is maintained under a positive pressure nitrogen blanket. The tank has a pressure gauge for checking the nitrogen blanket. The volume of contained material is not gauged.

E. Disposal Facilities

The disposal facilities of ENSCO currently consist of the thermal oxidation unit (TOU) and auxiliary equipment including a scrubber, a holding pond, a grinder, and a rotary kiln. The TOU has a volume in the two chambers of 6,000 ft^3. Temperatures are normally held between 1800 and 2000°F (980 to 1100°C). The residence time is related to the firing rate with from 5 to 12 sec available. Stack gases are vented through a high energy caustic scrubber, a cyclone demister, and then through a stack. The pH of the scrubber liquid is controled between 8 and 9.5. The effluent from the scrubber, after neutralization, is withdrawn to a sludge lagoon. A very detailed operating manual has been developed for the TOU unit.

To permit the destruction of polychlorinated biphenyls (PCB's) the TOU has been modified by the addition of a rotary kiln.

Capacitors will be ground and fed to the rotary kiln. The PCB's are partially destroyed in the kiln, with the remaining volatiles being fed to the TOU. Residue from the kiln travel by rotary action to an enclosed ash drop at the kiln exit. The residue will be removed from the ash drop periodically and disposed of in an out-of-state approved landfill. The temperature in the kiln, ash drop, and duct to the TOU will be maintained at 1500°F (815°C). Residence time for PCB's is 2.2 sec at 1500°F and 5.0 sec at 1800°F. The TOU system was modified in such a way as to permit simultaneous burning of organic and aqueous wastes with the PCB solids.

1. Feed rate control: The feed rate is normally 5 to 10 gpm and is controlled manually.

The maximum feed rate is limited by the TOU temperature limit and/or the presence of hydrocarbons in the stack. Waste feed is not started until the TOU is at its operating temperature. After starting waste feed, the feed rate of organic waste is increased until hydrocarbons in the stack exceed 1 ppm. The waste feed is then decreased slightly. As the TOU temperature increases, aqueous waste is injected to bring the gas temperature back down. If aqueous waste is not scheduled for destruction, the organic waste rate is decreased further to limit the temperature. Once the TOU is brought up to operating temperature, there is little danger of upsets while operating the system manually because of the large thermal mass of the TOU.

The system is being modified to include automatic feed shutdown in the event the TOU does not remain within its operating parameters. This modification is being incorporated in the unit to meet EPA requirements for the destruction of PCB's as set forth in Federal Register, 43(34):7150-7164 (February 17, 1978), "Polychlorinated Biphenyls (PCB's) Disposal and Marking."

2. Make-up fuel: If the waste feed rate is too low to maintain the required temperature in the TOU, the temperature can be increased by decreasing or stopping aqueous feed. If aqueous waste was not being incinerated, or if stopping the aqueous feed is not sufficient to increase the TOU temperature, additional fuel may be required. In this event, fuel oil or natural gas may be added using auxiliary burners.

Because of the thermal mass of the TOU, several hours are available to perform this task. A nomograph has been developed to guide the TOU operator in setting the various flow rates.

3. Low temperature cutoff: At present there is no low temperature feed cutoff. However, the TOU unit is being modified to add automatic low temperature control to meet EPA requirements as discussed above. This automatic feed cutoff requirement was probably included in the PCB legislation because most industrial incinerators will be much smaller than the ENSCO unit and will, therefore, not possess the large thermal mass.

4. Determining residence time: The residence time of volatile waste in the TOU as quoted by ENSCO has been calculated. The calculation is made using the volume of the system and the flow rate at the incinerator operating temperature. The values used to determine a residence time of 5 sec are consistent with the unit parameters. No further check of the residence time has been made by ENSCO.

5. Qualifications of operating personnel: The operation of the TOU is under the direction of the unit operations manager. An operating supervisor is responsible for operating the TOU system and reports directly to the unit operations manager. The kiln is under the direction of its own operating supervisor. The qualifications required for these positions consist primarily of being familiar with fluid handling systems and controls, having

the ability to understand operating procedures, and having a responsible attitude. Job descriptions for the operation supervisors have not yet been formalized but the unit operations manager job description has been formalized. Responsibilities consist of all operational activities except for laboratory, technical, and engineering functions.

6. Minimization of operating errors: The control of operating errors relies on a well-developed operations manual, tight control of feed quality, good communication channels, documentation of materials movement, and well-defined decision levels. Good training and a responsible attitude are essential since the system is largely under manual control. A very slow response to upsets in the TOU minimizes the critical aspects of manual operation. A TOU production report is completed daily. This will assist in inventory control and spot operational errors by permitting a check of feed rates and caustic and water consumption.

7. Scrubber operation: The scrubber is a well-designed unit with adequate capacity to handle the effluent from the TOU.

a. Materials controlled by scrubber: The existing scrubber is capable of removing particulates at a high efficiency. The use of slaked lime at a pH of 8.0 to 9.5 enables the scrubber to effectively remove many acid gases. In the more difficult removal cases, it will probably be necessary to utilize the available option of adding caustic to the makeup water to promote the absorption of acid gases. The sieve plates and the mobile packing should provide in excess of 99% removal of HCl and other halogen acids. There should also not be any problem with the emission of cyanides or nitrogen oxides. With the 50 in. ΔP provided, the outlet particulate concentration should be below 0.03 grains/dscf of gas.

b. Scrubber safety interlock: There is a safety interlock between the TOU system and the scrubber. The scrubber throat temperature and scrubber liquid flow are monitored. Automatic shutdown of the TOU will occur if either function falls below its set-point. The automatic shutdown stops the flow of all combustibles to the unit, stops the combustion air blower and the air flow to the scrubber jet, and starts the flow of an emergency water supply to the throat of the scrubber. Also, an alarm is sounded. All of the materials considered for incineration will provide sufficient water during combustion to convert the halogens to acids for efficient removal by the scrubber.

The venting of the combustion products after scrubbing is accomplished through a 190-ft stack. This system has the benefit of further reducing by dispersion emissions which are already below the limits set by EPA.

F. Decision Levels

The decision levels at ENSCO are well defined.

1. Normal operation: The movement of all waste material is under the direct control of the Technical Department headed by Dr. Wayne Sickels. This department has the authority to accept or reject material for processing, and for accepting the material on arrival at the ENSCO facilities.

The Technical Department issues the work orders for transferring material to storage and for its disposal. The Technical Department also authorizes the disposal of rainwater from the dikes if it is contaminated and directs the recovery and disposal of material from spills.

All material movement, then, is under the direct supervision of the Technical Department.

2. Accidential leaks: If equipment is found to be leaking, a decision is required to determine the best course of action. If the material is already in storage, an analysis will have been completed and emergency action can be taken at the direction of the Technical Department. If the material is from an unknown source or arrives in a leaking tanker, the Technical Department can decide to conduct an emergency destruction or transfer to an alternate container. Depending on thecause or nature of the emergency, special procedures may be required. In such an event, the Technical Department, in conjunction with consultants and the plant manager, has the authority to determine the best course of action.

3. Problems during transportation: If a leak or spill develops during the transportation of waste material, drivers are instructed to contact the Transportation Department. The transportation manager has the authority to enter into a contract for outside assistance.

4. Absence of normal authority: During the absence of any department manager, any other manager has the authority to take appropriate action.

G. Qualifications of Personnel

Job descriptions have been prepared for top management and technical positions at ENSCO. These positions consist of technical manager, engineering manager, sales manager, operations manager, safety manager, transportation, purchasing, personnel manager, controller, general manager, and executive committee. The remaining personnel's duties are of a general nature and are covered under general policies and procedures or are of a more specific nature covered under department responsibility descriptions. Resumes are available for all personnel holding responsible jobs and for consultants. The resumes give a complete and detailed description of their education and work-related experience.

H. Monitoring Program

The monitoring program at ENSCO covers a number of categories which are discussed by specific areas in this section.

1. Stack monitoring

a. Gases, continuous: at present only oxygen is determined on a continuous basis by using a Servomex Continuous Monitor. ENSCO is in the process of obtaining and installing a continuous monitor for carbon monoxide and carbon dioxide to meet EPA requirements for burning PCB's.

b. Gases, 8 hr: ENSCO is using Dräger tubes to monitor stack gas concentrations. The following gases will be measured every 8 hr during operation of the TOU: ammonia (5-700 ppm), carbon monoxide (5-700 ppm), chlorine (0.2-30 ppm), hydrogen cyanide (2-150 ppm), hydrogen sulfide (1-200 ppm), nitrogen oxides (20-500 ppm), ozone (0.5-14 ppm), phosgene (0.25-75 ppm), and sulfur dioxide (20-2,000 ppm).

c. Gases, weekly: Waste feed will be blended to obtain sufficient material for 1 week's operation of the TOU. Manual sampling will be conducted on the stack for sulfur dioxide and volatile chloride ions once each week. The sampling procedure followed is EPA Method 6. An aliquot of the impinger catch is analyzed for chloride ion using a selective ion electrode or volumetric analysis.

d. Hydrocarbons, continuous: Total hydrocarbons are monitored continuously on the stack using a Bendix 8401 analyzer.

e. Particulates, weekly: Total particulates in the stack will be determined at least once a week. Sampling will be conducted using an RAC Staksampler following EPA Method 5. Additional sampling will be conducted each time the waste feed is changed.

f. Particulate chemical analysis: In addition to measuring total particulates, the filter catch from Method 5 will be analyzed for chloride, phosphate, and sulfate ions using a selective ion electrode.

g. Special stack analysis: To comply with EPA requirements as outlined in the Federal Register, 43(34):7150-7164 (February 17, 1978), "Polychlorinated Biphenyls (PCB's), Disposal and Marking," the following test will be conducted when the incinerator is first used for the disposal of PCB's and when the incinerator is first used for PCB disposal after it has been modified in a manner which affects the characteristics of the stack emission products.

Monitoring will include, besides those substances normally monitored, total chlorinated organic content and PCB chemical substances. The samples will be collected by ENSCO personnel or an outside contractor using approved EPA procedures and analyzed by an outside contractor.

2. Combustion monitoring: Combustion monitoring, in addition to stack monitoring, consists of measuring temperatures and draft at the burners. Temperatures are monitored and recorded at 1-hr intervals at the outlet of the combustion chamber and the duct between the primary combustion chamber and the afterburner chamber.

3. Feed rates: Feed rates are measured and recorded at 1-hr intervals. The feed rates are measured using flowmeters installed in the organic waste stream, the aqueous waste stream, and the natural gas line. The flowmeter's calibration was checked by Acurex in the initial tests conducted for EPA during a chlorinated waste incineration.

4. Scrubber monitoring: Scrubber functions monitored consist of flow, temperature, and pH.

a. Scrubber flows: The air flow to the scrubber induction jet is monitored and recorded on an 8-hr basis. Water flow to the scrubber jet is also monitored and recorded every 8 hr. Recirculating brine and makeup water flow rates to the sieve plates are also monitored and recorded every 8 hr.

b. Scrubber temperatures: The scrubber temperatures at the throat, below the first sieve plate, and at the discharge to the stack are monitored and recorded every hour.

c. Scrubber liquids pH: The pH of the scrubber discharge liquid is monitored continuously and recorded every hour. Samples are collected from taps located at the first sieve plate, the demister, and the base of the stack every hour. The pH's of these samples are measured using pH paper or a pH meter and are recorded.

5. Sample monitoring: At the beginning of each lot of waste incineration, a sample of the organic and aqueous feed is collected and analyzed for total heating value, chlorine, phosphorus, and sulfur. Heating value is determined using a calorimeter. Sulfur, chlorine, and phosphorus content of the waste feed is determined on the residue from the calorimeter using standard analytical procedures.

In addition to the above test, the following data are recorded on a data sheet to assist in monitoring the TOU operation: total volume of organic waste incinerated, total volume of aqueous waste incinerated, feed analysis, stack test results, critical operating parameters of the TOU, and gas analysis by Dräger tubes.

6. Water well monitoring: The water well on the ENSCO property is checked for contaminants approximately monthly by either the ENSCO laboratory or outside contractors. The water is checked for chlorinated hydrocarbons. Only once has the presence of chlorinated hydrocarbons been reported, and this was found to be the result of a contaminated line and not contaminated well water.

Two groundwater monitoring wells will be in operation by December of 1978 to meet EPA requirements for handling PCB's. Soil samples will also be collected for testing at 18- and 36-in. depths within the diked area.

7. Ambient air: Plans call for obtaining four high volume particulate air samplers for fence-line monitoring. After they are in place, these samples will measure fugitive air emissions and source contribution.

a. Downwind concentration calculations: ENSCO has listed the pollutants which can be expected from its operation. The pollutants were selected based on good combustion of the feed material ENSCO plans to incinerate. The effluent list and the estimated concentrations as related to the TOU feed rates are conservative.

Based on the results of dispersion modeling, it was determined that the maximum concentration would occur 1,850 ft or less from the stack. ENSCO's property line extends to a minimum of at least 5,000 ft from the TOU stack. The maximum concentration, for which limits have been established, were in all cases at least 100 times below the established limits. For materials which the Arkansas Air Pollution Code has not established limits, the OSHA workplace limits were used as guidelines. The OSHA values are levels which are considered safe for exposure for 8 hr a day. The maximum concentration for the OSHA materials was also well below the limit.

I. Spill Prevention and Cleanup

The spill prevention and clean-up program at ENSCO consists of having a well-developed reporting and clean-up procedure, a detailed manual, frequent checks of the equipment, designation of employees responsible for leaks where they are working, and on-the-job training for the staff. The procedures are primarily directed toward preventing the discharge of toxic waste or oil into the waterway. This emphisis is, of course, the direct result of current legislation which dictates the control of such episodes. Currently, ENSCO is placing more emphasis on the rapid clean up of spills which occur on the property that may produce an odor problem.

1. Spill prevention: ENSCO has prepared a detailed document for the guidance of employees in the prevention of accidental spills. The document covers past spills, potential spills, and a spill contingency plan; it lists inspection and reporting requirements and outlines personnel training.

Included in this document is a complete description of the system's design and operation. This section discusses the facility's drainage, which is divided into four sections or areas. These are the process area, storage area, drumming area, and the general area.

Individual operations are then broken out for a detailed discussion under the subject headings of bulk storage tanks, transfer lines and associated equipment, and railroad and tank truck loading and unloading areas.

Government regulations which apply to each operation are presented, and a system and philosophy of contamination isolation are given.

2. Materials information: A materials safety data sheet has been prepared by ENSCO for use by the personnel handling waste accepted for disposal. The data sheet contains information necessary for the safe handling of the material and for clean up should a spill occur.

3. Bulk storage: The storage tanks are diked to contain any spills. The dikes are of sufficient capacity to contain the entire contents of a tank and a 25-year, 24-hr rain. Containment is the first step in a clean-up procedure. After containment, the contents of a diked area can be picked up with a pump and stored in alternate tanks while repairs are being made. There is sufficient spare tankage to handle such operations should the need arise. Leaks which might occur in transfer pumps and lines are handled by local diking. The material can then be picked up by vacuum and transferred to storage.

4. Equipment inspection: In addition to visual inspection of the system during operation, present plans call for an annual inspection and testing to be performed on all major equipment.

5. Security: Security is an important part of any spill prevention plan. Such procedures are required to prevent the unauthorized operation of any equipment which could cause material to be spilled. Most but not all of the ENSCO plant is fenced, and entrance is through one gate which can be locked and guarded when the plant is closed. Normally the plant is operating 24 hr a day. The gates are open during the day shift and locked during the other two shifts.

Open lines to plant valves are capped when not in use, and pump controls are located away from the pumps. The facility is lighted for inspection.

6. Clean up, minor spills: The procedure for cleaning up minor spills consists of containing the spill and treating the material in the ENSCO waste treatment system.

7. Spill contingency plan: The spill contingency plan covers spills which reach the water course; initially Boggy Creek. The plan lists plant supervisors to be notified, the information required on the spill, public officials to be notified, and procedures to be followed. The procedures are broken down into subcategories; spills in a fully diked area, spills in a undiked area, and spills into a tributary of navigable water. A list of equipment available for clean up and a list of contractors with phone numbers who are available for assistance are contained in the spill contingency document. Arrangements are now being investigated to have a spill response team supplied by EMPAK, a division of PAKTANK, U.S.A., stationed at ENSCO.

J. Fire Protection

Fire protection consists of employee training, fire fighting equipment, regular inspection of equipment, and preventive measures.

1. Employee training: The assistance of the local fire department has been obtained to train ENSCO in fire fighting procedures. During safety meetings, the nature of ENSCO operations and the associated fire hazards are examined. In addition, smoking and flame-producing devices are prohibited in general on the plant grounds. A notice of this regulation is posted at the plant entrance. Provisions have been made for smoking in controlled areas for the staff. For visitors, the regulations are enforced by the staff. Visitors are not allowed unescorted on the property.

2. Fire fighting equipment: The ENSCO facilities are supported by an extensive water main and hydrant system for fire fighting. A map is maintained which shows the location of the water mains and hydrants.

a. Extinguishers: A total of 29 class ABC extinguishers with a capacity of 10 to 20 lb are located throughout the facility. The extinguishers are checked on a regular basis, with the date they were last checked recorded on a report form. The report form is also a master list of the location of all of the extinguishers.

b. Fire hydrants: The fire hydrant system consists of 6-in. water mains and hydrants. The system is connected to the city water system and the plant well. There are approximately 20 hydrants now in service covering most of the current active areas of the ENSCO operation. This is the area north of the railroad tracks. A 210,000-gal. storage tank is being connected into the system to serve as a backup. The tank will be equipped with a 1,000-gpm diesel driven pump to make the system independent of the outside utilities.

K. Safety Regulations

The safety program at ENSCO consists of the appointment of a plant safety officer, the preparation of a safety manual, the preparation of a set of safety procedures for supervisors, and regular safety meetings held weekly.

1. Safety officer: The safety officer is under the direction of the technical manager. His responsibilities include safety training and updating the safety manual.

2. Safety manual: The safety manual is a well-prepared document. Each new employee is presented with a personal copy. The manual covers safety precautions, housekeeping, first aid, fire prevention, protective equipment, eye protection, use of hand tools, lift truck operation, opening and closing valves, ladder and scaffolding, procedures for control of heat-producing devices, entering tanks, protective tagging and locking out of equipment, motor vehicle operations, load lifting and handling, carpentry work, painting, welding, pipe work, sheet metal work, machine work, automotive repair, electricl work, instrument work, roads and grounds work, and laboratory procedures.

3. Supervisor's safety procedures: The supervisor's safety procedures go into more detail than the safety manual and cover the supervisors' areas of responsibility. Information is presented in those areas requiring the supervisor's permission before the work can be completed.

4. Safety meetings: Safety meetings are held weekly on a departmental basis. The department supervisor leads the discussion. Personel go through safety procedures individually to demonstrate their understanding and to locate any problem areas.

5. Enforcement: The organization handbook of ENSCO includes a number of violations which can result in warnings being included in an employee's record or immediate discharge or suspension. These are separated into minor violations, which result in a warning, and major violations, which result in discharge or suspension. Sixty-five percent of the rules are safety-related.

6. Accidents: The organization handbook references the safety manual and provides a section on reporting an accident and obtaining medical treatment.

L. Environmental Impact Statement

ENSCO has not prepared an environmental impact statement (EIS). This document was not prepared because ENSCO started operations before an EIS was required by the government.

M. Insurance

ENSCO's insurance consists of liability insurance, basic automobile insurance, group health and life insurance, and workman's compensation.

1. Liability insurance: ENSCO carries an umbrella liability policy for $1 million each occurrence and/or $1 million in aggregate for each annual period. This is in addition to the manufacturer's and contractor's general liability policy which provides basic coverage of $300,000 for bodily injury and $100,000 for property damage. The policy covers personal injury, property damage, and advertising liability. The insurance does not cover products and completed operation. The policy also does not provide protection for liability related to contracts except in the case of leases of premises, easement agreement except with railroads, undertakings to indemnify a municipality required by municipal ordinance, side track agreement, or elevation maintenance. The policy covers personal injury or property damage arising out of a sudden and accidental release of smoke vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere, or any water course or body of water.

2. Automobile insurance: ENSCO carries automobile insurance which covers owned, non-owned, and rented equipment. The policy defines automobile as any type of a land motor vehicle including a trailer or semitrailer designed to travel on public roads. The coverage is for bodily injury up to $100,000 for each person, $300,000 for each accident, and $100,000 for property damage for each accident. The policy does not cover bodily injury or property damage resulting from the transport of any nuclear material nor injury or death while entering or alighting from a vehicle. The policy also does not cover ENSCO's equipment if it has been leased by, hired by, or rented to another organization. ENSCO also carries an excess comprehensive automobile liability policy which gives an increase over and above the basic coverage for $150,000 each person and $200,000 each accident. The total coverage is therefore $250,000 for each person and $500,000 for each accident.

3. Group health and life insurance: ENSCO provides each employee with health insurance on a cost-sharing basis between 3 and 6 months' employment. After 6 months of employment, the health insurance is provided without to the employee. Cost-sharing health insurance is available for dependents. Term life and accidental death and dismemberment insurance is also available to the employee.

4. Workman's compensation: Standard workers compensation and employee's liability insurance in the amount of $100,000 for each accident is provided the employees.

N. Operating Permits

ENSCO has been granted Air Quality Permit No. 249-A and Water Quality Permit No. 1666-W by the Arkansas Department of Pollution Control and Ecology.

The U.S. Environmental Protection Agency regulates air emissions from incinerators as published in the Federal Register under the Clean Air Act and its Amendments of 1977.

To comply with the above requirements, a test burn on chlorinated hydrocarbons was conducted during the week of June 4, 1977. The test was conducted by the Acurex Corporation under EPA Region VI sponsorship.

The stack test results indicated that all of the chlorinated components were effectively destroyed. The destruction efficiencies were greater than 99.999% for all tests. Approval was therefore granted to proceed with the incineration of materials known to be no less difficult to destroy by incineration than the feed material. ENSCO has pending an application with EPA, Region IV, for the incineration of PCB's as required.

III. EVALUATION OF CURRENT STATUS

The following section presents an evaluation of each phase of ENSCO's operation. The discussion is organized and presented under the same subject headings that were used in Section II.

A. Transportation Facilities

The overall operation of ENSCO's transportation facilities appears to be satisfactory. ENSCO's responsibility is well defined by federal regulations. The staff at ENSCO are well informed. Provided the federal regulations and ENSCO rules are followed, there should be no problems.

1. Organization responsible: The drivers are familiar with labeling and identification requirements and have been given instructions and the authority to refuse materials improperly identified or of a questionable nature. Once the shipment is properly identified and accepted by the ENSCO agent (drivers), the shipment becomes the responsibility of ENSCO.

2. Responsibility of Transporter: After accepting the shipment, ENSCO's responsibility consists of following the Federal Motor Carrier Safety Regulations. It appears that all of these regulations are being followed. The drivers are well trained and know the procedures to be followed in case of accidents resulting in property and/or personal damage and in the case of discharge of all or part of the cargo.

3. Transportation equipment: The tractors and tankers now in use are modern, well-maintained equipment. The tractors are receiving inspection and maintenance as required by the Federal Motor Carrier Regulations.

The tractors carry the specified safety equipment. In addition, they are equipped with emergency equipment to protect the drivers and to aid in containing a spill should it occur during transportation. A CB radio is installed in each tractor for emergency communications. The equipment included in the tractor shows considerable planning and forethought, and the planning effort is to be commended.

4. Liability: ENSCO is aware of its responsibility and has done all that is reasonable to provide coverage for accidents during transportation of hazardous material. ENSCO personnel have made good provisions to hold damage to a minimum. Liability insurance is discussed in the relevant section.

5. Safety procedures: The safety procedures comply with the law and go beyond. Direction and procedures are excellent.

6. Clean-up procedures: The provision for spill clean up during transportation of materials is good, but there appear to be two potential problems which need to be addressed in the clean-up procedures. There are no instructions for the drivers as to the action to take if a spill occurs and they are unable to contact the Transportation Department. The possibility of such a situation occurring is remote under the existing system. However, this omission should be corrected.

Also, the procedure emphasizes the clean up of oil spills. But additional information should be presented for the clean up of other types of spills during transportation.

B. Inventory Control

The method of inventory control appears to be satisfactory providing the rules are followed.

1. Waste material acceptance: The procedures outlined in the ENSCO regulation should prove adequate for inventory control. The procedure of holding a shipment in the shipping container or trailer until confirmatory analysis is complete is excellent.

2. Material classification: Control of material received by issuing a work order for transfer is an excellent approach. This permits classification based on laboratory evaluation to precede transfer and prevents additions to incompatible stocks.

3. Blending: The blending procedures are adequate, based as they are on laboratory evaluations.

4. Inventory: The running inventory employed should be adequate. The use of work orders to transfer material to storage tanks and the use of the TOU production report should produce an acceptable material balance. The gauging of the tanks will serve as an additional check. The blending of material for 1 week's operation of the TOU combined with operation of the TOU until the entire supply blend is incinerated will prevent the accumulation of a highly complex blend. This will simplify inventory control into a workable system. These procedures are currently employed by ENSCO.

5. Special waste: The procedure for acceptance of special waste appears to be satisfactory. It is our understanding that if there is any question about satisfactory disposal of waste, the material will not be accepted by ENSCO. Such wastes have been turned down by ENSCO in the past.

C. Feed Analysis

The overall program of waste analysis is acceptable.

1. Sampling: The sampling procedure and methods are well designed and adequate.

2. Blending and storage compatibility: The laboratory tests to check samples for suitability for blending and storage are acceptable.

3. Chemical analysis: ENSCO has the trained personnel and equipment necessary to perform chemical analysis of the waste material presently accepted for disposal. The equipment is new and of high quality. The laboratory should meet ENSCO needs. Future expansion into new types of waste will require additional equipment or outside contractors.

D. Storage Facilities

1. Materials of construction: The storage facilities, although old, are in an acceptable condition. The dikes in use have been repaired and have adequate capacity. The proposed addition of impervious liners will greatly improve the versatility of the system and will increase the safety margin. Mild carbon steel is a satisfactory material for storage tanks and piping providing the laboratory continues to maintain careful control of compatibility with the materials stored. The proposed lining of the tanks with fiberglass will increase the capability of the storage facilities to handle a wide range of materials with improved safety.

2. Emission control: The Ventsorb units installed on the storage tanks should provide satisfactory emission control. This is true of course only if the units receive proper maintenance and service. The storage of aqueous materials in floating roof tanks will be acceptable only as long as the waste does not have a strong odor. Improved pump maintenance is needed.

3. Transfer facilities: The current transfer procedures which use air driven pumps should be acceptable. Under no circumstances should the portable gasoline driven pumps used on aqueous waste be used on an organic stream.

4. Safety: The safety features of the storage facilities meet minimum acceptable standards. The addition of foam and water fire protection to the storage tank will be a significant improvement. Additional features which are desirable but not required include lightning protection on the tanks, scheduled checks on the pressure relief valves, and automatic pressure and temperature monitoring-alarm systems on active tankage.

E. Disposal Facilities

The disposal facilities are superior. The TOU and associated equipment will safely handle almost any material which can be thermally oxidized.

1. Feed rate control: The existing system of manual control is acceptable primarily because of the large thermal mass of the TOU. The modification required for approval as a facility for the disposal of PCB's will make the unit virtually foolproof.

2. Make-up fuel: The existing provisions for adding make-up fuel when required to maintain temperature is adequate.

3. Low temperature cutoff: The control for low temperature cutoff of waste feed by manual operations as currently performed is acceptable in this unit. A problem could develop only by the inattention of the operator for several hours, a situation which is highly unlikely. However, the modifications required for approval for the incineration of PCB's will remove even this unlikely situation.

4. Determining residence time: The procedure used to calculate residence time is acceptable and the values used in the calculation are accurate. The calculated residence time of 5 sec is more than adequate for the destruction of waste.

5. Qualifications of operating personnel: The TOU operating personnel are qualified for their position, and no significant improvement is required.

6. Minimization of operation errors: The operating procedure has been well planned and documented. A record system exists to evaluate the systems performance. No further improvement appears to be required in this area.

7. Scrubber operation: The scrubber will handle the effluent produced by the TOU provided the existing feed criteria are observed. Even if the feed criteria were not followed, the scrubber had the capability of controlling a significant amount of the emission including a system upset.

a. Materials controlled by scrubber: The scrubber operating in the pH range of 8.0 to 9.5 will remove almost all particulate matter and most acid gases. The test performed by the Acurex Corporation for EPA found the particulate concentration to be between 2.3 and 4.0 mg/dscf. The HCl concentration in the stack was found to be 0.8 to 1.4 mg/dscf. These levels are very low and indicate a very high performance from the scrubber. ENSCO has stated that the scrubber will control P_4O_{10}, and they may be correct. However, in other systems P_4O_{10} has sometimes behaved in an unpredictable manner. The most effective procedure for removing P_4O_{10} has been to follow the scrubber with demister pads. This is not a problem at present because ENSCO is not incinerating materials with a high phosphorus content. However, if the disposal of high phosphorus materials such as pesticides is considered for incineration in the future, the system should be carefully reevaluated.

b. Scrubber safety interlock: The present safety interlock between the scrubber and the TOU is acceptable.

c. Stack: The stack is more than adequate for good dispersion.

F. Decision Levels

The decision levels are well defined and carry the necessary authority. The staff at ENSCO can obtain appropriate action where required. No further action is required.

1. Normal operation: A chain of command has been established with alternates available where required. No changes appear to be required.

2. Accidental leaks: The use of a committee led by the Technical Department to dispose of unestablished quality material is an excellent approach. This approach should prove more than satisfactory to meet the facility requirements.

3. Problems during transportation: The basic procedures as contained in the drivers instructions appear to be very clear and to the point. The instructions direct the driver to contact the Transportation Department for instructions after the truck has been removed from the road and the spill has been contained. Drivers authority should be defined in the event the driver cannot contact ENSCO.

4. Absence of normal authority: The present plan appears to be adequate with the exceptions of the previously stated omission.

G. Qualifications of Personnel

All personnel appear to be well qualified for their present positions.

H. Monitoring Program

The monitoring program appears to cover what could be considered the basic needs of ENSCO.

1. Stack monitoring

a. Gases, continuous: The present program of continuously monitoring only the oxygen content provides sufficient information for the safe operation of the ENSCO unit. The combination of excess oxygen and the long residence time and the minimum temperature of 1800°F assures complete combustion.

b. Gases, 8 hr: The use of Dräger tubes to monitor stack gas concentrations will be adequate. However, it should be remembered that Dräger tubes are semiquantitative, must be properly stored, and must be used before their expiration date to produce acceptable results.

c. Gases, weekly: Provided a week's supply of waste is blended as proposed by ENSCO, a measurement of once a week for sulfur dioxide and chlorides will probably be adequate. This approach will be satisfactory only as long as the same combustion conditions are maintained that existed during the test period. A continuous stack gas sulfur dioxide monitor would be desirable although not essential.

d. Hydrocarbons, continuous: The present system will meet the system's requirements satisfactorily.

e. Particulates, weekly: For particulates, a 1-week blend of fuel with a single analysis is conducted the same as for sulfur dioxide. The same limitations apply. A continuous opacity instrument would be desirable although not essential.

f. Particulate chemical analysis: The current programs should prove adequate.

g. Special stack analysis: Special stack gas analysis applies only if ENSCO receives approval to dispose of PCB's. If such approval is received, the analysis will be prescribed by EPA regulation.

2. Combustion monitoring: The system now in use is adequate and no modifications are required.

3. Feed rates: The present system for measuring feed rates is satisfactory, and recording the rates at 1-hr intervals is sufficient.

4. Scrubber monitoring: The procedure for monitoring the scrubber operation is adequate.

a. Scrubber flows: All critical flows are monitored and recorded at acceptable intervals.

b. Scrubber temperatures: All important scrubber temperatures are monitored, and the frequency of recording the data is acceptable.

c. Scrubber liquids pH: The locations, method of measuring, and frequency of monitoring the pH of scrubber liquids are adequate to assure proper operation of the scrubber.

5. Sample monitoring: The analytical program used to monitor the waste feed is capable of providing ENSCO with the information required to properly and safely operate the TOU.

6. Water well monitoring: The well water is analyzed to determine if the water table has been contaminated. The current program calls for sampling and analysis approximately once a month. This should be more than adequate to protect the environment.

7. Ambient air: The plans of ENSCO to monitor the air at the fence line is not a required but will provide a desirable check on the TOU operation.

a. Downwind concentrations calculations: The calculations of downwind maximum concentrations of emissions indicate that the safety factor is so large that ambient measurements would serve little purpose other than to check the calculations. Also, the measurement of such low concentrations would be difficult.

I. Spill Prevention and Cleanup

The spill prevention and cleanup procedures adopted by ENSCO should prove adequate in the event of a spill. Progress has been made in the rapid cleanup of small spills to prevent odor problems. However, additional progress is possible and desirable to eliminate such episodes as fully as possible. The odor problem is, of course, not health-related but rather is a good neighbor problem.

1. Spill prevention: The spill prevention plan appears to be well planned and adequate to meet the operation requirements. The facility should be under continuous surveillance to prevent vandalism.

2. Materials information: The availability of a materials data sheet is an excellent approach to providing the staff with information required to properly clean up a spill. No improvement can be suggested.

3. Bulk storage: The procedures specified for containing and cleaning up a spill in the bulk storage area are adequate.

4. Equipment inspection: The program for equipment inspection as specified should be adequate with the exception of the pumps. A quarterly inspection of the pumps should be initiated.

5. Security: The basic security program should be satisfactory.

6. Cleanup, minor spills: The specified procedure will be satisfactory providing the spill does not have a strong odor. If odors are a problem, the material should be collected and returned to storage or incinerated.

7. Spill contingency plan: The spill contingency plan to protect navigable waters should provide sufficient protection. Provisions should be made to notify city officials in the case of a spill as well as the state and federal agencies.

J. Fire Protection

The overall fire protection plan will handle minor fires and prevent their spreading. The plan relies on the local fire department in the

case of a major fire. Provision should be made to immediately provide the fire department information on the nature of the fuel in the event their assistance is required.

1. Employee training: The employee training is satisfactory.

2. Fire fighting equipment: The fire fighting equipment is adequate.

a. Extinguishers: The extinguishers are of the proper type, are identified and properly located, and are of adequate capacity; and a sufficient number are available. ENSCO regulations specify a yearly check of the extinguishers. In addition to this, the safety manual should require that a person discharging an extinguisher be responsible for taking it to the safety department for recharging and for picking up a spare unit.

b. Fire hydrants: The fire hydrants and water mains are acceptable. The proposed standby system is very desirable and will significantly improve the system's capabilities. A trailer (containing protective equipment and fire hoses) which could be pulled to a fire would be a desirable addition to the system's capabilities.

K. Safety Regulations

The overall safety regulations and their administration are acceptable with a few minor exceptions. A recent OSHA inspection uncovered only minor problems other than the fire in ENSCO's operation.

1. Safety officer: This position appears to be functioning satisfactorily.

2. Safety manual: In general, the safety manual is acceptable. However, there is insufficient instruction contained in many of the sections. The manual should be rewritten at the earliest possible convenience. The safety officer should review OSHA regulations as published in the Federal Register and make appropriate modifications.

3. Supervisors' safety procedures: The detailed instruction of supervisors is a good approach to improving safety.

4. Safety meetings: Regular safety meetings are an important part of any program. A weekly meeting is probably desirable while the personnel are being trained. Most organizations find that too frequent safety meetings have a negative effect. ENSCO might consider spacing out the meetings to once or twice a month after the initial training period.

5. Enforcement: The provisions for enforcing safety are satisfactory as specified.

6. Accidents: The information pertaining to accident reporting and treatment is detailed and satisfactory.

L. Environmental Impact Statement

An environmental impact statement is not required and therefore was not prepared.

M. Insurance

ENSCO's insurance appears to be complete in coverage and adequate.

1. Liability insurance: It is, of course, impossible to predict the insurance coverage that will be required for protection in the case of a lawsuit. However, based on precedence it appears that ENSCO's coverage should be adequate. The average cost of cleaning up an industrial spill has been running $49,000. This includes property damage but does not include fines leveled against the responsible party.

2. Automobile insurance: The automobile insurance, which includes coverage of the tractor trailers, exceeds legal requirements and is expected to prove sufficient.

3. Group health and life insurance: The ENSCO policy provides adequate protection for the staff. Although not required, these policies improve the staffs moral and therefore becomes a part of the safety program.

4. Workman's compensation: The policy covers the amount specified by law.

N. Operating Permits

ENSCO has the required operating permits for the State of Arkansas and is complying with the federal regulation which cover its operation.

IV. PROPOSED REGULATIONS

Attached to this report as an appendix are sections 3004 and 3005 of the proposed regulations which are being promulgated under Subtitle C - Hazardous Waste Management of the Resource Conservation and Recovery Act of 1976 (RCRA).

These sections apply directly to the ENSCO facilities and are presented in summary form except for the part relating to fiscal/liability which is presented verbatum. A review of the proposed regulations found that ENSCO is presently complying with or initiating procedures to comply with all sections with the exception of the requirements relating to fiscal responsibility/liability. ENSCO will also need to expand its analysis of groundwater to include the materials listed under Standard No. 14. It will also be necessary to add some components to the automatic waste feed cutoff mechanisms to meet the requirements specified in Section No. 16.

V. RECOMMENDATIONS

The recommendations made during the previous discussion are primarily of a minor nature and their adoption will only improve an already generally satisfactory operation. The evaluation did not uncover any serious problems. The staff is knowledgable, informed, courteous, and well trained. ENSCO should be able to perform the operation without endangering or significantly degrading the safety, health, or welfare of the community.

Financing is, of course, always a problem, especially in such a young organization. In this respect it is desirable that a trust fund be established to provide for the orderly shutdown of the operation and the disposal of existing inventory in the event the company's operations cease.

Since such legislation is now being considered by the federal government, is further recommended that the City of El Dorado defer action and allow time for the adoption of the federal regulations.

It is recommended that the City of El Dorado prepare and adopt an odor control ordinance. It appears from experience that the best approach is based on the use of trained observers and the evaluation conducted at the property fence line. Objectionable odors of 30 or more minutes duration are to be considered a violation.

No other recommendations have been developed from this investigation.

APPENDIX

PROPOSED REGULATIONS

The following sections are included as an appendix to this report because of the potential impact on the operations at ENSCO.

Regulations pertaining to the generation, transportation, and disposal of hazardous wastes are being promulgated under Subtitle C - "hazardous Waste Management" of the Resource Conservation and Recovery Act of 1976 (RCRA). The Act called for final regulations on hazardous waste to be promulgated by no later than April 1978, but it appears that this schedule will slip by 4 to 6 months. The regulations on hazardous waste will become effective 6 months after promulgation (probably February to April 1979).

It is important to note that under Section 3010 any person generating, transporting, or owning or operating a facility for storage, treatment, or disposal of hazardous waste must notify EPA within 90 days of promulgation of Section 3001 (i.e., probably by May to July 1979).

Preliminary drafts of the sections directly affecting the operation of disposal facilities (Sections 3004 and 3005) are available for public comment. The following paragraphs briefly summarize these drafts.

A. Draft of Section 3004

"Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," dated February 24, 1978.

This section is intended to define the levels of human health and environmental protection to be achieved by these facilities and to delineate the criteria against which EPA and/or state officials will measure applications for permits.

The following mandatory standards or objectives, i.e., those standards which must be complied with at all times, are delineated. Recommended procedures for complying with these mandatory standards are also provided in most cases. These procedures represent EPA advice on how to operate in order to comply with the respective mandatory standards but do not have to be followed if alternate procedures are effective.

1. Standard No. 1: Facilities. . . do not degrade any groundwater such that usable aquifers anywhere outside the facility property would at any time in the future be endangered.

Procedure: No discharge to groundwater.

2. Standard No. 2: Air emissions. . . do not adversely affect human health or the environment; air emission standards promulgated at any time under the Clean Air Act and its amendments will be met; as a interim measure, for air contaminants not yet regulated by EPA, maximum allowable

concentrations of one-tenth of the respective work room standard shall not be exceeded beyond the facility owner's property as a result of emissions from the facility.

Procedure: No open burning.

3. Standard No. 3: Point sources discharge (including leachates and surface runoff) to navigable waters shall comply with the regulation promulgated under the Federal Water Pollution Control Act, as amended.

Procedure: Collect and contine surface runoff before discharge; diversion of surface water runoff from active facilities with a capability to divert up to the runoff from a 24-hr, 25-year storm.

4. Standard No. 4: Facilities shall be located so as not to (a) constitute a threat to human health via public or private wells; (b) be on or near active fault zones; (c) be inundated by a 100-year flood; (d) be in a wetland, with certain exceptions; (e) be in a permafrost area, with certain exceptions; or (f) be in a critical habitat area (as defined in 50 CFR 17, Subpart F), with certain exceptions.

Procedure: Facilities constructed after the effective date of these regulations shall be located at least 100 ft from any public road, 200 ft from any residence, and on land with low alternate use value.

5. Standard No. 5: Specified requirements relating to fiscal responsibility/liability are delineated.

Procedure: As now proposed, the minimum level of financial responsibility is $5 million for claims arising out of injury to persons or property from the release of hazardous wastes to the environment.

This requirement applies to all facilities.

In addition to the regulations presented in these proposed rules, the following options were also considered.

1. Each owner or operator will maintain at least $1 million of financial responsibility during the operation of the site. A site-specific trust fund will be built up during the operation of the site to provide protection to the public for damages resulting from the escape of hazardous wastes to the environment after site closure.

2. Each owner or operator of a hazardous waste treatment, storage, or disposal facility shall have and maintain financial responsibility in the minimum amount of $10 million for injury resulting from release or escape of hazardous wastes to the environment.

a. Requirements for facility closure

(1) Cost estimation: Each owner or operator of a hazardous waste treatment, storage, or disposal facility shall estimate the costs of closing the facility after its capacity is reached.

(2) Financial assurance for facility closure: Each facility owner or operator shall furnish the administrator with a surety bond, and place an annual cash deposit in a bank account marked "in trust for the closure of the permitted hazardous waste facility." The sum of the surety bond and cash deposit shall equal the closure cost estimate made. The amount of the annual cash deposit shall be determined in the following manner:

If the site life of a facility is less than 5 years, the amount of the annual cash deposit for closure shall be determined by the following formula:

$$1/L\ (Cc)$$

in which L = the anticipated operation life, in years, of the facility, and Cc = the sum of the estimated closure cost. In each year the facility is in operation, the owner or operator shall place in the trust account an additional cash deposit in the same amount so that at the end of the facility operation, there shall be a total cash deposit that equals the estimated closure cost.

During each year the facility is in operation, the amount of the surety bond shall be reduced proportionately so that the sum of the bond and cash deposit shall always equal the total amount of the closure cost estimate.

If the site life of a facility is equal to or greater than 5 years but less than 12 years, the amount of the annual cash deposit for closure shall be determined by the following formula:

$$1/5\ (Cc)$$

in which Cc = the sum of the estimated closure cost. In each of the first 5 years the facility is in operation, the owner or operator shall place in the trust account an additional cash deposit in the same amount so that at the end of facility operation there shall be a total cash deposit that equals the estimated closure cost.

During the first 4 years of this period, the amount of the surety bond shall be reduced proportionately so that the sum of the bond and the cash deposit shall always equal the total amount of the closure cost estimate.

If the site life of the facility is 12 years or greater, the amount of the annual cash deposit shall be determined by the following formula:

$$2/L\ (Ce)$$

in which L = the anticipated operating life, in years, of the facility and Ce = the sum of the estimated closure cost. In each year for the first half of the life of the site, the owner or operator shall place in the trust account an additional cash deposit in the same amount so that at the end of the first half of the life of the site there shall be a total cash deposit that equals the estimated closure cost.

During the first half of the life of the site, the amount of the surety bond shall be reduced proportionately so that the sum of the bond and the cash deposit shall always equal the total amount of the closure cost estimate.

b. Requirements for post-closure monitoring and operations

(1) Cost estimation: Each hazardous waste disposal facility owner or operator shall estimate the annual costs of post-closure monitoring and maintenance at the facility. By definition, treatment and storage facilities will have no need to conduct post-closure monitoring or maintenance. The facility owner or operator shall estimate the number of years that the site in question is expected to operate prior to closure. These estimates shall be based on the types of wastes to be disposed of, disposal methods to be employed, estimated capacity of the site, and anticipated annual volume of wastes to be disposed of. These values shall then be used to estimate the size of a deposit, interest from which will provide sufficient funds to pay post-closure monitoring costs and maintenance costs in perpetuity using the following formula:

$$\text{post-closure operating cost deposit} = \frac{AC}{0.015}$$

in which AC = the sum of anticipated annual costs.

(2) Financial assurance for post-closure maintenance and operation: Each facility owner or operator shall furnish the administrator with a surety bond and place an annual cash deposit in a bank account marked "in trust for post-closure monitoring and maintenance of the permitted hazardous waste disposal facility." The sum of the surety bond and the annual cash deposit shall equal, with the accrual of interest on the cash deposit over the life of the site, the post-closure operating cost deposit. The amount of the annual cash deposit shall be determined in the following manner:

If the site life of a facility is less than 5 years, the amount of the annual cash deposit shall be determined by the following formula:

$$\frac{AC}{0.015 \sum^{L} (1+0.015)^{L-2}}$$

in which AC = the sum of the anticipated annual costs, and L = the anticipated operating life, in years, of the facility. In each year the facility is in operation, the owner or operator shall place in the trust account an additional cash deposit in the same amount so that at the end of the facility operation, there shall be a total cash deposit that equals, with the accrual of interest over the life of the site, the estimated post-closure operating cost deposit.

During each year of facility operation, the amount of the surety bond shall be reduced proportionately so that the sum of the bond and cash deposit shall always equal the total amount of the post-closure operating cost cash deposit required at the end of site life. The amount of the deposit required at the end of site life shall be calculated by the following formula:

$$\frac{AC}{0.015}$$

If the site life of a facility is equal to or greater than 5 years, but less than 12 years, the amount of the annual cash deposit shall be determined by the following formula:

$$\frac{AC}{0.015 \sum^{5} (1+0.015)^{L-2}}$$

in which AC = the sum of anticipated annual costs, and L = the anticipated operating life, in years, of the facility. In each of the next 4 years, each facility owner or operator shall furnish the administrator with an additional cash deposit in the same amount so that at the end of 5 hears there shall be a total cash deposit that equals, with the accrual of interest over the life of the site, the estimated post-closure operating cost deposit.

During the first 4 years of this period, the amount of the surety bond shall be reduced proportionately so that the sum of the bond and the cash deposit shall always equal the total amount of the post-closure operating cost cash deposit required at the end of the 5-year period. The amount of the deposit required at the end of the 5-year period shall be calculated by the following formula:

$$(1+0.015)^{-L+5} \times \frac{AC}{0.015}$$

If the site life of a facility is 12 years or greater, the amount of the annual cash deposit shall be determined by the following formula:

$$\frac{AC}{0.015 \sum^{L/2} (1+0.015)^{L-2}}$$

in which AC = the sum of the anticipated annual costs, and L = the anticipated operating life, in years, of the facility. In each year for the first half of the life of the site, each facility owner or operator shall place in the trust account an additional cash deposit in the same amount so that at the end of the life of the site there shall be a total cash deposit that equals, with the accrual of interest over the life of the site, the estimated post-closure operating cost deposit.

During the first half of the operational life of the site, the amount of the surety bond shall be reduced proportionately so that the sum of the bond and the cash deposit shall always equal the total amount of the post-closure operating cost cash deposit required at the end of the first half of the life of the site. The amount of the deposit required at the end of the first half of the life of the site shall be calculated by the following formula:

$$(1+0.015)^{-L+L/2} \times AC/0.015$$

c. Refunds and disbursement of closure cost and post-closure operating cost deposit trust funds

(1) Closure cost trust fund: When an owner or operator has ceased operations at a facility and has completed closure operations, he or she may apply to the regional administrator for return of all funds, principal and interests in the Closure Cost Trust Fund account for the site and shall be reimbursed all such funds upon submitting to the administrator the certification of proper closure.

(2) Post-closure operating cost deposit trust fund

(a) Post-closure operation and monitoring withdrawls: One year after completion of closure in compliance with regulations, and annually thereafter, a facility owner or operator who has carried out all necessary post-closure monitoring operations may, upon application to the regional administrator be reimbursed out of the funds in the Post-Closure Operating Cost Deposit Trust Fund in an amount equal to the anticipated annual costs of these functions used to compute the post-closure operating cost deposit of the facility.

(b) Reduction in post-closure responsibilities: At any time after site closure, the facility owner or operator may demonstrate to the satisfaction of the regional administrator that by reason of the biological or chemical stabilization of the wastes disposal in a hazardous waste facility, further monitoring, or post-closure maintenance either are not necessary to protect the public health and safety or to avoid injury to the environment, or are necessary on a diminished scale. If it is demonstrated that a portion of those activities will not be further required, a portion of the principal and accumulated interest of Post-Closure Operating Cost Deposit Trust Fund equal to the proportion of total annual costs of post-closure monitoring and operations that will no longer be required will be refunded to the permit holder out of the Post-Closure Operating Cost Deposit Trust Fund for the facility.

(d) Ownership: At any time after the closure of the facility, the facility owner or operator may apply to the regional administrator for a ruling governing reduced post-closure financial requirements and ownership as follows:

1. If all formerly hazardous materials disposed of at the site have been rendered nonhazardous by reasons of treatment or the passage of time so that no further post-closure monitoring is necessary, the facility owner or operator may be entitled to a refund of all funds in the applicable Post-Closure Operating Cost Deposit Trust Fund, and to use or transfer ownership of the site without further reference to the regulations.

2. If the formerly hazardous materials disposed of at the site have been rendered sufficiently less hazardous than at the time of their disposal by reason of treatment or the passage of time so as to make further post-closure monitoring unnecessary, provided that the site is not subjected to uses incompatible with protection of human health and the environment, the facility owner or operator may be entitled to a refund of all funds in the applicable Post-Closure Operating Cost Deposit Trust Fund.

3. Nothing contained in these regulations shall require the operator of a hazardous waste treatment, storage, or disposal facility to own the real estate on which the facility is located.

e. Financial responsibility

(1) Amount of financial responsibility required of owners or operators: Each owner or operator of a hazardous waste treatment, storage, or disposal facility shall have and maintain financial responsibility in the minimum amount of $5 million for claims arising out of injury to persons or property from the release or escape of hazardous wastes to the environment. Financial responsibility in this amount shall be established and maintained as of the effective date of the permit. Proof of current financial responsibility shall be approved by and filed with the regional administrator as part of the permit application. The owner or operator must further identify to the satisfaction of the regional administrator the mechanism or method which will be employed to ensure the necessary level of financial responsibility after closure of the site.

(2) Establishment of financial responsibility: Financial responsibility may be established by any one or a combination of the following:

1. Evidence of liability insurance

2. Trust fund

3. Self insurance, or

4. Other evidence of financial responsibility

Financial responsibility must be maintained during the operation of a hazardous waste treatment, storage or disposal facility and for a maximum of 40 years after a disposal site closure. If it can be proved by the owner or operator that the maintenance of financial responsibility is unnecessary for reasons of biological or chemical stabilization of the wastes, then the regional administrator may reduce the 40 years' maximum requirement.

6. Standard No. 6: The facility must be secure from the unauthorized entry of persons or domestic animals.

Procedure: Facility shall have a 6-ft fence or wall with warning signs, impassable ditches, and attendants at gates during operation.

7. Standard No. 7: The facility shall have a contingency plan to minimize human health or environmental damage in the envent of an accidental discharge.

8. Standard No. 8: The design and operation of the facility will be "such that fires, spills, and explosions do not occur."

9. Standard No. 9: In the event of an accidental discharge, the facility's emergency coordinator will notify the appropriate authorities.

10. Standard No. 10: Facility personnel will be required to be trained to perform their jobs (a) within 18 months of effective date of regulations, (b) within 12 months for new personnel at existing facilities, and (c) within 12 months for personnel at new facilities.

11. Standard No. 11: The facility shall maintain copies of all manifests or delivery documents for 3 years and will follow the reporting scheme outlined.

12. Standard No. 12: If the facility is closed, it shall be closed in such a manner that the land is amendable to some other productive use. Specific requirements at closing are outlined, including sampling.

13. Standard No. 13: The facilities shall be monitored so as to detect any discharge. For facilities constructed after the effective date of the regulations, monitoring shall be conducted in the zone of aeration immediately below any treatment and disposal facility which has the potential for discharge to a usable aquifer. A groundwater monitoring system shall be installed to detect discharges at all facilities which have the potential for discharge to usable aquifers.

Procedure: Install leachate and groundwater monitoring system.

14. Standard No. 14: Background wells shall be located up- and down-gradient to establish water background levels and detect leachage. For new facilities, water samples shall be analyzed before disposal and for existing facilities within 90 days of the effective date of these regulations. Samples shall also be collected and analyzed at least once a year. When significant ($p = 0.05$) concentrations are detected, the EPA regional administrator shall be notified within 7 days. This analysis shall include:

Principal hazardous components of waste received	Silver
Specific conductivity	Endrin
Total organic carbon (TOC)	Lindane
Hardness	Methoxychlor
Total dissolved solids (TDS)	Toxaphene
Color	2,4-D
Corrosivity	2,4,5-TP Silvex
Odor	Radium
pH	Gross alpha
Arsenic	Gross beta
Barium	Turbidity
Cadmium	Coliform bacteria
Chromium (VI)	Chloride
Fluoride	Copper
Lead	Foaming agents
Mercury	Hydrogen sulfide
Nitrate (as N)	Iron
Selenium	Manganese
	Zinc

15. Standard No. 15: Hazardous waste storage operations shall be conducted in such a manner that no discharge occurs, facilities shall be monitored so as to detect any discharge, and storage areas shall be constructed so as to be capable of containing any spill which may occur.

16. Standard No. 16: Emissions from the incineration of hazardous wastes shall be controlled so that no fugitive gaseous or particulate emissions may result.

Incinerators shall be located, designed, constructed, and operated so as to achieve the local and federal air quality requirements.

Incinerator ash shall be analyzed to determine if it is hazardous, or assumed to be hazardous, and then handled accordingly.

Procedures: All incinerator facilities shall conduct a trial burn in order to demonstrate compliance with air quality requirements. A trial burn shall be conducted for each waste which is significantly different from any previously demonstrated.

Incinerators used to thermally degrade hazardous wastes containing halogenated organic compounds or other substances which form hazardous soluble combustion products shall be equipped with wet scrubbers or any other suitable control device or process capable of removing 99% or more of any hydrogen halides that result.

Owners or operators of hazardous waste incinerators shall provide for the retention or impoundment of all scrubber liquid effluent streams prior to the release of the effluent as a point source for discharge or disposal in order to allow composite sampling for compliance testing.

Combustion temperature during incineration of hazardous wastes and the retention time for which hazardous wastes are held at the combustion temperature shall be no less than 1000°C and 2 sec, respectively, or a combination of combustion temperature and retention time which can achieve an equivalent destruction efficiency. Greater combustion temperatures and longer residence times may be required for certain hazardous wastes to obtain higher destruction efficiencies than those associated with 1000°C and 2 sec in order to ensure that the ambient air quality objective specified.

Hazardous waste incinerators shall be equipped with automatic waste feed cutoff mechanisms which shall be utilized when significant changes in flame, combustion chamber temperature, excess air, scrubber water flow rate, or other conditions would allow air emissions to violate the air objective.

Hazardous waste incinerators shall be equipped and constructed so as to allow stack sampling and monitoring. Hazardous waste incinerators shall continuously monitor and record combustion temperature and concentrations of carbon monoxide, carbon dioxide, and oxygen.

Hazardous waste incinerators shall be operated in a manner that assures maintenance of CO and CO_2 concentrations in the stack such that combustion efficiency (as calculated in the equation below) is equal to or greater than 99.9%.

$$\text{Combustion Efficiency} = \frac{C_{CO_2}}{C_{CO_2} + C_{CO}} \times 100$$

Hazardous waste incinerators shall be operated in a manner that assures that emissions of particulate matter do not exceed 270 mg/dscm (0.12 grains/dscf) with no excess air. Compliance may be achieved by emitting less than 180 mg of particulate matter per standard cubic meter (0.08 grains/dscf) corrected to 12% CO_2 in either of the following equations:

$$\text{Particulate Emissions} = \text{Measured Particulate} \times \frac{12\%\ CO_2}{\text{Measured Percent } CO_2}$$

or

$$\text{Particulate Emissions} = \text{Measured Particulate} \times \frac{\text{Stoichiometric Percent } CO_2}{\text{Measured Percent } CO_2 \times 1.5}$$

MONS 006640

Measured CO_2 sampling may be taken in the hot gas stream upstream from the scrubber.

B. Draft of Section 3005

"Permit System for Facilities Which Treat, Store, or Dispose of Hazardous Waste," Dated November 1977.

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to have a permit. Exceptions are municipal landfills receiving only household wastes and generators of hazardous wastes who properly store the wastes for less than 90 days and ultimately dispose of or treat them in an approved facility. Permits must be obtained for new facilities or for modifications to existing facilities prior to commencement of construction and again prior to commencement of operation. Permits are issued for a period not to exceed 10 years and may be renewed for similar periods.

Some facilities licensed under other federal laws may use those permits to meet all or part of the permit requirement of this Act.

1. Special permits: Three types of special permits which cover the ENSCO operation are being considered.

a. Emergency special permit: A person may in an emergency dispose, treat, or store a hazardous waste without a permit if the emergency is declared in advance of the action by an authorized public official. Within 48 hr the EPA regional administrator must be notified of the situation; he or she will then determine the steps to be taken.

b. Special product recovery permit: Permits will be issued to encourage the development and use of resource recovery technology. The applicant must supply necessary technical information and certify the facility will comply with Section 3004 standards.

c. Temporary permit for facilities in operation on effective date of these regulations: These temporary permits will set conditions under which existing facilities can operate for up to 4 years. Temporary permits cannot be renewed.

2. Application for a permit: Permit application must be submitted no later than 300 days in advance of the date of construction of a new facility unless permission for a later date is granted by the EPA regional administrator. The regional administrator will determine within 30 days if the application is complete.

A permit application shall include information relevant to the Section 3004 standards. Compliance with these standards will be the basis of issuance or denial of the permit. Application requirements will include but will not be limited to the following: (a) detailed topographic map; (b) master plan of the facility-buildings, operations, pollution control plans, closure plans, and contingency plans for emergency situations; (c) detailed description of the hazardous wastes and how they will be stored, treated, or disposed of: (d) detailed description of site geology, hydrology, and area climate; (e) listing of personnel qualifications; and (f) applicant's performance bonds, insurance, etc.

In addition to the above, a Supplementary Environmental Analysis (SEA) is required as part of the application for permit for new facilities or major modifications to existing facilities (excepting special emergency permits). The SEA will address methods proposed to comply with the Endangered Species Act, the National Historic Preservation Act, the Historic Sites, Buildings and Antiquities Act, the Fish and Wildlife Coordination Act, and the Coastal Zone Management Act; a discussion of alternative methods of dealing with hazardous wastes; definition of proximity to population centers, utilities, roads, etc.; a description of applicable local and state zoning laws; a description of adjacent land uses within 1 mile; and a listing of other applications submitted or permits obtained under other local, state, or federal acts involving toxic or hazardous waste.

In general, permits shall not be issued for a period longer than 10 years.

Facilities existing at date of enactment of the Act shall be treated as having such a permit until a final administrative decision is made on the permit application. The same action applies to facilities under construction on the date of enactment. For existing facilities that will need modification to meet Section 3004 standards, a 4-year conditional permit may be issued. For facilities under construction at the time of enactment, a 3-year conditional permit may be issued. Conditional permits for facilities under construction may be renewed for a single 2-year period. Application for these permits must be made within 6 months of enactment of these regulations.

The EPA regional administrator has the authority to modify permits if a change in operation occurs that is considered by the administrator to be significant. All modifications made in operations must be reported to the EPA regional administrator.

3. Permit renewal: An application for renewal of a permit should be submitted at least 180 days prior to the expiration date of the permit. The application should include: (a) a description of any new information which was not considered during the review of the permit application; (b) a description of any information submitted as part of the permit application which has changed or is no longer applicable; (c) proposed changes in

the condition of the current permit; and (d) certification that the applicant has conformed with the terms and conditions of the existing permit.

4. Process of permit applications: After receiving the application, the regional staff shall prepare a tentative determination on the permit including any proposed modifications of conditions. Public notice of the decision shall be made with a 30-day comment period allowed during which a public hearing may be requested. If the request for the public hearing is granted, public notice shall be given. After a public hearing, the regional administrator will review the tentative permit and make a final decision. An adjudicatory hearing may be held if this section is challenged. A second final decision is then issued by the regional administrator. This decision can be appealed to the EPA administrator or on through the courts; appeals may be carried only by a party that has participated in all previous hearings in the case.

5. Conditions of a permit: The holder of a permit must accept the following conditions: (a) operate in accordance with the conditions of the permit; (b) allow EPA inspection; (c) maintain all environmental control, monitoring, and testing devices properly, and (d) maintain ability to implement approved contingency plan. In addition, the regional administrator may impose additional regulations. If definitions of hazardous wastes are changed, so, too, may the conditions of the permit.

6. Revoking of a permit: A permit may be revoked after notice is given and an opportunity for an adjudicatory hearing is allowed. A permit may be revoked for the following reasons: (a) repeated and continuing violations of any terms or conditions of the permit, applicable regulations or RCRA; (b) a violation of the above or a change in any condition that substantially increases the threat to the environment or public health; and (c) misrepresentation or failure to disclose facts.