FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE INCINERATION OF WASTES AT SEA UNDER THE 1972 OCEAN DUMPING CONVENTION

U.S. DEPARTMENT OF STATE AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY

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DEPARTMENT OF STATE · UNITED STATES OF AMERICA

EPA

FINAL

ENVIRONMENTAL IMPACT STATEMENT

FOR

INCINERATION OF WASTES AT SEA UNDER THE 1972 OCEAN DUMPING CONVENTION

Prepared Jointly

by

Department of State

and

U.S. Environmental Protection Agency

February 1979

SUMMARY

STATEMENT TYPE: Final Environmental Impact Statement
PREPARED BY: The Department of State and the U.S. Environmental Protection Agency

Attention: Mr. William Mansfield, III
Office of Environmental Affairs
Room 7820
Department of State
Washington, D.C. 20520

1. Type of Action: Acceptance of amendments to a treaty

2. Brief Description of Proposed Action:

The proposed action is to accept amendments to Annexes I and II of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. The amendments establish international regulations for the incineration of wastes at sea to be enforced nationally by setting standards to minimize adverse impacts on the oceans and atmosphere from incineration at sea.

The United States participated in negotiations initiated during the Third Consultative Meeting of Contracting Parties to the Convention held in London, October 9-13, 1978. The Meeting adopted by consensus a Resolution on Incineration at Sea, the amendments to the *Annexes and the attached mandatory regulations, pending correction* for linguistic and editorial consistency in all official languages, to be carried out by the Secretariat.

3. Summary of Environmental Impacts and Adverse Environmental Effects:

Some largely local impacts on air and water quality from at-sea incineration are unavoidable in the burn site. Analysis of sea water samples for organochlorines during at-sea incineration resulted in *values below the 0.5 ppb limit of detection. Surface water samples* collected showed no significant differences in trace metals between test and control stations. Aerial monitoring showed that the maximum concentration of hydrogen chloride in the air five miles downwind of the burn site was on the order of 0.1 ppm, much lower than the Threshold Limit Value of 7 mg/m . Eight miles downwind the concentration was below detection limits --lower than the con-

centration of other acidic components allowed under the most stringent air standards for either SO_x or NO_x. At a distance greater than 10 miles, the effect would be even less with continued dispersion and neutralization of that hydrogen chloride which contacts the ocean or reacts with naturally occurring ammonia (20 ppb) in the atmosphere. For these reasons the acidity of rainfall on coastal locations would not be increased due to at-sea incineration in the approved site.

On biological specimens (phytoplankton and zooplankton) taken an examination of chlorophyll-a (an indicator of phytoplankton activity) levels, and adenosine triphosphate (ATP) levels in the specimen showed no deleterious or subtle adverse impacts. Various fish species exposed to the plume showed an elevation in the activity of P-450 enzymes. However, when exposed fish were left in clean water for a few days, the enzyme activity reverted to that of control organisms.

Environmental damage resulting from a marine accident to a ship loaded with chemical wastes or from spillage during loading and transfer could have moderate or serious consequences. A major spill near shore affecting an estuary would destroy many organisms (including bottom-living forms) and contaminate the area for a substantial period of time. A spill on the continental shelf could have significant short-term impact on local organisms; however, as the wave and current actions would greatly disperse the contaminant and the large volume of water would dilute the contaminant, the long-term impacts at the site would be significantly reduced. However, the probability of accidental discharges is greatly reduced by current regulations and design standards for the control of the transfer and transport of chemicals in bulk.

4. Summary of Major Alternatives Considered:

The alternative to the proposed acceptance of the amendments to the Convention establishing international regulations for at-sea incineration is to reject the amendments. If the amendments are rejected, the alternatives are: (a) to seek no action for the control of at-sea incineration, (b) to rely exclusively on national regulation, (c) to promote regional regulation, (d) to seek international enforcement of the regulations and (e) to prohibit at-sea incineration.

5. Comments on the Draft Environmental Impact Statement were received from the following Federal agencies, States, and private organizations:

U.S. Department of Commerce
Maritime Administration
National Oceanic and Atmospheric Administration

U. S. Department of Health, Education and Welfare
Public Health Service
Center for Disease Control
U. S. Department of the Interior
Office of the Secretary
U. S. Department of Transportation
Coast Guard

States of: Alabama, Alaska, California, Delaware, Florida, Hawaii, Louisiana, Mississippi, New Jersey, Oregon, Texas, Virginia, Washington

Manufacturing Chemists Association

6. Date Draft EIS was made available: October 4, 1978
   Date Final EIS was made available: February 9, 1979

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I. PROPOSED FEDERAL ACTION

A. Description

The proposed Federal action is to accept the regulations for incineration of wastes at sea contained in amendments to Annexes I and II of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.* The alternative is to reject the amendments. This is a change from the proposed Federal Action called for in the Draft Environmental Impact Statement (DEIS), reflecting forward movement in the international negotiations. At the time of the DEIS, the proposed Federal action was to negotiate and adopt certain amendments, proposed by the United States, to Annexes I and II of the Convention to establish regulations and guidelines for incineration of wastes at sea.

Since the preparation of the DEIS, the international negotiations for the preparation of the regulations have progressed. At the Third Consultative Meeting of the Contracting Parties to the Convention (see Section III of this Final Environmental Impact Statement) regulations for the control of incineration at sea were adopted and incorporated into amendments to the Convention. The regulations are mandatory and would be adopted as amendments to the Annexes of the Convention. Under Convention procedures (see Appendix C, Article 15) for adopting amendments to the Annexes, they enter into force for each Party either on notification of their acceptance or, in any case, 100 days after approval at the meeting for all Parties except

*Referred to hereafter as either "the Convention" or "the Ocean Dumping Convention"

those who have expressly declared they cannot accept them. The 100-day period expires March 10, 1979, and the amendments become effective on March 11, 1979.

While the international regulations will become binding on the United States, additional steps will be taken by the Environmental Protection Agency. The Agency will publish the regulations as minimum national standards to be included as requirements in all incineration at sea permits before promulgating final national regulations. During the interim period, EPA will include these requirements as permit conditions before authorizing incineration at sea. EPA must also designate all specific burn sites for at-sea incineration. EPA will prepare environmental impact statements before promulgating interim or final national regulations and designating each new burn site.

The regulations are based on existing scientific knowledge on the incineration process and current technology. Experimental incineration of liquid organohalogen wastes at sea has enabled specific guidelines to be developed covering the incineration of such wastes, but there are other types of wastes where information is insufficient at present. However, scientific work is proceeding in several countries and the guidelines will be revised as the results of further research and investigation become available.

The regulations apply to wastes referred to in paragraph 1 of Annex I (organohalogen compounds) and pesticides and their by-products not covered by Annex I.

In addition to the wastes specified in the regulations, all wastes

listed under the Convention must be disposed of in a manner consistent with the procedures of the Convention; specifically, disposal of Annex I substances will continue to be regulated by paragraphs 8 and 9 of the Annex.

For the purpose of applying these requirements, the following definition of incineration at sea has been adopted:

(1) "Incineration at sea" means the deliberate combustion of wastes or other matter on marine incineration facilities for the purpose of their thermal destruction. Activities incidental to the normal operation of vessels, platforms or other man-made structures are excluded from the scope of this definition.

This definition is broader than is necessary to cover the existing vessels which load wastes for the purpose of incineration and is so drafted to ensure that controls on incineration at sea should apply also to any incineration vessels, platforms, or other man-made structures and, at some future date, vessels which may conduct factory operations at sea and generate wastes which could be incinerated at sea.

The amendments to the Convention as adopted include the following significant requirements.*

(1) A provision which requires that every marine incineration facility be evaluated to ensure that during the incineration of waste combustion and destruction efficiencies are in

*For full text see Appendix A

excess of 99.9 percent.

(2) A mandatory provision which specifies that when an appropriate authority proposes to permit the incineration of wastes or other matter over which doubts as to the efficiency of combustion exist the incineration system shall be subject to the intensive stack monitoring associated with the initial vessel survey.

(3) Mandatory provisions which emphasize control of the incineration operation include the following:

a) the operation of the incinerator shall be controlled so as to ensure that the incineration of wastes does not take place at a flame temperature of less than 1250 degrees centigrade except where it has been demonstrated that the required destruction efficiency can be achieved at a lower temperature.

b) the combustion efficiency shall be at least 99.9 $\pm$ 0.05 percent;

c) there shall be no presence of black smoke or continuous or intermittent flame extension above the plane of the stack.

(4) Mandatory provisions specifying that in selecting a site for incineration of wastes or other matter the appropriate authority shall give the following factors, in addition to those listed in Annex III of the Convention, careful consideration:

a) the atmospheric dispersal characteristics of the area -- including such parameters as wind speed and direction, atmospheric stability, frequency of inversions and fog, precipitation types and amounts, humidity -- in order to determine the potential impact on the surrounding environment of pollutants released from the marine incineration facility, giving particular attention to the possibility of atmospheric transport of pollutants to coastal areas;

b) oceanic dispersal characteristics of the area in order to evaluate the potential impact of plume interaction with the water surface;

c) availability of navigational aids.

The mandatory provisions were based on research studies by the United States and other countries. These studies primarily focused on incinerator efficiencies, operating temperatures, incinerator controls and fail-safe devices in order to establish best practicable technology. Current research by EPA on the destruction of pesticides (organohalogens) has indicated that most pesticides can be destroyed at 1000 degrees centigrade with incinerator efficiencies of about 99.99 percent (Ref. 20). The proposed 1250 degrees centigrade requirement for incinerator vessels includes a safety margin of 250 degrees centigrade. It should be noted that the minimum operating efficiency of 99.95 $\pm$ 0.05 percent represents state-of-the-art monitoring capabilities and is for regulatory purposes only and

does not reflect the efficiency of at-sea incinerators which is about 99.99 percent.

In addition to establishing the best practicable technology for at-sea incineration, the United States and other countries have also evaluated the impacts of the emissions on the marine environment and found that the proposed mandatory requirement for controlling the incinerators and its operations are sufficient to protect the marine environment from adverse impact. To provide a further safeguard, the mandatory provisions also include special provisions relating to disposal site selection such as evaluation of atmospheric dispersal characteristics of the area.

The Contracting Parties emphasized within the adopted Resolution the need to consider advancements in waste disposal technology by recognizing "present methods of incineration at sea as being an interim method of disposal pending the development of environmentally better solutions, considering at all times the best available technology." They also affirmed that adoption of the mandatory regulations is not intended to increase the amounts and kinds of wastes incinerated at sea "for which there are available practical alternative land--based methods of treatment, disposal or elimination."

The Draft EIS referred to technical guidelines as being included with the proposed amendment to the Annexes. Since the technical guidelines are intended to be used only as recommendations, the Contracting Parties decided not to include them in the amendment.

Further revisions will be made on the guidelines and presented to the Fourth Consultative Meeting for consideration.

The amendment to the Notification Procedures was also adopted at the Third Consultative Meeting and is included as Appendix A with the adopted Regulations.

B. Background for Proposed Action

Prior to the passage of the Marine Protection, Research, and Sanctuaries Act (MPRSA) in 1972 (P. L. 92-532), it was common practice to dump organochlorine wastes directly into the sea. With the prohibition of such disposal methods by the MPRSA and the Convention, alternative technologies for proper disposal practices had to be developed. Land-based incineration, deepwell injection and landfill methods are primarily used in the United States; however, in Europe, in addition to land disposal methods, at-sea incineration technology was developed. Since 1974, the United States has on three occasions used at-sea technology and found it to be a viable alternative. At the first meeting of the Contracting Parties to the Convention, it was suggested that this technology should be regulated internationally through the mechanism of the Convention.

1. Brief History of Incineration at Sea in Europe

Organochlorine wastes have been destroyed by at-sea incineration in European waters since 1969. The disposal area in the North Sea, often referred to as the Dutch Incineration Area, is in the neighborhood of latitude 42° 16' N and longitude 03° 45' E.

Initial efforts were carried out by S. B. B. Stahl und Blech Bau GmbH, a German company, using the MATTHIAS I, a small tanker of approximately 1000 metric tons (MT), fitted with an incinerator. This vessel was decommissioned in 1975. A second tanker, the MATTHIAS II, of approximately 3500 MT, was similarly modified and continues to burn wastes in the same area. Data from the monitoring of burning organochlorine wastes by this ship are reported in References 1, 2, and 3.

The MATTHIAS II was tested during 23-25 April 1978 while burning organochlorine wastes of European origin resulting from production processes for chloroprene, trichlorobutene and propylene oxide. Chlorine content of these liquid wastes was approximately 40%. Preliminary data from the tests in Ref. 3 indicate the combustion efficiency to be 99.9%, with qualifications that: (1) the hydrocarbon content of the effluent stack gases, normally 5 to 10 mg/m^3, occasionally rose to 50 mg/m^3; and (2) at times, black smoke was observed in the stack. The burn was carried out with a 100% oxygen excess at a temperature greater than 1200 - 1300 degrees centigrade as determined by wall thermocouples.

In early 1975, the MATTHIAS III, a tanker of 19,300 MT, was modified in the Rendsburg, Germany, shipyards and commissioned as an at-sea incineration ship. The vessel was designed to carry 15,000 MT of liquid wastes in its tanks and several thousand 55 gallon drums on its main deck.

The MATTHIAS III was tested during two burns in the North Sea, the first from May 31 to June 4, 1976, and the second from August 30 to September 3, 1976. The first burn was carefully monitored by a team of scientists from the French Atomic Energy Commission (AEC). Analytical data obtained from this burn are reported in Ref. 4. During the second burn, routine analyses for CO_2, CO, and O_2 were made by Dragerwork AG, West Germany, (Ref. 5). Both burns were observed by a U.S. Environmental Protection Agency contractor.

The first burn, actually a "shakedown" cruise, was not successful. Although the second burn at times demonstrated combustion efficiencies of 98.75 to 99.99%, flames and black smoke were visible above the stack of the incinerator during much of the burn. Because of technical problems with the incinerator design, the MATTHIAS III was decommissioned in April 1978.

The M/T VULCANUS, a Dutch-owned incineration ship, has also burned organochlorine wastes in European waters. Monitoring of a burn in the North Sea was carried-out by scientists of the French AEC (Ref. 2), and by scientists from the Center for Studies and Research in Biology and of Oceanographic Medicine (CERBOM) (Ref. 6). Effluent gases of the VULCANUS North Sea incineration were analyzed by the Central Laboratory (TNO), Delft, Netherlands (Ref. 7), and by the French AEC scientists.

The M/T VULCANUS is a converted cargo ship of 4768 metric

tons with a waste tank capacity of 3503 cu. m. Waste is burned in two incinerators that have a combined maximum feed rate of 25 MT/hour. A crew of 18 mans the ship, 12 to operate the vessel and 6 to operate the incinerators. The M/T VULCANUS meets all applicable requirements of the Inter-Governmental Maritime Consultative Organization (IMCO) concerning transport of dangerous cargo by tanker.

2. Description of Incineration at Sea in the United States

The first officially sanctioned at-sea incineration operation conducted in the United States was performed aboard the M/T VULCANUS, in the Gulf of Mexico, during October 1974 through January 1975. Four shiploads, about 4,000 metric tons each, of toxic organochlorine wastes from the Shell Chemical Company, Deer Park Manufacturing Complex, were incinerated under permits granted by EPA at a Federally approved incineration site 143 nautical miles (305 kilometers) southeast of Galveston, Texas, and 165 nautical miles (352 kilometers) south of Cameron, Louisiana. The site was beyond the continental shelf, in water depths of 914 to 1829 meters (3000 to 6000 feet), outside all major shipping lanes, and well beyond commercial shrimping and fishing depths.

The wastes, which had resulted from the production of glycerin, vinyl chloride, epichlorohydrin, and epoxy resins, were a mixture of chlorinated hydrocarbons with trichloropropane, trichloroethane, and dichloroethane predominating. The first two shiploads were each incinerated under an EPA Research Permit; the second two shiploads were burned under an EPA Interim Permit. Composition of the waste

feeds was similar during the two research burns: both contained 63% chlorine, 29% carbon, 4% hydrogen, 4% oxygen, and traces of heavy metals. Combustion chamber flame temperatures ranged from 1340 - 1610 degrees centigrade. Combustion efficiencies, i.e., the percentage of hydrocarbons combusted, ranged between 99.92 and 99.98 percent. For the most part, the uncombusted hydrocarbons were not organochlorines. Efficiency of destruction of organochlorines averaged 99.995 percent. Reference 8 contains a detailed account of the operation.

A second at-sea incineration operation took place during the period of March to April 1977, under an EPA Special permit. Organochlorine wastes generated by the Shell Chemical Company were destroyed by the M/T VULCANUS in an incineration area located 130 miles south of Sabine Pass, Texas, in the Gulf of Mexico. A total of approximately 16,000 metric tons of wastes were destroyed in four burns. The first burn was monitored by a team of scientists and engineers from TRW Inc., Redondo Beach, California. Average waste feed rate was 22 MT/hour. Combustion efficiency was 99.95 percent. Pertinent data are summarized in Ref. 9.

The third and most recent incineration at sea of organochlorine wastes occurred during the period of July 14 to September 2, 1977, on board the M/T VULCANUS under contract to the U.S. Air Force. The operation was carried out in three consecutive burns, the first under an EPA Research Permit and two under a Special Permit, at a designated area in the Pacific, approximately 200 miles west of Johnston Atoll. These burns were monitored by a team of scientists

from TRW, Inc. During the first burn, a U.S. EPA observer was present. A U.S. Air Force officer, as a working member of the analytical team, was present during all three burns.

This operation required special monitoring and safety procedures because the waste was Herbicide Orange* and contained 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD) as an impurity to the extent of an average 2 parts per million. Because of the extremely high toxicity of TCDD, special precautions were placed in effect during all loading and operating procedures on the ship.

All burns were successfully completed. Average feed rate was 14.5 MT/hour. Destruction efficiencies for 2,4-D and 2,4,5-T were greater than 99.999 percent. Average combustion efficiency was 99.99 percent. Average destruction efficiency of TCDD was 99.93 percent. Results are reported in detail in Reference 10.

3. Projection of Type and Quantities of U.S. Wastes Which Might be Incinerated at Sea

The quantities of organochlorine wastes which will be available for incineration at sea have been the subject of study by the U.S. Maritime Administration (Ref. 21). Data in the following table are taken partly from this study and partly from other sources.

*Herbicide Orange is basically a mixture of equal parts by volume of the n-butyl esters of 2,4-dichlorophenoyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T).

Estimates of National Organic Chemical Production and Corresponding Wastes

	Metric Tons x 10^3		
	1977	1983	1989
Total organic chemical production	93,435	143,578	201,254
Total organic waste	2,302	4,249	6,354
Available to Gulf/East Coast Ports	245/30	569/69	851/103
Total organochloride production	13,340	20,500	28,740
Total organochlorine waste	328	606	907

4. Proposed Actions for the Construction of a U.S. Incinerator Vessel

The Maritime Administration is presently considering the development of a U.S. flag operated at-sea incineration vessel. One or more incinerator vessels may eventually be in operation nationwide. This project is in harmony with the intent of the Marine Protection, Research and Sanctuaries Act and the proposed Federal action.

A U.S. flag incinerator ship would be subject to extensive design, construction, and operational requirements. Most important are those of the U.S. Environmental Protection Agency concerning the incineration system, and the U.S. Coast Guard regarding the vessel itself.

II. ALTERNATIVES TO THE PROPOSED FEDERAL ACTION

The proposed action is to accept and adopt amendments to Annexes I and II of the Ocean Dumping Convention to establish international regulations for incineration of wastes at sea. The alternatives to this action is to reject the amendments. The alternatives for rejecting the amendments include taking no action to regulate at-sea incineration, developing national or regional regulations, seeking international control, and prohibiting waste incineration at sea. The implications of each of these alternatives are discussed below. The technical alternatives are discussed in Chapter VI.

A. No Action

This alternative assumes that it is not necessary to adopt international regulations and for at-sea incineration because the Ocean Dumping Convention already prohibits the dumping of the toxic substances listed in Annex I (including organohologen compounds) unless they are present only as "trace contaminants" and requires prior special permits for the dumping of materials listed in Annex II. Because incineration constitutes "dumping" within the meaning of the Convention, Contracting Parties wishing to burn wastes containing Annex I materials at sea are already obligated to ensure that the controlled materials reaching the ocean from the incinerator plume do not exceed "trace" amounts and to take special care in incineration of Annex II materials.

If no action were taken to establish international regulations, countries would develop their own regulations nationally. They

might also cooperate regional for the same purpose. The present situation therefore already provides significant environmental protection.

But many of the Convention's Contracting Parties, including the U.S., are concerned that, as more countries turn to at-sea incineration to dispose of wastes, national regulation alone may not ensure the desired degree of environmental protection, particularly as countries may not adopt standards as rigorous as the United States considers desirable for full compliance with the Convention's obligations. Mandatory international regulations will provide more effective environmental protection by requiring all Contracting Parties to apply stringent standards uniformly, not only for the design, certification and operation of marine incineration facilities, but also for the installation of the critical control and monitoring equipment that determines whether the required combustion efficiency is being met.

The current effort to develop international regulations has already fostered cooperative research, an important consideration in view of the work that remains to be done on the incineration of highly toxic and persistent substances. Moreover, the proposed international regulations contain special requirements for the monitoring and control of experimental incineration of wastes such as PCB's where the information on combustion efficiency is currently considered inadequate. Incorporating the regulations in the Convention Annexes enables them to be amended more easily to

keep abreast of current technology than would be possible on a country-by-country basis for national regulation. For these reasons, the proposed international approach would, from the U.S. viewpoint, have advantages over the status quo that would result from no action.

B. National Regulation

Under this option the United States would adopt its own standards. Indeed, on some past occasions the United States has perferred to rely on national regulation for its own environmental protection because it regarded international standards as inadequate or believed their acceptance might limit its right to set stricter standards. Neither of these concerns is valid in this case. The U.S. has played a leading role in developing the international regulations, which are based largely on U S. experimental work. Nor do the regulations contain any provisions limiting the right of nations, including the United States, to require stricter standards for at-sea incineration operations under their jurisdiction or to make stricter standards a condition for entry of their ports by foreign-flag incineration vessels.

Unilateral action by the U.S., while perhaps easier to accomplish, would not be as effective a way of meeting our interest in protecting the world's oceans as the adoption of stringent international standards through the amendment of the Convention's Annexes. At-sea incineration is at present an international operation, with specially designed ships calling at ports throughout the industrialized world to load toxic wastes and then incinerating the

wastes at designated sites in open ocean areas that are usually well beyond territorial waters. Thus, countries might find incineration operations taking place off their coasts which they cannot control through national regulation, although this would be unusual in the U.S. case because such operations off U.S. coasts would almost always involve wastes of U.S. origin loaded in U.S. ports. The proposed Federal action would, however, ensure that any incineration off U.S. coasts by other countries party to the Convention would be in accordance with international standards.

Additional advantages of an international approach to at-sea incineration have already been cited under the "no-action" alternative.

C. Regional Regulations

Regional approaches to environmental protection have proven effective, in part because countries in a region frequently share problems, perceptions and priorities. A number of regional marine pollution conventions deal with ocean dumping and work on at-sea incineration has been carried out under at least one -- the convention signed at Oslo in 1972 by the countries bordering the northeastern Atlantic. But a regional approach has limitations in meeting what is potentially a global problem. Not all countries are served by regional arrangements, and there may be differences and possible incompatibilities in regional approaches.

The only global instrument open to all potential users of at-sea incineration is the Convention under which the proposed Federal

action would be carried out. Working through this Convention is thus a more efficient way to regulate at-sea incineration and ensures a more uniform application of the standards. Moreover, the overlapping membership between the Ocean Dumping Convention and various regional marine protection conventions and the resulting interest in harmonizing standards and procedures suggests that work done under the global convention will also benefit regional conventions.

D. International Enforcement

Unlike the proposed action and the Convention itself, which depend on national enforcement of international standards, this alternative would involve international enforcement of the regulations for at-sea incineration. The Inter-Governmental Maritime Consultative Organization (IMCO), which provides the Convention's Secretariat, might agree to take on enforcement responsibilities for at-sea incineration if requested by the Contracting Parties, but to do so it would need an expanded staff and budget. The creation of a new international organization for this purpose would be even more costly. Governments, moreover, would be unlikely to concede enforcement control to an international body. There is no assurance that international enforcement would necessarily provide better environmental protection, particularly as the international body involved would ultimately depend on national governments for its information and financial support.

Experience to date with the Ocean Dumping Convention and regional conventions related to ocean disposal has demonstrated that despite differences in the effectiveness of enforcement by various countries national enforcement can provide the desired protection, especially where there are adequate review and dispute settlement procedures. There would appear, therefore, to be no significant advantages over the proposed action and some disadvantages to full international regulation.

E. Prohibit At-Sea Incineration

This alternative presumes that the risk of environmental damage from at-sea incineration is so great that it should not be permitted. While the long-term effects of at-sea incineration need to be closely monitored so that appropriate action can be taken if environmental damage is detected, there has been no evidence to date of such damage from the trace amounts of toxic substances reaching the ocean from the incinerator plume.

A ban on at-sea incineration would, moreover, eliminate a disposal option for toxic wastes at a time when landfill procedures are coming under growing question. Land-based incineration is a technically acceptable method for destruction of toxic wastes; however, these facilities are not, as yet, regulated to the same level as incineration at sea would be under the amendments; in addition, malfunctions could pose a more serious local environmental threat than at-sea operations (especially for the

more toxic wastes) because the facilities are closer to populous areas. Additionally, other factors such as site selection, storage of wastes, and capital cost become important since it would require about ten land-based facilities to provide the same rate of destruction as a single incinerator vessel.

Thus, the disadvantages of this alternative do not appear to be offset by clear and significant environmental benefits.

III. RELATIONSHIP OF THE PROPOSED ACTION TO INTERNATIONAL AGREEMENTS

A. Agreement Pertaining to Prevention of Marine Pollution by Dumping of Waste

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter was negotiated in London in November 1972, and came into force on August 30, 1975. Under the Convention, nations agree to regulate all ocean dumping through national administrative authorities. Dumping is not allowed without a permit. The disposal of wastes or other matter directly arising from or related to the exploration, exploitation and associated off-shore processing of seabed mineral resources is not covered by the provisions of this Convention.

"Dumping," as defined by the Convention, means: (a) any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea; (b) any deliberate disposal at sea of vessels, aircraft, platforms or other man-made structures at sea. Dumping does not include: (a) the disposal at sea of wastes or other matter incidental to, or derived from the normal operations of aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the disposal of such matter or derived from the treatment of such wastes or other

matter on such vessels, aircraft, platforms or structures; (b) placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the aims of this Convention.

The Convention requires each contracting nation to regulate the dumping of all material loaded in its ports for the purpose of being dumped at sea or loaded on a vessel or aircraft of its flag or registry in the territory of a nation not a party to the Convention. Participating nations are further required to maintain records concerning the nature and quantities of material which they permit to be dumped and the circumstances of such dumping. They must report this information periodically to the Inter-Governmental Maritime Organization (IMCO), the organization responsible for administration of the Convention. Contracting Parties are also to promote the disposal and treatment of wastes and other measures to prevent or mitigate pollution caused by dumping.

During the First Consultative Meeting of the Contracting Parties held on September 20-24, 1976, a resolution was adopted which requested the Secretary-General of IMCO to undertake the following:

(1) examine those provisions of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter which are applicable to at-sea incineration operations;

(2) consider and draft any special provisions with a view to preventing marine and atmospheric pollution from incineration operations at sea, and to submit them to the next Consultative Meeting.

At the Second Consultative Meeting, which was held on September 26-30, 1977, the Contracting Parties approved draft technical guidelines on the control of incineration at sea and adopted a Resolution recommending to governments their implementation. By that Resolution, the Parties also decided the provisions for the control of incineration at sea should be implemented on a mandatory basis in the form of a legal instrument, to be adopted within the framework of the Convention.

The regulations were redrafted as a legal instrument at an IMCO intersessional technical meeting in June 1978 for presentation at the Third Consultative Meeting on October 9-13, 1978. To a large extent, the draft regulations are based on the research work of the U.S. Environmental Protection Agency.

At the Third Consultative Meeting of the Contracting Parties to the Convention, held in London, mandatory regulations for the control of incineration at sea were adopted and incorporated in amendments to the Convention. The Consultative Meeting also approved recommendatory interim technical guidelines on at-sea incineration. Proposed revisions to the guidelines are shown at Appendix B. They treat more tentatively less-researched technical problems and will

be revised more frequently by the Parties. An intersessional meeting of an IMCO ad hoc group will develop them further, and will present them for consideration to the Fourth Consultative Meeting of the Contracting Parties in October 1979. They will be established as soon as possible.

It was agreed that the regulations, which are mandatory, would be adopted as amendments to the Annexes of the Convention. Article 15 of the Convention provides an expedited procedure for adopting amendments to the Annexes; two-thirds of the Contracting Parties present concurring, they enter into force for each Party immediately on notification of their acceptance and in any case 100 days after approval at the meeting for all other Parties except those who have expressly declared they are unable to accept them. The expedited procedures period began on December 1, 1978, and the 100-days period will conclude March 11, 1979, when the international regulations go into effect except for those Parties which have expressly not accepted them.

To implement the international regulations the U. S. Environmental Protection Agency will publish them as minimum national standards to be included as requirements in all incineration at sea permits issued by the Agency. Before promulgating final national standards for incineration at sea, EPA will prepare an environmental impact statement on the regulations. During the interim period, EPA will include these requirements as permit conditions

before authorizing incineration at sea. In addition, EPA will also prepare environmental impact statements on all new specific burn sites for at-sea incineration.

B. Agreements Pertaining to the Marine Environment

In addition to the foregoing international agreement, the following international conventions dealing with maritime safety and with protection of the marine environment, primarily from vessel-source pollution, would apply to incineration at sea:

-- The International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL) [not ratified by the U. S., not yet in force, amended by the 1978 Protocol]

-- Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 [not ratified by the U. S., not yet in force]

-- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 [ratified by the U. S., in force]

-- Protocol relating to Intervention on the High Seas in Cases of Marine Pollution by Substances Other Than Oil, 1973 [ratified by the U. S., not yet in force]

-- International Convention on Safety of Life at Sea, 1974 (SOLAS) [ratified by the U. S., not in force]

-- Protocol of 1978 relating to the International Convention on Safety of Life at Sea, 1974 [not ratified by the U. S., not in force]

The commitments which would be undertaken by parties to the proposal in the Federal action would be consistent with the obligations under the international agreements listed above.

IV. RELATIONSHIP OF THE PROPOSED FEDERAL ACTION TO DOMESTIC LEGISLATION

A. The Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) (P. L. 92-532)

This Act, enacted on October 23, 1972, provides for the regulation of ocean dumping, research on ocean dumping and other man-induced changes to the ocean ecosystems, and the designation, acquisition, and administration of marine sanctuaries.

Title I of the MPRSA provides for a regulatory scheme to control all materials transported from the United States for the purpose of dumping into ocean waters. In addition, the Act controls the dumping of material originating outside of the United States, if that dumping takes place in ocean waters subject to the jurisdiction or control of the United States. Finally, consistent with the declared policy, the Act also regulates the activities of Federal departments and agencies transporting material for dumping into ocean waters, regardless of the location from which the transportation is initiated.

Title I requires that no person, regardless of his nationality, may depart a United States port with material intended for dumping anywhere in the world's oceans, unless he has first obtained a Federal permit. The MPRSA also has a total prohibition against the dumping of radiological, biological, and chemical warfare agents, or any high-level radioactive wastes. These hazardous substances may not be dumped

or transported for dumping, and no permit can be issued for their disposal.

The regulatory provisions are enforceable by fines of up to $50,000 and a year in jail for each unauthorized dump. In addition, a civil penalty of up to $50,000 may be assessed administratively for each such act. The MPRSA contains a "citizens suit" clause pursuant to which any person may seek injunctive relief against an unauthorized dumper and may even recover his attorney's fees and other costs of the litigation.

The EPA has permit-granting authority with respect to all ocean dumping except dredged material; this permit authority includes incineration at sea. The dumping of dredged material requires a permit from the U. S. Army Corps of Engineers (COE). The EPA Ocean Dumping Regulations, 40 CFR Parts 220-228 (Ref. 12) describe the procedures relating to application for, issuance of, and denial of permits for ocean dumping. Criteria for evaluation of permit applications are also included.

The more significant provisions of the EPA regulations which relate to incineration at sea are as follows:

(1) Permits for Incineration at Sea. Permits for incineration of wastes at sea will be issued only as Research Permits or as Interim Permits until specific criteria to regulate this type of disposal are promulgated, except in those cases

where studies on the waste, the incineration method and vessel, and the site have been conducted, and the site has been designated for incineration at sea in accordance with the procedures established within the regulations.

(2) Special and Interim Permits. Areas where ocean dumping is permitted, subject to the specific conditions of individual Special or Interim Permits, will be designated based on environmental studies of each site, regions adjacent to the site, and on historical knowledge of the impact of waste disposal on areas similar to such sites in physical, chemical, and biological characteristics. All studies for the evaluation and potential selection of dumping sites will be conducted in accordance with the requirements of the regulations.

(3) The EPA Administrator may, from time to time, designate specific locations for temporary use for the disposal of small amounts of materials under a Special Permit only without disposal site designation studies when such materials satisfy the Criteria, and the Administrator determines that the quantities to be disposed of at such sites will not result in significant impact on the environment. Such designations will be for a specified period of time and for specified quantities of materials.

After adoption of the proposed international requirement for regulating incineration at sea, EPA would amend 40 CFR Parts 220-228 to implement the international regulations and guidelines when they are adopted. Currently, EPA regulates incineration at sea in a manner consistent with the intent of the Convention and the MPRSA, by including the provisions as special conditions in the Incineration Permit.

B. Other Statutes Relating to the Proposed Federal Action

1. National Environmental Policy Act of 1969 (NEPA) (P.L. 91-190)

The purposes of this Act are: to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere, and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the nation; and to establish a Council on Environmental Quality (CEQ).

Section 102(2)(C) of NEPA and the amended CEQ Guidelines, as published in the Federal Register on August 1, 1973, require all Federal agencies to include, in every recommendation or report on proposals for legislation and other Federal actions significantly affecting the quality of the human environment, a detailed statement on the environmental impact of the proposed action. Underlying the

preparation of such environmental impact statements is the mandate of both NEPA and Executive Order 11514 of March 5, 1970, that all Federal agencies, to the fullest extent possible, direct their policies plans and programs to protect and enhance environmental quality.

EPA will conduct environmental impact assessments for all disposal sites and publish environmental impact statements (EISs) prior to designating a site for incineration at sea. This will constitute compliance with the EPA regulations on ocean dumping. The EPA published a Final EIS for an incineration site in the Gulf of Mexico on July 8, 1976, and is currently preparing an EIS for the Atlantic site, commonly known as the "106 industrial waste site."

2. Resource Conservation and Recovery Act of 1976 (RCRA) (P.L. 94-580)

The purpose of RCRA is to provide technical and financial assistance for the development of management plans and facilities for the recovery of energy and other resources from discarded materials, for safe disposal of discarded materials, and to regulate the management of hazardous waste. The Act requires the Administrator of EPA to promulgate regulations establishing performance standards for the treatment, storage, or disposal of hazardous waste.

Although the provisions of this Act are applicable to incineration at sea, this method of hazardous waste disposal is adequately

regulated through the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA) and, because of the interrelationship between the MPRSA and the Convention, regulations developed under RCRA will not be used to control incineration at sea. However, RCRA will regulate land-based transport and storage of hazardous wastes permitted to be incinerated at sea, as well as the land-based alternatives to incineration at sea, and will promote resource recovery.

3. Ports and Waterways Safety Act of 1972 (PWSA) (P. L. 92-340)

The Ports and Waterways Safety Act of 1972 was amended during 1978 by the Port and Tanker Safety Act. This new law provides a stringent and comprehensive program dealing with the design, construction, operation, equipping, and manning of all tank vessels using U. S. ports to transfer oil and hazardous materials. The design, construction, and equipment requirements contained in this law are, for the most part, in agreement with the results of the 1978 Conference on Tanker Safety and Pollution Prevention. This Conference resulted in the adoption of Protocols of two of IMCO's most important Conventions, 1973 MARPOL and 1974 SOLAS (mentioned in Chapter III, B).

This Act is intended to promote the safety of ports, harbors, waterfront areas, and navigable waters of the United States. It consists of two sections.

Title I of the PWSA gives the Secretary of the Department in which the Coast Guard operates the authority to take means to prevent damage to, or the destruction or loss of, any vessel, bridge, or other structure on or in the navigable waters of the United States, or any land structure or shore area immediately adjacent to those waters; and to protect the navigable waters and the resources therein from environmental harm resulting from vessel or structural damage, destruction or loss.

Title II provides for the establishment of comprehensive minimum standards of design, construction, alteration, repair, maintenance and operation to prevent or mitigate the hazards to life, property and the marine environment. These standards will apply to all vessels documented under the Laws of the United States on entering the navigable waters of the United States.

Incineration vessels will need to comply with the design and construction requirements under Title II, as well as U.S. Coast Guard requirements (46 CFR, Part 153) which implement the IMCO Chemical Code. These Coast Guard requirements, as well as the IMCO Chemical Code, are based upon the philosophy of relating cargo containment features of vessel design, construction, and operation to the hazards of various chemicals. The key provision of these requirements as they relate to dangerous cargoes specify three different levels of vessel construction, containment system, and containment system location within the vessel:

Type I - a containment system to transport products which require maximum prevention measures to preclude their release;

Type II - a containment system to transport products which require significant preventive measures to preclude their release;

Type III - a containment system to transport products which require moderate preventive measures to preclude their release.

These three containment systems specify the location of the cargo tanks and piping within the ship and place minimum requirements for damaged and intact vessel stability. These assignments to containment system types take into account the nature and severity of the product's hazards if released.

The highest standard of cargo containment, Type I, is placed on those cargoes that on release could have the most wide- reaching effect beyond the immediate neighborhood of the vessel. No portion of the Type I cargo containment system may be located closer than one-fifth the vessel beam from side of the vessel or a distance equal to one-fifteenth the vessel beam above the vessel keel. The vessel with a Type I containment system must be designed to withstand prescribed damages (two-compartment standard of subdivision and damage stability throughout its length). In addition, to prevent the large-scale release of Type I cargo in event of rupture of the containment system, the size of each tank is limited to 1,250 cubic meters.

Cargoes with significant hazards, but whose release would not have far reaching effects, are carried in Type II containment systems. A Type II containment system must be located a minimum distance of 760 mm from the vessel side and beam/15 above the vessel's keel. These requirements should provide cargo protection against low-energy collisions and groundings associated with vessels in port. In addition, vessels greater than 150 m. long must have a two-compartment standard of subdivision and damage stability throughout their length. Vessels less than 150 m. must meet a two-compartment standard of subdivision and damage stability in the cargo containment portion of the vessel and a one-compartment standard for the engine room. To prevent the large-scale release of a Type II cargo, the individual tank size is limited to 3,000 cubic meters.

A Type III containment system is prescribed for products with lesser hazards. No separation of the cargo containment system from the ship's hull is required. However, increased damage stability, in excess of that required for a typical tanker, is required. Vessels greater than 125 m. with a Type III containment system must be able to survive damage to any position except an aft machinery space.

To determine the survival capabilities of the vessel hypothetical damage is assumed.

4. Federal Water Pollution Control Act, As Amended (P.L. 92-500)

In Section 311 of this Act Congress declared that it is the policy

of the United States that there should be no discharge of oil or hazardous substances into, or upon, the navigable waters of the United States, adjoining shorelines or upon, or into, the waters of the continguous zone.

Some essential features of the Act relating to spills include a revolving fund for cleanup operations, a national contingency plan for control of spills of oil and hazardous polluting substances, and authority to remove polluting spills of oil and hazardous substances. In addition, the President shall issue regulations consistent with maritime safety and with the marine and navigation laws: (1) establishing methods and procedures for removal of discharged oil and hazardous substances; (2) establishing procedures, methods and requirements for equipment to prevent discharges of oil and hazardous substances from vessels and from onshore facilties and offshore facilities.

The *Clean Water Act of 1977* (P.L. 95-217) further amended the FWPCA with respect to liability for oil and hazardous substance spills. Most notably, the CWA extends U.S. national jurisdiction for water pollution control to the ocean beyond the contiguous zone where fisheries and other natural resources of the U.S. may be adversely affected.

Section 311 of the FWPCA was again amended on November 2, 1978, when H.R. 12140 was signed into law.

5. Intervention on the High Seas Act, as Amended (P.L. 93-248)

The purpose of this Act is to implement the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties and Marine Pollution by Substances Other than Oil. The Act authorizes the Department of Transportation (U.S. Coast Guard) to prevent, mitigate, or eliminate pollution or threats of pollution on the sea by oil and other substances which results from a ship collison, stranding or other incident of navigation.

In the event that an incineration vessel while transporting hazardous wastes became involved in a marine disaster, the U.S. may take appropriate measures to eliminate an imminent danger to U.S. coastlines or related interests of the United States.

V. DESCRIPTION OF THE MARINE ENVIRONMENT

For convenience, the marine environment may be grouped into two major categories: the coastal ocean and the open ocean. The coastal ocean includes estuaries and adjacent wetlands, lagoons, waters over the continental shelves, and marginal seas. The open ocean lies seaward of the continental shelf.

There is no clear-cut boundary between the coastal and open oceans; but for this environmental impact statement, water deeper than 3,000 feet is considered to belong solely to the open ocean. Consideration of ocean conditions is necessary in order to make predictions of the movements and eventual fate of pollutants that may be spilled or discharged and to consider other environmental impacts arising from the operation of waste incinerator ships.

Information contained in the following paragraphs A through G along with additional detailed description is found in Reference 11.

A. Open Ocean

Beyond the continental shelves, the open ocean is relatively unaffected by the continental boundaries or the ocean bottom. Over most of the open ocean, warm surface waters are separated from the cooler deep waters by what is known as the pycnocline, a rapid increase in density that more or less separates surface ocean waters from deeper waters. The deeper waters are known to move sluggishly after forming in the polar regions (primarily the Antarctic) and to return to the surface about 600 to 1,000 years later.

Away from the continents that interrupt surface water movements, ocean currents are primarily directed east-west. Only in the areas of the continental boundaries are the currents deflected to the north or south forming major boundary currents. Open ocean currents generally move surface waters at speeds of a few miles per day. In the boundary currents such as the Gulf Stream or the Kuroshio Current, the waters move at speeds of ten to a hundred miles per day.

Winds blowing across the ocean set the surface waters in motion. In the open ocean where tidal currents are relatively weak, these wind drift currents account for about 40 percent of the surface currents.

B. Coastal Ocean

The coastal ocean is the water adjacent to the shore; there the adjacent land boundary, freshwater runoff from the land, and local atmospheric conditions contribute significantly to the movement and mixing of the waters. The width of the coastal ocean varies, and its outer boundary is not well defined. It may be quite narrow along coasts where the continental shelf is narrow and where oceanic conditions and "permanent" currents come close to shore. Conversely, where the continental shelf is wide, the coastal ocean may be ten or even hundreds of miles wide. The coastal ocean does not, however, always coincide with the continental shelf. Where the shelf is very narrow, the coastal ocean may extend beyond the edge of the shelf, or where the shelf is very wide, the coastal ocean may extend out from shore for only a part of the shelf width.

Although making up only 12.5 percent of the ocean surface, coastal ocean waters are vitally important. Heavily used for waterborne commerce, coastal waters are also used for recreational fishing and boating, commercial fishing, and waste disposal. Despite these heavy and often conflicting uses, coastal waters are still the most productive part of the world's ocean -- an estimated 90 percent of the world's marine food resources are harvested there.

C. Geological Setting

The continental shelf is defined physically as the zone extending from the line of permanent immersion around a continent to the depth where there is a marked or rather deep descent toward the great depths. In 1970, the Hague Conference defined the continental shelf as:

> "...the area between the mean low water line and the change in the inclination of the ocean floor, from about one-eighth of one degree to more than three degrees, that marks the beginning of the continental slope. This occurs at various depths, usually between 130 and 200 meters; but it can occur as shallow as 50 meters and as deep as 500 meters. The continental shelf ranges in width from zero to 1500 kilometers."

Geographically, the continental shelf is a subpart of the continental margin, a zone separating the submerged part of a continent from the deep-sea bottom. The other subparts are the continental slope and the continental rise.

The continental slope is the declivity from the outer edge of the continental shelf into the great depths. There exists a great variation in the steepness of the continental slope. The base of

the slope is marked by the continental rise. The rise is a gently sloping and smooth surface formed by the joining of a number of deep-sea fans.

D. Biological Setting

The offshore environment is broadly divided into the pelagic and benthic realms. The pelagic realm includes all ocean water above the bottom. Over the continental shelf, the waters constitute the neritic province. Waters over the slope and deep ocean bottom constitute the oceanic province. The biota of the pelagic division is generally subdivided into plankton and nekton. The benthic division includes the sea bottom and sub-bottom environment, and its biota is called benthos.

Microorganisms are present in large quantity in the ocean. According to information provided by NOAA, microorganisms can constitute up to 50 percent of the marine pelagic biomass and up to 90 percent of the benthic biomass. Furthermore, they perform important processes in the marine ecosystem such as nitrogen and carbon cycling and decomposition.

1. Pelagic Realm - Plankton

All mobile aquatic organisms, plant or animal, whose powers of locomotion are too feeble to resist the set and drift of currents are termed plankton. The plankton is divided into several different types on the basis of physiology and life history.

Phytoplankton includes the acellular (unicellular) floating plants and all floating multi-cellular plants, such as Sargassum. As plants, all phytoplankters are capable of producing their own food from raw materials by photosynthesis. The ubiquitous distribution and occurrence in pelagic waters is influenced by several factors. Both the horizontal and vertical distributions of phytoplankton are dependent on: (a) population origin and life cycles; (b) supply and level of nutrients and growth factors; (c) physiological requirements and adaptability; (d) salinity and temperature, and (e) grazing pressure by herbivores (plant-eating animals). In addition, vertical distribution alone is influenced by: (a) vertical water mixing, diffusion, and water stability; and (b) depth of the light zone.

The animal plankters are called zooplankton. Zooplankton distributions and occurrences are also relatively continuous in pelagic waters. In general, they are influenced by the same factors that affect phytoplankton distribution and occurrence. Inorganic nutrients and depth of the light zone are not as immediately important to zooplankton as to phytoplankton, but these factors affect distribution and abundance in that greater availability of nutrients and light allow higher primary productivity and consequently a greater food supply for zooplankton.

2. Pelagic Realm-Nekton

Organisms which remain suspended in water and whose powers of locomotion are great enough to resist the set and drift of cur-

rents, being subject only to large-scale physical forces, are called nekton. Nekton for the offshore waters are represented by five major taxonomic categories - marine mammals, marine reptiles, the fish, the cephalopod molluscs (octopus and squid), and certain crustaceans (shrimp and swimming crabs). Individuals of this group commonly, but not always, range over broad areas, thus participating in several biotic communities. For example, shrimp have a pelagic planktonic larvae, an estuarine juvenile, and pelagic adult. However, most nekton are limited in geographic and vertical ranges by the same environmental conditions as less mobile organisms, i.e., temperature, salinity, available food, and types of bottom.

The nektonic component of the environment can be divided into open water nekton and nekton which spend some portion of their lives in nearshore, estuarine, or marsh waters. Examples of the latter are shrimp, drum, croaker, menhaden, flounder, seatrout, salmon, etc. Many finfish of commercial and sportfishing importance, however, are strictly open water residents, such as red snapper, various groupers, sailfish, and marlin.

3. Benthic Realm-Benthos

Organisms (plant or animal) which, as adults or in sessile stages of their life cycles, live on the bottom are called benthos. The benthos is characterized by the large numbers of sessile or relatively inactive animals which exhibit marked zonation in the

inshore region. The organisms are generally distinct for each of the three zones of the neritic province (supratidal or suppralittoral, intertidal or littoral, and subtidal or sublittoral). Zonation is characterized more by dominant species than by distinct assemblages of numerous species.

E. Estuarine Circulation

Most of the world's existing ports and harbors are located on estuaries. Despite their variety of shapes and sizes, estuaries commonly exhibit similar physical and biological processes. An estuary is a semi-enclosed coastal body of water that has a free connection with the open sea. Within an estuary, seawater is measurably diluted with fresh water which runs off from land. Four types of estuaries can be distinguished: drowned river valleys, bar-built estuaries, fjord-like estuaries, and estuaries producted by tectonic processes.

F. Shores and Beaches

The shore is a narrow strip of land bordering the ocean that is alternatively exposed or covered by waves or by the changes in water level due to the tide. Where wave action is relatively vigorous and the supply of sand (or gravel) is adequate, the shore is marked by a beach, i.e., a movable deposit of loose sand (or gravel). In more protected areas, wetlands (either marshes or swamps) border the shoreline. In those areas where the land is rising due to mountain building (tectonism) or the recent retreat of continental glaciers, the shore may be marked by a rocky coastline, such as the New England coast (north of Cape Cod) or parts of the Pacific coast of the U.S. and the shores of Puget Sound.

Rocky shores are typical of steeply sloping coastal land areas where the sea acts directly on resistant rocks. In many of the areas used for deepwater ports (especially fjord-like estuaries), rocky shorelines are common owing to the effects of glaciers that provided deep waters near shore needed for deep draft vessels. In such areas, marine organisms typically attach themselves to the rocks which support extensive communities for animals and plants.

G. Wetlands

Tidal channels and low lying areas around lagoons, estuaries, and behind barrier islands are covered, either permanently or intermittently, by seawater. These areas, known as wetlands, are most common along the Gulf and Atlantic coasts of the U.S. but also occur on the Pacific and Alaskan coasts. Because of the shallow water in the associated lagoons, sounds, and the waterlogged soils of the regularly or intermittently flooded portions, wetlands have distinctive types of vegetation.

Wetlands are extensively used by wildlife such as waterfowl and aquatic mammals such as muskrats. Plants growing in wetlands are highly productive and constitute important food sources for marine organisms. The vegetated shallow water areas provide protection and act as hatching or nursery areas for many species of marine organisms important for commercial or recreational fisheries.

H. Nature of the Gulf of Mexico Incineration Site (Reference 18)

The location of the incineration site is centered 355 km ENE of the Texas-Mexico border, 315 km SSE of Galveston, Texas, and 350 km S of Cameron, Louisiana. The site occupies an area of approximately 4900 square kilometers. Water depths within this perimeter range from near 1100 m to more than 1835 m and the seafloor gradient for this portion of the outer continental slope is somewhat uniform and gradual. The site is seaward of Gealy's "hummocky zone" in an area of relatively low relief where the surface is cut by steep-sided troughs that extend down-slope. Alaminos Canyon and Ida Greene Canyon, probable extreme components of the trough zone, flank the area of the proposed site on the west and the east, respectively.

The Gulf of Mexico is a semi-enclosed sea with an approximate surface area of over 1,600,000 square kilometers and a maximum depth of about 3,840 meters. Most of the oceanic input is from the Caribbean Sea via the Yucatan Strait (160 km wide and 1650-1900 meters deep) with outflow being primarily through the Florida Straits (less than 160 km wide and only around 800 meters deep). The facts that both of these connections with the parent Atlantic are confined to the southeastern sector and that runoff from approximately two-thirds of the United States and more than half of Mexico also empties into the basin contribute greatly to the characteristics of the Gulf in general and the western Gulf in particular. Those vastly different influences are used as a basis

for dividing the Gulf into two major provinces: a carbonate province to the east and a terrigenous one, containing the proposed site, to the west (Uchupi, 1967). These provinces are delineated by De Soto Canyon in the northeast quadrant and by Campeche Canyon off the Yucatan Peninsula in the southwestern region (Antoine and Bryant, 1968). Significant characteristics of this basin are the great width of the shelves, the steepness of the lower part of the continental slope (the scarps) and the flatness of the floor of the main basin with its exceptionally thick sequence of sediments.

1. Physical and Chemical Properties of the Water

The incineration site is located in oceanic water and the physio-chemical parameters of the site's water column are typical of that found in the west central Gulf. The site's water column, as well as that of the west central Gulf, is vertically layered with five recognized water masses which are distinguishable by distinct values or gradients in specific parameters. Of these five layers, the upper-most, Surface Mixed Layer, undergoes greater seasonal changes in physio-chemical parameters than do the deeper water masses. However, the seasonal changes in the site's Surface Mixed Layer are muted in comparison to waters closer to shore.

Wind, waves, and currents prevail to the west-northwest with the calmer period of the year being June - August.

2. Pelagic Biota of the Gulf Coast Incineration Site

The data available for the incineration site show that it is not within as productive an area as either the adjacent continental shelf of upper continental slope regions. Such a finding holds true for both the phytoplankton and zooplankton components of the pelagic realm. Data show the relative adundance of phytoplankton cells collected within the limits of the area to be from one to four orders of magnitude less than counts obtained from the vicinity of the continental shelf break and landward. Constituents of the nekton, i.e., fishes and cephalopod mollusks, tend to concentrate in areas of abundant food supply since they are free-swimming forms. It seems likely that a number of the less important nektonic species inhabit the incineration site waters as year-around residents, whereas many predatory species of commerical and sport's interest (e.g., billfishes, tuna, dolphin) are probably only seasonal transients in the area, but little direct information on this point exists.

3. Benthic Biota of the Incineration Site

The benthic environment is in general affected and defined by the same factors that influence the waters above the bottom. Additional factors to consider for the sea bottom alone are: (1) nature of the substrate; (2) nature of the sediment; and (3) sub-bottom temperatures, salinity, oxygen and pH. The substrate may be hard or soft depending on the amount and nature of the sedimentation, and the degree of scouring by horizontal currents. Sediment type is usually described by percentages of carbonates, evaporites, sand,

silt, and clay. Sub-bottom temperature, salinity, oxygen, and pH can be much different than overlying waters, especially the oxygen and pH values. The benthic environment becomes more stable at greater depths, i.e., it is less affected by physical forces such as currents, waves, and storm surges. Temperature and salinity data tend to fluctuate less and have smaller ranges of values than in shallow water areas closer to the air-sea interface.

Whereas the plankton biota of the surface waters over the site may be viewed primarily as transitional between that of the shelf and that of the deep Gulf, such is probably not the case with the benthic fauna. Most of the benthic inhabitants of the slope are not found elsewhere, and together they constitute a complex, true slope fauna. Major depth-related faunal breaks were cited between 175-225 m, 50-550 m, and 750-800 m on the upper continental slope, along with speculation of additional assemblages of the deeper slope beyond the depth range of their study. Unpublished data from benthic stations near the incineration site tend to verify further zonation with faunal breaks around 1000 m (550 fm), between 1450-1750 m (800-950 fm), and near 2500 m (1350 fm). That is to say, there are probably two different benthic assemblage zones occupying the depth range of the site.

I. Proposed Atlantic Incineration Site - 106 Industrial Waste Site

This disposal site is located 106 nautical miles southeast of

Ambrose Light (at the entrance to New York Harbor) and approximately 90 nautical miles due east of Cape May, New Jersey. The site is off the continental shelf at depths ranging from 1,550 meters in the northwest corner of the site to 2,750m in the relatively flat southeast corner. The bottom is generally characterized by a rugged topography. A major topographic feature of the region, the Hudson Canyon, is to the north, northeast, and east of the dumpsite.

The hydrography of the dumpsite area is complex and the currents are seasonally variable. Any one of three water masses may be present at different times or at different levels in the water column; shelf, slope, and Gulf Stream water have all been identified. Circulation patterns are affected by mixing across frontal zones. Currents run predominantly southward along the coast, while the Gulf Stream runs generally northeastward.

In addition to hydrography, studies have also been made in the water column of the occurrence and, in some cases, the relative abundance of nutrients, zooplankton, ichthyoplankton, and nekton. The ocean bottom at the dumpsite has also been investigated by means of echo-sounding, photography, trawling and quantitative sampling in order to describe aspects of geology, geochemistry, and benthic fauna. Investigations have been made of heavy metal and other contaminants in water, sediments, and in the tissues of larger benthic fishes and invertebrates. (Ref. 22)

EPA is currently evaluating the data collected during these investigations for the purpose of preparing an EIS for the proposed incineration site.

VI. ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND TECHNICAL ALTERNATIVES

One of the key considerations for minimizing environmental impact is proper selection of the site for treatment and disposal of wastes. Marine incineration sites should not interfere with shipping, fishing, mineral extraction, fish and shellfish cultures and areas of special scientific importance. Of equal importance is the regulation of emissions from the incinerator, control of operating procedures, and requirements for equipment and devices to minimize malfunctions of the system. The proposed Federal action will ensure that these types of considerations and regulations will be applied uniformly by all Parties to the Convention.

A. General Site Selection (U.S. Procedures)

Sites for the direct dumping into the ocean are selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.

Locations and boundaries of a disposal site will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal

ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.

If at anytime, during or after disposal site evaluation studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria for site selection, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated. To the extent possible, sites for incineration will not be located within disposal areas designated for direct dumping of waste and the criteria for selection of incineration sites will also include consideration of atmospheric dispersal characteristics, adverse weather conditions and migratory bird flyways.

The sizes of ocean disposal sites will be limited in order to localize for identification and control any immediate adverse impacts and permit the implementation of effective monitoring programs to prevent adverse long-range impacts and surveillance for enforcement purposes. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation study.

The results of a disposal site evaluation and/or designation based on the EPA criteria will be presented in support of the designation promulgation as an environmental assessment of the impact of

the use of the site for disposal, and will be used in the preparation of an environmental impact statement for each site where such a statement is required by EPA policy. An environmental impact statement (EIS), in draft form, will be made available for public comment not later than the time of publication of the site designation as proposed rulemaking, and a final EIS will be made available at the time of final rulemaking.

B. Environmental Impacts Resulting from Emission from Incinerator Vessel in Compliance with International Standards

1. Types of wastes which may be incinerated and emission products

a. Organochlorine Wastes

Industrial wastes which may be incinerated at sea are principally organic chemicals. Such wastes will usually be liquid, although certain organic solids may be candidates because they are soluble in the waste or in fuel oil. Furthermore, the wastes may be "wet" or emulsified in water.

In general, these wastes will be organochlorine compounds whose principal combustion products are CO_2, H_2O, and HCl. However, there is no reason to exclude hydrocarbons or oxygenated organic compounds such as alcohols, aldehydes, ketones, ethers, acids and esters, provided that they are combustible and do not contain materials which are prohibited by current statutes and regulations. Principal combustion products from these non-chlorinated materials are CO_2 and H_2O.

A basic characteristic of at-sea incineration is that the combustion products of the waste go directly from the stack of the incinerator into the air and the ocean without any further treatment.

For land-based incinerators, emission control devices, such as scrubbers, are required to eliminate impacts on air quality resulting from toxic gas (HCl), vapors, mist and particulates. The consequences of these impacts are dependent upon the chemical nature of the pollutant and the assimilative capacity of the air environment. Since at-sea incineration sites are selected by also taking into account the atmospheric and meteorological conditions of the area, emission control devices are not required for incineration vessels. The emissions enter the sea and are neutralized and dispersed. The addition of a scrubber on an incineration vessel would concentrate the stack emission and could cause the localized stresses at the point of discharge; however, for fixed incineration facilities located on an offshore platform, it may be necessary to install scrubbers and diffusors.

The stack emissions contain the major products of combustion - CO_2, H_2O, and HCl; certain minor constituents which reflect the minor components of the waste; and whatever unburned waste which remains plus any organic materials which may have been synthesized

during the incineration process. Trace metals which may be present in the waste will appear in the effluent gases as particulates. Phosphorus, sulfur, and much of the combined nitrogen will appear as P_2O_5, SO_x and NO_x. Certain other minor constituents caused by equilibrium conditions in the furnace and stack, i.e., CO, Cl_2, and H_2, may also be present to the extent of 10^{-5} to 10^{-8} mole fraction.

In general, organic wastes of high inorganic content such as heavy metals are not suitable for at-sea incineration. Since inorganic substances are not destroyed by incineration the amount of an inorganic substance in a combustible waste will need to be evaluated in accordance with the criteria controlling direct disposal. If levels of an inorganic substance are unacceptable for direct dumping then they would also be unacceptable for incineration at sea.

Organochlorine wastes are generally produced during chemical manufacturing and other industrial processes. Specific categories of compounds include a large number of pesticides (e.g., DDT, 2,4,5-T, aldrin, dieldrin, kepone, etc.) which may have been off-specification or in surplus; a series of aliphatic low molecular weight chlorinated hydrocarbons produced as nonsaleable by-products during organic synthesis reactions; and wastes from the

plastics industry (e.g., polyvinyl chloride). The percentage of chlorine content of organochlorines is variable; some wastes can contain as little as 10% or less chlorine, while hexa-chlorocyclopentadiene production wastes may contain as much as 77% chlorine. Wastes containing up to 63.5% Chlorine have been shown to be capable of sustaining combustion in an incineration at sea system (Ref. 8). However, some wastes of very high chlorine content and very low hydrogen content will require the addition of fuel in order to permit combustion. Addition of fuel does not introduce environmental problems, but may increase the cost of an at-sea incineration operation.

b. Waste Requiring Special Controls

Certain classes of organochlorine wastes have physiological properties which cause them to be particularly hazardous to human or marine life. Some organochlorine wastes contain substances which have been identified as potential carcinogens, mutagens, or teratogens. Examples of these materials are PCBs (polychlorinated byphenyls); BHCs (benzene hexachlorides); PCTs (polychlorinated triphenyls); DDT - (1,1,1-trichloro-2,2-di[chlorophenyl]ethane); and VC (vinyl chloride).

The Federal Toxic Substances Control Act requires monitoring

of incinerators burning PCBs. Regulations based on the Resource Conservation and Recovery Act of 1976 will require additional continuing and intermittent monitoring equipment.

Based on EPA's ocean dumping regulations, special studies may be required prior to the issuance of a permit for incineration at sea, to determine the impact of human health and/or marine ecosystems, if candidate wastes are shown to contain carcinogens, mutagens, or teratogens.

c. Combustible Waste Containing Metals

Presence of trace metals in liquid organochlorine wastes has been demonstrated. Metal content will appear in the stack gases (and thus the plume) as particulate matter. The quantity of metal salts or metal oxides in the plume is independent of combustion efficiency and is directly proportional to the metal content of the waste itself. Control of the metal content of waste material accepted for at-sea incineration becomes the responsibility of regulatory agencies to ensure that wastes with unacceptably high metal content are not approved for burning at sea. Control must be implemented, however, by restrictions based on the air and water quality requirements. Metal content permitted in waste thus becomes a function of the plume model and of the at-sea incineration process, e.g., dilution in the plume, feed rate of waste, air feed rate and the speed of the incineration ship.

d. Solid Wastes

The acceptability of burning solids at sea remains to be determined because of the current unavailability of the MATTHIAS III. During past burns on this ship, entire drums of wastes were fed into the incinerator. There were indications of high particulate emissions. These emissions are due to the quantities and nature of inorganic constituents contained in the wastes and/or to the drum itself.

2. Incinerator Efficiencies

Combustion efficiency (CE) and destruction efficiency (DE) are two parameters often used to describe an incinerator's effectiveness in disposing of organic wastes. The CE value for a certain burn is based on measurements of CO and CO_2 concentrations of the hot gases leaving the combustion chamber. The expression which is usually used to make this determination is:

$$CE\ (\%) = \frac{C_{CO_2} - C_{CO}}{C_{CO_2}} \times 100$$

where

C_{CO_2} = measured concentration of carbon dioxide

C_{CO} = measured concentration of carbon monoxide

Carbon monoxide and carbon dioxide concentrations must be expressed in the same units.

Destruction efficiency is basically a measure of the difference between the amount of wastes being fed to the incinerator and the amount of waste contained in the exiting gas stream. A variety of sampling, analysis, and calculation procedures can be used to determine the destruction efficiency of a particular burn. References 9 and 10 describe these procedures in detail based on data obtained during the March-April 1977 burn in the Gulf of Mexico and the the July-September 1977 burn in the Pacific. For an organochlorine waste,

$$DE = \frac{\text{Total organochlorine fed - organochlorine in exit gases}}{\text{total organochlorine fed}}$$

This method was also used by the French scientists who monitored the MATTHIAS III during the June 29, 1976, burn in the North Sea (Ref. 4).

Combustion efficiencies of 99.99% and destruction efficiencies of 99.999% were demonstrated with organochlorine wastes on the M/T VULCANUS (Ref. 10).

3. Incinerator Flame Temperatures

During the recent organochlorine waste burns at sea, flame temperatures were measured in the incinerator by means of an optical pyrometer. Wall temperatures were also measured by means of thermocouples reaching to within a few centimeters of the interior firebrick walls of the incinerator (Refs. 9 and 10).

At the start of each burn, the two furnaces of the M/T VULCANUS were heated by fuel oil until a flame temperature of 1280 degrees centigrade was reached; at this point the burners were successively switched to waste feed. Permit requirements were thus met in all cases.

The flame temperature is maintained above 1280 degrees centigrade at all times during the incineration of organochlorine wastes. During a typical burn in the South Pacific in July 1977, flame temperatures ranged from 1375 degrees centigrade to 1610 degrees centigrade over a ten-day period.

4. Environmental Impacts of At-Sea Incineration

Analysis of environmental impacts resulting from at-sea incineration has been based on the results of models which are used to estimate the effects of plume constituents in air and water quality. Air quality simulation methodology is described in Ref. 16.

C. Air Quality Effects

Major input parameters for air quality simulation are: effective stack height (or plume rise), wind speed, and the atmospheric stability category which is applicable. Values for these parameters selected for use in simulators are considered to be generally representative of conditions likely to occur over the ocean under real world circumstances. In general, simulation parameters used in this section are based on information obtained in connection with the

incineration of Shell wastes on board the M/T VULCANUS in March 1977 (Ref. 9).

Effective stack height calculations are based on data obtained during this burn. Wind speed and atmospheric stability categories used were selected after review of measured and statistical data for shore locations in the general vicinity of a burn zone located off the Gulf Coast. (Measured wind speed data are not available for the proposed offshore site; therefore, data from the nearest shore-based meteorological stations are used instead.)

Wind speed (i.e., speed of the diffusing layer) is an input parameter which significantly influences predicted downwind pollutant concentrations. Generally, increasing wind speed decreases downwind concentration. When an incinerator ship is moving, the relative wind speed, as measured at the stack, may be greater than the speed of the diffusing layer. However, relative wind speed is not used as an input to the diffusion modeling performed here, because the materials emitted will assume the average speed of the diffusing layer shortly after they are discharged to the atmosphere. One result is that downwind concentrations near the source may be lower (due to the additional mechanical turbulence from the ship velocity) than estimated in this study. Downwind concentrations will also tend to be decreased by the fact that a moving source distributes its emissions into a larger volume of air per unit time (i.e., if the relative wind speed is greater than that of the diffusing layer).

The diffusion model assumes that the chemical species emitted remain airborne and are not removed from the atmosphere by either chemical or physical processes. There are a variety of technical arguments against this assumption. For example, particulate matter will be removed by gravity, and there will undoubtedly be acid-base interactions between airobrne dropletes of ocean water and HCl. In addition, if the plume does loft, the HCl will disperse into the atmosphere and ultimately come down into the sea with rainfall. However, the data required to take pollutant-marine boundary layer interactions into account are not available.

Estimates were made assuming feed rate and emissions characteristics of the M/T VULCANUS furnaces. Emissions data for particulates were not obtained during the March 1977 burn. However, data were available describing waste composition and emissions of various inorganic constituents. These data were converted to mass emissions rates and summed in order to derive an estimate of expected particulate emissions. Based upon worst case calculations the maximum sea level concentration of inorganics in the ambient air would be about 26 microgram per cubic meter which is ten times lower than the EPA primary or health standards for particulates. It should be noted that these results compare favorably with the analysis data indicating a loss on ignition value of 99.8% for the waste (Ref. 9).

A Threshold Limit Value (TLV) of 7 mg/m^3 has been established for HCl. This level represents the maximum allowable

HCl concentration for humans in a work area. Excursions beyond this level for periods greater than 15 minutes result in either intolerable irritation, or chronic or irreversible tissue damage (Ref. 17). The maximum ambient HCl level of 4.4. mg/m predicted as a result of at-sea incineration is below this TLV.

D. Water Quality Effects

Estimation of the effects of at-sea incineration on ocean water quality were generally obtained by using a diffusion model to identify the ocean area affected by the plume and by determination of the water concentrations of plume constituents. The concentrations were determined by assuming that all of the material in the plume dissolved in a prescribed depth of the affected water area.

HCl concentrations in the plume are high because the combustion gases are not scrubbed. However, because of its buffering capacity, one cubic meter of ocean water is capable of neutralizing 80 gm of HCl (80,000 ppb) (Ref. 14). Thus, the 197 ppb contribution of HCl from plume touchdown would never be detected by a pH change and *the corresponding quantity of chloride ion would be negligible* compared with the 19,000 ppb chloride background of the ocean.

During the 1974 burn of organochlorine waste onboard the M/T VULCANUS, water samples were obtained in the vicinity of plume touchdown (Ref. 8). Analysis of these samples showed no significant *difference in pH and copper (the most abundant heavy metal*

constituent of the waste) as compared with samples from control areas. Organochlorine wastes were undetected at the 0.5 ppb level.

Biological specimens (phytoplankton and zooplankton) were also taken during the 1974 burn (Ref. 8). Examination of chlorophyll-a (an indicator of phytoplankton activity) levels, and adenosine triphosphate (ATP) levels in the specimen showed no deleterious or subtle adverse impacts.

A series of biological tests were also associated with the March 1977 burn. Various fish species were exposed to the plume of the M/T VULCANUS during the incineration. Exposure was accomplished by using a device called a biotal ocean monitor (BOM), which allows specific organisms to be exposed under field conditions and then retrieved. The BOM tests which represent a worst case condition showed an elevation in the activity of P-450 enzymes. However, when exposed fish were left in clean water for a few days, the enzyme activity reverted to that of control organisms (Ref. 15).

The experimenters concluded that the overall effects were localized and temporary and do not represent drawbacks to the use of incineration at sea for organochlorine waste disposal (Ref. 15).

E. Socio-Economic Impacts

Selection of an appropriate disposal site is implicit in controlling the environmental impact and the socio-economic effects which may result from an incineration at sea process.

1. Beach and Shoreline Recreation

No impact on beach and shoreline recreation activities would be expected to result from incineration at sea in a properly selected disposal zone. If the site chosen is suitably located away from the nearest coastline it is doubtful that incineration at sea will have any adverse effects upon the coastal water or beach areas. However, a possible adverse effect could be produced by an accidental spill in port or while the ship is underway near the coast. Any ship operating under an EPA permit to incinerate chemical wastes must meet Coast Guard regulations requiring protection appropriate to the hazardous cargo, which minimizes loss of cargo resulting from collisions or stranding and reduces the likelihood of sinking.

2. Recreational Use

The sites chosen for at-sea incineration are in areas where sport fishing is known to be minimal. The incineration site should be away from major shipping lanes where feasible. Accordingly, pleasure craft are also not likely to transit this area. Even if such vessels stray into the area during a burn, existing observations during test burns show that the concentrations of toxic materials at any one point near the water surface are such that no harm will result. Warnings of action

which may be dangerous are also circulated and the disposal site is usually shown on a chart. Permits require the incineration vessel to position itself downwind from any vessels other than those engaged in environmental monitoring. Thus, the impact of incineration at sea will have little or no effect on pleasure craft.

One possible impact of incineration at sea on recreational values would be from accidental discharge of chemical wastes while the ship is in transit to the site. Such an accidental discharge, if in significant quantity, could result in a localized kill of marine life. For this reason, the route of the ship to the site will be controlled so as to minimize vessel transport through recreational areas. In addition, the design of the ship will meet the Coast Guard requirements for carrying hazardous cargo, thereby minimizing the probability of the discharge of the cargo even if the ship is involved in an accident at sea.

3. Population characteristics

Neither the incineration operation nor the use of a disposal site will have demographic effects of any significance. The only ship currently in operation which has performed incineration of chemical wastes and can reach the United States is the M/T VULCANUS, which carries a crew of 18. The ports in which the ships would be fueled and loaded are major seaports, so that the effect of the use of this ship would not significantly affect the population of land-based support personnel.

4. Economic Impact

The short run economic impact of the site designation and its use will be minimal. The ship VULCANUS, which has been utilized for such incineration, already exists and is of foreign registry with a foreign crew. The loading of the ship will utilize existing dock facilities and employees in the United States and the additional load on these facilities is minimal due to the small amount of such waste products relative to the tonnage of commodities already handled by these facilities. For example, in 1974, the Port of Houston alone handled in excess of 34 million short tons of cargo in foreign trade. Approximately 3.4 million short tons, or 10 percent of this total, were chemicals. These figures, of course, do not include the large amount of domestic cargo handled by the Port. Moreover, by the very nature of the cargo, the incinerator vessel will take on waste at the chemical plant's private dock.

Neither the incineration operation nor the use of the burning zone will have any measurable economic impact on commercial fishing and shrimping. Observations from both the MATTHIAS III and the VULCANUS indicated no interference with commercial fishing activities. In addition, the concentrations of wastes remaining in the stack emissions after a properly carried-out incineration are so small that it is highly unlikely that any damage would be done to any fish in the immediate area.

5. Impact on Land Use and Land Use Trends

Neither the incineraiton operation nor the use of the burning zone would have a significant impact on existing land use or trends in land use. No additional land is required for the project. The existing port facilities are adequate for the loading of the wastes.

Land-based disposal methods require substantial land use; incineration at sea does not. Designation of proposed sites could open the way for incineration at sea of suitable materials that are now disposed by incineration on land or by deep-well injection. Also, as a beneficial impact, improved air and water quality is expected when land treatment is shifted to incineration at sea.

6. Public Service

Neither the incineration operation nor the use of a properly selected burning site will have impact on required public service. The loading in all probability will be carried-out from existing facilities using the existing labor force. Thus, no additional public services will be necessary.

F. Technical Alternatives to Incineration at Sea

1. Chemical Landfills and Potential Environmental Impacts (Ref. 19)

Landfills operate on the following principles:

a) utilization of the adsorptive capacity of the soil,

b) storage of wastes so that they are isolated from man and the surface environment, and

c) to a minor extent, biodegradation.

The typical landfill methods currently utilized for disposal of hazardous waste include subsurface injection, isolation, burial, surface adsorption, and direct landfill. Each of these methods results in the underground emplacement of wastes. The amount and type of cover varies with the method, which, in turn, is determined by type of waste. A relatively shallow cover of impermeable material may be used in surface adsorption and direct landfill, whereas isolation burial and subsurface injection generally involve deeper underground placement of the waste materials. In isolation burial, the wastes are often surrounded by an impermeable layer of soil, as well as covered by it. The landfills meeting the most stringent requirements for hazardous waste disposal are called "secure landfills", and are generally the only landfills considered adequate to prevent environmental damage to all media. The secure landfill is designed to provide complete protection for all of the quality of ground and surface waters from the disposed wastes. Measurement and analyses of leaching rates at experimental waste disposal sites indicate that secure landfills of untreated hazardous wastes can be constructed such that adverse impacts will not occur.

In recent years, the more stringent regulation of discharges of toxic pollutants into air and water has precipitated a growing trend to dispose of hazardous wastes on land. Because of inadequate legal restrictions and economic factors, the prevailing methods of land disposal of hazardous wastes have often been inadequate.

Various damage incidents have resulted from cases of improper land disposal. The damage has occurred via groundwater contamination, surface water contamination by runoff, air pollution from open burning, evaporation, sublimation and wind erosion, poisonings by direct contact and through the food chain, and fires and explosions at land disposal sites. Landfills and surface impoundments thus may constitute sources of environmental damage. Certain materials of high-toxicity and poor biodegradability are being excluded from disposal in landfills. These materials include specific organochlorine compound types, e.g., polychlorinated biphenyls (PCBs) and hexachlorocyclopentadiene (C-56). Thus, landfills may have inherent problems as alternatives for disposal of organochlorine wastes for the following reasons.

- Organochlorine wastes are not readily biodegradable and, thus, remain in-situ.
- Landfills may cause pollution of ground water aquifers by percolation and surface water contamination through circumstances over which the responsible agencies have no control, e.g., flooding and earthquakes.
- Landfills may cause air pollution through evaporation and/or wind erosion.

On the other hand, landfill methods have certain advantages, such as:

- relatively low cost
- minimal energy requirements

- low capital investment in equipment and machinery
- simplicity of operation

Secure landfills must be considered as alternatives to at-sea incineration, although they appear to possess disadvantages which may make them less desirable for organochlorine waste disposal than more positive methods such as incineration or chlorolysis.

2. Land-Based Incineration

Land-based incineration requires two basic components, a combustion chamber and a gas scrubber. Typically, land-based disposal processes use liquid incinerators where the liquid waste is atomized to increase the surface area available for thermal destruction just as in the case of at-sea incineration.

Combustion products of heavily chlorinated organochlorine wastes are usually passed through a scrubber after leaving the combustion chamber. Such scrubbers are designed to remove primarily particulates and HCl, but other combustion products may also be abstracted. The most common type of scrubber system consists of a Venturi scrubber followed by a packaged tower or a separator tank with a demister.

The efficiency of waste destruction in a land-based system has been shown to be in most cases on the order of 99.99 percent. Waste constituents were not found in the stack gases being vented to the atmosphere. The maximum ground level concentration of HCl is several orders of magnitude lower than the TLV of 7 mg/m^3.

The wastewater from the scrubber will contain suspended par-

ticulates, dissolved HCl, trace quantities of organic materials and waste constituents and trace metals which were in the waste stream. It may need treatment before it is returned to the environment. Land-based facilities utilizing alkaline scrubber water may contribute additional total dissolved solids (TDS) to water resources. Depending on the organochlorine waste incinerated, the scrubber wastewater could have TDS values higher than seawater. For inland areas, discharge of wastewater with TDS values approaching or higher than seawater will have a more significant impact because there is not an ocean nearby to serve as an appropriate sink.

Solid residues appear to present only a minor problem. Analysis of solid residue from hexachlorocyclopentadiene showed mostly carbon and no measurable quantities of this waste.

Land-based incineration is considered a viable alternative to at-sea incineration for the disposal of organochlorine wastes. However, in case of catastrophic or periodic malfunction accidents at either facility, the potential for acute adverse effects on the environment is greater at the land-based facility due to its close proximity to population centers and areas of environmental concern.

3. Feasible Methods of Waste Recovery -- Chlorolysis

The Resource Conservation and Recovery Act of 1976 requires that recovery of useful components of waste be undertaken before final disposal. Recycling, fractionation and chemical treatment are potential alternatives to gross disposal. However, these

methods are dependent upon energy requirements and on the economics of the recovery process.

One of the currently attractive methods of waste recovery is chlorolysis. In this process, the waste is treated with chlorine to produce carbon tetrachloride. While this process will produce a useful material as an end product, it is ultimately dependent on the market for carbon tetrachloride. The process also requires a "clean waste" stream and, thus, is expected to be applicable to only approximately 10 percent of the organochlorine wastes which are available. Furthermore, chlorolysis uses elemental chlorine which not only requires electrical energy for its production, but is also competitively sought by other processes in the chemical industry.

For chlorolysis, the predicted maximum ground level concentrations of hydrogen chloride, chlorine, carbonyl chloride, carbon tetrachloride, and sulfur dioxide are all several orders of magnitude lower than their respective TLV's. Emissions from chlorolysis are lower than those from at-sea incineration, and are also lower than those from land-based incineration with the exception of hydrogen chloride emissions. Environmental impacts associated with the chlorolysis process should, therefore, be lower than those associated with the other two disposal processes.

Chlorolysis is a viable alternative for the treatment of some organochlorine wastes before ultimate disposal of non-recoverable residues.

VII. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

During the organochlorine waste incineration tests in the Gulf of Mexico, EPA undertook a sampling and analysis program to acquire the data necessary for evaluating the incinerator waste destruction efficiency. Although these efforts provide an assessment of the acute effects of incinerating organochlorine wastes, a better understanding of the potential long-term effects of at-sea incineration is needed. Evaluation of long-term effects is dependent upon the advancement of at-sea monitoring technology which is in its early stages of development. Therefore, the use of a disposal site may be limited or terminated based on the impact of disposal at the site.

The procedure and criteria for evaluating the disposal site impact are specified in the EPA regulations for ocean disposal of waste. The basic rationale for the impact classification system is that some changes in the composition of water and sediments may be tolerated, but any significant sign of damage to any of the biota may be a forerunner of adverse changes affecting the entire ecosystem and steps should be taken to reduce waste loadings to levels at which no changes in the biota are detectable. Thus, EPA recognizes that there is some impact on the biota that may presage some form of significant long-range impact and regards this level of impact as being "unreasonable degradation" and will take

appropriate steps to preclude this from happening.

Research will be conducted to develop better models to predict plume dispersion and impact on air quality. Continued research will be conducted on the marine environment (such as use of the BOM discussed in Chapter VI, section D) to determine any long-term impacts resulting from stack emissions.

The Convention does not require the development of procedures and criteria for evaluating the impact waste disposal at designated sites; however, the Convention does require the parties to monitor the condition of the seas and take all practicable steps to prevent harm to living resources and marine life. Based on results of future research conducted in the atmosphere and marine environments as previously outlined, the U.S. will recommend to the Contracting Parties any necessary changes to the incineration at sea regulations.

VIII ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED

A. Emissions from Incinerators

1. Impact on Air Quality

Some largely local impacts on air quality from the at-sea incineration process are unavoidable in the burn site. Among these are the large output of hydrogen chloride with far lesser amounts of carbon monoxide, chlorine, and unburned organochlorines. At 99.96% destruction efficiency of the waste, the maximum predicted concentration of organochlorines would be approximately 2.75 ug/m3. In the March 1977 Gulf burn, the maximum air concentration of hydrogen chloride found was 10 ppm (one occasion only). Most frequently, values ranged from 0-5 ppm. Sea-level concentrations of hydrogen chloride generally were in the range of 1-2 ppm several kilometers down-wind during the October 1974 burn. These low atmospheric concentrations of hydrogen chloride posed no hazard to birds or personnel in the area. The concentrations of carbon monoxide and chlorine in the atmosphere are negligible.

Within 5-10 miles of the incinerator ship, acid rain from incineration could equal or exceed that normally produced when rain washes out the naturally occurring acidic sulfur (SO_x) and nitrogen (NO_x) as well as chloride in salt spray. In this case the acid rain would be neutralized immediately by the natural carbonates in the ocean (Ref. 14).

Beyond ten miles, any hydrogen chloride remaining in the air would be so diluted that it would be insignificant compared to naturally occurring acidic components of the atmosphere. Aerial monitoring of at-sea incineration in 1974 showed that the maximum concentration of hydrogen chloride in the air five miles downwind was on the order of 0.1 ppm. This concentration is much lower than the TLV. Eight miles downwind the concentration was below *detection limits (0.005 ppm). This concentration is lower than the* concentration of other acidic components allowed under the most stringent air standards for either SO_x or NO_x.

At any greater distance than ten miles, the effect would be even less with continued dispersion and neutralization of the hydrogen chloride which contacts the ocean or reacts with naturally occurring ammonia (20 ppb) in the atmosphere. For these reasons, the acidity of rainfall on coastal locations would not be increased due to at-sea incineration in the proposed site.

B. Deterioration of Water Quality

The ability of sea water to assimilate hydrogen chloride without measurable change is well known. Analysis of sea water samples for organochlorines during organochlorine burns resulted in values below the 0.5 ppb limit of detection. In addition, surface water samples collected during burns showed no significant differences in trace metals between test and control stations under normal *meteorological conditions.*

A "worst case" condition would be the rapid fallout of HCl caused by rainfall. Rainfall occurs less than 25 days per year at the Gulf of Mexico burn site. If rainfall occurred in the immediate vicinity of the incinerator vessel, it is estimated for a typical organochlorine waste (63% chlorine) that the maximum fallout rate of HCl would be between 30 and 60 grams per square meter of ocean surface. A depression in pH would occur but would have short-term and local effects since neutralization would occur within the first few meters of the water column. If the rain occurred directly downwind at a distance of 5-10 miles from the incinerator vessel, acid rain would be neutralized immediately by the natural buffering capability of the ocean. At distances greater than ten miles, acidity due to input of HCl from incineration of organochlorines would be neutralized by ambient ammonia in the atmosphere.

C. Accidental Spillage

Even though incineration at sea has been found to have no demonstrable deleterious effects upon the upper portion of the water column and its biota, potential for environmental damage resulting from an accidental collision, stranding, or sinking while loaded with chemical wastes is of considerable environmental concern. Such an accident could occasion moderate or serious consequences, depending in large measure upon where it occurred. For instance, a major spill near shore affecting an estuary would destroy many organisms (including bottom-living forms) and contaminate the area for a substantial period of time.

A spill on the continental shelf could have significant short-term impact on local organisms; however, as the wave and current actions would greatly disperse the contaminant and the large volume of water would dilute the contaminant, the long-term impacts at the site would be significantly reduced.

In addition to the possibility of collision and catastrophic marine accidents, spillage may result from improper loading and transfer operations. The U.S. Coast Guard data on spills of oil and other matter indicate that about 34 percent of such spills occur in port and harbor areas. However, of these, only 17 percent occur at marine transfer facilities.

In order to reduce the potential for such discharges, the Coast Guard conducts surveillance flights at ports handling over 10 million tons of petroleum products annually and flights are conducted in all coastal waters. Specific coastal surveillance areas are determined by pollution potential expected as a result of vessel density studies and historical spill data. The Federal Water Pollution Control Act requires polluters to report spills, and non-spilling industries and the public are encouraged to report spills to augment this mandate.

The Coast Guard enforces regulations that protect the marine environment against pollution from chemical carriers. These fall into several categories: standards for design and construction of navigating vessels, cargo containment and fire protection

requirements, navigating equipment necessary for safe operation, and cargo transfer regulations and procedures for notifying proper authorities if a spill occurs.

Since most liquid bulk chemical carriers are a special form of tanker designed to safely transport hazardous bulk liquid cargoes, they must meet the construction and operation requirements of all applicable U. S. Coast Guard tank vessel regulations, as well as the special requirements for the specific bulk cargoes to be carried when transporting flammable and combustible liquid cargoes in bulk. The terminology "chemical carriers" includes ships which may also carry bulk chemicals not in liquid form and petroleum products in addition to liquid bulk chemicals. In any event, the Coast Guard requires that adequate pollution control measures for cargoes carried must be incorporated in the design of the ship, its cargo tanks, cargo transfer equipment and other protective auxiliary equipment.

The Coast Guard Captain of the Port (COTP) is responsible for general port safety and enforcement of pollution prevention regulations. His staff daily inspects vessels, facilities, and anchorages. The purpose of these inspections is to safeguard vessels, harbors, ports, and waterfront facilities by enforcement of hazardous material regulations and other related safety regulations. The COTP is also responsible for establishing, coordinating, and, if necessary, putting into effect emergency contingency plans in the event of a major casualty in the port.

During the transfer and transport of Herbicide Orange, special precautions were taken to reduce the potential for spillage. A contingency plan was drawn up by the Air Force, EPA, and the Coast Guard. The contingency plan defined precautions to be taken to prevent spills of herbicide and the countermeasures to be taken if a spill occurred during any stages of the disposal operation, including emptying of the drums and moving the contents to the dock in Gulfport, Mississippi; loading the herbicide into the VULCANUS; ocean transit; transit of the Panama Canal; and operations at Johnston Island. Organization of the operation was to be under the direction of an Air Force project director or his deputy; the director or his deputy was on call 24 hours a day, either at Gulfport or at Wright-Patterson Air Force Base in Ohio. Preventing spills and taking appropriate measures in the event of a spill were the responsibility of the Air Force On-Scene Coordinator, who was at Gulfport and Johnston Island during operations there. The contingency plan also listed government agencies and commercial salvage firms that could be called for assistance and government agencies to be notified in the event of a spill or any other accident.

It is to be anticipated that similar precautions would be taken when loading, transferring and transporting hazardous wastes for incineration at sea.

IX. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A. Commitment of Physical and Biological Resources

The conversion and operation of at-sea incineration ships involves the use of mineral resources, some of which cannot be recovered. In the construction of the vessel, coal, limestone, and other materials are used to produce steel and other materials used in construction. While many materials are recoverable, such as steel used in construction, other materials are not. The character of these materials is not unique, nor will the quantities used be such that their use is significant in terms of our national resources.

The loss of thermal energy due to waste combustion is a significantly large irretrievable resource. A typical organochlorine waste would be rated at 11630 kilojoules/kg. At a waste destruction rate of 25 metric tons/hour, this figure represents a loss of energy to the environment of 290×10^6 kilojoules/hour.

At the present time, the highly corrosive nature of the effluent gases (which may contain 5% HCl) at an estimated 1000 degrees centigrade, makes recovery of the energy for propulsive or storage use a major and expensive undertaking.

B. Commitment of Other Resources

The proposed Federal action would not involve the irrecoverable use of resources other than fuel, that quantity required for transport

of the waste and the amount required to bring the incinerator to proper operating temperature. A preliminary study of incineration at sea (Ref. 23) indicates that for transport and destruction of wastes in the Gulf of Mexico it would require about 0.1 metric tons of fuel per metric ton of waste destroyed.

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APPENDIX A

ADOPTED RESOLUTION AND AMENDMENTS TO THE CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER

Resolution adopted on 12 October 1978

THE THIRD CONSULTATIVE MEETING,

RECALLING Article I of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, which provides that Contracting Parties shall individually and collectively promote the effective control of all sources of pollution of the marine environment,

HAVING NOTED the use of incineration at sea as a means of disposal of wastes containing highly toxic substances and the consequent risks of marine and atmospheric pollution which may result from this process,

DESIRING to prevent such pollution and to minimize the risk of hazards to other vessels or interference with other legitimate uses of the sea which could arise from incineration operations at sea,

RECOGNIZING present methods of incineration at sea as being an interim method of disposal of wastes pending the development of environmentally better solutions. considering at all times the best available technology,

AFFIRMING that the intention of the adoption of mandatory provisions for the control of incineration at sea is not to increase the amounts and kinds of wastes or other matter incinerated at sea for which there are available practical alternative land-based methods of treatment, disposal or elimination,

REAFFIRMING that, in accordance with Article IV(3) of the Convention, Contracting Parties can apply additional regulations for incineration at sea on a national basis,

NOTING that Article VIII of the Convention encourages Contracting Parties, within the framework of regional conventions, to develop further agreements reflecting the conditions of the geographical area concerned,

RECALLING the decision of the Second Consultative Meeting that provisions for the control of incineration at sea should be implemented by Contracting Parties on a mandatory basis in the form of a legal instrument adopted within the framework of the Convention (LDC II/11, Annex II).

HAVING CONSIDERED the proposed amendments to the Annexes of the Convention for the control of incineration at sea contained in the Report of the Ad Hoc Group of Legal Experts on Dumping,

ADOPTS the following amendments to the Annexes to the Convention in accordance with Articles XIV(4)(a) and XV(2) thereof:

(a) addition of a paragraph 10 to Annex 1;

(b) addition of a paragraph E to Annex II; and

(c) addition of an Addendum to Annex I, containing Regulations for the Control of Incineration of Wastes and Other Matter at Sea,

the texts of which are set out in Attachment to this Resolution,

ENTRUSTS the Inter-Governmental Maritime Consultative Organization with the task of ensuring, in collaboration with the Governments of France, Spain, the Union of Soviet Socialist Republics and the United Kingdom, that the texts of the above Amendments are drawn up by 1 December 1978 in all official languages of the Convention with the linguistic consistency in each text, which would then become the authentic text of the Annexes to the Convention in the English, French, Russian and Spanish languages,

RESOLVES that for the purposes of Articles XIV(4)(a) and XV(2) of the Convention, 1 December 1978 shall be treated as the date of the adoption of the amendments,

REQUESTS the Secretary-General of the Organization to inform Contracting Parties of the above-mentioned amendments,

REQUESTS the Ad Hoc Group on Incineration at Sea to prepare draft Technical Guidelines for the Control of Incineration of Wastes and Other Matter at Sea with a view to adoption by the Fourth Consultative Meeting,

INVITES Contracting Parties to implement, as an interim measure, the existing Technical Guidelines (LDC II/11, Annex II, with amendments (IAS/9, Annex IV)) and the notification procedure set out in Annex 2 to LDC III/12.

Attachment

AMENDMENTS TO ANNEXES TO THE CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER CONCERNING INCINERATION AT SEA

The following paragraph shall be added to Annex I:

10. Paragraphs 1 and 5 of this Annex do not apply to the disposal of wastes or other matter referred to in these paragraphs by means of incineration at sea. Incineration of such wastes or other matter at sea requires a prior special permit. In the issue of special permits for incineration the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to this Annex (which shall constitute an integral part of this Annex) and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation.

The following paragraph shall be added to Annex II;

E. In the issue of special permits for the incineration of substances and materials listed in this Annex, the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to Annex I and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation, to the extent specified in these Regulations and Guidelines.

ADDENDUM

REGULATIONS FOR THE CONTROL OF INCINERATION OF WASTES AND OTHER MATTER AT SEA

PART I

REGULATION 1

Definitions

For the purposes of this Addendum:

(1) "Marine incineration facility" means a vessel, platform, or other man-made structure operating for the purpose of incineration at sea.

(2) "Incineration at sea" means the deliberate combustion of wastes or other matter on marine incineration facilities for the purpose of their thermal destruction. Activities incidental to the normal operation of vessels, platforms or other man-made structures are excluded from the scope of this definition.

REGULATION 2

Application

(1) Part II of these Regulations shall apply to the following wastes or other matter:

(a) those referred to in paragraph 1 of Annex I;

(b) pesticides and their by-products not covered in Annex I.

(2) Contracting Parties shall first consider the practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the wastes or other matter less harmful, before issuing a permit for incineration at sea in accordance with these Regulations. Incineration at sea shall in no way be interpreted as discouraging progress towards environmentally better solutions including the development of new techniques.

(3) Incineration at sea of wastes or other matter referred to in paragraph 10 of Annex I and paragraph E of Annex II, other than those referred to in paragraph (1) of this Regulation, shall be controlled to the satisfaction of the Contracting Party issuing the special permit.

(4) Incineration at sea of wastes or other matter not referred to in paragraphs (1) and (3) of this Regulation shall be subject to a general permit.

(5) In the issue of permits referred to in paragraphs (3) and (4) of this Regulation, the Contracting Parties shall take full account of all applicable provisions of these Regulations and the Technical Guidelines on the Control of Incineration of Waste and Other Matter at Sea for the waste in question.

PART II

REGULATION 3

Approval and Surveys of the Incineration System

(1) The incineration system for every proposed marine incineration facility shall be subject to the surveys specified below. In accordance with Article VII(1) of the Convention, the Contracting Party which proposes to issue an incineration permit shall ensure that the surveys of the marine incineration facility to be used have been completed and the incineration system complies with the provisions of these Regulations. If the initial survey is carried out under the direction of a Contracting Party a special permit, which specifies the testing requirements, shall be issued by the Party. The results of each survey shall be recorded in a survey report.

(a) An initial survey shall be carried out in order to ensure that during the incineration of waste and other matter combustion and destruction efficiencies are in excess of 99.9 per cent.

(b) As a part of the initial survey the State under whose direction the survey is being carried out shall:

(i) approve the siting, type and manner of use of temperature measuring devices;

(ii) approve the gas sampling system including probe locations, analytical devices, and the manner of recording;

(iii) ensure that approved devices have been installed to automatically shut off the feed of waste to the incinerator if the temperature drops below approved minimum temperatures;

(iv) ensure that there are no means of disposing of wastes or other matter from the marine incineration facility except by means of the incinerator during normal operations;

(v) approve the devices by which feed rates of waste and fuel are controlled and recorded;

(vi) confirm the performance of the incineration system by testing under intensive stack monitoring, including the measurements of O_2, CO, CO_2, halogenated organic content, and total hydrocarbon content using wastes typical of those expected to be incinerated

(c) The incineration system shall be surveyed at least every two years to ensure that the incinerator continues to comply with these Regulations. The scope of the biennial survey shall be based upon an evaluation of operating data and maintenance records for the previous two years.

(2) Following the satisfactory completion of a survey, a form of approval shall be issued by a Contracting Party if the incineration system is found to be in compliance with these Regulations. A copy of the survey report shall be attached to the form of approval. A form of approval issued by a Contracting Party shall be recognized by other Contracting Parties unless there are clear grounds for believing that the incineration system is not in compliance with these Regulations. A copy of each form of approval and survey report shall be submitted to the Organization.

(3) After any survey has been completed, no significant changes which could affect the performance of the incineration system shall be made without approval of the Contracting Party which has issued the form of approval.

REGULATION 4

Wastes Requiring Special Studies

(1) Where a Contracting Party has doubts as to the thermal destructibility of the wastes or other matter proposed for incineration, pilot scale tests shall be undertaken.

(2) Where a Contracting Party proposes to permit incineration of wastes or other matter over which doubts as to the efficiency of combustion exist, the incineration system shall be subject to the same intensive stack monitoring as required for the initial incineration system survey. Consideration shall be given to the sampling of particulates, taking into account the solid content of the wastes.

(3) The minimum approved flame temperature shall be that specified in Regulation 5 unless the results of tests on the marine incineration facility demonstrate that the required combustion and destruction efficiency can be achieved at a lower temperature.

(4) The results of special studies referred to in paragraphs (1), (2) and (3) of this Regulation shall be recorded and attached to the survey report. A copy shall be sent to the Organization.

REGULATION 5

Operational Requirements

(1) The operation of the incineration system shall be controlled so as to ensure that the incineration of wastes or other matter does not take place at a flame temperature less than 1250 degrees centigrade, except as provided for in Regulation 4.

(2) The combustion efficiency shall be at least 99.95 ± 0.05% based on:

$$\text{Combustion efficiency} = \frac{C_{CO_2} - C_{CO}}{C_{CO_2}} \times 100$$

where C_{CO_2} = concentration of carbon dioxide in the combustion gases

C_{CO} = concentration of carbon monoxide in the combustion gases.

(3) There shall be no black smoke nor flame extension above the plane of the stack.

(4) The marine incineration facility shall reply promptly to radio calls at all times during the incineration.

REGULATION 6

Recording Devices and Records

(1) Marine incineration facilities shall utilize recording devices or methods as approved under Regulation 3. As a minimum, the following data shall be recorded during each incineration operation and retained for inspection by the Contracting Party who has issued the permit:

(a) continuous temperature measurements by approved temperature measuring devices;

(b) date and time during incineration and record of waste being incinerated;

(c) vessel position by appropriate navigational means;

(d) feed rates of waste and fuel - for liquid wastes and fuel the flow rate shall be continuously recorded; the latter requirement does not apply to vessels operating on or before 1 January 1979;

(e) CO and CO_2 concentration in combustion gases;

(f) vessel's course and speed.

(2) Approval forms issued, copies of survey reports prepared in accordance with Regulation 3 and copies of incineration permits issued for the wastes or other matter to be incinerated on the facility by a Contracting Party shall be kept at the marine incineration facility.

REGULATION 7

Control over the Nature of Wastes Incinerated

A permit application for the incineration of wastes or other matter at sea shall include information on the characteristics of wastes or other matter sufficient to comply with the requirements of Regulation 9.

REGULATION 8

Incineration Sites

(1) Provisions to be considered in establishing criteria governing the selection of incineration sites shall include, in addition to those listed in Annex III to the Convention, the following:

(a) the atmospheric dispersal characteristics of the area - including wind speed and direction, atmospheric stability, frequency of inversions and fog, precipitation types and amounts, humidity - in order to determine the potential impact on the surrounding environment of pollutants released from the marine incineration facility, giving particular attention to the possibility of atmospheric transport of pollutants to coastal areas;

(b) oceanic dispersal characteristics of the area in order to evaluate the potential impact of plume interaction with the water surface;

(c) availability of navigational aids.

(2) The coordinates of permanently designated incineration zones shall be widely disseminated and communicated to the Organization.

REGULATION 9

Notification

Contracting Parties shall comply with notification procedures adopted by the Parties in consultation.

***

NOTIFICATION OF SPECIAL PERMITS TO INCINERATE WASTES AND OTHER MATTER AT SEA

The Organization shall be notified immediately following issuance of a special permit to incinerate wastes or other matter at sea. The form of report for notification is given in the Appendix.

APPENDIX

The notification shall contain the following information for each special permit:

(a) issuing authorities;

(b) date issued;

(c) period for which the permit is valid;

(d) country of origin of wastes and port of loading;

(e) total quantity of wastes (in metric units) covered by the permit;

(f) form in which the waste is presented (bulk or containers; in the latter case, also size and labelling);

(g) composition of the waste (physical form; specific gravity; viscosity; water content; principal organic components; organohalogens; main inorganic components; (radioactive or not) solids in suspension; caloric value; other properties such as, if necessary, toxicity and persistence; specify whether the analysis relates to dry or wet weight; give the above-mentioned information in ppm in the case of low concentrations);

(h) industrial process giving rise to the waste;

(i) name of the marine incineration facility and state of registration;

(j) area of incineration (geographical location; distance from the nearest coast);

(k) expected frequencies of incineration;

(l) special conditions such as to the operation of the marine incineration facility outside those specified in the Regulations or Technical Guidelines.

***

APPENDIX B

PROPOSED TECHNICAL GUIDELINES ON THE CONTROL OF INCINERATION OF WASTES AND OTHER MATTER AT SEA

APPENDIX B

PROPOSED TECHNICAL GUIDELINES ON THE CONTROL OF *INCINERATION OF WASTES AND OTHER MATTER AT SEA*

In addition to the regulations contained in the Addendum to Annex I, the Contracting Parties should take full account of these Guidelines when issuing permits for incineration at sea and undertaking surveys of marine incineration facilities.

A. *Incinerator Operations*

1. Waste type and feed rate to the incinerator.

   (a) Continuous flow measuring devices should be installed on existing vessels by (January 1, 1980). Interim methods of control should be based on a continuous display of the waste and fuel pump status supplemented by manual checks of the amount of waste burned every hour, to be recorded in the ship's log.

   (b) Where solid wastes are burned, the waste type and rate of input should be recorded.

2. Control of the air feed to the incinerator.

   (a) The amount of air entering the incinerator must be sufficient to ensure that a minimum of 3 percent excess oxygen is present in the combustion gases near the incinerator *stack exit.*

(b) Excess air should be monitored by an automatic oxygen analyzer to routinely record the oxygen concentration.

(c) Although existing incinerator vessels employ a fixed air input rate, marine incineration facilities may in the future use a variable air feed in which case this rate should be recorded.

3. Control and recording of temperatures.

(a) Temperature controls and records should be based on the measurement of wall temperature by thermocouples. The appropriate authority should establish the relationship between the readings of each wall thermocouple and the flame temperature to define the position and type of control thermocouples required. Unless otherwise determined by the appropriate authority, there should be three or more control thermocouples for each incinerator.

(b) From the relationship between wall and flame temperatures, the authority should define the wall temperature below which the flow of waste to the incinerator shall be automatically shut off by approved equipment.

(c) If a correlation between wall temperature and flame temperature has not been satisfactorily established, a minimum wall temperature of 1200 degrees centigrade should be applied.

4. Residence time of incinerator.

   (a) The residence time of all wastes in the incineration should be of the order of one second or longer at a flame temperature of 1250 degrees centigrade.

B. General Controls on the Marine Incineration Facility and Its Operation

1. Disposal of residues.

   (a) There should be no discharge of wastes or other matter from the marine incineration facility except by means of the incinerator during normal operations.

   (b) Tank washings should be incinerated at sea, in accordance with the regulations in the Addendum to Annex I or with these guidelines, or discharged to port facilities in consultation with the relevant national authorities.

   (c) In the combustion of containerized solid wastes, certain residues may remain as ash in the incinerator. Such residues should not be removed from an incinerator vessel except while the vessel is in harbor and they should be recovered for safe on-land disposal. They should not be dumped in the sea from the marine incinerator facility.

2. Loading of waste.

   (a) Liquid wastes should not be transferred from barges or other vessels outside harbor limits.

(b) Solid wastes in damaged containers should not be taken on board.

(c) Unless the regulations in the "International Maritime Dangerous Goods Code" prescribe otherwise, containerized solid waste should be stowed on the tween-decks or, in the case of new incinerator vessels, in the lower hold. With existing incinerator vessels where storage below deck is not possible, containers stored on deck must be held securely within special enclosures to be approved by the Contracting Party or appropriate authority.

(d) Measures should be taken to ensure that containers loaded on board are adequately labeled. Containers and their contents should only be discharged by the incinerator.

3. Prevention of hazards to vessels.

(a) In licensing the incineration of wastes on approved marine incineration facilities, the appropriate authority should have regard to the need to avoid hazards to vessels by appropriate location of the incineration zones concerned and by ensuring that the relevant maritime authorities are notified of the vessel's date of sailing and intended schedule, as well as its intended movements during incineration (whether underway, at anchor, etc.).

(b) The coordinates of permanently designated incineration zones and recommended off-shore incineration routes should be widely promulgated, and be designated on navigational charts.

(c) Regular radio warnings should be broadcast during the period of incineration. The marine incineration facility should reply promptly to radio calls at all times during the incineration.

4. Construction of marine incineration facilities.

(a) For the carriage of liquid wastes, an incinerator vessel must carry a valid "Certificate of Fitness" as required under the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.

(b) An incinerator vessel should comply with the requirements for a Type II ship of the IMCO Code and should adhere to such other provisions as may be specified for the carriage of dangerous chemicals.

5. Data recording.

(a) In addition to the records required by the Addendum to Annex I, marine incineration facilities should also record:

(1) oxygen concentration in the combustion gases;

(2) meteorological conditions, e.g. wind speed and direction;

(3) tank from which the waste is taken;

(4) rate and type of waste input to the furnace.

(b) Parameters which may be required in the future, subject to satisfactory technical develpment, include routine measurement of destruction efficiency and total particulate matter in the combustion gases.

C. Nature of Waste and Notification

1. Characteristics of Waste.

(a) A permit application for the incineration of waste or other matter at sea shall include information on the characteristics of the waste sufficient to fulfill the requirements of paragraph D. 2(a).

(b) Where possible, the chemical and physical transformation of the waste after incineration, in particular, subsequent formation of new compounds, composition, of ashes or unburned residues, shall be determined.

(c) [Where doubts exist as to the thermal destruction of the waste, pilot scale tests should be undertaken.]

2. Notification.

(a) Contracting Parties shall comply with notification procedures adopted by Special and Consultative Meetings.

APPENDIX C

TEXT OF THE CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter

The Contracting Parties to this Convention,

Recognizing that the marine environment and the living organisms which it supports are of vital importance to humanity, and all people have an interest in assuring that it is so managed that its quality and resources are not impaired;

Recognizing that the capacity of the sea to assimilate wastes and render them harmless, and its ability to regenerate natural resources, is not unlimited;

Recognizing that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control to not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction;

Recalling Resolution 2749 (XXV) of the General Assembly of the United Nations on the principles governing the sea-bed and the ocean floor and the subsoil thereof, beyond the limits of national jurisdiction;

Noting that marine pollution originates in many sources, such as dumping and discharges through the atmosphere, rivers, estuaries, outfalls and pipelines, and that it is important that States use the best practicable means to prevent such pollution and develop products and processes which will reduce the amount of harmful wastes to be disposed of;

Being convinced that international action to control the pollution of the sea by dumping can and must be taken without delay but that this action should not preclude discussion of measures to control other sources of marine pollution as soon as possible; and

Wishing to improve protection of the marine environment by encouraging States with a common interest in particular geographical areas to enter into appropriate agreements supplementary to this Convention;

Have agreed as follows:

ARTICLE I

Contracting Parties shall individually and collectively promote the effective control of all sources of pollution of the marine environment, and pledge themselves especially to take all practicable steps to prevent the pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

ARTICLE II

Contracting Parties shall, as provided for in the following Articles, take effective measures individually, according to their scientific, technical and economic capabilities, and collectively, to prevent marine pollution caused by dumping and shall harmonize their policies in this regard.

ARTICLE III

For the purposes of this Convention:

1. (a) "Dumping" means:

(i) any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea;

(ii) any deliberate disposal at sea of vessels, aircraft, platforms or other man-made structures at sea.

(b) "Dumping" does not include:

(i) the disposal at sea of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures;

(ii) placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the [illegible] this Convention.

(c) The disposal of wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources will not be covered by the provisions of this Convention.

2. "Vessels and aircraft" means waterborne or airborne craft of any type whatsoever. This expression includes air cushioned craft and floating craft, whether self-propelled or not.

3. "Sea" means all marine waters other than the internal waters of States.

4. "Wastes or other matter" means material and substance of any kind, form or description.

5. "Special permit" means permission granted specifically on application in advance and in accordance with Annex II and Annex III.

6 "General permit" means permission granted in advance and in accordance with Annex III

7. "The Organisation" means the Organisation designated by the Contracting Parties in accordance with Article XIV(2).

ARTICLE IV

1 In accordance with the provisions of this Convention Contracting Parties shall prohibit the dumping of any wastes or other matter in whatever form or condition except as otherwise specified below:

(*a*) the dumping of wastes or other matter listed in Annex I is prohibited;

(*b*) the dumping of wastes or other matter listed in Annex II requires a prior special permit;

(*c*) the dumping of all other wastes or matter requires a prior general permit.

2 Any permit shall be issued only after careful consideration of all the factors set forth in Annex III, including prior studies of the characteristics of the dumping site, as set forth in Sections B and C of that Annex.

3 No provision of this Convention is to be interpreted as preventing a Contracting Party from prohibiting, insofar as that Party is concerned, the dumping of wastes or other matter not mentioned in Annex I. That Party shall notify such measures to the Organisation.

ARTICLE V

1 The provisions of Article IV shall not apply when it is necessary to secure the safety of human life or of vessels, aircraft, platforms or other man-made structures at sea in cases of *force majeure* caused by stress of weather, or in any case which constitutes a danger to human life or a real threat to vessels, aircraft, platforms or other man-made structures at sea, if dumping appears to be the only way of averting the threat and if there is every probability that the damage consequent upon such dumping will be less than would otherwise occur. Such dumping shall be so conducted as to minimise the likelihood of damage to human or marine life and shall be reported forthwith to the Organisation.

2 A Contracting Party may issue a special permit as an exception to Article IV(1)(a), in emergencies, posing unacceptable risk relating to human health and admitting no other feasible solution. Before doing so the Party shall consult any other country or countries that are likely to be affected and the Organisation which, after consulting other Parties, and international organisations as appropriate, shall in accordance with Article XIV promptly recommend to the Party the most appropriate procedures to adopt. The Party shall follow these recommendations to the maximum extent feasible consistent with the time within which action must be taken and with the general obligation to avoid damage to the marine environment and shall inform the Organisation of the action it takes The Parties pledge themselves to assist one another in such situations.

3. Any Contracting Party may waive its rights under paragraph (2) at the time of, or subsequent to ratification of, or accession to this Convention.

ARTICLE VI

1 Each Contracting Party shall designate an appropriate authority or authorities to:

(*a*) issue special permits which shall be required prior to, and for, the dumping of matter listed in Annex II and in the circumstances provided for in Article V(2);

(*b*) issue general permits which shall be required prior to, and for, the dumping of all other matter;

(*c*) keep records of the nature and quantities of all matter permitted to be dumped and the location, time and method of dumping;

(*d*) monitor individually, or in collaboration with other Parties and competent International Organisations, the condition of the seas for the purposes of this Convention.

2. The appropriate authority or authorities of a Contracting Party shall issue prior special or general permits in accordance with paragraph (1) in respect of matter intended for dumping:

(a) loaded in its territory;

(b) loaded by a vessel or aircraft registered in its territory or flying its flag, when the loading occurs in the territory of a State not party to this Convention.

3. In issuing permits under sub-paragraphs (1) (a) and (b) above, the appropriate authority or authorities shall comply with Annex III, together with such additional criteria, measures and requirements as they may consider relevant.

4. Each Contracting Party, directly or through a Secretariat established under a regional agreement, shall report to the Organisation, and where appropriate to other Parties, the information specified in sub-paragraphs (c) and (d) of paragraph (1) above, and the criteria, measures and requirements it adopts in accordance with paragraph (3) above. The procedure to be followed and the nature of such reports shall be agreed by the Parties in consultation.

ARTICLE VII

1. Each Contracting Party shall apply the measures required to implement the present Convention to all:

(a) vessels and aircraft registered in its territory or flying its flag;

(b) vessels and aircraft loading in its territory or territorial seas matter which is to be dumped;

(c) vessels and aircraft and fixed or floating platforms under its jurisdiction believed to be engaged in dumping.

2. Each Party shall take in its territory appropriate measures to prevent and punish conduct in contravention of the provisions of this Convention.

3. The Parties agree to co-operate in the development of procedures for the effective application of this Convention particularly on the high seas, including procedures for the reporting of vessels and aircraft observed dumping in contravention of the Convention.

4. This Convention shall not apply to those vessels and aircraft entitled to sovereign immunity under international law. However each Party shall ensure by the adoption of appropriate measures that such vessels and aircraft owned or operated by it act in a manner consistent with the object and purpose of this Convention, and shall inform the Organisation accordingly.

5. Nothing in this Convention shall affect the right of each Party to adopt other measures, in accordance with the principles of international law, to prevent dumping at sea.

ARTICLE VIII

In order to further the objectives of this Convention, the Contracting Parties with common interests to protect in the marine environment in a given geographical area shall endeavour, taking into account characteristic regional features, to enter into regional agreements consistent with this Convention for the prevention of pollution, espe-

cially by dumping. The Contracting Parties to the present Convention shall endeavour to act consistently with the objectives and provisions of such regional agreements, which shall be notified to them by the Organisation. Contracting Parties shall seek to co-operate with the Parties to regional agreements in order to develop harmonized procedures to be followed by Contracting Parties to the different conventions concerned. Special attention shall be given to co-operation in the field of monitoring and scientific research.

ARTICLE IX

The Contracting Parties shall promote, through collaboration within the Organisation and other international bodies, support for those Parties which request it for:

(a) the training of scientific and technical personnel;

(b) the supply of necessary equipment and facilities for research and monitoring;

(c) the disposal and treatment of waste and other measures to prevent or mitigate pollution caused by dumping;

preferably within the countries concerned, so furthering the aims and purposes of this Convention.

ARTICLE X

In accordance with the principles of international law regarding State responsibility for damage to the environment of other States or to any other area of the environment, caused by dumping of wastes and other matter of all kinds, the Contracting Parties undertake to develop procedures for the assessment of liability and the settlement of disputes regarding dumping.

ARTICLE XI

The Contracting Parties shall at their first consultative meeting consider procedures for the settlement of disputes concerning the interpretation and application of this Convention.

ARTICLE XII

The Contracting Parties pledge themselves to promote, within the competent specialised agencies and other international bodies, measures to protect the marine environment against pollution caused by:

(a) hydrocarbons, including oil, and their wastes;

(b) other noxious or hazardous matter transported by vessels for purposes other than dumping;

(c) wastes generated in the course of operation of vessels, aircraft, platforms and other man-made structures at sea;

(d) radio-active pollutants from all sources, including vessels;

(e) agents of chemical and biological warfare;

(f) wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources.

The Parties will also promote, within the appropriate international organisation, the codification of signals to be used by vessels engaged in dumping.

ARTICLE XIII

Nothing in this Convention shall prejudice the codification and development of the law of the sea by the United Nations Conference on the Law of the Sea convened pursuant to Resolution 2750 C (XXV) of the General Assembly of the United Nations nor the present or future claims and legal views of any State concerning the law of the sea and the nature and extent of coastal and flag State jurisdiction. The Contracting Parties agree to consult at a meeting to be convened by the Organisation after the Law of the Sea Conference, and in any case not later than 1976, with a view to defining the nature and extent of the right and the responsibility of a coastal State to apply the Convention in a zone adjacent to its coast.

ARTICLE XIV

1. The Government of the United Kingdom of Great Britain and Northern Ireland as a depositary shall call a meeting of the Contracting Parties not later than three months after the entry into force of this Convention to decide on organisational matters.

2. The Contracting Parties shall designate a competent Organisation existing at the time of that meeting to be responsible for Secretariat duties in relation to this Convention. Any Party to this Convention not being a member of this Organisation shall make an appropriate contribution to the expenses incurred by the Organisation in performing these duties.

3. The Secretariat duties of the Organisation shall include:

(*a*) the convening of consultative meetings of the Contracting Parties not less frequently than once every two years and of special meetings of the Parties at any time on the request of two-thirds of the Parties;

(*b*) preparing and assisting, in consultation with the Contracting Parties and appropriate International Organisations, in the development and implementation of procedures referred to in subparagraph (4) (e) of this Article;

(*c*) considering enquiries by, and information from the Contracting Parties, consulting with them and with the appropriate International Organisations, and providing recommendations to the Parties on questions related to, but not specifically covered by the Convention;

(*d*) conveying to the Parties concerned all notifications received by the Organisation in accordance with Articles IV(3), V (1) and (2), VI(4), XV, XX and XXI.

Prior to the designation of the Organisation these functions shall, as necessary, be performed by the depositary, who for this purpose shall be the Government of the United Kingdom of Great Britain and Northern Ireland

4. Consultative or special meetings of the Contracting Parties shall keep under continuing review the implementation of this Convention and may, *inter alia:*

(*a*) review and adopt amendments to this Convention and its Annexes in accordance with Article XV;

(*b*) invite the appropriate scientific body or bodies to collaborate with and to advise the Parties or the Organisation on any scientific or technical aspect relevant to this Convention, including particularly the content of the Annexes;

(*c*) receive and consider reports made pursuant to Article VI (4);

(*d*) promote co-operation with and between regional organisations concerned with the prevention of marine pollution;

(*e*) develop or adopt, in consultation with appropriate International Organisations, procedures referred to in Article V(2), including basic criteria for determining exceptional and emergency situations, and procedures for consultative advice and the safe disposal of matter in such circumstances, including the designation of appropriate dumping areas, and recommend accordingly;

(*f*) consider any additional action that may be required.

5. The Contracting Parties at their first consultative meeting shall establish rules of procedure as necessary.

ARTICLE XV

1. (a) At meetings of the Contracting Parties called in accordance with Article XIV amendments to this Convention may be adopted by a two-thirds majority of those present An amendment shall enter into force for the Parties which have accepted it on the sixtieth day after two-thirds of the Parties shall have deposited an instrument of acceptance of the amendment with the Organisation. Thereafter the amendment shall enter into force for any other Party 30 days after that Party deposits its instrument of acceptance of the amendment.

(b) The Organisation shall inform all Contracting Parties of any request made for a special meeting under Article XIV and of any amendments adopted at meetings of the Parties and of the date on which each such amendment enters into force for each Party.

2 Amendments to the Annexes will be based on scientific or technical considerations Amendments to the Annexes approved by a two-thirds majority of those present at a meeting called in accordance with Article XIV shall enter into force for each Contracting Party immediately on notification of its acceptance to the Organisation and 100 days after approval by the meeting for all other Parties except for those which before the end of the 100 days make a declaration that they are not able to accept the amendment at that time Parties should endeavour to signify their acceptance of an amendment to the Organisation as soon as possible after approval at a meeting A Party may at any time substitute an acceptance for a previous declaration of objection and the amendment previously objected to shall thereupon enter into force for that Party.

3. An acceptance or declaration of objection under this Article shall be made by the deposit of an instrument with the Organisation. The Organisation shall notify all Contracting Parties of the receipt of such instruments.

4. Prior to the designation of the Organisation, the Secretarial functions herein attributed to it shall be performed temporarily by the Government of the United Kingdom of Great Britain and Northern Ireland, as one of the depositaries of this Convention.

ARTICLE XVI

This Convention shall be open for signature by any State at London, Mexico City, Moscow and Washington from 29 December 1972 until 31 December 1973.

ARTICLE XVII

This Convention shall be subject to ratification. The instruments of ratification shall be deposited with the Governments of Mexico, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

ARTICLE XVIII

After 31 December 1973, this Convention shall be open for accession by any State. The instruments of accession shall be deposited with the Governments of Mexico, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

ARTICLE XIX

1. This Convention shall enter into force on the thirtieth day following the date of deposit of the fifteenth instrument of ratification or accession.

2. For each Contracting Party ratifying or acceding to the Convention after the deposit of the fifteenth instrument of ratification or accession, the Convention shall enter into force on the thirtieth day after deposit by such Party of its instrument of ratification or accession.

ARTICLE XX

The depositaries shall inform Contracting Parties:

(*a*) of signatures to this Convention and of the deposit of instruments of ratification, accession or withdrawal, in accordance with Articles XVI, XVII, XVIII and XXI, and

(*b*) of the date on which this Convention will enter into force, in accordance with Article XIX.

ARTICLE XXI

Any Contracting Party may withdraw from this Convention by giving six months' notice in writing to a depositary, which shall promptly inform all Parties of such notice.

ARTICLE XXII

The original of this Convention of which the English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Governments of Mexico, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America who shall send certified copies thereof to all States.

IN WITNESS WHEREOF the undersigned Plenipotentiaries, being duly authorised thereto by their respective Governments have signed the present Convention.

DONE in quadruplicate at London, Mexico City, Moscow and Washington, this twenty-ninth day of December, 1972.

ANNEXES

ANNEX I

1. *Organohalogen compounds.*
2. Mercury and mercury compounds.
3. Cadmium and cadmium compounds.
4. Persistent plastics and other persistent synthetic materials, for example, netting and ropes, which may float or may remain in suspension in the sea in such a manner as to interfere materially with fishing, navigation or other legitimate uses of the sea.
5. Crude oil, fuel oil, heavy diesel oil, and lubricating oils, hydraulic fluids, and any mixtures containing any of these, taken on board for the purpose of dumping.
6. High-level radio-active wastes or other high-level radio-active matter, defined on public health, biological or other grounds, by the competent international body in this field, at present the International Atomic Energy Agency, as unsuitable for dumping at sea.
7. Materials in whatever form (e.g. solids, liquids, semi-liquids, gases or in a living state) produced for biological and chemical warfare.
8. The preceding paragraphs of this Annex do not apply to substances which are rapidly rendered harmless by physical, chemical or biological processes in the sea provided they do not:

   (i) make edible marine organisms unpalatable, or

   (ii) endanger human health or that of domestic animals.

The consultative procedure provided for under Article XIV should be followed by a Party if there is doubt about the harmlessness of the substance.

9. This Annex does not apply to wastes or other materials (e.g. sewage sludges and dredged spoils) containing the matters referred to in paragraphs 1–5 above as trace contaminants. Such wastes shall be subject to the provisions of Annexes II and III as appropriate.

ANNEX II

The following substances and materials requiring special care are listed for the purposes of Article VI(1)(a).

A. Wastes containing significant amounts of the matters listed below:

arsenic
lead
copper
zinc
} and their compounds

organosilicon compounds
cyanides
fluorides
pesticides and their by-products not covered in Annex I.

B. In the issue of permits for the dumping of large quantities of acids and alkalis, consideration shall be given to the possible presence in such wastes of the substances listed in paragraph A and to the following additional substances:

beryllium
chromium
nickel
vanadium
} and their compounds

C Containers, scrap metal and other bulky wastes liable to sink to the sea bottom which may present a serious obstacle to fishing or navigation.

D Radio-active wastes or other radio-active matter not included in Annex I. In the issue of permits for the dumping of this matter, the Contracting Parties should take full account of the recommendations of the competent international body in this field, at present the International Atomic Energy Agency.

ANNEX III

Provisions to be considered in establishing criteria governing the issue of permits for the dumping of matter at sea, taking into account Article IV(2), include:

A. Characteristics and composition of the matter

1. Total amount and average composition of matter dumped (e.g. per year).
2 Form, e g solid, sludge, liquid, or gaseous.
3. Properties: physical (e g. solubility and density), chemical and biochemical (e g oxygen demand, nutrients) and biological (e.g. presence of viruses, bacteria, yeasts, parasites).
4. Toxicity.
5 Persistence: physical, chemical and biological.
6 Accumulation and biotransformation in biological materials or sediments.
7. Susceptibility to physical, chemical and biochemical changes and interaction in the aquatic environment with other dissolved organic and inorganic materials
8 Probability of production of taints or other changes reducing marketability of resources (fish, shellfish, etc.).

B. Characteristics of dumping site and method of deposit

1. Location (e g co-ordinates of the dumping area, depth and distance from the coast), location in relation to other areas (e.g. amenity areas, spawning, nursery and fishing areas and exploitable resources).
2 Rate of disposal per specific period (e g. quantity per day, per week, per month).

3. Methods of packaging and containment, if any.

4. Initial dilution achieved by proposed method of release.

5. Dispersal characteristics (e g. effects of currents, tides and wind on horizontal transport and vertical mixing).

6. Water characteristics (e g temperature, pH, salinity, stratification, oxygen indices of pollution—dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD)—nitrogen present in organic and mineral form including ammonia, suspended matter, other nutrients and productivity).

7. Bottom characteristics (e.g. topography, geochemical and geological characteristics and biological productivity).

8. Existence and effects of other dumpings which have been made in the dumping area (e.g. heavy metal background reading and organic carbon content).

9. In issuing a permit for dumping, contracting Parties should consider whether an adequate scientific basis exists for assessing the consequences of such dumping, as outlined in this Annex, taking into account seasonal variations.

C. General considerations and conditions

1. Possible effects on amenities (e.g. presence of floating or stranded material, turbidity, objectionable odour, discolouration and foaming).

2. Possible effects on marine life, fish and shellfish culture, fish stocks and fisheries, seaweed harvesting and culture.

3. Possible effects on other uses of the sea (e.g. impairment of water quality for industrial use, underwater corrosion of structures, interference with ship operations from floating materials, interference with fishing or navigation through deposit of waste or solid objects on the sea floor and protection of areas of special importance for scientific or conservation purposes).

4. The practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the matter less harmful for dumping at sea.

APPENDIX D

TEXT OF THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT OF 1972, AS AMENDED

(PL 92-532)

Public Law 92-532
92nd Congress, H. R. 9727
October 23, 1972
(incorporates all amendments through November 4, 1977)

AN ACT

To regulate the transportation for dumping, and the dumping, of material into ocean waters, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That this Act may be cited as the "Marine Protection, Research, and Sanctuaries Act of 1972."

FINDING, POLICY, AND PURPOSE

Sec. 2. (a) Unregulated dumping of material into ocean waters endangers human health, welfare, and amenities, and the marine environment, ecological systems, and economic potentialities.

(b) The Congress declares that it is the policy of the United States to regulate the dumping of all types of materials into ocean waters and to prevent or strictly limit the dumping into ocean waters of any material which would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.

(c) It is the purpose of this Act to regulate (1) the transportation by any person of material from the United States and, in the case of United States vessels, aircraft, or agencies, the transportation of material from a location outside the United States, when in either case the transportation is for the purpose of dumping the material into ocean waters, and (2) the dumping of material transported by any person from a location outside the United States, if the dumping occurs in the territorial sea or the contiguous zone of the United States.

DEFINITIONS

Sec. 3. For the purposes of this Act the term---

(a) "Administrator" means the Administrator of the Environmental Protection Agency.

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* P. L. 93-254, March 22, 1974
P. L. 94-62, July 25, 1975
P. L. 94-326, June 30, 1976
P. L. 95-153, November 4, 1977

(b) "Ocean waters" means those waters of the open seas lying seaward of the base line from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606; TIAS 5639).

(c) "Material" means matter of any kind or description, including but not limited to, dredged material, solid waste, incinerator residue, garbage, sewage, sewage sludge, munitions, radiological, chemical, and biological warfare agents, radioactive materials, chemicals, biological and laboratory waste, wreck or discarded equipment, rock, sand, excavation debris, and industrial, municipal, agricultural, and other waste; but such terms does not mean sewage from vessels within the meaning of section 312 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1322). Oil within the meaning of section 311 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1321), shall be included only to the extent that such oil is taken on board a vessel or aircraft for the purpose of dumping.

(d) "United States" includes the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Canal Zone, the territories and possessions of the United States, and the Trust Territory of the Pacific Islands.

(e) "Person" means any private person or entity, or any officer, employee, agent, department, agency, or instrumentality of the Federal Government, of any State or local unit of government, or of any foreign government.

(f) "Dumping" means a disposition of material: Provided, That it does not mean a disposition of any effluent from any outfall structure to the extent that such disposition is regulated under the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1376), under the provisions of section 13 of the Rivers and Harbors Act of 1899, as amended (33 U.S.C. 407), or under the provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011, et seq.), nor does it mean a routine discharge of effluent incidental to the propulsion of, or operation of motor-driven equipment on, vessels: Provided futher, That it does not mean the construction of any fixed structure or artificial island nor the intentional placement of any device in the ocean waters or on or in the submerged land beneath such waters, for a purpose other than disposal, when such construction or such placement is otherwise regulated by Federal or State program: And provided futher, That it does not include the deposit of oyster shells, or other materials when such deposit is made for the purpose of developing, mantaining, or harvesting fisheries resources and is otherwise regulated by Federal or State law or occurs pursuant to an authorized Federal or State program.

(g) "District court of the United States "includes the District Court of Guam, the District Court of the Virgin Islands, the District Court of

Puerto Rico, the District Court of the Canal Zone, and in the case of American Samoa and Trust Territory of the Pacific Islands, the District Court of the United States for the District of Hawaii, which court shall have jurisdiction over actions arising therein.

(h) "Secretary" means the Secretary of the Army.

(i) "Dredged material" means any material excavated or dredged from the navigable waters of the United States.

(j) "High-level radioactive waste" means the aqueous waste resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated waste from subsequent extraction cycles, or equivalent, in facility for reprocessing irradiated reactor fuels, or irradiated fuel from nuclear power reactors.

(k) "Transport" or "transportation" refers to the carriage and related handling of any material by vessel, or by any other vehicle, including aircraft.

(l) "Convention" means the Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter.

Sec. 4. (a) The Administrator of the Environmental Protection Agency (hereinafter referred to in this section as the "Administrator") shall end the dumping of sewage sludge into ocean waters, or into waters described in section 101 (b) of Public Law 92-532, as soon as possible after the date of enactment of this section, but in no case may the Administrator issue any permit, or any renewal thereof (under title I of the Marine Protection, Research, and Sanctuaries Act of 1972) which authorizes any such dumping after December 31, 1981.

(b) For purposes of this section, the term "sewage sludge" means any solid, semisolid, or liquid waste generated by a municipal waste-water treatment plant the ocean dumping of which may unreasonably degrade or endanger human health, welfare, amenities, or the marine environment, ecological systems, or economic potentialities.

TITLE I--OCEAN DUMPING

PROHIBITED ACTS

Sec. 101 (a) Except as may be authorized by a permit issued pursuant to section 102 or section 103 of this title, and subject to regulations issued

pursuant to section 108 of this title,

(1) no person shall transport from the United States, and

(2) in the case of a vessel or aircraft registered in the United States or flying the United States flag or in the case of a United States department, agency, or instrumentality, no person shall transport from any location

any material for the purpose of dumping it into ocean waters.

(b) Except as may be authorized by a permit issued pursuant to section 102 of this title, and subject to regulations issued pursuant to section 108 of this title, no person shall dump any material transported from a location outside the United States (1) into the territorial sea of the United States, or (2) into a zone contiguous to the territorial sea of the United States, extending to a line twelve nautical miles seaward from the base line from which the breadth of the territorial sea is measured, to the extent that it may affect the territorial sea or the territory of the United States.

(c) No officer, employee, agent, department, agency, or instrumentality of the United States shall transport from any location outside the United States any radiological, chemical, or biological warfare agent or any high-level radioactive waste, or, except as may be authorized in a permit issued under this title, any other material for the purpose of dumping it into ocean waters.

EVIRONMENTAL PROTECTION AGENCY PERMITS

Sec. 102. (a) Except in relation to dredged material, as provided for in section 103 of this title, and in relation to radiological, chemical, and biological warfare agents and high-level radioactive waste, for which no permit may be issued, the Administrator may issue permits, after notice and opportunity for public hearings, for the transportation from the United States or, in the case of an agency or instrumentality of the United States, or in the case of a vessel or aircraft registered in the United States or flying the United States flag, for the transportation from a location outside the United States, of material for the purpose of dumping it into ocean waters, or for the dumping of material into the waters, described in section 101 (b), where the Administrator determines that such dumping will not unreasonably degrade or endander human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities. The Administrator shall establish and apply criteria for reviewing and evaluating such permit applications, and, in establishing or revising such criteria, shall consider, but not be limited in his consideration to, the following:

(A) The need for the proposed dumping.

(B) The effect of such dumping on human health and welfare, including economic, esthetic, and recreational values.

(C) The effect of such dumping on fisheries resources, plankton, fish, shellfish, wildlife, shore lines and beaches.

(D) The effect of such dumping on marine ecosystems, particularly with respect to---

(i) the transfer, concentration, and dispersion of such material and its byproducts through biological, physical, and chemical processes.

(ii) potential changes in marine ecosystem diversity, productivity, and stability, and

(iii) species and community population dynamics.

(E) The persistence and permanence of the effects of the dumping.

(F) The effect of dumping particular volumes and concentrations of such materials.

(G) Appropriate locations and methods of disposal or recycling, including land-based alternatives and the probable impact of requiring use of such alternate locations or methods upon considerations affecting the public interest.

(H) The effect on alternate uses of oceans, such as scientific study, fishing, and other living resource exploitation, and non-living resource exploitation.

(I) In Designating recommended sites, the Administrator shall utilize wherever feasible locations beyond the edge of the Continental Shelf.

In establishing or revising such criteria, the Administrator shall consult with Federal, State, and local officials, and interested members of the general public, as may appear appropriate to the Administrator. With respect to such criteria as may affect the civil works program of the Department of the Army, the Administrator shall also consult with the Secretary. In reviewing applications for permits, the Administrator shall make such provision for consultation with interested Federal and State agencies as he deems useful or necessary. No permit shall be issued for a dumping of material which will violate applicable water quality standards.

To the extent that he may do so without relaxing the requirements of this title, the Administrator, in establishing or revising such criteria, shall apply the standards and criteria binding upon the United States under the Convention, including its Annexes.

(b) The Administrator may establish and issue various categories of permits, including the general permits described in section 104 (c).

(c) The Administrator may, considering the criteria established pursuant to subsection (a) of this section, designate recommended sites or times for dumping and, when he finds it necessary to protect critical areas, shall, after consultation with the Secretary, also designate sites or times within which certain materials may not be dumped.

(d) No permit is required under this title for the transportation for dumping or the dumping of fish wastes, except when deposited in harbors or other protected or enclosed coastal waters, or where the Administrator finds that such deposits could endanger health, the environment, or ecological systems in a specific location. Where the Administrator makes such a finding, such material may be deposited only as authorized by a permit issued by the Administrator under this section.

(e) In case of transportation of material, by vessel or aircraft registered in the United States or flying the United States flag, from a location in a foreign State Party to the Convention, a permit issued pursuant to the authority of that foreign State Party, in accordance with Convention requirements, and which otherwise could have been issued pursuant to subsection (a) hereof, shall be accepted, for the purposes of this title, as if it were issued by the Administrator under the authority of this section.

CORPS OF ENGINEERS PERMITS

Sec. 103. (a) Subject to the provisions of subsections (b), (c), and (d) of this section, the Secretary may issue permits, after notice and opportunity for public hearings, for the transportation of dredged material for the purpose of dumping it into ocean waters, where the Secretary determines that the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.

(b) In making the determination required by subsection (a), the Secretary shall apply those criteria, established pursuant to section 102 (a), relating to the effect of the dumping. Based upon an evaluation of the potential effect of a permit denial on navigation, economic and industrial development, and foreign and domestic commerce of the United States, the Secretary shall make an independent determination as to the need for the dumping. The Secretary shall also make an independant determination as

to other possible methods of disposal and as to appropriate locations, for the dumping. In considering appropriate locations, he shall, to the extent feasible, utilize the recommended sites designated by the Administrator pursuant to section 102 (c).

(c) Prior to issuing any permit under this section, the Secretary shall first notify the Administrator of his intention to do so. In any case in which the Administrator disagrees with the determination of the Secretary as to compliance with criteria established pursuant to section 102 (c) relating to the effects of the dumping or with the restrictions established pursuant to section 102 (c) relating to critical areas, the determination of the Administrator shall prevail. Unless the Administrator grants a waiver pursuant to subsection (d), the Secretary shall not issue a permit which does not comply with such criteria and with such restrictions.

(d) If, in any case, the Secretary finds that, in the disposition of dredged material, there is no economically feasible method or site available other than a dumping site the utilization of which would result in non-compliance with the criteria established pursuant to section 102 (a) relating to the effects of dumping or with the restrictions established pursuant to section 102 (c) relating to critical areas, he shall so certify and request a waiver from the Administrator of the specific requirements involved. Within thirty days of the receipt of the waiver request, unless the Administrator finds that the dumping of the material will result in an unacceptably adverse impact on municipal water supplies, shell-fish beds, wildlife, fisheries (including spawning and breeding areas), or recreational areas, he shall grant the waiver.

(e) In connection with Federal projects involving dredged material, the Secretary may, in lieu of the permit procedure, issue regulations which will require the application to such projects of the same criteria, other factors to be evaluated, the same procedures, and the same requirements which apply to the issuance of permits under subsections (a), (b), (c), and (d) of this section.

PERMIT CONDITIONS

Sec. 104, (a) Permits issued under this title shall designate and include (1) the type of material authorized to be transported for dumping or to be dumped; (2) the amount of material authorized to be transported for dumping or to be dumped; (3) the location where such transport for dumping will be terminated or where such dumping will occur; (4) the length of time for which the permits are valid and their expiration date; (5) any special provisions deemed necessary by the Administrator or the Secretary, as the case may be, after consultation with the Secretary of the Department in which the Coast Guard is operating, for the monitoring and surveillance of the transportation or dumping; and (6) such other matters as the Administrator or the Secretary, as the case may be, deems appropriate.

(b) The Administrator or the Secretary, as the case be, may prescribe such processing fees for permits and such reporting requirements for actions taken pursuant to permits issued by him under this title as he deems appropriate.

(c) Consistent with the requirements of sections 102 and 103, but in lieu of a requirement for specific permits in such case, the Administrator or the Secretary, as the case may be, may issue general permits for the transportation for dumping, or both, of specified materials or classes of materials for which he may issue permits, which he determines will have a minimal adverse environmental impact.

(d) Any permit issued under this title shall be reviewed periodically and, if appropriate, revised. The Administrator or the Secretary, as the case may be, may limit or deny the issuance of of permits, or he may alter or revoke partially or entirely the terms of permits issued by him under this title, for the transportation for dumping, or for the dumping, or both, of specified materials or classes of materials, where he finds that such materials cannot be dumped consistenly with the criteria and other factors required to be applied in evaluating the permit application. No action shall be taken under this subsection unless the affected person or permittee shall have been given notice and opportunity for a hearing on such action as proposed.

(e) The Administrator or the Secretary, as the case may be, shall require an applicant for a permit under this title to provide such information as he may consider necessary to review and evaluate such application.

(f) Information received by the Administrator or the Secretary, as the case may be, as a part of any application or in connection with any permit granted under this title shall be available to the public as a matter of public record, at every stage of the proceeding. The final determination of the Administrator or the Secretary, as the case may be, shall be likewise available.

(g) A copy of any permit issued under this title shall be placed in a conspicuous place in the vessel which will be used for the transportation or dumping authorized by such permit, and an additional copy shall be furnished by the issuing official to the Secretary of the department in which the Coast Guard is operating, or its designee.

Sec. 105 (a) Any person who violates any provision of this title, or of the regulations promulgated under this title, or a permit issued under this title shall be liable to a civil penalty of not more than $50,000 for each violation to be assessed by the Administrator. No penalty shall be assessed until the person charged shall have been

given notice and an opportunity for a hearing of such violation. In determining the amount of the penalty, the gravity of the violation, prior violations, and the demonstrated good faith of the person charged in attempting to achieve rapid compliance after notification of a violation shall be considered by said Administrator. For good cause shown, the Administrator may remit or mitigate such penalty. Upon failure of the offending party to pay the penalty, the Administrator may request the Attorney General to commence an action in the appropriate district court of the United States for such relief as may be appropriate.

(b) In addition to any action which may be brought under subsection (a) of this section, a person who knowingly violates this title, regulations promulgated under this title, or a permit issued under this title shall be fined not more than $50,000, or imprisoned for not more than one year, or both.

(c) For the purpose of imposing civil penalties and criminal fines under this section, each day of a continuing violation shall constitute a separate offense as shall the dumping from each of several vessels, or other sources.

(d) The Attorney General or his delegate may bring actions for equitable relief to enjoin an imminent or continuing violation of this title, of regulations promulgated under this title, or of permits issued under this title, and the district courts of the United States shall have jurisdiction to grant such relief as the equities of the case may require.

(e) A vessel, except a public vessel within the meaning of section 13 of the Federal Water Pollution Control Act, as amended (33U.S.C. 1163), used in a violation, shall be liable in rem for any civil penalty assessed or criminal fine imposed and may be proceeded against in any district court of the United States having jurisdiction thereof; but no vessel shall be liable unless it shall appear that one or more of the owners, or bareboat charterers, was at the time of the violation a consenting party or privy to such violation.

(f) If the provisions of any permit issued under section 102 or 103 are violated, the Administrator or the Secretary, as the case may be, may revoke the permit for a specified period of time. No permit shall be revoked or suspended unless the permittee shall have been given notice and opportunity for a hearing on such violation and proposed suspension or revocation.

(g) (1) Except as provided in paragraph (2) of this subjection any person may commence a civil suit on his own behalf to enjoin any person, including the United States and any other governmental instrumentality or agency (to the extent permitted by the eleventh

amendment to the Constitution), who is alleged to be in violation of any prohibition, limitation, criterion, or permit established or issued by or under this title. The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce such prohibition, limitation, criterion, or permit, as the case may be.

(2) No action may be commenced ---

(A) prior to sixty days after notice of the violation has been given to the Administrator or to the Secretary, and to any alleged violator of the prohibition, limitation, criterion, or permit; or

(B) if the Attorney General has commenced and is dilengently prosecuting a civil action in a court of the United States to require compliance with the prohibition, limitation, criterion, or permit; or

(C) if the Administrator has commenced action to impose penalty pursuant to subsection (a) of this section, or if the Administrator, or the Secretary, has initiated permit revocation or suspension proceedings under subsection (f) of this section; or

(D) if the United States has commenced and is diligently prosecuting a criminal action in a court of the United States or a State to redress a violation of this title.

(3) (A) Any suit under this subsection may be brought in the judicial district in which the violation occurs.

(B) In any such suit under this subsection in which the United States is not a party, the Attorney General, at the request of the Administrator or Secretary, may intervene on behalf of the United States as a matter of right.

(4) The court, in issuing any final order in any suit brought pursuant to paragraph (1) of this subsection may award costs of litigation (including reasonable attorney and expert witness fees) to any party, whenever the court determines such award is appropriate.

(5) The injunctive relief provided by this subsection shall not restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any standard or limitation or to seek any other relief (including relief against the Administrator, the Secretary, or a State agency).

(h) No person shall be subject to a civil penalty or to a criminal fine or imprisonment for dumping materials from a

vessel if such materials are dumped in an emergency to safeguard life at sea. Any such emergency dumping shall be reported to the Administrator under such conditions as he may prescribe.

RELATIONSHIP TO OTHER LAWS

Sec. 106. (a) After the effective date of this title, all licenses, permits, and authorizations other than those issued pursuant to this title shall be void and of no legal effect, to the extent that they purport to authorize any activity regulated by this title, and whether issued before or after the effective date of this title.

(b) The provisions of subsection (a) shall not apply to actions taken before the effective date of this title under the authority of the Rivers and Harbors Act of 1899 (30 Stat. 1151), as amended (33 U.S.C. 401 et. seq.)

(c) Prior to issuing any permit under this title, if it appears to the Administrator that the disposition of material, other than dredged material, may adversely affect navigation in the Territorial sea of the United States, or in the approaches to any harbor of the United States, or may create an artificial island on the Outer Continental Shelf, the Administrator shall consult with the Secretary and no permit shall be issued if the Secretary determines that navigation will be unreasonably impaired.

(d) After the effective date of this title, no State shall adopt or enforce any rule or regulation relating to any activity regulated by this title. Any State may, however, propose to the Administrator criteria relating to the dumping of materials into ocean waters within its jurisdiction, or into other ocean waters within the jurisdiction of such State, and if the Administrator determines, after notice and opportunity for hearing, that the proposed criteria are not inconsistent with the purposes of this title, may adopt those criteria and may issue regulations to implement such criteria. Such determination shall be made by the Administrator within one hundred and twenty days of receipt of the proposed criteria. For the purposes of this subsection, the term "State" means any State, interstate or regional authority, Federal territory or Commonwealth or the District of Columbia.

(e) Nothing in this title shall be deemed to affect in any manner or to any extent any provision of the Fish and Wildlife Coordination Act as amended (16 U.S.C. 661-666c).

ENFORCEMENT

Sec. 107. (a) The Administrator or the Secretary, as the case may be, may, whenever appropriate, utilize by agreement, the personnel, services and facilities of other Federal departments, agencies, and instrumentalities, or State agencies or instrumentalities, whether on a reimbursable or a nonreimbursable basis, in carrying out his responsibilities under this title.

(b) The Administrator or the Secretary may delegate responsibility and authority for reviewing and evaluating permit applications, including the decision as to whether a permit will be issued, to an officer of his agency, or he may delegate, by agreement, such responsibility and authority to heads of others Federal departments or agencies, whether on a reimbursable or nonreimbursable basis.

(c) The Secretary of the department in which the Coast Guard is operating shall conduct surveillance and other appropriate enforcement activity to prevent unlawful transportation of material for dumping, or unlawful dumping. Such enforcement activity shall include, but not be limited to, enforcement of regulations issued by him pursuant to section 108, relating to safe transportation, handling, carriage, storage, and stowage. The Secretary of the Department in which the Coast Guard is operating shall supply to the Administrator and to the Attorney General, as appropriate, such information of enforcement activities and such evidentiary material assembled as they may require in carrying out their duties relative to penalty assessments, criminal prosecutions, or other actions involving litigation pursuant to the provisions of this title.

REGULATIONS

Sec. 108. In carrying out the responsibilities and authority conferred by this title, the Administrator, the Secretary, and the Secretary of the department in which the Coast Guard is operating are authorized to issue regulations as they may deem appropriate.

INTERNATIONAL COOPERATION

Sec. 109. The Secretary of State, in consultation with the Administrator, shall seek effective international action and cooperation to issue protection of the marine environment, and may, for this purpose, formulate, present, or support specific proposals in the United Nations and other competent international organizations

for the development of appropriate international rules and regulations in support of the policy of this Act.

EFFECTIVE DATE AND SAVINGS PROVISIONS

Sec. 110. (a) This title shall take effect six months after the date of the enactment of this Act.

(b) No legal action begun, or right of action accrued, prior to the effective date of this title shall be affected by any provision of this title.

Sec. 111. There are hereby authorized to be appropriated not to exceed $3,600,000 for fiscal year 1973, not to exceed $5,500,000 for each of the fiscal years 1974 and 1975, not to exceed $5,300,000 for fiscal year 1976, not to exceed $1,325,000 for the transition period (July 1 through September 30, 1976), not to exceed $4,800,000 for fiscal year 1977, and not to exceed $4,800,000 for fiscal year 1978, for the purposes and administration of this title, and for succeeding fiscal years only such sums as the Congress may authorize by law.

Sec. 112. The Administrator, the Secretary, and the Secretary of the department in which the Coast Guard is operating shall each individually report annually, on or before March 1 of each year, with the first report to be made on or before June 30, 1973 to the Congress, on his administration of this title, including recommendations for additional legislation if deemed necessary.

TITLE II--COMPREHENSIVE RESEARCH ON OCEAN DUMPING

Sec. 201. the Secretary of Commerce, in coordination with the Secretary of the department in which the Coast Guard is operating and with the Administrator shall, within six months of the enactment of this Act, initiate a comprehensive and continuing program of monitoring and research regarding the effects of the dumping of material into ocean waters or other coastal waters where the tide ebbs and flows or into the Great Lakes or their connecting waters and shall report from time to time, not less frequently than annually, his findings (including an evaluation of the short-term ecological effects and the social and economic factors involved) to the Congress.

Sec. 202. (a) The Secretary of Commerce, in consultation with other appropriate Federaal departments, agencies, and instrumentalities shall, within six months of the enactment of this Act, initiate a comprehensive and continuing program of research with respect to the possible long-range effects of pollution, overfishing, and man-induced changes of ocean ecosystems. In carrying out such research, the Secretary of Commerce shall take into account such factors as existing and proposed international policies affecting oceanic problems, economic considerations involved in both the protection and the use of the oceans, possible alternatives to existing programs, and ways in which the health of the oceans may best be preserved for the benefit of succeeding generations of mankind.

(b) In carrying out his responsibilities under this section, the Secretary of Commerce, under the foreign policy guidance of the President and pursuant to international agreements and treaties made by the President with the advice and consent of the Senate, may act alone or in conjunction with any other nation or group of nations, and shall make known the results of his activities by such channels of communication as may appear appropriate.

(c) In March of each year, the Secretary of Commerce shall report to the Congress on the results of activities undertaken by him pursuant to this section during the previous fiscal year.

(d) Each department, agency, and independant instrumentality of the Federal Government is authorized and directed to cooperate with the Secretary of Commerce in carrying out the purposes of this section and, to the extent permitted by law, furnish such information as may be requested.

(e) The Secretary of Commerce, in carrying out his responsibilities under this section, shall, to the extent feasible utilize the personnel, services, and facilities of other Federal departments, agencies, and instrumentalities (including those of the Coast Guard for monitoring purposes), and is authorized to enter into appropriate inter-agency agreements to accomplish this action.

Sec. 203. The Secretary of Commerce shall conduct and encourrage, cooperate with, and render financial and other assistance to appropriate public (whether Federal, State, interstate, or local) authorities, agencies, and institutions, private agencies and institutions, and individuals in the conduct of, and to promote the coordination of, research, investigations, experiments, training, demonstrations, surveys, and studies for the purpose of determining means of minimizing or ending all dumping of materials within five years of the effective date of this Act.

Sec. 204. There are authorized to be appropriated for the first

fiscal year after this Act is enacted and for the next two fiscal years thereafter such sums as may be necessary to carry out this title, but the sums appropriated for any such fiscal year may not exceed $6,000,000. There are authorized to be appropriated not to exceed $1,500,000 for the transition period (July 1 through September 30, 1976), not to exceed $5,600,000 for fiscal year 1977, and not to exceed $6,500,000 for fiscal year 1978.

TITLE III---MARINE SANCTUARIES

Sec. 301. Notwithstanding the provisions of this subsection (h) of section 3 of this Act, the term "Secretary", when used in this title, means Secretary of Commerce.

Sec. 302. (a) The Secretary, after consultation with the Secretaries of State, Defense, the Interior, and Transportation, the Administrator, and the heads of other interested Federal agencies, and with the approval of the President, may designate as marine sanctuaries those ares of the ocean waters, as far seaward as the outer edge of the Continental Shelf, as defined in the Convention of the Continental Shelf (15 U.S.T. 74; TIAS 5578), of other coastal waters where the tide ebbs and flows, or of the Great Lakes and their connecting waters, which he determines necessary for the purpose of preserving or restoring such areas for their conservation, recreational, ecological, or esthetic values. The consultation shall include an opportunity to review and comment on a specific proposed designation.

(b) Prior to designating a marine sanctuary which includes waters lying within the territorial limits of any State or superjacent to the subsoil and seabed within the seaward boundary of a coastal State, as that boundary is defined in section 2 of title I of the Act of May 22, 1953 (67 Stat. 29), the Secretary shall consult with, and give due consideration to the views of, the responsible officials of the State involved. As to such waters, a designation under this section shall become effective sixty days after it is published, unless the Governor of any State involved shall, before the expiration of the sixty-day period, certify to the Secretary that the designation, or a specified portion thereof, is unacceptable to his State, in which case the designated sanctuary shall not include the area certified as unacceptable until such time as the Governor withdraws his certification of unacceptability.

(c) When a marine sanctuary is designated, pursuant to this section, which includes an area of ocean waters outside the territorial jurisdiction of the United States, the Secretary of State

shall take such actions as may be appropriate to enter into negotiations with other Governments for the purpose of arriving at necessary agreements with those Governments, in order to protect such sanctuary and to promote the purposes for which it was established.

(d) The Secretary shall submit an annual report to the Congress, on or before November 1 of each year, setting forth a comprehensive review of his actions during the previous fiscal year undertaken pursuant to the authority of this section, together with appropriate recommendation for legislation considered necessary for the designation and protection of marine sanctuaries.

(e) Before a marine sanctuary is designated under this section, the Secretary shall hold public hearings in the coastal areas which would be most directly affected by such designation, for the purpose of receiving and giving proper consideration to the views of any interested party. Such hearings shall be held no earlier than thirty days after the publication of a public notice thereof.

(f) After a marine sanctuary has been designated under this section, the Secretary, after consultation with other interested Federal agencies, shall issue necessary and reasonable regulations to control any activities permitted within the designated marine sanctuary, and no permit, license, or other authorization issued pursuant to any other authority shall be valid unless the Secretary shall certify that the permitted activity is consistent with the purposes of this title and can be carried out within the regulations promulgated under this section.

(g) The regulations issued pursuant to subsection (f) shall be applied in accordance with reconized priciples of international law, including treaties, conventions, and other agreements to which the United States is signatory. Unless the application of the regulations is in accordance with such principles or is otherwise authorized by an agreement between the United States and the foreign State of which the affected person is a citizen or, in the case of the crew of a foreign vessel, between the United States and flag State of the vessel, no regulation applicable to ocean waters outside the territorial jurisdiction of the United States shall be applied to a person not a citizen of the United States.

Sec. 303. (a) Any person subject to the jurisdiction of the United States who violates any regulation issued pursuant to this title shall be liable to a civil penalty of not more than $50,000 for each such violation, to be assessed by the Secretary. Each day of a continuing violation shall constitute a separate violation.

(b) No penalty shall be assessed under this section until the person charged has been given notice and opportunity to be heard. Upon failure of the offending party to pay an assessed penalty, the Attorney

General, at the request of the Secretary, shall commence action in the appropriate district court of the United States to collect the penalty and to seek such other relief as may be appropriate.

(c) A vessel used in the violation of a regulation issued pursuant to this title shall be liable in rem for any civil penalty assessed for such violation and may be proceeded against in any district court of the United States having jurisdiction thereof.

(d) The district courts of the United States shall have jurisdiction to restrain a violation of the regulations issued pursuant to this title, and to grant such other relief as may be appropriate. Actions shall be brought by the Attorney General in the name of the United States, either on his own initiative or at the request of the Secretary.

Sec. 304. There are authorized to be appropriated not to exceed $10,000,000 for each of the fiscal years 1973, 1974, and 1975, not to exceed $6,200,000 for fiscal year 1976, not to exceed $1,550,000 for the transition period (July 1 through September 30, 1976), not to exceed $500,000 for fiscal year 1977, and not to exceed $500,000 for fiscal year 1978, to carry out the provisions of this title, including the acquisition, development, and operation of marine sanctuaries designated under this title.

APPENDIX E

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington D.C. 20230
(202) 377-3301 4335

December 11, 1978

Mr. William H. Mansfield
Office of Environmental Affairs
Department of State
Washington, D.C. 20520

Dear Mr. Mansfield:

This is in reference to your draft environmental impact statement entitled "The Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention." The enclosed comments from the National Oceanic and Atmospheric Administration and the Maritime Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving twelve (12) copies of the final statement.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure Memos from: Capt. George Steinman
Maritime Administration

Mr. Douglas LeComte,
Mr. Eldon V. C. Greenberg, and
Mr. Frank Hebard
National Oceanic and Atmospheric
Administration

UNITED STATES DEPARTMENT OF COMMERCE
Maritime Administration
Washington D.C. 20230

November 17, 1978

MEMORANDUM FOR Dr Sidney R Galler
Deputy Assistant Secretary for
Environmental Affairs

Subject Draft Environmental Impact Statement for the Incineration of Waste at Sea Under the 1972 Ocean Dumping Convention

The subject document has been reviewed as requested by your memorandum of October 12, 1978 MarAd has a special interest in this matter since it directly affects the MarAd Chemical Waste Incinerator Ship Project Our comments are as follows

1. Summary, page 1

Under item 3 "Summary of Environmental Impacts and Adverse Environmental Effects", the following corrections should be made

1. a The Threshold Limit Value is 7 mg/m^3, not $7/mg/m^3$

b. The reference to the "proposed site" should be changed to the "approved site."

2 Description, pages I-1 to 5

2. a It is recommended that the reference to "the Convention" in the first sentence on page I-1 include the year of adoption, i e , 1972

b This discussion should include a listing of those wastes to which the subject international regulations and guidelines apply as indicated in Appendices A and B

3 Routine Analyses, page I-7

3. The last sentence on this page discusses routine analyses of exhaust gases The monitored gases should read "CO_2, CO, and O_2."

4. Incineration in the United States, page I-9

4. It is recommended that the first sentence of the second paragraph conclude with the word "predominating "

5 Estimates of Chemical Production and Corresponding Wastes, pages I-11 and 12

5. a *The reference on page I-11 is 21, not 11*

b The quantities of commodities listed on page I-12 should be "Metric Tons x 10^3."

6 International Agreements, pages III-3 and 4

6. It is recommended that the list of international agreements include the following

- o International Convention on Safety of Life at Sea, 1974
- o Protocol of 1978 relating to the International Convention on Safety of Life at Sea, 1974

In this regard, it is further recommended that the words "maritime safety and with" be inserted after the words "dealing with" in the first sentence of the third paragraph on page III-3

7 NEPA, page IV-4

7 It is stated here that "the amended CEQ Guidelines were published on August 1, 1973 " It should be noted that these Guidelines have recently been revised.

8 Ports and Waterways Safety Act of 1972 (P L 92-340), pages IV-6 to 9

8. a It is recommended that this discussion note that the Ports and Waterways Safety Act of 1972 was amended during 1978 by the Port and Tanker Safety Act This new law provides a stringent and comprehensive program dealing with the design, construction, operation, equipping, and manning of all tank vessels using U S ports to transfer oil and hazardous materials The design, construction, and

equipment requirements contained in this law are, for the most part, in agreement with the results of the 1978 Conference on Tanker Safety and Pollution Prevention This Conference resulted in the adoption of Protocols to two of IMCO's most important Conventions, 1973 MARPOL and 1974 SOLAS

b The Coast Guard requirements which implement the IMCO Chemical Code are contained in Title 46 of the Code of Federal Regulations, primarily in 46 CFR Part 153 It is suggested that this

8. (continued) information be included in the second paragraph on page IV-7. These Coast Guard requirements, as well as the IMCO Chemical Code, are based upon a philosophy of relating cargo containment features of vessel design, construction, and operation to the hazards of various chemicals

c In the first paragraph on page IV-8, the limiting size of a tank for Type I cargo should be 1,250m^3

d In the second paragraph on page IV-8, the limiting size of a tank for Type II cargo should be 3,000 m^3.

9 Clean Water Act of 1977 (P L 95-217), pages IV-9 and 10

9. The Clean Water Act of 1977 amended the Federal Water Pollution Control Act (FWPCA). With respect to oil and hazardous substance liability, it specifically amended Section 311 of the 1972 FWPCA Amendments (P L 92-500) The essential features of Section 311, as discussed on pages IV-9 and 10, were originally part of P L 92-500 P L. 95-217 is most notable because it extended U S national jurisdiction for water pollution control to the ocean beyond the contiguous zone where the fisheries and other natural resources of the U S may be adversely affected It is, therefore, recommended that pages IV-9 and 10 be revised to include a discussion of Section 311 of the 1972 FWPCA Amendments (P L 92-500) In this regard, it should also be noted the Section 311 of the FWPCA was amended once again on November 2, 1978, when the President signed H R 12140 into law

10 Marine Environment, page V-1 to 12

a The third paragraph on page V-1 should be rewritten as follows·

10. "Information contained in the following paragraphs A through G is found in Reference 11."

b It is recommended that Chapter V be expanded to more comprehensively describe the marine environment Pages II-1 to 13 of the Reference 11 in conjunction with the descriptions of the incineration sites on pages V-8 to 12 would provide useful information

11. Emission Products, pages VI-3 to 5.

a. In the last paragraph on page VI-3, the principal combustion products of organochlorines should be
11. CO_2, H_2O, and HCl It is also recommended that the last sentence of this paragraph be rewritten as follows.

"Principal combustion products from these non-chorinated materials are CO_2 and H_2O."

b In the second paragraph on page VI-4, other minor constituents should be CO, Cl_2, and H_2

c In the third sentence of the first paragraph on page VI-5, the word "organochlorides" should be "organochlorines."

12 Combustible Waste Containing Metals, VI-7

12. *What is meant by "total combustion of air" in the first paragraph?*

13. Incinerator Efficiencies, page VI-8

In the first sentence of the second paragraph, the word "amound" should be "amount."

13. 14 Air Quality, page VI-11

In the second sentence of the first paragraph, the word "asssume" should be "assume "

15 Chemical Landfills, page VI-19

13. (continued) In the sixth sentence of the second paragraph, the word "polychlorobiphenls" should be "polychlorinated biphenyls."

16 Reference, page X-3

Reference 21, which is dated June 1978, should be labeled a "Preliminary Draft."

17 *Appendix A, page A-18*

It is not clear, based on a review of Appendices A and B, what is meant by the reference to paragraph D 2(a) in paragraph C 1(a)

14.

GEORGE C. STEINMAN
Chief, *Environmental Activities Group*
Office of Shipbuilding Costs

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES
Boulder, Colorado 80309

To: Bill Aron 22 November 1978

From: Frank Hebard

Subject: DEIS For the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention (7810.16)

MESA has two short comments regarding subject DEIS:

15. 1) Microorganisms should be addressed under the biological setting; they can constitute up to 50% of the marine pelagic biomass and up to 90% of the benthic biomass. Furthermore, they perform important processes in the marine ecosystem such as nitrogen and carbon cycling, and decomposition.

16. 2) The long-term implications of hazardous chemical loading in the vicinity of the incineration sites should be discussed. Even if you get a 99.9% destruction efficiency, there is a fraction (100.00-99.9%), that will get into the environment. If the quantities to be incinerated over the long-term are quite large, then the long-term loading to marine ecosystem may also be quite large. This point needs to be addressed.

NOV 2 1978

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL DATA SERVICE
Washington D.C. 20235

October 30, 1978

TO A/PP - William Aron

FROM: OA/Dx61 - Douglas LeComte

SUBJECT DEIS 7810.16 - The Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention

General Comments

17. It is not clear whether or not oceanographic and meteorological conditions were considered when the Gulf of Mexico and Atlantic incineration sites were selected. Draft Regulation 9 (page A-11), for instance, states that atmospheric dispersal characteristics of the area should be given careful consideration, but the D.E.I.S. does not indicate if this was the case.

18. Shore weather data used for diffusion modeling may not be representative of ocean sites, but several publications give offshore data for areas close to the selected incineration sites. One is Environmental Conditions Within Specified Geographical Regions, Offshore East and West Coast of the United States and in the Gulf of Mexico, April 1973, the National Data Buoy Center. Another good reference is Volumes 2, 3, and 4 of the Summary of Synoptic Meteorological Observations, North American Coastal Marine Areas, U.S. Naval Weather Service Command, May, 1975. Order numbers are (Volume 2) AD-A-008666, (Volume 3) AD-A-008816/1SL, and (Volume 4) AD-A-008889/8SL.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville Maryland 20852

November 15, 1978

TO. PP - Dr. William Aron

FROM: GC - Eldon V. C. Greenberg

SUBJECT: State/EPA DEIS on Ocean Incineration Amendments to Ocean Dumping Convention

ISSUE:

You asked me to review the Draft Environmental Impact Statement, No. 7810.16 ("the DEIS"), issued by the Department of State and Environmental Protection Agency (EPA) on incineration of wastes at sea under the 1972 Ocean Dumping Convention. I have accordingly considered the merits of the proposed action as well as the adequacy of the DEIS itself.

CONCLUSIONS:

I conclude that there are significant unresolved issues in the proposed action, as well as significant defects in the DEIS.

BACKGROUND·

A. Legal

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 236 U.S.T. 2403, TIAS No. 8165, ____ U.N.T.S ____ (1972) ("the Convention"), applies to "dumping," which is defined as "any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea," Art. III (1)(a)(i). The regime created by the Convention prohibits the dumping of substances listed in Annex I of the Convention, Art IV(1)(a), and provides for national regulation via special permits for substances listed in Annex II of the Convention, Art. IV(1)(b). The dumping of all other substances is subject to general permits issued by national authorities. The parties are supposed to give careful consideration to factors enumerated in Annex III of the Convention in issuing special and general permits. Art. IV(2).

For a number of reasons, disposal of wastes by incineration at sea may not be effectively regulated by the Convention. First, such

disposal may not be "disposal at sea" at all, since effective incineration at sea may not lead to measurable changes in the marine environment at the incineration site. Second, although the substances for which incineration at sea would be conducted would likely include substances whose dumping is prohibited by Annex I of the Convention, a paragraph of that Annex provides that the prohibition on dumping of Annex I substances does not apply to substances which are "rapidly rendered harmless by physical, chemical or biological processes in the sea" and which do not make marine organisms upalatable or endanger the health of humans or domestic animals. Annex I, Par. 8. As will be seen, incineration measures carried out at sea are likely to produce wastes that are completely neutralized by sea water or are present in such small quantities that the specified harms would not occur. Third, the prohibition on dumping Annex I substances does not apply to the dumping of certain substances - including mercury and cadmium compounds, organohalogen compounds, persistent plastics or synthetics, or oil mixtures - which are contained only as "trace contaminants". It is likely that incineration of prohibited wastes at sea would, in addition to providing virtually complete elimination of the organohalogens, result in only trace amounts of these other prohibited substances. See DEIS at II-6.

The contemplated amendments to the Convention therefore would represent a mixed blessing. On the one hand, the amendments would legitimize incineration at sea as a permissible form of waste disposal for substances whose disposal at sea would otherwise be prohibited by the Convention. On the other hand, the proposed amendments would apply certain regulations to such operations as well as lay out a set of technical guidelines to be considered in implementing the regulations.

B. Political

The Convention was adopted in 1972 and became effective according to its terms in 1975. Both prior to the effective date of the Convention and after it incineration operations have been carried out by several European nations. The United States has issued special permits through the EPA for incineration operations at sea on three occasions, all of which involved substances whose disposal at sea would have been prohibited by the Convention and under the terms of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), P.L. 92-532. Two such operations involved chlorinated hydrocarbon wastes generated by the Shell Chemical Company and were conducted at a site in the Gulf of Mexico. The last such operation involved incineration of "Agent Orange," a herbicide used in the Vietnam War which was found to contain levels of 2,3,7,8-tetracloro-dibenzo-p-dioxin ("TCDD" or "dioxin") that represented a danger to human life and health. Incineration was conducted at a site in the Central Pacific Ocean. See DEIS at I-9 ff.

During the First Consultative Meeting of the Contracting Parties to the Convention in 1976, a resolution was adopted which requested the Inter-governmental Maritime Consultative Organization (IMCO), which serves as the Secretariat for the Convention pursuant to Article XIV (2) of the Convention, to consider the relation of incineration at sea to the Convention and draft provisions, if necessary, to regulate such incineration. At the Second Consultative Meeting, in 1977, the parties approved draft technical guidelines for the regulation of incineration at sea and recommended their implementation. They also decided to pursue a mandatory regulatory regime to be established within the provisions of the Convention. See DEIS, at III - 2-3.

The action proposed at this time is to participate in international negotiations to amend the Convention to add language to Annex I that would specifically permit incineration of certain Annex I substances and regulate certain aspects of their incineration at sea, and add language to Annex II that would create a regulatory regime for incineration at sea of Annex II substances. An addendum to Annex I would specify regulations applicable to incineration at sea and describe technical guidelines for such operations. This Addendum would apply to both Annex I and Annex II substances.

C. Technical

Incineration at sea is usually carried out in specially constructed, reconstructed, or fitted vessels. Operations to date have resulted in incineration temperatures of 1250° C. or more, and nearly complete combustion of the wastes incinerated (99.9%). The primary products of the incineration process are H_2O and CO_2. When *incineration is of chlorinated hydrocarbons, significant amounts* of HCl would also be produced. See generally I-5 ff.. However, the quantity of HCl produced and deposited into ocean waters would certainly be completely neutralized by the waters. See DEIS at VI-13. To the extent that trace metals are contained in the wastes, they would appear as particulates in the plume resulting from the incineration. See DEIS at VI-4, VI-6. Most such particulates would be deposited in ocean waters, but because of the dispersion caused by wind and the movement of the vessel during the incineration operation the concentration of such substances reaching ocean waters would be beneath acceptable thresholds. See DEIS at ____. Furthermore, incinceration operations are usually conducted in waters overlying the ocean basin and away from the continental shelf or shore. Locations are also generally chosen to avoid any accidents caused by the presence of other vessels in the area.

The proposed amendments to the Convention would apply uniform international standards, to be administered by the national authorities, to such incineration operations, including standards concerning the

location of the site, specification and performance standards for the incinerator, and standards concerning the characteristics of the vessel. Incineration of substances identified in paragraphs 1, 5, and 7 of Annex I — i.e., organchalogen compounds, oils and oily mixtures, and materials in any form produced for biological and chemical warfare -- would specifically be subject to an Addendum to Annex I which would prescribe regulations for such operations and lay out technical guidelines for consideration in their implementation. Other Annex I substances would not be affected by the amendment; incineration of such substances would be controlled only "to the satisfaction of the Contracting Party issuing the special permit." "Draft Regulations for the Control of Incineration of Wastes and Other Matter at Sea" ("Draft Regulations"), Regulation 2(2).

Annex II would also be amended to include a clause under which the incineration regulations of the Addendum to Annex I would be applied to Annex II substances, and the technical guidelines of the Addendum should be applied, but only "to the extent specified in the Regulations and Guidelines." The incineration of other wastes would be subject to general permits issued by national authorities. Regulation 2(3). However, in issuing general permits or special permits for Annex I and Annex II substances not subject to the entire regulatory regime of the Addendum, permitting States would still be obliged to take full account of all applicable provisions of the Draft Regulations and the "Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea" ("Technical Guidelines"). Regulation 2(4).

"Incineratio· at sea" within the Draft Regulations and Technical Guidelines is defined to mean:

> ...the deliberate combustion of wastes or other matter on marine incineration facilities for the purpose of their thermal destruction. Regulation 1(1).

Other combustion incidental to vessel operations is excluded. "Marine incineration facility" refers to any

> ...vessel, platform, or other man-made structure which carries out incineration at sea. Regulation 1(2).

The Draft Regulations generally require:

(1) That the construction of incineration vessels comply with applicable international standards relating to construction, equipment, and design. Regulation 3(1). This is interpreted to mean that the provisions of the IMCO code on vessels transporting hazardous substances would apply, at least for states adhering to this code. See DEIS at IV-7.

(2) That initial and biennial surveys of the incineration equipment be conducted by national authorities and certificates of compliance with applicable standards be issued. The surveys would be based on performance and specification standards. Performance standards would include combustion and efficiences in excess of 99.9%, an adequate supply of air, and a minimum 1250° C. flame temperature. Specification standards would include national standards on the design of monitoring thermocouples, gas sampling system, shut-off temperature system, waste and fuel flow monitoring devices, stack monitoring devices, and provisions ensuring that no waste can be discharged from the tanks during normal operations except through the incinerator. Regulation 4.

(3) That preliminary stack monitoring be conducted as part of the initial survey when incineration of wastes "over which doubts as to the efficiency of combustion exist" is contemplated. Examples are PCB's, PCT, TCDD, DDT, and other organohalogens. Consideration is also to be given to sampling particulates where incineration of liquid of semi-liquid wastes is contemplated. Regulation 5.

(4) That certain performance standards be met, including no discharge during normal operations except through the incinerator, maintenance of 1250°C. flame temperature, and combustion efficiency of 99.95± 0.05%, and an absence of black smoke or flame extension above the stack. Regulation 6.

(5) That certain data be recorded during operation and records be kept of this data. Regulation 7.

(6) That wastes to be incinerated be identified and that the by-products of incineration also be identified "where possible". Regulation 8(1)-(2).

(7) That certain factors be taken into consideration in site selection and that notification procedures be followed. Regulations 9, 10. A recommendation has been made on notification. Under the recommendation, notification of incineration operations would be post facto and compiled by IMCO into annual summaries. See Amendment to Interim Notification Procedures; Annex I, DEIS at A-20. Notifications by national permitting authorities should include information concerning the nature of the waste, the processes generating it, its form, and the area and frequency of incineration. See Appendix A to Draft Regulations, DEIS at A-21.

ANALYSIS:

The proposed amendments to the Ocean Dumping Convention raise issues concerning both the merits of the proposal and the adequacy of the DEIS. While these issues overlap somewhat, I will discuss them

here according to whether they are primarily issues as to the merits of the proposal or the adequacy of the DEIS.

A. Substantive Issues

(1) Under the Convention there is considerable uncertainty as to what constitutes a permissible "trace contaminant" of certain Annex I substances and when certain substances are "rapidly rendered harmless" by discharge into ocean waters. Inorganic substances present in wastes to be incinerated will not be destroyed by
19. incineration, and will appear as particulates in the plume resulting from incineration. See DEIS at VI-4. The proposed amendments specifically carry over the exemption of substances rapidly rendered harmless or present as trace contaminants from the prohibition of Annex I on introduction of such substances into the marine environment. Thus inorganic components of the incinerated waste could be discharged into the ocean, provided they were in amounts that qualify for one of the exemptions.

(2) There is apparently little basis for the distinction between matters contained in the Draft Regulations and those contained in the Technical Guidelines. The Technical Guidelines contain important regulatory items not addressed in the Draft Regualtions, including percentage of excess oxygen present in the combustion gases near the stack exit; the residence time of wastes in the incinerator; standards on disposal of residues including tank washings and ashy deposits; provisions on loading of liquid wastes at sea, container integrity, stowage, and labelling; specific measures on prevention of maritime hazards, including notification of route and location of operations and ongoing radio warnings; specific application of the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk; and provision for pilot tests in certain instances (bracketed).

20. There is also some ambiguity concerning the legal effect of the distinction between the Draft Regulations and the Technical Guidelines. According to an amendment to Annex I, parties "shall apply the Regulations...and take full account of the Technical Guidelines" for incineration of enumerated Annex I substances; "shall apply the Regulations...and take full acount of the Technical Guidelines...to the extent specified in these Regulations and Guidelines" for Annex II substances; and "shall take full account of all applicable provisions of these Regualtions and the Technical Guidelines" for incineration of substances not included in the foregoing as well as for substances subject only to general permits. However, the introductory paragraph to the Technical Guidelines states that parties "should take full account of these Guidelines". It is unclear whether there is a distinction in meaning between whether a party "shall" take the Technical Guidelines into consideration, or "should" take them into consideration.

(3) Under Regulation 2(2), incineration of wastes subject to special permits, other than Annex I wastes specifically enumerated in Regulation 2(1)(a), or Annex II wastes outside the scope of the controls imposed under the amendment to Annex II, "shall be controlled to the satisfaction of the Contracting Party issuing the special permit." This appears to leave us worse off than under the present regime. Whereas under the Convention in its present form the terms of the Convention would apply to such substances provided they were deposited in sufficient quantities to cause measurable changes in the ocean environment and (in the case of Annex I substances) were not rapidly rendered harmless or present only as trace contaminants, these substances would under the proposed amendments not be subject to any international regulatory regime.

This would include substances containing mercury, cadmium, and their compounds, persistent plastics or other persistent synthetic materials, as well as Annex II substances to which the Draft Regulations and Technical Guidelines do not specify their applicability. See Annex II, Par. E. This last clause appears to leave considerable doubt as to the applicability of the Draft Regualtions and the Technical Guidelines to specific Annex II substances. Furthermore, it appears to place the burden of proof on a party seeking to show that a specific substance should be covered by the Draft Regulations and Technical Guidelines, and not on a party attempting to exclude it from coverage.

(4) Regulation 2(1)(b) contains a bracketed clause that would apply the proposed regualtory regime to "pesticides and their by-products not covered in Annex I." It has not been made clear why pesticides should be mentioned specifically, or why they should not be classified according to their components, and placed in an appropriate Annex. More discussion is required on this point. However, it appears that if the bracketed provision were adopted, a more satisfactory regulatory regime would be created.

(5) The proposed amendments would not apply to incineration operations conducted at ocean locations that were not conducted on "marine incineration facilities" as defined in the amendments. Such facilities are defined to include only vessels, platforms, and other man-made structures. Regulation 1(2). Thus, parties to the Convention could carry out incineration operations at remote locations, such as islands, without conforming to the terms of the amendments. In conducting such operations, parties would usually apply only whatever regulations they regularly implement concerning atmospheric discharges from such land-based sources. The resulting discharges into the ocean would likely not be regulated. Furthermore, the potential dangers of such operations would be as great or greater than ocean dumping operations. Such operations could, like marine incineration, involve maritime transport to the incineration station, and in addition could involve

offloading at the station. The environmental effects of ordinary operations would also be greater, since island and similar locations would usually have continental shelves or fringing reefs, as well as more aquatic life than would be present in mid-ocean locations used by incineration vessels.

24. (6) The DEIS refers to the necessity for contingency planning to accompany marine incineration operations. See DEIS at VIII-6. The proposed amendments do not address this issue.

B. Adequacy of the DEIS

A number of the issues that arise concerning the adequacy of the DEIS are related to the failure of the DEIS to specify exactly what action is contemplated. Since it is not clear what stage of decision-making has been reached on the proposed amendments, it is difficult to determine whether there is an adequate consideration of alternatives, whether there is sufficient factual documentation of the statements made in the DEIS, and whether there is sufficient analysis of environmental consequences.

25. As far as the description of the proposed action itself goes, it is described simply as "to negotiate and adopt amendments to Annexes I and II of the Convention...to establish international regulations and guidelines for incineration of wastes at sea." DEIS at I-1. Previous international negotiations on this issue are discussed only briefly. DEIS at III - 2-3. Thus it is unclear what point in the international negotiations has been reached, and what negotiating options have already been lost at this stage in the amendment process. (It is indicated that the DEIS, issued Oct. 4, 1978, is intended to apply to negotiations to be initiated at the Third Consultative Meeting of the parties to the Convention which was to have been held in London on Oct. 9-13, 1978. DEIS at 1.) Furthermore, there is no indication what future actions must be taken by the Department of State or EPA. Some such actions would presumably require another environmental impact statement (EIS). Such actions could include adoption and ratification of the proposed amendments to the Convention, and promulgation of implementing regulations. Therefore it is difficult to assess what level of detail should be required in the present document and what alternatives should be considered at this time.

Specific comments on the adequacy of the DEIS, a number of which relate to the insufficient description of the precise action proposed, are listed below.

26. (1) The DEIS fails to identify and describe potentially significant environmental consequences of the proposed action.

(a) According to the DEIS, see DEIS at VI-13, VIII-1, incineration of chlorinated hydrocarbon wastes at sea, without stack scrubbers,

would result in generation of significant quantities of HCl gas. The DEIS concludes that there would be negligible results on ocean waters from the HCl discharge. The DEIS also states that the localized concentrations of HCl will not exceed acceptable maxima. DEIS at VI-12. The DEIS does not, however, consider the effects of release of HCl on the atmosphere as a long-term matter.

27. (b) The DEIS states that evaluation of long-term effects of incineration operations on ocean waters depends on continued advances in ocean monitoring technology. DEIS at VII-1. It further states that although some changes in ocean chemistry may be tolerated, any effects on biota might signal unacceptable changes in the ecosystem. EPA regulations on domestic operations are said to incorporate these considerations. DEIS at VII-1.

These effects are not satisfactorily dealt with by the proposed amendments, which continue to allow traces of Annex I substances to be deposited into the ocean as a result of marine incineration, and in addition allow disposition of "harmless" amounts of such substances. Regulation 8(3). According to the Convention in its present form, harmless amounts are those which do not cause unpalatability in seafood or detrimental effects to humans or domestic animals. The Convention, Annex I, Par. 8. The proposed amendments therefore do not appear to regulate long-term changes in the ocean environment resulting from disposition of small amounts of prohibited substances.

28. (c) The DEIS fails adequately to assess the risks posed by navigational hazards. The DEIS does not consider the effects of a spill of hazardous materials from an incinerator vessel in any detail, nor does it discuss the satisfactoriness of currently available regulations, including construction and equipment standards, that affect navigational safety. It simply lists presently available measures, including Coast Guard regulations and the IMCO code on transportation of hazardous substances. There is no evaluation of the probable frequency of accidents. See DEIS at VIII-3 ff..

(2) The DEIS fails to discuss meaningfully the alternatives to the proposed action.

29. (a) The DEIS fails to identify significant alternatives. For example, the proposed amendments would not require stack scrubbers for incinerator vessels. DEIS at VI-13. Stack scrubbers would remove virtually all the HCl produced by combustion of chlorinated hydrocarbons. There is no explanation of why this presumably technically feasible alternative has been omitted.

In part this defect may relate to the stage of negotiations presently reached or to other political considerations. However, this point is not discussed in the DEIS.

30. (b) The DEIS fails adequately to consider the possible advantages of the no-action alternative. In discussing the no-action alternative, the DEIS states that if this alternative were selected, nations would proceed with domestic enforcement under the Convention as presently in effect. The DEIS makes the questionable statement that incineration at sea is definitely within the terms of the Convention. DEIS at II-1. The DEIS also states that a uniform international regulatory regime would, however, probably lead to better regulation. This is probably true.

However, the DEIS does not discuss to what extent legitimizing marine incineration by providing a specific regime of regulation within the provisions of the Convention would foreclose future options that may be more desirable. Premature adoption of marine incineration as a disposal option for the wastes likely to be incinerated may freeze technology and remove the incentive to devise other technical options. Such options could include reprocessing, deactivation through bacterial action or the like, as well as other forms of disposal. A "delay" alternative could be chosen which would await such developments. These issues should be discussed further in the DEIS.

31. (c) The DEIS fails to consider land incineration adequately. Land incineration, because of the probable relative proximity of settlements and absence of the amounts of water that could neutralize certain wastes, e.g. HCl, would probably utilize stack scrubbers that would be virtually completely effective in removing HCl and particulates. DEIS at VI-21. Land incineration would also involve an entirely different transportation network. The relative dangers of land and sea transportation to the incineration site have not been addressed. Instead, the DEIS merely states that catastrophes at land sites would be more dangerous, since they would likely be closer to populated areas. DEIS at VI-22. While this may be true, it must be balanced against the fact that most transshipment of wastes for marine incineration operations would occur at busy ports. DEIS at VI-16.

32. (d) The DEIS also fails to consider the reprocessing alternative adequately. From the materials contained in the DEIS, it appears that chlorolysis is an environmentally acceptable alternative. This method of reprocessing is excluded apparently only because it may be undesirable from an energy and economic point of view. If the reprocessing alternative is to be dismissed, it should be compared straightforwardly with the marine incineration proposal, to compare the environmental, energy, and economic considerations separately.

33. (3) The DEIS appears to contain inadequate factual documentation. This defect once again may result from uncertainty as to the role of the present document. The level of factual information contained in the DEIS is insufficient either to choose marine incineration as a disposal option or to take further steps toward implementing it.

Many unsupported factual statements are made. For example, it is
33. (Continued) stated that it would require about ten land-based facilities to provide the same rate of destruction as a single incinerator vessel. No factual support is given for this statement. See DEIS at II-7.

(4) It is unclear why certain analyses are included in the DEIS and others are omitted. Only a very general discussion of environmental consequences on the ocean environment is included, yet there are specific descriptions of proposed sites. See DEIS at V-8 ff., V-10 ff. The DEIS states that EPA will do additional EIS's on designated sites prior to allowing marine incineration operations to commence. DEIS at IV-5, V-12. Does this mean that the present document is intended to function as the draft of the only EIS that will be performed on marine incineration before sites are designated and operations are commenced under special permits? If this is the case, then a great deal more discussion is required as to why certain
34. options have already been foreclosed in the negotiations process, why other options should not be chosen and a prohibition on marine incineration sought, and what the long-term effects of both a technological and environmental nature would be of adopting this alternative now. In addition, there would have to be a more detailed discussion of alternatives and the environmental consequences of marine incineration, as well as greater factual documentation. Regulations proposed by the Council on Environmental Quality (CEQ) on EIS's pursuant to NEPA would require that EIS's be stacked to avoid unnecessary duplication in discussion and documentation. If the present document is to play a significant role in decisionmaking *at this time, more detail is required.* Such detail would be inappropriate in EIS's issued further down the road on more concrete disposal proposals.

cc: Sam Bleicher, CZxl
Kilho Park, Ocean Dumping Program
Bud Ehler

DEPARTMENT OF HEALTH EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA GEORGIA 30333
TELEPHONE (404) 633 3311

November 20, 1978

Mr. William H. Mansfield
Office of Environmental Affairs
Department of State
Washington, D.C. 20520

Dear Mr. Mansfield

We have reviewed the draft environmental impact statement for the Incineration of Wastes at Sea under the 1972 Ocean Dumping Convention. We are responding on behalf of the Public Health Service.

With respect to the comparable alternatives for disposal of toxic wastes, incineration at sea appears to be the logical choice and will cause the least detriment to human health and the environment.

Careful planning should be adhered to when the sites and zones for incineration are chosen. These selections should consider distances from land-based populations, sport fishing areas, and other vessel traffic to minimize
35. *their contact with emissions or residues. Since incineration sites are* prototype facilities at present, special surveillance and monitoring are warranted until future data alleviates concern of adverse effects.

It was noted on page I-9, the chlorine content of the waste material, by analysis, is less than the chlorine content of any of the chlorinated
36. hydrocarbons listed. The analysis of the waste does correspond closely, however, to the calculated composition of dichloropropene. Is it possible that the bulk of the waste material is dichloropropene?

Thank you for the opportunity of reviewing this document. We would appreciate receiving a copy of the final statement when it is issued.

Sincerely yours,

Frank S. Lisella

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Bureau of State Services

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D C 20240

PEP ER 78/973

NOV 30 1978

Mr William H. Mansfield
Office of Environmental Affairs
Department of State
Washington, D C. 20520

Dear Mr. Mansfield

The Department of Interior has completed its review of the draft environmental impact statement for the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention Generally, the statement appears adequate from our area of concern, however we do have the following minor comments

37. Please note that the Bureau of Outdoor Recreation listed on page ii, is now the Heritage Conservation and Recreation Service.

38. We suggest that you change the last paragraph on page VI - 15 to read as follows "For this reason, the route of the ship to the site will be controlled so as to keep the vessel out of recreational areas." The sentence now says that the route of the ship should be controlled.

Thank you for the opportunity to comment on this draft statement.

Sincerely,

Deputy Assistant Larry E. Meierotto SECRETARY

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS
U S COAST GUARD (G-WEP-7/73)
WASHINGTON D C 20590
PHONE 202-426-3300

21 NOV 1978

Mr. William H. Mansfield
Office of Environmental Affairs
Department of State
Washington, D.C. 20520

Dear Mr. Mansfield

The concerned operating administrations and staff of the U. S. Coast Guard have reviewed the draft environmental impact statement for Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention. We offer the following comments for use in developing the final statement.

39. Page I-3, paragraph (4)(a). This paragraph apparently prohibits other discharges of facility wastes such as bilge pumping, sewage discharge, and trash and garbage dumping when they are authorized. A definition of "waste, excluding these other materials, would be helpful in removing this ambiguity.

40. Page I-4, paragraph (5)(c). We suggest using the term "navigational aids' in lieu of navigational controls" since vessel navigation is not really controlled.

41. Page IV-8. 1,250 m and 3,000 m should read 1,250 cubic meters and 3,000 cubic meters.

42. Page V-8. It would be helpful to describe the Gulf of Mexico site in regard to size, location and distance from major ports as is done regarding the 106" site on pages V-11 and V-12.

43. Page VI-2, paragraph 2. The statement describes "monitoring surveillance programs to prevent adverse long-range impacts.' We suggest this terminology be changed to "monitoring programs to prevent adverse long-range impacts and surveillance for enforcement purposes.

44. Page VIII-4, paragraph 2. Surveillance flights are conducted at ports handling over 10 million tons of petroleum products annually and flights are conducted in all coastal waters. Specific coastal surveillance areas are determined by pollution potential expected as a result of vessel density studies and historical spill

SPEED LIMIT 55
It's a law we can live with

data, and flights are not restricted to high-pollution areas. The Federal Water Pollution Control Act requires polluters to report spills, and non-spilling industries and the public are encouraged to report spills to augment this mandate.

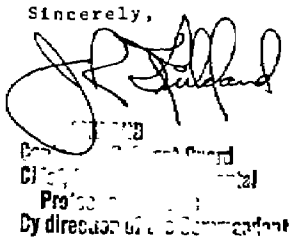
45. Page A-8, Regulations 5, line 6. "Initial vessel survey" should read "initial incineration survey."

46. Page A-9, Regulation 6 (1) and Page A-15, B.1.(a). The same comments hold here as for page I-3.

47. Page A-15 B.2.(a). We suggest the wording here be changed to "liquid wastes in bulk should not.....". This will allow use of small, specially designed tanks or drums for transfering wastes should an offshore incinerator facility be established.

The opportunity to review the draft environmental impact statement is greatly appreciated.

Sincerely,



STATE OF ALABAMA

ALABAMA DEVELOPMENT OFFICE

GEORGE C WALLACE
GOVERNOR

R C "RED" BAMBERG
DIRECTOR

W M "BILL" RUSHTON
ASSISTANT DIRECTOR

December 8, 1978

TO Mr William H Mansfield, III
Office of Environmental Affairs
Department of the State
Washington, D C 20520

FROM Michael R Amos, Administrator
State Clearinghouse
State Planning Division

SUBJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Applicant Department of the State

Project Draft Environmental Impact Statement for the Incineration of Wastes at Sea under the 1972 Ocean Dumping Convention.

State Clearinghouse Control Number ADO-033-78

The Draft Environmental Impact Statement for the above project has been reviewed by the appropriate State agencies in accordance with Office of Management and Budget Circular A-95, Revised.

The comments received from the reviewing agencies are attached.

Please contact us if we may be of further assistance. Correspondence regarding this proposal should refer to the assigned Clearinghouse Number.

A-95/05
Attachments
Agencies contacted for comment.
Environmental Health Administration
ADO - Sternenberg

3734 ATLANTA HIGHWAY • MONTGOMERY, ALABAMA
MAILING ADDRESS STATE CAPITOL • MONTGOMERY, ALABAMA • 36130
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Final

REQUEST FOR REVIEW OF PROJECT NOTIFICATION

TO Mr. W. T. Willis
Environmental Health Adm.

CH Number ADO-033-78

Applicant Dept of the State

Program Draft Environmental Impact Statement for the Incineration of Wastes at Sea under the 1972 Ocean Dumping Convention.

DATE October 23, 1978

Return Prior to ASAP
Date

Please review the attached Environmental Impact Statement and indicate your comment with respect to any environmental impact involved

Comments (Please check one block)

No comment (Environmental Impact Statement is in order and no additional comments are offered)

Comments (Elaborate below)

Comment here

W. T. Willis
Signature

Please Return Original to

Alabama Development Office
Office of State Planning
State Clearinghouse
c/o State Capitol
Montgomery, Alabama 36130

FORM CH-2a
8/71

01 A3LH

STATE OF ALASKA

OFFICE OF THE GOVERNOR

DIVISION OF POLICY DEVELOPMENT AND PLANNING

JAY S HAMMOND, Governor

Phone 465-3512
Pouch AD - Juneau 99811

December 11, 1978

Mr. William H. Mansfield
Office of Environmental Affairs
Department of State
Washington, D.C. 20520

Subject Incineration of Wastes at Sea
State I.D No. 78102403

Dear Mr. Mansfield

The Alaska State Clearinghouse has completed review on the subject project.

The State Clearinghouse has no comment on this project.

This letter will satisfy the review requirements of the office of Management and Budget's Circular A-95.

Sincerely,

Jerry Madden
State-Federal Coordinator

JM/cz

OFFICE OF THE SECRETARY
RESOURCES BUILDING
1416 NINTH STREET
95814

(916) 445 5656

Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Navigation and Ocean Development
Department of Parks and Recreation
Department of Water Resources

EDMUND G. BROWN JR
GOVERNOR OF
CALIFORNIA

Air Resources Board
California Coastal Commission
California Conservation Corps
Colorado River Board
Energy Resources Conservation and Development Commission
Regional Water Quality Control Boards
San Francisco Bay Conservation and Development Commission
Solid Waste Management Board
State Coastal Conservancy
State Lands Commission
State Reclamation Board
State Water Resources Control Board

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO CALIFORNIA

1978 DEC 13

Mr. William Mansfield, III
Office of Environmental Affairs
Room 7820
U. S. Department of State
Washington, D. C. 20520

Dear Mr. Mansfield:

The State of California has reviewed the "Draft Environmental Impact Statement for the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention", prepared by the Environmental Protection Agency and submitted through the Office of Planning and Research in the Governor's Office.

The only comment received from the reviewing State offices was that of the State Water Resources Control Board, as follows:

48. On page VI-14, the DEIS mentions that fish exposed to plume fallout exhibit higher activity of P-450 enzymes than control organisms do, but it does not discuss the toxicological significance of this. The final EIS should discuss the significance of increased P-450 activity.

49. The Board has designated 34 Areas of Special Biological Significance which require protection of species or biological communities to the extent that alteration of natural water quality is undesirable (report attached). Similar protection may be afforded off-shore areas of other states or countries. Therefore, the Board recommends that proposed regulations require that designation procedures for disposal sites and transportation routes for toxic wastes consider potential impacts on such areas and appropriate measures to prevent input of toxic spills to them.

Questions concerning these comments should be directed to Dennis Corcoran at (916) 322-9875.

The State's review fulfills the requirements of Part II of Office of Management and Budget Circular A-95 and the National Environmental Policy Act of 1969. It was coordinated with the Departments of Conservation, Fish and Game, Navigation and Ocean Development, Parks and Recreation, Water Resources, Food and Agriculture, and Transportation; the Air Resources and Water Resources Control Boards, and the Coastal, Energy, Public Utilities, and State Lands Commissions.

We appreciate having been given an opportunity to review this document.

Sincerely,

L. FRANK GOODSON
Assistant Secretary for Resources

Attachment

cc: Director of Management Systems
Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH 78110658)

STATE OF DELAWARE
EXECUTIVE DEPARTMENT
OFFICE OF MANAGEMENT BUDGET AND PLANNING
DOVER DELAWARE 19901

OFFICE OF THE DIRECTOR

PHONE (302) 678 4271

November 16, 1978

Mr William H, Mansfield
Office of Environmental Affairs
Department of State
Washington, D C 20520

Dear Mr Mansfield

RE Draft Environmental Impact Statement for Incineration of Wastes at Sea

The Office of Management, Budget and Planning, in its function as the State Clearinghouse, has reviewed the subject DEIS and has no comments to make at this time

Thank you for the opportunity to review this document

Sincerely,

Nathan Hayward III
Director

fb

TWIN TOWERS OFFICE BUILDING
2600 BLAIRSTONE ROAD
TALLAHASSEE FLORIDA 32301

REUBIN O D ASKEW
GOVERNOR

JOSEPH W LANDERS JR
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

DIVISION OF STATE PLANNING,
Bureau Of
Intergovernmental Relations
DEC 20 1978
RECEIVED
SAI NO

December 19, 1978

~~Boring Lovell,~~ Chief
Bureau of Intergovernmental Relations
Department of Administration
Division of State Planning
Room 530, Carlton Building
Tallahassee, Florida 32304

Dear Mr Lovell

Draft Environmental Impact Statement for the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention, SAI No 79-0718E

The Department of Environmental Regulation has reviewed the above referenced Draft Environmental Impact Statement and submits the following comments

1. The Draft EIS does not indicate that any review at the state level would be provided regarding the issuance of incineration permits or for the designation of incineration areas. Nevertheless, the coastal states must assume a major risk in the transportation handling and loading of the various wastes scheduled for ocean incineration The port areas would essentially focalize the on-loading activities The table, "Estimates on National Organic Chemical Production and Corresponding Wastes" indicates that 89% of the total national wastes either being currently generated or projected to be produced could be ocean incinerated through gulf and east coast ports Port terminals would essentially focalize the handling activities and a significant potential hazard is anticipated in bay, esturine and near offshore areas of the effected states. Spillage could result from mishandling, accidents or collision The discharge of such wastes as insecticides, herbicides, PCB's and other organic compounds could be devastating to the biota in the general area 50.

Loring Lovell, Chief
Page Two
December 19, 1978

2. The incineration of heavy metals represents a long term concern of this proposal Increased combustion efficiency does not significantly reduce the amount of metal salts and metal oxides being emitted from the stack It has been noted that "the convention does not require the development of procrdures and criteria for evaluating the impact (of) waste disposal at designated
51. sites ." (page VII-2). Therefore, we are encouraged that EPA may require special studies to be performed prior to the issuance of permits for the ocean incineration of certain wastes The monitoring of incineration operations of questionable wastes, only, basically provides after-the-fact data It is hoped that the special studies aspect will be elaborated upon in the final EIS We are interested in knowing what criteria or standards would be used to determine, "unacceptable high metal content," and what other components of questionable wastes EPA anticipates as candidates for special study

Ocean incineration appears to be a viable alternative to ocean dumping, landfill disposal and deep well injection We would like to review the final EIS when it is available We appreciate the opportunity to comment on this environmental document

Sincerely,

John B Outland

John B Outland
Intergovernmental Programs
Review Section

JBO/hdk

STATE OF FLORIDA

Department of Administration

Division of State Planning

Room 530 Carlton Building
TALLAHASSEE
32304
(904) 488-1115

R.G. Whittle, Jr
STATE PLANNING DIRECTOR

Reubin O D Askew
GOVERNOR

Wallace W Henderson
SECRETARY OF ADMINISTRATION

December 12, 1978

Mr William H Mansfield
Office of Environmental Affairs
Department of State
Washington, D C 20520

Dear Mr Mansfield

Functioning as the State Planning and Development Clearinghouse contemplated in U S Office of Management and Budget Circular A-95, we have reviewed the following draft Environmental Impact Statement Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention, SAI 79-0718E

During our review we referred the environmental impact statement to the following agencies, which we identified as interested Department of Environmental Regulation, Department of Natural Resources, Department of Legal Affairs, Department of State, Game and Fresh Water Fish Commission, and Department of Administration's Bureau of Land and Water Management Agencies were requested to review the statement and comment on possible effects that actions contemplated could have on matters of their concern During the review period the above agencies either did not comment, or submitted letters of no comment If any agency should submit a letter of comment regarding this document, we will forward it immediately

In accordance with the Council on Environmental Quality guidelines concerning statement on proposed federal actions affecting the environment, as required by the National Environmental Policy Act of 1969, and U S Office of Management and Budget Circular A-95, this letter should be appended to the final environmental impact statement on this project

Thank you for giving us the opportunity to review this draft statement We request that you forward us copies of the final environmental impact statement prepared on this project

Sincerely,

R. G. Whittle, Jr

R G Whittle, Jr
Director

RGWjr Kmb
cc Ken Tucker
Loring Lovell
J W Landers, Jr
H E Wallace
Harmon Shields
L Ross Morrell

STATE OF FLORIDA

Department of Administration

Division of State Planning

Room 530 Carlton Building
TALLAHASSEE
32304
(904) 488-1115

R G Whi Jr
STATE PLANNING DIRECTOR

Reubin O D Askew
GOVERNOR

Wallace W Henderson
SECRETARY OF ADMINISTRATION

December 26, 1978

Mr William H Mansfield
Office of Environmental Affairs
Department of State
Washington, D C 20520

Dear Mr Mansfield

Reference our December 12, 1978, letter of response to your draft Environmental Impact Statement, Incineration of Wastes at Sea under the 1972 Ocean Dumping Convention SAI 79-0718E, attached for your consideration is a letter of comment from our Department of Environmental Regulation We request that you consider these comments as part of our earlier response

Thank you for your cooperation

Sincerely,

R. G. Whittle, Jr

R G Whittle, Jr
Director

RGWjr Kmg
Attach.
cc J W Landers, Jr.

GEORGE R ARIYOSHI
GOVERNOR

RICHARD L O'CONNELL
DIRECTOR

TELEPHONE NO
548-6915

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST
ROOM 301
HONOLULU HAWAII 96813

January 5, 1979

Mr William Mansfield, III
Office of Environmental Affairs
Room 7820
Department of State
Washington, DC 20520

Dear Mr. Mansfield

SUBJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE INCINERATION OF WASTES AT SEA UNDER THE 1972 OCEAN DUMPING CONVENTION

We have reviewed the subject document and offer the following comments for your consideration·

52. 1. The draft EIS indicates that incernation will be done in less travelled areas of the open ocean. The EIS should also consider avoiding the migration paths of whales.

53. 2. The EIS does not discuss the treatment of containers which contain hazardous materials for incineration. Will the containers be washed on board the ship? Where will the containers be disposed?

54. 3. Although the appendix includes information on the disposal of residue in the "Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea," there is no discussion on the disposal of harmful residues such as from dioxins. Only on-site disposal is considered. Such land disposal of the residue could be hazardous and this problem should be discussed in the EIS.

We trust that these comments will be helpful to you in preparing the final EIS. We thank you for the opportunity to review this document and request that a copy of the final EIS be provided to us when it becomes available.

Sincerely,

Richard L. O'Connell
Director

cc DPED

OSTEP
OFFICE OF SCIENCE, TECHNOLOGY & ENVIRONMENTAL POLICY

Edwin W Edwards Governor — Lee W Jennings Director

October 20, 1978

Mr. William H. Mansfield
Office of Environmental Affairs
Department of State
Washington, D.C. 20520

RE: Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention

Dear Mr. Mansfield:

The above-referenced matter concerning environmental quality has been received and reviewed by the staff of the Office of Science, Technology and Environmental Policy. From the information contained in the package sent to our office, the staff of OSTEP issues a no objection on this particular project. The rules and regulations governing this project should continue to be in full compliance with all State and Federal regulatory agencies.

The staff of OSTEP appreciates this opportunity to participate in the review process.

Sincerely,

William J. Mollere
Manager, Administration and Operations

WJM/cdh

cc: Mr. George Gullett, Environmental Coordinator
Office of Planning and Technical Assistance
Department of Urban and Community Affairs

STATE CAPITOL BUILDING POST OFFICE BOX 44095 BATON ROUGE, LA. 70804 (504) 389-2549

NATIONAL SPACE TECHNOLOGY LABORATORIES, NSTL STATION MISSISSIPPI 39529 (601) 688-3003

F/NC

OFFICE OF THE GOVERNOR
Planning & Coordination
1503 Walter Sillers Building
JACKSON MISSISSIPPI 39201
354 7018

CLIFF FINCH
GOVERNOR

JAMES A FLEMING
DIRECTOR

STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

TO Department of State
Office of Environmental Affairs
Washington, D.C. 20520

Attn William H Mansfield

STATE CLEARINGHOUSE NUMBER

78101812

DATE November 7, 1978

PROJECT DESCRIPTION

Draft Environmental Impact Statement for Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention. The United States will participate in negotiations to amend the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter to establish internationl regulation and guidlines for the incineration of wastes at sea to be enforced nationally -Nationwide-

The State Clearinghouse, in cooperation with the state agencies interested or possibly affected, has completed the A-95 review of the project described above.

None of the state agencies involved in the review had comments or recommendations to offer at this time This concludes the State Clearinghouse review, and we encourage appropriate action as soon as possible

A copy of this letter is to be attached to the application as evidence of compliance with the A-95 requirements

Lester Howell, Coordinator
Clearinghouse for Federal Programs

State of New Jersey
DEPARTMENT OF COMMUNITY AFFAIRS

PATRICIA Q SHEEHAN
COMMISSIONER

363 WEST STATE STREET
POST OFFICE BOX 2768
TRENTON N J 08625

October 19, 1978

Mr Donald R King, Director
Office of Environmental Affairs
Bureau of Oceans and International
Environmental and Scientific Affairs
Department of State
Washington, D C 20520

RE OSRC-FY-79-463

Dear Mr King

This will acknowledge receipt of your recent Project Notification for an Incineration of Wastes at Sea Under the 1972 Dumping Convention The project has been designated application OSRC-FY-79-463 for all future references

We have circulated this Project Notification to the appropriate State agencies for review and comment We anticipate no problems during the review phase, but should any conflicts or issues arise, it will be necessary to schedule a conference in order to resolve the issues prior to the issuance of a Letter of Certification

Very truly yours,

Jerry H. Eure, Sr
Supervising Program
Development Specialist
Project Review Section
Division of State and
Regional Planning

JHE cp

Department of Land Conservation and Development

1175 COURT STREET N E , SALEM OREGON 97310 PHONE (503) 378-4926

November 22, 1978

Mr William Mansfield, III
Office of Environmental Affairs
Room 7820
Department of State
Washington, D C 20520

Dear Mr Mansfield

We have briefly reviewed the Draft Environmental Statement (DEIS) prepared by the Department of State and the U S Environmental Protection Agency for the incinerations of wastes at sea under the 1972 ocean dumping convention Our comments are with respect to Section IV a through IV-4 of the report

The State of Oregon's Coastal Zone Management Program has been approved containing statewide planning goals and special statutes Permits and licenses issued under the Marine Protection, Research
55. and Sanctuaries Act having an impact on the State are required to be consistent with the Oregon Coastal Zone Management Program The Ocean Resources Goal included in the Program addresses the issues in this report A copy of all Coastal Resource Goals has been submitted with these comments *

Thank you for this opportunity to comment

Sincerely,

James H Claypool
State Agency Coordinator

JHC cf

Enc *Attachment "Statewide Planning and Guidelines 16, 17, 18, & 19 for Coastal Resources", Effective 1 January 1977

cc Jon Christensen

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division,
306 State Library Building, Salem, Oregon 97310
Ph 378-3732

PNRS STATE REVIEW

Project # _____ Return Date _____

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1 A response is required to all notices requesting environmental review
2 OMB A-95 (Revised) provides for a 30-day extension of time, if necessary If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project does not have significant environmental impact

( ) The environmental impact is adequately described

(/) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project

( ) No comment

REMARKS

See attached letter

Agency LCDC By J H Claypool

Department of Land Conservation and Development

1175 COURT STREET N E , SALEM OREGON 97310 PHONE (503) 378-4926

November 22, 1978

Mr William Mansfield, III
Office of Environmental Affairs
Room 7820
Department of State
Washington, D C 20520

Dear Mr Mansfield

We have briefly reviewed the Draft Environmental Statement (DEIS) prepared by the Department of State and the U S Environmental Protection Agency for the incinerations of wastes at sea under the 1972 ocean dumping convention Our comments are with respect to Section IV a , through IV-4 of the report

The State of Oregon's Coastal Zone Management Program has been approved containing statewide planning goals and special statutes Permits and licenses issued under the Marine Protection, Research and Sanctuaries Act having an impact on the State are required to be consistent with the Oregon Coastal Zone Management Program The Ocean Resources Goal included in the Program addresses the issues in this report A copy of all Coastal Resource Goals has been submitted with these comments

Thank you for this opportunity to comment

Sincerely,

James H Claypool
State Agency Coordinator

JHC cf

Enc

cc Jon Christensen

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon 97310
Ph. 378-3732

PNRS STATE REVIEW

Project # [illegible] Return Date _____

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project does not have significant environmental impact

( ) The environmental impact is adequately described

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project

( ) No comment.

REMARKS

56 If it is true, as the draft EIS states, that air contaminates are below detection levels at distances greater than 10 miles from the incineration site, and there is no detectable level of water contamination, why is it necessary to risk the transport of toxic substances to sea for incineration? Certainly, there are land sites in this country, and others, where safe incineration could take place without adding the marine jeopardy factor.

Agency DEQ By Glen D. Carter 11/29/78

OFFICE OF THE GOVERNOR

DOLPH BRISCOE
GOVERNOR

November 30, 1978

Mr Donald R King, Director
Office of Environmental Affairs
Department of State
Washington, D C 20520

Dear Mr King

The "Draft Environmental Impact Statement for the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention" has been reviewed by the Budget and Planning Office and by interested and affected State agencies

The comments of the reviewing agencies are enclosed to assist your planning effort If this Office can be of further assistance, please contact us

Sincerely,

Roy Hogan

Roy Hogan, Assistant Director
Budget and Planning Office

Enclosure

EXECUTIVE OFFICE BUILDING • 411 WEST 13TH STREET • AUSTIN TEXAS 78701

TEXAS DEPARTMENT OF WATER RESOURCES

November 9, 1978

RECEIVED
NOV 14 1978
BUDGET/PLANNING

Mr Charles E Travis, Director
Governor's Budget & Planning Office
700 Executive Office Building
411 West 13th Street
Austin, Texas 78701

Dear Mr Travis

Subject U S Department of State/U S Environmental Protection Agency Draft Environmental Impact Statement (DEIS) -- Incineration of *Wastes at Sea Under the 1972 Ocean Dumping Convention* (September 1978)

In response to your October 31 memorandum, the Texas Department of Water Resources (TDWR) has reviewed the subject DEIS on proposed amendments to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (December 20, 1972) in order to establish international regulations and guidelines for the incineration of wastes at sea to be enforced nationally The proposed regulations (see DEIS at Appendix A), provide standards to minimize adverse impacts on oceans, atmosphere, shipping, and other legitimate uses of sea which could result from the incineration of wastes and other matter at sea (Activities incidental to normal operation of ships, or platforms, are excluded from the proposed definition of "incineration at sea" (Also, see Article III 1(b)(i) of "Convention" in DEIS at Appendix B, page B-2)

TDWR has reviewed the subject DEIS from the standpoint of its statutory, Statewide planning, development, and regulatory responsibilities relative to water resources water quality, wastewater, and industrial or hazardous solid wastes Within this limited scope of review, TDWR offers the following staff review comments

Page, I-2 to I-5 II-3, I-5, and I -10

TDWR believes that the proposed amendments are mutually beneficial and consistent with relevant objectives, goals, and activities of the State of Texas in the Gulf of Mexico [illegible] This overall general evaluation based on the following reasons

a At-sea incineration of wastes already is an international operation, specially-designed ships call at world ports to load toxic wastes for incineration in ocean areas usually beyond territorial waters (DEIS at pages II-3, -4)

b The mandatory provisions of the proposed regulations are realistic in that they incorporate results of studies which "focused on incinerator efficiencies, operating temperatures, incinerator controls and fail-safe devices in order to establish best practicable technology " (DEIS at pages I-2 to I-5, emphasis added) In addition, it has been concluded that the proposed mandatory requirements for incineration operations "are sufficient to protect the marine environment from adverse impact " (DEIS at page I-5)

c Two officially-permitted incineration operations involving toxic organochlorine wastes have been successfully performed in the Gulf of Mexico, i e , 16,000 metric tons, 143 miles southeast of Galveston, Texas during October 1974 - January 1975, and, 16,000 metric tons, 130 miles south of Sabine Pass, Texas during March to April 1977 (DEIS at pages I-9 and -10)

d The need for developing and applying at-sea monitoring technology to evaluate long-term effects is recognized (DEIS at page VII-1)

e Specially-designed and operated U S flag incinerator ships for nation-wide operations are planned (DEIS at page I-12, IV-4 to IV-10)

2 Pages V-2 to V-10 ("Description of the Marine Environment")

TDWR believes that in an appropriate place in the comparative descriptions of "open ocean" (pages V-1, -2), "coastal ocean" (pages V-2, -3), "biological setting" (page V-4), "estuarine circulation" (pages V-6, -7), and "nature of the Gulf of Mexico Incineration Site" (pages V-8 to V-11), special mention should be made that from a scientific standpoint, the waters of the oceans, bays, estuaries, and near-shore coastal areas, are often quite different from one another and from fresh waters in their ability to assimilate wastes The chemical, biological, and physical characteristics of waters of the marine environment require specialized knowledge to keep discharges of some materials (e g , copper, or nickel-bearing materials, and other trace materials) from becoming particularly harmful pollutants (See DEIS at pages VI-6, and -7, pages VII-1, and -2, and pages VIII-2, and -3)

TDWR appreciated the opportunity to review the subject DEIS which appears to fulfill adequately the administrative, analytical, and coordinative requirements of Section 102(2)(C) of the National Environmental Policy Act of 1969, and Circular No A-95 of the Office of Management and Budget Please advise if we can be of further assistance

Sincerely yours,

Dick Whittington for

Harvey Davis
Executive Director

TEXAS
PARKS AND WILDLIFE DEPARTMENT

COMMISSIONERS

PEARCE JOHNSON
Chairman Austin

JOE R. FULTON
Vice Chairman Lubbock

JOHN M. GREEN
Beaumont

HENRY B. BURKETT
EXECUTIVE DIRECTOR

4200 Smith School Road
Austin, Texas 78744

COMMISSIONERS

LOUIS I. STUBBS
San Antonio

JACK S. RAY
Palestine

PERRY R. BASS
Fort Worth

RECEIVED
DEC 1 1978
Budget/Planning

November 30, 1978

Mr. Ward C. Goessling, Jr., Coordinator
Natural Resources Section
Governor's Budget and Planning Office
Executive Office Building
411 West 13th Street
Austin, Texas 78701

Re Draft Environmental Impact Statement The Incineration of Wastes at Sea under the 1972 Ocean Dumping Convention

Dear Mr. Goessling

The subject document has been reviewed by this agency and the following comments are offered for your consideration.

Although at sea incineration of wastes in the described manner is preferable to the past dumping of unburned and untreated wastes directly into Gulf waters, fish and wildlife resources can be adversely affected if such activities are not tightly controlled and monitored, therefore, this agency will support any regulations designed to achieve this purpose.

On page VI-22 of the document, it is noticed that "the economics of the recovery process" will help to determine the use of feasible methods of waste recovery as an alternative to gross disposal. It is recommended that the economic feasibility of such recovery processes be determined on a long-term basis in view of potential long-term cumulative environmental damages from alternative disposal processes. Often such considerations are based only upon short-term economic concerns and disregard the economic consequences of long-term environmental damages.

Since it is likely that the greatest environmental damages from the described incineration can be brought about by accidental spills of the wastes during

transit, it is assumed that stringent, enforceable regulations will apply to such activities.

We appreciate the opportunity to comment on this document.

Sincerely,

HENRY B. BURKETT
Executive Director

HBB JR bp

General Land Office
AUSTIN TEXAS 78701
BOB ARMSTRONG COMMISSIONER

ENVIRONMENTAL MANAGEMENT
1700 North Congress
Austin, Texas 78701

(512) 475-1539

NOV 20 1978
State Planning

Mr Terry Leifeste, Coordinator
Budget and Planning Office
Office of the Governor
411 West 13th Street
Austin, Texas 78711

Dear Mr Leifeste

Members of the General Land Office have reviewed the report on, "The Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention" We offer the following comments

1 That the incineration plumes, especially drift, pose no threat to human life, health, activities or property

2 That occurence and levels of toxic and/or persistent compounds in the flora and fauna of State-owned lands does not increase as a result of incineration at Sea

3 That no precaution be overlooked with regard to preventing accidental spillage

We appreciate the opportunity to submit our comments

Cordially,

A J Bishop
Administrative Assistant

COMMONWEALTH of VIRGINIA

Council on the Environment

903 NINTH STREET OFFICE BUILDING
RICHMOND 23219
804 786-4500

November 29, 1978

Mr Donald R King
Director, Office of Environmental Affairs
Bureau of Oceans and International Environmental and Scientific Affairs
Department of State
Washington, DC 20520

SUBJECT Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention

Dear Mr King

Thank you for the opportunity to review the subject Draft Environmental Impact Statement The Virginia State Water Control Board has commented that the use
60. of scrubbers to remove particulates and HCL was mentioned in the discussion of land based incineration The impact statement should explain why scrubbers are not considered for use in the incineration of wastes at sea The Board has also commented that it might be useful to address the advisability of a waiting period for commercial fishing activities after each burn.

Please do not hesitate to contact me if you have any questions about these comments or if I can be of assistance in any way

Sincerely,

J B Jackson, Jr
Administrator

JBJ mlt

cc Honorable Maurice B Rowe, Secretary of Commerce and Resources
Mr Ray Bowles, State Water Control Board

STATE OF WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY
Olympia Washington 98504 206/753 2800
Mail Stop PV-11

November 14, 1978

Mr. Mike Mills
Office of Financial Management
House Office Building (AL-01)
Olympia, Washington 98501

Dear Mike:

Thank you for the opportunity to review a copy of the draft environmental impact statement prepared jointly by the Department of State and the Environmental Protection Agency on "Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention."

I am attaching a memorandum from a member of our Hazardous Waste Section in which he offers some very cogent comments for inclusion in your review letter to the Department of State.

Should you have questions, please contact me at 753-6890.

Yours very truly,

Peter R. Haskin
Environmental Review Section

PRH bjw

Attachment

STATE OF WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY
Olympia Washington 98504 206/753 2800

MEMORANDUM

November 13, 1978

TO Mike Mills
Office of Fiscal Management

THRU Pete Haskin

FROM Jim Knudson JK
Hazardous Waste Section

SUBJECT Review of Draft Environmental Impact Statement for the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention

---

This E I S covers the establishment of international regulations and guidelines for the incineration of highly toxic, persistent organic wastes at sea These would be developed under the 1972 Ocean Dumping Convention

The Department of Ecology has developed regulations that designate halogenated organic wastes as extremely hazardous waste under WAC 173-302. This is because such wastes are persistent, tend to bio-accumulate in living organisms and may be chronically and acutely toxic to wildlife and humans These wastes will by law have to (1) be shipped to the Hanford Reservation, or (2) detoxified or (3) shipped out-of-state

Because the incineration at sea would accomplish (2) and (3) above, our main comment is to strongly support the concept of incineration as opposed to land disposal and long term care It should be pointed out that the Hanford Reservation could serve as a storage and collection center for such wastes prior to seaport delivery and at-sea incineration Our proximity to Canadian waters and shipping lanes is reason enough to recommend the chosen alternative of international regulation and guidelines

One other minor comment

The discussion about controlling the emissions of the incinerator by a sea water or alkaline scrubber should be discussed A scrubber would remove hydrochloric acid and some metal oxide particulates depending upon scrubber design; dispersion of the resulting effluent would be quick given the vast quantities of ocean water This would avoid having to dispose of any ash in land-based facilities

JK drs

November 29, 1978

Mr William H Mansfield
Office of Environmental Affairs
Department of State
Washington, D C 20520

Dear Mr Mansfield

Review of the draft environmental impact statement for Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention has been completed by agencies of the State of Washington The review was coordinated by the Office of Financial Management, as the designated State clearinghouse

Comments were received from the Department of Ecology The Department strongly supports the concept of incineration as opposed to land disposal and long term care It should be pointed out that the Hanford Reservation could serve as a storage and collection center for such wastes prior to seaport delivery and at-sea incineration The Department cites Washington's proximity to Canadian waters and shipping lanes as reason enough to support the chosen alternative of international regulation and guidelines We understand that the Department of State will respond directly to the Department of Ecology's comments

Thank you for the opportunity to review the document We hope you find the comments useful in preparing the final statement

Sincerely,

T A Mahar

Thomas A Mahar
Assistant Director

TAM db

Enclosure

MANUFACTURING CHEMISTS ASSOCIATION

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December 14, 1978

Mr. William Mansfield, III
Office of Environmental Affairs
Room 7820
Department of State
Washington, D. C. 20520

Dear Mr. Mansfield:

In response to your request, we have reviewed the "Draft Environmental Impact Statement for the Incineration of Wastes at Sea Under the 1972 Ocean Dumping Convention," October 1978. We support the proposed federal action to negotiate and adopt amendments to the ocean dumping convention so as to establish international regulations and guidelines for incineration of wastes at sea.

The Manufacturing Chemists Association is a nonprofit trade association having 192 United States company members representing more than 90 percent of the production capacity of basic industrial chemicals within this country. Its member companies operate about 1,500 plants in nearly every state.

We have followed closely the experimental incineration of liquid organohalogens, using ships fitted for trial burns. Even though those ships were not specifically designed for the difficult task, results show incineration at sea to be a promising waste disposal method that should be encouraged and supported in ways that would make it more readily accessible to a broad spectrum of waste generators.

Sincerely,

C A Gosline

C. A. Gosline
Secretary, Environmental
Management Committee

CAG/cmc

THE WRITER'S DIRECT DIAL NUMBER IS (202) 328-4244

APPENDIX F

DEPARTMENT OF STATE AND EPA

RESPONSES TO COMMENTS ON THE DEIS

1. Corrections made

2 Corrections and suggested change made in text

3 Correction made

4 See revised text, Chapter I, section B 2.

5 Corrections made

6 See revised text, Chapter III, section B

7 Corrections and suggested changes made in revised text, Chapter IV, section B 1.

8 Corrections and suggested changes made in revised test, Chapter IV, section B. 3

9 See revised text, Chapter IV, section B 4

10 Suggested change made During preparation of site specific EISs, more detailed description of the marine environment will be included within the documents

11. Corrections and suggested changes made in text.

12. Text has been revised to "air feed rate "

13 All corrections noted in comments 13-16 are made in text

14 Correction has been made to change D. 2(a) to C. 2(a).

15 See additions to text, Chapter V, section D

16 At this time there is insufficient data to project long-term impacts, further monitoring and research will be undertaken if incineration at sea is carried out more routinely in the U S A study conducted in 1977 showed a slight change in the activity of P-450 enzymes, however, the effects were only temporary.

17 Both conditions were considered in the Gulf incineration site selection The Atlantic incineration site EIS has not been completed, these conditions will be considered in its preparation

18. During preparation of EISs for designation of specific sites, these documents will be considered.

19 This conclusion is correct and procedures for determining "trace contaminants" and concentrations of substances which are "rapidly rendered harmless" are currently being developed by the Contracting Parties to the Convention. With respect to inorganic substances the U S. will apply the same criteria that is used to evaluate a waste for direct ocean dumping to evaluate waste which may be incinerated at sea.

20 The regulations specify the most important provision for ensuring proper control of incineration at sea operations and the technical guidelines include other desirable provisions which are of interest from the standpoint of design and operation of the incinerator For example, if the incinerator complies with the combustion efficiency there is no need to provide additional monitoring equipment to measure excess oxygen. Residence time is primarily for design purposes and is not an important parameter if all the provisions in the regulations have been met The U. S and Canada have submitted suggestions to the Secretariat which would revise the technical guidelines shown in Appendix B of this FEIS. The suggested revisions state that the Contracting Parties "shall take full account ."

21 This analysis is incorrect since a Contracting Party must still comply with the terms of the Convention for such wastes and paragraphs 8 and 9 of Annex I are applicable (see revised text, Chapter I, section A) Also the provisions of Regulation 2(4) require the Contracting Party to take full account of all applicable provisions of the regulations and the technical guidelines when considering incineration of such waste at sea.

22 The bracketed provision was adopted in the regulations and is identical to the wording contained in Annex II, paragraph A of the Convention

23 This is true, however, the Convention does not apply to land-based operations such as ocean outfalls and incinerators Since this is beyond the scope of the Convention these concerns would need to be addressed under other conventions and national legislation.

24. This requirement is addressed under other laws and conventions, but could be included in the technical guidelines.

25. The FEIS has been revised to clarify these points, see text at Chapter I, section A and Chapter III, section A.

26 See response #16

27. See response #16

28 The amount of waste transported for incineration at sea is quite small and there have been no reported spills or accidents associated with incineration at sea. IMCO is currently evaluating design and construction requirements for ocean dumping vessels and incineration vessels Until this study is completed the present IMCO chemical code will be applicable

29 A discussion explaining why scrubbers are not used for at-sea incineration has been included in the FEIS at Chapter VI, section B 1

30. Incineration at sea is currently carried out with no international controls, therefore, to fail to adopt the requirement would not result in less incineration at sea. Also, the adopted Resolution and regulations do provide for and encourage technological improvement in disposal of such waste (see revised text at Chapter I, section A)

31. See response #29

32 The volume of waste suitable for chlorolysis is quite small compared to that which may need to be destroyed on land or at sea There is no simple solution for disposal or reprocessing of industrial waste and consideration must be given to reprocessing as well as thermal destruction.

33 The answer is no. Additional EISs will be prepared on specific sites for incineration at sea.

34 See response #33

35 The present EPA Ocean Dumping Regulations and Criteria require that such considerations be given in site selection

36. The main constituents of the waste were trichloropropane and dichloropropene

37. Correction made

38. Text revised, see Chapter VI, section E. 2

39. The mandatory regulations adopted at the Third Consultative Meeting are a revision of those that were presented in the Draft EIS. The concerns noted in this comment are covered by the adopted regulations, the text of the Final EIS is revised accordingly.

40. See comment #39

41. Correction made

42. Text revised as suggested, see Chapter V, section H

43. Text revised as suggested, see Chapter VI, section A.

44. Text revised as suggested, see Chapter VIII, section C.

45 See comment #39

46 See comment #39

47 The draft technical guidelines were not acted upon as noted in the revised text (Chapter I). This comment will be taken into consideration when preparing further revisions to the guidelines

48. The activity of some enzyme systems may be either increased or decreased by the presence of certain toxic materials within an organism The P-450 system activity is increased by the presence of certain toxic organic materials, this process is reversible at low concentrations of toxicants, and no permanent change in the P-450 system or adverse toxicological effects would be expected at low concentrations

49 The U S has ocean dumping regulations dealing with site selection which will take into consideration the nature of toxic wastes This will also be emphasized in the U.S. regulations for incineration at sea

50. Section 222 3 of the Ocean Dumping Regulations and Criteria provides for publication and review of the notice of tentative determination regarding the issuance or denial of a permit application; Section 228 4-228 6 provides criteria for site selection, including preparation of an environmental impact statement to be made available for public comment

We agree with the concerns expressed over the risk of accidental discharge of certain wastes prior to incineration. All possible precautions will be taken to avoid spillage of hazardous wastes during all phases of each incineration project.

51 The U S will apply the same criteria to evaluate wastes for at-sea incineration as is applied under the Ocean Dumping Regulations and Criteria to evaluate wastes for direct ocean dumping

52 Consideration of possible effects on marine life must be taken into consideration in site selection These and other requirements are adequately covered under Annex III to the Convention

53 The treatment of containers is a matter for each Contracting Party to determine under its domestic regulations Any disposal of washings from containers would be regulated as an operational discharge under the 1973 MARPOL Convention Dumping of containers at sea would be subject to the provisions of Annexes I, II, and III of the London Dumping Convention, any disposal on land would be subject to the domestic regulations of the State where the disposal occurs.

54 In previous tests it has not been demonstrated that residues result from at-sea incineration. However, since these regulations are international and apply to various countries, any residue from other wastes incinerated in the future would be subject to land disposal regulatons of the country conducting the incineration at sea

55 All coastal states' programs will be taken into account in considering permits for incineration at sea. The states will have an opportunity for review as explained in response #50.

56 There are land transportation risks, regulatory and other problems associated with land based and all hazardous waste disposal methods These regulatons are not intended to promote incineration at sea, but to regulate and consider this along with other methods of waste disposal and recovery.

57 Each part of the marine environment has its own special characteristics The EPA site selection criteria enumerate eleven different site characteristics to be considered in designating ocean dumping sites (including ocean incineration sites) As discussed in Chapter VI the EIS points out that there are site specific factors which are to be considered on a case-by-case basis. Since ocean incineration sites will always be in the open ocean far from land, a detailed discussion of the differences between various parts of the marine environment would not be pertinent to the purpose of this EIS

58. This point is discussed in part in Chapter VI Additional research is continuing.

59 There are international and domestic regulations dealing with these issues, see Chapter III, section B and Chapter VIII, section C.

60 A discussion explaining why scrubbers are not used for at-sea incineration has been included in the Final EIS at Chapter VI section B 1 In selecting sites for incineration at sea consideration is given to commerical fishing activities and in the U S. the sites will be outside any commerical fishing area

61 A discussion of why scrubbers are not used for at-sea incineration has been included in the Final EIS at Chapter VI B.1 U S. experience with incineration of liquid organochlorine waste indicates that there will be no residual ash requiring disposal