ANNEX 2

RESOLUTION LDC.17(8)

GUIDANCE FOR THE APPLICATION OF ANNEX III

THE EIGHTH CONSULTATIVE MEETING,

RECALLING Article 1 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,

NOTING the discussion which took place within the Scientific Group on Dumping on the need for Contracting Parties, when establishing criteria governing the issue of permits for the dumping of matter at sea, to be guided in their application of the provisions of Annex III to the Convention,

HAVING CONSIDERED the draft Guidelines for the Application of Annex III to the Convention prepared by the Scientific Group on Dumping,

NOTING that, subject to Articles IV(2) and VI(3) of the Convention, the factors listed in Annex III may not be relevant to all materials to be dumped and thus, in certain cases such as with some clean dredged material, not all of the factors and corresponding interpretations may be applicable,

1 ADOPTS the Guidelines for the Application of Annex III to the Convention as set out at Annex,

2 RESOLVES that Contracting Parties to the Convention shall take full account of the Guidelines for the Application of Annex III in considering the factors set forth in that Annex prior to the issue of any permit for the dumping of matter at sea,

3 RECOMMENDS that in the application of those guidelines referring to the characteristics of dumping site and method of deposit the content and conclusions of the GESAMP Reports and Studies No.16 on Scientific Criteria for the Selection of Waste Disposal Sites should be taken into account.

ANNEX

GUIDELINES FOR THE APPLICATION
OF ANNEX III* TO THE LONDON
DUMPING CONVENTION

Article IV(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.
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:

Interpretation:

Each authority or authorities designated in accordance with Article VI for the issue of general and special permits for the disposal of wastes and other matter at sea shall, when considering a permit application, carefully study all the factors set out in Annex III. This includes the establishment of procedures and criteria for:

1 deciding whether an application for sea disposal should be pursued in the light of the availability of land-based disposal or treatment methods;

2 selecting a sea disposal site, including the choice and collection of relevant scientific data to assess the potential hazards to human health, harm to living resources and marine life, damage to amenities or interference with other legitimate uses of the sea;

3 choosing appropriate disposal methods and conditions;

4 developing an appropriate monitoring programme.

The above mentioned criteria should enable permit applications to be effectively assessed and likely environmental hazards to be evaluated.

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* For the disposal at sea of radioactive wastes additional requirements recommended by the IAEA have to be taken into account (INFCIRC/205/Add.1/Rev.1). For the control of incineration of wastes at sea specific site selection criteria have been established (Regulation 8 of Addendum to Annex I).

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).

Interpretation:

In order to assess environmental transport and fate, including potential effects on water quality and biota, the total amount of wastes proposed to be dumped within a time period, and the physical, chemical and biological composition of the waste should be known. The first step for the characterization of a waste or other matter proposed for dumping at a site should be the collection of existing data on the waste composition or a waste analysis.

This should not mean that every waste should be subjected to exhaustive chemical analysis to establish the concentrations of a standard wide-ranging list of chemical elements or compounds. Knowledge of the raw materials and production processes used may often provide a key to the probable composition of the waste. A selective analysis may then be sufficient for a preliminary assessment. As a minimum, it should be established whether any Annex I or Annex II materials are present.

The analysis should include appropriate measurements of the composition of major components. In cases where anthropogenic chemicals of high toxicity are known or suspected to be involved, those minor components which are reasonably identifiable should be measured.

In addition data should, as appropriate, be obtained on physical, chemical and biological properties of the waste or other matter, such as:

- Solubility
- Percent solids
- Density (specific gravity) of bulk matter, its liquid and particle phases
- Grain size fractions of total solid phase (e.g. clay-silt/sand-gravel fractions of dredged material)
- pH
- Biochemical oxygen demand (BOD)
- Chemical oxygen demand (COD)
- Nutrients
- Microbiological components.

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4 Toxicity.

5 Persistence: physical, chemical and biological.

6 Accumulation and biotransformation in biological materials or sediments.

Interpretation:

If the chemical analysis of the wastes shows the presence of substances whose biological effects are not well known, or if there is any doubt as to the exact composition or properties of the waste, it may be necessary to carry out suitable test procedures for toxicity, persistence and bioaccumulation, which may include the following:

1 acute toxicity tests on phytoplankton, crustaceans or molluscs, fish, or other such organisms as may be appropriate;

2 chronic toxicity tests capable of evaluating long-term sublethal effects, such as bioassays covering an entire life cycle;

3 tests to determine the potential for bioaccumulation of the substances contained in the waste and, if appropriate, the potential for eventual elimination. The test organisms should be those most likely to bioaccumulate the substances concerned; and

4 tests for determining the persistence of substances contained in the waste. The potential for degradability of these substances should be determined using bacteria and water typical of the proposed dumping site. The tests should attempt to reflect the conditions at the proposed dumping site.

If appropriate, the test procedures described above should be carried out separately with the solid, suspended and/or liquid phases of wastes proposed for sea disposal.

A number of substances, when entering the marine environment, are known to be altered by biological processes to more toxic substances. This should be taken into particular account when the various tests mentioned above are performed.

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7 Susceptibility to physical, chemical and biochemical changes and interaction in the aquatic environment with other dissolved organic and inorganic materials

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Interpretation:

Substances introduced into the sea may be rapidly rendered harmless by physical, chemical and biochemical processes but others may be changed to products with more hazardous properties than those of the original substances. In these latter cases, it may be appropriate to carry out the tests outlined in paragraph A6 above with the anticipated products.

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8 Probability of production of taints or other changes reducing marketability of resources (fish, shellfish, etc.)

Interpretation:

In evaluating the possible effects of the waste concerned on marine biota, particular attention should be paid to those substances which are known to accumulate in marine organisms with the result that seafood is tainted and rendered unpalatable. In many cases there might be a suspicion about the tainting property of a substance without the availability of firm data. In these cases a taste panel will have to determine threshold limits, if any, of the tainting properties of the substance concerned.

"Other changes reducing the marketability of resources" referred to in paragraph 8 of Section A include discolouration of fish flesh, and fish diseases such as fin rot and tumours.

B - CHARACTERISTICS OF DUMPING SITE AND METHOD OF DEPOSIT

Matters relating to dump site selection criteria are addressed in greater detail in a study prepared by GESAMP* (Reports and Studies No.16: Scientific Criteria for the Selection of Waste Disposal Sites at Sea, IMO 1982) which should be considered in conjunction with these guidelines.

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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).

Interpretation:

Basic site characterization information to be considered by national authorities at a very early stage of assessment of a new site should include the co-ordinates of the dumping area (latitude, longitude), as well as its location with regard to:

- distance to nearest coastline
- recreational areas
- spawning and nursery areas
- known migration routes of fish or marine mammals
- sport and commercial fishing areas
- areas of natural beauty or significant cultural or historical importance
- areas of special scientific or biological importance (marine sanctuaries)
- shipping lanes
- military exclusion zones
- engineering uses of seafloor (e.g. potential or ongoing seabed mining, undersea cables, desalination or energy conversion sites).

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* IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution.

2 Rate of disposal per specific period (e.g. quantity per day, per week, per month).

Interpretation:

Although the amounts of matter to be dumped (e.g. per year) are considered under paragraph A1 above, many operations, e.g. those related to dredging, are of shorter periods. In order to assess the capacity of the area for receiving a given type of material the anticipated loading rates (e.g. per day) or in the case of existing sites, the actual loading rates (frequency of operations and quantities of wastes or other matter disposed of at each operation per time period) should be taken into consideration.

3 Methods of packaging and containment, if any.

4 Initial dilution achieved by proposed method of release.

Interpretation:

The data to be considered under this item should include information on:

- type, size and form of packaging and containment units
- presence of any Annex I or Annex II substances as packaging material or in any matrix that might be used
- marking and labelling of packages
- disposal method (e.g. jettisoning over ship's side; discharge of liquids and sludges through pipes, pumping rates, number and location of discharge pipe outlets (under or above waterline, water depth), etc.). In this connexion the length and speed of the vessel when discharging wastes or other matter should be used to establish the initial dilution.

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).

Interpretation:

For the evaluation of dispersal characteristics data should be obtained on the following:

- water depths (maximum, minimum, mean)
- water stratification in various seasons and weather conditions (depth and seasonal variation of pycnocline)
- tidal period, orientation of tidal ellipse, velocities of minor and major axis
- mean surface drift (net): direction, velocity
- mean bottom drift (net): direction, velocity
- storm (wave) induced bottom currents (velocities)
- wind and wave characteristics, average number of storm days per year
- concentration and composition of suspended solids.

Where the chemical composition of the waste warrants, it may be appropriate to evaluate pH, suspended solids, persistent organic chemicals, metals, nutrients and microbiological components. BOD and COD or organic carbon determinations in the suspended or dissolved phase, together with oxygen measurements, may also be appropriate where organic wastes or nutrients are concerned.

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

Interpretation:

Maps and bathymetric charts should be consulted and specific topographic features which may affect the dispersal of wastes (e.g. marine canyons) should be identified.

The geochemical observations of sediments in and around the disposal site should be related to the type of waste(s) involved. The range of chemical constituents should be the same as that provided for the characterization of the waste or other matter, with the minimum range of data set out in paragraph A1 above.

In areas where wastes may reach the bottom, sediment structure (i.e. the distribution of gravel, sand, silt and clay) as well as benthic and epibenthic community characteristics should be considered for the site area.

Mobility of sediments due to waves, tides or other currents should be considered in any waste disposal site assessments. The possibility of seismic activities in the area under consideration should be investigated, in particular when hazardous wastes in packaged form are concerned. The distribution of sediment types in an area provides basic information as to whether dumped solids with certain characteristics will accumulate at a site or be dispersed.

Sorption/desorption processes under the range of dump site redox and pH conditions, with particular reference to exchanges between dissolved and fine particulate phases, are relevant to the evaluation of the accumulative properties of the area for the components of the waste proposed for dumping and for their potential release to overlying waters.

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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).

Interpretation:

The basic assessment to be carried out of a site, either a new or an existing one, shall include the consideration of possible effects that might arise by the increase of certain waste constituents or by interaction (e.g. synergystic effects) with other substances introduced in the area, either by other dumpings or by river input and discharges from coastal areas, by exploitation areas, and maritime transport as well as through the atmosphere. The existing stress on biological communities as a result of such activities should be evaluated before any new or additional disposal operations are

established. The possible future uses of the sea area should be kept under consideration.

Information from baseline and monitoring studies at already established dumping sites will be important in this evaluation of any new dumping activity at the same site or nearby.

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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.

Interpretation:

When a given location is first under consideration as a candidate disposal site, the existing data basis should be evaluated with a view to establishing whether the main characteristics are known in sufficient detail or accurately enough for reliable modelling of waste effects. Many parameters are so variable in space and time that a comprehensive series of observation have to be designed to quantify the key properties of an area over the various seasons.

If at any time, monitoring studies demonstrate that existing disposal sites do not satisfy these criteria, alternative disposal sites or methods should be considered.

C - GENERAL CONSIDERATIONS AND CONDITIONS

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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.

Interpretation:

Particular attention should be given to those waste constituents which float on the surface or which, in reaction with sea water may lead to floating substances and which, because they are confined to a two-dimensional rather than a three-dimensional medium, disperse very slowly. The possibility of reaccumulation of such substances caused by the presence of surface

convergences which may lead to interferences with amenities as well as with fisheries and shipping should be investigated.

Information on the nature and extent of commercial and recreational fishery resources and activities should be gathered.

Body burdens of persistent toxic substances (and, in the case of shellfish, pathogens) in selected marine life and, in particular, commercial food species from the dumping area should be established.

Certain grounds although not in use for fishing may be important to fish stocks as spawning, nursery or feeding areas, and the effects of sea disposal on these grounds should be considered.

The effects which waste disposal in certain areas could have on the habitats of rare, vulnerable or endangered species should be recognized.

Besides toxicological and bioaccumulation effects of waste constituents other potential impacts on marine life, such as nutrient enrichment, oxygen depletion, turbidity, modification of the sediment composition and blanketing of the sea floor, should be addressed.

It should also be taken into account that disposal at sea of certain substances may disrupt the physiological processes used by fish for detection and may mask natural characteristics of sea water or tributary streams, thus confusing migratory species which consequently lose their direction, go unspawned or fail to find food.

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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).

Interpretation:

Consideration of possible effects on the uses of the sea as outlined in paragraph C3 should include interferences with fishing, such as the damaging or fouling of fishing gear. Any possibility of excluding the future uses of the sea dumping area for other resources, such as water use for industrial purposes, navigation, erection of structures, mining, etc., should be taken fully into account.

Areas of special importance include those of interest for scientific research or conservation areas and distinctive habitats of limited distribution (such as seabird rookeries, kelp beds or coral reefs); information should also be provided on all distinctive habitats in the vicinity of the proposed site which might be affected by the material to be dumped. Attention should also be given to geological and physiographical formations of outstanding universal value from the point of view of science, conservation or natural beauty.

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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.

Interpretation:

Before considering the dumping of matter at sea every effort should be made to determine the practical availability, including technical feasibility and environmental soundness, of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the matter less harmful for dumping at sea.

Other means of disposal should be considered in the light of a comparative assessment of:

- Human health risks
- Environmental costs
- Hazards (including accidents) associated with treatment, packaging, transport and disposal
- Economics (including energy costs)
- Exclusion of future uses of disposal areas,

for both sea disposal and the alternatives.

If the foregoing analysis shows the land alternative to be more practical, a licence for sea disposal should not be given.

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