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(56) Documents cited  
**GB A 2129190** **GB A 2003310**  
**GB A 2004681**

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(54) **Disposal of radioactive waste material**

(57) A method of disposal of radioactive waste consists in disposing the waste in trenches dredged in the sea bed beneath shallow coastal waters. Advantageously selection of the sites for the trenches is governed by the ability of the trenches naturally to fill with silt after disposal. Furthermore, this natural filling can be supplemented by physical filling of the trenches with a blend of absorber for radionuclides and natural boulders.

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## SPECIFICATION

**Disposal of radioactive waste material**

5 This invention relates to the disposal of radioactive waste material. It has become conventional in nuclear waste literature to refer to solid wastes suitable for simple burial under a soil cover as low-level waste (LLW). Heat-generating or high level  
10 wastes (HLW) arise from highly active fuel reprocessing liquors. Intermediate level wastes (ILW) are solids between these categories. It is with the latter class, the ILW, with which the present invention is concerned.

15 A commonly used method of waste disposal is dumping on the sea bed of the deep oceans. However, precautions to ensure that such dumping is safe and reliable are difficult and costly to effect. Moreover, international criteria at present constrain  
20 the amount of activity disposed to the ocean and are likely to become more constraining still.

There is therefore a need for a less costly and less difficult method of disposal than dumping in the deep oceans, particularly where intermediate level  
25 wastes are concerned.

According to the invention, a method of disposal of radioactive waste consists in disposing the waste in trenches dredged in the sea bed beneath shallow coastal waters.

30 Advantages of such a system of disposal are as follows:

1. a disposal position in the stagnant saline ground water environment under the sea bed is accessed within an acceptable distance from land as to permit  
35 sea bed dredging;

2. such activity migration as may eventually occur after long periods of time will be to sea and thereby will have a much lower environmental impact than in a corresponding potable groundwater situation;

40 3. the technical problems of dredging the sea bed in shallow water are much less than the corresponding requirements of emplacement under the bed of the deep ocean (the difficulties of excavation, emplacement, inspection and monitoring etc make the  
45 latter method of disposal very difficult to establish as a feasible engineering operation);

4. Regulatory constraints applicable to ocean disposal concerning concentrations and total quantities of activity are avoided and

50 5. it is particularly advantageous in many instances to be able to effect disposal direct from the site where the wastes arise, thus avoiding transfers through the public sector.

The silts present on the sea bed themselves have, in sufficient thickness, a barrier effect against migration of radionuclides. Therefore, if the sites of  
55 trenches in coastal waters are made where a natural filling in by silt will occur, a natural barrier will develop. This might with advantage, be improved in stability and nuclide sorption properties by using a  
60 suitable blend of high efficiency absorber and natural boulders.

Suitable absorbers for saline environments are set forth in the following publications, to which reference is directed:-  
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1977-09-14. Brush L H. "Prediction of radionuclide migration rates for a sub-sea bed repository" CONF-811122-37; and Murray, C N and Stanner, D A. "Developments of an assessment methodology for the disposal of high-level radioactive waste into deep ocean sediment", Radioactive Waste Management Volume 2 (3) March 1982, pps 239-293.

70 Particularly attractive applications of the described sea bed dredging scheme are in the disposal of large items of wastes derived from the decommissioning of nuclear facilities; cutting up into sections then packaging for transport through the public sector is thereby avoided.

## 80 CLAIMS

1. A method of disposal of radioactive waste consisting in disposing the waste in trenches dredged in the sea bed beneath shallow coastal waters.

85 2. A method according to claim 1, wherein sites for the trenches are selected where a natural filling of the trenches by silt after disposal of the waste therein, will occur.

90 3. A method according to claim 2, wherein the natural filling is supplemented by the step of filling with a blend of absorber for radionuclides, for example silt and natural boulders.

95 4. A method of disposal of radioactive waste, substantially as hereinbefore described.