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AD HOC COMMITTEE TO STUDY THE PEACEFUL
USES OF THE SEA-BED AND THE OCEAN FLOOR
BEYOND THE LIMITS OF NATIONAL JURISDICTION

EFFECT OF THE EXPLOITATION OF MINERAL RESOURCES
ON THE SUPERJACENT WATERS AND ON OTHER USES OF
THE MARINE ENVIRONMENT

Note by the Secretariat

1. The effect of mineral exploitation on the superjacent waters and on the marine environment cannot at present be assessed with certainty and a careful and comprehensive study would be necessary to obtain adequate information. Such a study would have to consider, inter alia, the possible effects (a) of operations related to the exploration and evaluation of mineral deposits, and (b) of those related to the mining operations.
2. Concerning the operations relating to the exploration and evaluation of mineral deposits, one may note, for example, that search for economic mineral deposits often requires the use of explosives for geophysical prospecting. Experience has shown however that interference with fisheries can be minimized through the adoption of appropriate regulations governing the use of such explosives. A good example is the Norwegian decree on "Regulations relating to safe practice, etc. in exploration for the exploitation of petroleum resources of the sea-bed and its subsoil" which has been presented to the Ad hoc Committee in document A/AC.135/1/Add.1. In its section 10 of chapter II, this decree sets out the rules to be observed in using explosives.
3. In addition, the transport of drilling rigs, dredges, platforms, or other devices to the location of deposits might also cause interference with other uses of the sea, and their installation at the chosen place entails a number of difficulties. Some of the operations of these devices are already covered by international conventions on the Rules of the Road at Sea. Others are under consideration and study by the Intergovernmental Maritime Consultative Organization.

4. Actual exploitation might well involve additional interference. For example, in the recovery of minerals from the sea-bed and ocean floor and its subsoil by dredging, problems of interference with cables may in one respect be more acute than is the case with fisheries, since fishing trawls are generally dragged over the bottom whereas dredging will involve penetration into the subsoil.
5. Moreover, it is unlikely that the proprietors of present submarine cables know their precise locations on the sea-bed beyond the limits of national jurisdiction. Errors of up to one nautical mile in fixing their position could be common, whereas, as pointed out on p.41 of document E/4449/Add.1, a precision of 100 feet or less is desirable in marine mineral surveys in detailed work, and reduction to a few feet may be necessary in the delineation of a deposit. If mineral recovery operations are to be carried out in the vicinity of submarine cables, some means of locating them more precisely and ways of protecting them from interference must be found.
6. One aspect requiring special attention is that of interference between adjacent or nearby mining claims. If dumped at the surface, the tailings from a mineral recovery operation will not usually sink vertically to the sea-bed. Before reaching the ocean floor, they will instead be carried some distance laterally, where they may bury minerals not yet exploited, impede exploration activities, or interfere with the exploitation of deposits which have been discovered earlier. In general, the largest and heaviest particles will sink fastest and most nearly vertically, while the finer material will sink more slowly and hence be carried farther horizontally. By means of laboratory studies, considerable information is already available on the sinking rates of sedimentary particles, but the characteristics of subsurface currents in the open sea are still barely understood. Much more information than presently available is required before the full effects of sea-bed mining operations can be assessed.
7. With regard to the effects on the superjacent waters of extraction of minerals from the sea floor, it should be noted that the minerals to be recovered, and their impurities, are either authigenic or clastic deposits. Even if beneficiation or concentration is carried out at sea and the tailings returned to the ocean, no deleterious effects from the standpoints of sanitation or pollution are necessarily anticipated. There is of course the problem of burial

of sedentary organisms of possible economic value through the dumping of mine tailings, just as there is the problem of possible destruction of immature populations of such creatures through mineral dredging operations.

8. If, however, chemicals are used for beneficiating minerals at sea, an important pollution hazard might arise. Another pollution possibility is hydrogen sulphide, a poisonous compound produced in buried marine sediments through natural processes, which could be released during mining operations. An operation recovering 10,000 tons per day of subfloor material might conceivably release 0.1 ton per day of hydrogen sulphide into the surface layers, inasmuch as hydrogen sulphide concentrations of 10 parts per million have been observed in certain sediments. However, it is quite possible that the vast capacity of the sea for absorbing most inorganic chemicals would render even this quantity of sulphide harmless in short order, as it would very quickly be oxidized to sulphate which is fairly abundant naturally in sea water.
