## ABSTRACT

An Evaluation of the Status of Oil Pollution
in the Jamaican Coastal Environment

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This study was carried out in order to evaluate the state of petroleum hydrocarbon contamination in Jamaica's coastal environment. This was done by the analysis of various parameters which assessed the occurrence and levels of different forms of petroleum hydrocarbon residues. These were the analysis of the occurrence and levels of slicks/sheens; dissolved/dispersed petroleum hydrocarbons in the water column (DDPH); pelagic tar balls; stranded beach tar; residues accumulated in biota and sediments. The analytical methods used were carried out according to CARIPOL specifications.

Residues were collected from twenty-nine on-shore beach stations, two off-shore beach stations, six sea stations and four biota culture sites. Monthly visits were made to the on-shore beach stations for analysis of beach tar, while quarterly visits were made to sea stations for the analysis of DDPH and pelagic tar over the period December 1987 to February 1989. The biota

used in this study was the mangrove oyster Crassostrea rhizophorae which was cultured specifically for this project to ensure the analysis of the same species of organism, with the same age and history, at each sampling period. C. rhizophorae was collected twice at three month intervals, and was cultured over the period September 1988 to February 1989. Sediment samples were collected once, in October 1988.

Eleven slicks/sheens were observed or publicly reported over the 15 month period. DDPH was detected in 100% of the samples with concentrations ranging from 0.59-34.60 $\mu g\ l^{-1}$ in Negril and Kingston Harbour, respectively. Pelagic tar levels ranged from 0 mg $m^2$ in 85.7% of the samples to 109.9 mg $m^2$ at Barnawell. Beach tar was the most prevalent and persistent form of petroleum hydrocarbon contamination in Jamaica's coastal environment. A very clear pattern was seen in the islandwide distribution of this parameter. The east coast and Kingston Harbour Area are subjected to constant relatively large amounts of fresh tar; the north coast had the highest level of tar but appeared to have been impacted by a particular incident about two years ago; the west coast is virtually clean and the south coast (with the exception of the Kingston harbour area) showed no evidence of stranded beach tar

pollution at any time over the period.

All biota samples analysed indicated the presence of petroleum hydrocarbon residues. The levels in biota followed a similar trend to the water column levels. The levels ranged from 1.19 $\mu g\ g^{-1}$ at Discovery Bay to 74.09 $\mu g\ g^{-1}$ at Barnswell, while further analysis indicated that levels accumulated by C. rhizophorae increase with increasing water column contamination (DDPH) and the oysters show a preference for the accumulation of aromatic compounds.