

Site Investigation | Risk Assessment

Escape of Oil From Pulrose Power Station – Isle of Man

Introduction

Approximately 50,000 litres of heavy fuel oil were lost during this oil spill, which coincided with a period of exceptionally heavy rain and flooding. Oil had impacted flooded land, culverts, the River Douglas and Douglas Harbour. A Joint Response Committee was established by the Isle of Man Government, including representatives from Ecologia Environmental Solutions Ltd, The Department of Local Government and Environment, The Department of Agriculture, the Port Authority and the Department of Transport. Ecologia were appointed by insurers to advise the JRC and to assess the environmental liabilities.

Environmental Surveys And Risk Assessments

The key objectives of the environmental assessment were:

Quantification of the extent and severity of contamination present in the impacted areas
Ecological assessment and determination of the level of biotoxicity resulting from the oil spill

Quantitative Risk Assessments to define the need for remedial action or further assessment

Differentiate between contamination resulting from the oil leak and from historical contamination

The oil spill had impacted a wide area covering a range of environmental / ecological habitats. In order to simplify the environmental assessment, the entire affected area was divided into nine discrete geographical zones. Environmental sampling was undertaken in three stages, over a period of 6 months. Several hundred soil, sediment and water samples were collected, with spacial mapping assisted by use of Geographic Information Systems (GIS) and Global positioning Systems (GPS).

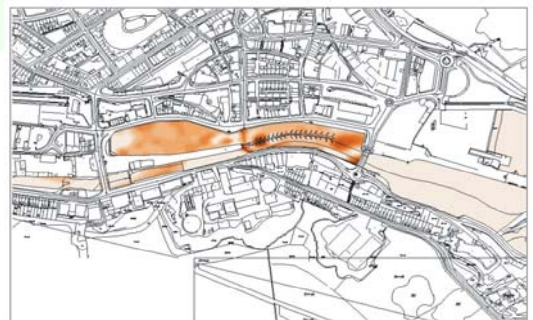
Initial assessments focused on soil and sediments upgradient of the River Douglas. A Quantitative Risk Assessment was carried out using recognised UK methodologies set against three different legislative standards for determining clean up targets. On the basis of this risk assessment, remedial operations were recommended over a limited area to prevent further impact on the downstream ecosystems.

The second stage of assessment focussed on the River Douglas and inner & outer Douglas Harbours. Successful evaluation required information of the nature, concentration and extension of the pollution, as well as site-specific variables that could impact the aquatic environment. A triad approach was adopted to assess the environmental impact of contaminants on sediment quality:

- Measurement of contaminant concentrations using analytical laboratory procedures.
- Measurement of toxicity and bioavailability via sediment toxicity testing.
- Assessment of the resident biota via community bio-assessment / survey procedures.

Each of these components was analysed and interpreted in relation to each other in order to provide comprehensive information for an overall assessment of the impacted site.

Ecologia conducted an extensive search of international legislation related to sediment quality, as neither the Isle of Man nor the UK have sediment quality guidelines in place that provide for a thorough assessment of the impact of a leak of this type on marine or freshwater sediments



Outputs

The overall conclusion from this study was that the river and harbours had suffered little long-term impact from the Pulrose oil spill. Quantitative assessments demonstrated that expensive remedial works were not required.

Hydrocarbon profiling demonstrated that the majority of contamination in the harbour sediments was due to inputs from terrestrial organic matter and pyrolytic (combustion) sources, rather than a petrogenic source.

No toxicity was demonstrated in any of the river or harbour sediment samples tested. These samples included the most heavily contaminated samples from the River Douglas and Douglas Harbour.