Section 12 Sediment, Dredging and Disposal

Guiding Principle

To work towards a better understanding of the process of sedimentation and to maintain deep water access in the estuary while causing minimum environmental impact

Each year a significant volume of sediment has to be dredged from the estuary to maintain the deep water channel. As in most estuaries there are two main potential sediment sources; sand from offshore areas being washed into the estuary or sediment being transported by the rivers draining into the estuary from the land.

12.1 Work towards reducing sediment input into the estuary

Siltation is a process occurring naturally in any river. The amount of siltation that occurs at any one time is related to the geology of the landscape and the oceanographic regime.

A rapid rise in sea level following the last glaciation 10,000 years ago drowned the river valley to form the steep sided narrow Fowey Estuary. Natural sediment supply rates were low, but human activity in the medieval period had a dramatic effect. Working the river sediments on Bodmin Moor for the mineral cassiterite, the source of tin, was a huge industry and the workings released a large amount of sediment into the rivers. This sediment accumulated and led to rapid siltation – the narrow head of the estuary started to fill up with sediment, affecting maritime trade. The intertidal sediments near Lostwithiel provide clear chemical and mineralogical record of this impact *(Source: Camborne School of Mines)*. Once the working for tin stopped, the rate of sediment supply to the estuary decreased.

Currently, the river catchment is largely pasture and forestry whose associated land management techniques have their own influences on the amounts of sediments running off the land and into the streams, rivers and the estuary. Land management changes can have the biggest impact on the sediment content of a river system.

The flow characteristics of the River Fowey are regulated to a degree by South West Water and the Environment Agency through the operation of Colliford Dam and Siblyback Reservoir, resulting in the altering of peaks of flow reducing the natural erosion.

The deposition of sediment within a river system is dependent on a number of factors that need to be looked at in detail. Work will be continued by Camborne School of Mines as part of commissioned research by Fowey Harbour Commissioners. Additionally, the West Country Rivers Trust, the Environment Agency and the Fowey Voluntary Marine & Coastal Conservation Area all wish to see sediment run off from land based sources reduced wherever practical, through appropriate land management practises and the distribution of guidance and literature referring to best practise.

12.2 Seek alternative disposal for maintenance dredging spoil

Maintenance dredging remains an essential activity, dredging to at least 7 metres below chart datum in the main channel, from the harbour mouth to the commercial berths at Mixtow, to guarantee safety of navigation within these limits at all states of the tide. The Harbour Commissioners maintain a constant dredging programme from the entrance to Pont Pill up as far as jetty number 8 with dredging activities taking place all year round.

Currently the only viable option open to the Fowey Harbour Commissioners is the disposal of the dredged sediment at sea to a DEFRA licensed spoil ground. This is located off Lantic Bay, I mile to the east of the Harbour mouth. The Commissioners annually apply for a Maintenance Dredging Disposal at Sea Licence *(Under the Food & Environment Protection Act 1985: Part II (As amended) deposits at Sea)* from DEFRA. The spoil ground site is monitored and there is no indication that sediment has caused detriment to the area. Alternative methods of disposal are constantly sought for the dredged spoil and is a requirement as part of the dumping at sea licence.

12.3 Monitor sediment quality

Heavy metals present in estuarine sediments have the ability to attach to fine grain sediments, with the potential to be dredged in the estuary then discharged offshore at the spoil ground into the marine environment. Sediments from areas of intense shipping and industrial activities tend to have higher metal concentrations than those from less active areas. Metal pollutants often occur in West Country estuaries, mainly as a result of the historic mining and tin streaming activities. The metals enter the estuary in both dissolved and particulate form, mainly through riverine input at tidal limits, freshwater run-off and outfalls discharging from banks. Heavy metals can have a detrimental effect on many organisms if they are released into the environment in high concentrations.

The toxicity of target contaminants within dredged spoil are assessed every three years to ensure compliance with strict guidelines. The sample results for the Fowey Estuary as analysed by DEFRA are well within the prescribed criteria in order to permit dumping of sediment at sea under the present guidelines. Although the prescribed criteria for Organotins vary according to

the specific dredging regime of a particular area, if levels are less than 0.1 mg/kg (ppm) then they generally attract no further investigations.

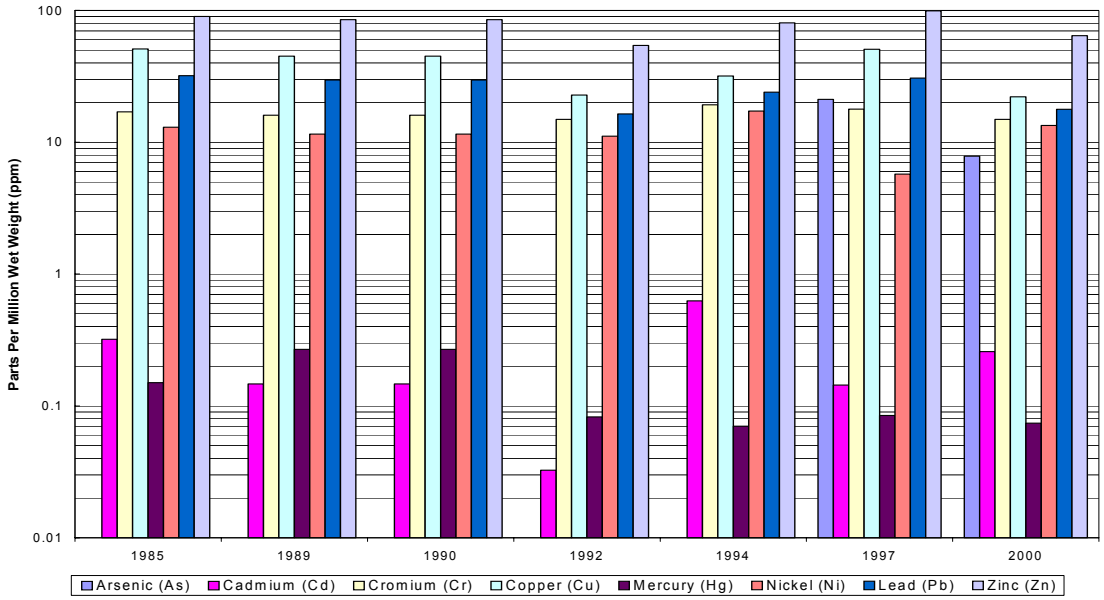

Figure 3: Average results for Heavy Metals in sediment samples from the Fowey Estuary taken by DEFRA. Arsenic was added to the DEFRA sampling regime in 1997.

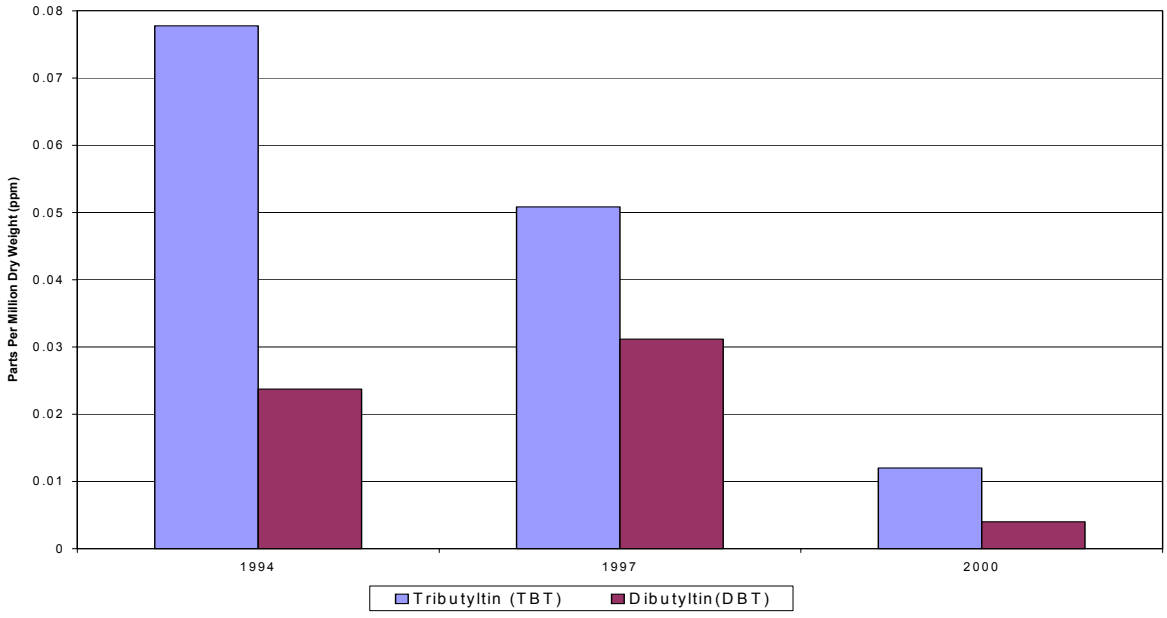

Figure 4: Average results for Organotin Analyses in sediment samples from the Fowey Estuary by DEFRA. Tributyltin & Diybutyltin were added to the DEFRA sampling regime in 1994.

Research work by Camborne School of Mines into the chemical composition of the estuarine sediments has indicated relatively low heavy metal contamination in comparison to other estuaries in the Southwest. The metals present in the Fowey sediments are not bioavailable i.e. they are associated with the sediment in such a way that the flora and fauna of the estuary cannot ingest them, even if the sediments are disturbed.

The Lantic Bay*, Fowey Harbour Commissioner's Dredger*

12.4 Support the implementation of the shoreline management plan

The Rame Head to Lizard Shoreline Management Plan identifies sustainable coastal defence strategies for the future management of the shoreline. The preferred strategic option for the Fowey Estuary (covering the estuary banks south of Town Quay, excluding Pont Pill) is in the short term to keep the undefended stretches that way, and to hold the line elsewhere.

Section 13 Litter and Waste Disposal

Guiding Principle

Work towards ensuring that the Estuary remains, as far as practical, free from litter; that recycling is encouraged where possible, and that waste is disposed of safely and according to current legislation

Virtually all activities taking place in and around the estuary involve the production of waste materials. If not disposed of responsibly, the litter produced can become an unsightly problem in the countryside and may cause damage or death to the wildlife. Personal awareness needs to be raised and adequate facilities must be available in order to limit irresponsible waste disposal.

The management of waste is the responsibility of all parties involved in the handling of waste and is regulated by a series of European Directives and UK Legislation.

13.1 Support the implementation of waste strategies in the area covered by the Fowey Estuary Management Plan

Fowey Harbour Commissioners have a statutory responsibility for providing management for waste disposal within their jurisdiction, and this is clearly set out in the Port Waste Management Plan. The Port Waste Management Plan is in compliance with the Merchant Shipping Notice M1709.

The Waste Management Plan is internally reviewed every year and updated through consultation every two years. It is split into three sections dealing with commercial waste, leisure waste and Fowey Harbour Commissioners own waste streams separately.

Caradon and Restormel District Councils have local responsibility for waste generated in the local area and strategies work in tandem with Fowey Harbour Commissioners where possible. The Port Waste Management Plan sets out the areas in which this is achievable, for example using a floating skip on the water to collect bagged yacht waste, which is then collected and disposed of by the council.

13.2 Promote recycling of waste wherever possible

The emphasis on recycling is being increased, from waste generated in all areas of life. The public are being asked to separate household waste and businesses are similarly being expected to send an increasing proportion of their waste for recycling. The waste strategy 2000, as set out in the LEAP Review 2001 sets targets for recycling and recognises the need for development of recyclable markets and landfill tax funding towards green initiatives.

Fowey Harbour Commissioners are working closely with Restormel and Caradon District Councils to increase the amount of waste recycled from the Harbour area and to encourage the use of facilities provided. This is in accordance with the targets set by Government in the Directive to Councils to reduce landfill, and in accordance with Fowey Harbour Commissioners Waste Management Plan.