Office of the Environmental Monitor

Fact Sheet: Contaminants in Fish Monitoring Program

How can fish become contaminated?

Fish can become contaminated when levels of metals and organic compounds that can pose a risk to the fish or public health, enter the food chain and accumulate in fish flesh.

Most metals such as arsenic and nickel occur naturally in the rocks and soil found in Port Phillip Bay's (the Bay) 9,790 square kilometre catchment. In an ongoing process, sediment from this catchment is carried into the rivers and settles in the lower reaches of the Yarra and Maribyrnong Rivers. Every storm and flood carries sediments into the rivers and the Bay each year, resulting in metals being naturally present in the Yarra River and the Bay.

Human activities within the catchment such as agriculture, urban development and industry can lead to higher levels of metals ending up in the rivers and can also result in other metals and organic compounds to be recorded.

Sediments are considered to be polluted with contaminants, when the concentrations of compounds reach levels that may pose risks to the environment or public health.

Photo: Black bream will be sampled during the monitoring program

As part of regular maintenance of the Port of Melbourne shipping channels, dredging of contaminated material has occurred for more than one hundred years. The last major dredging program in the Yarra River and Hobsons Bay was in the early 1980s. The contaminated sediments that have accumulated in the Yarra River since then will be dredged during the Channel Deepening Project (the Project).

The contaminated sediment identified in these shipping channels largely occurs as a layer of silt that has settled on top of the riverbed's packed clay. This clay is more than one million years old. Some of this clay will also be dredged as part of the Project.

Where present, the contaminants are in the main, bound to the sediment. This limits the extent to which they can dissolve in the water and enter the marine aquatic ecosystem. However, small amounts of contaminants may be taken up by fish and other marine organisms.

A 2007 study by Environment Protection Authority (EPA) Victoria of fish in the lower Yarra and Maribyrnong Rivers found that where contaminants were present in fish, none were above the relevant standards, including the Australian and New Zealand Food Standard maximum residual levels.

In response to this study, Victoria's Chief Health Officer said fish was part of a balanced diet; however urban waterways could become contaminated with industrial residues, which in turn could build up in fish and eels.

He further said; "While it is safe to eat fish caught from these rivers [Yarra and Maribyrnong Rivers] it is recommended people limit themselves to one serve a week. I reiterate my advice following the initial pilot study of 2005 to limit serves of eel to one a month."

He further advised that it was not uncommon for a more conservative approach to be recommended for women of child-bearing age and children and advised they should limit fish consumption to one serve a month and they should not eat eels caught in these rivers.

A health advisory is in place and this can be found at: http://www.health.vic.gov.au/environment/downloads/eat_fish.pdf.

During the assessment phase of the Project, the Port of Melbourne Corporation (PoMC) was required to examine sediments from the Yarra River for metals and organic compounds and consider any affects to human health and the Bay's ecosystem.

The assessment identified no likely health risk concerns for Bay users as a result of dredging contaminated sediment (see the Minister for Planning's Environmental Effects Assessment of the Channel Deepening Project at www.dpcd.vic.gov.au)

Contaminants in Fish Monitoring Program

The Project has a rule book, the Environmental Management Plan, which sets standards and controls to avoid and minimise the dispersal of contaminated sediment and the potential mobilisation of the contaminants.

These include: building a bund wall to stop the sediment from spreading across the sea floor, using non-overflow mode when using the trailing suction hopper dredge and a diffuser to place the sediment from the dredge into the bund, and limiting the height of the bund wall above the seafloor so that the contaminated sediment is not disturbed by storm waves. A layer, at least 0.5 metres thick of clean sands dredged from the South Channels will cap the contaminated sediment to prevent marine animals from burrowing into it. This sand layer will also be at a water depth where it will not be affected by storm waves. Controls are also in place to ensure that the process for changing work methods between dredging contaminated and non-contaminated material is properly managed.

As an assurance that these standards and controls have been effective, the rule book includes the Contaminants in Fish Monitoring Program to be administered by EPA Victoria. It is one of nine Baywide Monitoring Programs. The program's objective is to detect if the concentration of contaminants in fish tissue in the lower Yarra River after dredging of contaminated sediments is outside expected variability.

Fish will be sampled approximately three months after the dredging, of contaminated sediment from the Yarra and Williamstown Rivers channel area, is complete.

For consistency with previous studies, fish species targeted for sampling will be black bream, yellow-eyed mullet, mulloway and eels. The fish will be tested for:

- Heavy metals including cadmium, copper, chromium, zinc, lead, selenium, arsenic and mercury;
- Organochlorine pesticides, polycyclic aromatic hydrocarbons, tributyl tin and total petroleum hydrocarbon;
- Total polychlorinated biphenyls (PCBs); and
- Ultratrace dioxins, furans, dioxin-like PCBs and brominated diphenyl ethers.

An expert workshop will review the results of these tests. As an outcome of this review, a second round of sampling may occur.

How the Port of Melbourne Corporation will use the data?

PoMC will use results from the Contaminants in Fish Monitoring Program to detect changes outside expected variability. Where changes outside of expected variability are detected, the findings will be referred to EPA Victoria and/or Department of Human Services for advice.

The role of the Office of the Environmental Monitor

The Office of the Environmental Monitor (the Office) will in the first instance scrutinise the Project's effects on water quality to judge its performance against PoMC's assessment finding that identified no likely health risk concerns for Bay users as a result of dredging. The Office will then use the results of contaminants in fish monitoring to judge the Project's environmental performance against the rule book.

The Office will also monitor all data relating to PoMC's compliance with the management actions specified in the rule book, which have been designed to minimise effects on water quality.

For further information on the nine Baywide Monitoring Programs visit www.oem.vic.gov.au/Monitoringprogramsandresults.

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