

Office of the Environmental Monitor

Fact Sheet: Nutrient Cycling Monitoring Program

What are nutrients?

Nutrients such as nitrogen and phosphorus regularly enter Port Phillip Bay (the Bay) via rivers and streams and from the Western Treatment Plant. Nitrogen is the key nutrient that affects the growth of algae in the Bay.

The health of the Bay depends on a fine balance of nitrogen. If there is not enough nitrogen, the Bay's plants cannot grow. If nitrogen builds up, it can cause excessive algal growth (just as in a fish tank, when too much food causes the water to turn green). When algae dies, bacteria breaks it down, using oxygen that the Bay's marine life needs to survive.



Photo: Scientist collecting water samples from the benthic chamber

This fine balance is maintained by a process called denitrification, which removes the excess nitrogen entering the Bay. In summary, nitrogen enters the water in the form of nutrients, is processed by naturally occurring microscopic plants and animals in the water and on the seabed, and is finally released into the atmosphere as nitrogen gas.

Nutrient Cycling Monitoring Program

The Channel Deepening Project has a rule book, the Environmental Management Plan, which limits how the Project can affect nutrient cycling by setting standards and controls to avoid and minimise environmental effects such as smothering of plants and animals living on the sea floor from stirred up sand and silt and the reduction of light from increased levels of turbidity.

The rule book includes the Nutrient Cycling Monitoring Program, which is one of nine Baywide Monitoring Programs. The program's objective is to detect changes beyond expected variability to critical elements of Bay nutrient cycling processes.

The program uses sediment denitrification efficiency, and a range of water quality measurements to provide an early warning of changes in nutrient cycling that are large enough to be ecologically significant.

The program consists of four parts:

1. Continuous monitoring of water characteristics at two depths at Hobsons Bay, Central Port Phillip Bay, Middle Ground Shelf and Long Reef (see figure 1). Divers will upload data from the meters every two months;
2. Interpretation of samples collected by the Water Quality Monitoring Program at Hobsons Bay, Central Port Phillip Bay, Middle Ground Shelf and Long Reef;
3. Quarterly benthic chamber monitoring of nitrogen transfer and nutrient cycling efficiency in the sediments at Hobsons Bay, Central Port Phillip Bay and Middle Ground Shelf; and
4. A one-off study of the impact of a Yarra River storm event on the nutrient cycling in the north of Port Phillip Bay.

How the Port of Melbourne Corporation will use the data

The Port of Melbourne Corporation (PoMC) will use results from the Nutrient Cycling Monitoring Program to detect changes outside of expected variability to the nutrient cycling process during the Project and until 2012. Where changes outside of expected variability are detected, a risk review will be undertaken. It will determine if the changes are significant to the ecosystem of the Bay and any action that may be required.

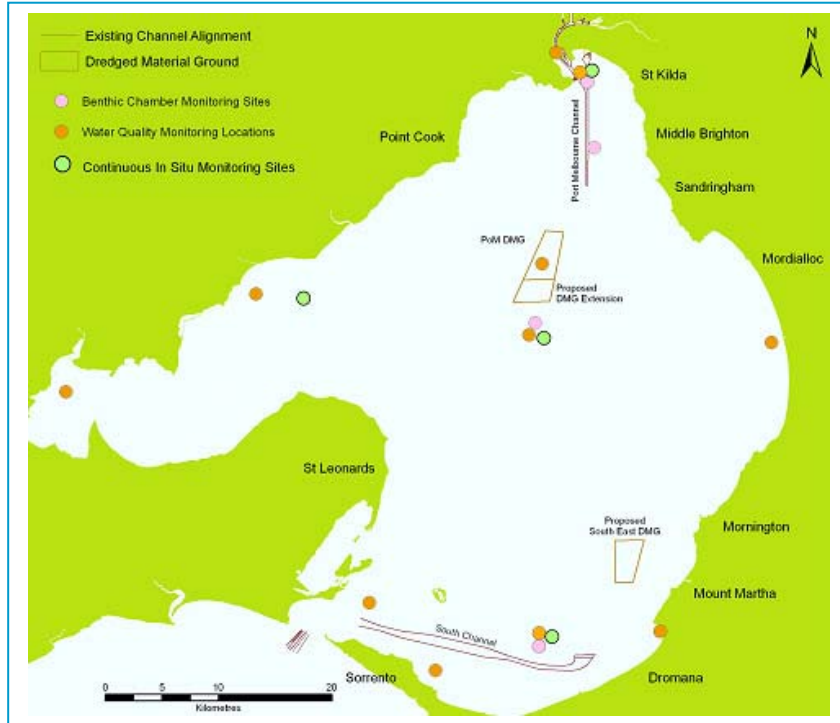


Figure 1: Nutrient Cycling Monitoring Program data collection sites

The role of the Office of the Environmental Monitor

The Office of the Environmental Monitor (The Office) will scrutinise the Channel Deepening Project's effects on nutrient cycling to judge the environmental performance of the Project. The nutrient cycling monitoring data will be used to judge if the dredging effects on the nutrient cycling process are consistent with that expected.

The Office will also monitor all data relating to PoMC's compliance with the management actions specified in the Environmental Management Plan that have been designed to minimise effects on nutrient cycling.

These include Environmental Controls relating to when, where and how dredging can take place and have been designed to minimise the area and intensity of the effect on nutrient cycling. These also include Environmental Limits set to ensure that adequate light is available for the nutrient cycling process to function through the control of turbidity.

The combination of these monitoring results will provide the Office with an understanding of potential changes to the Bay's nutrient cycling processes. The Office will use the results to judge the environmental performance of the Channel Deepening Project.

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