

7. WATER QUALITY

7.1 Introduction

This section provides a qualitative assessment of potential water quality impacts associated with the EPIWs.

Key issues addressed in this section are the generation of construction runoff and operational wastewater which may cause adverse water quality impacts on water sensitive receivers if not properly controlled. Where appropriate, mitigation measures have been described to control potential water quality impacts so that residual (post-mitigation) discharge levels meet the *Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM)* standards and EPD's "zero discharge" policy for the Deep Bay catchment.

7.2 Construction Phase

Construction activities in areas currently occupied by fish/duck ponds and streams may cause disturbance to these water bodies. Potential sources of impacts to water quality from the construction of the EPIWs could include the following:

- Construction runoff and drainage;
- Runoff from general construction activities; and
- Sewage effluents generated from the construction workforce.

7.2.1 Construction Runoff and Drainage

7.2.1.1 Construction Runoff and Drainage

Runoff from construction sites may contain increased loads of suspended solids (SS) and contaminants. Potential sources of water pollution from site runoff include:

- Runoff and erosion from site surfaces, drainage channels, earth working areas and stockpiles;
- Wash water from dust suppression sprays and wheel washing facilities; and
- Fuel, oil and lubricants from maintenance of construction vehicles and equipment.

Construction runoff and drainage may cause physical, chemical and biological impacts. In view of the scale of the works, the impact associated with construction runoff would be minimal.

Since the EPIWs include minor road junction improvements and widening of existing roadways, existing storm water drainage and sewerage systems may be affected.

However, the impact would be limited given the fact that all the storm water drainage and sewerage system would be properly re-designed.

7.2.1.2 Runoff from General Construction Activities

General construction activities have the potential to cause water pollution from debris and rubbish, such as packaging and used construction materials, which may enter the water column, resulting in floating refuse in the vicinity of the site that reduces the aesthetic quality of any receiving water body. Spillages of liquids stored on site, such as oil, diesel and solvents could also result in water quality impacts if they enter surrounding water bodies and soils.

The effects on water quality from these construction activities are likely to be minimal provided that site boundaries are well maintained and good construction practices are observed to ensure that litter, fuels and solvents are managed, stored and handled properly.

7.2.1.3 Sewage Effluents

Sewage effluents will arise from sanitary facilities provided for the on-site construction workforce for the EPIWs, and these have the potential to cause water pollution. Sewage is characterised by high levels of biochemical oxygen demand (BOD), ammonia and *E. coli* counts. This sewage is expected to be connected to the existing sewerage system, since all the EPIWs lie within town centres which are connected to public foul sewerage and treatment systems. However, construction workers are likely to be dispersed along the alignment so that the installation of portable toilets and the proper disposal of sewage may be necessary to ensure that discharge standards are met.

7.2.2 Recommended Environmental Control Considerations

It is important that appropriate measures are implemented to control runoff and drainage to prevent SS loadings from entering the water courses and impacting on downstream WSRs. Proper site management will be essential to minimise surface water runoff, soil erosion and sewage effluents.

Construction site runoff and drainage should be controlled in accordance with the guidelines stipulated in the EPD's *Practice Note for Professional Persons, Construction Site Drainage* (ProPECC PN 1/94). Good housekeeping and stormwater best management practices should be implemented to ensure that runoff from construction areas and any stored excavated material comply with the WPCO and no unacceptable impact on the WSRs arises due to the construction of West Rail. All discharges from the construction site should be controlled to comply with the TM standards and the "zero discharge" policy.

The followings are measures to further improve the environmental performance of the works in order to minimise water quality problems.

7.2.2.1 Construction Runoff and Drainage

Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Runoff-related impacts associated with above ground construction activities can be readily controlled through the use of appropriate mitigation measures, which include:

- The use of sediment traps; and
- The adequate maintenance of drainage systems to prevent flooding and overflow.

The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates.

All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment traps should be regularly cleaned and maintained. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.

Sand and silt in the wash water from the wheel washing facilities should be settled out and removed before discharging into storm drains. A section of the road between the wheel washing bay and the public road should be paved with backfall to prevent wash water or other site runoff from entering public road drains.

Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources associated with construction, and regularly emptied to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.

7.2.2.2 General Construction Activities

Debris and rubbish on site should be collected, handled and disposed of properly to avoid entering the water column and cause water quality impacts. The solid waste management requirement on site to prevent such impact is detailed in *Section 9* of this report.

All fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the receiving water bodies.

7.2.2.3 Sewage Effluent

Construction workforce sewage is expected to be connected to the existing trunk sewer or sewage treatment facilities, although precise information on the size of the on-site

workforce is not available at this stage. Construction sewage may need to be handled by portable chemical toilets and sewage holding tanks if the construction workers are likely to be dispersed along the alignment. Appropriate and adequate portable toilets should be provided by a licensed contractor who will be responsible for appropriate disposal and maintenance activities.

7.2.3 Residual Impacts

General construction activities associated with EPIWs could lead to site runoff containing elevated concentrations of SS and associated contaminants. However, water quality impacts will generally be temporary and localised during construction. Therefore, no unacceptable residual water quality and drainage impacts are anticipated from the construction of EPIWs, provided that:

- All of the recommended mitigation measures including appropriate drainage and silty runoff collection facilities are adopted; and
- All construction site discharges comply with the TM.

It is considered that controls on discharges from land based construction activities and proper site management procedures, as discussed above, will minimise residual water quality impacts to acceptable levels, and that there should be no adverse impacts on local environmental resources.

7.2.4 Cumulative Impacts

The construction of EPIWs will be undertaken either in advance, or together with, the construction of the West Rail Stations at Tuen Mun, Tin Shui Wai and Yuen Long. The environmental impact associated with the land-based EPIWs construction works is similar to that of West Rail, such that the control measures recommended in Section 7.2.2 can be incorporated into the West Rail construction mitigation measures. However, as the relative scale of the EPIWs is much smaller than the West Rail project, the additional environmental impact associated with the EPIWs is minimal. Provided the environmental control measures and specifications (stated in Section 7.2.2 and 7.2.3 respectively) are observed it is not anticipated that there will be any significant cumulative water quality impacts from undertaking the EPIW construction works together with the West Rail construction works.

7.2.5 Operational Phase

No water quality impacts are expected during the operational phase of EPIWs.

7.3 Conclusion

The water quality assessment has determined that no insurmountable water quality impacts should result from the construction and operation of the EPIWs, provided that the recommended mitigation measures, as outlined below in *Table 7.3a* are implemented.

Table 7.3a - Summary of Recommended Mitigation Measures During Construction and Operation of the Project

Phase	Recommended Mitigation Measures
Construction Phase	<p>Appropriate mitigation measures are required to control construction runoff and drainage to prevent SS loadings from entering into nearby water courses and impacting on downstream WSRs. Proper site management will be essential to minimise surface water runoff, soil erosion and sewage effluents.</p> <p>Construction site runoff and drainage should be controlled in accordance with the guidelines stipulated in the EPD's <i>Practice Note for Professional Persons, Construction Site Drainage</i> (ProPECC PN 1/94). Good housekeeping and storm water best management practices should be implemented to ensure that runoff from construction areas and any stored excavated material comply with the WPCO and no unacceptable impact on the WSRs arises due to the construction of EPIWs. All discharges from the construction site should be controlled to comply with the TM standards and the "zero discharge" policy.</p>
Operation Phase	None required.