Appendix E

Water Quality Risk Assessment Template

Introduction

The following template has been prepared as a basis for the production of a Water Quality Risk Assessment. Refer to Section 5 of the Protecting Waterways Manual for an explanation of each step.

Note, for larger and more complex projects the risk assessment should be undertaken for various areas of the site that may have different risks.

Water Quality Risk Assessment

(Project Name)

This water quality risk assessment process (as set out in the DPTI Protecting Waterways Manual) aims to determine the potential nature, scale and likelihood of any impacts on water quality during both the construction and operational phases of (*Project Name)* to assist in identifying appropriate management measures to manage the project impacts.

The main steps in the risk management process are:

1. Establish the context
2. Identify risks
3. Analyse risks
4. Evaluate risks
5. Treat risks

1. Context Setting

(Refer to Section 5.2.2 of the Protecting Waterways Manual for more details).

1.1. Purpose and nature of the project

1.2. Legislative compliance requirements

1.3. Relevant plans including Natural Resource Management Plans

1.4. Environmental concerns raised by the community

1.5. Risk acceptance criteria

2. Identification of Risk

(Include consideration of both Construction and Operational Phases. Refer to Section 5.2.3 of the Protecting Waterways Manual for more details).

2.1. Site Characteristics

- Topography of the site
- Nature and erodibility of soils
- Drainage pattern and size of catchments
- Quality and nature of surface receiving waters

- Quality and depth to groundwater and any pollution transport mechanisms
- Vegetation and ecology of the site and surrounding area including the downstream aquatic environment.
- Purpose and capabilities of any water quality treatment measures already in place downstream of the project area.

2.2. Project Characteristics

- Timing and scale of the project.
- Proposed staging of the project.
- Extent of cut and fill.
- Volume and nature of traffic, extent of commercial vehicles or hazardous loads.
- Potential traffic accident characteristics.
- Concentration or dispersion of stormwater, changing the nature, timing and location and quality of flows or altering flood patterns.
- The effect of the project on any water quality treatment measures already in place downstream of the project area.
- Impediments to achieving any water quality objectives for the catchment
- Scouring and erosion of the project site.
- Changes to flow regime, volumes and peak flows, temperature changes.
- The potential for spillage or leakage of toxic substances used on site.

3. Analysis and Evaluation of Risk for the Operational Phase

The Risks arising from the site and project characteristics identified in Section 2 were examined in regard to the likelihood and consequences of the risk occurring. The following questions were considered:

- How likely is it to happen?
- What could be the consequence if it does happen?

A qualitative risk analysis matrix was used to evaluate the level of risk for the Operational Phase. The results are documented in Table 1. The Construction phase risks are dealt with in Section 4.

Likelihood	**Consequence**		
	Low Minor adverse social or environmental impact	**Medium** Measurable adverse environmental or social impact. Will result in annoyance or nuisance to community	**High** Significant damage or impact on environmental systems and local community
Low The event could occur only rarely, or is unlikely to occur	Very Low Risk	Low Risk	Medium Risk (could be High)

Medium The event will occur occasionally or could occur	Low Risk	Medium Risk	High Risk
High The event will occur often or is most likely to occur	Medium Risk	High Risk	High Risk (Critical)

(Note for larger and more complex projects this assessment should be undertaken for various areas of the site which may have different risks. Refer to Appendix B of the Protecting Waterways Manual for information on treatment measures).

Table 1 – Operational Phase Risk Assessment

Risk	Likelihood	Consequence	Risk	Proposed Management Measures	Reassessed Risk (following implementation of Management Measures)
Heavy metal export creating toxicity in downstream environment					
Industrial pollutants being deposited on road surface, to be later washed off.					
Hydrocarbons from vehicles creating significant Biochemical Oxygen Demand (BOD) in the downstream environment.					
Sediment export causing increased turbidity, decreased light penetration and smothering of aquatic vegetation.					
Nutrient export creating impact on water bodies					
Vegetative matter washed into waterways, and creating BOD					
Significant litter export having a visual impact					
Accidental Spills (including hazardous)					
Runoff volume change causing erosion or saturation downstream					
Runoff peak flow in excess of downstream pipe capacity					
Runoff temperature change having an impact on biota					
Pollutants entering groundwater					

VL	Very Low	H	High
L	Low	C	Critical
M	Medium	N/A	Not applicable for this location

4. Analysis and Evaluation of Risk for the Construction Phase

The Risks arising from the site and project characteristics identified in Section 2 were examined in regard to the likelihood and consequences of the risk occurring. The following questions were considered:

- How likely is it to happen?
- What could be the consequence if it does happen?

A qualitative risk analysis matrix was used to evaluate the level of risk for the Construction Phase. The results are documented in Table 2.

Likelihood	**Consequence**		
	Low Minor adverse social or environmental impact	**Medium** Measurable adverse environmental or social impact. Will result in annoyance or nuisance to community	**High** Significant damage or impact on environmental systems and local community
Low The event could occur only rarely, or is unlikely to occur	Very Low Risk	Low Risk	Medium Risk (could be High)
Medium The event will occur occasionally or could occur	Low Risk	Medium Risk	High Risk
High The event will occur often or is most likely to occur	Medium Risk	High Risk	High Risk (Critical)

(Note for larger and more complex projects this assessment should be undertaken for various areas of the site which may have different risks. Refer to Appendix C of the Protecting Waterways Manual for information on treatment measures).

Table 2 – Construction Phase Risk Assessment

Risk	Likelihood	Consequence	Risk	Proposed Management Measures	Reassessed Risk (following implementation of Management Measures)
Accidental spills affecting waterways					
Pollution of waterways because of proximity of worksite					
Extra turbidity due to pile driving affecting water quality					
Dredging exporting sediment to deposit elsewhere in the watercourse					
Soil erosion that causes significant deposition in watercourses.					

VL	Very Low	H	High
L	Low	C	Critical
M	Medium	N/A	Not applicable for this location

4.1. Water Sensitive Urban Design Targets

The project is assessed to determine if the setting of water sensitive urban design targets is appropriate.

4.2. Initial Site Erosion Risk Assessment

The risk of soil erosion may be determined by the application of the initial site erosion risk procedure.
(Refer to Table 5.4 of the manual for an explanation of this assessment).

Table 2 - Initial Site Erosion Risk Assessment

Parameter	Score
Location	
Average Slope	
Soil type	
Duration of risk	
Area disturbed	
Sensitivity of Receiving area	
Total Score	

4.3. Soil Erosion & Drainage Management Plan

Discussion regarding required detail of SEDMP.
(Refer to Section 5.5.2 and 7.3 of the Protecting Waterways Manual and Appendix B1 for more details).

4.4. Water Quality Monitoring

Discussion regarding level and duration of Water Quality Monitoring.
(Refer to the Water Quality Monitoring Manual for Construction Sites).

Discussion regarding other construction phase risks.

5. Treatment of Risks

Discussion regarding treatment of risks.

(Refer to Appendix A and C for information on treatment measures).

6. Workshop Participants

If a workshop was held to formulate this risk assessment the participants should be recorded here.