

**ENVIRONMENTAL  
MANAGEMENT FOR  
ROADING CONTRACTORS**

**III. PROVISIONAL GUIDELINES FOR  
ENVIRONMENTAL MANAGEMENT  
DURING ROAD WORKS**

**Transfund New Zealand Research Report No. 132**



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## EXECUTIVE SUMMARY

### Introduction

A project, *Environmental Management for Roading Contractors*, was undertaken in 1997-98 to prepare two sets of provisional environmental guidelines for roading contractors carrying out road works in New Zealand.

Its objectives were to:

- provide specific and simple policies and guidelines about the environmental effects of road works, particularly those related to construction, and aimed for use by roading contractors;
- assist roading contractors to understand the environment within which they work, and
- improve the environmental image of roading contractors.

### Structure of Project

The results of the project are presented as three reports:

- I. *Overview & Case Study: Transfund New Zealand Research Report No. 130.*
- II. *Provisional Guidelines for Erosion & Sediment Management during Road Works: Transfund New Zealand Research Report No. 131.*
- III. *Provisional Guidelines for Environmental Management during Road Works: Transfund New Zealand Research Report No. 132.*

The first task of the project was to carry out a literature review of relevant guidelines, and undertake a case study with an associated environmental effects assessment. *Transfund New Zealand Research Report No. 130, I. Overview & Case Study*, describes the initial work used to develop the guidelines.

The guidelines, which form parts II and III of the project (*Transfund New Zealand Research Reports 131 and 132*), have been developed in order to minimise adverse effects of erosion and sediment run-off created by construction of roads and to improve environmental management by roading contractors. They are to help contractors achieve a favourable environmental outcome and also to help promote compliance with the Resource Management Act 1991 (RMA).

In this report, *III. Provisional Guidelines for Environmental Management during Road Works*, the legal requirements under the RMA and other Acts are discussed and sources for advice are suggested. Use of the guidelines is explained, and a checklist provides the steps to follow during the planning stages of the road works.

The guidelines provide the steps to follow in order to manage and avoid erosion and sedimentation as follows:

- |  |                                       |
|--|---------------------------------------|
| - careful planning                     | - natural character and visual values |
| - water quality                        | - hazardous substances                |
| - soil protection                      | - spraying                            |
| - management of spoil on site          | - noxious plants                      |
| - protection of vegetation             | - waste disposal                      |
| - dust, noise, and other air emissions | - legal requirements                  |
| - social values                        |                                       |

## ABSTRACT

A project, *Environmental Management for Roading Contractors*, was undertaken in 1997-98 to prepare two sets of provisional environmental guidelines for roading contractors carrying out road works in New Zealand.

Objectives of the project were to:

- provide specific and simple policies and guidelines about the environmental effects of road works, particularly those related to construction, and aimed for use by roading contractors;
- assist roading contractors to understand the environment within which they work, and
- improve the environmental image of roading contractors.

The results of the project are presented as three reports:

- I. Overview & Case Study: *Transfund New Zealand Research Report No. 130.*
- II. Provisional Guidelines for Erosion & Sediment Management during Road Works: *Transfund New Zealand Research Report No. 131.*
- III. Provisional Guidelines for Environmental Management during Road Works: *Transfund New Zealand Research Report No. 132.*

Part I is an overview of the project, and a case study with associated environmental effects assessment used to develop the guidelines. The guidelines which form Part II, and this Part III of the project have been developed in order to minimise the adverse effects of road works associated with erosion and sediment run-off caused by construction of roads. They are also to help improve environmental management, and promote compliance with the Resource Management Act 1991, by roading contractors.

## **1. INTRODUCTION**

### **1.1 Purpose of Guidelines**

This project was undertaken in 1997-98 to prepare two sets of provisional guidelines for roading contractors - one for managing any erosion and sediment movement that may occur during road works, and the other for environmental management during road works. The guidelines aim to provide clear sets of principles and methods to ensure that the environmental effects of road works on the surrounding environment can be minimised by roading contractors. They are intended to be used primarily by roading contractors.

The results of the project are presented as three reports:

- I. Overview & Case Study: *Transfund New Zealand Research Report No. 130.*
- II. Provisional Guidelines for Erosion & Sediment Management during Road Works: *Transfund New Zealand Research Report No. 131.*
- III. Provisional Guidelines for Environmental Management during Road Works: *Transfund New Zealand Research Report No. 132.*

The first task of the project was to carry out a literature review of relevant guidelines, and undertake a case study which identified associated environmental effects. The project included input from users and regulatory authorities. The first report, *I. Overview & Case Study*, describes the initial work used to develop the guidelines.

These guidelines have initially been produced as provisional to provide the opportunity for refinement following their trial use by roading contractors. They are not substitutes for resource consents or for any additional conditions or rules used by regulatory authorities. Instead, they are a practical tool to alert contractors of the legal context in which they are working and of the potential for adverse environmental effects arising from their activities. The provisional guidelines also identify ways to avoid, remedy and mitigate potential adverse effects.

Transfund New Zealand is committed to minimising the adverse effects of the road infrastructure on the environment. Part of this commitment included developing these guidelines to inform roading contractors of their responsibilities under the Resource Management Act 1991 (RMA), thereby avoiding costly measures to clean up any adverse effects, and also the costs of possible litigation.

By following the guidelines, adverse effects on the environment can be minimised and compliance with the RMA promoted. In the process of developing these guidelines, it has also been recognised that contractors are becoming more pro-active in their approach and awareness of environmental issues.

## **1.2 The Environment and Roading**

The environment includes vegetation, soil, water, air, landforms, people and communities; natural and physical resources, scientific and scenic values. Care is needed to ensure that the environment is managed and sustained for future generations.

Road works, especially earthworks, can harm the environment through:

- **Physical works in waterbodies**, e.g. channel realignment and flood protection and maintenance works. Waterbodies are particularly sensitive to environmental change.
- **Destruction of aquatic habitats and lowering of water quality** by allowing sediment into waterbodies, resulting in damage to streamlife. Pollutants can attach to sediment particles and be carried into waterbodies. Sediment may also block irrigation equipment.
- **Visual effects** where sediment run-off may discolour water. Also, earthworks have the potential to scar the landscape.
- **Vegetation clearance** can damage plant and wildlife habitats, and cause erosion.
- **Hazardous substances** if accidentally spilled contaminate soil and water.
- **Wastes and rubbish** have adverse effects if not minimised or disposed of properly.
- **Archaeological sites** and heritage buildings can be damaged or disturbed.
- **Dust, noise and air emissions** can affect amenity values, and health and safety.
- Inappropriate **spoil disposal** sites may result in contamination of waterbodies.
- **Noxious plants and harmful chemicals** can cause contamination.

Such works-related environmental effects can cause other undesirable outcomes:

- **Additional costs** for roading contractors as a result of extra work and site clean-up, and more downtime.
- **Litigation** under the RMA in cases of serious negligence, especially with non-compliance of resource consent conditions.

## **1.3 Legal Requirements**

### **1.3.1 Resource Management Act 1991**

The legislation that is most relevant to roading contractors carrying out road works is the RMA. Its purpose is to promote sustainable management. This includes protecting the environment, especially air, water, soil, and ecosystems.

### III. Provisional Guidelines for Environmental Management during Road Works

The RMA seeks to control activities, such as road construction, and their environmental effects by means of regional and district plans. These plans contain rules about how to carry out activities, and also state which activities require resource consents.

#### **1.3.2 Resource Consents under the RMA**

Various consents may be required by some regulatory authorities for road construction and maintenance (some examples are given in Table 1.1).

Activities requiring resource consents need to be identified before work commences. Contractors may also have to obtain some resource consents for associated activities (e.g. spoil disposal sites).

As contractors are often required to operate within the conditions of the consents already obtained for their activity, they therefore need to take responsibility for familiarising themselves with the consents.

Compliance with these Transfund New Zealand guidelines does not constitute consent under the RMA.

**If in doubt, talk to your local council.**

#### **1.3.3 Liability of Roading Contractors for Environmental Damage**

If the RMA is not followed, and rules in district and regional plans are broken, the people responsible (including workers and their managers) in cases of serious harm to the environment can incur fines up to \$200,000 and/or be imprisoned for up to 2 years.

Councils can also serve abatement notices and enforcement orders requiring the activity to be stopped and improvements to be made before carrying on. This also has cost implications.

Therefore read and understand the resource consents for your project to avoid liability. Find out what the conditions are. Discuss these with the council and other affected parties.

In addition, contractors are recommended to develop their own standard operating procedures based around or in addition to these *Provisional Guidelines for Environmental Management during Road Works*. Using the guidelines in this way may help to reduce liability if difficulties are encountered in complying with the RMA.

## 1.4 Regulatory Authorities Responsible for Administering the RMA

Three types of councils work within the framework of the RMA: Regional Councils, District (and City) Councils, and Unitary Authorities.

- **Regional Councils** are responsible for the formation of regional policy statements and plans (including rules) and for the management of water, soil (including soil conservation), geothermal resources, pollution control, natural hazard mitigation and hazardous substances (with district councils) and coastal management (with the Minister of Conservation).
- **District and City Councils** are responsible for the formation of district plans (including rules) and for the management of land use (including subdivision). They complement the role of regional councils on some issues such as natural hazard mitigation and management of hazardous substances.
- **Unitary Authorities** perform the functions of both regional and district councils.

These Councils' main functions are outlined in Table 1.1, as they relate to roads and the types of consents required for constructing roads. These functions should be identified by contractors before work commences.

**Table 1.1 Functions of regulatory authorities concerning road works.**

<b>Regulatory Authority</b>	<b>Functions</b>	<b>Examples of Resource Consents Required</b>
District /City Council	<ul style="list-style-type: none"> <li>• Control effects of land use and land subdivision</li> <li>• Control and mitigate noise and its effects</li> <li>• Control effects of activities on surfaces of rivers and lakes</li> </ul>	<ul style="list-style-type: none"> <li>• New development of a road</li> <li>• Machinery noise near urban settlements</li> <li>• Activities adjoining lakes or rivers</li> </ul>
Regional Council	<ul style="list-style-type: none"> <li>• Control use of land for soil conservation, maintenance and enhancement of water quality and quantity, avoidance and mitigation of natural hazards, management of hazardous substances</li> <li>• Control, in coastal marine areas, use of land resources, water, discharges of contaminants, hazardous substances, noise and activities on the water surface</li> <li>• Control use, retention and diversion of water</li> <li>• Control discharges of contaminants into or onto land, air or water</li> <li>• Control introduction of plants to waterbodies</li> </ul>	<ul style="list-style-type: none"> <li>• Stormwater discharge</li> <li>• Culverts, bridges, and other structures in waterbodies</li> <li>• Removal of vegetation</li> <li>• Earthworks and land disturbance</li> <li>• Spoil disposal</li> <li>• Works in beds or banks of lakes or rivers</li> <li>• Taking water</li> <li>• Damming water</li> <li>• Discharge of water to surface water &amp; to groundwater</li> <li>• Works adjacent to the coast</li> </ul>

## **1.5 Sources of Further Advice**

### **1.5.1 Councils**

Your first point of contact for advice will probably be your local regional or district council.

Telephone and ask the receptionist to put you through to the relevant person, e.g. the person who deals with disturbance to streams by earthworks. Council staff are there to help. They prefer to be asked for advice openly about practices that will have adverse environmental effects.

Identifying, at the initial stages of the project, the environmental issues and the methods to avoid adverse environmental effects, ensures compliance with the RMA, and saves time and money.

Councils can also help you identify the people and organisations that you need to discuss the proposal with.

Some councils identify, on plans, sites of special sensitivity, such as significant wetlands, native vegetation, outstanding natural features and landscapes, provision of public access, etc.

Make sure you understand any resource consent conditions. Council staff welcome enquiries as it is easier and cheaper for everyone concerned to prevent problems occurring, rather than trying to fix them up later.

### **1.5.2 Department of Conservation (DOC)**

DOC staff have detailed knowledge of local conservation values and, for example, of areas that contain rare plants and wildlife. If you have any doubts about the values of certain streams, they can advise you of the streams that should be avoided at certain times of the year, and how to carry out works in and near waterbodies in an environmentally sound way.

DOC consent is needed for any activities on DOC land (e.g. reserves). It has powers under the Conservation Act 1987, which has the purpose of promoting the conservation of natural and historic resources.

DOC has responsibilities, also under the Conservation Act 1987, for fresh-water fisheries. The discharge of contaminants into fresh water may be an offence under the RMA or the Conservation Act. Substantial fines can be levied for discharging or casting any material into fresh water that will adversely affect fish or fish habitats.

If in doubt, call your local DOC office. As with Councils, DOC staff appreciate being questioned in advance, and can give you appropriate advice.

### **1.5.3 Fish and Game Council**

Another good source of advice are local Fish and Game Council officers. They also have knowledge of local conservation values, specifically about streams and special fish areas as their interests are protecting fish and game for anglers and hunters. They are very approachable, and can often give advice over the telephone.

For example, if obstructions, like culverts, have to be constructed in waterbodies, consult with Fish & Game Councils.

### **1.5.4 Other Contacts**

Landowners and the local iwi should be contacted and informed of the proposed road works as part of the procedures. They can or will often provide useful information and advice especially about local conditions. The regulatory authorities can assist you in establishing contact with these people.



## **2. HOW TO USE THESE GUIDELINES**

These guidelines provide some simple and practical ideas and methods to improve environmental performance during construction and maintenance of roads.

### **1. Read & Use Checklist**

- Use the checklist (Section 3) during planning stages, and refer to it throughout the project
  - Identify areas and stages of project that need particular attention to avoid adverse environmental effects, erosion and sediment run-off
    - Select appropriate control measures
- Use checklist on every job so if & when something goes wrong, the contractor can show that reasonable steps had been taken to avoid, remedy or mitigate adverse effects



### **2. Determine Values to be Protected**

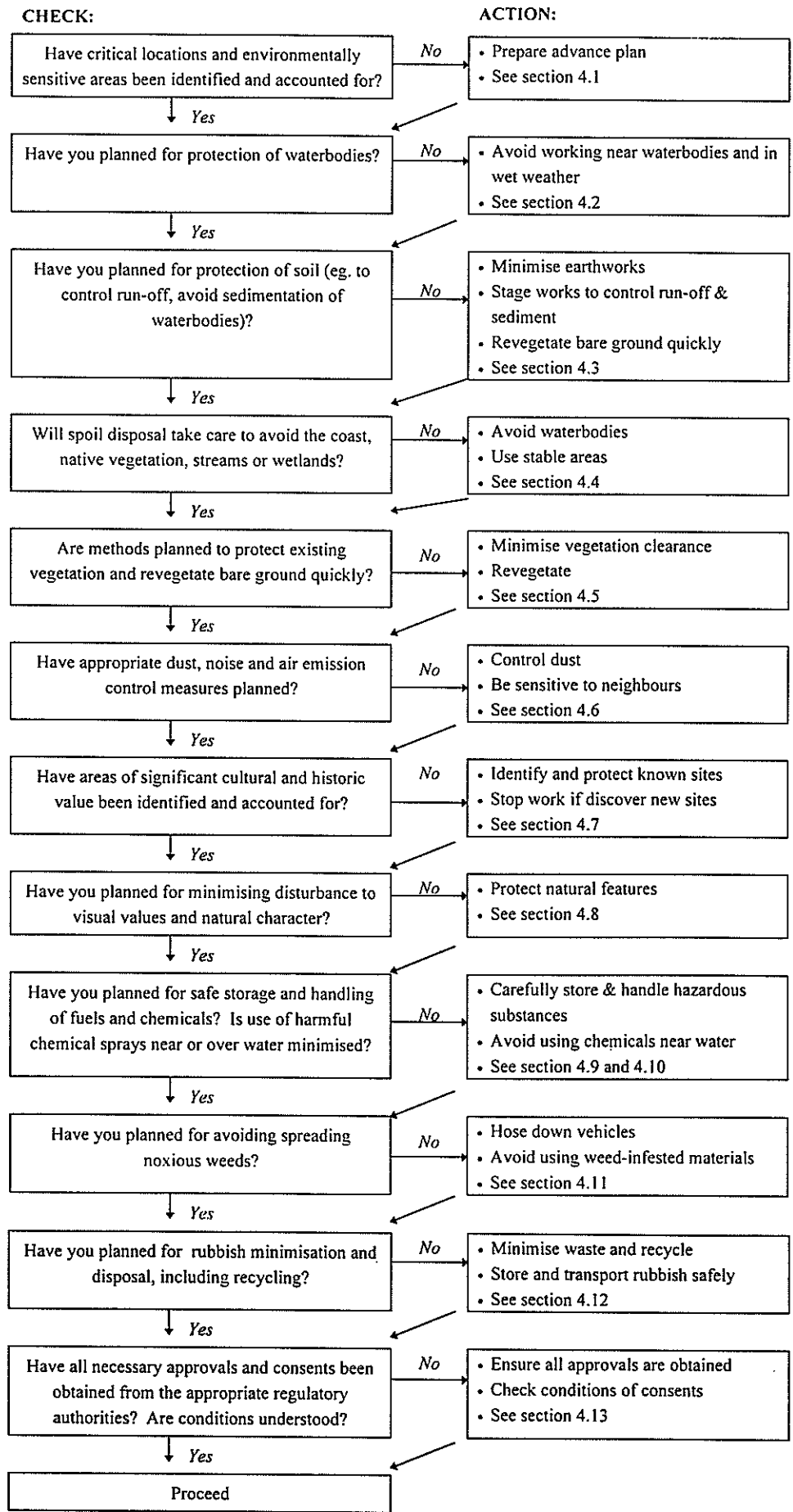
- Read Section 4 for helpful tips to assist with this step
- Before project commences, liaise with appropriate council to discuss planned works, identify environmental issues and requirements for any resource consents
- Identify methods to avoid adverse environmental effects at the initial stages of project, to promote compliance with the RMA, and to save time and money



### **3. Decide on Best Methodology**

- Read Section 4 for some proven methods and techniques
- Decide which will ensure effects of road works are kept to a minimum

**ENVIRONMENTAL MANAGEMENT CHECKLIST:**



## **4. ENVIRONMENTAL MANAGEMENT GUIDELINES**

### **4.1 Careful Planning**

**Plan the project carefully, before work starts.**

- Identify environmental values - visit the site. Look for areas of erosion-prone areas, steep slopes, swampy areas, streams, historic sites and areas of native vegetation.
- Talk with the local council before a project begins, to discuss the planned works and identify any needs for environmental protection, e.g. sediment control or historic sites to be avoided.

This promotes compliance with the RMA, and saves time and money later.

- Avoid environmentally sensitive areas.
- Have contingency plans in place for all the area, e.g. extra bunding to cope with unexpected large rainstorms.
- Use work methods that minimise use of natural resources, e.g. stabilise in-situ materials rather than excavating to waste and replacing with new fill.
- Stage the project, to keep disturbed areas small and time of soil exposure short, i.e. work small areas at a time.
- Avoid earthworks in wet seasons. Some councils have a set season within which earthworks are to be carried out. Check the daily weather forecast.
- Check with council staff, DOC, and others, which streams have particular fish or other conservation values, e.g. during spawning.
- Monitor the performance of the project throughout to ensure compliance with resource consents, and to rectify any deficiencies as they are noticed.

Make use of **Environmental Plans**, especially for large scale projects.

The environmental management checklist (Section 3) will help you to prepare an environmental plan, which is used to:

- Identify environmental values of the site
- Identify contract operations that could cause adverse effects
- Select the most cost-effective and low impact techniques and technologies which best manage site activities and minimise adverse effects
- Identify site-specific controls
- Ensure that all necessary consents and approvals have been obtained and are understood
- Monitor compliance and performance throughout, and following, the project

## 4.2 Water Quality

**Waterbodies such as streams, rivers, lakes, wetlands, water races, drains, estuaries and the sea, as well as aquifers, are particularly sensitive to environmental change and therefore need protection from contamination. Aquifers can be contaminated during excavation or drilling.**

Clean water is important to people, who are generally very aware of the importance of clean water. It is important for fish feeding and breeding, and to the survival of other aquatic animals and plants.

The best ways to keep water clean are:

- Locate new roads away from waterbodies.
- Avoid using and storing machinery close to streams, rivers, lakes, wetlands, estuaries and the coast.
- Minimise soil erosion and sedimentation (see *II. Provisional Guidelines for Erosion and Sediment Management during Road Works* for practical methods of managing erosion and sedimentation).
- Before works start, put in place a system to direct water run-off away from the site and into stable, flat areas.
- Keep clean water separate from dirty water to reduce the total volume of dirty water.
- Control potential contaminants (leaching, run-off, direct application) (see Section 4.9 - Hazardous Substances).
- Protect vegetation next to waterbodies (riparian strips). Use this vegetation as a buffer strip to keep machinery from disturbing waterbodies.
- Design structures to cross streams at right angles. Bridges are preferable to culverts, which are preferable to fords.
- Avoid blocking fish movement. Avoid disturbing streams with special trout and native fish values, particularly during spawning season. Check with DOC and Fish & Game Council about streams that may have special values.
- Ensure road run-off and stormwater management are in place when the project is completed.

**Resource Consents:** Remember to check if the local council requires you to have a resource consent for:

- taking certain quantities of water from streams or other natural waterbodies, or
- carrying out works which affect a stream, or
- gravel extraction.

### **4.3 Soil Protection**

**Protect the soil from erosion and sedimentation, and aim to keep topsoil intact.**

- Plan and mark road alignment before commencing, to restrict the area of earthworks.
- Minimise the areas of disturbed and compacted soil, and the length of time that soil is bare.
- Put in place sediment control measures first (e.g. contour drains, cut-offs and sediment traps - see *II. Provisional Guidelines for Erosion and Sediment Management during Road Works* for more specific assistance).
- Channel run-off onto stable ground away from fill areas.
- Filter run-off through vegetation, hay-bale barriers or filter fences, or into sediment ponds before it enters waterbodies.
- Keep entrances of culverts, sediment traps and flumes clear, and maintain them regularly.
- Use cut and fill or endhauling on steep slopes. Endhauling, although more costly, has significantly less adverse impact than sidecasting.
- Use excavators in sensitive areas (e.g. near archaeological or cultural sites, protected trees, or near waterbodies).
- Create stepped unstable batters and reduce batter slopes.
- Stockpile topsoil on site and re-use as soon as work is finished.
- Re-vegetate bare earth as soon as work is finished.
- Seed (e.g. by hydroseeding) and fertilise where necessary.
- Avoid physical works in wet weather, or in wet seasons, where practicable.
- Avoid fuel and chemical spills (see Section 4.9 - Hazardous Substances).
- Protect vegetation as it is vital for keeping soil stable.

#### **4.4 Management of Spoil on Site**

**Spoil from road works site needs to be managed to reduce sedimentation off-site.**

- Endhauling, although more costly, has significantly less adverse impact than sidecasting (see Section 4.3 - Soil Protection).
- Store spoil in stable areas, well clear of waterbodies.
- Check if consents are needed, as some councils require consents for placement of spoil or clean fill.

#### **4.5 Protection of Vegetation**

**Retain vegetation in order to keep soils stable.**

- Rapid re-vegetation of bare ground is particularly valuable (e.g. with quick-strike rye corn, ryegrass, etc.) to provide quick cover and build-up of an organic layer. Make sure plant types are compatible with the area.
- Minimise the amount of vegetation cleared at any one time, and minimise the length of time soil is left bare.
- Retain vegetation in gullies and alongside waterbodies (as riparian or buffer strips) wherever possible, as this helps keep sediment run-off out of aquatic ecosystems.
- Where riparian vegetation has to be removed, re-plant as soon as possible with native species or other approved species.
- Keep machinery clear of waterbodies (preferably at least 5 m away).
- Keep cleared vegetation out of waterbodies, or remove it on the same day.
- When storing or disposing of vegetation, ensure it is covered and/or turned regularly to increase aerobic decomposition and reduce production of toxic leachates.

#### **4.6 Dust, Noise, and other Air Emissions**

**Avoid creating a nuisance to neighbours by managing dust and noise.**

Dust is a major problem in road works, especially in dry weather and when operating near residential and commercial areas, while excessive noise is very disruptive to people living and working nearby.

- Maintain plant and equipment properly, e.g. keep vehicles well-maintained with good exhaust systems.
- Minimise pavement burning (and in some areas, pavement burning may be prohibited or may require resource consent).
- Use water-based bituminous emulsions where possible, to minimise the amount of volatiles which evaporate into the atmosphere.

### *III. Provisional Guidelines for Environmental Management during Road Works*

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- Use thermoplastic road markings to eliminate the need for hydrocarbon solvents.
- Minimise the amount of exposed soil as this is the most effective way to prevent dust.
- Spray with water to control dust. Consider using new products available on the market, such as “dust tack”, a gum which binds dust to the ground surface.
- Talk to residents of nearby houses about timing any noisy operations.
- Consider using close-boarded fences to reduce construction noise in urban areas.
- Understand and adhere to the construction noise standards (NZS 6803P:1984).

## **4.7 Social Values**

**Road works can damage or disturb archaeological sites, historic buildings and trees, and these matters may be important to various people and groups in the community.**

The RMA has a very strong focus on recognising the environmental values held by Maori, such as protecting significant places (e.g. pa sites and burial sites which are often not publicly known).

- Identify any known cultural or historical values early in the project, to avoid unnecessary delays later.
- Do not start work on these sites until approval is granted by an authorised person.
- Where sites have special heritage values, obtain written authorisation from the NZ Historic Places Trust before work proceeds. Check with your local council.
- Consult if required with representatives of local Maori about archaeological sites and significant places that may be present and how these can be managed.

Although this is likely to have been done as part of the resource consent application, nevertheless check consent conditions before proceeding.

- Stop work immediately where any archaeological find is turned up (e.g. stone tools, human bones).
- Advise the local branch of the NZ Historic Places Trust and local Maori immediately, because work cannot continue until they remove or protect the items.

Even if it might be inconvenient to stop work, such finds are extremely important and you risk prosecution if appropriate procedures are not followed. It may be possible to continue work in other areas.

- If a Maori observer is required, ensure that they are present during excavations in sensitive areas.
- Indicate sites which are to be protected with physical barriers (such as fences). Such barriers can also be used to restrict the works to a defined area.

#### **4.8 Natural Character and Visual Values**

**People now place greater value on the natural and visual values of their surrounding landscape. Roads and road works can create obvious disturbances to surrounding landscapes and can cause long-term adverse visual effects unless properly planned.**

- Minimise soil disturbance.
- Protect valued natural features and landscapes (e.g. clumps of native bush, large trees, areas with rare birds, and coastal bluffs).
- Design roads to blend in with the overall landscape.
- Use appropriate vegetation on the road edges.
- Undertake a high standard of restoration (e.g. re-vegetation, see Section 4.5).
- Leave the site tidy and clean when works are completed.

#### **4.9 Hazardous Substances**

**Hazardous substances include chemicals, fuels (such as diesel and oil), bituminous products and highly flammable substances. They are dangerous to the environment and personnel, and need to be carefully stored and used.**

- Store all hazardous materials in a secure enclosed facility which will protect the surrounding environment from any spillages.
- Where practicable, construct a bund around stored fuel and chemicals, and around oil changing areas, to contain accidental spills.
- Always keep a spill kit on site which contains special absorption materials to soak up oil or other spills.
- Keep *Materials Safety Data Sheet* (MSDS) information for hazardous substances available on site.
- Have no leaking fuel or chemical lines.
- Service construction machines away from the site to avoid spills.
- Where possible, use mini tankers, complete with their own spill kits, to refuel machinery and vehicles on site, rather than store fuel on site (which also invites vandalism and theft).



#### **4.10 Spraying**

**Chemical spraying may be harmful to plant and animal life, including humans.**

- Avoid mixing, storing or using chemicals near waterbodies.
- Target the problem area only.
- Do not spray in windy conditions.
- Advise the public when spraying on or close to public areas.
- Wash out equipment away from waterbodies and avoid any possibility of material ponding or running off into waterbodies.
- Dispose of containers and surplus chemicals in the approved manner (i.e. as specified on packet or by the regulatory authority).

#### **4.11 Noxious Plants**

**Noxious and unwanted plants, i.e. weeds, can have dramatic detrimental effects on the survival of native plants and animals. Spreading noxious weeds is avoidable, and preventing their spread is particularly important when working within or near National Parks and scenic reserves.**

- All machinery and vehicles should be thoroughly hosed down before moving to/from a new site. This is a very simple way to prevent introduction of weeds.
- Collect road construction material from areas which are not infested with weeds, to avoid transporting weeds to a new area.
- Use appropriate sprays and seek expert advice.

#### **4.12 Waste Disposal**

**A tidy work site minimises the risks of an accident or spillage.**

- Remove rubbish and excess materials from the site regularly, and upon completion of work.
- Dispose of waste in the approved manner (e.g. as required by the regulatory authority).
- Empty portaloos at a treatment facility.
- Minimise wastes that are produced, and recycle them if possible.

### **4.13 Legal Requirements**

**It is important to ensure that you have all necessary authorisations and resource consents. Otherwise you risk possible prosecutions, delays and costs.**

- Ensure that all necessary permits and consents have been obtained.
- Read them, and understand the conditions.
- Check with the works supervisor that all relevant people have been consulted (e.g. adjoining land owners, local Maori groups).
- If in doubt, check with the local council who issued the consents. They will appreciate your concerns and should be able to answer your questions quickly.

## **5. GLOSSARY**

<b>Bund</b>	mound or embankment of earth or other material
<b>Dam</b>	a barrier or embankment which confines water
<b>Earthworks</b>	the disturbance of land surface by blading, contouring, ripping, moving, placing or replacing soil or earth, or by excavation, or by cutting or filling operations
<b>Embankment</b>	long mound of earth or the exposed face formed when soil is excavated or deposited
<b>Endhauling</b>	spoil is removed by truck to end of road
<b>Erosion</b>	the wearing away of the earth's surface (rock, soil or loose material by wind, water or ice)
<b>Fill</b>	material, usually excavated soil or rock, deposited on an area
<b>Pollutant</b>	material or substance that alters the properties of the environment in such a way as to create a hazard or potential hazard to the health, safety or welfare of any living species
<b>Road Works</b>	disturbance of landscape in order to construct or maintain a road
<b>Run-off</b>	surface discharge or flow of water that is laden with sediment
<b>Sediment</b>	mineral or organic material that has been eroded then deposited; the term "suspended sediment" is sometimes used for soil which has become suspended in water
<b>Sedimentation</b>	the deposition of sediment from suspension in water
<b>Side Casting</b>	spoil is pushed off the side of the road
<b>Silt</b>	sediment made up of predominantly small earth particles (0.02-0.004 mm)
<b>Spoil</b>	earth brought up in excavation or dredging
<b>Waterbody</b>	includes streams, rivers, lakes, wetlands, aquifers, water races, drains, estuaries, and sea
<b>Wetland</b>	includes permanently or intermittently wet areas, shallow water, and land water margins which support natural ecosystems of plants and animals that are adapted to wet conditions

## **6. ACKNOWLEDGMENTS**

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