

Areas of responsibility:

The Developer:

The developer is responsible for site planning issues and for demonstrating that environmental best practices have been incorporated into the development application. Any regulatory requirements placed on the site, such as consent conditions, should be brought to the attention of the site manager. Appropriate pollution controls should be identified and incorporated into the development proposal at the earliest possible stage.

It is the responsibility of the developer to liaise with site management (the site supervisor or builder) to discuss issues such as sediment controls, excess concrete and wash-down locations. Proper site planning can help identify and reduce site problems encountered during the construction stage.

The Site Manager:

The site manager has the overall responsibility for environmental management of the site. They are also responsible for ensuring that all workers and contractors comply with the Resource Management Act 1991 and other relevant legislation.

Ensuring that all site contractors have procedures in place to avoid discharges, reduces the environmental risk of the site considerably. The responsibility to promote and maintain appropriate environmental standards ultimately rests with the site manager.

The site manager must provide site access, excess concrete management and wash-down areas as necessary for the concrete supplier.

The Contractors

The contractor has the responsibility to ensure their activity, or the activity of their subcontractors, does not cause any environmental harm. Contractors with staff must ensure appropriate training and environmental awareness has been provided. Staff must also be provided with adequate resources (e.g. time and equipment) to avoid, prevent and remedy discharges to the environment.

All contractors should discuss existing worksite pollution control measures (e.g. washing areas and sediment control methods) with the site manager before commencing work.

Eel killed from chemical burns caused by concrete wastewater entering the stream



Legal Obligations:

The Resource Management Act 1991 is New Zealand's environmental protection legislation. Section 15 of this Act prohibits unauthorised discharges of contaminants to land or water. Put simply, this means that nothing but clean rainwater is to be discharged onto the ground, into stormwater drains or into natural waters, such as streams or lakes. Polluters face substantial penalties including imprisonment for a maximum term of 2 years or a fine of up to \$200,000, with a further \$10,000 for each day the offence continues. Environmental Infringement Notices (EIN's) are fines of up to \$1000, which may also be issued.

Section 17 of the Act also makes individuals responsible for ensuring that their activities do not result in pollution. Every person must take responsibility for his or her actions. If you are the director of a company, you are also responsible for ensuring that all of your staff are aware of this responsibility.

Section 340 allows for a person (or organisation and its directors) to be liable for the actions of employees and contractors.

ARC Water Pollution Hotline Ph. 377 3107 24 Hours



Good Practice – Containment and removal of concrete slurry and wastewater



Construction Activities

Are you an owner, developer, construction manager, contractor, subcontractor or "DIY'er"? Do you know your legal requirements to protect the environment? This factsheet provides guidelines to improve your site management and reduce environmental risk.

Water pollution issues from construction:

Concrete

Concrete and cement-related products are extremely toxic to aquatic life. The lime in cement dissolves in water and this solution causes chemical burns to fish, insects and plants. Water that comes into contact with fresh concrete, cement, or concrete dust quickly increases in alkalinity and will cause damage if it is allowed to enter waterways. It is **extremely** important to stop all concrete wastewater entering on-site drains or escaping offsite into roadside gutters and drains. Concrete wastewater requires a massive amount of dilution to reduce the alkalinity e.g. To neutralise 1 litre of cement slurry would require 10,000 litres of water (a truckload). **Attempting to dilute concrete wastewater by washing it away is not the answer; it will only create a bigger problem downstream.**

The alkalinity of concrete wastewater cannot be filtered. Hay bales, weed mat, felt or cloth do not reduce the toxicity of concrete wastewater.

Paint & Plaster

Waste paints, paint thinners and plastering compounds contain a number of pollutants. These include toxic solvents, heavy metals (e.g. lead, cadmium, chromium, mercury) and suspended solids. If discharged, these substances can:

- Smother small animals and destroy habitat.
- Prevent light (energy) from entering the water.
- Irritate, clog or destroy the gills of aquatic animals.
- Directly poison animals and plants.

These substances must never enter the stormwater system or natural water.

Sediment

Sediment is a serious pollutant and is the biggest cause of shellfish loss in our estuaries. Sediment **must** be controlled on-site. Sediment causes:

- Smothering of habitat, reduced light penetration, scouring and abrasion of aquatic life, and accelerated infilling of estuarine areas.
- Sediment also provides particles for other pollutants to attach to; either suspended or settled in our waterways it will poison and smother aquatic life. **We can't breathe dirty air- fish can't breathe dirty water.**



■ Key to site diagram

1. Concrete delivery & concrete pumping:

Proper management during the delivery and pumping of concrete will reduce the risk of contaminating roadside gutters, stormwater drains and waterways.

- **Never hose down any spillage to stormwater or natural water.**
- Where possible, ensure the delivery and pumping of concrete occurs on-site and away from stormwater drains.
- If the delivery of concrete occurs on a street, put controls in place before pouring or pumping begins (e.g. spill mats placed under pump and/or sandbags in gutter and/or blocking stormwater catchpits).
- The site manager should check that controls are in place before pouring or pumping begins.
- Sweep or shovel any spills that occur and allow residue to set before removing.
- Truck and equipment **must** only be washed in a designated wash-down area.
- Trucks should not track any concrete or mud and sediment off site. All tyres must be clean before vehicles leave.
- When selecting a supplier or pumping contractor, ensure they have an Environmental Management Plan (EMP) that includes appropriate environmental training for employees and contractors, as well as emergency response procedures.

2. Creating designated wash-down areas on site:

Establish and maintain a designated washdown area on site. This allows workers and subcontractors to properly wash equipment, tools, paint brushes, trucks and vehicles without contaminating the stormwater system.

- Decide on the location of the wash-down area during the planning stage. The proposed area should be highlighted in the site management plan. Choose a location on site that provides best access for contractors and their equipment.
- Locate the washdown area away from drainage lines and stormwater pits.
- Ensure all contractors are aware that a wash-down area is available. It should be clearly signposted.
- Scrape excess concrete and mud off equipment before it is washed.
- Place excess concrete into a site receptacle and allow setting.
- Use high pressure, low volume water spray nozzles to minimise the amount of wastewater.
- Wastewater may be reused or allowed to soak into the soil, ensuring that there is no flow to natural water or the stormwater system. The hardened residue may then be placed in a designated concrete/masonry recycling bin on site.
- The site manager should monitor areas used for on-site concrete wash-down and excess concrete handling on a regular basis.

3. Concrete, brick and tile cutting:

When mixed with water, the fine particles produced by concrete cutting are just as toxic as fresh concrete. The products can be highly alkaline, contain oxides, heavy metals or petroleum products. Any dust or wastewater generated from these activities must be controlled and disposed of appropriately.

- Before starting work, assess the site and block off all stormwater drains using drain plugs, sand bags, etc. Set up equipment away from stormwater drains.
- Do not dry cut if possible. If a dry cut is made, collect dust by sweeping or vacuuming.
- Divert runoff away from street gutters and stormwater drains to ground soakage or use a wet vac (or sucker truck) to collect cutting water.
- Monitor control measures regularly to ensure they are working effectively. Ensure the ground can soak up the wastewater effectively.
- Immediately after job completion, shovel, sweep, or vacuum any residue left in street gutters. **Do not hose residue down the stormwater system.**

4. Washing exposed aggregate concrete:

Exposing concrete aggregate is a **high-risk activity** due to the high volumes of **toxic wastewater** generated and the proximity to stormwater drains and roadside gutters.

- Before starting work, assess the site and block off all stormwater drains using drain plugs, sand bags, diversion booms etc.

- Use as little water as possible. Use high-pressure, low-volume washing equipment if possible.
- Divert runoff away from street gutters and stormwater drains to ground soakage, or use a wet vac (or sucker truck) to collect wastewater.

5. Sediment Control:

The cumulative effects of sediment discharges from Auckland's many individual building and earthworks sites has a major effect on waterways, degrading their ecology and reducing recreational and economic value.

- Preventative measures reduce cost and effort – unexposed soil can't erode and doesn't need capturing in sediment control measures.
- A stabilised entranceway should be the first works to occur on site. Soil transferred to the roadway by vehicles will be washed into the stormwater system. All vehicles should use it for site entry and exit. Plywood sheets or metal aggregate laid down at site entranceways can be used for successful stabilisation. Vehicles should not track any mud or sediment from the site to the road.
- Silt fences are useful for lesser disturbed areas or sloping areas. For steep slopes, use more than one silt fence and decrease the spacing between fences as slope increases. Check condition of all fences on a regular basis.
- Diversion earth bunds may be constructed across slopes and near the edges of the site to control and direct runoff while. Bunds may be constructed from clay from the site.
- Minimise exposed areas. Disturb as little soil as possible at any one time and maintain vegetative cover if possible. Plan ahead. Stage disturbance and stabilise exposed areas as soon as possible using straw mulch, aggregate or other materials such as geotextile. Where appropriate grass should be sown as soon as works are completed.
- Material from trenching and excavation (e.g. piles of dirt) should be stockpiled away from low points, runoff channels or kerbs. Stockpiles should be covered with plastic, tarpaulins or hay etc. This will prevent sediment washing away during rainstorms and reduce wind-blown nuisance.
- Separation of clean water and dirty water will greatly reduce the effort needed to prevent sediment runoff. Divert all upstream runoff away from the site with a stabilised bund or diversion channel. During construction, roof runoff may be diverted to the kerb by connecting a non-perforated pipe to the downpipe outlet.
- The use of a dewatering tank is good for storing dirty water from trenches. Once the tank is full, leave it to settle, until cleared, and then siphon the water out to an unsealed area. Make sure the sediment that has settled on the bottom is not disturbed. Siphon from the top.
- Do not pump sediment water directly to the kerb or catchpit. Direct this water to a silt fence, decanting earth bund or storage tank. Never pump from the bottom of a trench or tank, as this will move any settled sediment.
- **HAYBALES DO NOT, CANNOT, AND WILL NOT FILTER SEDIMENT-LADEN OR CONCRETE WASH WATER!**
- Haybales may only be used to divert sediment-laden or contaminated water to treatment devices such as decanting earth bunds or unsealed earth. It is important that they are installed correctly.
- Filter cloth across catchpits should only be used on a temporary emergency basis. Filters are not an effective control measure they block quickly and are difficult to install and maintain. Proprietary catchpit inserts, consisting of geotextile-lined cages, which sit under the catchpit grate, are another option. These filters need to be monitored regularly and replaced after each rain event. The cages can be used on any site. These inserts are also a last resort and are not intended for use as a treatment device.
- Ensure controls are regularly maintained check controls regularly for leaks. Controls should be cleaned out if they become more than 20% full of sediment. This sediment may sometimes be re-spread over the works area.

More information on measures suitable for both large and small sites is outlined in ARC's "Erosion and Sediment Control Guidelines for Land Disturbing Activities" (TP 90). To get this publication, or for other enquiries call ARC on (09) 366 2000 or visit the ARC website www.arc.govt.nz (search "Publications").

Remember – Stormwater Systems are exclusively for removing clean rainwater. They only drain rain