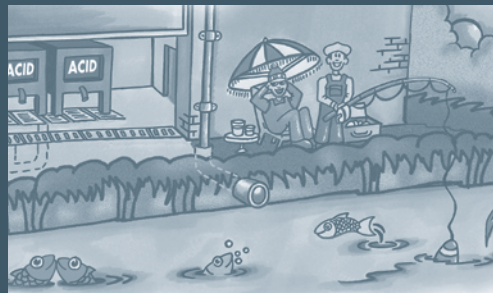


**POLLUTION
PREVENTION
GUIDE:**

Drainage



Report: R08/26

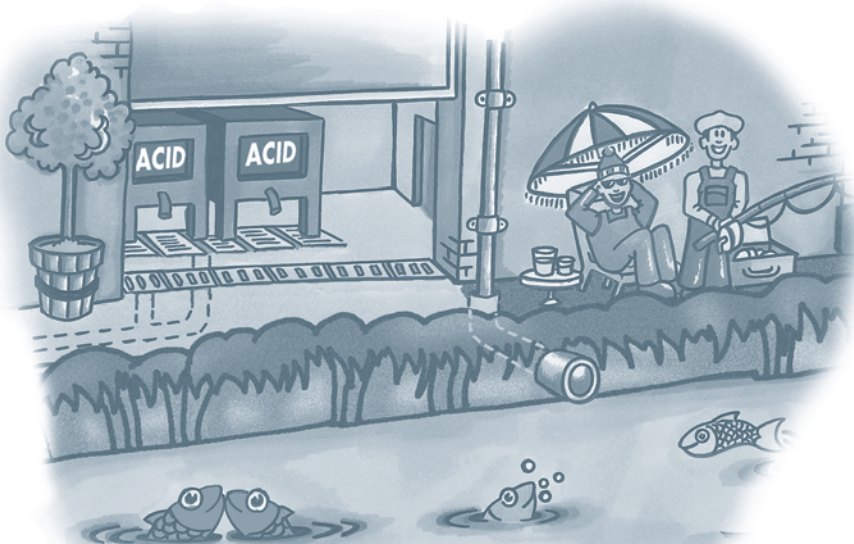
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PPG: Drainage Module



**Environment
Canterbury**
Your regional council



DRAINAGE

When it comes to drainage on sites, it is often a case of out of sight and out of mind. It is easy to think that once a material goes down the drain it is no longer a problem. However, the drainage from your site is one of the most important routes by which pollutants enter the environment. To prevent water pollution, you must understand the difference between drains on your site.

On most sites there will be two types of drain:

- Storm water pipes collect rainfall that lands on OUTDOOR surfaces like roofs, roads, yards, driveways and car parks. The rain running off these surfaces is channelled through storm water drains in to road gutters, yards and parking lots into storm water pipes. These pipes carry this runoff to a stream, harbour, beach, lake or underground water systems
- Sewers collect waste flows primarily from INSIDE houses, offices, factories, hotels, shops, schools and other buildings in the city. Wastes from sinks, laundries, toilets, baths, showers and liquid trade wastes from most industrial processes flow through the sewer network to a treatment plant where they are treated before being disposed of into the environment.

Contaminants or wastes that get into storm water pipes end up untreated in our rivers, harbours or groundwater.

Most of Canterbury's urban pollution happens because people don't know where storm water pipes go. So they misuse storm water drains for waste disposal or let polluted runoff get into them.

USE EACH DRAIN FOR THE RIGHT PURPOSE:

- Only uncontaminated rainwater goes down your storm water drain
- Only trade waste, toilet waste and gray water goes into the sewer.

If toilet or trade wastes get into storm water pipes, they come out untreated and pollute streams, beaches or groundwater.

If storm water gets into the sewer, it floods the sewers and pump stations which pump sewage to the treatment plant, causing overflows of untreated sewage and industrial wastes onto private properties and into rivers, streams and the sea.



STORM WATER PROTECTION SYSTEMS

All storm water leaving your site has the potential to be carrying contaminants, for example:

- Small oil leaks in car parking areas
- Soot from roof water
- Rainwater coming into contact with uncovered waste storage areas
- Sediment that is washed or blown off stock piles and areas of bare ground, or tracking from gravelled areas.

Sediment is one of the most significant contaminants of our streams, lakes and coastal waters. Industrial sites are a major source and sediments are likely to carry other pollutants including, metals and petroleum compounds.

You are responsible for ensuring that storm water running off your site is clean. Good housekeeping can go a long way towards this (see Housekeeping Module) but storm water from some parts of your site may need to be treated before it can be discharged into the environment.

You can make your storm water treatment system very cost-effective by minimising the extent of contaminated runoff on your site and diverting clean storm water away from your treatment system. This will target your 'hot spots' and treat only contaminated runoff.

Keep your storm water clean

- Use roof water for non critical site water uses to reduce the amount of storm water running off the site
- Cover waste storage and regular stockpiling areas to prevent rain coming into contact with waste or sediments and contaminating storm water
- Plant unused areas in grass to reduce sediment loading of storm water runoff – it also improves the appearance of your site
- Pass storm water runoff over a grassed swale (shallow channel) which forms part of the site landscaping and removes contaminants and sediment
- Outdoor drum storage and other high risk areas (for example, loading and unloading areas) could be either roofed with secondary containment that discharges to the sewer, or have runoff passing through a treatment device before it is discharged
- To prevent oil and diesel getting into storm water install oil interceptors in refuelling or car parking areas. Detergents should not be washed into interceptors
- Inspect and maintain storm water catch pits regularly, empty them out before more than 60% of the space between the out flow and bottom of the pit is filled with sediment
- Manage storm water flows on, off and through your site to eliminate contact between storm water and sources of contamination (including sediments)
- Even things like saw dust or bark can affect water quality and the ability for fish to breathe.

TRADE WASTES

Trade wastes from manufacturing or industrial processes may be discharged into the sewer for treatment and disposal. Some firms have dedicated sewer lines for their trade wastes which hook into the area's main sewer.

Why do you need consent to discharge trade wastes?

To ensure:

- The health and safety of sewer and treatment plant workers are protected
- The integrity of the sewer system and the waste treatment plant
- The environments where the treated wastewater and sludge are disposed of are protected
- You pay a fair share of the cost of treating and disposing of your wastes.

If you discharge trade wastes into the sewers, you may need consent from your city or district council. If you don't know whether or not you need a trade waste consent, ring the trade waste section at your district or city council and tell them:

- What material you discharge
- How much you discharge
- Whether storm water is excluded.

And they will advise you of any requirements. For contact details of district and city councils in the region see Useful Contact fact sheet.

What are the potential problems?

- Wastes which contain solvents, acids or alkalis (bases), explosive, poisonous or other dangerous substances pose a health risk to sewer staff and the public. They can also cause damage to the system that is expensive to repair
- Metals in some trade wastes can make the sludge from the waste treatment plant toxic and difficult to re-use or dispose of safely
- Sewer overflows occur if the volumes discharged exceed the sewer capacity or if discharges occur at times of peak sewer flow
- High loads of fats or solids clog drains and pump stations, causing overflows.

What are your responsibilities if you have a trade waste consent?

You must comply with the conditions of your consent and maintain any treatment systems you have, to avoid damaging sewers or causing overflows into the environment.

Call your district or city council to find out what its by-laws say.

What are the alternatives if your waste is unacceptable for discharge to the sewer?

If your trade waste is not suitable for disposal into the sewer, you will need to find a responsible waste operator who will take care of it for you at a licensed treatment and/or disposal facility (you may have to pre-treat some wastes).

When choosing a waste operator it is a good idea to look for one that uses the internet based Waste TRACK system. This enables you to monitor where and how the waste you generate is disposed of. See the Wastes Module or www.wastetrack.co.nz for further information or ask your waste disposal contractor if they use the system.

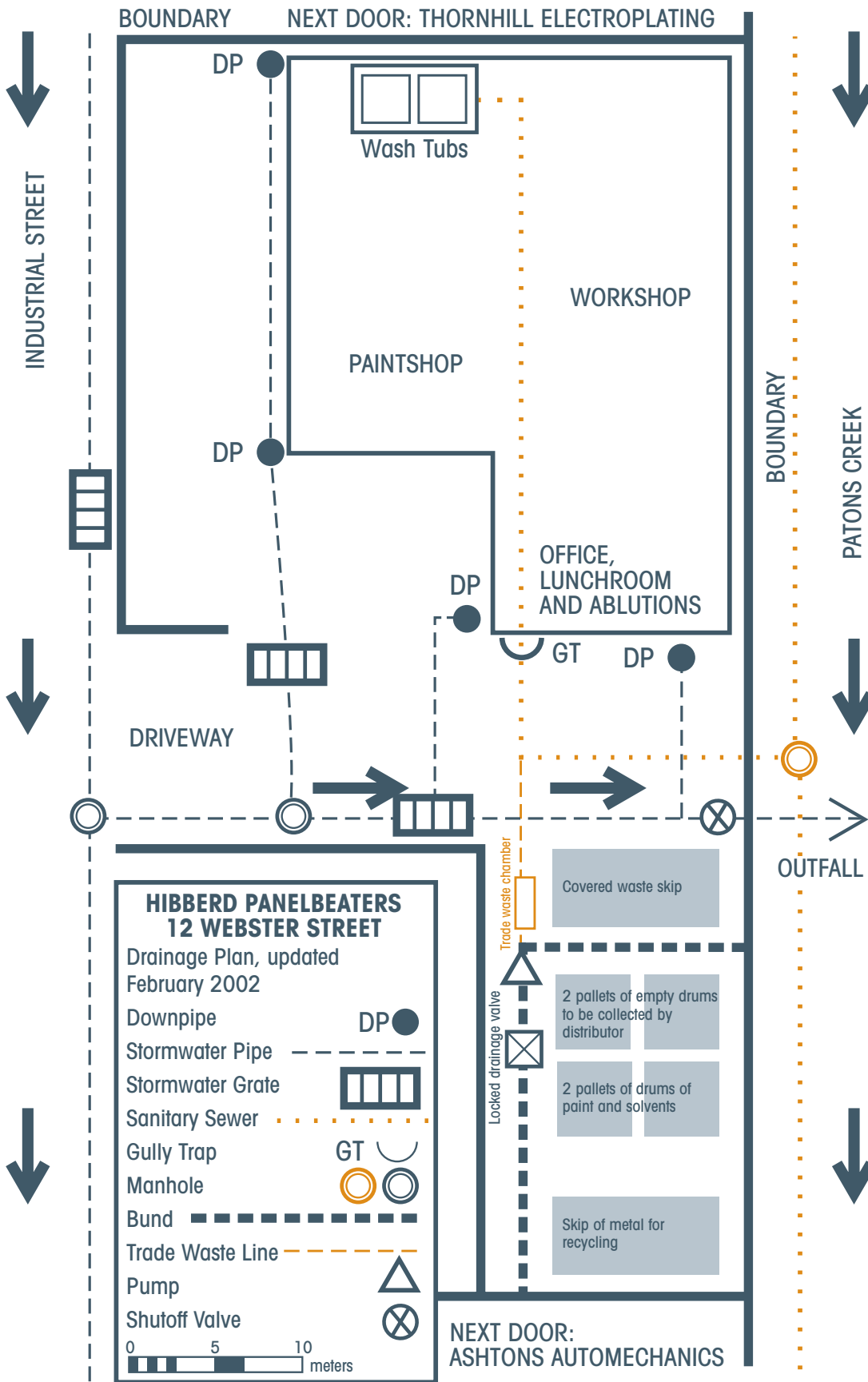
DRAINAGE PLANS

If you don't know where your drains go and what's going into them, then, unknown to you, your site could be causing water pollution - a serious state of affairs for your local environment and your company's environmental liability. You should develop a site drainage plan which identifies all sewer and storm water pipes on your site.

You need to:

- Find your drainage plan
- Get it up to date with our simple checklist
- Your drainage plan must be up to date, but most firms' plans are very outdated and inaccurate. Walk all over your site to find out:
 - Where do all your drains go
 - Are they all being used for the right purpose
 - Are they all shown on the plan
- Here are some common mistakes found on industrial sites:
 - Wrong connections, for example outside sinks hooked into down pipes going to storm water drains, or roof water put into the gully trap going to the sewer
 - No raised walls around gully traps, allowing surface water from the yard to flow into the sewer
 - Holes in roof guttering and broken or crushed down pipes that do not reach the ground meaning storm water does not go where it is intended.

An example drainage plan is shown on the next page.



IN THIS MODULE

	Done	Date
Your drainage plan	<input type="checkbox"/>	<input type="text"/>
Storm water	<input type="checkbox"/>	<input type="text"/>
Wastewater	<input type="checkbox"/>	<input type="text"/>
Wash down areas	<input type="checkbox"/>	<input type="text"/>
Your water supply	<input type="checkbox"/>	<input type="text"/>
Finalising your drainage plan and site labelling	<input type="checkbox"/>	<input type="text"/>
Other (specify) <input type="text"/>	<input type="checkbox"/>	<input type="text"/>
Urgent action	<input type="checkbox"/>	<input type="text"/>
Cross check	<input type="checkbox"/>	<input type="text"/>
Drainage plan updated and filed	<input type="checkbox"/>	<input type="text"/>
Action list	<input type="checkbox"/>	<input type="text"/>

DRAINAGE

YOUR DRAINAGE PLAN

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

1. Can you find the drainage plan for your site?

If NO ask your city or district council if they have one. If you rent your site, ask your landlord for a copy of the drainage plan or ask them to obtain the plan on your behalf from the city or district council. If the council does not hold a copy, you will need to get a new one drawn up that shows all the things in these checklists relevant to your site. If your site is old or has complex drainage you may require some assistance; look in the Yellow Pages under DRAINAGE CONTRACTORS, DRAINLAYERS or ENGINEERS - CONSULTING.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

2. Your drainage plan should show:

- Site boundaries
- All activity areas with labels showing their use (include all indoor and outdoor areas and buildings)
- Storm water pipes and their inlets, down pipes, storm water drains and manholes
- Any open drains
- Any low point where runoff might pool
- Direction of flow of sewers and storm water pipes
- Neighbouring sites and what happens there, especially if these are sensitive activities like a kindergarten, hospital, rest home, wetlands etc
- Water bodies and their direction of flow
- Your sites soak pit, if you are not connected to a reticulated storm water system
- Unsealed areas (open ground) or where un piped runoff leaves your site
- Storm water treatment systems, for example:
 - oil or grease interceptors
 - -flow control or shut-off devices on sumps
 - -swales
 - -ponds
 - -filters
- Clearly identify the sewer and storm water systems (colour coding is useful).

Now go through the next sections about storm water and wastewater to make sure your drainage plan is accurate and up to date. This process will help you make sure your site is not polluting Canterbury's rivers, groundwater, harbours or sea.

STORM WATER

Storm water pipes are not wastewater pipes.

Check that only storm water - clean rainfall runoff - gets into your storm water system.

3. Are all storm water pipes and inlets connected to the storm water system?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

4. Do your storm water pipes contain any trace of waste? Wastes include:

- Boiler blow down waters
- Sewage
- Compressor condensates
- Trade wastes
- Treated recirculated cooling water
- Wash bay or wash down water
- Other process waste waters
- Sediment.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

If YES, you will need to trace the source of pollution and remove it. Depending on the level of contamination you might need to contact a liquid and hazardous waste contractor to remove the pollution.

5. Are any waste pipes connected to the storm water system?

If YES and you find any of these connect into down pipes or direct into storm water pipes, then:

- **Remove the connection immediately from the down pipe or storm water**
- **Discuss the problem with your city or district council to find out how to legally connect your waste pipes to sewer**

Failure to do so will result in pollution and increase your risk of prosecution.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

6. Are there areas on your site where storm water runs freely across outdoor surfaces during or after rain?

If YES does the storm water come into contact with:

- Stockpiles that could be washed away
- Areas of bare soil or gravel
- Wash bays and wash down areas
- Any spilt substances or storage areas
- Refuelling areas?

If YES; you will need to manage the storm water entering and exiting these areas. If not managed properly rainwater will pick up contaminants and discharge them to the local waterways or groundwater. Some areas, such as refuelling areas and hazardous substance stores, will require some form of onsite treatment before storm water can be appropriately disposed off.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

DRAINAGE

Storm water outfalls

If you know where storm water from your site reaches a river, stream or beach, you will be able to go straight there to contain a spill that gets off your site.

NO YES

7. Do you know where the last storm water manhole and/or waste trap/inspection point is on your site where you can intercept a spill and stop it from escaping from your site?

NO YES

8. Does the drainage plan show or point to the place where your on-site storm water pipes discharge into either:
- The council's reticulation system
 - A soak hole
 - An open watercourse or harbour?

Show or tell your staff where your storm water ends up, to make them more aware of the consequences of a spill.

Outdoor activities and facilities

Spills, leaks and runoff from outdoor facilities such as loading and unloading areas, stockpiles (that could be blown or washed away) and waste storage areas can contaminate the storm water system and cause pollution.

NO YES

9. Does your drainage plan show every OUTDOOR activity such as:
- Loading/unloading areas
 - Decanting areas
 - Refuelling and/or lubricating oils storage areas
 - Pumping or dispensing areas?

NO YES

10. Does your drainage plan show all areas where materials are stored:
- Raw materials
 - Regular stockpiling areas for resources (that can be blown or washed away)
 - Wastes, including hazardous wastes
 - Cleaning liquids or other cleaning products
 - Biocides (like weedkillers)
 - Other hazardous substances (fuel, paint)
 - Underground storage tanks
 - Above-ground storage tanks
 - All finished goods?

NO YES

11. Does your drainage plan show any other outdoor areas that could pose a water pollution risk:

- Other (please specify): _____
- Other (please specify): _____

WASTEWATER

Wastewater pipes are not storm water pipes. Wastewater is anything that is not clean rainwater. Check that no storm water (rainfall runoff) gets into your sewer drains.

Closed loop systems

Look for any liquid circulation or recirculation systems like hydraulic oil systems or cooling water. Although these do not generally discharge, they have the potential to cause pollution from leaks or ruptures.

Disused systems

You may not need to show these on your main drainage plan, but you do need a map of any old pipes and underground storage tanks on your site, as pollution problems can sometimes be traced back to them. The older your site the more likely it will have disused pipe systems; you may need to contact a drainlayer to assist with this.

12. Does your drainage plan show:

	NO	YES
<ul style="list-style-type: none"> Sewer pipes on the site and their inlets: gully traps, internal floor drains, manholes, toilets, sinks and trade waste connections 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Closed loop systems, including: <ul style="list-style-type: none"> – all inlets and top up points – all outlets from maintenance discharges – all overflows from liquid process systems, including recycling or recirculating systems and pressure release points 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Disused systems, consider: <ul style="list-style-type: none"> – old pipes – underground storage tanks 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> Other wastewater systems 	<input type="checkbox"/>	<input type="checkbox"/>

13. Is every gully trap walled off to prevent storm water runoff getting in to it?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

14. Are these gully traps properly contained or connected to the trade waste or sewers?

For example:

- Trade wastes from process areas, laboratories, etc.
- Wastes from toilets and changing rooms, cafeteria etc.
- Any floor drains in indoor areas.

Other (please specify): _____

If NO then discuss it with your city or district council and connect the pipe legally to the sewer. Failure to do so will result in pollution and increase your risk of prosecution.

DRAINAGE

NO YES

15. Are all facilities (disused systems) no longer in use properly drained and/or decommissioned?

WASH BAY AREAS

One of the consequences of cleaning equipment on your site such as vehicles, machinery or containers is the production of wash bay water that can contain oil, grit, dirt, concrete dust or chemicals. Contaminated wash water must not get into storm water.

NO YES

16. Is all wash water on your site disposed of either via trade waste consent or resource consents, or in a way that storm water or groundwater is not contaminated?

If NO then look at some of the management options described below and see if any of these could be used on your site.

OPTION 1: Use a dry wash method - anti-static brushes, wet rag/dry rag, bucket and rag - on vehicles, containers and equipment.

OPTION 2: Take vehicles, containers or equipment to a responsible commercial washing facility with a sewer connection or recirculating system.

OPTION 3: Dispose of 100% of your wash waters to the sewer via an approved connection: fully contain and roof the wash bay to contain wash water and eliminate storm water. You may need a trade waste consent or a building permit to do this, so call your city or district council to find out.

OPTION 4: Recycle 100% of your wash water. Fully contain the wash bay to contain wash water and EITHER roof it to eliminate storm water OR put storm water into the treatment and storage facility as top-up, with an overflow to direct excess clean runoff into the storm water system.

OPTION 5: Recycle most of your wash waters and dispose of the excess to the sewer via an approved sewer connection or to a holding tank for removal by a responsible liquid and hazardous waste contractor. You will still need to fully contain the wash down area and EITHER roof it to eliminate storm water OR use a demand-driven first flush diversion valve to divert the first 10mm of rain to the wash water treatment facility.

OPTION 6: Collect and treat wash water for disposal to the storm water system or to natural water. You will need a resource consent from Environment Canterbury and use of detergents, degreasers or chemical additives is unlikely to be allowed.

NO YES

17. Are all wash down areas maintained in a clean state to prevent the build up of contaminants on surfaces, and operated in accordance with consents?

18. Do you have maintenance contracts with your suppliers, a site management plan or monitoring plan to ensure good ongoing performance of:
- First flush/diversion valves
 - Treatment/recirculation systems
 - Other wash down equipment.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

Trade wastes

19. Do you have a trade waste consent?

You will need one if you are a commercial or industrial trade premises discharging any process water to the sewer other than just toilet waste.

If you are unsure whether or not you need a trade waste consent contact your local district or city council. Details of the region's local authorities can be found in the Useful Contacts fact sheet.

You cannot discharge waste water directly to soak pit or surface water without resource consent from Environment Canterbury.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

20. Do you keep accurate records of how much liquid waste you discharge and how much it costs you every year to dispose of it to the sewer?

See the Waste Module for more information on the cost of waste, and how to do a waste audit.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

21. Do you get any waste treatment, storage or disposal contractor/s to remove your liquid trade waste?

If NO, did you know it is a requirement to ensure that your waste is removed from your site by either a trade waste consent or a qualified liquid handler.

If YES do you know:

- Who takes it away
- What do they do with it
- Date, volumes, mass, and types of wastes removed
- The cost of removal
- Does your waste contractor use WasteTRACK or a similar waste tracking system?

www.wastetrack.co.nz

It is important to know that you are legally still the owner of your waste even after it has been removed from your site. Furthermore you are liable for what your waste disposal contractor does with waste from your site. See the Waste Module for more information on tracking and auditing your waste.

NO	YES	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

YOUR WATER SUPPLY

If you provide your own water supply, you need to show this on your drainage plan too. It's in your own interest to protect it!

NO YES

22. Do you provide your own water supply from a bore (well), river or roof supply?

If YES, you need to show this on your drainage plan.

NO YES N/A

23. If you provide your own water supply from a bore (well), or surface water; do you have a resource consent to do so?

If NO then contact Environment Canterbury immediately to apply for consent. To find out more information call Customer Services (03) 353 9007 and 0800 EC INFO (0800 324 636) and ask for information on Bores and Groundwater and Taking Surface Water to be sent to you.

NO YES N/A

24. If you draw water from a bore is it fitted with back flow prevention to protect the groundwater resource?

If NO, Environment Canterbury requires all groundwater bores to have a device fitted within the pump outlet plumbing or within the mainline to prevent backflow of water into the bore. You will need to investigate the options available to you, contact Customer Services (03) 353 9007 and 0800 EC INFO (0800 324 636).

IDENTIFYING YOUR DRAINS

One of the most common reasons for water pollution incidents is a lack of awareness of the purpose of drains.

NO YES

25. Are workers on your site easily able to tell which drains on your site lead to sewer and which are storm water drains?

If NO, use the stencils available from your Pollution Prevention Officer. Labelling storm water drains and colour coding manholes is a simple and successful way of making sure that anyone working on your site does not tip anything down storm water drains. An easily recognisable colour code system is:

- **red** for sewer or trade waste sewer manholes, pipes and drains
- **blue** for storm water manholes, pipes and drains.

ECan has designed 3 stencils:

Rain Only	Drains to River for identifying storm water drains connected to a reticulated storm water system.
Rain Only	Drains to Our Drinking Water for identifying soak pits or storm water drains connected to a soak pit.
Process Drain	for identifying drains connected to the sewer system or a managed waste storage tank.

FINALISING YOUR DRAINAGE PLAN

26. You need to easily tell the difference between the sewer and the storm water network on the drainage plan, including any dedicated trade waste lines. Have you colour coded pipes, manholes and other drainage facilities on the plan:

- red for sewer and trade waste sewers
- blue for storm water pipes?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

27. Have you checked for evidence that changes have been made to your drainage system - you must ensure that they are legal and that there are no wrong connections between storm water and sewers.

Especially, look for:

- strips of concrete that indicate new drains have been laid or new connections put in
- any pipes that join to roofing down pipes.

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

28. Have you checked around the back of every building or outdoor storage area for hidden or forgotten drains?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

29. Have you found any pipes which drain to an unknown destination?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

If YES you need to trace which system they connect to - Try:

'Yell' test: get someone to lift a manhole lid on the pipe concerned and someone to lift one on other pipes it might drain into and shout until the volume indicates you've found the right drain (be careful about putting your head down a drain if harmful wastes are likely to be present)

A smoke test

A dye test

Or, as a last resort, a video inspection.

Look in the Yellow Pages under DRAINAGE CONTRACTORS for firms which can do dye, smoke testing or video inspections of drains for you.

30. Do you have ongoing untraceable pollution problems?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

If YES, consider checking the integrity of your pipes by video inspection. This will indicate old, broken, collapsed, corroded or clogged pipes as well as unknown pipes and illegal connection. You should inform your city or district council or Environment Canterbury, if you find any of the above problems, they may be able to help.

Look in the Yellow Pages under DRAINAGE CONTRACTORS, DRAIN LAYERS or ENGINEERS-CONSULTING.

DRAINAGE

MORE DETAIL FOR YOUR SITE

As you walk around your site and make new observations, there may be extra things you see that you may want to add. If so, add them here.

ITEM: _____

ACTION: _____

ITEM: _____

ACTION: _____

ITEM: _____

ACTION: _____

■ URGENT ACTION

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

31. Do you treat and/or discharge any wastes, liquid or solid:

- into or onto land
- into the storm water system
- directly into any natural body of water?

Examples include:

- wash waters
- process waters
- boiler condensate/compressor blowdown.

DISCHARGES OF THESE OR OTHER WASTES ARE ILLEGAL UNLESS YOU HAVE A RESOURCE CONSENT OR IT IS A PERMITTED ACTIVITY

If you answered YES to any one or more of the above questions, you must discuss this with Environment Canterbury's Customer Services (03) 353 9007 and 0800 EC INFO (0800 324 636). The activity may be permitted, or you may need to apply for a resource consent, or they may be able to advise you about a cost effective and/or more environmentally friendly way of dealing with your waste which does not require a consent.

You must also prevent any more discharges until you have fixed the problem.

CROSS CHECK

32. On your drainage plan do any red and blue pipes join up anywhere, or does a red line go into a watercourse?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

If YES, this indicates a cross connection, for example a sewer connected to storm water or storm water getting into a sewer. You must engage a registered drain layer immediately to fix the problem to prevent further water pollution from your site. You must also prevent any more discharges until you have fixed the problem.

33. Do you have a staff training programme and make sure these key items are covered in it:

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

- The difference between storm water pipes and waste sewers
- What should and should not go down each system
- Where the storm water outfall for your site is.

34. Have you updated your drainage plan to indicate any works you have undertaken that affect your drainage system?

NO	YES
<input type="checkbox"/>	<input type="checkbox"/>

Once the drainage plan is complete, write the date on it, and on the page overleaf and keep the drainage plan behind it.

ACTION LISTS

If you ticked a (highlighted box) then this is an action you need to take.

Put all actions on a copy of the ACTION LIST at the end of this module.

SIGNS OF SUCCESS

By the time you have gone through the Drainage checklists you should have achieved these key successes:

- Each drain is only used for the right purpose
- All manholes on site are either painted red for sewers or blue for storm water
- Your drainage plan is accurate and up to date
- Your storm water drains have labels by them saying "Rain Only - Drains to River"
- Your storm water drains have labels by them saying "Rain Only - Drains to our drinking water"
- All your staff understand the difference between storm water pipes and sewers:
 - Storm water only for rain
 - Sewers only for wastes
- All your staff understand the colour coding of manholes on site.

