

Directional Drilling

If you have any questions about this procedures sheet contact Rotorua Lakes Council - Pollution Control

1. WHEN SHOULD I USE THIS SHEET?

This Best Management Practice (BMP) applies to any site where directional drilling is occurring, regardless of site size or duration of works.

2. WHAT'S THE AIM?

Stormwater systems must only drain rain.

To manage directional drilling operations; protecting downstream receiving environments (e.g. kerb channels, stormwater cesspits, groundwater and natural water bodies) from sedimentation and water quality degradation.

3. WHY MANAGE DIRECTIONAL DRILLING?

Directional drilling, or otherwise called directional boring, horizontal directional drilling or HDD, is the practice of drilling of non-vertical bores with a drilling rig. Directional drilling is a common method of installing underground pipes and conduits along a prescribed bore path from the surface.

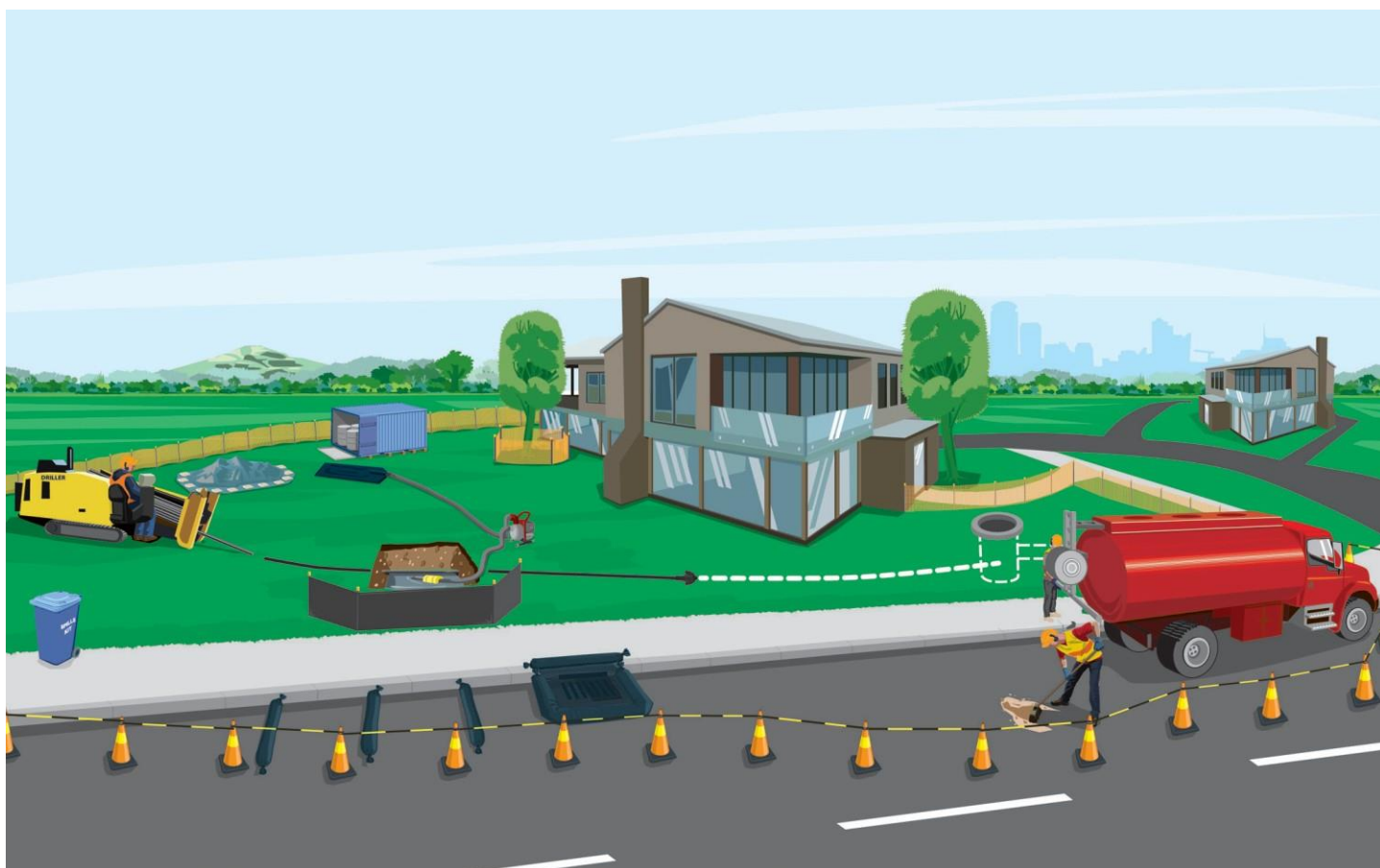
Most directional boring machines use a high pressure jet of drilling fluid, which is generally a mixture of bentonite clay, water and additives, to cut through the soil and form the bore. The soil cuttings become suspended in the drilling fluid, which flow to a containment pit where the slurry is either allowed to soak in or is removed through dewatering methods.

Directional drilling excavations and the production of drilling slurry pose a risk of sediment and other contaminant discharges to the environment. 'Clean' stormwater and groundwater can also accumulate in containment pit, resulting in sediment laden water that must be managed appropriately.

If discharged these substances can:

- Clog the gills of fish and damage other sensitive tissues through abrasion;
- Suffocate aquatic plants, fish and insects by smothering them;
- Reduce the amount of light entering the water, which can stop plants and algae growing – removing a major food source for fish and insects;
- Burn and poison aquatic plants and animals;
- Interfere with fish vision making them vulnerable to predators or unable to see their prey; and
- Increase the risk of flooding.

Other contaminants contained in the drilling fluid, such as polymer extenders, and copper drill lubricants can result in a range of adverse effects on natural habitats and ecosystems, and may pass through the food chain and concentrate in the tissues of fish, birds or humans.



Best Management Practice - Directional Drilling

4. SITE MANAGEMENT AND ENVIRONMENTAL CONTROLS.

FORWARD PLANNING – BEFORE YOU START WORKS.

- Before you start works identify the potential environmental risks and define how these can be mitigated or reduced through site practices or environmental controls.
- Check the lay of the land and decide where any run-off is likely to go. Pay particular attention to receiving environments.
- Identify the path of the bore-mark the location of underground services (call 0800 B4UDIG (0800 248344) and where drilling works are likely to occur in and around trees. Gain any necessary approvals, protect and carefully manage works to avoid impacts on services and trees.
- Have a plan to deal with incidents and emergencies-keep a fully stocked spill kit on-site and make sure staff are well trained in spill response and emergency management procedures (refer to Spills and Emergency Management BMP).
 - be aware of pathways to receiving environments when refuelling or refilling the drill rig with drilling fluid and take steps to minimise risks.
- Identify a person who will be responsible for ensuring environmental practices and controls are followed and implemented prior to starting works.

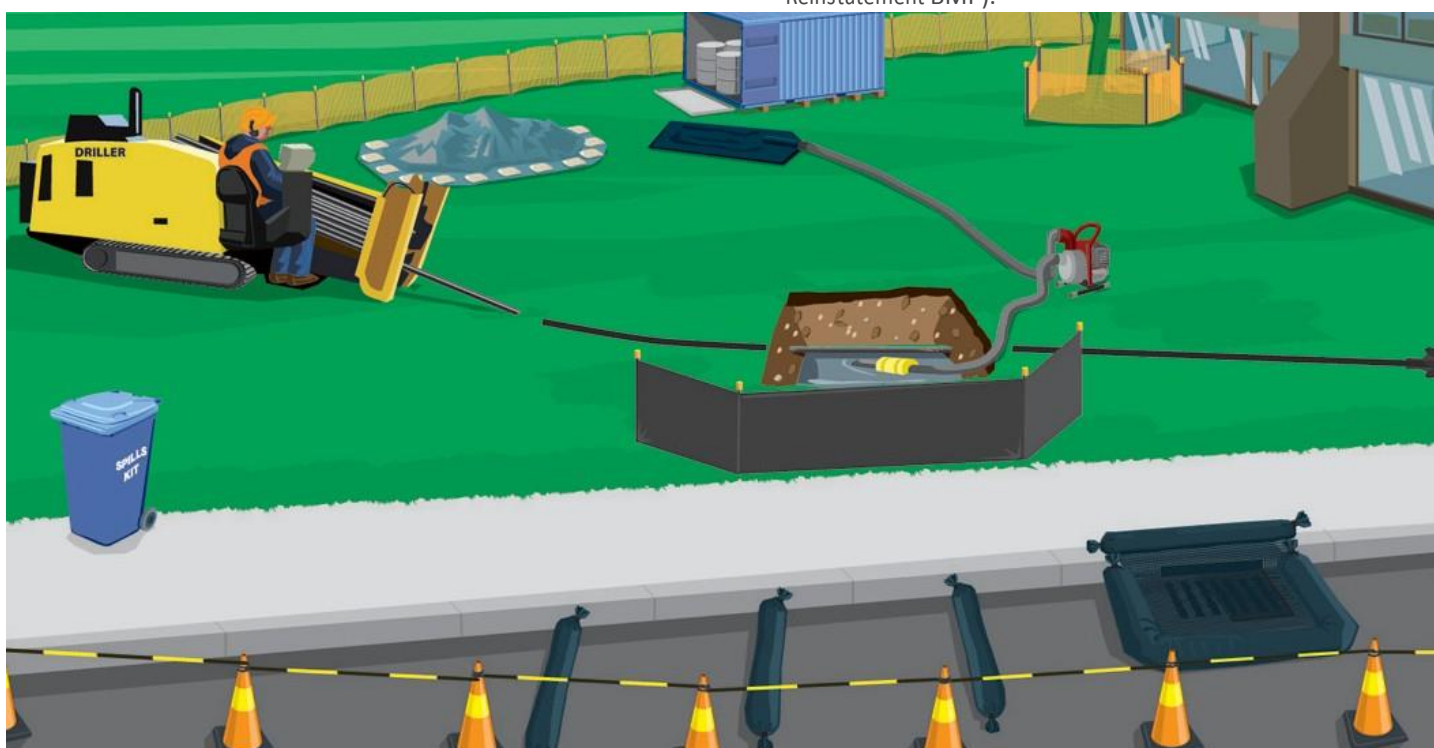
ENVIRONMENTAL PRACTICES AND CONTROLS.

- Try to maintain a grass berm between drilling operations and the roadside.
- Put in place clean water diversions (e.g. bunding, sandbags etc.) at stages uphill of the site to divert stormwater around the works. This will help to reduce the amount of water that you have to manage.
- Put in place sediment controls around the works (e.g. bunding, silt fences etc) to prevent sediment runoff.

- Install stormwater cesspit protection measures as a form of secondary control (refer to the cesspit Protection BMP). Often multiple cesspits will need to be protected.
- Avoid stockpiling of soil on-site.
- If stockpiling is required, identify an appropriate area for spoil or stockpiling of soil away from receiving environments. Do not stockpile material near stormwater cesspits, kerb channels, near any surface water body or in over-land flow paths or on gradients steeper than 15%.
- Cover stockpiles (e.g. with a tarpaulin, polythene sheet or geotextile fabric) to prevent sediment runoff.

CONTAINMENT PIT

- Put in place sediment controls around the area to be excavated for the containment pit (e.g. silt fences etc.) to prevent sediment runoff.
- Dig a containment pit of appropriate size to contain the drilling slurry, groundwater ingress and any rainfall that may occur (refer to the Sediment and Dust Management BMP to manage sediment during excavations).
- If there isn't enough room to dig a containment pit, use other containment options such as drums or wasteships.
- Working spoil should be placed up slope of the entry/exit pit so that any runoff will flow into the pit.
- When possible, allow the drilling slurry and any other accumulated water to soak into the containment pit.
- Where ground infiltration is insufficient, undertake dewatering practices (refer to the Dewatering BMP) to remove drilling slurry and any other accumulated water.
- Remove any accumulated sediment and recycle on-site or dispose of appropriately off-site.
- Reinstatement and stabilise the containment pits as works are completed in stages/areas (refer to Site Stabilisation/ Reinstatement BMP).



Best Management Practice - Directional Drilling

MONITORING AND MAINTENANCE.

- Regularly assess site practices and environmental controls to make sure that they are mitigating or reducing environmental risk to an acceptable level.
- Ensure that no discharge is occurring. Adjust practices or controls if they are not working efficiently.
- Monitor drilling fluid volume in the containment pit to ensure that it is sized appropriately.
- Regularly inspect and cleanout sediment controls and secondary cesspit protection.
- Regularly sweep up any sediment or dust and dispose of it appropriately so that it will not become airborne or enter surface water.
- Once works are complete remove environmental controls. Inspect stormwater cesspits and remove any contamination associated with site works.

5. TIPS.

Although this BMP presents a range of accepted best practice methods, there are many ways of achieving the above aim.

- Inspect site controls at least once a day to ensure they are working properly.
- Remember that cesspit protection measures are only to be used as secondary sediment control devices. Correct site practices and environmental controls will reduce the reliance on these devices.
- Have a spill response plan and spill kit on-site and make sure staff are well trained.
- Rehabilitate all disturbed areas as soon as possible and stabilise exposed soils.

6. USEFUL LINKS AND INFORMATION.

- Go to www.rdc.govt.nz and search for 'pollution', here you will find a range of helpful information and links to the range of pollution related resources and educational materials.
- Refer to the following BMPs
 - An Introduction BMP;
 - Sediment and dust management;
 - Works with in water course;
 - Noise;
 - Works within contaminated sites;
 - Spills and Emergency Management;
 - Concrete and asphalt;
 - Working in and around trees; and
 - Works within sites of significance.
- Go to www.beforeudig.co.nz or call 0800B4UDIG (0800 248344) to locate underground services.



If a discharge occurs that has the potential to, or has entered the stormwater system or natural receiving environments, contact the Rotorua Lakes Council 24 HOUR POLLUTION HOTLINE on (07) 348 4199 immediately.

For access to this BMP and to find the other BMP information sheets, go to the link below:

www.rotorualakescouncil.nz/stormwater

Important Notice: ©Rotorua Lakes Council 2012. This best management practice sheet is an information guide only and is not technical or compliance advice. Its recommendations may not be complete or appropriate for all situations, and the person doing/arranging the work remains solely responsible for making their own assessments and doing the work properly, safely and in compliance with all laws and regulations. Our thanks to Auckland City Council for allowing us to reproduce their campaign.