SUSTAINABLE FUTURES 30|50
WHANGAREI DISTRICT

Contaminated Land in the Whangarei District

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10/40541

June 2010

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1 Introduction

New Zealand has a legacy of soil contamination due to the historic use, storage and disposal of chemicals utilised in industry, agriculture and horticulture. This report describes the current statutory framework that deals with contaminated land issues, and highlights the inconsistency in approaches between the different local authorities. Although the Resource Management Act provides for local authorities to maintain records of the contaminated sites within their respective regions and districts, the database held by the Northland Regional Council has large gaps.

This lack of knowledge can potentially have serious consequences if future development were to occur on unidentified contaminated sites; particularly if the development involves changing the use of the land to a more sensitive land use.

The purpose of this report is to highlight the potential dangers and costs involved with the development of such contaminated lands, together with constraints which should be taken into account before final decision-making.

2 The Contamination Problem

2.1 New Zealand's Legacy of Soil Contamination

The historical use of chemicals in agriculture, horticulture and industry has left a legacy of soil contamination all around New Zealand. Contamination has primarily been caused by the storage and use of hazardous substances, and disposal of hazardous wastes (MfE, 2010).

The most common past activities that have led to the creation of contaminated sites are:

- *The manufacture and use of pesticides* – mainly found on horticultural land where agrichemical spraying was used to control pests.
- *Production of gas and coal products* – includes many old gasworks sites located in most towns and cities.
- *Production, storage and use of petroleum products* – contamination has occurred from leaking fuel storage facilities at tank farms and service stations.
- *Historic mining* – usually associated with metals leaching from old tailings dams and mine shafts.
- *Timber treatment* – PCP (pentachlorophenol) was one of a number of chemical formulations used routinely at most sawmills and timber treatment plants from the 1950s until 1988, when its use ceased.
- *Livestock dipping* – use of DDT, arsenic and other chemicals to treat parasites on livestock in thousands of locations around the country, usually on sheep farms, but also known to be located in stockyards and railway sidings.

Many of these activities were not known to be hazardous at the time (MfE, 2010).

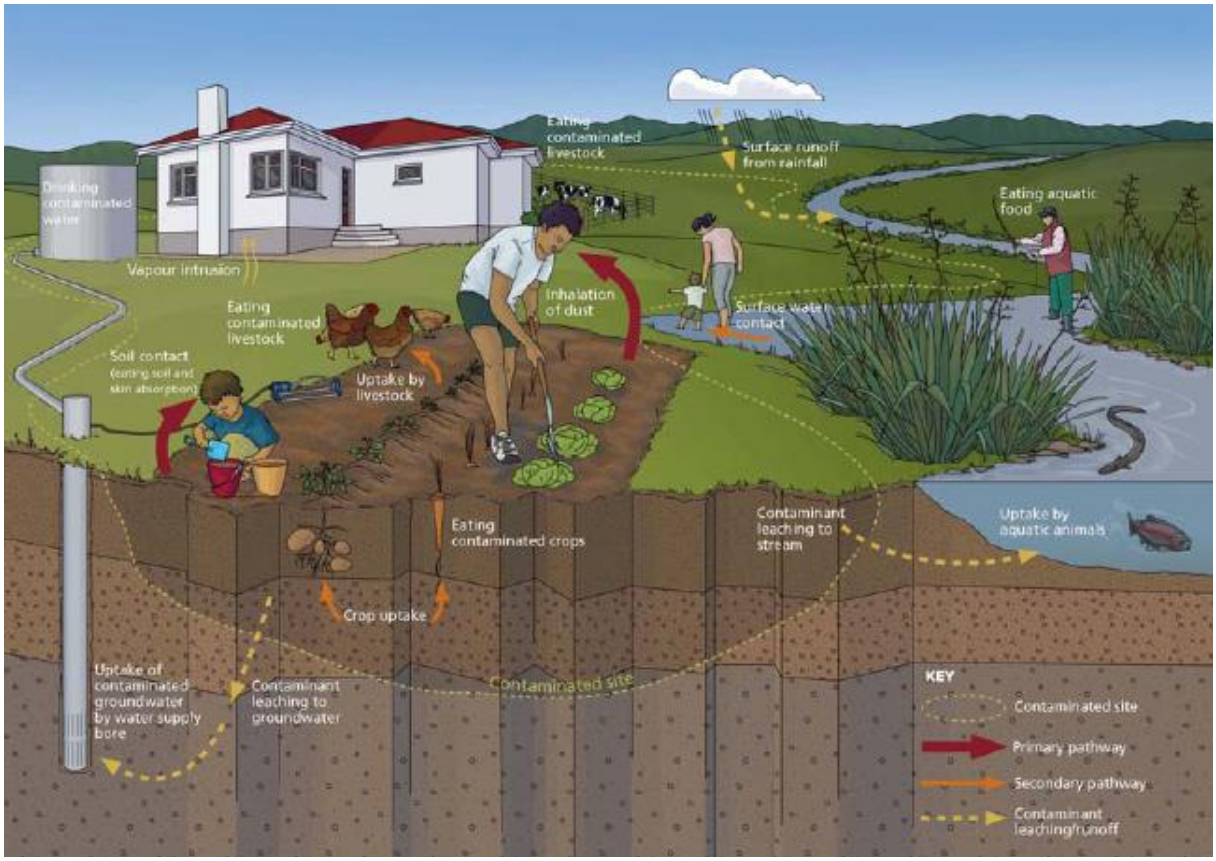
2.2 When are Soil Contaminants a Problem?

Contaminants are a problem when the hazardous substances are at a concentration and in a place where they have, or are reasonably likely to have, an adverse effect on human health and the environment. Contaminants are a greater problem in environments where food is grown or in close proximity to buildings, people, water bodies and important habitats.

Contamination is not always limited to a specific site. Hazardous substances may seep through the soil into groundwater, or be carried to nearby land and waterways in rainwater or when attached to dust. Hazardous gases can also pollute the air.

The different pathways by which humans can be exposed to contaminants in soil are illustrated in Figure 1.

Figure 1 – Pathways by which contaminants in soil can affect human health



Source: Ministry for the Environment, Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil, 2010.

2.3 Potential Adverse Effects of Soil Contaminants

2.3.1 Human Health

The effects to human health from exposure to contaminants can be categorized into short-term (acute) effects and long-term (chronic) effects.

- *Acute toxic effects* – can result in immediate adverse health impacts; for example, acute arsenic poisoning has the potential to occur where children ingest soil contaminated with high levels of arsenic associated with old sheep dip or timber treatment sites.
- *Chronic effects* – are adverse health effects that can result from an on-going but low-level chemical exposure over an extended period. Carcinogenic (cancer-causing) or developmental effects (e.g affecting organ function) may not be expressed to the extent of being able to be diagnosed until many years later.

Humans are exposed to a myriad of chemicals every day. However, this exposure occurs mostly at levels that do not prevent the ability of our bodies to function normally (MfE, 2010).

2.3.2 Environmental Health

Contaminants in soil can alter the metabolism of microorganisms and arthropods (type of invertebrate) in a given soil environment, which can lead to the destruction of some layers of

the primary food chain, resulting in negative effects on predator animal species. Small life forms may consume harmful chemicals which may then be passed up the food chain to larger animals. This may lead to increased mortality rates, and even extinction. Similarly, soil contaminants may alter plant metabolism and reduce crop yields. Trees and plants may absorb soil contaminants and pass them up the food chain. (Ignatova, 2008).

2.3.3 Other Effects

As well as endangering human health and the well-being of living organisms, the presence of contaminants can also cause corrosion that may threaten buildings and structures; it can limit the use of the land and reduce the land value (MfE, 2010).

3 Statutory Framework

The current framework for managing land contamination includes a mix of laws and regulations, guidelines and funding arrangements. This mix of instruments is implemented by a range of central and local government agencies, which are the agencies most directly involved in managing soil contamination (MfE, 2010).

There are seven main pieces of legislation that relate to contaminated land or the effects of contaminated land (see Figure 2). These Acts can be generally grouped by their relevance to contaminated land. The four main areas are:

- prevention of contamination
- contaminated land management, enforcement, remediation and liability (post-1991)
- protection of the environment, including human health, from the effects of contaminated land
- access to information about contaminated land (MfE, n.d.).

Figure 2: Main legislation relating to contaminated land, and relevant areas

<table>
<tr><th>Prevention</th><th>Management</th><th>Protection of the environment</th><th>Access to information</th></tr>
<tr><td colspan="3">Resource Management Act 1991</td><td></td></tr>
<tr><td>Hazardous Substances & New Organisms Act 1996</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>Health Act 1956</td><td></td></tr>
<tr><td></td><td></td><td>Health & Safety in Employment Act 1992</td><td></td></tr>
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<tr><td></td><td></td><td></td><td>Local Government Official Information & Meetings Act</td></tr>
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Source: Ministry for the Environment, Working towards a comprehensive policy framework for managing contaminated land in New Zealand, n.d.

A number of Acts appear to overlap, especially for the protection of the environment. Within the environmental area there are five pieces of legislation, although (with the exception of the RMA) most of these Acts have quite separate and distinct functions:

- the Health Act relates to public health nuisance from contaminated land
- the Health and Safety in Employment Act relates to workplace safety

- the Food Act relates to food safety
- the Building Act relates to the suitability of land for proposed buildings.

The RMA, with its emphasis on effects-based management and a holistic definition of the environment, overlaps with most of this legislation.

3.1 Resource Management Act (RMA)

The RMA provides for the sustainable management of natural and physical resources, and it is the core piece of environmental legislation for controlling the effects of contaminated land on the environment and people. The RMA offers a definition of contaminated land, requires planning controls for the effects of contaminated land, and defines functions for local government in relation to contaminated land.

The RMA defines the environment widely to include ecosystems, people and communities, natural and physical resources, and amenity values. The RMA is designed to protect the environment through local government's control of activities through plans and resource consents.

3.1.1 Roles and Responsibilities of Local Government

Each council controls the activities in its area through policies and rules in district and regional plans, designed to control the discharge of contaminants to land to ensure that no new contaminated sites are created, and to control the effects of contaminated land on the environment.

The functions given to local government under sections 30 and 31 of the RMA generally mean the following:

Regional councils work to identify and monitor land that is contaminated within their region. Most regional councils also collate and manage information about contaminants on land in a specific land-use information register.

District and city councils have the responsibility of ensuring, when decisions are made concerning land-use changes or the subdivision or development of land, that the potential for environmental effects, including health effects, are evaluated.

Because each of these district and regional plans are prepared individually, there is a lot of variability between requirements and thresholds, and in terms of how they address contaminated land. In addition, a Ministry for the Environment review of contaminated land provisions in district and city plans showed that most of the plans do not yet reflect the important amendments made to the RMA in 2005.

3.1.2 Roles and Responsibilities of National Government

Section 43 of the RMA also enables the use of national regulation for the management of contaminated land. Section 43(1)(a)(iv) states that a national environmental standard (NES) can prescribe "soil quality in relation to the discharge of contaminants" (MfE, n.d.). An earlier review carried out by the Ministry for the Environment assessing local authorities' district and city plan provisions, had highlighted the deficiency in controls. As a result, MfE notified the Proposed National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil in February 2010.

The NES proposes a nationally consistent step-by-step process for identifying, assessing and remediating/containing contaminants in soil. Submissions on this NES closed on 19 April 2010. A final decision on this document will be at least several months away.

3.2 Guidelines and Other Measures

In the past 10 years New Zealand authorities have undertaken a work programme to address the risks from historical contamination, building on the policy foundation established under the Australian and New Zealand Environment and Conservation Council (ANZECC) in 1992. The result has been a series of contaminated land management guidelines (CLMG) developed by the Ministry for the Environment, in consultation with industry and local government. These guidelines represent a significant component of the existing policy framework, and provide a theoretical context to contaminated land management while supporting local government in carrying out its functions under the RMA.

A number of industry-based guidelines were also developed containing soil guideline values for specific contaminants of concern.

Since 2003 the Government has made $1.78 million available for the contaminated sites remediation fund which is intended for high-risk sites where the landowners are unable to fund the management or clean up.

Under the Stockholm Convention, New Zealand is obliged to remove stockpiled persistent organic compounds, such as agrichemicals like DDT, by 2013. Since 2003 approximately 270 tonnes of agrichemicals have been collected and removed from rural properties across New Zealand.

The New Zealand Waste Strategy was developed in partnership with local government in 2002. The strategy provides a series of targets for contaminated land, which guide the activities of central and local government over the next decade. The targets involve the identification, management and remediation of high-risk contaminated land according to the Ministry's guidelines.

3.3 Northland Regional Council

The NRC manages a list of sites in the region that are, potentially, contaminated. In 2009, NRC set about making this information available to the public and has now released this data for Northland (NRC, 2010). Many of the more than 300 sites identified cover land that has been used for activities involving the use of hazardous substances, and are located within urban areas. The majority are currently still being used for activities involving these hazardous substances, such as landfills, petrol stations, panelbeaters and marine industry. Each year, Regional Council staff visit and inspect a selection of these sites to check the information that is held for them and to verify whether or not they pose any significant threat to the environment and/or people.

However, the data held by NRC is far from complete. Being listed on the register does not necessarily mean that the site is contaminated. It merely means that there is a potential for contamination, and further research is required to verify whether actual contamination has occurred.

In addition, comprehensive research and investigations are still required to confirm the location of sites that were once the subject of persistent herbicide and pesticide use, and livestock dipping. These sites are mainly found in rural areas, and could potentially form a significant health hazard if, in the future they were to be developed for more sensitive land uses without appropriately remediating the land.

As new information comes to light, the NRC continually updates data, whether newly discovered sites are added, or land is confirmed to be clean, remediated or managed in a way that minimizes risks to human health and the environment.

3.4 Whangarei District Council

The role of the Whangarei District Council (WDC) mainly lies in the dissemination of information on contaminated sites via LIMs (Land Information Memorandum) and PIMs (Project Information Memorandum), once potentially contaminated sites have been identified by the NRC. However, as mentioned above, there are still a lot of sites for which this information is lacking.

It is also a function of WDC to control the effects of land uses. In regard to contaminated sites, this means that WDC needs to have regard to the potential effects of contaminated land on the environment, including human health and safety. This may include requiring sites to be remediated, mitigation measures to be put in place, or may involve for sites to be completely avoided if mitigation and/or remediation is not possible.

The functions of WDC in relation to contaminated sites is limited by the lack of information on the number and location of such sites. Until this information is available the WDC is constrained in its statutory role, both in regard to disseminating information on, and managing effects of, contaminated land.

4 Considerations for the Future

Given the currently inadequate checks and controls on the use, subdivision and development of land affected by soil contamination, there is a real danger that the risk of exposing people and the environment to contaminants is increased when development occurs. This is especially true when the land is being put to a more sensitive land use activity.

Proposals for future development and growth in the Whangarei District will have to be cognisant of the latent dangers and prospective costs associated with the identification, mitigation, remediation and/or management of potentially contaminated land, particularly where plans involve the use of rural lands.

For obvious reasons, there are inherent constraints in developing land that is contaminated, whether these constraints come in the form of costs of remediating the contamination, the cost of having land that is not suitable for further development or the cost to human life and the environment. Identifying and keeping records on land that is potentially contaminated is an important step in managing its future uses.

It is believed that there could potentially be a large number of sites in the rural areas of Whangarei District where livestock dipping and the use of persistent herbicides and pesticides was a common occurrence. However, there are currently no records as to the number nor location of these sites.

Identifying where these historic activities used to take place requires a substantial amount of resources, both in human and in financial terms. Some progress towards identifying contaminated sites has been made, but there is still a long way to go. If future development is to avoid contaminated land, the NRC needs to make better progress on identifying and testing potentially contaminated sites.

It is thought that the process suggested in the Proposed NES will assist local authorities in identifying potentially contaminated land, however, it may be some time yet before the standard is enacted. Even then, it will still remain to be seen how effective the process will be.

5 References

Ignatova, I. (2008). Environmental pollution: Its sources and effects. In Tropical-Rainforest-Animals.com. Retrieved 27 April 2010 from http://www.tropical-rainforest-animals.com/Environmental-Pollution.html

Ministry for the Environment. (2010). Proposed national environmental standard for assessing and managing contaminants in soil. Wellington, New Zealand: Ministry for the Environment.

Ministry for the Environment. (n.d.). Working towards a comprehensive policy framework for managing contaminated land in New Zealand. Retrieved 27 April 2010 from http://www.mfe.govt.nz/publications/ser/hazardous/policy-framework-contaminated-land-nov06/html/page4.html

Northland Regional Council. (2010). 2008-2009 Annual Environmental Monitoring Report. Retrieved May 24, 2010 from http://www.nrc.govt.nz/Resource-Library-Summary/Environmental-Monitoring/2008---2009-Annual-Environmental-Monitoring-Report/Waste-Management/Contaminated-Sites/