Contaminated land

This report assesses the extent to which the contaminated land management objectives and anticipated environmental outcomes of the Waikato District Plan are being achieved. The objectives and anticipated environmental outcomes are:

Objective

Human health or the environment is not harmed by the use or development of contaminated land.

Anticipated environmental outcome

(a) Avoidance of the use or development of contaminated land that would adversely affect human health.
(b) Remediation of contaminated land.

Executive summary

There are several pieces of legislation that govern local authorities in their management of contaminated land. These include the Resource Management Act 1991 (RMA), Hazardous Substances and New Organisms Act 1996, Health Act 1956 and most recently the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES) that came into effect on 1 January 2012. Waikato District Council must also comply with the requirements of the Waikato Regional Plan.

Waikato District Council has specific rules in its district plan to ensure it meets its requirements under governing legislation and the regional plan, and that ultimately land being developed is fit for purpose.

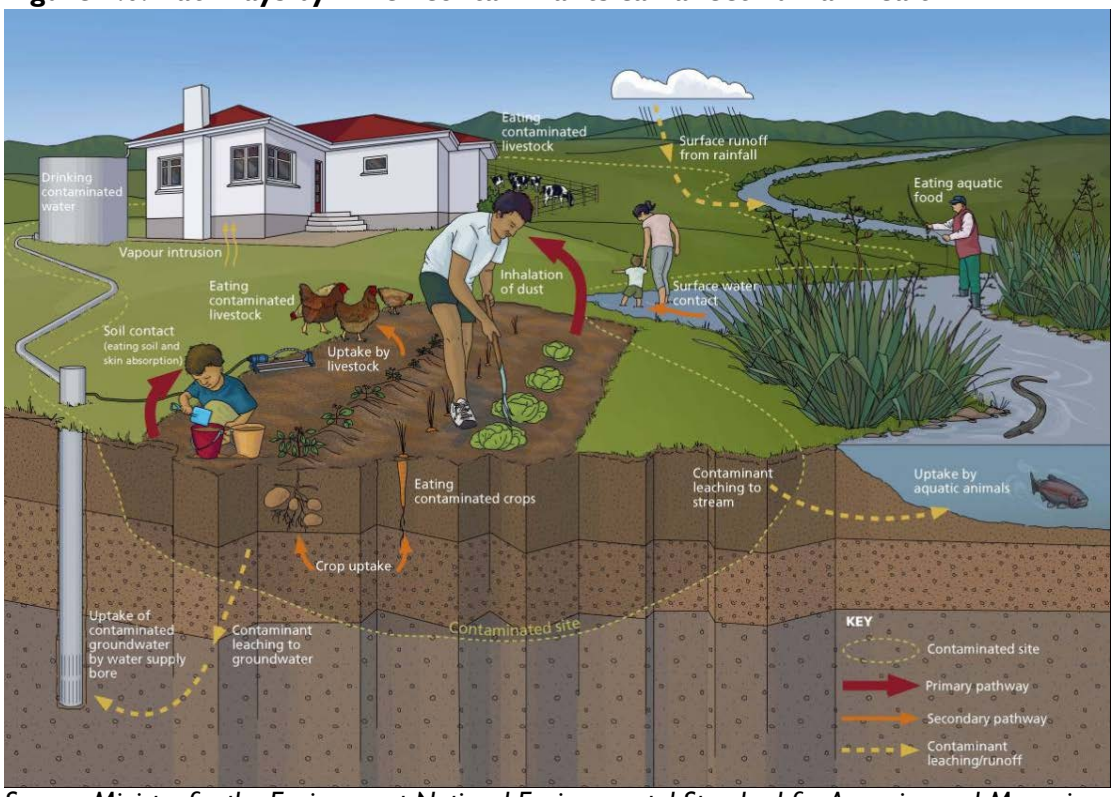
Waikato District Council has introduced several new processes to ensure a streamlined and integrated approach to contaminated land management within the district following the introduction of the NES.

Background

In the past there has been uncertainty about the functions of councils in regard to the management of contaminated land. Accordingly, the RMA was amended in August 2005 to make territorial authorities responsible for preventing or mitigating any adverse effects of the use, development or subdivision of contaminated land through the inclusion of a new section, section 31(1)(b)(iia)). At this time it was identified that without the introduction of a national environmental standard specifically designed to address contaminants in soil, councils may need to develop their own identification and investigation processes in order to meet their functions under section 31 of the RMA. As a result, councils throughout the country have, until very recently, often had very different approaches to addressing the potential for land contamination.

As detailed in the figure 2.0 below, there are many ways in which people can become exposed to harmful contaminants. In order to meet our legal obligations, the identification of potentially contaminated sites is very important.

Figure 2.0: Pathways by which contaminants can affect human health



Source: Ministry for the Environment National Environmental Standard for Assessing and Managing Contaminants in Soil, 2012.

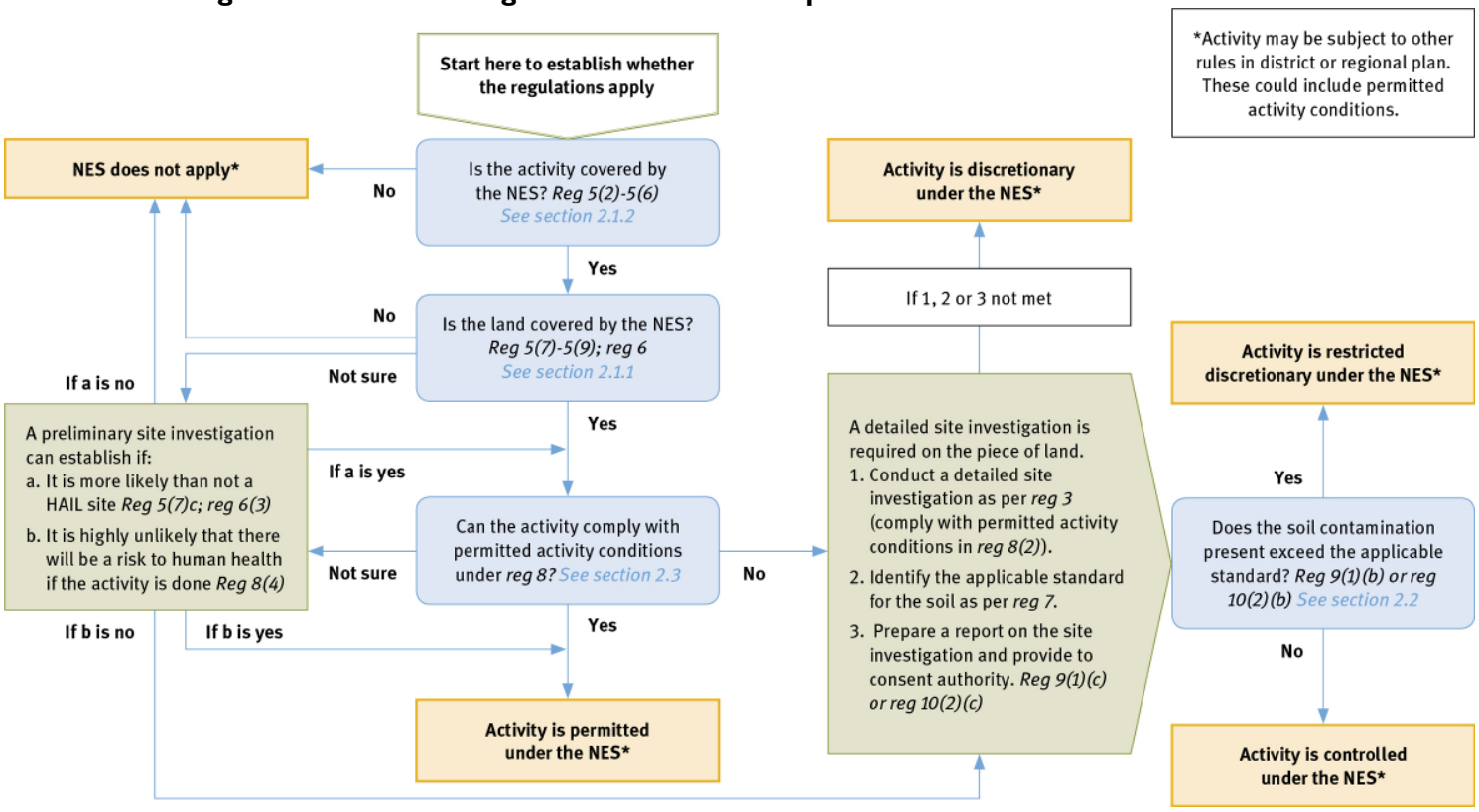
In January 2012 the NES came into effect prescriptively legislating how councils must manage (potentially) contaminated sites. The introduction of this standard has regulated the process across all territorial authorities nationally. Accordingly, those contaminated land rules in the district plan relating to human health protection have been superseded by the NES and must be reviewed and replaced accordingly.

The NES imposes planning controls on five prescribed activities undertaken on land where an activity or industry described in the Ministry for the Environment Hazardous Activities and Industries List (HAIL) has been, is being, or is more likely than not to have been

undertaken. These activities include the removal or replacement of an underground fuel storage system, soil sampling, soil disturbance, a change in land use and subdivision.

The NES dictates a process, as outlined in figure 2.1 below, for determining whether or not a consent is required and if so, its activity status, based upon what is known of the site.

Figure 2.1: Determining resource consent requirements under the NES



Regulation 5(7) -5(9) of the NES, as described above makes reference to whether the land is being, has been, or is more likely than not to have been subjected to an activity or industry found on the HAIL. The HAIL is a list of activities and industries that have a likelihood of leading to site contamination due to the use or storage of hazardous contaminants. The original HAIL list was largely based on the Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines and was produced by the Ministry for the Environment in 2004 as a tool for local government in their assessment of sites for potential contamination. A recent revision to accompany the introduction of the NES has seen the HAIL referenced in the NES and has therefore given the document regulatory significance.

A full copy of the HAIL is available at:
http://www.mfe.govt.nz/issues/hazardous/contaminated/hazardous-activities-industries-list.html

The past use of chemicals (hazardous substances) in industry, agriculture and horticulture within New Zealand has left a legacy of soil contamination, primarily caused by practices in which chemicals were used, stored and disposed of in a way that is not safe by today's standards.

It is important that contaminated land is identified and addressed to avoid harm to people and to the environment. Hazardous substances in soil (contaminants) can have significant adverse effects on human health, and on the quality of soil and water resources. At

hazardous concentrations, contaminants can limit the use of land, cause corrosion that threatens building structures, and reduce land value.

Waikato District Council currently has a Land Use Register which captures information about sites that have been subjected to land use activities or industries found on the HAIL, sites that have subsequently been confirmed contaminated, or sites that have been remediated to meet specific soil guideline values and are therefore fit for a particular purpose. This register has been designed in general accordance with the Ministry for the Environment Contaminated Land Management Guideline No 4: Classification and Information Management Protocols, 2006.

Information contained within the register is sourced in most cases through resource consent and building consent applications. In other instances information is reported by the public or by internal staff who have noted potentially contaminating activities within the district or is provided to us from the Waikato Regional Council Selected Land Use Register.

Pressure

- **Lack of awareness surrounding current legislation/changing legislation**

Waikato District Council has an obligation under section 31 of the RMA to prevent or mitigate any adverse effects of the development, subdivision or use of contaminated land.

In January 2012, the NES came into effect governing and standardising the way in which councils must manage potentially contaminated sites throughout the country. This was a welcome improvement to the management of contaminated land throughout the country but has not been without its challenges.

Councils throughout New Zealand, including Waikato District Council, are currently working to align their district plan provisions and continue to implement processes that incorporate the requirements of the standard into their day to day operations.

The NES imposes planning controls on five prescribed activities undertaken on land where an activity described in the HAILhas been or is being undertaken. The HAIL is a list of activities and industries that have a likelihood of leading to site contamination due to the use or storage of hazardous contaminants.

Unfortunately, the public are generally unaware of legislation governing the way in which councils must manage potentially contaminated sites. Furthermore, they are often unaware that activities that have been or are being undertaken on their land have the potential to lead to contamination.

Waikato District Council is currently looking at ways to improve awareness of HAIL activities and of the requirements of the NES within the district. We are also in the process of updating forms, data capture processes and spatial representation of information in order to streamline both internal and consenting processes.

- **Lack of education regarding potentially contaminating activities**

The HAIL forms the basis for screening land for potential contamination within the district.

Waikato District Council is required to ensure that resource and building consent applications include adequate information to identify any potential risk for contamination. This screening process relies on the identification of activities, past or present, which can be found on the HAIL. Where a resource consent application is received for a change in land use, subdivision or earthworks, and a HAIL activity is identified on the land, the NES may apply.

People are often unaware of the HAIL and have no idea that the activities that have, or are, being carried out on their land could lead to the contamination of their site. As a result, further information is often sought, in some cases leading to the requirement for site investigation by a suitably qualified and experienced practitioner and remediation as required. Understandably this can lead to frustration by the applicant.

Often rural activities where practices may have been in place for decades, lead to the build up of contaminants in the soil. A good example of this is the build up of the highly toxic metal cadmium in the soil through regular and prolonged application of super-phosphate fertiliser. It is only the availability of modern science and the introduction of new regulations that has led to this understanding but farmers in many cases are unaware of such

developments/changes to regulations that have the potential to affect future land use and value.

Waikato District Council is currently addressing ways in which it can improve the availability of information to the public surrounding HAIL activities and the potential for contamination of land within the district.

- **Financial constraints**

Financial constraints play a major role in the development of land that is potentially contaminated. While the land may be purchased for a reduced price, it is important that a purchaser does their homework and is aware of the requirements of the NES and the implications of this on land development – particularly with regard to financial implications. In the majority of cases, potentially contaminated land will need to be investigated to determine the potential risk, if to be developed. All site investigation must be carried out by a suitably qualified and experienced practitioner in contaminated land. Report prices will vary depending on the scope of works and the consultant engaged for services, and investigation may require several reports including a Preliminary Site Investigation, Detailed Site Investigation, Remedial Action Plan and Site Validation Report. This process can very quickly become prohibitive on a financial basis.

Likewise, financial constraints can discourage landowners from being honest about sources of contamination on their land. A prime example is the infilling of sheep dips without disclosure of their location to avoid the costs of investigation and remediation. This is a dangerous and unwise option as the contaminants being 'covered up' can cause serious health implications and in some cases have the potential to be fatal.

Population growth

Over the next ten years the projected population growth for the Waikato district is estimated to be 18.6 per cent or 1.7 per cent per annum. Over the past 20 years the population growth has averaged 1.2 per cent, with the past five years being at 2 per cent. This latter increase has been in the non-urban areas consistent with higher demand for countryside living and rural residential sections, following the trend of people moving away from the cities such as Auckland and Hamilton. As detailed below, this trend is likely to remain relatively constant.

	2012	*2022*	*Change*
Estimated population	*65,114*	*77,331*	*12,217*
Estimated dwellings	*23,240*	*27,975*	*4,735*
Estimated urban/rural mix	*47/53*	*49/51*	

Note: These growth estimates are from our detailed population modelling prepared in conjunction with the National Institute of Demographic and Economic Analysis and includes base information from the 2006 census. The 2010 census was postponed because of the Canterbury earthquakes.

The census Usually Resident Population (URP) counts show that Waikato district is in the top ten territorial authority areas with an increase of population from 2006 to 2013 of 10.1% (Statistics New Zealand). The URP counts as detailed below show that the estimated population count for the district in 2013 is below the 2012 estimate and would not have

taken into account the boundary change with the creation of Auckland Super City (incorporation of Franklin district).

	2001	2006	2013
Usually Resident Population	**51,843**	**57,585**	**63,378**

State

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

The Waikato District Council has processed 441 land use and 270 subdivision consents since the introduction of the NES on 1 January 2012. Of these, approximately 75 per cent of all land use consents (for example those relating to earthworks that exceed the thresholds set out in the NES or those relating to residential activities) and 100 per cent of subdivision consents have been reviewed with regard to the requirements of the standard.

It is estimated that 60 per cent of those applications reviewed have required further information to be submitted in order to meet the requirements of the NES as set out in regulation 6 and/or to allow us to determine whether HAIL activities have been undertaken on the site.

Of those consents reviewed, only an estimated 15 to 20 per cent have required further investigation. Information relating to all properties that have had HAIL activities identified, those that have been investigated and confirmed contaminated and for those that have been remediated, is recorded in the Council's Land Use Register. Relevant statistics relating to the register can be found in the Land Use Register section of this document.

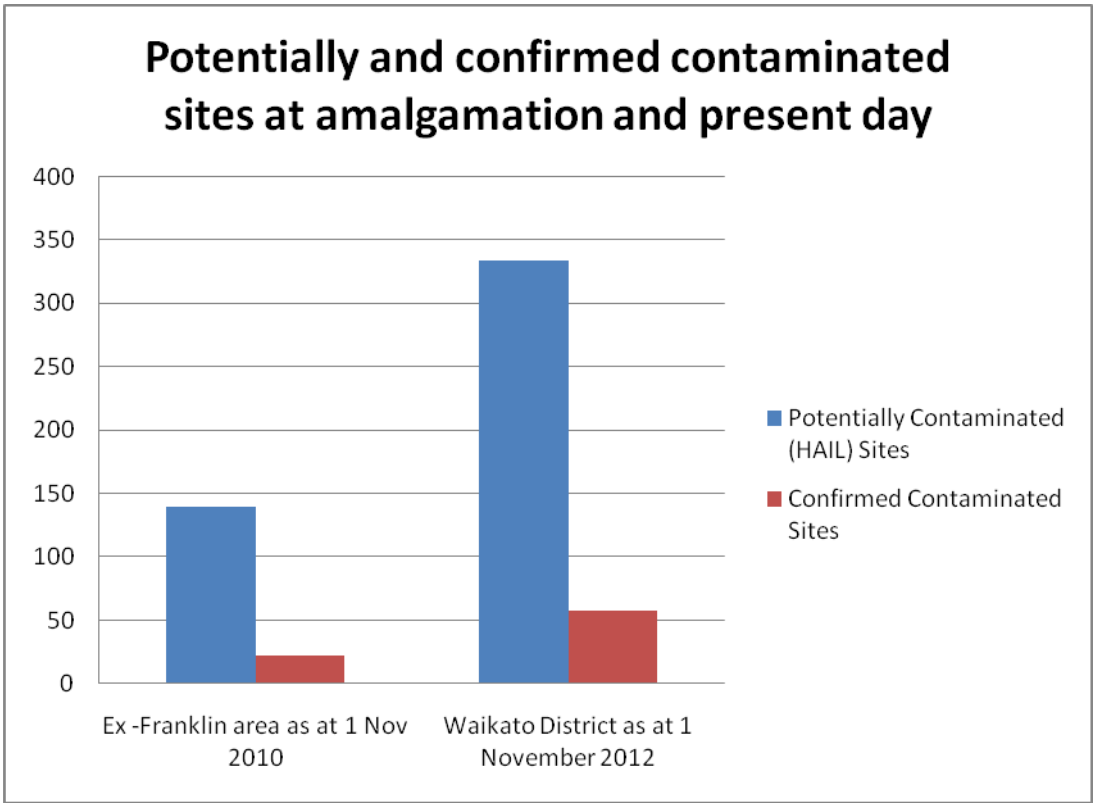
We have recently amended our application forms to ensure that the NES is addressed adequately within an application prior to submission. We are also in the process of updating the functionality of our database and internal systems so that we can more accurately report on statistics relating to the impact of the NES on our daily operations.

The Land Use Register

Waikato District Council has been developing and maintaining a Land Use Register for information relating to HAIL sites and contaminated land for a number of years. However, in November 2010 the Council also inherited Information relating to the southern portion of the former Franklin district during the Auckland local government reorganisation.

The statistics are detailed in figure 2.2 below:

Figure 2.2: Potentially and confirmed contaminated sites within the Waikato district

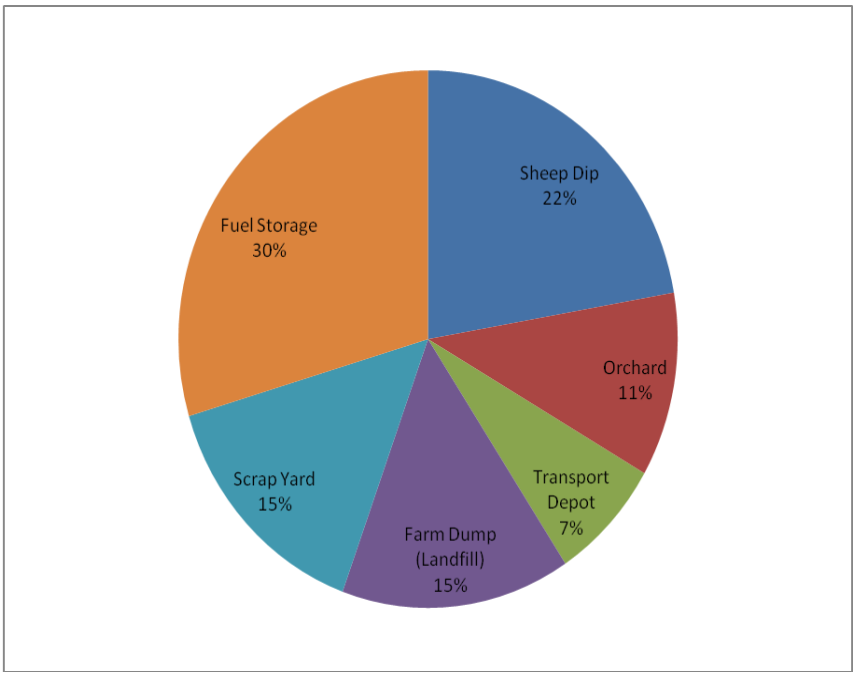


At the time of amalgamation the Waikato District Council and the Franklin District Council were operating entirely different systems for the capture and management of information relating to contaminated land. An extensive project was undertaken to combine the two systems into a single useful operating database. This was achieved close to the time of the NES introduction and as such, the most useful statistics and data analysis are attainable from this date. Work continues to further develop the existing database to ensure that we capture all required information in such a way that reporting is an easy and useful component of the operating system.

Overall, Waikato District Council currently has 353 registered HAIL sites within the district. We have made 49 additions to our Land Use Register relating to verified and unverified HAIL activities since 1 January 2012. The predominant activities verified within the district are fuel storage, sheep dips, orchards established pre 1980, farm dumps and transport depots, with the most predominant unverified activity being HAIL Activity Class I relating to the accidental release of the highly toxic and persistent metal cadmium in the soil. This is as a result of prolonged and regular super phosphate fertiliser application to the land (please

refer to the Cadmium section of this document for further information). HAIL activities verified since the introduction of the NES are identified in figure 2.3 below:

Figure 2.3: Predominant HAIL activities verified within the Waikato district



As evident in Figure 2.3 the predominant HAIL activities identified within the district are consistent with a predominantly rural environment, with on site fuel storage, sheep dips and farm dumps being amongst the predominant activities identified.

In addition to those that have been verified as HAIL sites, ten sites have been confirmed as contaminated since the introduction of the NES. The consenting process for six of these sites resulted in the applications being considered as restricted discretionary activities and the properties being remediated to meet the appropriate soil contaminant standards for the site. Four sites were remediated to meet rural residential standards, one to industrial standards and another was remediated to meet agricultural guidelines.

The four properties that were not addressed under the provisions of the NES were outside of the scope of the standard because they were addressing the disturbance of contaminated material but did not relate to soil. This highlights a potential deficiency in the NES whereby the provisions relate to soil only and not to all contaminated material that poses a risk to human health.

It is important to note that when we assess an application and it is identified that no HAIL activities have occurred on a site, then the NES does not apply. Similarly if a subdivision relates to lots with existing developments, or is simply adjusting boundaries and production land will remain in production, the NES does not apply.

Cadmium

Waikato Regional Council has published information suggesting that Waikato's productive pastoral, horticultural and arable surface soils now contain five times more cadmium than they began with and are two-thirds of the way to reaching a 1.0 mg/kg threshold. Loading calculations confirm that the dominant source of this cadmium is superphosphate fertiliser, which contains cadmium as an impurity.

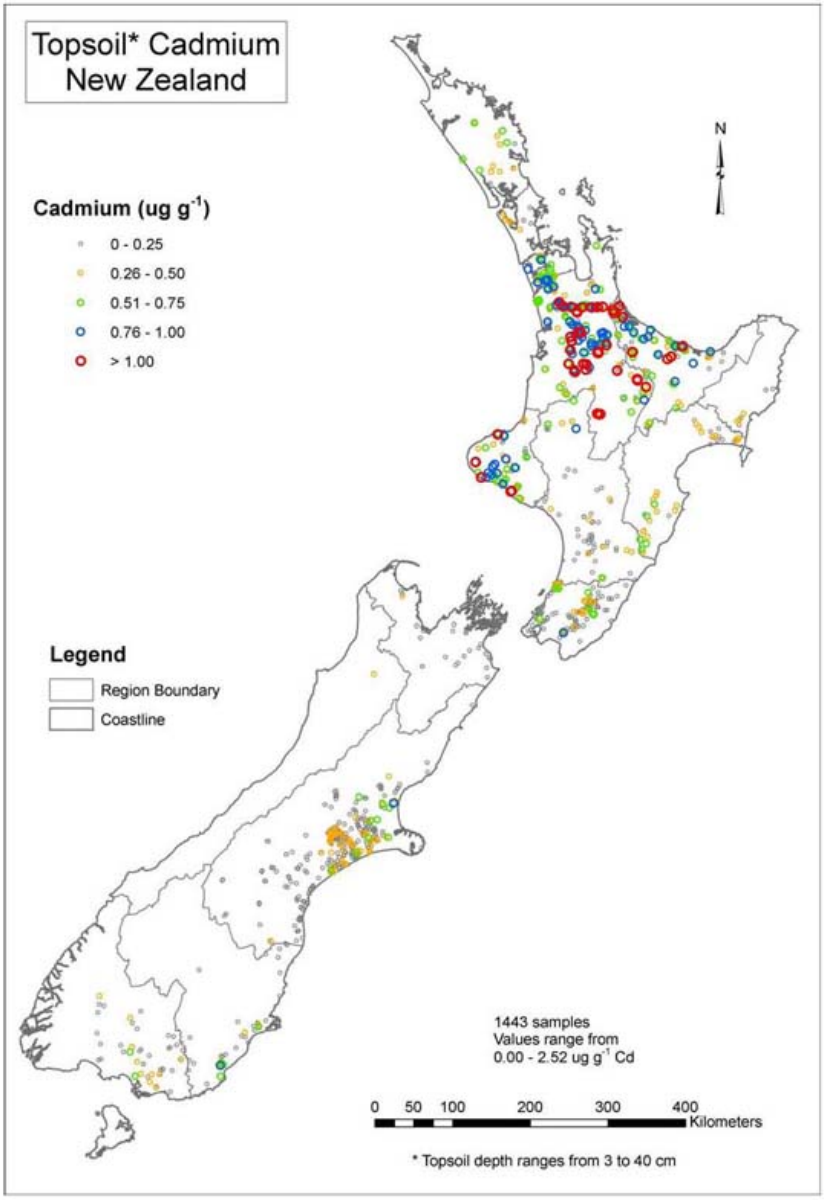
Cadmium is a highly toxic heavy metal that is persistent in the environment and therefore builds up in the soils over time and can cause numerous serious health effects at elevated levels.

The application of super-phosphate fertiliser leading to the incidental application of cadmium to the soil is therefore considered a HAIL activity Class I, due to the accidental release of hazardous contaminants to the soil at levels that could pose a risk to human health.

The NES lowered the allowable level for cadmium in soils in a rural/residential setting from 1.0 to 0.8mg/kg and as such the council must address the potential for this type of contamination through land development.

Several cases have been found where cadmium levels have exceeded the NES soil contaminant standards for a rural/residential setting.

Figure 2.4: Topsoil cadmium within New Zealand



Source: Ministry for Primary Industries, New Zealand

As shown in Figure 2.4 the cadmium levels in the Waikato Region are amongst the highest in the country and often exceed 1.00mg/kg. This further supports the requirement for Waikato District Council to investigate the potential for cadmium contamination of Waikato soils where the regular application of super-phosphate fertilizer has been identified.

Organochlorine Pesticides

Organochlorine Pesticides (OCPs) are chlorinated hydrocarbons used extensively in New Zealand agriculture, between the 1940s and 1960s, eventually being phased out by the mid 1970s. Common activities that made use of such chemicals include sheep dips, orchards and crops.

The use of pesticides in New Zealand was not subject to compulsory regulatory control until the Agricultural Chemicals Act 1959 established the Agricultural Chemicals Board. The

use of persistent OCPs was then progressively restricted by a succession of legislative measures, so that, by the mid-1970s their use had effectively ceased in agriculture and horticulture (MfE, 2011). Commonly recognised OCPs include DDT, endrin, aldrin, dieldrin, chlordane and lindane.

These contaminants are persistent and therefore accumulate in the environment over time and remain in situ for decades, leaving behind a legacy of contamination which must then be identified and managed to prevent human exposure. It is the role of the Council to prevent or mitigate any adverse effects of the development, subdivision or use of contaminated land. It is for this reason that we must take every practicable step to ensure that land to be developed is not at risk from OCP contamination with potential to affect human health.

Exposure to OCPs over a short period may produce convulsions, headache, dizziness, nausea, vomiting, tremors, confusion, muscle weakness, slurred speech, salivation and sweating. Long-term exposure to OCPs may damage the liver, kidney, central nervous system, thyroid and bladder. Many of these pesticides have been linked to elevated rates of liver or kidney cancer in animals and there is some evidence indicating that OCPs may also cause cancer in humans (Envirolink, 2006).

Figure 2.0 identifies ways in which people can be exposed to contaminants including through accidental inhalation or dermal exposure, chemical ingestion through consuming fish, dairy products, and other fatty foods that are contaminated or by consuming root crops such as carrots and potatoes, and curcubits such as pumpkins, squash and zucchinis that are also able to take up OCPs from the soil.

Sheep dips were the second highest category of HAIL activity identified within the district over the past two years. This indicates that we are succeeding in identifying sites that could be subject to high OCP concentrations and are therefore achieving our objectives under the anticipated environmental outcomes set out in the Waikato District Plan.

The NES relates only to activities occurring on a piece of land where a HAIL activity is, has, or is more likely than not to have, occurred. As such, on large rural properties where a HAIL activity, eg sheep dip, is identified in an area that is located remotely from the area to be developed, the information will be stored in our land use register for future reference and the NES will not apply. The NES will only be triggered when the HAIL site is to be developed.

Council may however act under the provisions of the RMA if there is deemed an immediate risk to human health or the environment.

Regional involvement

Waikato District Council also participates in a regional forum known as the Waikato Regional Contaminated Land Liaison Group (WRCLLG). This group has proven invaluable in sharing information across the region and in streamlining processes across councils, particularly in light of the introduction of the NES. The WRCLLG focuses on:

- Liaison, communication and exchange of technical and policy information relating to contaminated land issues between territorial authority and regional council officers in the Waikato region.
- Having support and collaborative advice available to members of the group on contaminated land issues.
- Providing better consistency between local authorities throughout the region in their approach to contaminated land management.
- Facilitating the co-ordination with other agencies.
- Providing a forum for discussion of (and submissions on if necessary) Government policy initiatives relating to contaminated land.
- Facilitating consistency in implementation of the NES.

Response

- Development of an education and awareness package for ratepayers and community members in conjunction with the Council's Communications team to improve awareness of HAIL activities and the requirements of the NES within the district.
- Completion of updating forms within Council to incorporate the requirements of the NES. Currently underway.
- Improving data capture processes to streamline both internal and consenting processes. This will include the updating of events in Waikato District Council's Property and Rating system and the redevelopment of a segment of the Land Use Register. Both currently underway, although the redevelopment of the Land Use Register is still in its early stages.
- Improving the availability of information to the public surrounding HAIL activities and the potential for contamination of land within the district. Work is currently underway to achieve this.

District Plan analysis

The Waikato section of the Waikato District Plan contains rules addressing the identification and management of contaminated land during development within the district.

The district plan rules permit the identification, investigation and remediation of potentially contaminated sites as defined by Appendix L of the plan, provided that the sites are not subject to land use activities specified within the plan, including a residential activity, a school or early childhood centre, or a sports field.

The site must be investigated and certified to be of a standard suitable for the intended use, or remediated to a standard suitable for the proposed activity to meet the permitted activity criteria. All proposed activities on land that do not meet the permitted activity criteria specified within the plan are considered discretionary activities.

The first issue raised with the way the rules have been written is that Appendix L includes the HAIL which has been updated since the inclusion of Appendix L within the plan. A schedule 1 process under the RMA would normally have to be implemented to update this list. This is a relatively cumbersome process and the way that the HAIL is referenced within the plan should be reviewed.

The second issue with the way the rules are written is that in order to meet the permitted activity criteria, a specialist report would be required on all land undergoing a change of land use where a HAIL activity has been undertaken on the land. A specialist report should not be required to meet the requirements of a permitted activity rule. Ideally these rules should be controlled. This would allow Council to ensure the adequacy of any such reports and sampling methodologies, to capture the required information surrounding the affected property(s) and to ensure that any contaminated material is removed to a suitably licensed facility.

Additionally, the current rules within the plan address only a change in land use and remediation. No other scenarios that could lead to the disturbance of and exposure to contaminated soil/material have been considered.

The Franklin section of the district plan contains no rules specifically managing (potentially) contaminated land, however, part 15.3 does outline objectives, policies and methods addressing this. Rural Plan Change 14 does include rules pertaining to the management of sites that are identified to be potentially contaminated; however, these rules are not yet operative. Having reviewed the rules, they are not thorough in their identification of contaminated land and have made no reference to the HAIL.

The way in which the rules should be structured and the scope of the rules has since been addressed in the most part through the introduction of the NES???
The NES was prepared in accordance with Sections 43 and 43A of the RMA, was passed through the Council on 10 October 2011 and came into force on 1 January 2012. The NES establishes a nationwide set of planning controls that regulate activities on contaminated or potentially contaminated land and provides for a nationwide approach to site investigations and reporting by reference to the Ministry for the Environment's best practice guidelines for investigating and reporting on contaminated or potentially contaminated land. This regulation provides restrictions for five specific activities on land whose soil may be contaminated in such a way as to be a risk to human health. The potential for the soil on a piece of land to be contaminated is determined by the likelihood of the previous and/or current activities being undertaken on that piece of land to be potentially contaminating activities. The current version of the HAIL lists the activities that are considered to be potentially contaminating.

The RMAstates that local authorities must observe and enforce the NES and must ensure the rules in the district plans are not more lenient or more stringent than the NES unless the NES expressly states that rules in the plan can be more stringent. In addition the Act requires local authorities to ensure that current rules in the district plan do not either duplicate or conflict with the rules within the NES. A rule is considered to conflict with the NES if it is either more lenient or more stringent than the rules in the NES. Where amendments to district plans are required to remove duplication or conflicts, these amendments can be made without using a Schedule 1 process (ie the changes can be made without the need for a section 32 report (justification for the plan change, public notification or a hearing).

The Waikato District Council District Plan, including the Franklin section, as discussed above, does contain an existing range of methods to manage the use and remediation of contaminated land. These include objectives, policies, rules, reasons and definitions. There have been a number of conflicts and duplications identified between the rules within the NES and the existing rules and as a result these must be removed. A draft version of the required amendments has been prepared and is currently being legally reviewed to ensure the proposed amendments can be undertaken without a schedule 1 process. Once the review is completed the district plan will be updated accordingly and the changes will have full legal status.