

had the highest carbon and nitrogen levels of all land use types, well above (for example) native forestry or tussock. In this work, the average levels of carbon and nitrogen in Taranaki's dairying soils were 22% and 24%, respectively, higher than the national average for dairying soils.

However, this same study showed that soil compaction in Taranaki's dairying soils was worse than the average, scoring only 6.1% on the soil compaction measure used, compared to an average of 10.1% across the whole country, although it is worth noting that these were sampled at the end of winter, the worst-case timing. Nationwide, half of all dairy soil sites scored below 10% which is the threshold of adverse effects upon productivity.

In terms of cadmium levels, nationwide, the highest single soil cadmium level has been found in Waikato, with Bay of Plenty also having a high average along with Taranaki³⁴. The highest results are associated with dairying, but orcharding had similar average values. Peat soils were found to have the highest potential for cadmium accumulation. These soils are rare in Taranaki. Beef and sheep farming sites had values very close to the national average.

3.3 CONTAMINATED SITES

Contaminated sites result from historical activities and industries where hazardous substances were inappropriately stored, used or disposed of, although these activities may well have been lawful at the time. Contamination may remain on-site in soil and/or move off site in surface water, groundwater or air discharges, posing a wider risk to both public health and the environment. Examples of land uses that could result in site contamination include landfills, engineering workshops, timber treatment sites, rail yards, gasworks, scrap metal yards and stock dips.

Present day activities and industries are much less likely to result in contaminated land, as those involving discharges to the environment are controlled under the RMA, while the storage and use of hazardous substances is controlled under the Hazardous Substances and New Organisms Act 1996 (HSNO).

3.3.1 WHAT IS THE STATE OF CONTAMINATED SITES IN TARANAKI?

In 1992 a report on potentially contaminated sites in New Zealand³⁵ was released, suggesting there might be 272 potentially contaminated sites in Taranaki. Given the desirability of a degree of certainty about the extent of any site contamination in the region, the Taranaki Regional Council embarked on a programme to investigate sites of interest, particularly timber treatment sites, sawmilling sites, landfills and rubbish dumps. This resulted in a number of extensive and thorough investigations and reports³⁶.

No national environmental standard currently exists on contaminants in soil. Sites are therefore classified on the basis of inspections and investigations carried out by the Council and a variety of currently available guidelines from both New Zealand and overseas.

The Council also developed a database, called the Register of Selected Land Uses (RSLU), to record information about sites in the region, where past or current activities may have resulted in contamination.

The RSLU includes information on sites which have been investigated for various reasons, including allegations of contamination. The total number of sites on the database does not indicate the number of contaminated sites, but rather the number of sites that have been investigated. There are 1,281 sites currently on the RSLU database (Table 3.6). The majority of sites (757), almost 60% of the total, have been investigated and no contamination has been found. A further 480 sites, or 37%, have had hazardous substances detected, but they pose no risk. Sixteen sites have been remediated, and there are no sites where the risk of the contamination means they are unable to be used.

Twenty eight sites remaining on the database require further investigation. These are generally low-risk sites, such as sites where notification has been received from the New Zealand Police regarding clandestine drug laboratories (previous investigations have shown that the land at such properties is not usually contaminated). The 28 sites also include those identified in the Moturoa oil field investigation³⁷,

Table 3.6: Status of sites on the Register of Selected Land Uses (RSLU).

No. of sites	Status	Comments
757	Hazardous substances not present - No identified contamination	Investigations have shown no contamination is present
480	Hazardous substances present - Risk acceptable for land use	Includes managed and remediated sites
16	Hazardous substances not present - Remediation undertaken	Remediated to background levels
0*	Hazardous substances present - Risk unacceptable for land use	Contaminated sites
28	Verified history of hazardous activity/industry	Low-risk sites unlikely to be contaminated, where further investigation is required to confirm status

*At the time of preparing this report, asbestos at the Patea freezing works site had been stabilised, and so the site in the interim does not pose an unacceptable risk environmentally. Long-term remediation is still necessary.

34 Taylor M et al. 2007. *Soil Maps of Cadmium in New Zealand*. Published by Landcare Research.

35 Ministry for the Environment 1992. *Potentially Contaminated Sites in New Zealand: A broadscale assessment*. Prepared by Worley Consultants Ltd

36 Taranaki Regional Council. *Investigation of Possible Dieldrin Storage and Disposal Sites in Taranaki*, (1993); *Investigations of Past Refuse Dumping Sites in Taranaki*, (1995); *Investigations of Past Refuse Dumping Sites in Taranaki*, (1996); *Investigation of Timber Treatment and Sawmilling Sites in Taranaki*, (1995); *Site Investigations: Drycleaners, scrap metal yards, rail yards and gasworks*, (2000); and *Investigation of Alleged Agrichemical Waste Disposal Sites in New Plymouth*, (2001).

37 Taranaki Regional Council, Feb 2003. *Moturoa Oil Field Investigation: Stage 1*. Prepared by Transfield Worley Ltd

where any risk is due to the presence of the abandoned oil wells rather than the presence of hazardous substances. The Council has completed a follow-up investigation of one well which showed no evidence of any leaking from the well head. Investigations of other wells are planned.

3.3.2 HOW ARE CONTAMINATED SITES MANAGED IN TARANAKI?

(A) REGIONAL POLICY STATEMENT AND PLANS

The *Proposed Regional Policy Statement for Taranaki, 2008* states that all known and potentially contaminated sites are to be identified and managed in a manner that avoids or mitigates actual and potential adverse effects on both the environment and human health. Priority actions are determined by the type of contaminants, the degree of contamination, existing and future uses of the site and the potential for adverse environmental and public health effects. The *Regional Air Quality Plan* and *Regional Fresh Water Plan* contain rules to regulate the discharge of hazardous substances.

(B) DISTRICT PLANS

The *New Plymouth District Plan*, the *South Taranaki District Plan* and the *Stratford District Plan* all contain policies and methods that recognise the importance of managing hazardous substances to avoid contaminating the environment, and aim to facilitate the clean-up and rehabilitation of contaminated sites. District councils work closely with the Taranaki Regional Council to ensure that information about known contaminated sites is readily available to interested parties, such as landowners, potential purchasers and developers. Subdivisions and uses of rehabilitated sites are managed under district plans.

(C) PROPERTY DATABASE

The RSLU database is continually updated as new information is received. Information may be obtained from the Council's own activities, including investigations, regular monitoring and inspection programmes, and responses to unauthorised incidents. Information may also be provided by consultants carrying out site investigations, property owners, and members of the public.



Dangerous goods storage.

Sites on the RSLU database are identified on www.trc.govt.nz through the Regional Explorer. The information available includes the historical and current land uses, site status and a link to inspection data. A full site report can be made available on request from the Taranaki Regional Council. Real estate agents, land valuers, and solicitors have been advised of the RSLU and regularly make use of it.

Future development and subdivision of former agricultural or industrial land for residential use has the potential to lead to an increase in the number of sites considered contaminated as land uses change.

(D) MONITORING AND INSPECTIONS

The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal³⁸. The list includes industries such as abrasive blasters, cement works, garages/workshops, light engineering, paint sprayers, sawmills and other industries. The Council regularly monitors these industries for their compliance with consent conditions or permitted activity standards. Where industries fail to meet consent conditions or standards in regional plans they are re-inspected and if required, enforcement action is undertaken (including requirements for remediation).

(E) INVESTIGATIONS AND REMEDIATION

The Council has been proactive in the investigation of sites where past or current activities may have resulted in contamination. Some of these investigations have identified site contamination that poses unacceptable risks to the environment. A number of sites, with no apparent owner, have successfully been remediated in co-operation with the region's district councils. In 2003-04 this included four scrap metal yards, a garage, and two former gasworks sites.

In May 2008 the Council reported on the investigation undertaken of the former Pātea freezing works³⁹ (see case study). The report concluded that asbestos and electrical equipment containing PCBs are the only contamination issues remaining on the site.

Due to the careful and strategic use of resources the Council has devoted to the issue of contaminated land since the early 1990s, only a small number of low-risk sites now require further investigation.



Taranaki Sawmills, Bell Block.

³⁸ Ministry for the Environment, 2003. *Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand.*

³⁹ Taranaki Regional Council, 2008. *Patea Freezing Works Detailed Site Investigation Report.*



Fire raged through the abandoned Patea Freezing Works, 6 February 2008.

AFTER THE HEAT CAME THE LIGHT

The heat went on – literally – in the midst of a lengthy site contamination investigation at the abandoned Patea freezing works.

Interrupted by a major fire, the investigation was one of the most extensive and complicated ever carried out by the Taranaki Regional Council. But it has helped to define a positive way forward in dealing with the site.

Asbestos, hydrocarbons, PCBs and a range of other chemicals including nitric acid were on the list of possibilities in 2007 as Council staff began preparing to assess the site, which has lain disused for 20 years.

On-site work began in January 2008 but was dramatically interrupted on Ash Wednesday, 6 February, when a major fire at the old works caused the evacuation of hundreds of townsfolk because of fears of airborne asbestos in the smoke.

While subsequent air sampling indicated no asbestos contamination in the township, it was obvious that as a priority, urgent measures were needed to stabilise asbestos fibres left in the ruins of the site. Taranaki Regional Council technical and compliance staff suggested the use of a polymer dust suppressant of the type they are familiar with at construction sites and transport yards.

This succeeded beyond expectations, adhering to hard surfaces and soaking into the fine material and forming a thick spongy layer that bound ash and other fire debris, and ensured dust from the site wouldn't go anywhere. Subsequent air sampling has confirmed this.

(F) HAZARDOUS SUBSTANCES AND NEW ORGANISMS ACT

The Council inspects industries and businesses to check compliance with the Hazardous Substances and New Organisms Act. Businesses are not charged for the HSNO inspections which are done in conjunction with other inspections or monitoring wherever possible. The inspections are done under a contract with the Department of Labour.

The tangled mess left at the site posed more challenges for Council staff as they resumed their site assessment. PCBs were removed where possible, and old drums of acid were removed or neutralised on-site.

In the meantime, the publicity around the big fire highlighted uncertainty over ownership of the site, with several parties involved.

On-site investigations continued for four more months, covering soil, groundwater, air quality, and the ecology of the adjacent estuary. As a result of the site investigation, the Taranaki Regional Council's report concluded that concentrations of all on-site contaminants are below relevant guidelines except for asbestos, which has been stabilised with the polymer binder.

Surface water discharging from the site has elevated levels of metals. This goes directly into the estuary where it is immediately diluted many times over, and would not exceed guidelines or pose a significant risk to human health, or to the Patea River ecosystem.

The Council's Director-Environment Quality, Gary Bedford, said he was pleased the investigation carried out by the Council had provided encouraging answers to many questions about the state of the site.

The South Taranaki District Mayor, Ross Dunlop, said that now his Council knows what contaminants it is dealing with, it can make plans for moving forward. He says the next step will be talks with central Government, land owners and iwi aimed at getting the site cleaned up.

The then Minister for the Environment, Trevor Mallard, announced Government funding of \$1.5 million to help with cleaning up the site. The clean-up was expected to take place over a period of up to 40 weeks in 2009.



Taranaki Regional Council staff prepare to move hazardous waste after the fire.

The Environmental Risk Management Authority assigns various controls for sites based on the risk of hazardous substances that are stored or used. Controls may include 'Location Test Certificates' (similar to the old dangerous goods licences), 'Approved Handlers Registrations' for people handling hazardous substances, and tracking of hazardous substances. Compliance with these controls is assessed during inspections.

(G) SUMMARY OF PROGRESS

Progress on implementing regional objectives and policies on contaminated sites is summarised in Table 3.7.

3.3.3 HOW DO WE COMPARE?

In the *Environment New Zealand 2007*⁴⁰ report, 10 regions in New Zealand self-reported on contaminated sites. The data are shown in Table 3.8.

Since this report was released, remediation has occurred at additional sites in the Taranaki region. The figures show that as expected, most reported and confirmed contaminated sites are in the more populated regions that have high levels of industrial and agricultural activity.

As discussed earlier, Taranaki has no contaminated sites - all sites have either been remediated or are actively managed to ensure there are no significant adverse effects on the environment, such as the Pātea freezing works site.

Table 3.7: Summary of progress: implementing regional objectives and policies on contaminated sites.

Issue	What do we want to achieve?	What are we doing about it?	Where are we at?
Management of hazardous substances	Improvement in management	<ul style="list-style-type: none"> RMA and HSNO advice, controls and monitoring are provided by the Regional Council. 	<ul style="list-style-type: none"> Inspections of businesses are undertaken by the Regional Council in conjunction with RMA monitoring. There is a high level of compliance.
Investigation and management of contaminated sites	Information on potentially contaminated sites, provision of accessible public information, and appropriate management of sites where there is an environmental or public health risk.	<ul style="list-style-type: none"> All identified high-risk contaminated sites have been remediated and by December 2008 all identified medium risk contaminated sites will be effectively managed or remediated by the Council. The Council contaminated sites database will conform to the Ministry for the Environment Classification and Management Protocols and district councils will have access to this database and subsequent updates. The district councils will acknowledge within five working days an enquiry for information concerning contaminated sites. 	<ul style="list-style-type: none"> All contaminated sites in Taranaki remediated or effectively managed. 1,281 sites recorded on the database. MfE proposing a National Environmental Standard for database requirements. Register of selected land uses incorporates current MfE guidelines. Enquiries regarding the database come directly from the public.

Table 3.8: Self-reported information on contaminated sites in 10 regions, 2006–2007.

Region	Total number of sites that have been found to be contaminated	Number of contaminated sites not yet cleaned up or actively managed ¹	Number of cleaned up sites	Number of actively managed sites
Auckland	368	93	109	166
Waikato	258	118	140	See note 2
Wellington	149	77	46	26
Canterbury	134	10	124	See note 2
Otago	93	35	21	37
Bay of Plenty	85	42	4	39
Hawke's Bay	65	8	57	See note 2
Taranaki	39	0	10	29
Marlborough	24	5	15	4
Tasman	23	4	19	See note 2
Total	1,238	392	545	301

Notes:

(1) This column includes only sites that have not yet been cleaned up or managed, except for the Auckland figure, which includes some sites that have resource consents (and are therefore managed).

(2) The number of managed sites in this region is included under the column for confirmed cleaned up sites.

Data source: Listed regional councils.