FACT SHEET Commercial sites

Past or current activities carried out on commercial sites may have caused contamination of soil and groundwater on the property or on neighbouring properties. Therefore before undertaking earthworks, subdivision activities, buying or selling a commercial site, or applying for a consent, for example, to change the land use always check for contamination.

This fact sheet will give you some useful hints to start the process.

Step 1 Collect as much information from the local and regional council about the site.

Step 2 Collect anecdotal information by talking to neighbours, previous property owners, etc. who may point you to other people who 'know a lot about the area'. Libraries may have a collection of old photographs and if your property is in town you may be able to identify the type of business it was.

Step 3 If any of the activities may have caused or is causing contamination the concentration and extent (volume of soil and/or groundwater affected) need to be investigated to assess:

- whether there is any health hazard or danger to the environment.
- current environmental damage done to the site. This can be stated in a dollar value often expressed as a range. The more data available the narrower this range will be.
- whether the contamination is migration off-site; or from a neighbouring property onto the site

The Ministry for the Environment has published the hazardous Activities and Industries List (HAIL) which is copied below. This list gives some insight into which activities can cause contamination.

Hazardous Activities and Industries List (HAIL)

(ref: http://www.mfe.govt.nz/issues/hazardous/contaminated/hazardous-activities-industries-list.html)

This Hazardous Activities and Industries List defines industries and activities which typically use or store hazardous substances that could cause contamination if these substances escaped from safe storage were disposed of on the site, or were lost to the environment through their use. The fact that an activity or industry appears on the list does not mean that hazardous substances were used or stored on all sites occupied by that activity or industry, nor that a site of this sort will have hazardous substances present in the land. The list merely indicates that such activities and industries are more likely to use or store hazardous substances and therefore there is a greater probability of site contamination occurring than other uses or activities. Conversely, an activity or industry that does not appear on the list does not guarantee such a site will not be contaminated. Each case must be considered on its merits, considering the information at hand.

In applying the list, it must be remembered that the activity may only have occupied a small part of the site, and therefore the possibility of contamination will also be for a small part of the site.

1. Abrasive blasting – carrying out abrasive blast cleaning (other than cleaning carried out in fully enclosed booths) or disposing of abrasive blasting material.
2. Acid/alkali plant, formulation and bulk storage.
3. Agrichemical spray contractor's premises used for filling and washing out tanks for commercial agrichemical application.
4. Airports – fuel storage, workshops, washdown areas, stormwater runoff from hardstanding.
5. Analysts – commercial analytical laboratory sites.
6. Asbestos products production, use, and disposal. Also sites with buildings containing asbestos products known to be in a deteriorated condition.
7. Asphalt or bitumen manufacture or bulk storage – manufacturing asphalt or bitumen, or bulk storage of these products, other than at a single-use site used by a mobile asphalt plant.
8. Battery manufacture or recycling – assembling, disassembling, manufacturing or recycling batteries (other than storing batteries for retail sale).

9. Brake lining manufacturers, repairers and recyclers.
10. Cement or lime manufacturing – manufacturing cement or lime from limestone material using a kiln and storing wastes from the manufacturing process.
11. Cemeteries
12. Chemical manufacture and formulation and bulk storage such that land use consent is required.
13. Coal and coke yards.
14. Concrete manufacture and bulk cement storage
15. Defence works and defence establishments, including ordinance storage and training areas where live firing is carried out.
16. Drum and tank reconditioning or recycling.
17. Dry cleaning plants – restricted to premises where dry cleaning is carried out and solvents are stored.
18. Electrical transformers – manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment.
19. Electronics – manufacturing & reconditioning
20. Engine reconditioning – use of solvents and degreasers
21. Explosive production or bulk storage
22. Fertiliser manufacture – manufacturing or bulk storage of agriculture fertiliser.
23. Foundry operations – commercial production of metal products by injecting or pouring molten metal into moulds and associated activities.
24. Gasworks – manufacture of town gas from coal or oil feedstocks.
25. Gun, pistol or rifle ranges or areas with lead shot deposition
26. Iron and steel works
27. Landfill sites
28. Livestock dip or spray race operations
29. Market gardens, orchards, glass houses or other areas where the use of persistent agricultural chemicals occurred.
30. Metal treatment or coating – including polishing, anodising, galvanising, pickling, electroplating, heat treatment using cyanide compounds and finishing, curing works or commercially finishing leather.
31. Mining and extractive industries and mineral processing – including chemically or physically extracting metalliferous ores, exposure of faces or release of groundwater containing hazardous contaminants and storing hazardous wastes, including waste dumps and tailings dams, but not gravel extraction (just note that these areas can be included because of fuel storage).
32. Motor vehicle workshops
33. Paint manufacture and formulation
34. Pest control – commercially operating premises (or former pest destruction board, now regional council sites) where storage and preparation of pesticide occurs, including preparation of poisoned baits and filling or washing of tanks.
35. Pesticide manufacture (including animal poisons, insecticides, fungicides and herbicides) – commercially manufacturing, blending, mixing or formulating pesticides.
36. Petroleum or petrochemical industries or storage, including oil production and operating a petroleum depot, terminal, blending plant or refinery, retail or commercial refuelling facility, and facilities for recovery, reprocessing or recycling petroleum based materials and bulk storage above and below ground.
37. Pharmaceutical manufacture - commercially manufacturing, blending, mixing or formulating pharmaceuticals, including animal remedies and illicit drug manufacturing.
38. Port activities – including dry docks and ship and boat maintenance facilities.
39. Power stations and switchyards
40. Printing – commercial printing, using metal type, inks and dyes, or solvents.
41. Railway yards – operating a railway yard including goods-handling yards, workshops, refuelling facilities and maintenance areas.
42. Sawmills – use of antisapstain chemicals during milling
43. Scrap yards – operating a scrap yard including automotive dismantling or wrecking yard or scrap metal yard.
44. Service stations
45. Smelting or refining – fusing or melting metalliferous ores or refining the metal.
46. Tannery, fellmongery or hide curing – operating a tannery or fellmongery or hide curing works or commercially finishing leather.
47. Transport depots
48. Storage tanks and drum storage for fuel, chemicals and liquid waste.
49. Waste storage, treatment and/or disposal including land disposal of wastes, but not the use of biosolids as soil conditioners.

50. Wood treatment and preservation and bulk storage of treated timber.
51. Wool, hide and skin merchants (e.g. drying, scouring).
52. Any site that has been, or could be, subject to the migration of hazardous substances from hazardous substances present in soil or water on adjacent sites.
53. Any other facility or activity that stores, uses or disposes of hazardous substances, in sufficient quantity that intentional or accidental discharge of the substance could be a risk to human health or the environment.

Many other activities have caused contamination for example on farms:

a. Sheep and cattle dipping
b. Anti foot-rot baths
c. Farm tips
d. Temporary waste and machinery storage areas
e. Glass houses
f. Fertiliser storage areas
g. Chemical storage areas
h. Fence lines if H4 treated posts and battens are used

And on agricultural / horticultural sites:

a. Spray shed areas
b. Wells / bores especially when used to fill sprayers
c. Multiple hotspots from hydrant systems
d. Blocks with larger trees (old variety apple and most pear tress) hold higher levels of contaminants
e. Glass houses
f. Residues in soil from past fertiliser use (Cadmium) or pesticide application (DDT on pasture)
g. Sheds / painted fences / fences of H4 – H3 treated wood
h. Other industries: intensive chicken & pig operations, cut flower growing properties.

National Environmental Standard (NES: http://www.mfe.govt.nz/laws/standards/contaminants-in-soil/)

On 1 January 2012 the NES was introduced to protect human health from potential contaminants in soil. The NES applies nationally and sets the minimum standards for soil quality for several end uses. In the NES the Soil Contaminant Values ($SCVs_{(health)}$) have been developed for 12 priority contaminants to determine the acceptability of the contamination, and therefore whether or not resource consent is required[1] (see table on the following page).

During the Preliminary Site Investigation stage it is useful to relate these 12 contaminants to potential activities on the property under investigation. An example is given below. The outcome of analysis is compared to the soil contaminant values ($SCVs_{(health)}$) provided in the NES for the current or future use of the site which leads to a conclusion about suitability or the need for remediation. If concentrations of contaminants in the samples taken exceed the soil contaminant values ($SCVs_{(health)}$), often a further investigation needs to be carried out to determine the extent of contamination found.

[1] Appendix B, Cabinet paper on proposed National Environmental Standard

Priority Contaminant	Common use	Expected Y / N	Reason	Samples needed ?
Arsenic	Related to CCA wood and sheep dipping, orchard sprays applied 1900 – 1970	Yes	Site was in Orchard by at least 1935 – which is well within the lead-arsenate spaying era	Yes; XRF field test on regular pattern, 1 in 10 samples to lab. Extra samples in NE corner.
Boron	Timber treatment	No	No such activity	NO
Cadmium	Residue from Super phosphate fertiliser	Yes	Low intensity as pastoral use has been intermittent	Yes, a few checks as it will be homogenous
Chromium	Electroplating, pigments, treated timber	Yes	Unlikely, however could be related to CCA posts in orchard	Yes, a few check samples

Table 2: Summary of soil contaminant values for inorganic substances (mg/kg)

	Arsenic	Boron[1]	Cadmium (pH 5)[2]	Chromium[1]		Copper[1]	Inorganic lead	Inorganic mercury compounds[3]
				III	VI			
Rural residential / lifestyle block 25% produce	17[4]	NL	0.8	NL	290	NL	160	200
Residential 10% produce	20	NL	3	NL	460	NL	210	310
High-density residential	45	NL	230	NL	1,500	NL	500	1,000
Recreational	80	NL	400	NL	2,700	NL	880	1,800
Commercial / industrial outdoor worker / maintenance	70	NL	1,300	NL	6,300	NL	3,300	4,200

1 SCVs for boron, chromium III and copper are much greater than the soil concentration at which plant health will be affected. Plant and other environmental effects may need to be considered separately.

2 Default value is for pH 5. See Appendix 1 of the *Methodology Report*[22] for SCVs at other soil pH values.

3 The inorganic mercury SCV does not apply to elemental (pure) mercury.

4 Derived value replaced with 99th percentile of national dataset of background concentrations as described in the *Methodology Report*.

Note: NL = No Limit. Derived value exceeds 10,000 mg/kg.

Table 3: Summary of soil contaminant values for organic compounds (mg/kg unless shown otherwise)

Scenario	BaP [1] (mg/kg)	DDT (mg/kg)	Dieldrin[2] (mg/kg)	PCP[3] (mg/kg)	Dioxin (µg/kg TEQ)[4]	
					TCDD	Dioxin-like PCBs[5]
Rural residential / lifestyle block 25% produce	6	45	1.1	55	0.12	0.09
Residential 10% produce	10	70	2.6	55	0.15	0.12
High-density residential	24	240	45	110	0.35	0.33
Recreational	40	400	70	150	0.60	0.52
Commercial / industrial outdoor worker / maintenance	35	1,000	160	360	1.4	1.2

More stringent guidelines will need to be used if it can be expected that sediment run-off will occur frequently to more sensitive areas, such as estuaries and nature reserves.