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The development of 'EnviroPork™: pork industry guide to managing environmental effects' has been structured to ensure that a high quality document is produced. The New Zealand Pork Industry Board (NZPIB) would like to thank the following people and groups for providing their knowledge and expertise during this process. Their efforts have ensured that this document provides easy to read and accurate information, as well as providing a fair and balanced approach to the management of environmental effects:

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- Federated Farmers of New Zealand
- Massey University
- Ministry for the Environment - Sustainable Industry Group
- NZPIB Directors, District Chairmen, pork producers who were part of the Working Party, and a cross section of producers throughout the industry

A. Introduction

1. Purpose

The purpose of 'EnviroPork™: pork industry guide to managing environmental effects' is to provide pork producers, council officers, persons looking to enter into the pork industry, and other stakeholders a reference for acceptable practices to managing the environmental effects of pork production. Adopting these management practices will assist in meeting the anticipated requirements of the Resource Management Act (1991) in each region.

Note: EnviroPork™ (V1.0, 2005) supersedes the New Zealand Pork Industry Board Code of Practice – Pig Farming (1997).

2. Pig Industry Overview

Pig farming (Pork production) has long been an integral part of the rural scene in New Zealand. The pork industry supply chain contributes in excess of 700 million dollars to the New Zealand economy.

Pig farms can be classified as being 'intensive', 'extensive', 'dispersed' or 'hobby/lifestyle'. Over recent years, increased awareness of the potential effects on the environment of all farming activities have led to significant changes to the way producers are managing their farms.

The number of commercial farms has decreased, but the size of the sow herds are steadily increasing. There are properties where a small number of pigs are housed, often for personal rather than commercial reasons. 'EnviroPork™: pork industry guide to managing environmental effects' (EnviroPork™) should be applicable for all types of piggeries, including these smaller herds.

Generally pig diets are grain meal based. Hence a large proportion of commercial New Zealand piggeries are found in the grain growing areas of the South Island. These are largely intensive piggeries although there is a growing trend towards extensive farming. Pig farms can also be found where dairy and food industry by-products form the basis of pig diets.

3. Environmental Legislation

The Resource Management Act (1991) superseded legislation governing the management of pig farming activities. This effects-based legislation focuses on the effects of any farming activities and requires any adverse effects to be avoided, remedied or mitigated.

The Resource Management Act (RMA) provides regional and territorial authorities (district councils) with opportunities to manage the effects of activities such as pig farming to promote sustainable management. The types of rules councils may use in their plans and the types of resource consent a pork producer may require are summarised in the table below.

Table 1. Summary of activity and resource consent type requirements on local authorities under the RMA

Local Authority	Types of Resource Consent	Type of Activity in Rules in Council Plans
District Council	<p>Land use consent - anything requiring consent under a district plan (most rural activities).</p> <p>Subdivision consent - includes leases, cross leases and unit titles.</p>	<p>1. Permitted activity – allowed without a consent provided they comply with standards, terms and conditions in the plan.</p> <p>2. Controlled activity - will be granted a consent subject to conditions on the matters specified in the plan.</p>
Regional Council	<p>Land use consent – for activities on a lake or river bed, and also for certain activities requiring consent under a regional plan.</p> <p>Water consent - for taking, using, damming or diverting water.</p> <p>Discharge consent - for discharging water or contaminants into water, into or onto land or into air.</p> <p>Coastal consent - for any of the above activities other than subdividing land in a coastal marine area.</p>	<p>3. Restricted discretionary activity – may be granted consent based on the authority's consideration of specified matters.</p> <p>4. Discretionary activity – may be granted a consent based on the authority's consideration of the application overall.</p> <p>5. Non-complying activity - contravenes the plan or is not specifically referred to, a consent may be granted if adverse effects on the environment are minor and the activity is not contrary to the objectives and policies of the plan.</p> <p>6. Prohibited activity - cannot apply for a consent.</p>

Producers and other persons having an interest in the establishment and/or expansion of a pig farm are strongly advised, at an early stage, to contact their local Regional and District Councils to seek compliance requirements with local rules relating to pig farms.

Under the Building Act 1991 a building consent will be required for all new buildings, additions to old buildings and, in some districts, effluent ponds. See Appendix A for a list of all the legislation that is relevant to pig farming in New Zealand.

4. Treaty of Waitangi

The principles of the Treaty of Waitangi must be taken into consideration in decision making under the Resource Management Act 1991.

Maori spiritual values are a primary concern of the Treaty of Waitangi. Maori consider that waste water is purified by being returned to the earth. Such a practice remains a very practical, environmentally sound option for disposing of manure. Maori concerns, ancient in origin and expressed in spiritual terms, are in many respects a forerunner of environmental law in New Zealand. Consultation with Maori in your area may be a part of obtaining a resource consent.

5. What is an Effect?

The Resource Management Act (1991) requires all activities that have an effect on the environment need to be considered and planned for by district and regional councils. The RMA states that an 'effect' includes:

- Positive or adverse effects
- Temporary or permanent effects
- Past, present or future effects
- Cumulative effect which arises over time or in combination with other effects
- Any potential effect of high probability
- Any potential effect of low probability, which has a high potential impact.

6. Anticipated Environmental Effects

It is anticipated that EnviroPork™ will provide guidance so that producers can remain compatible with the sustainable development goals of the RMA and Local Government Act (2002). EnviroPork™ also reflects the recognition that key stakeholder such as councils are required to implement policies that are as effects based as possible.

EnviroPork™ makes a distinction between 'effluent' and 'manure'. For the purposes of EnviroPork™, the term 'effluent' is defined as everything excreted by pigs (both solid and liquid). It also includes bedding, water used to hose, flush and clean piggery buildings. Manure is defined as being everything that is applied to land (once again including both solid and liquid parts). Once the effluent has been collected and/or processed, it then becomes manure if applied to land because of its benefits to soil structure and nutrient supply.

A major concern of the pork industry is the use of rural land for non-traditional purposes, such as rural subdivision. It is important to recognise that pig farming is a legitimate rural activity. Residential encroachment into the countryside can threaten this long-standing legitimacy. If residents' expectations mean a pig farm cannot operate within the rural area, this will threaten the sustainability of the pork industry. This concept is called **Reverse Sensitivity** and is now a recognised 'effect' (see Table 2), with many councils beginning to include controls for reverse sensitivity in their plans.

Table 2. Summary of potential effects of pig farming on the environment

Activity	Potential Effect	Potential Solution	Possible Benchmark
Piggery Location	<ul style="list-style-type: none"> • Loss of productive soils • Odour, dust and noise emissions • Visual impact • Birds and rodents 	<ul style="list-style-type: none"> • Appropriate design and landscaping • Appropriate zoning • Suitable climate, topography, soil type • Pest control 	<ul style="list-style-type: none"> • District and regional council plans • EnviroPork™ • Environmental Management System
Piggery Design	<ul style="list-style-type: none"> • Odours • Pathogens • Nutrient leaching and runoff • Visual impact • Birds and rodents 	<ul style="list-style-type: none"> • See solutions above • Drainage • Effluent processing systems • Manure application practices • Landscaping • Pest control 	<ul style="list-style-type: none"> • District and regional council plans • EnviroPork™ • Environmental Management System
Piggery	<ul style="list-style-type: none"> • All of the above 	<ul style="list-style-type: none"> • Staff skill/ stockmanship • Hygiene • Maintenance 	<ul style="list-style-type: none"> • EnviroPork™ • Environmental Management System
Public Relations	Unrealistic public perceptions of pork production	<ul style="list-style-type: none"> • Communication and cooperation* • Sensitivity to other activities 	<ul style="list-style-type: none"> • EnviroPork™ • Environmental Management System

* Consultation with neighbours may be required as part of a resource consent application.

7. Other Resources

There are a number of other environmental based resources that may be of value to those interested in the pig industry. These are:

1. *Environmental Management System* – see NZPIB website (www.pork.co.nz)
2. *Do you own pigs?* - for small, non-commercial farms. see NZPIB website
3. *Pigs and the Resource Management Act* - contact the Ministry for the Environment (www.mfe.govt.nz)
4. *Managing Rural Amenity Conflicts* – contact Ministry for the Environment (www.mfe.govt.nz)

B. General Farm Management

Introduction

There are a number of management techniques that can be used to minimise environmental effects. It is anticipated that a good producer will be able to achieve desired environmental outcomes through using a combination of management practices and systems, discussed below, that are best suited to their site.

1. Intensive Piggeries

1.1 Area requirements

Piggery location and building sites and manure application areas should be selected to minimise adverse effects.

Good Practice Guidelines No. 1 - Location	
1.	Compliance with Land Use resource consent if applicable – see district council plan.
2.	Surface run-off of manure should be controlled.

Other factors to consider

- Proximity to sensitive activities
- Capacity of the area surrounding piggery to reduce potential nuisance
- Adequate land for buildings and effluent treatment with area available for expansion
- Land susceptible to flooding

1.2 Site layout/Building design

Building design can vary widely. The most common types of building are deep litter, or full/partially slatted floors with natural or controlled ventilation. See the Animal Welfare (Pigs) Code of Welfare (contact Biosecurity New Zealand – <http://biosecurity.govt.nz/animal-welfare/codes/pigs/index.html>).

Good Practice Guidelines No.2 – Site layout and building design	
1.	Flooring and other structures should be designed to permit the efficient removal of all effluent.
2.	The specific regulatory requirements and standards should be adhered to, with regard to general design and construction detail. Refer to the Animal Welfare (Pigs) Code of Welfare.

Other factors to consider

- Permanent buildings on intensive piggeries should be constructed of materials having an expected service life of at least 10 years.
- Sheds should be sufficiently spaced from other buildings or trees for ventilation and dispersion of odour.

- For a new development, consideration of location and siting can be given more weight than when buildings are being added to an existing unit.
- Landscape design should result in the structures blending more readily into their surroundings.

1.3 Drainage surrounding a piggery

Good Practice Guidelines No.3 - Drainage	
1.	The effluent system should be designed to meet peak flow conditions.
2.	Contaminated storm water should be considered as forming a part of piggery effluent.

Other factors to consider

- Collected storm water can be stored for use for diluting effluent when applying to land, cleaning and/or as flushing water. Otherwise it should be discharged by the most suitable means to a watercourse or ground soakage.
- There is a risk of erosion where pigs are run on land where ground cover is not maintained. This can result in sedimentation in waterways.

1.4 Storage and disposal of containers and toxic substances

Producers will need to ensure they are complying with the Hazardous Substances and New Organisms Act (2003) with regard to how various chemicals are stored and used (a guide can be accessed via the Ministry for the Environment website - www.mfe.govt.nz).

2. Extensive Piggeries

2.1 General

Farming of pigs outdoors is dependent on a range of environmental factors. Free-draining soil, low rainfall, and a temperate climate are all necessary for successful operation, which means that there are areas of New Zealand unsuitable for this system of production.

Good Practice Guidelines No.4 – Extensive piggeries	
1.	Soil should be free draining.
2.	Pasture cover should be maintained throughout the year.

Other factors to consider

- Recovery of pasture may require paddock rotation.
- The amount of land required will depend on various factors. As a general guide, a maximum stocking density of 12-24 sows per hectare should be adhered to. The Animal Welfare (Pigs) Code of Practice has specific suggested stocking rates.

2.2 Housing

Outdoor shelters can be purpose designed for a variety of functions including dry sow, farrowing, weaner and grower accommodation. Refer to the Animal Welfare (Pigs) Code of Practice for minimum standards.

C. Managing the Effects of Discharging to Land and Water

I. Effluent Collection, Storage and Processing

I.1 General

There is a variation in the composition of raw pig manure across piggeries due to differences in pig diets, pig herd genetic makeup and ‘on farm’ conditions. Given this variation, there are a number of systems used in New Zealand for effluent collection. Table 3 gives a description of these systems.

Table 3. Types of effluent collection systems

Collection system	Description of activity
Hydraulic	This system includes manual cleaning with hoses, flushing under slats, flushing open gutters (solid dunging channels) and under slat storage with periodic discharge (up to 3 weeks). The total volume of flush water required per day for adequate cleaning is dependent on many factors including: the availability and cost of water, building design, and effluent-handling system.
Mechanical	Scraper systems minimise the volume of effluent generated as they do not require water. These systems are not common in New Zealand.
Solids Separation	Effluent can be separated into solid and liquid parts using sedimentation basins or screens. The most common system involves pumping the effluent over a wedge wire screen. The benefits of solid/liquid separation of piggery effluent include: 10 - 30% reduction in Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) from the raw effluent, increased pump protection from large particles, allows liquid manure to infiltrate soil more quickly when irrigated, generates a solid by-product that can be composted. See table below.
Organic Bedding Matter	This is a housing system where the pigs are kept on a bedding or organic matter such as sawdust or straw. The effluent is slowly composted within the organic matter and is removed at regular intervals depending on the system used. This system has a number of benefits including: reduction in odour, little water required for cleaning/flushing, and the creation of a valuable compost product that can be applied to land or sold.

Good Practice Guidelines No.5 –Effluent collection

1. Flushing, scraper blade and operating channel systems should be well designed and accurately dimensioned so minimal material is left in the drain.
2. Routine management of the effluent collection system, including regular cleaning of screens, is essential for continued optimum effectiveness.

Other factors to consider

- Correct assessment of the flushing volume minimises the water use while ensuring adequate cleaning.
- Properly designed systems will minimise odour.
- In flushing systems, effluent should be removed, preferably at not greater than 24-hour intervals, from dung races and drains, including drains under slats.
- Collection/storage systems with effluent in pits under the shed will allow storage for a number of months before emptying (dependant on the design of the system).

1.2 Sumps/Storage Tanks

Sumps and storage tanks are used as temporary storage for effluent that has been collected from the piggery sheds.

Good Practice Guidelines No.8 – Sumps

1. Sumps and tanks should be made out of materials that are strong and corrosion resistant.

Other factors to consider

- When sizing sumps, consideration needs to be given to flushing frequency, volume, pumping frequency, pumping capacity and entry of storm water.

1.3 Pond systems

Ponds are used for effluent processing on farm and may be anaerobic and/or aerobic. A pond treatment system comprising an anaerobic pond and aerobic pond in series can achieve up to 95% BOD and up to 70% nitrogen reduction.

1.4 Anaerobic (primary) ponds

Good pond design should reflect local climate, pig numbers (loading rate), piggery management systems and effluent pre-treatment systems.

Good Practice Guidelines No.6 – Anaerobic Ponds

1. At the time of construction, the anaerobic pond depth should be a minimum of 3-4 metres
2. Ponds in permeable soils or high water table areas should be lined with a clay or synthetic liner to minimise the risk of leaching.

Other factors to consider

- Anaerobic ponds should be sited away from dwellings.
- Anaerobic ponds may need to be desludged depending on the loading rate, size/depth of pond, and if the effluent is screened.

1.5 Aerobic (secondary) pond

Aerobic ponds provide further breakdown of BOD, micro-organisms and nutrients in the presence of oxygen.

Good Practice Guidelines No.7 –Aerobic Ponds

1. Aerobic ponds should not exceed 1.2 metres deep as a greater pond depth does not allow adequate sunlight for algal growth or sufficient surface area for oxygen diffusion.

1.6 Constructed wetlands

Constructed wetlands can be used as a polishing stage following aerobic pond treatment. The wetland allows for the uptake of further nutrients and organic matter. Well-designed and managed wetlands require low maintenance.

1.7 Organic bedding systems

These systems are a method of housing where the pigs are penned on a bed of sawdust, straw or other organic material. The bedding system contains all manure within the confines of the pen with material only being removed at

intervals dependant on the management system.

Factors to consider

- Water spillage into the bedding from drinkers should be avoided.
- Availability and cost of bedding material
- Greater space allowances per pig, compared to non-bedded systems.
- Utilisation of used bedding by spreading to land, composting, or sale off-farm.
- Well stockpiled used bedding is stable and will compost slowly.

1.8 Composting

Screened piggery effluent solids when combined with a carbon source such as sawdust or straw, or material from organic bedding systems can be successfully composted.

Good Practice Guidelines No.9 – Composting
<ol style="list-style-type: none"> 1. Ensure the appropriate mix of water, carbon, nitrogen and oxygen is maintained.

Other factors to consider

- Aeration of the material will speed the composting process.
- Composting requires specific plant, machinery and adequate space.

1.9 Other Technologies

There are a number of technologies that are being developed and improved so that effects on the environment can be minimised. These include:

- Biogas production (a number of systems)
- Flocculation (solids separation)
- Composting and Worm farming
- Constructed wetlands

2. Application of Manure to Land

2.1 Introduction

Many regional councils in New Zealand strongly encourage producers to use systems that discharge pig manure to land rather than to water. The nitrogen content of piggery manure is usually the major determinant of the land area required for application. In recent years, the pork industry and various councils have used 200kg N/hectare/yr as a guide for applying effluent to land. However, using a nutrient budget may demonstrate that higher levels of nitrogen can be applied. As a general guide, the table below provides nutrient rates for fresh,

untreated effluent.

Table 4. Nutrient values of fresh, untreated effluent

Type of pig	No. for a 250 sow intensive piggery	Total solids per pig kg/yr	Total nutrient output Kg/yr		
			N*	P	K
Boars	8	186	120	42.4	30.4
Dry sows	204	186	2835	1060	755
Gilts	14	197	168	64	56
Lactating sows and litters	46	422	2300	598	506
Weaners	670	54	2613	737	737
Porkers	777	108	7148	2331	4865
Baconers	444	181	7015	2264	1820
Total	2136		22200	7098	5769

Reference: Australian Pork Limited - 'National Environmental Guidelines for Piggeries'

* It is important to note that various systems for effluent collection, processing, and application to land can reduce the amount of nitrogen by as much as 90%. If using any form of effluent processing system, testing is recommended to determine specific NPK levels for the piggery prior to application to land.

Land application of piggery manure can be used to:

- Apply nutrients to the soil and improve soil structure
- Reduce fertiliser costs
- Irrigate

2.2 Land suitability - Soil type and hydraulic loading

Good Practice Guidelines No.10 – liquid application of manure

1. Soil infiltration should be considered when determining application rate.
2. Soil type and moisture holding capacity should be considered when determining application volume.
3. Nutrient application should be balanced with crop/pasture utilisation.

Other Factors to consider

- Climatic factors
- High rainfall events will limit the amount of liquid manure that can be applied to land

2.3 Land application equipment

Manure can be applied to land using various types of equipment including: travelling irrigators, stationary irrigators, slurry tankers, and soil injectors.

2.4 Manure applied off farm

Where manure is applied to land off-farm this activity may be subject to the same resource consent controls as on-farm application (check with your regional council).

D. Managing Discharges to Air

Management practices should be adopted to minimise nuisance. Sections 2, 3 and 4 above also provide guidance in these management practices.

I. Odour, Dust and Noise

The RMA (1991) effectively requires that there should be no offensive or objectionable odour beyond the boundary of the farm. In recent years, case law has established that reverse sensitivity is a valid effect and should be considered by councils.

The offensiveness of odour is reliant on individual perception, council methods of measurement, and management practices of the pork producer. The Environmental Management System (EMS) – see brief description on page 10 - deals with these management practices ensuring the effect of odour is taken into account when the pork producer is designing and/or undertaking activities relating to these areas of the farm. These are:

- Pig housing
- Effluent treatment areas
- Land application areas
- Feed milling and mixing areas

E. Other Management Requirements

1. Carcass disposal

If managed correctly, the disposal of carcasses will have a minimal effect on the environment. There are a range of disposal methods that can be used, such as composting, offal holes, or off farm rendering. It is important to check council plan rules as councils can vary in their approach to carcass disposal.

2. Monitoring

Compliance with the guidelines mentioned in EnviroPork™ should ensure a good level of environmental management, providing councils with an incentive to reduce monitoring costs. It is envisioned that Council's could encourage producers to self-audit using the EMS workbook (see description below), and in return undertake less regular compliance checks.

F. Contingency Procedures

I. Have a Plan

There is a chance that an emergency may mean that the piggery may not be able to meet the above guidelines and legal obligations. For example,

- Industrial action, either on or off the farm
- Extreme weather
- Earthquake
- Fire
- Electric power failure

Despite the fact that these events are unavoidable, there should be a plan in place that ensures adverse effects on the environment are kept to a minimum. Refer to the Animal Welfare (Pigs) Code of Welfare - <http://biosecurity.govt.nz/animal-welfare/codes/pigs/index.html>). - for legal requirements.

Environmental Management Systems Template

EnviroPork™ sets the benchmark whereby all producers should be able to set themselves against. Where a higher level of management is required, the pork industry's Environmental Management System (EMS) template can be used.

This EMS is a voluntary management tool, which includes a workbook that is filled out by the producer. Once completed, this workbook provides a guide for farm activities that need to be improved as well as a series of suggested buffer distances between each set of activities and those on a neighbouring property. See the NZPIB (www.pork.co.nz) website for an online version of the EMS template.

Legislation	Administrative Bodies
<p style="text-align: center;">Water</p> <p>Health Act 1956 (se60, 62). <i>Control of water pollution</i></p> <p>Resource Management Act 1991. <i>Environmental protection</i></p>	<p>Ministry of Health</p> <p>Ministry for the Environment</p>
<p style="text-align: center;">Animal Welfare</p> <p>Animal Welfare Act 1999..<i>Animal Welfare (Pigs) Code of Welfare 2005</i></p>	<p>Biosecurity New Zealand (MAF)</p>
<p style="text-align: center;">Biosecurity</p> <p>Biosecurity Act 1993.</p> <p><i>Control of risk management and spread of diseases</i></p>	<p>Biosecurity New Zealand (MAF)</p>

H. Glossary

Aerobic bacteria	Bacteria that require free oxygen for growth. They are involved in effluent treatment in an aerobic pond.
Aerobic	In the presence of free oxygen.
Aerobic pond	A pond where effluent is treated in the presence of aerobic bacteria. Usually preceded by an anaerobic pond.
Anaerobic bacteria	Bacteria that do not require free oxygen for growth. They are involved in effluent treatment in an anaerobic pond.
Anaerobic	In the absence of free oxygen.
Anaerobic pond	The pond where effluent is treated anaerobically by anaerobic bacteria.
BOD	Biological Oxygen Demand - the quantity of oxygen required for breakdown of organic compounds in water.
COD	Chemical Oxygen Demand - the measure of the oxygen consuming capacity of inorganic and organic matter in water.
Composting	The process in which organic material undergoes biological aerobic degradation of solids to a stable end product.
Constructed Wetland	Includes man-made permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.
Contaminant	Includes any substance (including gases, odorous compounds, liquids, solids, and micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy, or heat - <ul style="list-style-type: none"> a) When discharged into water, changes or is likely to change the physical, chemical, or biological condition of water; or b) When discharged onto or into land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which it is discharged.

Controlled activity	An activity that complies with any standards, terms or conditions specified in the District or Regional Plan is assessed according to matters the Council has reserved control over, and is allowed only if a Resource Consent is obtained.
Organic bedding system	Housing system in which pigs are kept on a layer of organic bedding material, usually straw or sawdust.
Discharge Permit	A resource consent to do something (other than in a coastal marine area) that otherwise would contravene s15 of the Resource Management Act 1991.
Discharging	Includes ‘emitting’, ‘depositing’, or ‘allowing to escape’ any contaminant into the environment.
Discretionary activity	An activity that requires a resource consent and is allowed at the discretion of the local authority.
District	An area in relation to, and under the management of, a District or City Council.
Effluent	Animal excreta and waste water containing animal excreta.
Effluent treatment	Any treatment resulting in the alteration of the characteristics of effluent as it leaves the piggery, including anaerobic and aerobic lagoons, solids/liquids separators, bio-gas manufacture, chemical flocculation, composting, and package treatment systems.
Extensive farming	Keeping, breeding or rearing for any purpose, of pigs on pasture (but including areas used for access to shelter) at a stocking density that sustains the maintenance of pasture or ground cover.
Farrowing	Giving birth to piglets.
Hydraulic loading	Depth of water applied to an area of land (mm/ hectare).
Intensive farming	The breeding or rearing of pigs where the predominant productive processes are carried out within buildings or closely fenced outdoor runs where the stocking density precludes the maintenance of pasture or ground cover.
K	Potassium.
Leaching	The removal of soluble constituents (e.g. salts, fertiliser nutrients) from the soil by water moving downward through the soil profile.

Lifestyle/Hobby farm	A farm where the <i>primary</i> motivation for farming is the enjoyment of the rural lifestyle and not financial gain.
Local authority	A Regional Council or Territorial Authority (i.e. District Council, City Council or Unitary Authority).
Manure	Any substance, e.g. dung, urine, compost (including ‘fresh’ effluent), or artificial material that is spread over, or mixed with soil, to fertilise it.
Mechanical aeration	Mechanically mixing air and effluent together, using air pumps, agitators or liquid sprayers, in order to raise the concentration of dissolved oxygen within the effluent.
Micro-organisms	Microscopic organisms, such as bacteria, viruses, algae, protozoa and fungi that can live in water, soil, air, animals and plants.
N	Nitrogen.
Non-complying activity	Contravenes a rule in a District or Regional plan and is allowed only if a resource consent is obtained from the relevant local authority
P	Phosphorus.
Permitted activity	An activity that is allowed by a Regional Plan or District Plan without a resource consent if it complies in all respects with any standards, terms, or conditions.
Pig farming	The keeping, raising or breeding of pigs for any purpose in numbers exceeding those defined as “Pig keeping”.
Pig keeping	The keeping, raising or breeding for any purpose, of not more than five pigs which have been weaned, or two sows, providing that any progeny are not retained beyond the weaner stage. See Pig Farming
Polishing	Where primary and secondary treated effluent undergoes a final treatment.
Pond system	A constructed ponding system. Usually comprises anaerobic pond followed by an aerobic pond.
Prohibited activity	An activity that is expressly prohibited in a Regional or District plan.
Region	An area in relation to, and under the management of, the Regional Council.

Regional plan	A plan prepared by the Regional Council for managing the use and protection of natural and physical resources (i.e. Land, river and lake beds, water, geothermal, air, and coast).
Resource consents	refer to Resource Management Act 1991 (s87).
Reverse Sensitivity	The effects of the existence of a sensitive activity on a pre-existing activity in their vicinity leading to restraints in the carrying out of the pre-existing activity.
Sediment	Solid material (e.g. silt and sand) that is carried in water or effluent that will ultimately settle to the bottom of sumps, ponds, barrier ditches, constructed wetlands or waterways.
Sow	An adult female pig, which has had one or more litters.
Stocking density	The number of pigs kept per square metre of pen area.
Stormwater	Rainwater that has drained from the farm buildings and yards and is collected in guttering/pipes, or has run off from the surrounding land.
Water	Means water in all its physical forms whether flowing or not and whether over or under the ground and includes fresh water, coastal water, and geothermal water and does not include water in any form while in any pipe, tank or cistern.
Water table	The surface below which fissures or pores in the strata are saturated with water. It approximately conforms to the configuration of the ground. Where the water table rises above ground level a body of standing water exists.

