

**BEFORE THE HEARINGS PANEL AT RANGIORA**

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of the hearing of submissions on The  
Proposed Waimakariri District Plan  
Hearing Stream 6

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**STATEMENT OF EVIDENCE OF IAN BARUGH**

**FOR THE NEW ZEALAND PORK INDUSTRY BOARD**

**25 SEPTEMBER 2023**

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## **SUMMARY STATEMENT**

1. This statement of evidence has been prepared in relation to a submission from the New Zealand Pork Industry Board (“**NZPork**”) on the Waimakariri District Council’s (“**WDC**”) Proposed Waimakariri District Plan (“**PDP**”), Hearing Stream 6.
2. My evidence focuses on describing commercial pig farming systems and effects within New Zealand and Waimakariri District, to assist in determining whether outdoor pig-farming should be classified as extensive or intensive primary production and the need to provide for farm staff accommodation.
3. In my opinion, the effects of pig farming which are likely to require management for effects on amenity values in a rural area, result from indoor pig farming. Outdoor pig farming has similar effects to other outdoor farming activities involving livestock.
4. On-site accommodation can be required on commercial pig farming operations for animal husbandry, welfare, biosecurity and operational security, in my experience, staff accommodation on-site is a usual part of commercial pig farming activities.

## **QUALIFICATIONS AND EXPERIENCE**

5. My name is Ian Barugh. I am employed as the Technical Manager with NZPork.
6. I hold a Bachelor of Agricultural Science degree and a Diploma in Science.
7. I have been involved in the New Zealand pork industry for over 50 years; nearly 30 of those as the Technical Manager for NZPork and its predecessor; based at Massey University.
8. I have been involved in a number of roles in research and practice in the New Zealand pork industry including:
  - (i) Three years working on and managing pork production/pig breeding units/boar test stations;
  - (ii) Thirteen years as a farm advisory officer/consultant, covering all aspects of pork production (animal husbandry, nutrition, management, building design, manure and effluent management and economics);

- (iii) Twenty-eight years as a technical manager providing support for NZPork, pork producers, nutritionists veterinarians and other personnel servicing the pork industry. Key roles have included industry training, technology transfer and environmental support, with a recent focus on welfare issues especially housing systems for sows, integrating outdoor pigs into the nutrient budget Overseer, and developing Good Management Practice (GMP) guidelines for pig farming.

## **SCOPE OF EVIDENCE**

9. I have been asked to provide some evidence on the following matters:
- The different pig farming systems that operate within New Zealand and Waimakariri District;
  - Effects of pig farming activities, particularly those effects which may be relevant to land use planning; and
  - The requirement for staff accommodation on commercial pig farms.

## **TYPES OF PIG FARMING SYSTEMS USED IN NEW ZEALAND**

10. A wide range of farming and housing systems are used to raise pigs in New Zealand, including the breeding and/or finishing farms; and raising pigs in indoor, free-farmed and outdoor systems. I will explain each system below.

### **Breeding, Finishing and Farrowing-Finishing Units**

11. Breeding units carry breeding sows, their replacement progeny and boars. The management for the breeding unit is on a regular weekly flow or batch system where at any time there will be gestating sows, sows about to be mated, boars, replacement gilts, and lactating sows and litters, on hand.
12. Pigs weaned (known as weaners) from the breeder unit may be moved to a weaner/nursery on the same site (farrowing-finishing farms) or may be sold or transferred to another farm – a finishing unit.
13. Newly weaned pigs remain in the nursery for up to six weeks and are then transferred to a grower/finishing facility where they are grown to the point of slaughter at about 20 weeks of age.

14. At each stage the housing, feed, environmental and animal husbandry needs are different, and this will determine the type of accommodation required to house pigs.

### **Housing Types**

15. A variety of housing systems are used to house pigs after weaning. Pigs can thrive in diverse environments which provide shelter from the elements, space, and access to feed and water. As they grow, their feed and temperature requirements are adjusted to meet their needs.
16. Housing can consist of different styles of buildings, constructed from timber or steel framing with varying amounts of insulation. Walls can be constructed of concrete panels, concrete blocks, plywood or 'freezer panel' walls with corrugated iron or 'freezer panel' roof construction. Ventilation systems include fully enclosed controlled environments to more reliance on natural ventilation using curtains and roof vents.
17. Pole barns, utility implement sheds or hooped framed shelters covered with a waterproof fabric are often used in conjunction with straw or sawdust bedding as a deep litter system.
18. The different housing systems have different systems for manure collection, storage and treatment, and they all should be designed to minimise environmental impacts.

### **Farm Systems**

19. Pig farming can be broadly separated into two categories: indoor pig farming and outdoor pig farming. Outdoor pig farming can then be further classified into 'free-farmed' systems and 'free-range' systems.
20. Waimakariri District has ten commercial indoor pig farming operations registered with NZPork. As NZPork is an industry good body, we hold the details of all commercial pig farmers who pay industry levies.
21. Given the soil types and climate, Waimakariri District is also suitable for outdoor pig farming systems. We are aware of one or two small-scale, free-range operations in the District and it is feasible that outdoor pig farming increases in the future. Pigs are monogastric animals so have much lower greenhouse gas emissions than ruminants.

### Indoor Systems

22. In indoor systems, pregnant sows are housed indoors all year round. They are housed in groups in environmentally controlled or naturally ventilated sheds.
23. Prior to farrowing (giving birth) the sows are transferred and housed individually in specialist facilities. These farrowing facilities are environmentally controlled, allow for individual feeding and care, are easy to keep clean, designed to provide protection to the piglets from being rolled or trampled on, and meet the different temperature requirements for the sow and the piglets.
24. Around 55% of New Zealand's commercial pig herd is farmed indoors.

### Outdoor free-farmed systems

25. Free-farmed systems are those that have an outdoor-based breeding herd and an indoor-based system for growing pigs.
26. The breeding sows and boars live outdoors for their whole life, provided with housing in a variety of forms. The dry sow huts/shelters are designed to accommodate groups of breeding animals, depending on the size of the farm and the ability for the huts to be able to be shifted through gates into different paddocks. These huts come in a variety of forms, examples of which are shown in Figures 1 to 4 below. Trees are used for shelter and the huts face away from the predominant wind direction.



Fig. 1



Fig. 2



Fig. 3



Fig. 4

**Figures 1,2 3 & 4: Examples of housing for outdoor dry sows**

27. At farrowing time, the sows are moved to a separate area and give birth in individual huts which they can move in and out of freely.
28. After weaning, the piglets are transferred and raised in open-fronted shelters or barns with straw or saw dust for bedding, or in an environmentally controlled shed(s). The majority of outdoor pig farms operate in this manner.

Outdoor free-range systems

29. In free-range systems, breeding sows and boars live outdoors for their whole life, provided with shelter and protection from the elements. The sows give birth in individual huts, which they can move in and out of freely. Newly weaned pigs may be kept for a short period in a fenced outdoor pen with shelter, before being fully transitioned for rearing outdoors during the grower-finisher period, where they are provided with huts for shelter.
30. Less than 5% of New Zealand's commercial pig herd is farmed in free-range systems.

Extensive and Intensive Pig Farming

31. The majority of outdoor pig farming systems in New Zealand have both an 'extensive' and an 'intensive' component.
32. The stock densities for outdoor breeding herds are significantly lower than those typically associated with indoor farming systems.
33. Stock densities for outdoor breeding herds will vary between farms depending on environmental conditions and any regulatory requirements. However, if managed in accordance with NZPork Good Management Practice (GMP) guidelines, stock densities can range between 17-32

sows/ha or 300-600m<sup>2</sup> per breeding animal. In contrast, stock densities for indoor breeding herds on slatted floors in environmentally controlled sheds can be up to 5m<sup>2</sup> per breeding animal and 1m<sup>2</sup> for indoor growing pigs.

34. Therefore, if ground cover is maintained in accordance with NZPork GMP guidelines (see below), an outdoor pig farming system should not be classed as intensive primary production. However, post weaning nursery and grower facilities, where pigs are raised on bedding in barns, can be intensive.

### **EFFECTS OF PIG FARMING**

35. There are five potential effects on amenity values from pig farming systems: odour, dust, noise, traffic generation and building form. I shall address each issue below as it relates to an outdoor pig farming system to help illustrate whether these systems ought to be subject to the same provisions as indoor intensive pig farming operations.
36. Before discussing the potential environmental effects of pig farming systems, I wish to outline for the Hearing Panel the relevant industry environmental guidelines developed by NZPork. A copy of these documents has been provided to the Hearings Panel along with my evidence.

### **NZPork Good Practice Guidelines**

37. The NZPork Industry Guidance for Environmental Management was developed by NZPork working in conjunction with Landcare Research and Environment Canterbury (the Canterbury Regional Council). The guidelines were designed primarily to manage nutrient, sediment and pathogen loss to waterways from farms. Level of ground cover is a key determinant in losses of all three contaminants, with losses increasing as groundcover decreases. For this reason, maintenance of ground cover is a foundation of good environmental management on outdoor pig farms.

### NZPork Industry Guide: Environmental Management

38. This guide provides pork producers, council officers, persons looking to enter the pork industry, and other stakeholders a reference for acceptable practices to manage the environmental impacts of pork production. For outdoor pig



farming, the guide includes factors to consider in the establishment of an outdoor piggery operation, including:

- Maintenance of pasture cover throughout the year;
- Rotation of paddocks where necessary to allow pasture recovery;
- Inclusion of outdoor pigs as part of an arable rotation to enable crops to utilise nutrient build-up; and
- Selecting a suitable land area depending on various factors including any applicable nutrient management rules. In the absence of specific council rules, the guide recommends following the GMP stocking rates.

39. A copy of the NZPork Industry Guide for Environmental Management is included with my evidence.

### **Effects of Pig Farming**

#### Odour

40. Most odour complaints made to or about commercial pig farmers from neighbouring properties arise from effluent storage, treatment and spreading as fertiliser, rather than from the animals themselves.
41. All effluent has some smell. The odour of pig effluent is also influenced by variables such as the diet pigs are fed, and the effluent storage and treatment system used.
42. Odour can be managed through a range of strategies including regular flushing and cleaning of sheds, direct injection of manure to soil, low spray height and low pressure to avoid aerosols being sprayed too high, discharging or applying effluent in favourable wind conditions, and strategic use of wind breaks.
43. In an outdoor environment, pig manure is deposited directly to pasture as in other pastoral farming systems. There is no accumulation, storage or treatment of effluent from these areas. Attachment One to my evidence is a table showing the principal factors influencing odour from piggery effluent in both indoor and outdoor systems.

#### Dust

44. Dust can occur from stockpiling of sawdust or bedding material outdoors, or from exposure of bare ground in dry, windy conditions. Strategies for managing dust in an outdoor pig operation include ensuring proper storage of dry materials, and maintenance of groundcover to prevent bare ground. Maintaining groundcover may require adjusting stoking rates and resting paddocks where necessary, nose ringing sows to prevent rooting, and the strategic use of shelter belts around outdoor pig paddocks.

#### Noise

45. Like all livestock, pigs have occasions when they are vocal, e.g., when sows are in oestrus or about to be fed. However, at GMP stocking densities noise should not be a significant issue in outdoor operations, Noise from machinery will be similar to that of other pastoral farming activities, with vehicles and tractors used regularly for feeding out, farm maintenance and scheduled activities such as moving farrowing huts.

#### Traffic generation

46. Traffic generation will be similar on a pig farm to any farming activity. Stock trucks typically arrive weekly on finishing farms to take market-ready grower pigs for processing. Feed delivery trucks and staff travelling to and from work may also generate regular traffic movements.

#### Building form

47. Farrowing and dry sow huts are the only structures used with an outdoor breeding herd. They are low to the ground, few in number and visually unobtrusive.
48. Based on the information provided above, I believe that outdoor pig farming operations in which pigs are on pasture and managed in accordance with NZPork GMP guidelines, will not cause effects on rural amenity from odour, noise, traffic, dust or built form such as those effects which can be associated with intensive farming operations, and should not be classified as such.

### **FARM STAFF ACCOMMODATION**

49. Finally, I have been asked to provide some evidence on the need for farm staff accommodation on site as part of commercial pig farming operations.

50. Like all farming activities, whether a commercial pig farmer requires staff accommodation on-site will depend on several factors including the scale of the operation, its location, and management structure.
51. However, in my experience it is usual for commercial pig farms to house staff on-site for several reasons:
- Animal husbandry – commercial pig farming is labour intensive. Farrowing sows and weaner/grower pigs require regular feeding and care over a 24-hour period. Indoor operations require staff available at all times to monitor and maintain building temperature, ventilation systems, effluent management provide for the welfare of pigs and other processes.
  - Farm security
  - Biosecurity – biosecurity is a significant risk factor for commercial pig farming and some operators prefer staff to live on-site to help reduce biosecurity risks, particularly the risk of people living on or near other properties that keep pigs.
52. In my view, it is a normal part of commercial pig farming and other farming activities to be able to provide farm staff with accommodation on-site.

**Ian Barugh**  
**25<sup>th</sup> September 2023**

**ATTACHEMNT ONE –PRINCIPAL FACTORS INFLUENCING ODOUR FROM PIGGERY OPERATIONS IN BOTH INDOOR AND OUTDOOR SYSTEMS.**

<b>Factor</b>	<b>Indoor</b>	<b>Outdoor</b>
<b>Effect of diet on odour</b>	Feed composition is closely matched to pig's nutritional requirements, especially protein to minimise the amount of odour precursors subject to anaerobic decomposition of protein in the manure. This means 2 or more and appropriate diets and feed levels for the physiological (reproductive) states of animal e.g., separate gestation diet and lactating diet and for growing pigs separate weaner, grower and finisher diets.	Feed composition is closely matched to pig's nutritional requirements, especially protein to minimise the amount of odour precursors subject to anaerobic decomposition of protein in the manure. This means 2 or more and appropriate diets and feed levels for the physiological (reproductive) states of animal e.g., separate gestation diet and lactating diet and for growing pigs separate weaner, grower and finisher diets.
<b>Manure storage</b>	Increased odour emissions expected when handling stored manure.	Does not occur.
<b>Solis separation</b>	Increased odour emissions when moving and handling separated solids.	Does not occur.
<b>Slurry storage</b>	Increased odour emissions expected when handling stored slurry.	Does not occur.
<b>Slurry drains/pipes</b>	Where possible have covered sumps or pits and use pipes rather than open drains.	Does not occur.
<b>Cleanliness of yard and raceway areas.</b>	Manure on yards and raceways following stock handling and moving, hosed away directly on completion,	Does not occur in paddocks.

Factor	Indoor	Outdoor
<b>Housing and Management</b>	Ventilation systems designed for correct air flow to prevent build-up of odours. All pens and stock checked for cleanliness on a daily basis. All pens cleaned between batches. Potential odorous spillages such as feed and manure cleaned up immediately. Stocking density maintained at or below those in Welfare Code.	Pigs rotated around clean paddocks. Ground cover maintained. Feed wastage removed. Stocking density is very light compared to Welfare Code requirements for indoor farms.
<b>Under slats</b>	Flushed out regularly.	Does not occur.
<b>Pull plug pits</b>	Flushed at a time to minimise transfer of odorous emissions,	Does not occur.
<b>Spreading manure to land</b>	Spread at a time to incorporate into crops. Spread with a favourable wind direction.	Does not occur. Pigs deposit dung and urine daily.
<b>Spreading of slurry to land</b>	Spread at a time when plants utilise nutrients. Spread with a favourable wind direction. Use low trajectory splash plate or irrigator. Spreading at a time of favourable weather forecast.	Does not occur.
<b>Feed storage</b>	Dry feeds and feed ingredients all stored in covered bins and hoppers.	Dry feeds and feed ingredients all stored in covered bins and hoppers.