

**IN THE MATTER**

of the Resource  
Management Act 1991  
(RMA)

**AND**

**IN THE MATTER**

of proposed Variation 6  
to the Proposed Natural  
Resources Regional  
Plan – Chapter 4 Water  
Quality Hearing

**TO BE HEARD BY**

Environment  
Canterbury

**HEARING DATE**

14<sup>th</sup> April 2010.

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**Statement of Evidence of Mathew Ellen on Behalf of Ravensdown  
Fertiliser Co-operative Ltd**

**14 April 2010**

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## **Introduction**

1. My name is Mathew Ellen and I am Process Manager at Ravensdown Hornby. My qualifications are Bachelor of Applied Science and New Zealand Certificate in Science, both majoring in Chemistry. I have over 11 years experience in the fertiliser industry and have been Process Manager for Ravensdown since Feb 2009 prior to which I was Works Chemist at the site.
2. As Process Manager I have the responsibility for managing the technical processes on site and the three resource consents the site operates under.
3. I provide the following statement of evidence in support of the submission lodged by Ravensdown Fertiliser Co-operative Ltd (Ravensdown) on proposed Variation 6 to Chapter 4 – Water Quality of the proposed Natural Resources Regional Plan.

## **Outline of Evidence**

4. My approach today is to provide you with an overview of technical matters relating to the proposed control of land use activities in the groundwater protection zones and the potential impact these may have on Ravensdown's interests in the area.
5. My evidence will start by giving an overview of Ravensdown's interests in the area and this variation and will then go on to specifically address:
  - Brief history of the Hornby site
  - An outline of the activities on the site
  - An outline of the hazardous substances contained on the Hornby site
  - An overview of the procedures in place to meet HSNO requirements
  - Existing environmental management on site that represent Best Practice
  - Potential future development concepts for the Hornby site
  - Comment on how proposed Variation 6 might affect the overall management and future development of the site

## **Ravensdown's interests in the area impacted by proposed Variation 6**

6. Ravensdown has two main interests in the area covered by this variation. They are:
  - The Hornby fertiliser manufacturing site is located within an area of proposed Zone 1A

- Ravensdown represents the farming community in matters where they can be affected by plan provisions. There are proposed controls on agricultural landuses, mainly within Zone 1 which will limit the ability of landowners to use their land.
7. My evidence relates to the first of these points.

### **History of Ravensdown's Hornby fertiliser manufacturing site**

8. Ravensdown is a farmer-owned co-operative which manufactures, imports and distributes fertiliser products and other farm inputs throughout New Zealand. Throughout New Zealand Ravensdown provides soil fertility products and services by way of analysis, advice and supply of the appropriate materials where and when required at the lowest sustainable net cost. The achievement of this is based on a set of core company values, which include an absolute commitment to outstanding levels of environmental care in the importation, manufacturing, storage and use of its products.
9. In the 2008-2009 year Ravensdown sold 1.08 million tonnes of fertiliser of which a significant percentage was superphosphate. The supply of superphosphate fertiliser to New Zealand farmers remains a key component of a strong agricultural and New Zealand economy.
10. Ravensdown has three fertiliser manufacturing sites located at Napier (Awatoto Works), Christchurch (Hornby Works) and Dunedin (Ravensbourne Works), and over 100 stores nationally.
11. Ravensdown owns and operates the Hornby Fertiliser Works (Hornby Works) located at 312 Main South Road, Hornby. The Hornby site was built in 1922 and has been manufacturing fertiliser and sulphuric acid for 85 years. It started its life as Kempthorne Prossers (KP's) and has been Ravensdown from 1979 onwards.
12. The construction of the Hornby Works commenced in 1919 and from 1922 has been manufacturing fertiliser and sulphuric acid. The current site was chosen because of its close proximity to a port, access to labour and its rural location.
13. The annual operating budget is approximately \$7 million. In addition to the operating budget the Hornby Works has had capital expenditure of approximately \$11 million over the last seven years.

## Activities undertaken at Ravensdown's Hornby site

14. The primary activities carried out at the Hornby Works are the import of raw materials and the manufacture, storage and sale of fertilisers. The primary industrial processes are the manufacture of sulphuric acid and the subsequent manufacture of superphosphate. The plant includes a Sulphuric acid plant and ancillary equipment, rock phosphate grinding mills, a single superphosphate plant and associated equipment, three fertiliser screening and despatch systems, associated buildings to house the equipment and bulk storage bins. Supporting utilities and amenities include office and laboratory buildings, engineering workshops and storage areas; motor control centres and electrical supply equipment and plant control rooms.
15. Currently the site produces approximately 150,000 – 230,000 tonnes of superphosphate and stores up to 10,000 tonnes of sulphur and 35,000 tonnes of phosphate rock, and approximately 75,000 tonnes of other fertiliser products. The site manufactures approximately 40,000 – 80,000 tonnes of sulphuric acid per year and has storage for 7000 tonnes of sulphuric acid. Sulphuric acid and raw phosphate rock are the primary inputs to the superphosphate manufacturing process.
16. The Hornby Works main processes are the manufacture of sulphuric acid, grinding of phosphate rock and mixing with sulphuric acid (acidulation) to make single superphosphate. Superphosphate and other fertilisers are stored on site and then despatched from blending and screening despatch plants onto road transport. Sulphur, phosphate rock and other fertiliser products are imported by ship into the Lyttelton Port. The phosphate rock used by Ravensdown is a fluoro apatite and is currently sourced from Morocco, China, Vietnam and Christmas Island.
17. The bulk fertiliser products are transported primarily from the Hornby Works by Road Transport. Rural freight operators transport commodity goods into Christchurch and backload fertiliser into the rural regions. This provides efficient use of transport capacity and reduces overall supply chain costs.
18. Sulphuric acid is manufactured in an Acid Plant. The plant is capable of producing between 80 and 260 tonnes of 98.5% sulphuric acid per day. The sulphuric acid manufacturing process involves: the melting of solid sulphur to

a liquid form; the combustion of sulphur to produce sulphur dioxide; oxidation of the sulphur dioxide to sulphur trioxide and absorption of the sulphur trioxide by sulphuric acid, plus the addition of water to control acid strength at 98.5%.

19. Phosphate rock is stored onsite then ground in the grinding plant, to a size suitable for superphosphate manufacture. The superphosphate plant produces granules of fertiliser products that are then cure din the bulk storage areas.

#### **Hazardous substance storage at Ravensdown's Hornby site**

20. The Hornby works currently has the capacity to store up to 7000 tonnes of sulphuric acid in tanks. These tanks were given HSNO approval by ERMA on the 1<sup>st</sup> of April 2009. The site HSNO compliance plan is attached as Appendix 1.
21. The sulphuric acid tanks are stored in a sealed bund that can hold 1.5 times the total storage capacity of the largest tank as secondary containment.
22. In addition to this the ground around the entire acid plant is sealed and all storm water runoff is collected and held in retention ponds. From here the runoff is reused in the Superphosphate manufacture process. This prevents any discharge to open ground.
23. The site also has a 20,000 litre diesel storage tank. This tank is self bunded and situated on hard stand that forms part of the containment system described in 28.
24. Any other hazardous substances are kept in small quantities (e.g. lubricants, paints) are stored in HSNO approved dangerous goods stores.

#### **Existing procedures in place to meet HSNO requirements for hazardous substance storage**

25. As noted above Ravensdown has HSNO approval of the sulphuric acid tanks from ERMA and other hazardous substances are kept in small quantities in HSNO approved dangerous goods stores. This approval of the stores is the main procedure in place to ensure that stores meet the HSNO requirements. In addition Ravensdown follow relevant codes of practice to assist in management of these materials. Ravensdown's staff has undergone training in the requirements of HSNO and currently there are six approved handlers on

site. Ongoing inspections, maintenance records and reporting are undertaken in accordance with HZNO requirements.

### **Existing site environmental management and best practises**

26. The HSNO requirements fall within Ravensdown's overall site environmental management procedures utilised on site. These include a number of measures and best practises that aim to minimise the potential for environmental effects arising from our activities.
27. Ravensdown's commitment to the environment is a guiding principle in its business planning and development. Our environmental policy states that this commitment will be delivered by:
  - a. *Taking account of environmental issues in all commercial decision making.*
  - b. *Complying with the conditions of our discharge permits code of practice and other relevant environmental legislation and regulations.*
  - c. *Ensuring that emissions are at the lowest level possible, consistent with sound operation and economics of production.*
  - d. *Putting in place programmes to continually improve the environmental performance of the site and to reduce risk to the environment.*
  - e. *Developing awareness and understanding among the company's employees of the interactions between the environment and the Company's activities.*
  - f. *Influencing all employees and people working on behalf of the company to consider and respect the environment and to seek to protect the environment in the course of their activities.*
  - g. *Being a good neighbour, concerned for the community and the environment.*
28. The Hornby Works operates a comprehensive Environmental Management System and has been certified to the ISO:14001 Environmental Management System for the last 10 years.
29. ISO:14001 Environmental Management System is an International Standard audited by an external organisation on a six monthly basis. The core tenets of the system are:
  - a. Identify and understand all environmental aspects and impacts.

- b. Continually minimise and reduce our environmental impact through a demonstrable/structured improvement programme with clear objectives and targets.
  - c. Comply with relevant legislation and standards.
- 30. The last recertification audit for ISO 14001 was completed in June 2009 by Telarc SAI. Re-certification takes place every three years with six monthly surveillance audits in between. The key comments from this audit for the Hornby site were:
  - a. The Environmental Management System was found to be working effectively for the organisation.
  - b. The internal audit process was found to be working effectively.
  - c. Since the previous Triennial audit, the Hornby Works has continued to maintain and develop its environmental management systems.
- 31. Ravensdown also monitor and report our environmental performance both internally and externally. Ravensdown's governance structure includes an elected Board of Directors who make periodic visits to the company's manufacturing sites and receive comprehensive monthly reports on the performance and status of the manufacturing plants and environmental compliance reporting.
- 32. The performance of the manufacturing sites is also reported annually in the company's Annual Report which highlights productivity and environmental outcomes.
- 33. The site currently holds three resource consents that are subject to compliance monitoring by Environment Canterbury. These are CRC971802 to abstract ground water, CRC980393 to store and use a diesel tank on site, and CRC080001 for discharges to atmosphere.
- 34. With respect to ongoing improvements of our operations Ravensdown contracts out to a number of internationally recognised consultancy and service providers. These organisations assist with benchmarking, providing best practice systems, technology advice and impartial reviews of Ravensdown's systems. Examples of independent advisors used are Process Developments Ltd Wellington (now part of Connell Wagner Ltd) for the review of all acid plant and manufacturing systems conducted as part of the

recently completed HAZOP (Hazard and Operability review) on all three manufacturing sites.

35. The HAZOP review of both the acid and manufacturing processes is an example of the robust approach to process improvement. A HAZOP study is a rigorous technique for identifying potential safety, operational, and environmental risks associated with the operation of process plants. A team consisting of plant personnel and Process Development Ltd engineers systematically looked for cause and effect deviations from normal operation. To control the risks from our day to day operations its operational activities and industrial processes include automatic controls on processes to minimise the risk of discharges. These include controls on the acid and superphosphate plants as follows.
36. An example is the computer monitoring of both the acid and superphosphate production processes. PLC's record all the process parameters and alerts the operator to any deviations from optimal operating parameters. Critical interlocks are in place so that if equipment fails then automatic shutdown sequences will occur. The computer monitoring and the upgraded interlocking was installed in 2002 to improve the overall process control and to minimise the possibility of accidental discharges in the event of plant malfunctions. The computer software systems and controls continue to be upgraded on an ongoing basis with the latest software being installed in 2008.

#### **Potential future development concepts for the Hornby site**

37. For any business to survive change will be necessary. I have already outlined the primary activities carried out at the Hornby Works however change will occur whether it is an extension of the current activities or the introduction of new activities.
38. Extension of existing activities may include:
  - Increase in acid storage
  - Increase in storage for fertiliser and other products
  - Further development in fertigation manufacture
39. New activities may include:

- Warehousing of other farm inputs that Ravensdown is already supplying the market such as agrochemicals and animal health products
40. We are confident that by using similar controls to our present activities that these changes can be sufficiently mitigated to have no or minimal effect on Christchurch's drinking water.

**Ravensdown's view of how proposed Variation 6 might affect the overall management and future development of the site**

41. Over the years of ownership Ravensdown has invested significantly in the Hornby Works. The effective replacement value of a plant of similar size and capacity to Hornby would be in the vicinity of \$75 million.
42. It should be noted that it would be uneconomic to replace the Hornby plant with a plant of the same relatively small size and capacity. I consider that the Hornby Works has the potential to continue to play an important role in the South Island and New Zealand economies for many years to come.
43. Ravensdown does however have concerns regarding the proposed control on land use activities to only those provided for in the existing Regional Policy Statement and Christchurch City Council Plan. It is not clear exactly what this does and does not allow for and we have concerns regarding whether it will limit the potential future use of the site.
44. The Christchurch City Council City Plan shows that the Hornby works is located on land that is primarily zoned B5 (General Industrial). The exception is a 50 metre wide strip along the Main South Road side of the site, which is zoned B4 (Suburban Industrial). The B4 zone is a light industrial/commercial designation and provides a buffer between the B5 zone on which the manufacturing buildings are located, and the residential land located to the south across the Main South Road. That land is zoned L1 (outer suburban), a residential designation that allows for extensive "*low density permanent living accommodation*" (CCC, 1999) and effectively expects that adverse environmental effects will be minimised.
45. The B5 zoning allows for extensive industrial activity and its associated effects, at a wide range of scales, with "*a distinct presence of 'heavy' industries which, in comparison with other business zones, have significant impacts in terms of noise, traffic, building scale and also emissions in some areas. A lower level of environmental outcomes is anticipated within parts of*

*the zone in reflection of its location and character.*” (CCC, 1999). Therefore, this activity is taking place in a zoning environment which expressly allows for an elevated level of adverse effect to occur. Therefore it appears that the CCC plan will allow for ongoing fertiliser manufacture at the site and importantly allow for changes to those processes.

46. In conclusion, our concern is that there is no clarification within the proposed Variation 6 of what may constitute a change to the land use that is allowed for and whether there is likely to become a point at which proposed site activities were deemed to have not been provided for in the existing plan. This is a matter of significant concern to us and which I request the Commissioners make sure that the Plan does not limit the future development of this site.