BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF the Resource Management Act 1991
AND
IN THE MATTER OF the Proposed Canterbury Air Regional Plan (PCARP)

STATEMENT OF EVIDENCE BY PETER WILLIAM HAY

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1. INTRODUCTION

Qualifications and experience

1.1 My name is Peter William Hay and I am the Works Manager of the Hornby Works for Ravensdown Limited (Ravensdown). I have been employed by Ravensdown for a total of 17½ years and my previously held positions within the company have been as South Island Stores Operations Manager, South Island Logistics & Stores Manager, South Island Logistics Manager, Upper North Island Logistics Manager and Horticultural Field officer. I have been in my current position for the last 9 years.

1.2 I hold a Bachelor of Horticultural Science from Lincoln University.

1.3 As the Hornby Works Manager I am responsible for all aspects of the Works operation on site. The primary functions of the role include:

i. Maintaining, developing and enhancing Health and Safety management to ensure a healthy and safe workplace.

ii. Maintaining, developing and enhancing the Hornby site environmental management so it complies with all resource consent conditions, all environmental aspects and impacts are identified and understood, any adverse effects on the receiving environment are continually monitored and the overall environmental performance of the site is improved.

iii. Ensuring compliance with all other legislative regulations such as HSNO.

iv. Personnel management and leadership of the Hornby Works staff.

v. Financial management of operational and capital budgets.

vi. Overall management of the receipt, processing and manufacturing, storage and despatching of raw material fertilisers and finished fertiliser.

vii. The continuous improvement and optimisation of all operations and chemical processes.
viii. Ensuring the quality of product manufactured meets company specifications.

1.4 During my tenure as Hornby Works Manager I have been involved with capital upgrades and general management of the plant, maintaining the certification of ISO:9000 Quality and ISO:14001 Environmental Management Systems, the re-consenting of the sites’ current Air Discharge Permit granted in 2010, and consulting with various interested parties/stakeholders of the Hornby Works.

Scope of evidence

1.5 My evidence addresses:
   i. Overview of Ravensdown and the Hornby Works.
   ii. Process description and overview of the manufacturing systems.
   iii. Environmental commitments.

2. OVERVIEW OF RAVENSDOWN AND THE HORNBY WORKS

Fertiliser Manufacture in New Zealand

2.1 Superphosphate was first manufactured in Dunedin in 1881. Superphosphate is a very effective way to provide the vital nutrients of phosphate and sulphur to farmland in New Zealand. It also is a product that can be readily fortified with extra sulphur which is necessary for the South Island high country. The need for phosphate and sulphur in New Zealand’s pastoral farming system is well documented and superphosphate provides this in appropriate ratios.

2.2 Fertiliser is a vital input to the farming and New Zealand economy. According to the Canterbury Development Corporation, primary production contributes $1.5 billion to the national GDP, and $4.5 billion in primary products are exported from Christchurch annually (Canterbury Development Corporation summary report ‘Christchurch & Rural Sectors Relationship Analysis, N Brunsdon April 2014).
2.3 The supply of the nutrients phosphate and sulphur are essential to the achievement of this agricultural productivity. Fertiliser Research has clearly demonstrated that withholding superphosphate significantly reduces pasture and animal production as shown by the following two examples:

i. At the Te Kuiti Research area pasture and animal production decreases were evident by the second year of withholding superphosphate. By years three and four animal production had fallen by 20-30%, and after six years white clover content decreased with more moss and weeds. (O’Connor et al. 1989)

ii. At Ballantrae Hill Country Research Station pasture production declined by nearly 5% every year. Ewe and lamb wool and live weights also decreased over the withholding period (Lambert et al, 1989)

Superphosphate is the preferred source of soil nutrients due to the combination of phosphate and sulphur which are required in most New Zealand soils to promote the growth of productive rye grass species and white clover.

The Company

2.4 Ravensdown is a 100% farmer owned co-operative which manufactures, imports and distributes fertiliser products and other farm inputs throughout New Zealand. Ravensdown was established in 1977 through the merger of Dominion Fertiliser and Kempthorne Prosser. Since 1977 annual sales have grown from 100,000 tonnes to a peak of 1.6 million tonnes in 2003, with current sales around 1.2 million tonnes. Over that time the co-operative has grown to become the leading supplier of farm nutrients with just under half of the New Zealand fertiliser market, employing approximately 675 staff.

2.5 Ravensdown provides farmers with whole-farm solutions, from soil testing and environmental management, through to spreading and mapping services. To do this, we have qualified and well trained staff, have invested in manufacturing capability, an extensive store network, spreading operations and technology. The achievement of this is based
on a set of core company values, which include a commitment to outstanding levels of environmental care in the importation, manufacturing, storage and use of its products.

2.6 Within the Canterbury region, Ravensdown owns and operates a major fertiliser manufacturing plant in Hornby, two lime quarries, eight bulk fertiliser stores and is involved with ten bulk consignment stores. Each year we import approximately 380,000 tonnes of mineral fertilisers into Canterbury, through the ports of Lyttelton and Timaru.

2.7 Ravensdown imports phosphate rock and sulphur for the purpose of manufacturing single superphosphate. This is carried out at three locations in New Zealand - Ravensbourne in Dunedin, Awatoto in Napier and Hornby in Christchurch. The respective current maximum capacities are Awatoto 500,000 tonnes, Dunedin 200,000 tonnes, and Christchurch 220,000 tonnes. Finished fertilisers, ready for direct application to farms, are also imported and distributed through over 100 stores nationally.

The Hornby Works

2.8 The Hornby Works is located at 312 Main South Road, Hornby. The Hornby Works occupies approximately 14 hectares and sits within the Hornby industrial area. The site is situated between State Highway 1 and the Main South rail trunk line to the west of Christchurch.

2.9 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. At the time of establishment there were only five homes in the immediate area.

2.10 Kempthorne Prosser established and operated the site until 1977 when Ravensdown was established with the merger of Dominion Fertiliser and Kempthorne Prosser.
2.11 The primary activities carried out at the Hornby Works are the import of raw materials and the manufacture, storage and sale of fertilisers. The industrial processes are the manufacture of sulphuric acid and superphosphate. The plant includes a Simon Carves Sulphuric acid plant and ancillary equipment, Bradley pulveriser rock phosphate grinding mills, a Broadfield single superphosphate plant and associated equipment, three fertiliser screening and despatch systems, associated buildings to house the equipment and bulk storage stores. 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.

2.12 The site employs 51 staff with an annual operating budget of approximately $9 million, of which over $4 million is paid to staff in salaries and wages. In excess of $2 million is paid to local contractors (fitters, electricians, carpenters etc.) and service providers with up to 15 contractors employed on site for sustained periods. A contribution of approximately $1 million goes to the purchase of locally supplied operational and engineering parts and consumables. The site is a significant user of the Lyttelton Port and indirectly employs local stevedores and support services to assist in the receiving of the company's raw materials and products.

2.13 In addition to the operating budget the Hornby Works has a significant capital expenditure programme as it redevelops the site post the September 2010 earthquakes and the continuing investment in site improvements. In the last five years over $30 million has been invested into the Hornby site alone, with a further $25 million forecast over the next five years.

2.14 The Hornby Works annually supplies in excess of 280,000 tonnes of manufactured and imported fertilisers to the Upper and Central South Island regions at an approximate value of $190 million. Currently the site produces between 98,000-195,000 tonnes of superphosphate and between 35-80,000 tonnes of sulphuric acid per year. Approximately 4,000 tonnes of food grade sulphuric acid is supplied to food manufacturers like Fonterra each year. 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.

2.15 The Hornby Works operates under an Air Discharge Permit to discharge contaminants to air that was granted in February 2010 and expires in February 2030. The process to obtain this consent started in 2006 and involved significant technical assessments and consultation with key stakeholders. It was a thorough and robust process demonstrating that the discharges from the site with the appropriate mitigation are at acceptable levels. A copy of the Air Discharge Permit is attached to my evidence and marked "A".

2.16 The technical assessments required to obtain the Air Discharge Permit included;
   i. Assessment of all discharges covering sulphur dioxide, fluoride, dust, odour, total acid discharges and cooling tower aerosols.
   ii. Health Risk Assessments
   iii. Building material effects
   iv. Vegetation assessments

2.17 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 $130 million for the manufacturing plants and raw material storage areas. The additional product storage and despatch facilities that would also be required would cost a further $30 - 50 million.

3. PROCESS DESCRIPTION AND OVERVIEW OF MANUFACTURING SYSTEMS

3.1 The Hornby Works main processes are the manufacture of sulphuric acid, grinding of phosphate rock and reacting with sulphuric acid (acidulation) to make single superphosphate. In my evidence I discuss these processes in some detail. My reason for doing so is to ensure the Commissioners understand the extent to which the various processes
are carefully managed to achieve good environmental performance and to ensure Ravensdown remains fully compliant with its Air Discharge Permit. 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.

3.2 All bulk raw materials and imported fertilisers are transferred by road from Lyttelton to the Hornby Works in covered trucks. The incoming material is generally unloaded from the trucks over two intake systems and transported to storage areas via covered conveyors and are stored undercover.

**Sulphuric Acid Plant**

3.3 Sulphuric acid is manufactured in a Simon Carves Acid Plant. The plant is capable of producing between 100 and 230 tonnes of 98.5% sulphuric acid per day. A generation plant associated with the process can produce up to 2 MW of electricity which is used within the site and exported to the grid.

3.4 The sulphuric acid manufacturing process involves: the melting of solid sulphur to a liquid form; the combustion of sulphur to produce sulphur dioxide; catalysed 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%.

3.5 The first step in this process is the conveying and placement of solid sulphur into a melting vessel to produce molten sulphur. Closed steam coil heaters are used to melt the sulphur. During this process and the storage of molten sulphur water is evaporated and a small amount of hydrogen sulphide is released from the sulphur (although the bulk sulphur is pre-treated before it is shipped to New Zealand to minimise the potential for the release of hydrogen sulphide). The molten sulphur is extracted and treated through a small venturi scrubber and a bio trickling filter to remove hydrogen sulphide liberated from the melter process. After this treatment, water vapour and traces of hydrogen
sulphide are discharged to air. The hydrogen sulphide emissions are regularly measured and the results show that the filter achieves greater than 98% removal efficiency as required by Condition 26 of the Air Discharge Permit.

3.6 The molten sulphur is then filtered to remove impurities and stored in a heated tank. Liquid sulphur is pumped to the acid plant to produce sulphuric acid and to the superphosphate plant to produce elemental sulphur fortified superphosphate.

3.7 Normally the energy required to melt and store the sulphur comes from steam produced by the acid plant. When the acid plant is shut down for maintenance the steam bloc boiler (a fuel oil fired auxiliary boiler) can be used. The use of this option is infrequent at the Hornby Works as the approach is to build sulphur stocks prior to any maintenance shut down. The steam bloc boiler discharges products of combustion. The blow-down from the boiler occurs continuously and enters the site’s green water system.

3.8 The melter and filtering systems are periodically emptied and the filter cleanings are removed. The cleanings are allowed to solidify and then broken up and recycled into the manufacture of superphosphate. Any fine particle debris is swept up and reused in the process. Any subsequent washing or storm water run-off containing fine particle sulphur will enter the site’s green water system.

3.9 The filtered molten sulphur is pumped to the sulphur furnace for combustion within the acid plant. The sulphur, mixed with dry air, ignites resulting in a gas stream with typically 8.0 to 10.0% sulphur dioxide.

3.10 This gas is cooled in preparation for its oxidation to sulphur trioxide through a fire tube steam boiler. The resulting steam generation is used to produce electricity through a turbine and alternator.

3.11 The cooled gas enters a stainless steel converting tower which contains a series of four catalyst beds where sulphur dioxide is converted (oxidised) to sulphur trioxide. The first three catalyst beds use a
vanadium pentoxide catalyst while the last bed uses a caesium catalyst achieving an overall conversion to greater than 99% efficiency. The sulphur trioxide gas is then absorbed by a solution of strong sulphuric acid within the absorption tower to produce sulphuric acid which is pumped to the production tanks. 99.99% of sulphur trioxide is removed in this process. Acid mist carry-over in the gas stream is minimised using twenty-four sulphuric acid laden Brink filters in the top of the absorption tower.

3.12 Sulphuric acid is stored on site in one 5,000 tonne and one 1,000 tonne tank that are banded within the acid plant confines.

3.13 The sulphur dioxide that is not converted, and traces of sulphur trioxide and sulphuric acid mist are discharged to air. This discharge is via a 67 metre high stack. A requirement of the Air Discharge Permit granted in 2010 was to raise the acid plant stack to at least 50 metres (from its previous height of 41 metres). However air modelling work completed by Golder Associates demonstrated that at 67 metres there was a significant reduction in ground level concentrations of sulphur dioxide so the new stack was increased to this height. Analysis of the sulphur dioxide data has shown the benefits of the increased stack height in reducing off-site ground level concentrations.

3.14 During acid plant start-up emissions of sulphur dioxide and ‘total acidic discharge’ can be higher (but within consent requirements) if the process is not carefully controlled. The reason for this is the catalyst has to be at the correct operating temperature (usually 410 to 440 degrees Celsius) to achieve the maximum conversion of sulphur dioxide to sulphur trioxide. Acid temperature, strength and flows over the towers impact on the absorption process and control of sulphur trioxide emissions. On start-up acid temperature management is important and we target to reach optimum operating temperatures within twenty minutes.

3.15 The primary method of controlling the discharge of sulphur dioxide, sulphur trioxide and acid mist to air is by accurate and tight control of process parameters. These parameters of the acid plant include the
continuous monitoring of the gas stream temperatures, catalyst temperatures, absorbing acid strengths, liquid flows and temperatures, pump flows and power use and various pressures.

3.16 A computer monitors and records 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.

3.17 An ‘in stack’ sulphur dioxide monitor and airflow recorder continuously monitors the concentration and mass of the sulphur dioxide discharge.

3.18 The Hornby Works laboratory measures the concentration of sulphur dioxide and trace sulphur trioxide/acid mist at fortnightly intervals using validated externally approved methodology.

3.19 The computer monitoring and control systems present the operator with a significant amount of information to optimise plant conditions. Automatic controls provide assurance that key operational parameters are maintained so sulphur dioxide emissions are minimised and maintained within consent requirements.

3.20 Two cooling tower systems operate on site both dedicated to the acid plant. One is used for cooling the acid plant’s steam turbine condenser cooling system and the other for cooling the water that controls the acid temperature.

3.21 Cooling towers may contain microbes such as Legionella pneumophila bacteria within the fine aerosols. Both towers are controlled by a robust management plan which involves on going chemical treatment and regular water sampling. Sampling is completed at least monthly, but normally on a fortnightly basis. This is significantly more frequent than current guidelines recommend.

Phosphate Rock Grinding Plant
3.22 The phosphate rock is stored in bulk storage buildings. It is transferred into blending hoppers via front-end loader where it is blended to the desired mix and transferred to mill feed hoppers. The rock is transferred from the feed hoppers into two air swept Bradley Pulveriser mills which grind the rock to a talcum powder consistency. The transfer conveyor drop points are all extracted and filtered to minimise fugitive dust within the building.

3.23 The fineness of the rock is controlled by adjusting the airflow and classifier system on the mills. When the rock is ground to the desired particle size it is lifted out of the mill within the air stream. It is then separated from the air stream by cyclone separators and high efficiency reverse pulse jet bag filters. The filtered air stream from the mills is vented to air from two roof top vents.

3.24 The discharges associated with this process are:

i. Fugitive dust from loading the rock into the blending hoppers. The rock storage, handling and grinding processes are enclosed within a building.

ii. Moist air is vented from the mill dust collectors to control humidity and fine dust from the mill air stream. The bag filters remove the fine rock from this air and the air discharge is monitored continuously by a dust sensor. Automatic shutdown prevents dust being discharged due to a bag filter rupture or an internal malfunction in the mill system. The mill exhaust emissions are independently audited (CRL Energy Ltd) for PM10. The most recent audit stated, ‘particulate concentrations are exceptionally low’ with emission rates of PM10 particulate <0.01 kg/hr.

Superphosphate Plant

3.25 Ground phosphate rock, sulphuric acid, a solution of fluorosilicic acid (recycled scrubbing liquor) and water are mixed and react to produce superphosphate. Molten sulphur is added on occasions to produce a sulphur fortified superphosphate.
3.26 The components are metered into a Broadfield mixer which vigorously blends the ingredients. A reaction takes place in the mixer and a slurry is formed. This slurry is discharged into a Broadfield den which has a slow moving floor. The product forms a cake as the mix solidifies in the den for approximately 15-30 minutes, and this is where most of the reaction occurs. Rotary cutters situated at the end of the den cut the mix and this is conveyed to the granulation drum. The product entering the drum is of a wet sand consistency.

3.27 The granulation drum is a rotating drum where the product is tumbled into small spherical granules. A classifying screen removes granules above 5.0 mm and these are disintegrated to powder to re-enter the granulation drum.

3.28 The granulated superphosphate passing through the screen is then conveyed to storage where it remains in heaps for ideally up to 10 days while the chemical reaction proceeds to near completion.

3.29 The reaction of sulphuric acid with the rock in the mixer and den converts the insoluble tricalcium phosphate to a mono-calcium phosphate form which is available for uptake by plants on application to soil.

3.30 The reaction also produces a number of gases being: carbon dioxide; sulphur dioxide; water vapour; silicon tetra-fluoride; hydrogen sulphide; and organic sulphur compounds.

3.31 These gases are extracted at a rate of 30,000 m³/hr under vacuum from the mixer and den and scrubbed in the den scrubber. The scrubbing system is a multistage system with a venturi scrubber followed by eight in-series void tower scrubbers and then two odour scrubbers.

3.32 The venturi scrubber receives the untreated air stream and then discharges the partially scrubbed stream to the eight void tower scrubber towers. Make-up water is supplied to the last of the void towers and flows counter-current to the gas stream. This ensures that
progressively cleaner air is contacted with progressively cleaner scrubber water.

3.33 Following the second stage (the void tower scrubbers) the gas stream then passes through two scrubbers, which are designed to reduce odorous compounds prior to discharging to air. This is achieved by using caustic (sodium hydroxide) dosing to adjust liquor pH to a level of 9.2. Ozone is injected to oxidise odorous compounds.

3.34 During the scrubbing process silicon tetrafluoride gas is wet scrubbed with water to form FSA (fluoro-silicic acid). The water scrubbing solution within the scrubber system becomes high in acidity and fluoride. This stream is recycled back to the mixer, where it is reincorporated back into the superphosphate product.

3.35 The exhaust from the den scrubber system is then combined with the exhaust from the hygiene scrubber system and discharged via a single 41.9 metre high stack.

3.36 The hygiene scrubber system has been designed to collect fugitive emissions that are released post the den stage. The system targets the granulator discharge point, transfer conveyors and general building air. The air extracted from the building (60,000 m³/hr) is passed through the hygiene water scrubber which removes fluoride and acidic compounds before being discharged to atmosphere via the combined stack.

3.37 The superphosphate plant and scrubber system is monitored and controlled by a computer system. The computer continually monitors the plant process parameters and essential equipment operating data such as pump pressures and power consumption, liquid flows, temperatures, pH and fluoride strengths. Motion sensors continually monitor all plant components to ensure they are operating.

3.38 The computer monitoring system assesses if the equipment and process is within a pre-set optimum range and will automatically shut down the plant in sequence if the process parameters deviate from the desired range.
3.39 All scrubber sump liquid levels are monitored using level sensors to ensure the vacuum is not broken because this would reduce the extraction on the mixer. The scrubber area is bunded to contain any spillage.

3.40 The fresh superphosphate after granulation and screening is then transferred by conveyor to bulk storage for the final curing over a period of up to 10 days. Although the acidulation reactions and associated volatile emissions mainly occur within the den, they continue at a decreasing rate throughout the granulation circuit, downstream transfer conveyors, and within the superphosphate storage piles.

3.41 The stored fertilisers are transferred from the storage sheds to the feed hoppers in the despatch plant by front-end loader and the fertiliser is screened prior to loading onto trucks. The front-end loader movement and tipping into the feed hoppers, conveying and screening of fertiliser can result in the discharge of fertiliser dust. The feed hoppers and despatching systems are located within a building ensuring that dust is confined. Dust extraction and collection systems exist on the main conveyor drop points where dust generation is likely. The screens are enclosed by dust covers.

3.42 The fertiliser is loaded onto trucks using an extending chute from shuttle conveyors or loaded directly over the side by the loaders onto the trucks. To minimise dust emission the trucks are loaded within the despatch plant buildings.

4. ENVIRONMENTAL COMMITMENT

4.1 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:

i. Taking account of environmental issues in all commercial decision making.
ii. Complying with the conditions of our discharge permits code of practice and other relevant environmental legislation and regulations.

iii. Ensuring that emissions are at the lowest level possible, consistent with sound operation and economics of production.

iv. Putting in place programmes to continually improve the environmental performance of the site and to reduce risk to the environment.

v. Developing awareness and understanding among the company’s employees of the interactions between the environment and the Company’s activities.

vi. 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.

vii. Being a good neighbour, concerned for the community and the environment.

4.2 Other relevant values are a commitment to the free flow and transparency of information to staff, shareholders and the community. A decentralised organisation structure is maintained to empower staff to make appropriate decisions locally. Our values include an unequivocal commitment to ensure staff working conditions, practices and the working environment are safe.

4.3 Ravensdown also funds independent research and development of fertiliser codes of practice into the use and production of fertiliser by the Fertiliser Association of New Zealand. Ravensdown is also a fully active member of the International Fertiliser Association (IFA) which provides a forum for sharing research and best practice in fertiliser manufacture and use globally.

4.4 Governance of Ravensdown 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.
4.5 The environmental performance of the site is documented in an annual summary supplied to Environment Canterbury as part of our Air Discharge Permit.

4.6 The Hornby Works operates a comprehensive Environmental Management System and has been certified to the ISO: 14001 Environmental Management System for the last 16 years.

4.7 ISO: 14001 Environmental Management System is an International Standard audited by an external organisation. The core tenets of the system are:
   i. Identify and understand all environmental aspects and impacts.
   ii. Continually minimise and reduce our environmental impact through a demonstrable/structured improvement programme with clear objectives and targets.
   iii. Comply with relevant legislation and standards.

4.8 Ravensdown has and will continue to investigate and evaluate new technologies and plant improvements.

5. CONCLUSIONS

5.1 Ravensdown strives to be a world leader in the manufacture of superphosphate fertiliser. The company's commitment to the environment is a guiding principle in its business planning and development. The Hornby Works is a long term strategic asset for Ravensdown.

5.2 I am proud of what we have achieved in recent years. I am determined that Ravensdown will continue to operate as a responsible and valuable member of the Hornby, Christchurch and Canterbury communities.

5.3 Ravensdown is a stable corporate citizen of the highest integrity and good will, borne out by its record of investment and ongoing operational improvement. The company is committed to making ongoing improvements at the site to minimise the impact of air discharges.
5.4 A key aspect of being able to commit to ongoing capital expenditure to improve performance is the security that comes from having a legislative framework that enables industries to operate in an environmentally responsible manner.

5.5 As Chris Hansen has outlined in his evidence (on behalf of Ravensdown) provisions included within the notified pCARP would have a profound negative effect on the Hornby plant should we wish to alter the site in any way, should ECAn wish to review the current consents, or when the consent is renewed in 2030. The pCARP as drafted has no recognition of the importance of industry and the investment made in existing industry. Avoidance policies and prohibited activity status will likely mean this well-established operation commissioned in 1922 will need to close at the expiry of the consent or possibly sooner.

Peter Hay
October 2015
RESOURCE CONSENT CRC080001
Pursuant to Section 104 of the Resource Management Act 1991
The Canterbury Regional Council (known as Environment Canterbury)

GRANTS TO: Ravensdown Fertiliser Co-Operative Limited
A DISCHARGE PERMIT: To discharge contaminants to air.
COMMENCEMENT DATE: 4 February 2010
EXPIRY DATE: 4 February 2030
LOCATION: 312 MAIN SOUTH ROAD, HORNBY

SUBJECT TO THE FOLLOWING CONDITIONS:

GENERAL

1) The discharges into air shall be only from the manufacture of sulphuric acid and superphosphate fertiliser and associated activities, located at 312 Main South Road, Christchurch, at or about map reference NZMS 260 M35:7260-4050.

2) The discharges shall not cause odour or particulate matter, which is offensive or objectionable, beyond the boundary of the property on which the consent is exercised.

3) The consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, as soon as practicable of any plant malfunction or breakdown that results in an abnormal discharge to air.

4) The consent holder shall keep a log of all complaints relating to discharges to air at the site.
   (a) The log shall include:
       (i) the date and time of the complaint or incident;
       (ii) the nature of the complaint or incident;
       (iii) the location;
       (iv) weather conditions at the time;
       (v) plant operating parameters at the time; and
       (vi) any action undertaken in response.
   (b) The complaints log shall be provided to the Canterbury Regional Council upon request.

5) (a) All sampling and surveys shall be carried out by an independent suitably qualified person, or by the consent holder or its representative where the Canterbury Regional Council has agreed to this in writing.
   (b) Where the consent holder or its representative carries out testing or monitoring, an independent suitably qualified person shall audit the monitoring and testing methodology at least once per year, unless otherwise agreed in writing by the Canterbury Regional Council.
   (c) The independent auditor shall provide a written report describing the extent of compliance with the required protocols.
   (d) A copy of this audit report shall be supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

6) All analyses in accordance with conditions on this consent shall be carried out by an independently accredited laboratory to ISO/IEC Guide 25, or to the satisfaction of the Canterbury Regional Council.

Environment Canterbury is the promotional name of the Canterbury Regional Council.
7) The Canterbury Regional Council may, once per year, on any of the last five working days of October, serve notice of its intention to review the conditions of this consent for the purposes of:
   (a) Dealing with any adverse effect on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage; or
   (b) Requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment caused by the exercise of this consent; or
   (c) Dealing with an adverse effects of building material corrosion that an independent person who is qualified and suitably experienced, has attributed to the discharge allowed by this consent, based on monitoring results under condition (51).

OUTSIDE STORAGE

8) With the exception of phosphate rock, all raw materials and processed fertiliser shall be stored in enclosed buildings.

9) No more than 30,000 cubic metres of phosphate rock shall be stored outside at any time.

10) Outside storage of phosphate rock shall occur only:
   (a) When covered storage is not practicable;
   (b) In the existing bunded area at the east of the site;
   (c) In a stockpile at a height at least 0.5 metres below the height of the bund;
   (d) For a total of no more than 180 days during the rolling average of any five year period.

11) The consent holder shall prevent dust escaping from the outside storage pile by either:
   (a) Establishing and maintaining an automated dust suppression sprinkler system that covers the storage pile, except for the working face, which will activate and remain operational for the duration of outside product pile storage, including unloading and loading; or
   (b) Covering the top surface of the outside storage pile with impermeable material.

12) Phosphate rock stored outside shall be used in preference to phosphate rock stored in the enclosed building. Notwithstanding this, the consent holder shall endeavour to minimise the number of occasions that the outside stockpile is disturbed and utilised.

13) Notwithstanding conditions (11) and (12) above the consent holder shall ensure that at all times outside storage complies with the requirements of the management plan prepared under condition (42) of this consent.

14) (a) The consent holder shall provide notice to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, at least 10 working days prior to the outside storage of phosphate rock that outside storage is to occur.
   (b) This notice shall include:
      (i) an explanation of why outside storage is necessary;
      (ii) the type and source of phosphate rock to be stored outside;
      (iii) the volume of phosphate rock to be stored outside;
      (iv) an estimated date and time of arrival of the phosphate rock to be stored outside; and
      (v) an estimated duration of outside storage of the phosphate rock.

15) Stockpiles of outside stored phosphate rock shall not be loaded onto, or broken into, when the gust wind speed measured on-site exceeds five metres per second.

16) (a) The phosphate rock outside storage area entrance, and associated internal road areas, shall be swept in order to remove deposited dust.
   (b) Sweeping shall be done:
      (i) before unloading or loading operations commence; and
      (ii) upon completion of unloading or loading operations.

Environment Canterbury is the promotional name of the Canterbury Regional Council.
ACID MANUFACTURING PLANT

17)  (a) The discharge from the acid manufacturing plant shall be via a stack with its outlet at least 40 metres above ground level.
(b) If during the term of this consent the Christchurch City Plan provides for a stack height of 50 metres or more above ground level to be an activity for which a consent could be obtained, the consent holder shall apply for resource consent to raise the stack height to at least 50 metres above ground level within six months of the rule becoming operative. The stack shall be raised to at least 50 metres within twelve months of any such consent being granted.

18) With the exception of a period of no more than two hours following startup of the acid plant, the discharge from the acid plant emission stack shall be clear and colourless at all times.

19)  (a) Subject to conditions (19)(b), (c) and (d), the acid manufacturing plant sulphur dioxide emission rate shall not exceed 86 kilograms per hour at any time.
(b) The acid manufacturing sulphur dioxide emission rate shall not exceed 77 kilograms per hour measured as a 10-minute average more than ten percent of the time over any twelve month period.
(c) If the discharge rate of sulphur dioxide exceeds 86 kilograms per hour over a 10 minute period, measured as a 10-minute average, the sulphur dioxide emission rate shall be reduced immediately.
(d) A system shall be installed within six months of granting this consent that automatically shuts down the sulphuric acid production process if the discharge rate of sulphur dioxide from that process exceeds 86 kilograms per hour over a 30 minute period, measured as three consecutive 10-minute averages.

20)  (a) The gas flow rate in the acid manufacturing plant stack shall be measured on a continuous basis with measurements recorded at least every minute.
(b) The sulphur dioxide concentration in the acid manufacturing plant stack shall be measured on a continuous basis with measurements recorded at least every minute.
(c) The measurement of the sulphur dioxide concentration shall be by method ISO 7935:1992(E) or equivalent.
(d) All measurements that show exceedances of 19(a) of this consent shall be notified to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 24 hours of the exceedances.

21)  (a) The gas flow rate in the acid manufacturing plant stack shall be measured manually at least once per month.
(b) The sulphur dioxide concentration in the acid manufacturing plant stack shall be measured manually at least once per month.
(c) The manual measurement of the sulphur dioxide concentration shall be by USEPA method 8 or equivalent.
(d) A copy of the gas flow rates and sulphur dioxide test results shall be supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

22) The consent holder shall repair any detected leaks of sulphur dioxide in the acid manufacturing plant as soon as practicable.

23) The combined rate of discharge of sulphur trioxide and sulphuric acid mist from the acid manufacturing plant stack, expressed as sulphur trioxide, shall not exceed 0.6 kilograms per hour.

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24) (a) The sulphuric acid and sulphur trioxide concentration, expressed as sulphur trioxide, in the acid manufacturing plant stack shall be measured at least once every two weeks.
(b) The measurement of the sulphuric acid and sulphur trioxide concentration shall be by USEPA method 8 or equivalent.
(c) A copy of the sulphuric acid and sulphur trioxide test results shall be supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

25) (a) At least once per week the consent holder shall measure the hydrogen sulphide concentration in the discharge from the sulphur melter biotrickling filter.
(b) The measurement of the hydrogen sulphide concentration shall be by a method approved by the consent authority.
(c) A copy of the hydrogen sulphide test results shall be supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, upon request.

26) (a) The sulphur melter bio-trickling filter shall be maintained and operated to ensure that at least 98 percent of the hydrogen sulphide in the discharge is removed by the filter system for 90 percent of any 12 month period, measured as a rolling average.
(b) Operation and maintenance shall include, but not be limited to, maintaining the correct operating temperature and ensuring that the filter medium does not become blocked.
(c) This condition shall be read in conjunction with condition (2), as the maintenance of the biotrickling filter is for the purpose of odour management.

27) (a) The consent holder shall:
(i) install sulphur dioxide detectors in the sulphur storage and processing areas; and
(ii) operate sulphur dioxide detectors at all times.
(iii) Ensure that the sulphur dioxide detectors are connected to an alarm system to provide warning of sulphur fires.
(b) Within six months of the date of commencement of this consent the consent holder shall install and operate at least four sulphur dioxide detectors around the acid manufacturing plant in order to detect fugitive sulphur dioxide emissions.
(c) The monitoring programme and the method of measurement shall be approved in writing by the Canterbury Regional Council.

28) (a) The consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, whenever an acid plant cold start is to occur.
(b) Cold start notification shall be made at least five working days prior to the commencement of the event. For the purpose of this consent “working day” is as defined in the Resource Management Act.
(c) Cold start notification information shall include:
(i) the date and time of the commencement of the event;
(ii) the name and contact details of the staff member in charge of the commencement event.

FERTILISER MANUFACTURING PLANT

29) All manufacturing den scrubber and hygiene scrubber emissions from the fertiliser manufacturing plant shall be discharged via a stack with its outlet at least 41.5 metres above ground level.

30) The fertiliser manufacturing plant stack total fluoride compounds emission rate shall not exceed:
(a) one kilogram per hour for 90 percent of samples taken in any 12 month period, measured as a rolling average; and
(b) two kilograms per hour at any time.

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31) (a) The total fluoride compounds concentration in the discharge from the fertiliser manufacturing plant stack shall be measured at least once per week, provided that where a weekly test returns a result greater than one kilogram per hour, daily testing shall be carried out until such time as a result of one kilogram per hour or less is measured. Weekly testing may then resume.
(b) The measurement shall be undertaken during superphosphate manufacture and no test may commence within one hour of starting acidulation.
(c) The measurement of the total fluoride compounds concentration shall be by, USEPA Method 13B (Total fluoride specific ion electrode) or an alternative method approved, in writing, by the Canterbury Regional Council.
(d) A copy of the total fluoride test results shall be supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, upon request.

32) The fertiliser manufacturing plant stack gas condensate pH shall not be less than 3.0.

33) (a) The pH of the condensate in the fertiliser manufacturing plant stack gas shall be measured at least once per week.
(b) A copy of the pH test results shall be supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, upon request.

34) (a) The total suspended particulate (TSP) matter discharges from the mill vents shall not exceed:
(i) a concentration of 20 milligrams per cubic metre adjusted to zero degrees Celsius and one atmosphere, and
(ii) a combined mass emission rate of 0.45 kilograms per hour.
(b) The concentrations and emission rates of TSP matter, PM_{10} and PM_{2.5} in the discharges from the mill vents shall be measured during manufacturing at least once every three months during the first year after the commencement of this consent and at least three times every year thereafter, two of which measurements are to take place in June, July or August.
(c) The method of sampling and analysis shall be ISO 9096: 2003, ASTM D3685- 98, USEPA Method 17 or an equivalent method.
(d) The organisation performing the testing shall be currently accredited under ISO 17025, to undertake the method used to perform the testing.
(e) A copy of the mill vents test results shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

35) (a) Each mill baghouse shall be fitted with a continuously monitored dust sensor device.
(b) The dust sensor devices shall be connected to an automatic control system.
(c) If the dust sensor devices indicate that there has been a bag failure, the baghouse and associated processing equipment shall cease operation.
(d) The consent holder shall keep a log of all bag failures.
(e) The log shall include:
(i) Date and time of the failure;
(ii) Time that discharges from the bag filters ceased; and
(iii) Action undertaken in response.
(f) The baghouse and associated processing equipment shall commence operation only when the baghouse is fully functional.
(g) The bag failure log shall be provided to the Canterbury Regional Council upon request.

COOLING TOWERS

36) (a) Testing for Legionella spp in the cooling towers shall be undertaken at least once per calendar month.
(b) The response to measured Legionella spp concentrations shall follow the consent holder’s "Legionella management plan".

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(c) A copy of the Legionella management plan shall be provided to the Canterbury Regional Council within three months of the date of commencement of this consent and when any revision is completed.

DIESEL COMBUSTION

37) (a) The discharge shall occur via a stack at a height at least 5.8 metres above ground level.
   (b) The discharge shall be directed vertically into air and shall not be impeded by any obstruction above the stack that decreases the vertical efflux velocity below that which would occur in the absence of such obstruction.

38) The diesel-oil burning rate shall not exceed 550 litres per hour.

39) The sulphur content of the diesel-oil used shall not exceed 0.006 percent by weight.

40) The opacity of the stack discharge shall not be darker than the Ringelmann Shade 1 as determined in accordance with the New Zealand Standard 5201:1973, except for a period not exceeding two minutes in each hour of operation.

41) (a) The furnace shall be serviced at least once every three years by a person competent in the servicing of such appliances. This servicing shall include:
   (i) testing of the ratio of combustion gases discharged i.e., carbon monoxide, carbon dioxide and oxygen, using a suitably calibrated instrument; and
   (ii) adjustment if necessary of the fuel to air ratio.
   (b) Service reports shall be prepared and retained, and copies shall be provided to the Canterbury Regional Council upon request.

DUST AND ODOUR MANAGEMENT

42) (a) The consent holder shall maintain and comply at all times with a Dust and Odour Management Plan.
   (b) The consent holder shall take all practicable steps to minimise the discharge of particulate matter and odour.
   (c) Minimising steps shall include, but not be limited to:
      (i) road sweeping on a regular basis;
      (ii) hardstand area sweeping on a regular basis;
      (iii) covering of potential discharge points on outdoor conveyors;
      (iv) maintaining the high-speed doors on the superphosphate dispatch (B) building; and
      (v) inspecting and changing bag filters as necessary.
   (d) The consent holder shall notify the Canterbury Regional Council: Attention: RMA Compliance and Enforcement Manager, at least five working days prior to desludging the stormwater pond.
   (e) A copy of the Dust and Odour Management Plan shall be provided to the Canterbury Regional Council: Attention: RMA Compliance and Enforcement Manager, within three months of the date of commencement of this consent and when any revision is completed.

ENVIRONMENTAL MONITORING

43) (a) The consent holder shall operate and record data from a meteorological monitoring station.
   (b) The meteorological monitoring station shall be located:
       (i) on the applicant's site; and
       (ii) in a position that provides data on typical conditions at the site.
   (c) The meteorological monitoring station shall record wind speed, wind direction, ambient temperature and relative humidity.
   (d) The meteorological monitoring data shall be recorded at intervals of not more than 10 minutes.
   (e) All recording equipment shall be:

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(i) regularly calibrated; and
(ii) maintained in good condition.

(f) Meteorological monitoring data shall be retained, and copies shall be provided to the Canterbury Regional Council upon request.

44) (a) The consent holder shall operate and record data from at least two ambient sulphur dioxide monitoring stations; and

(i) The monitoring required under (i) shall continue for the term of this consent for one monitor, and at least five years for the second monitor; and

(ii) After the five year period required by (ii) above, monitoring from one of the ambient monitors required by (i) may cease provided that:

(1) there have been no recorded exceedances of the ambient trigger concentrations specified in condition (45)(a) attributable to the consent holder’s operations for at least the preceding two years at any of the monitors; and

(2) at least 10 working days prior to the cessation of the ambient monitor, the consent holder has provided to the Canterbury Regional Council a report demonstrating compliance with condition (44)(a)(iii)(1).

(b) The sulphur dioxide monitoring station(s), including that remaining following the exercise of condition (44)(a)(iii)(1), shall be located at sites approved by the Canterbury Regional Council.

(c) The sulphur dioxide monitoring stations shall continuously record ambient sulphur dioxide.

(d) The data from the monitors shall be relayed in real time to the acid manufacturing plant control room.

(e) The measured sulphur dioxide concentrations shall be taken into account in operating the acid manufacturing plant.

(f) The method of sulphur dioxide monitoring shall be in accordance with that recommended by the National Environmental Standards for air quality.

(g) The consent holder shall retain sulphur dioxide monitoring data, and copies shall be provided to the Canterbury Regional Council upon request.

45) (a) If the data collected in accordance with condition (44) indicates that ambient sulphur dioxide concentrations exceed an average of 450 micrograms per cubic metre for 10 minutes; or a single exceedance of 300 micrograms per cubic metre (1 hour average), the consent holder shall take steps to determine whether the exceedance is attributable to the consent holder’s operations, including assessing the meteorological conditions and the sulphur dioxide emission rate.

The consent holder shall immediately reduce the sulphuric acid production rate if:

(i) the emission rate is above 50 kilograms per hour; and

(ii) a contribution to the exceedance from the consent holder’s operations cannot be excluded due to the meteorological conditions; and

(iii) a second consecutive average of more than 450 micrograms per cubic metre for 10 minutes or exceedance of 300 micrograms per cubic metre (one hour average) occurs.

(b) The consent holder shall keep a log of all sulphuric acid production rate reductions undertaken as a result of (a).

(c) The log shall include the:

(i) date and time of the reduction; and

(ii) the rate of production at the time of the exceedance in (a) and the level the rate of production is reduced to as a result of (a).

(d) A copy of the acid reduction log shall be provided to the Canterbury Regional Council upon request.
46)  (a) The consent holder shall operate and record data from at least three ambient fluoride monitoring stations for the term of this consent.
(b) These fluoride monitoring stations shall be located at the western end of the site at or about map reference NZMS 260 M35:7225-4045, at the eastern end of the site at or about map reference NZMS 260 M35:729405 and near the Iplex building at or about map reference NZMS 260 M35:7226-407, or as otherwise agreed in writing by the Canterbury Regional Council.
(c) The fluoride monitoring stations shall continuously monitor ambient fluoride.
(d) The method of fluoride monitoring shall be AS 3580.13.2-1991 or equivalent.
(e) Fluoride monitoring data shall be retained, and copies shall be provided to the Canterbury Regional Council upon request.

47)  (a) The consent holder shall operate and record data from two ambient total suspended particulate (TSP) monitoring stations at all times that phosphate rock is stored outside.
(b) The TSP monitoring stations shall be located at sites located near the site boundary and the phosphate rock storage bund and determined with the approval of the Canterbury Regional Council.
(c) The TSP monitoring shall be undertaken:
(i) with low or medium volume samplers or a continuous monitoring instrument approved by the Canterbury Regional Council; and
(ii) with an averaging period of 24 hours or less.
(d) The TSP monitoring required by condition (47)(a) shall:
(i) commence at least seven days prior to the outside storage of phosphate rock;
(ii) continue for the duration of outside storage; and
(iii) continue for at least seven days after the outside storage is complete.
(e) The method of TSP monitoring shall be in accordance with accepted practices for nuisance dust management.
(f) TSP monitoring data shall be retained, and copies shall be provided to the Canterbury Regional Council upon request.

SURVEYS

48)  (a) Within two years of the commencement of this consent and at five yearly intervals thereafter, the consent holder shall undertake a community odour survey or an odour diary programme.
(b) The odour survey or odour diary programme shall be undertaken using accepted methodology, to the approval of the Canterbury Regional Council.
(c) A copy of the odour survey or odour diary programme results shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

49)  (a) Within two years of the commencement of this consent and at least every three years thereafter for the term of this consent, the consent holder shall undertake a vegetation injury survey.
(b) The survey shall be undertaken in a manner consistent with previous vegetation surveys (as described in Dr D. Doley’s report titled “Assessment of the Visible Effects of Atmospheric Emissions from the Ravensdown Fertiliser Works on Vegetation in the Hornby Area”), using accepted methodology to the approval of the Canterbury Regional Council.
(c) A copy of the vegetation injury survey results shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

50)  (a) Within three years of the commencement of this consent, and every three years thereafter, the consent holder shall undertake a survey of the effects of fluoride etching on window glass.
(b) The survey shall be of at least 15 representative dwellings located within the outlined area shown in Figure Al of BRANZ report DZ082 dated October 2004, which is attached to this consent.

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(c) The survey shall be undertaken using the methodology outlined in BRANZ report DZ082.
(d) Should the survey undertaken in accordance with conditions (b) and (c) above show window replacement is necessary in more than 20 percent of the dwellings surveyed, the consent holder shall undertake further investigations of at least five properties within 100 metres of each of the affected dwellings where replacement is required.
(e) Any windows found to be affected to pen test level 3 or where Light Gloss Units (LGU) are equal to or less than 120 in the location and according to the method described in the BRANZ report DZ082 dated October 2004, shall be replaced by the consent holder at the consent holders cost if the owner wishes the glass to be replaced.
(f) A copy of the fluoride etching survey results shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of receipt by the consent holder.

51) (a) The consent holder shall comply with the attached Building Materials Monitoring Plan ("BMMP") dated July 2009 and any variation under condition (51)(b), until such time, if ever, that the Canterbury Regional Council advised by written notice that the purpose of the BMMP has been met and that notice shall not be given before the 6th anniversary of the exercise of this consent. The purpose of the BMMP shall be determined if corrosion rates within the discharge plume of the Hornby Works (as defined in the BMMP) exceed those considered normal for corrosion rates of building materials in an industrial area.
(b) The BMMP may be varied with the written agreement of the Canterbury Regional Council at any time. Any such variation may include, without limitation:
   (i) the number and location of test racks;
   (ii) the positioning/orientation of test racks;
   (iii) the materials to be tested;
   (iv) the frequency of testing.
(c) After the 6th anniversary of the exercise of this consent the consent holder may by written notice to the Canterbury Regional Council, request that the requirement for compliance with condition (51)(a) be suspended because its purpose has been met. Any notice by the consent holder to suspend compliance with the BMMP must be accompanied by a report from a suitably qualified expert setting out how the purpose of the BMMP has been met. The Canterbury Regional Council shall notify the consent holder of any decision. If, following a period of discontinuance of the BMMP, the Canterbury Regional Council becomes aware of any circumstance which warrants the recommencement of the BMMP, the Canterbury Regional Council may give written notice to the consent holder specifying the circumstances and giving a date by which the BMMP must be recommenced. Any recommenced BMMP shall be subject to all the provisions of this condition.
(d) All results from monitoring under the BMMP will be reported to the Canterbury Regional Council no less frequently than annually, and will form part of the yearly report required pursuant to condition (52).

52) (a) The consent holder shall provide to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, a yearly summary that includes but is not necessarily limited to all monitoring undertaken in accordance with the requirements of this consent.
(b) The yearly report shall include an assessment of the actual and potential environmental effects associated with the matters considered.

53) (a) Within one year of the commencement of this consent, and every year thereafter, the consent holder shall undertake consultation with a community representative group.
(b) The consultation shall be in regard to the discharges authorised by this consent.
(c) A copy of the consultation outcomes shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 10 working days of the consultation.

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54) The consent holder shall notify the Canterbury Regional Council as soon as practicable of any exceedance of National Environmental Standards or Ministry for the Environment guidelines for contaminants Measured during ambient monitoring required under this consent.

Issued at Christchurch on 23 March 2010

Carly Steers
TEAM LEADER CONSENTS OPERATIONS
on behalf of the Canterbury Regional Council

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