

Before the Independent Hearings Panel
at Timaru

under: the Resource Management Act 1991

in the matter of: Submissions and further submissions in relation to
Timaru Proposed District Plan – Hearing B

and: **Fonterra Limited**
Submitter 165

Statement of evidence of Richard Leslie Chilton

Dated: 5 July 2024

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STATEMENT OF EVIDENCE OF RICHARD LESLIE CHILTON

INTRODUCTION

- 1 My full name is Richard Leslie Chilton.
- 2 I am an Air Quality Scientist with Tonkin & Taylor Limited (T+T), where I hold the positions of Technical Director - Air Quality and Discipline Manager of Environmental Engineering. I have 25 years' experience in air quality assessment and management.
- 3 I hold the following qualifications, membership and certification:
 - 3.1 Bachelor of Science (Geography)
 - 3.2 Master of Science (Honours) in Environmental Science
 - 3.3 Member of the Clean Air Society of Australia and New Zealand (CASANZ)
 - 3.4 Certified Air Quality Professional (CAQP)
 - 3.5 Accredited RMA decision maker (Making Good Decisions certificate holder)
- 4 My broader qualifications, expertise and experience are included in more detail in **Appendix A** of this evidence.
- 5 In terms of experience relating to dairy factories, I have project managed air discharge assessments and air discharge permit applications for many of Fonterra Limited's (*Fonterra*) sites. This includes the Fonterra Darfield (Stages 1 and 2), Clandeboye, Studholme, Pahiatua, Edendale, Kaikoura, Brightwater, Hautapu, Waitoa, Te Awamutu, Takaka, and Stirling sites. I have also been involved in the technical review of the air quality assessment of the expansion of Synlait's dairy factory to the south of Dunsandel.
- 6 Although this is a council hearing, I confirm I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and I agree to comply with it while giving oral evidence before the hearing committee. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

SCOPE OF EVIDENCE

- 7 I have been asked by Fonterra to prepare this brief of evidence to assist the Hearing Panel in relation to air quality issues associated with its Clandeboye site, for the purposes of informing proposed plan provisions that *inter alia* are intended to address reverse sensitivity effects.
- 8 In preparing my evidence I have reviewed the following:

- 8.1 Fonterra's submission in relation to the notified proposed Timaru District Plan (*PDP*).
- 8.2 The air discharge permits relating to the Fonterra Clandeboye site, which is located within the Timaru District.
- 8.3 The Ministry for the Environment's (*MfE*) Good Practice Guide for Assessment Odour (MfE, 2016a).
- 8.4 The MfE's Good Practice Guide for Assessing Discharges to Air from Industry (MfE, 2016b).
- 8.5 The 'section 42A Report: Rural Zones', prepared by Mr Andrew MacLennan

PURPOSE AND STRUCTURE OF EVIDENCE

- 9 The purpose of my evidence is to address the potential reverse sensitivity air quality effects that Fonterra seeks to address through its submission to the proposed PDP, with a particular focus on odour.
- 10 My evidence is structured as follows:
 - 10.1 Overview of my understanding of Fonterra's submission on the proposed PDP as they relate to air quality considerations.
 - 10.2 A discussion of reverse sensitivity air quality effects and how these are recognised by the Ministry for the Environment and managed in relation to industrial discharges under the Canterbury Air Regional Plan (*CARP*).
 - 10.3 An example of reverse sensitivity air quality effects, highlighting the significant implications of this issue.
 - 10.4 A description of the activities at the Fonterra Clandeboye site that generate air discharges (including currently known future development). This helps to set the scene for how reverse sensitivity can impact on the Clandeboye site from an air quality perspective; and
 - 10.5 A response to the s42A Officer's comments in relation to GRUZ-P5.

UNDERSTANDING OF FONTERRA'S SUBMISSION

- 11 Fonterra's submission describes the proposed 'General Industrial Zone' as "... a poor fit for its Clandeboye site, and instead proposes that the site be zoned as a specific new zone – 'Special Purpose Zone – Strategic Rural Industry' (*SPZ-SRI*)". Since submissions, I understand that Fonterra has revised the scope of its submission and is seeking a Special Purpose Zone: Clandeboye Dairy Manufacturing (*CDMZ*), which is intended to provide flexibility to operate and the ability to expand existing activities, while also

providing both Council and the surrounding community realistic expectations for the site in the long term.

- 12 Fonterra's submission seeks variously to recognise and manage "... *the establishment of incompatible land uses...*" with respect to its Clandeboye site, which has a functional and operational need to locate in rural areas to support primary production activities. It also specifically seeks to protect "... *industrial land from inappropriate activities establishing within the zone and protecting the zone interface to avoid reverse sensitivity effects*".

REVERSE SENSITIVITY AIR QUALITY EFFECTS

- 13 Reverse sensitivity air quality effects occur where a new activity (such as establishment of a new residential dwelling) increases the sensitivity of the area to necessary discharges from a legally established industrial activity. As I highlighted, this is a key aspect of Fonterra's submissions.
- 14 Reverse sensitivity air quality effects are a recognised issue for industrial activities and are described in various Ministry for the Environment Good Practice Guides relating to air discharges, such as that for odour¹, dust², and for industrial discharges³. The GPG for assessing discharges to air from industry describes reverse sensitivity as follows:

"Reverse sensitivity occurs when sensitive activities, such as residential properties, are allowed to locate where they may be adversely affected by existing industrial or noxious activities. This has the adverse effect of limiting the ability of the industry or noxious activity to operate efficiently and with long-term certainty. Allowing sensitive activities to establish in close proximity to existing industry can potentially result in adverse effects on the health, safety or amenity values of people, as well as potentially adversely affecting the economic and safe operations of industries."

- 15 In my experience, reverse sensitivity effects can be realised through two key avenues:
- 15.1 Enforcement action: a sensitive activity making complaints to the regulatory authority (i.e., Environment Canterbury), who then has responsibility to investigate and take relevant enforcement actions where necessary. This can impose significant costs on an industry or, at worst, make it unviable to remain in that location.
- 15.2 Impact on ability to secure replacement air discharge permits: Impacts on an industry seeking to renew its resource consent to discharge contaminants into air due to policies in the CARP.

¹ MfE 2016a. Good Practice Guide for Assessing and Managing Odour. Ministry for the Environment.

² MfE 2016b. Good Practice Guide for Assessing and Managing Dust. Ministry for the Environment.

³ MfE 2016c. Good Practice Guide for Assessing Discharges to Air from Industry. Ministry for the Environment.

- 16 The CARP, includes an objective and policy that require industry to recognise and manage the potential for reverse sensitivity air quality effects. In particular, I note the following objectives and policies:

Objective 5.8: Discharges from existing activities are managed in response to evolving characteristics of the receiving environment.

Policy 6.10: If the sensitivity of the receiving environment is altered by authorised land use change so that an existing discharge results in significant adverse effects on the receiving environment, require the effects of that discharge to be reduced and provide a reasonable timeframe for achieving that reduction.

- 17 Objective 5.8 and Policy 6.10 are relevant to Fonterra's Clondeboye site given it is an existing consented activity. They place an onus on industry such as Fonterra to monitor and respond to changes in its receiving environment to manage the potential for reverse sensitivity air quality effects, such as through this district plan process.

EXAMPLE OF REVERSE SENSITIVITY

- 18 I have direct experience of a reverse sensitivity impact on an existing industry when I worked as an Air Quality Officer for the Auckland Regional Council (1999-2004). During that time, I was involved in processing resource consents for discharges to air, as well as compliance and enforcement in relation to those consents.
- 19 The situation arose in relation to an established flexible packaging manufacturing operation (Huhtamaki Van Leer Limited⁴) located in west Auckland. Air emissions from the operation were discharged via a number of tall stacks.
- 20 As a result of a district plan change authorised by the Waitakere City Council, it became possible for a high-rise apartment block to be constructed on a property adjacent to this industry, with balconies and windows that opened at a similar height to the top of the discharge stacks.
- 21 Following the establishment of the apartment block and residents moving in, I was involved in responding to and investigating complaints made to the Auckland Regional Council by the new residents. The outcome for the industry was that the effects of its discharges on the new residential activities were such that it was no longer able to operate in compliance with its environmental obligations at that location.
- 22 While there are obvious differences between this example in urban Auckland and that of the Clondeboye site, the example is still relevant and illustrates the issue being considered. The issue in my view is probably more of a challenge for the Clondeboye site given its scale of development and significance to the surrounding rural sector. This situation is in my view amplified because of the large area required for the site and the scale

⁴ Air discharge permit 22459, File 14/10/Air/14027, issued by Auckland Regional Council

of investment, limiting the ability for the operations to relocate to alternative locations for it.

NATURE OF DISCHARGES TO AIR FROM THE CLANDEBOYE SITE

- 23 To understand the potential for reverse sensitivity air quality effects in relation to Fonterra's Clandeboyne site I will now outline the nature of discharges from the site, including describing the permits it holds for those discharges.
- 24 Fonterra's Clandeboyne site holds seven resources consents from the Canterbury Regional Council (CRC) authorising its discharges to air (air discharge permits) from activities carried out at the site. These permits include the following:
 - 24.1 CRC186093 for the discharges to air from the operation of the dairy factory. This includes discharges from the site's boilers, milk powder driers, and includes odour from the site. This is arguably the main air discharge permit for the site, and includes an extensive suite of conditions, including discharge limits, operating requirements, as well as monitoring and reporting requirements.
 - 24.2 CRC156538 for the discharge of contaminants into air (i.e., odour) from the storage and handling of solid waste associated with a resource recovery facility located at the Clandeboyne site.
 - 24.3 CRC173212 for the discharge of contaminants into air (i.e., odour) from the disposal of sludge for the disposal of air flotation (DAF) plants at the milk processing plant.
 - 24.4 CRC156534 for the discharges to air from the operation of waste oil heaters.
 - 24.5 CRC191296 for the discharge of contaminants into air (i.e., odour) from the aerated-tank storage of Proliq (a lactose rich by-product that can be used as stock feed) approximately 2.5 km northeast of the Clandeboyne site.
 - 24.6 CRC156403 for the discharge of contaminants into air (i.e., odour) from the irrigation of dairy factory wastewater to land.
 - 24.7 CRC156421 for the discharge of contaminants into air (i.e., particulate matter and odour) from the operation of a lactose drying plant.
- 25 The main discharges to air associated with the above permits can be summarised as follows:
 - 25.1 Fine particulate matter arising from the operation of the sites coal fired boilers and milk powder driers.

- 25.2 Combustion gases, such as sulphur dioxide, nitrogen dioxide and carbon monoxide from the operation of the sites coal fired boilers and other smaller combustion plant (such as the waste oil heater).
 - 25.3 Odour from a variety of sources, including those associated with wastewater treatment and disposal, as well as an intrinsic tangy milk like odour associated with the operation of the processing plant.
 - 25.4 Dust associated with the handling of product (e.g., milk powder), and coal handling.
- 26 Each of these discharge permits include conditions requiring that discharges from the site do not give rise to offensive or objectionable odour and dust effects beyond the site boundary. I highlight this for a couple of reasons as follows:
- 26.1 Both regional and district councils have responsibility for managing odour and dust and its useful to understand the distinction between the two (I discuss this later in my evidence).
 - 26.2 Odour and dust discharges are in my experience a key driver for reverse sensitivity effects. That is, they are aspects that most commonly give rise to complaints from sensitive activities in relation to air discharges from industrial activities.
- 27 I have discussed compliance with the above air discharge permits with Fonterra and understand that it has not received any odour or dust complaints in the last 5 years. I have also reviewed the site's most recent annual air quality compliance report⁵ required under CRC186093 and note that it substantively⁶ meets the requirements of that consent.
- 28 An anticipated future development at the Clandeboye site is the conversion or replacement of the site's existing coal fired boilers that are used to generate process heat to another energy source, most likely to be in the form of biomass (e.g., wood fired boilers). This is necessitated through the introduction of the Resource Management (National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat) Regulations 2023 (NES-GHG). The burning of biomass (as a renewable fuel source) instead of coal will enable a reduction in greenhouse gas emissions associated with fossil fuel combustion.
- 29 A change or replacement of the air discharge permit CRC186093 is anticipated to be required to provide for this conversion in fuel type to biomass and would need to be made by way of an application to the CRC. Any application would need to consider the potential localised air quality effects of the discharges from the boilers, taking into account the nature of the receiving environment, including if that receiving environment has

⁵ Fonterra 2023. Fonterra Clandeboye Annual Report 2022/23 – Resource Consent CRC186093. Report prepared for Fonterra Limited by WSP New Zealand Limited.

⁶ A single noncompliance was noted in relation to a continuous in-stack monitor for SO₂, which has since been replaced.

become more sensitive due to the encroachment of sensitive activities. This would include the discharge of fine particulate matter and combustion gases (e.g., nitrogen dioxide and carbon monoxide). Wood-biomass handling and combustion are in my experience unlikely to give rise to offensive or objectionable odour effects.

RESPONSIBILITY FOR THE REGULATION OF AIR DISCHARGES

- 30 By and large, the authority that has responsibility for regulating air discharges associated with the operation of Fonterra's Clondeboy site is the CRC, through the issue of air discharge permits (which I canvassed earlier) and in relation to compliance with permitted activity rules in the CARP. At Clondeboy, CRC permits authorise the discharge of contaminants (including contaminants considered hazardous) to air as well as odour and dust from the site.
- 31 In my experience there is often overlap between a district and a regional council when it comes odour and dust. It is my understanding that it is a regional council that has the responsibility for regulating discharges to air, including odour, from 'industrial or trade activities', such as that of Fonterra's Clondeboy site. By comparison, it is my understanding that a district council has a responsibility for managing odour and dust in terms of amenity and other effects through land use planning instruments.
- 32 The MfE's 'Good Practice Guide for Assessing and Managing Odour' sets out the legislative context for managing odour under the RMA. The guide notes that district plan requirements are often similar to those of regional plans with respect to odour management, but that there are two general approaches for exercising local government odour management functions:
- (i) *The effects of odour emissions should primarily be controlled at the regional level.*
 - (ii) *A combined approach is taken, where odour emissions associated with any land use are controlled at the district level, and odour emissions associated with any activity requiring consent for discharges to air are controlled at the regional level.*
- [my emphasis added as underlined text]*
- 33 The guide goes on to note that "*Ideally, duplication between district and regional plans should be avoided.*" These approaches are consistent with my own experience with how regional and district council's approach the matter of odour regulation in New Zealand. It is my experience that where an odour-discharging activity requires a resource consent for discharges to air from the CRC, District Councils in Canterbury will typically defer to the CRC in relation to odour effects.
- 34 Notwithstanding the above, a key method for industries to manage residual or unanticipated odour and dust effects (following implementation of good practice mitigation measures) is being appropriately separated from sensitive activities (e.g. residential dwellings). This is best achieved in my

experience through zoning provisions that recognise the potential for reverse sensitivity effects and minimise the likelihood of sensitive and incompatible activities encroaching on appropriately located industries.

RESPONSE TO S42A OFFICER'S REPORT

- 35 Section 13.2, of the section 42A Report: Rural Zones, prepared by Mr Andrew MacLennan, addresses Fonterra's submission in relation to its Clandeboye site.
- 36 At paragraph 13.2.20, Mr MacLennan describes how he has:
- "...provisionally recommended that a new setback standard be included within GRUZ-S2 requiring a setback from the boundary of any area used for the discharge of industrial trade waste at Fonterra Clandeboye. However, I have not recommended a distance for that setback. I welcome evidence from the submitter setting out the potential effects associated with the discharge, justification for the 500-metre setback distance, and further details of the geographic extent area that will be impacted by the proposed setback."*
[my emphasis added as underlined text]
- 37 I have been asked by Fonterra to respond to this request from Mr MacLennan. In doing so, I consider the requirements of Fonterra's existing resource consent for discharges to air from irrigation of industrial wastewater to land (CRC156403) to be relevant.
- 38 Industrial wastewater is generated at the Clandeboye site from a number of different sources. Some of the wastewater undergoes initial treatment to remove fatty solids in the wastewater, but is otherwise discharged to land via irrigation or via the site's ocean outfall. The nature of the wastewater means that it can degrade over time and become odorous, with the potential to result in odour effects when irrigated to land. Management practices employed by the Site aim to reduce the likelihood of this occurring.
- 39 CRC156403 was granted in 2001 and includes the following conditions that refer to setback requirements:
- 39.1 Condition 2: During the hours of 0800 to 2400, the wastewater shall not be applied within 600 metres of the Davidson dwelling when the mean wind direction is in the range of plus or minus 20 degrees of a line from any portion of the irrigator which is closer than 600 metres to that dwelling.
- 39.2 Condition 3: Wastewater shall not be irrigated within 600 metres of the Davidson dwelling when the wind speed is less than 1.5 metres per second.
- 40 The context of these separation distances is relevant as they have informed proposed separation distances sought by Fonterra relating to GRUZ-P5.

- 41 The providence of the 600 m distance described in Condition 2 and 3 is unclear from my discussions with Fonterra staff. However, in my experience it is an unusually large separation distance for this type of activity. It is my speculation that such a large separation distance may have been the result of a private agreement between the two parties at the time when the consent was originally granted.
- 42 Wastewater from the Clandeboye site may be treated with a 'dissolved air flotation' (DAF) to remove fatty solids, but does not otherwise undergo further treatment. In my experience, including that of the Fonterra Darfield site where a similar wastewater treatment and irrigation regime is used, a separation distance of 250 m is appropriate and would be a more appropriate value to use in relation to GRUZ-S4.
- 43 With regard to the 'geographic extent area that will be impacted by the proposed setback', I have produced Figure 1, which shows the Clandeboye site (in blue), its irrigation areas (in red – approximate extent of 970 ha) and illustrates the geographic extent of a 250 m setback from the irrigation area (red-dashed line – extent of approximately 560 ha). I have also noted the location of neighbouring houses within this setback of 250 m, which I have identified from reviewing aerial imagery. This in my opinion, highlights the issue of why its important to avoid further encroachment of the irrigation areas.

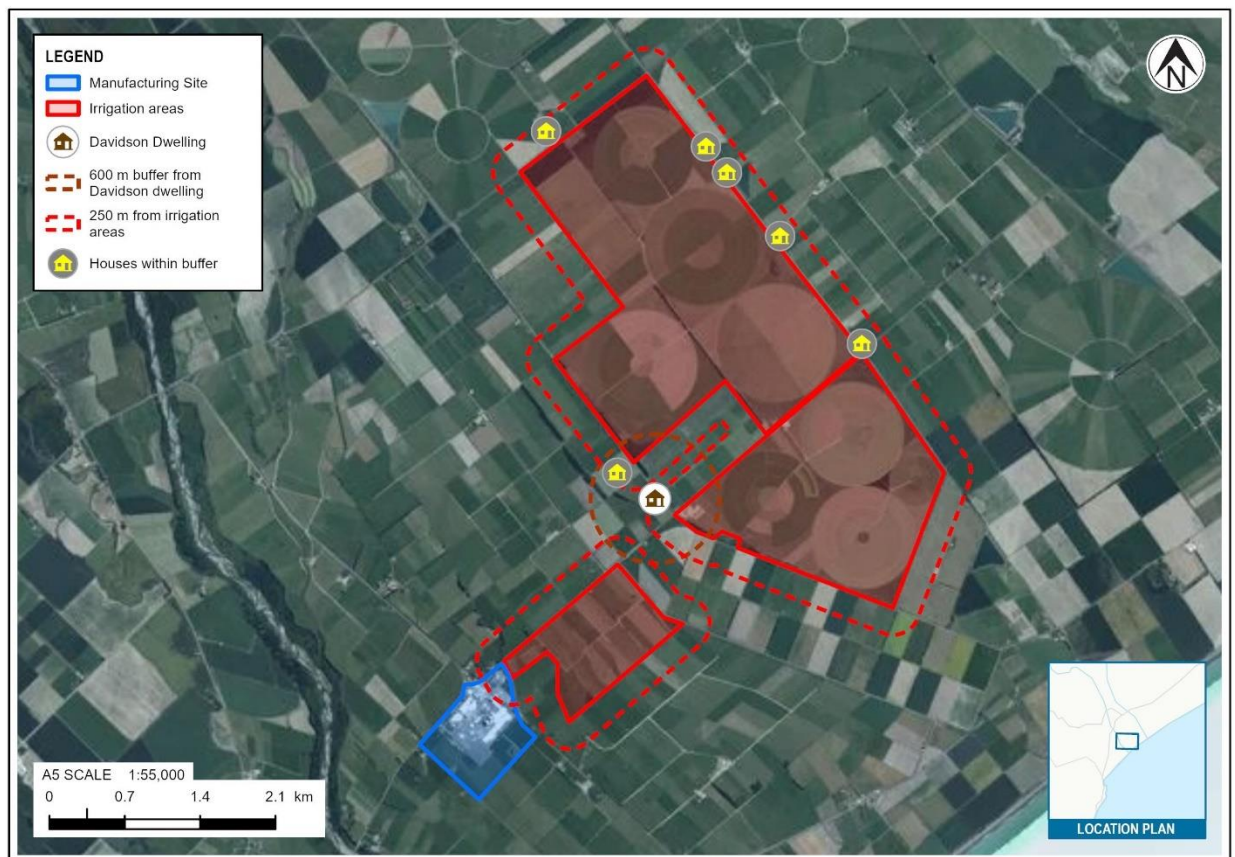


Figure 1: Fonterra Clandeboye site and irrigation areas.

SUMMARY AND CONCLUSION

- 44 In conclusion, I have highlighted the importance of managing potential reverse sensitivity air quality effects, particularly odour and dust, which can be key drivers for complaints from sensitive activities in relation to air discharges from industrial activities like Fonterra's Clandeboye site.
- 45 Fonterra's proposal for a special purpose zone, the CDMZ, as well as other submission points relating to reverse sensitivity effects, reflects an understanding of this complex issues and the importance it represents in terms of being able to continue to operate at its Clandeboye site. The establishment of zone provisions that recognise and address reverse sensitivity also addresses the objective and policy direction of the CARP, which will be relevant considerations when it is time for Fonterra to seek replacement of its existing air discharge permits.
- 46 In my opinion, avoiding reverse sensitivity effects begins with planning: clear demarcation of responsibilities between regional and district councils to avoid duplication, and avoiding locating new sensitive activities near to established industries, including those that have well controlled air discharges.
- 47 With regard to setbacks from the irrigation land associated with the Clandeboye site and in response to clarification sought by Mr MacLennan, I have:
- 47.1 Clarified the need for such a setback;
- 47.2 Recommended a separation distance of 250 m; and
- 47.3 Clarified the geographic area that such a setback would affect.



Richard Leslie Chilton

5 July 2024

APPENDIX A: QUALIFICATIONS AND AFFILIATIONS

I hold a Bachelor of Science (Geography) gained from University of Canterbury in 1997 and a Master of Environmental Science with honours gained from the University of Canterbury in 2000. My Masters' thesis specialised in air pollution meteorology.

I am a member of the Clean Air Society of Australia and New Zealand (CASANZ) and are a Certified Air Quality Professional (CAQP). I am also a certified RMA decision maker.

EXPERIENCE

I have over 25 years of experience assessing environmental impacts of air discharges in New Zealand, Fiji, Australia and the United Kingdom. He has been extensively involved in assessing the discharges to air from industrial and transport related projects, undertaken science related projects for regional councils, as well as regional air quality policy reviews for industrial and council clients.

My experience includes the petrochemical, dairy manufacturing, mining and quarrying, waste management, fertiliser, urban development, land transport, rail, power and agricultural sectors.

Notable recent project examples that I have undertaken air quality assessments for are as follows:

Fonterra Limited – various projects (2006-2024): Prepared air discharge assessments and resource consent application for various Fonterra sites, including the Te Awamutu, Darfield, Pahiatua (dryer 3 expansion), Clandeboye, Studholme (biomass conversion and site expansion), Stirling, Kaikoura, Edendale (dryer 4 expansion), Hautapu, Waitoa, Takaka, Te Awamutu, Kauri, Longburn, Whareroa, and Brightwater sites. The work also involved preparing detailed air quality assessment reports, partaking in community consultation, and presenting expert evidence at permit application hearings. For Fonterra Limited.

LPC Coal Stock Yard (2020 – 2023): Preparation of an air quality assessment for the coal stock yard at the Port of Lyttleton. This included developing a detailed ambient monitoring programme to consider the community impacts of PM10 and PM2.5 and the likely contribution from the coal stock yard (through source apportionment monitoring). Dispersion modelling was used to evaluate the location for ambient monitoring sites. The project included the evaluation of dust control measures, liaison with ecologists, responding to requests for further information and community consultation. Expert evidence was presented at a resource consent hearing, which included expert caucusing. The consent application was subsequently granted.

Ravensdown Napier Works (2020 – 2022): Preparation of an air quality assessment for the reconsenting of air discharges for Ravensdown's largest superphosphate manufacturing plant near Napier. The work included

evaluating the height of a new combined stack, a detailed review of stack and ambient monitoring data, meteorological modelling and dispersion modelling of emissions. It also assessed odour and dust effects of the site's operation. The project included the preparation and presentation of expert evidence.

Technical review of Smooth Hill Landfill (2019-2022): Overall project manager and air quality technical expert for the review of resource consent applications by Dunedin City Council for a proposed municipal waste landfill at Smooth Hill. This included overseeing technical reviews with regard to acoustics, geotechnical, ground and surface water, and ecological effects, and included preparing the technical review for air quality and subsequent preparation of expert evidence. For Otago Regional Council.

City Rail Link (2014-2022): Prepared an assessment of construction and operational effects for all stages of the Auckland City Rail Link (CRL) project. This included demolition and construction effects, and operational effects of the railway system. Dispersion modelling was undertaken to consider the impacts of tunnel portal vent emissions. Technical reviewer and advisor regarding ongoing construction monitoring and investigations. For Aurecon / Auckland Transport.

New Zealand Refining Company (2019-2021): The preparation of an air quality assessment for the consenting of the Marsden Point Oil Refinery. This included detailed meteorological and dispersion modelling to predicted contaminant concentrations from combustion plant, including various deposition effects in terms of drinking water supplies and terrestrial ecology. The work has also involved detailed analysis of ambient monitoring data and site emission data, particularly with regard to sulphur dioxide. For the New Zealand Refining Company.