FINDINGS of Coroner McTaggart following the holding of an inquest under the *Coroners Act* 1995 into the death of:

Robert John Ryan

Contents

Record of Investigation into Death (With Inquest)

Coroners Act 1995
Coroners Rules 2006
Rule 11

I, Olivia McTaggart, Coroner, having investigated the death of Robert John Ryan with an inquest held at Launceston in Tasmania make the following findings.

Hearing Dates

The inquest was held in Launceston on 25, 26, 27, 28 and 29 October 2021 and 17 December 2021 and in Hobart on 30 June 2022

Representation

Counsel Assisting the Coroner: C Lee

Counsel for Zurich Australia Insurance Limited: D Symes

Counsel for Mrs Deborah Ryan: D Grey

Introduction

1. Mr Robert Ryan, aged 35 years, was a senior stockman on the farming property Malahide at Fingal. He lived with his wife and family on the property. He enjoyed his work which involved, amongst other things, using farm chemicals. He did not apparently have any particular stress in his life and had no enemies. He was in good physical health and did not have any significant medical history. He suffered bipolar disorder which was controlled by medication, which he took regularly and responsibly. He had never expressed thoughts of suicide to his family, friends or doctor.

2. On the morning of 7 January 2015, Mr Ryan experienced a sudden, severe and disabling medical episode whilst driving his utility in the course of a work day on the farm. He was located by colleagues on the grass next to his vehicle just outside the front gate of Malahide. He had vomited and was unable to speak coherently to tell them what happened. They took him immediately to the St Mary's Community Health Centre, where he was still confused and unable to provide reliable information. On the basis of his symptoms, he was treated for chemical poisoning and then conveyed

by ambulance to the Launceston General Hospital. Despite all efforts, his condition deteriorated and he died as a result of multiorgan failure.

3. Mr Ryan's death was reported to the coroner and there followed an investigation over many years. The investigation was unusually prolonged due to initial inadequacies, ongoing issues obtaining further evidence regarding the likely cause of death, difficulties sourcing expert opinion, attempts made to reconcile differing medical opinions and the need to conduct further toxicological testing.

4. I am satisfied that the evidence obtained in the investigation following inquest was as complete as it could realistically have been in the circumstances. However, a significantly more comprehensive forensic examination of the scene and testing of samples was required in order to understand this very unusual case.

5. Nevertheless, the highly qualified experts and treating doctors providing evidence were all of great assistance. They largely favoured the view that Mr Ryan's sudden collapse and illness was due to ingestion of poison. However, they faced considerable difficulties in determining the nature of the poison when aspects of Mr Ryan's clinical course and the evidence generally pointed in other directions. Further, there was debate between the experts concerning the role played by Mr Ryan's prescribed medications in his illness and the role played by the medications administered in treating him before his death.

6. The inquest focused, in considerable depth, upon the circumstances leading to Mr Ryan's death and the cause of his death.

7. After considering all of the evidence, I cannot determine to the standard required the cause of Mr Ryan's death or the crucial circumstances surrounding it. Below, I set out the reasoning for this conclusion. This finding largely follows the format of the comprehensive submissions of Mr Lee, counsel assisting. I am very grateful to him for setting out the evidence fairly and accurately.

Evidence tendered at inquest

8. The following witnesses gave evidence during the inquest in the following order:

    a. Dr Sue (Susan) Gelston, Mr Ryan's general practitioner;

    b. Mr Lee Bennett, stepson of Mr Ryan;

c. Mr Patrick Dargan, Merchandise and Sales representative at Landmark chemical supply business;

d. Mrs Deborah Ryan, wife of Mr Ryan;

e. Mr Allister Woods, Assistant Manager of Malahide;

f. Mr Robert Barnes, employee of Malahide;

g. Dr Cyril Latt, general practitioner at St Mary's Health Centre;

h. Dr Scott Parkes, medical practitioner and Director of Intensive Care at Launceston General Hospital at the time of Mr Ryan's death;

i. Senior Constable Peter McCarron of Tasmania Police Forensic Services;

j. Ms Katrina Nielsen, Inspector with Consumer, Building and Occupational Services, WorkSafe;

k. Mr Steven Collins, Senior Inspector at WorkSafe;

l. Mr Neil McLachlan-Troup, forensic scientist at Forensic Science Service Tasmania;

m. Dr Michael Manthey, forensic scientist at Forensic Science Service Tasmania;

n. Ms Lorinda Swann, chemical laboratory technician with Queensland Scientific Services;

o. Mr Craig Gardener, forensic scientist at Forensic Science Service Tasmania;

p. Dr Donald Ritchey, State Forensic Pathologist;

q. Dr Anthony Bell, Medical Advisor to the Coroner;

r. Dr Jack Dale, Registrar in Occupational Medicine;

s. Mr Edward Beacham, Property Manager on Malahide;

t. Associate Professor Naren Gunja, clinical and forensic toxicologist at Westmead Hospital.

9. A copy of the exhibit list is annexed hereto and marked **"A".**

Glossary

10. Some of the main terms used in this finding, with a brief explanation, are as follows:

Organophosphates: A class of chemicals widely used as insecticides on a variety of crops. They work by inhibiting the activity of the enzyme acetylcholinesterase in the nervous system of insects, leading to paralysis and death. However, they can also be harmful to humans and other animals if ingested or inhaled in large amounts. Symptoms of organophosphate poisoning include nausea, vomiting, diarrhoea, dizziness, headache, tremors, and seizures.

Carbamates; Carbamates are a class of insecticides structurally and mechanistically similar to organophosphate insecticides.

Atropine: An anticholinergic medication used to treat certain types of nerve agent and pesticide poisonings as well as some types of slow heart rate. In particular, atropine is used as an antidote to poisoning by organophosphates and carbamates.

Glyphosate: Glyphosate is a common herbicide used to control weeds and grasses. It is the active ingredient in the weed killer, Roundup. It is said to be safe for humans if used in accordance with its label. However, it can be lethal if orally ingested in large quantities.

MCPA: (2-methyl-4-chlorophenoxyacetic acid): MCPA is a widely used phenoxy herbicide. It acts by mimicking the action of the plant growth hormone *auxin*, which results in uncontrolled growth and eventually death in certain plants. MCPA is the active ingredient in the product Agritone 750. MCPA may be lethal if ingested orally in large quantities.

Doramectin: The active ingredient in the product Dectomax, a sheep and cattle drench to control worms and parasites. It is toxic, and likely lethal, to humans if ingested in large quantities.

The Law

11. The *Coroners Act* 1995 ("the *Act*") sets out the legislative framework for the Coroner's Court. A Coroner may hold an inquest when a death occurs, within jurisdiction, whenever a Coroner considers it desirable to do so.[1]

12. Section 24 of the *Act* sets out the jurisdiction of the Coroner to hold an inquest into a death. As Mr Ryan was believed to have died as a result of an accident or injury in his place of work, an inquest must be held by virtue of section 24(1)(ea) of the *Act*.

13. Section 28 of the *Act* sets out the findings and recommendations a coroner must make, providing of course, it is possible to do so on the evidence. This process requires the making of findings without apportioning blame or guilt for the death.[2]

14. In the context of this case, the question of whether anyone else was responsible for his death was an issue under consideration. Section 28(4) of the *Act* stipulates that a Coroner must not include in a finding or comment any statement that a person is or may be guilty of an offence.

15. One of the matters required under the *Act* for findings to be made about is how the death occurred. This involves the application of ordinary principles of causation.[3]

16. Section 51 of the *Act* provides that *"a coroner holding an inquest is not bound by the rules of evidence and may be informed and conduct an inquest in any manner the coroner reasonably thinks fit"*. Whilst this section affords "considerable latitude" in determining the conduct of the proceedings,[4] that is not to say that an inquest can be held in an unfettered manner. There must be evidence relevant to the issue in dispute and it must be logically capable of bearing upon that issue.[5]

17. The standard of proof applying to inquests is the ordinary civil standard of proof, namely that findings of fact may only be made if the coroner is satisfied of a particular matter upon the balance of probabilities.

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[1] Section 24(2) of the *Act*.
[2] *R v Tennent; ex parte Jaeger* [2000] TASSC 64 per Cox CJ at par 7.
[3] *March v Stramare (E and MH) Pty Ltd* (1991) 171 CLR 506.
[4] See for example *White v FAI General Insurance Co Ltd* A29/1991 per Zeeman J at p4.
[5] *Alison Jane Connolly v P and O Resorts Pty Ltd T/A Cradle Mountain Lodge* [1996] TASSC 132 (7 November 1996) at par 20 per Wright J.

Mr Ryan's early years

18. Robert Ryan was born in New Zealand on 5 September 1979. At the time of his death he was 35 years old. His parents were Brent and Maryleigh Ryan. He has two sisters, Kristen and Jacelyn, both of whom live in New Zealand.[6]

19. Mr Ryan worked in a number of jobs in his early years including: land surveying, working on a family farm, as a chef, as a tree planter and sprayer, in a delicatessen, on various other farms as well as fishing boats.[7]

20. In about 1998 Mr Ryan, aged 19 years, is said to have developed acute mania and depression and was diagnosed with bipolar disorder.[8]

21. When he moved to Tasmania in 2010, he was already taking the drug paroxetine, 2x20mg per day.[9]

22. In Tasmania, Mr Ryan held a number of jobs including working on farms at Woolnorth and at Clovely in Bridport.[10]

23. In about 2012 Mr Ryan met his wife, Deborah Ryan. Mrs Ryan already had four children: Kacey, Shaun, Lee and Grace.[11] They became engaged on 1 February 2013.[12]

Commencing work at Malahide

24. Mr Ryan commenced working at Malahide on 29 July 2013. He commenced full-time contractual work on the property in November 2013. It was also at this time that Mr Ryan and his wife and her children moved into a home on the Malahide property just prior to the birth of their daughter Imogen on 3 December 2013.[13]

25. Malahide, owned by Fingal Pastoral Pty Ltd, is a long established and very large farming estate. It is located at 80 Mathinna Road, Fingal. At the time relevant to this inquest, sheep and cattle were run on the property, and crops and poppies were grown. As

[6] Exhibit C11 p1 [par2]
[7] Exhibit C11 pp1-2
[8] Exhibit C9B p1
[9] Exhibit C9B P1
[10] Exhibit C11 p2 [par 7]
[11] Exhibit C11 p2 [pars 8-9]
[12] Exhibit C11 p2 [par 10]
[13] Exhibit C11 p2 [par 11]

part of the farming practices undertaken on the property, chemicals were used to control weeds and insects and to drench stock.

26. Mrs Ryan remarks in her affidavit that her husband was working at Malahide *"without any issues"* and life was *"fantastic"*. Mrs Ryan said her husband never mentioned any serious medical conditions to her, although she acknowledged that he was being treated for mild depression.[14]

27. Mr Ryan's general practitioner from 2014 onwards was Dr Sue Gelston. Dr Gelston has practiced medicine since 1969, a period of 52 years at the time of the inquest.[15]

28. On 4 July 2014 Mr Ryan visited Dr Gelston, needing a repeat script for paroxetine. He was noted to be taking paroxetine 2x20 mg per day and there was no notes regarding his mood.[16] In her oral evidence, Dr Gelston said that Mr Ryan's mood seemed perfectly normal.[17]

29. On 16 July 2014 Mr Ryan visited Dr Gelston again, this time requesting genetic testing for haemochromatosis, as his mother in New Zealand had recently been diagnosed with this condition in New Zealand).[18] He was again noted to be taking paroxetine 2x20 mg per day and there was no mention in the notes about his mood.[19] Again, Dr Gelston gave evidence at inquest that Mr Ryan's mood seemed perfectly normal at that consultation.[20]

30. Following these two visits to Dr Gelston, Mr Ryan's father visited him from New Zealand. He arrived on 26 November 2014 and departed on 3 December 2014.[21]

31. On 8 December 2014 Mr Ryan visited Dr Gelston for the third and final time. His wife was present during that appointment. Dr Gelston's note of the visit included the following: [22]

    - Mood flat, depressed.
    - Taking paroxetine, 2x20 mg per day and still depressed.

[14] Exhibit C11 p3 [par 14]
[15] Transcript p25 lines 15-16
[16] Exhibit C9B p2
[17] Transcript p30 lines 16-18
[18] Transcript p30 line 35
[19] Exhibit C9B p2
[20] Transcript p30 lines 35-36
[21] Exhibit C11 p3 [pars 15-16]
[22] Exhibit C9B, pp 1-2

- No cause for depression, bit worse in winter.

32. At this appointment, Mr Ryan requested a further mood stabiliser and Dr Gelston prescribed him a small dose of lamotrigine with instructions to increase the dose but not to exceed 100 milligrams.

33. In Dr Gelston's oral evidence she placed her notes into context:

> *MR LEE: "And then you've said mood flat, depressed, since 1999, never gets manic, gets depressed. ….. Yes that's what he told me. He said that he got flat and depressed. He didn't seem to be depressed at all, but he said he um he's never had mania, I've asked him that, never had mania since his initial presentation. But he said his mood was flat, um he didn't seem depressed but his main concern was that um he might be depressed when he was away, he was more worried that he could be depressed and that he didn't want to spoil everybody's holiday".*[23]

34. Dr Gelston went on to say that *"it seemed more a fear of being depressed"*, that *"he never appeared depressed to me at any stage"* [24] and that *"to me he seemed quite a happy person".*[25]

35. In Dr Gelston's affidavit sworn on 10 November 2021 she mentioned Mr Ryan feeling *"very flat"* and may have had a gastro bug in the family based on what he told her. Dr Gelston supplied a medical certificate for the period retrospectively for 1- 8 December 2014.[26]

36. Mr Allister Woods, Assistant Manager at Malahide, said in his affidavit that he considered Mr Ryan to be in good health and only discovered he had suffered depression at his funeral.[27] He did state, however, when re-called to give oral evidence that Mr Ryan had used all his sick leave in 2014 and was *"in the red".*[28] He also considered Mr Ryan to have been off work for 3 days in either the week prior to his death or the week before it. In oral evidence, he said that Mr Ryan's days off sick were *"… just in that sort of period".*[29] It is likely that he was confusing that period with the

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[23] Transcript p31 lines 24-32
[24] Transcript p32 lines 2-4
[25] Transcript p32 line 34
[26] Exhibit C35
[27] Exhibit C13A [par1]
[28] Transcript p638 line 41 to p639 line 4
[29] Transcript p189 lines 13-16

first week of December 2014 when Mr Ryan visited Dr Gelston for a medical certificate.

37. Apart from a possible gastrointestinal virus, it seems to me that Mr Ryan was struggling with a depressed mood and that may have been reason for his time off work in early December 2014.

38. Dr Gelston considered that Mr Ryan was a patient who was compliant with his medication and was *"always keen to keep his mood stable"*.[30]

39. In relation to the added prescription of lamotrigine, both Dr Gelston and the other medical experts gave evidence at inquest that this drug is not associated with serotonin syndrome, a toxic condition that will be discussed further.[31] I note that Mr Ryan's paroxetine was not increased.[32] In fact, Dr Gelston said that Mr Ryan was already taking 2x20 mg when she first treated him, that the dose had not changed throughout that time and that it was below the maximum recommended prescribing dose of 3x20 mg.[33]

40. I note that Mrs Ryan could not recall Mr Ryan ever having vomited before his severe episode on 7 January 2015.[34] She did not recall anyone else in her house being sick in the week before that episode.[35]

The weeks leading up to Mr Ryan's death

41. On 18 December 2014 Mr Ryan visited Western Australia with his family and returned on 1 January 2015. According to Mrs Ryan, *"nothing occurred out of the ordinary"* during that trip. [36]

42. The family were planning a trip to New Zealand in April 2015.[37] Mrs Ryan gave evidence that Mr Ryan was very much looking forward to it.[38]

43. On 2 January 2015, upon returning to work, Mr Ryan injected cattle at Malahide.[39]

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[30] Exhibit 9B p3 [par8]
[31] Exhibit C26 p1 [par2]
[32] Exhibit C26 p1 [par2]
[33] Exhibit 9B p3
[34] Transcript p127 lines 16-17
[35] Transcript p128 lines 6-7
[36] Exhibit C11 p3 [pars 16-17]
[37] Exhibit C11 p3 [par 16]
[38] Transcript p70 lines 5-10
[39] Exhibit C11 p3 [par 18]

44. On 3 January 2015 the family went to Bridport for the day which included snorkelling for abalone.[40] Mrs Ryan said the abalone, which was frozen at the time, was not eaten until after Mr Ryan's death.[41]

45. On 4 January 2015 he brought some cattle in for artificial insemination the following day.[42]

46. On 5 January 2015 the Talbots, being the owners of Malahide, returned to the United Kingdom and Mr Ryan took their luggage to the airport. Mrs Ryan said that her husband went about his normal duties but she did not know what they were.[43] Mrs Ryan did mention she sprayed the area around the house with a Bunnings-type weed killer containing glyphosate.[44]

47. On 6 January 2015 it was, according to Mrs Ryan, *"a normal day with nothing out of the usual and Rob didn't tell me that anything out of the usual had occurred*".[45] They all ate roast pork for dinner and no one became sick.[46]

48. Mr Lee Bennett, who was 16 years of age at that time considered that Mr Ryan, his stepfather, was *"his normal self"* in the weeks leading up to his death.[47] He said that Mr Ryan was *"happy"* and his marriage was *"good"*.[48]

49. It was universally stated by witnesses that they had not noticed Mr Ryan in a depressed state or even not his usual self in the weeks leading up to his death.

The trip to and from Landmark

50. Landmark Operations Limited ("Landmark") was a distributor of farming supplies and fertilisers, and was situated at Western Junction, near Launceston. The company has since merged with Nutrien Ag Solutions and is no longer present at that address.

[40] Exhibit C11 p3 [par 18]
[41] Transcript p117 line 30
[42] Exhibit C11 p3 [par 19]
[43] Exhibit C11 p3 [par 20]
[44] Exhibit C11A p2 [par 11]
[45] Exhibit C11 p4 [par 21]
[46] Transcript p118 lines 12-15
[47] Exhibit C14A
[48] Exhibit C14B p1 [par4]

51. At around 6.30am on the morning of 7 January 2015 Mr Ryan and Mr Bennett drove from Malahide to Landmark in Mr Ryan's work utility to collect the following chemicals:

    - 80 litres of Roundup Ultra Max (active chemical being glyphosate).
    - 40 litres of Agritone 750 (active chemical being MCPA)
    - 20 litres of L1700 (wetting agent).[49]

52. The containers for the above products are shown in the investigation photographs tendered in evidence.[50]

53. Mr Bennett said in his affidavit that he and his stepfather were talking all the way on the trip to Landmark and both were in a good mood.[51]

54. Mr Patrick Dargan was working at Landmark when Mr Ryan and Mr Bennett arrived. Mr Dargan provided an affidavit and also gave evidence during the inquest. He described how he would have loaded the chemicals onto Mr Ryan's utility with a forklift and his general dealings with personnel from Malahide. Mr Dargan no longer worked for the company and his affidavit was not prepared until September 2021. It is understandable that his evidence of this apparently unremarkable event lacked detail.[52] Mr Bennett said that he and Mr Ryan loaded the chemicals into the utility themselves.[53] I prefer Mr Bennett's evidence given Mr Dargan's lack of recollection but ultimately little turns on this discrepancy.

55. I find upon the evidence that the three chemicals referred to above in those stated quantities were collected at Landmark by Mr Ryan and Mr Bennett and transported back to Malahide.

56. Mr Allister Woods, the Assistant Farm Manager, said that Mr Ryan and Mr Bennett returned to Malahide at around 8.30am.[54]

    Mr Bennett said that upon returning to Malahide *"we took ute and unopened chemicals to the place where chemicals get mixed together to unload"*.[55] It was common ground

[49] Exhibit C12 pars 4-5
[50] Exhibit C 16: Roundup Ultra Max - with "636620_44. JPG"; LI 700 Surfactant- "636620_45.JPG"; Agritone 750 -"636620_49.JPG".
[51] Exhibit C14
[52] Exhibit C29
[53] Exhibit C14B
[54] Exhibit C13A p1 [par 4]
[55] Exhibit C14

amongst the witnesses that this is the location known as the "chemical mixing table" or "mixing platform", a small table-like structure with an attached tap. [56] The chemical mixing table was situated within a short distance from a shed where chemicals were stored, this being a red metal shed constructed from a shipping container ("the chemical shed").[57] The chemicals stored in this shed were for weeds, plants and crops. Adjoined to the chemical shed was a wooden platform.

57. Mr Bennett said that Mr Ryan had to move things around to make room for the chemicals they had just collected. He then said *"we"* unloaded the chemicals. He said he was not aware of any leaks or spills and they did not mix any chemicals.[58]

58. In his subsequent affidavit[59], he said *"we had to make room to put some drums in. It took us 10 to 15 minutes"*. He said some of the old chemicals had been opened and even used. Consistently, in his further affidavit he said *"I helped my stepfather move the items and would have probably touched a lot of what he did"*.[60]

59. The accounts provided by Mr Bennett in his statement and affidavits indicate that both he and Mr Ryan moved the chemicals. Therefore it is less likely that one person would become sick but not the other if it the cause of illness was somehow linked back to the movement of those drums.

60. However, the precise location referred to by Mr Bennett as the place of unloading the chemicals is not entirely clear. In his sworn affidavit, as opposed to his original statement, Mr Bennett's evidence was noticeably different. He referred in his affidavit to taking the chemicals to *two* different locations. The first was the storage area and the second was another location about 100 metres away. Regardless, he did not notice any spillage or leakage and did not believe they were wearing gloves.[61] In this regard, it appears that he was referring to taking the chemicals to the chemical shed. In his testimony at inquest, Mr Bennett provided further details, stating they actually went *inside* the shed:

[56] Exhibit C19, Photograph 8.
[57] Exhibit 19, photos 9 and 10. Exhibit C16 "636620_40" is a clearer image of the shed.
[58] Exhibit C14
[59] Exhibit C14A
[60] Exhibit C14B p2 [par 8]
[61] Exhibit C14B p2 [par8]

"– you've said here um "took the chemicals to two locations on the farm, the first was the storage area. We unloaded some. Don't recall if it was locked but we had to move some other items around to fit them in".

Um so do I take it from that paragraph there that you um that you put the chemicals inside somewhere first of all, or left them out in the open?.....So, no we put the first went into the shed and then the other ones we left out in um [indistinct word(s)]".[62]

61. The accounts of other credible witnesses as to the location where the chemicals were unloaded favoured that the chemicals were placed on the wooden platform adjoining the chemical shed or simply outside the shed. In summary:

- Mr Edward Beacham, Property Manager, said they were unloaded onto *"a table near the chemical shed*".[63]
- Mr Woods said they were dropped off at the chemical shed and, more precisely *"out the front of the shed and not opened"*.[64]
- Mr Barnes said they were left outside the chemical shed. Mr Barnes considered this was because Mr Ryan did not have a key to the shed.[65]

62. In the context of Mr Bennett indicating that he and Mr Ryan deposited at least some of the chemicals *inside* the chemical shed, it is necessary to consider who had keys to that shed.

63. Mr Barnes said that only he, Mr Beacham and Mr Woods had keys to the chemical shed.[66] Similarly, Mr Beacham believed it was just he, Mr Barnes and Mr Woods who had keys. He was a little unsure about Mr Ryan but believed he probably did not as he left the chemicals in front of the shed.[67] Mr Woods was not sure whether Mr Ryan had a key.[68]

64. The stronger body of evidence is that Mr Beacham, Mr Barnes and Mr Woods were the only known people to have keys to the chemical shed, and that the chemicals were not placed inside the shed but rather left in front of the shed. I find that Mr Bennett was mistaken in his recollection that he and his stepfather went inside the

[62] Transcript p76 lines 24-32
[63] Exhibit C12 p1 [par4]
[64] Exhibit C13A p2 [par 5] and p3 [par 13]
[65] Exhibit C21 p1 [par4]
[66] Exhibit C21 p1 [par4]
[67] Transcript p533 lines 25-39
[68] Transcript p156 lines 23-25

chemical shed to deposit some or all of containers that they had collected from Landmark that morning.

65. Significantly, the credible evidence of Mr Barnes was that after returning from taking Mr Ryan to the St Mary Community Health Centre (SMCHC) after his severe medical episode later that morning, he placed the chemicals Mr Ryan had delivered from Launceston into the chemical shed.[69] They were on the platform out the front of the shed; only there and nowhere else.[70]

66. I find upon all of the evidence that Mr Ryan and Mr Bennett had placed them on the wooden platform at the front of the shed and did not enter the locked chemical shed at all.

67. In relation to the issue of leaks and spillage, all of the evidence in the investigation satisfies me that that there were no issues with the seals on those containers or that any leakage was detected throughout that day or on subsequent days. Mr Barnes specifically said that he checked the chemicals and there were no leaks and they were in *"sound condition"*.[71]

68. There is no evidence that either Mr Ryan or Mr Bennett was wearing gloves when handling the chemical containers collected from Landmark or any other chemical containers that may have been rearranged on the platform outside the chemical shed. If both had moved the same chemical containers, it is highly unlikely that Mr Ryan could have become unwell through that process and not Mr Bennett. Moreover, there is also no evidence of anyone else having become unwell on the property, including whoever had been using or even touching those particular containers previously.

69. After unloading the chemicals, Mr Bennett said that Mr Ryan took him back to the house.[72] They were in a good mood.[73] He described Mr Ryan as being his *"happy well self"*.[74] Mr Bennett said in his affidavit:

> *"When we finished, we drove back to our house, when my stepfather went inside, was there for about 10-15 minutes, spoke to my mother and all was good. He made no complaints about anything being wrong or feeling unwell. He made a cup of coffee*

[69] Exhibit C21 p1 [par 4]
[70] Transcript p241 lines 36-40
[71] Exhibit C21 p1 [par4]
[72] Exhibit C14
[73] Exhibit C14
[74] Exhibit C14

> *and I think he took it with him. He drove away, heading off to see what else needed to be done on the farm".*[75]

70. In his evidence at inquest, Mr Bennett gave evidence that everything between his mother and stepfather was "*real good*".[76] He could not recall them having a fight or argument in the week before he died.[77] He could not recall anyone in his family being sick that week.[78]

71. Mr Ryan's wife, Deborah Ryan, said in her affidavit:

> *"When Rob got home he saw me and Imogen and went to the bathroom. He made himself a cup of coffee in his travel mug which he always had with him. He would have only been home for around 10 minutes. After he made his coffee he said "I better go see what's happening for the rest of the day baby" and that he would see me at lunch time and that he loved me".*[79]

72. In her subsequent affidavit, Mrs Ryan described her husband as laughing and appearing to be his normal self with Lee.[80]

73. Mr Woods described Mr Ryan and his wife as *"close"* and said *"I saw nothing to indicate anything untoward in the marriage".*[81] He also said that *"no one has mentioned any issues with Rob and Deb".*[82]

74. The evidence, on its face, and indicates that all was well that morning. I am conscious that there is often an understandable reluctance of witnesses to give evidence regarding conflict in relationships. However, there is nothing notable in Mr Ryan's demeanour or interactions with his family members and others that was out of the ordinary. Having seen and heard him in the witness box, there is no reason to consider that Mr Bennett was deliberately concealing any matter relevant to this inquest. I will deal later with the credibility of the evidence of Mrs Ryan.

75. At approximately 9.10am Mr Ryan left his house in his utility.[83]

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[75] Exhibit C14B p2 [par9]
[76] Transcript p69 lines 8-10
[77] Transcript p69 lines 20-26
[78] Transcript p69 lines28-29
[79] Exhibit C11 p4 [pars 25-26]
[80] Exhibit C11A p1 [par6]
[81] Exhibit C13A p1 [par3]
[82] Exhibit C37 p2 [par3(2)]
[83] Exhibit C11 p4 [par 22-23]

Mr Ryan's actions near the animal shed

76. The next sequence of events in the circumstances surrounding Mr Ryan's death relates to Mr Ryan being seen near the animal care shed ("the animal shed"). This would appear to have been at a time shortly after Mr Ryan left his house that morning. The animal shed contains chemicals for treating animals and is located a short distance from the chemical shed.

77. Mr Woods said he noticed Mr Ryan's utility parked at the fuel bowser. The fuel bowser, again, is located next to the workshop and animal shed. Mr Woods considered the position of the vehicle to be odd as it was parked facing the opposite direction to that required (with reference to the fuel tank) to refuel it. [84] He described seeing Mr Ryan near the animal shed, stating *"as he saw me he appeared to hesitate"* before turning and going into the shed.[85] In his subsequent affidavit Mr Woods said:

> *"When I saw Ryan at the animal shed, and he saw me, his body language looked like he was nervous. I thought he was stealing fuel, his reaction on seeing me was one of guilt. When I saw him at the shed, I was 100 metres away from him and never got closer".*[86]

78. Mr Woods stated that, a short time later, he observed Mr Ryan drive past the manager's residence, towards the main gate. Upon the evidence, this call was likely to have been at about 9.30am. Mr Woods phoned him to give him his work allocation for the next three days because he (Mr Woods) was going away. Mr Woods said Mr Ryan *"sounded quite normal and there didn't seem to be anything wrong".*[87] He described it as being a five minute conversation.[88] He said Mr Ryan was able to communicate with him and he regarded it as a *"normal conversation".*[89]

79. In response to questions at inquest, Mr Woods said he was not aware of any other duties Mr Ryan had scheduled for the day. He said he was not sure where Mr Ryan was driving to when he telephoned him.[90]

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[84] A general photo of utility is at exhibit C16 "636620_31.JPG".
[85] Exhibit C13 p1 [par 2]
[86] Exhibit C13A p2 [par10]
[87] Exhibit C13 p1 [par3]
[88] Exhibit C13A p2 [par 6]
[89] Transcript p640 lines 14-16
[90] Transcript p202 lines 8-17

80. On 5 August 2021 I conducted, with counsel, a view of the areas of Malahide relevant to the investigation into Mr Ryan's death. It was apparent that Mr Woods had a relatively clear and unobstructed view of Mr Ryan from his property, although from a distance of approximately 100-150 metres away. I certainly accept that he saw Mr Ryan near the bowser and animal shed, as he described. I have no doubt that it seemed to him that Mr Ryan's movements were unusual. They may have been somewhat anomalous but I must be cautious of placing undue reliance upon Mr Wood's assessment which was made in hindsight and after Mr Ryan's sudden death.

The medical episode at the front gate

81. Upon the evidence, I find that Mr Ryan arrived at the front gate of Malahide while speaking to Mr Woods or having just finished speaking with him, perhaps at about 9.35am. The front gate is located approximately one kilometre from both Mr Woods' house and the cluster of farm buildings that include the fuel bowsers, chemical shed, workshop and animal shed.

82. At approximately 9.40am Mr Barnes found Mr Ryan and his utility stopped outside the front gate of Malahide the property. His car was pointing as if he had been intending to turn right to go towards Mathinna.[91] Mr Barnes described seeing Mr Ryan bent over on his knees. He didn't reply when spoken to and Mr Barnes noticed that he had been *"spewing"*.[92]

83. Mr Ryan told him to call "*Fred*", the nickname for Mr Woods. Mr Barnes did so and held onto Mr Ryan to keep him seated on the ground.[93] He described there being a trail of vomit and what *"looked like a clear liquid, with black streaks in it"*.[94]

84. After being contacted by Mr Woods, Mr Beacham proceeded to the front gate and said that he *"found Robert near the front gate beside the utility, bent over, sweating and having vomited"*.[95] He could not recall if Mr Ryan had any odour coming from his mouth.[96]

[91] Transcript p243 lines 35-37
[92] Exhibit C21 p2 [par5]
[93] Exhibit C21 p2 [par 5]
[94] Exhibit C21 p2 [par 8] and Transcript p244
[95] Exhibit C12 pp1-2 [par5]
[96] Transcript p537 lines 17-18

85. Mr Woods also arrived at the front gate a few minutes after the phone call with Mr Ryan to the front gate.[97] He described seeing Mr Ryan lying on the grass with sweat running out of him and Mr Ryan saying that he was dizzy. Mr Woods asked him if he had taken any poison but he said that he had not. He noticed vomit on the roadway and grass and it appeared to be a *"blue/black colour"*.[98] He said he did not get close enough to notice whether any odour was coming from Mr Ryan's mouth.[99] In his subsequent affidavit, he reiterated that the vomit was *"black bluey in colour"*.[100] He said the chemical Dectomax (a parasiticide) is pale blue in colour and was similar to Mr Ryan's vomit.[101] Mr Woods gave evidence that the only blue chemicals on the farm were Dectomax and Roundup.[102]

86. Mr Woods said that three days later the grass was dead in the spot where Mr Ryan had vomited.[103] Mr Beacham said he could never recall anyone spraying (with a herbicide) outside the front gate before Mr Ryan became unwell.[104]

87. Associate Professor Gunja's evidence was that people will usually vomit within half an hour of ingesting a herbicide or pesticide.[105]

88. Associate Professor Gunja also noted that vomit is generally never blue but it could be black if you had bleeding in the stomach. He said *"A true blue colour vomit is nearly always if somebody ingested something blue in colour"*.[106]

89. In further explaining that vomit is not normally blue in colour, Associate Professor Gunja said:

> *"So again, a blue/black tends not to be the description, and I'm talking about the way patients, families, bystanders, ambulance officers, nurses have described vomit to me in 20-30 years of practice, and I have seen lots of people vomit, um blue/black is not the way people would describe that. Um blue – if if someone had um vomit from*

[97] Exhibit C13 p1 [par 4]
[98] Exhibit C13 p1 [par4]
[99] Transcript p205 lines 10-11
[100] Exhibit C13A p2 [par7]
[101] Exhibit C13 p2 [par8]
[102] Exhibit C13A p3 [par14]
[103] Exhibit C13A p2 [par7]
[104] Transcript p535 lines 34-35
[105] Transcript p558 lines 19-21
[106] Transcript p558 line 32 to p559 line 4

bleeding that is ah turned a dark colour, people say um dark red, a browny -red, um or they might say black. It's usually not bluish".[107]

90. In relation to the colour of diesel and unleaded fuels, Associate Professor Gunja described them as varying between a clear colour to a straw colour or a brown colour.[108]

Travel to and treatment at St Marys Community Health Centre

91. Mr Beacham drove Mr Ryan straight to the St Marys Community Health Centre (SMCHC), a distance of approximately 21 kilometres (about an 18-minute drive).[109] Mr Barnes was in the tray of the utility with Mr Ryan. Mr Barnes said in his affidavit that he kept asking Mr Ryan if he was okay but Mr Ryan *"never really replied".*[110] In evidence at inquest, he described there being no verbal communication from Mr Ryan.[111]

92. Immediately after Mr Woods saw Mr Ryan unwell outside the front gate to the property, he said he went to Mr Ryan's residence to inform Mrs Ryan of what had occurred. He said that Mrs Ryan told him that her husband had been okay five minutes ago and he had given her a kiss before he left.[112] He also checked the chemicals which had been collected earlier by Mr Ryan. He said they were out the front of the chemical shed and not opened.[113]

93. The inquest heard evidence from Dr Cyril Latt who treated Mr Ryan at the SMCHC. Dr Latt said he had been a doctor for over 20 years and his area of practice is general practice, emergency medicine and palliative care.[114] His evidence generally was most impressive.

94. Mr Ryan was admitted to the SMCHC at 10.10am.[115] According to the initial assessment form in the records, his state of consciousness was noted to be *"responsive to noise".* [116] Organophosphate poisoning was questioned as a diagnosis because of his

[107] Transcript p559 lines 8-15
[108] Transcript p560 lines 9-26
[109] Exhibit C12 p2 [par5] & Google maps distance from 80 Mathinna Rd to SMCHC
[110] Exhibit C21 p2 [par 6]
[111] Transcript p255 lines 30-31
[112] Exhibit C13A p3 [par 11]
[113] Exhibit C13A p3 [par 13]
[114] Transcript p263 line 34 to p264 line 3
[115] Exhibit C10 p3
[116] Exhibit C10 p14

cluster of symptoms.[117] Organophosphorous compounds are used as herbicides and pesticides and can be toxic to humans.

95. Mr Ryan was noted on arrival to be confused, to have excessive sweating, salivation and muscular weakness.[118] One chart record referred to Mr Ryan as being orientated.[119]

96. A registered nurse contacted the Poisons Hotline and was advised that poisoning was unlikely, and to advise an alternate diagnosis.[120]

97. However, the clinical assessment of his symptoms, including double incontinence, indicated that poisoning was deemed to be highly likely.[121]

98. Specifically, in his evidence at inquest, Dr Latt said:

> *"So he was brought in by the – the, one of his mates and on arrival he was quite - he's confused, the - and significantly, the hypothermia, the temperature is around 32, 33 degrees centigrade, it's quite low - quite low and he had developed incontinence and sweating profusely. So I never seen someone like that condition. So that's why I vividly remember when he came in it's something not quite right".*[122]

99. Dr Latt considered Mr Ryan likely to have some form of organophosphate poisoning.[123] He said that one of the gentlemen accompanying Mr Ryan (being either Mr Beacham or Mr Barnes) provided information that organophosphates were not used on the farm.[124]

100. Dr Latt was also told that earlier in the day Mr Ryan was handling drums of pesticide but they were all sealed with no evidence of leakage. Either Mr Beacham or Mr Barnes told Dr Latt that Mr Ryan went home and had breakfast after handling the chemicals. Dr Latt was told, correctly, that Mr Ryan collapsed after he had gone home and was back on the farm. On that basis, Dr Latt appeared to form a view that "something happened" at the time Mr Ryan went home to have breakfast. [125]

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[117] Exhibit C10 p3
[118] Exhibit C10 p5
[119] Exhibit C10 p16
[120] Exhibit C10 p5
[121] Exhibit C10 p5
[122] Transcript p265 lines 35-41
[123] Transcript p267 lines 8-9
[124] Transcript p268 lines 9-12
[125] Transcript p269 lines 6-38

101. Dr Latt said further in his evidence that he had used the wrong term in making a diagnosis of organophosphate poisoning and he corrected this evidence by saying that he was of the view that Mr Ryan suffered *"some sort of the insecticide or pesticide poisoning, so I can't really tell which one".*[126]

102. It is understandable that Dr Latt, despite referring to organophosphates, did not in fact intend at this early stage of Mr Ryan's presentation to differentiate between types of herbicides or pesticides in his diagnosis. He was in receipt of limited information and was required to treat Mr Ryan urgently. Later, during his treatment of Mr Ryan, he came into receipt of Mr Ryan's general practitioner records to assist him.

103. The first dose of atropine (1.2 mg) to counteract the effects of the apparent pesticide or herbicide poisoning was administered at 10.15am. A partial positive response was noted.[127] Dr Latt said in evidence that there was a clear improvement in Mr Ryan's symptoms.[128]

104. At about this time the Emergency Department of the Launceston General Hospital (LGH) was contacted for advice and, it seems, with a view to transporting Mr Ryan to that hospital. The Emergency Department consultant expressed no concern about the administration of atropine to Mr Ryan and advised him to continue the decontamination processes.[129]

105. A note at 10.20am indicates that an Ian Bradbury was contacted in relation to an ambulance to transport Mr Ryan to the LGH.[130]

106. A second dose of atropine, again 1.2 mg, was administered at 10.22am.[131] Mr Ryan was noted to have hypothermia and blankets and thermals were applied. The decontamination process continued with him being given a whole body wash.[132]

107. At 10.25am Mrs Ryan arrived at SMCHC.[133] In her affidavit, she stated that she asked Mr Ryan whether he drank the chemicals and he said *"don't be so fucking stupid*

[126] Transcript p269 lines 30-32
[127] Exhibit C10 p5
[128] Transcript p271 lines 33-34
[129] Exhibit C10 p5
[130] Exhibit C10 p17
[131] Exhibit C10 p6
[132] Exhibit C10 p6
[133] Exhibit C10 p16

baby".[134] For the reasons later discussed, I doubt that Mr Ryan was able to make such a statement.

108. The Poisons Hotline was again contacted. Dr Latt spoke to a Dr Andrew Dawson who agreed with Dr Latt's initial assessment that a poisoning had occurred.[135] Dr Latt said in evidence that Dr Dawson was of the view that Mr Ryan had suffered some form of farm chemical poisoning.[136]

109. At 10.30am a first line of intravenous saline was started.[137] A second line was started at 11.00am.[138]

110. At 11.10am Mr Ryan was noted to be frothing at the mouth. He was having momentary seizures and was cold.[139]

111. A third and final dose of atropine was administered to Mr Ryan at 11.28am.[140] There were no ECG changes and hypothermia was again noted. There was also a fluid starter.[141] Dr Latt did not consider there had been much change following this dose.[142]

112. It appears that at about 11.35am that potassium infusion treatment was started for suspected organophosphate poisoning.[143] Low potassium levels (hypokalaemia) are characteristic of poisoning by organophosphate.

113. At 11.45am Mr Ryan had a sudden onset of headache (scored at 8/10 in severity) and the potassium infusion was stopped. By 11.55am the headache was scored 10/10. An ECG was repeated with no changes.[144]

114. The potassium infusion was re-started at 12.15pm.[145]

115. With the impending arrival of an ambulance to transport Mr Ryan to the LGH, Mr Ryan was discharged from SMCHC. The principal diagnosis questioned organophosphate poisoning and bipolar disorder. The discharge documentation was

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[134] Exhibit C11A p3 [par18]
[135] Exhibit C10 p6
[136] Transcript p274 line 28
[137] Exhibit C10 p19
[138] Exhibit C10 p19
[139] Exhibit C10 p16
[140] Exhibit C10 p6
[141] Exhibit C10 p6
[142] Transcript p278 line31
[143] Exhibit C10 p16
[144] Exhibit C10 p17
[145] Exhibit C10 p17

prepared by the triage nurse[146] as well as a letter from Dr Latt to the LGH physician.[147]

116. At 12.35pm Mr Ryan was loaded into the ambulance. I note that there were several prior conversations between hospital staff and Ambulance Tasmania in order to organise an ambulance, as there appeared to be a shortage in the area.[148]

117. In terms of hospital staff being able to elicit information from Mr Ryan directly, Dr Latt gave evidence that, throughout his treatment and at discharge, Mr Ryan was conscious but confused. Dr Latt explained that Mr Ryan was unable to give him the necessary history as to the events leading to the sudden illness, and had to rely upon the gentlemen accompanying him and later, his medical records and information from Mrs Ryan.[149] Dr Latt gave evidence that when he asked Mr Ryan how he became unwell he did not know. Dr Latt said in evidence:

> *"And what were the words that he used back to you?..... So I can't really - something like he not recall anything, like say even being to the home for breakfast and everything he did not recall. That's why I said he's confused. I didn't get any - any information. The only thing I got is 'did you take any poison' and he said no.*
>
> *So you specifically asked him whether he'd taken any poison ?.....*
>
> *Yes.*
>
> *And his reply was no?..... No".*[150]

118. I fully accept the independent evidence of Dr Latt and the hospital records made by the staff that Ryan was in a confused state and not able to provide meaningful information to inform his treatment. The evidence of Mr Barnes, accompanying Mr Ryan in the back of the utility, is corroborative of Mr Ryan being in a state of reduced awareness or confusion.

119. Mrs Ryan conveyed to the court that her husband was lucid. She stated in her subsequent affidavit that she was able to communicate with Mr Ryan when she arrived at SMCHC and that he was conscious and able to respond to her questions.[151] She

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[146] Exhibit C10 p2
[147] Exhibit C10 p7
[148] Exhibit C19 p6
[149] Transcript p279 lines 1-26
[150] Transcript p284 line 21 to p285 line 4
[151] Exhibit C11A p3 [par20]

also said he was responsive.[152] I do not accept that Mr Ryan was able to speak coherently or respond accurately to questions as Mrs Ryan indicates. Because of his mental state, it is difficult to know whether his denials of consuming chemicals made to Dr Latt and Mr Woods were true and made with understanding of the question. I deal with the issue of suicide further on.

120. A final issue under this part concerns the quantity of atropine administered to Mr Ryan by Dr Latt. Dr Latt's records mistakenly indicated that he had given Mr Ryan a total of 4.8 mg when in reality the total administered was 3.6 mg. [153] The records of SMCHC were conveyed to the LGH and therefore contained incorrect information. It is unlikely that this error had any bearing upon Mr Ryan's later treatment, as will be discussed.

Travel to and treatment at Launceston General Hospital

121. During Mr Ryan's trip in the ambulance, he was assessed periodically from 12.59pm to 2.00pm and consistently scored well in his Glasgow Coma Scale (GCS). He was noted to be verbally orientated and was able to obey commands. He had clear and continuous speech, with regular rhythm and pulse.[154] I cannot reconcile this description of his state of awareness with the hospital assessments before or following his ambulance transport. There is no indication in the ambulance record that Mr Ryan gave any history or account concerning his illness.

122. The LGH Inpatient Admission Form referred to Mr Ryan being admitted at 2.43pm and his admission diagnosis being *"unconscious, cause not determined"*. This seems to be consistent with Dr Latt's assessment that Mr Ryan's consciousness levels faltered from 11 to14.[155] His intensive care unit (ICU) discharge record noted that LGH staff struggled to elicit exposure history from Mr Ryan, information vital for his treatment. In her affidavit, Mrs Ryan described her husband as sitting up in bed when she arrived at the LGH. She said she heard him tell staff that he was not aware of coming into contact with a snake, spider or anything dangerous. She then described seeing him convulsing and lose consciousness, which he never regained. [156] Again, I do not accept this statement on its face and I find that Mr Ryan was variously in a state of reduced

[152] Transcript p123 line 41
[153] Transcript p287 lines 15-40
[154] Exhibit C18 p3
[155] Exhibit 10 p7
[156] C11 p5

consciousness or unconsciousness at the LGH and unable give meaningful information to inform his treatment.

123. I will briefly summarise the course of his treatment and attempted resuscitation at the LGH.

124. When Mr Ryan arrived at LGH he presented with a variety of symptoms, which included hypothermia, altered GCS, defecation, hypersalivation, hyperidrosis, clonus and irritability.[157] Despite initial stability, Mr Ryan was intubated after a seizure in the Emergency Department.[158] He was then transferred to ICU for supportive care after a clear CT scan of his brain.[159]

125. In the ICU Mr Ryan was provided with standard ICU care, alongside with a lumbar puncture which was diagnostically unhelpful.[160] ICU staff also began treatment for meningitis or encephalitis which included antibiotics and antivirals. His temperature was then managed to 36 degrees using paracetamol and mechanical cooling.[161]

126. By 9.35pm that evening, Mr Ryan was sedated, intubated and mechanically ventilated. However, his seizures continued which resulted in the increase of his midazolam infusion.[162] By 11.50pm his seizures were noted to have ceased with the continuation of supportive therapy, antibiotics, antivirals and dexamethasone.[163]

127. Overnight, Mr Ryan's symptoms changed. He had a fever and was sweating and tremulous. He required cooling. He had a further seizure whilst ventilated.[164] At this stage he was managed with atropine and pralidoxime, but only until discussions occurred between his treating clinicians which resulted in the exclusion of organophosphate exposure and ethylene glycol exposure.[165] After this, dialysis in the form of a high dose continuous hemodiafiltration was initiated along with charcoal

[157] Exhibit C18 (Discharge summary)
[158] Exhibit C26 p4
[159] Exhibit C18 (Discharge summary)
[160] Exhibit C26 p4
[161] Exhibit C18 (Discharge summary) & Exhibit C26 p4
[162] Exhibit C26 p4
[163] Exhibit C26 p5
[164] Exhibit C26 p5
[165] Exhibit C18 (Discharge summary). Ethylene glycol is a toxic alcohol used in various domestic and industrial substances, including antifreeze.

hemoperfusion.[166] Additionally, a diagnosis of serotonin syndrome was considered, with supportive care already in place.[167]

128. ICU medical staff were able to restore Mr Ryan's oxygen levels, and were in communications with Alfred Hospital ICU on whether Mr Ryan could be transferred. It was agreed that if he was stable enough the following day he would be transferred to the Alfred Hospital in Melbourne. [168]

129. Despite the efforts of medical staff in ICU in improving his oxygen levels, Mr Ryan developed multiple organ failure. Following his decline, major resuscitative efforts were promptly undertaken. Unfortunately, Mr Ryan did not recover and passed away at 5.45pm on 9 January 2015. [169]

130. Dr Bell commented upon the good standard of treatment of Mr Ryan and the ability of LGH medical staff to provide extensive and quick support to him.[170] I accept that this was the case and that nothing more could reasonably have been done to prevent Mr Ryan's deterioration in death.

The attendance of Tasmania Police and WorkSafe Tasmania at Malahide

131. Mr Beacham gave evidence that on 9 January 2015 he was advised by staff at the Launceston General Hospital that Mr Ryan was seriously ill, that he was currently in intensive care and it was not known whether he would survive. Mr Beacham contacted police at Fingal to advise of the event.[171] He said he advised police that evening that Mr Ryan had, in fact, died.[172]

132. Mr Beacham was not aware of any other Malahide employees being sick in any way.[173]

133. At 11.45am on 10 January 2015 Senior Constable Peter McCarron of Tasmania Police Forensic Services attended Malahide where he was briefed by officers Sergeant Sharmaine Ward and Constable Donald Bonner. He viewed the front gate area and observed an area of discolouration which he considered to be consistent with the description given to him of Mr Ryan having vomited. He noticed a further area of discolouration with a visible patch of dying grass/vegetation approximately 20

[166] Exhibit C18 (Discharge summary)
[167] Exhibit C26 p6
[168] Exhibit C18 (Discharge summary)
[169] Exhibit C26 p6
[170] Exhibit C26 p6
[171] Exhibit C12 p2 [par8]
[172] Exhibit C12 p2 [par9]
[173] Exhibit C12 p2 [par10]

centimetres in diameter. A swab of the bitumen and a soil sample were collected. Photographs of the areas concerned were taken.[174]

134. Senior Constable McCarron also observed some weeds around Mr Ryan's home to be dying off, which he considered might be due to recent spraying. He noted some pump action sprays in the shed.[175] He considered there was nothing out of place inside the home[176] and no evidence of leaks or spills at the locked shipping container.[177] Photos of his inspections were taken and include a spray bottle from Mr Ryan's shed depicting a hand-written label "Roundup". [178]

135. Senior Constable McCarron also took possession of a backpack and coffee cup (with contents remaining) from Mr Ryan's utility.[179] A Camelbak water bladder was attached to the back pack, being Mr Ryan's usual source of drinking water.

136. Overall, Constable McCarron said he *"found no leaks and all containers had sealed and properly fitted lids"*[180] and his examination of the property did not reveal anything out of the ordinary.[181] However, that he did not examine the area in and around the animal shed.[182]

137. The early testing of soil and bitumen samples may well have been critical in terms of establishing how Mr Ryan died. However, these items were not tested at the time and were degraded by the time testing was considered several years later.

138. WorkSafe Tasmania was contacted by Tasmania Police at 8.45pm on Friday 9 January and attended the property on the afternoon of Monday 12 January 2015. Senior Inspector Steven Collins and Inspector Katrina Nielsen were the staff members in attendance. The matter had also been reported to WorkSafe Tasmania by Mr Beacham on that Monday morning.[183]

139. The pertinent points arising from the report prepared by the WorkSafe inspectors and their oral evidence are:

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[174] Exhibit C16 pp1-2 [pars 3-5] and photos 5 and 7,
[175] Exhibit C16 p2 [par 6]
[176] Exhibit C16 p2 [par 7]
[177] Exhibit C16 pp2-3 [pars 9-10]
[178] Exhibit C22B
[179] Exhibit C16 p2 [par8]
[180] Exhibit C16 p2 [par9]
[181] Exhibit C16 p3 [par10]
[182] Transcript p342 lines 29-31
[183] Exhibit C19 (Investigation report) p2

- The area where Mr Ryan had vomited appeared as if the grass had been "burnt".[184]
- They did not enter the chemical shed beyond, in effect, standing just inside the doorway.
- They did not inspect the area in or around the animal shed.[185]
- As cause of death could not be established, they could not find whether Mr Ryan's sudden illness was work related or if there were any legislative breaches. They were therefore not in a position to proceed to further investigation.[186]

140. In hindsight, the investigations by Tasmania Police and Worksafe Tasmania should have been more thorough when confronted with such unusual circumstances.

141. The chemical shed was not inspected adequately and the area in and around the animal shed was not inspected at all. Mr Ryan's sudden death should have been investigated initially as a suspicious death. The scene should have been preserved and a more comprehensive forensic examination of the scene conducted. As submitted by counsel assisting, it was not known that the highly toxic herbicide, paraquat, stored in the middle of the chemical shed,[187] was there until witnesses were questioned at inquest. The investigation did not seek to establish at an early stage a schedule of the chemicals that were actually present on the farm at the time Mr Ryan died.

The discovery of a drenching gun and experiment at the front gate

142. Mr Woods gave evidence that about three days after Mr Ryan became sick and when he had returned from his holiday break, he observed the grass to be dead where Mr Ryan had vomited.[188] He did not take any photos.

143. Mr Woods said that he happened to be in the animal shed about three days after Mr Ryan became ill. At that time he noticed a drenching gun for Dectomax still having liquid in the applicator. He stated it was normal practice for the gun to be cleaned before the chemical is stored. He was not sure how it happened and said it could have

[184] Exhibit C19 (Investigation Report) p4
[185] Transcript p354 lines 6-12
[186] Exhibit C19 p11
[187] Transcript p247 lines 21-23
[188] Exhibit C13A p2 [par7]

just been an oversight.[189] He did, however, say it was *"really unusual that the gun was on the floor and had chemical in it"*.[190]

144. Mr Woods gave evidence that he had never previously seen a drenching gun left out of place in the animal shed, particularly one still containing liquid. He explained *"I've got Mr Beacham…he would have drilled us all"*.[191] It is clear from the evidence of those working at Malahide that Mr Beacham required them to adhere strictly to set procedures and did not tolerate departures. Relevantly, he required the drenching guns to be rinsed and returned to their allocated spot after use.

145. Mr Woods said he sprayed the chemical from the drenching gun on the grass in the general area where Mr Ryan had vomited in an endeavour to determine the possible role of Dectomax in the death of Mr Ryan. He said he used the same gun and pack he found to perform the experiment.

146. Mr Woods said that the Dectomax killed the grass as it did with Mr Ryan's vomit.[192] I fully accept that this occurred. Further, Mr Woods gave evidence that the only two blue chemicals on the farm are Dectomax and Roundup.[193] He said that Dectomax was the only blue chemical in the animal shed.[194]

147. The inquest also explored the possibility of Dectomax poisoning with reference to a previous incident of poisoning experienced by Mr Woods. He gave evidence that he had been drenching stock and believed that some of the drench must have come into contact with his hand and he then inadvertently touched his mouth. Mr Woods considered the symptoms to be similar to those experienced by Mr Ryan. [195]

148. On the basis of the affidavits, it had been thought during the course of the investigation that this incident had occurred shortly before Mr Ryan's death. However, Mr Woods' medical records were obtained and they indicated that at 12.10pm on 27 May 2011he attended SMCHC. [196] He was seen by Dr Latt and presented as *"light*

[189] Exhibit C13B p1 [par2]
[190] Exhibit C37 p2 [par3(4)]
[191] Transcript p184 lines 40 to p185 line 9
[192] Exhibit C13A p2 [par8]
[193] Exhibit C13A p3 [par 14]
[194] Transcript p178 line 3
[195] Exhibit C13 p2 [par 7].
[196] Exhibit C13C

headed and unwell" having handled Rametin Combo Sheep Drench. This drench contains an organophosphate.[197]

149. It appears that Mr Woods was given atropine for organophosphate poisoning and discharged later that day at about 5.05pm. The notes do not indicate that Mr Woods suffered vomiting, diarrhoea or any of the other major symptoms that were displayed by Mr Ryan.

150. The incident relating to Mr Woods is not connected temporally or factually to the death of Mr Ryan. As submitted by counsel assisting, they appear to be significantly different from a medical perspective. Aside from confirmation that ingestion of doramectin produces toxicity (even a small quantity consumed inadvertently), this incident does not assist in ascertaining the circumstances surrounding Mr Ryan's death.

The autopsy

151. On 13 January 2015, forensic pathologist Dr Donald Ritchey performed an autopsy upon Mr Ryan. Dr Ritchey provided an affidavit with his detailed conclusions. I will discuss Dr Ritchey's opinions in greater depth further on in these findings.

152. Dr Ritchey, in his affidavit, stated as follows:

> *"…lungs were markedly heavy and congested and histologically had diffuse alveolar damage. The kidneys grossly had large cysts and histologically had widespread acute tubular necrosis. These findings confirm that the proximate/anatomical cause of death (mechanism of death) was multiple organ failure. The cause of this multiple organ failure is a source of considerable complexity and therefore possible differences of opinion".*[198]

153. Dr Ritchey did not find at autopsy (including histological testing) any anatomical or obvious cause for Mr Ryan's entry into multiorgan failure. He also had regard to the results of toxicological testing of Mr Ryan's ante-mortem (before death) and post-mortem (after death) blood samples, which revealed the presence of Mr Ryan's prescription medication but not the presence of chemicals used for herbicides, insecticides or parasiticides.

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[197] Exhibit C13C
[198] Exhibit C4 p10

154. Dr Ritchey also noted that Mr Ryan's oesophagus had *"widespread sloughing of the superficial mucosa with underlying submucosal haemorrhage"*.[199] Upon the evidence, this oesophageal ulceration *may* be an indication of ingestion of farm chemicals or may be explained by other conditions.

155. Upon microscopic examination of the brain, Dr Ritchey found, among other things, that the cerebellum had marked pallor and cell loss within the granular cell layer. I note that Associate Professor Gunja said in evidence that cellular injury to the brain was not inconsistent with chemical poisoning as various degrees of brain cell death may occur from poisoning.[200]

156. Based upon a very thorough post-mortem investigation process, Dr Ritchey ultimately formed the opinion that Mr Ryan's multiorgan failure was due to serotonin toxicity caused by paroxetine drug interaction.[201] Put simply, he considered that Mr Ryan's illness was precipitated by toxicity caused by his prescription medication for his bipolar disorder and not because of any natural cause or poisoning by a farm chemical.

157. All of the other medical experts agreed that Mr Ryan experienced multiorgan failure and this was the immediate cause of his death. However, none considered that serotonin syndrome was the original cause of his illness.

The blood tests

158. Numerous tests were undertaken both in Tasmania and Queensland in relation to Mr Ryan's blood, serum and vitreous humour. The testing of these samples and further testing of scene exhibits took place over a period of six years.

159. Unfortunately, numerous obstacles were encountered in attempting to achieve accurate and thorough testing for the presence of farm chemicals. These obstacles included:

- The unknown nature of the chemical to which Mr Ryan may have been exposed;
- The fact that the chemicals required to be tested required specialised testing interstate;

[199] Exhibit C4 p6
[200] Transcript p585 lines 23-32
[201] Exhibit C4 p10

- The limited quantity of available samples for additional testing for further chemicals;
- Complexities surrounding the rate at which particular substances are naturally excreted from the body;
- That Mr Ryan's *post-dialysis* ante mortem blood samples collected at the LGH were of reduced value, for the reasons set out below; and
- The process of collecting and testing scene exhibits was, in hindsight, not sufficiently thorough or timely.

160. Ante-mortem blood was taken from Mr Ryan for treatment purposes on 7 January 2015 at 3.00pm (pre-dialysis). Mr Ryan's dialysis procedure at LGH commenced at 2.20pm on 8 January 2015.[202] Another blood sample for treatment purposes was taken on 9 January 2015 at 12.05pm (almost 24 hours after commencement of dialysis).[203] These samples were subsequently tested during the coronial investigation.

161. Mr Neil McLachlan-Troup, forensic scientist with FSST, gave evidence that was that it is possible that a drug in the blood may be removed by dialysis (depending on the drug) and dialysis could at least reduce the level of certain drugs.[204] Dr Parkes considered there would also be clearance of the drug but to what extent would be dependent on a number of factors which he outlined in evidence.[205]

162. Dr Parkes helpfully explained Mr Ryan's dialysis treatment in evidence at inquest:

> *"But the, certainly the intention of both the dialysis and particularly the charcoal hemoperfusion, and we have those two circuits running contemporaneously, would be blood purification. The whole point of doing those would be to reduce those chemicals within the blood if we felt they were causing the toxicity. And I think it would be fair to say that it's very likely that those drugs would have undergone, or those, you know, any toxins would have undergone substantial reduction with those therapies."* [206]

163. Similarly, Associate Professor Gunja also noted that dialysis will reduce the presence of glyphosate in the blood. He said that it was possible that, by virtue of Mr Ryan's own bodily processes together with dialysis, there may well have been none

[202] Transcript p304 lines 19-20
[203] Exhibit C6 p1
[204] Transcript p382 lines 38-41
[205] Transcript p311 lines 19-20
[206] Transcript p311 line 29 to p312 line 23

detectable in the blood by the time the blood sample was taken from him on 9 January 2015. [207]

164. The test results for the pre-dialysis ante mortem blood taken on 7 January 2015 are as follows:

- Caffeine (detected).
- Nicotine/Cotinine (detected).
- Lamotrigine (1.1mg/L - therapeutic).
- Paroxetine (0.08 mg/L – high therapeutic).
- Morphine (less than 0.02 mg/L – low therapeutic). [208]

165. Mr McLachlan-Troup also sets out the *post mortem* blood results as being:[209]

- Nicotine/Cotinine (detected).
- Paroxetine (0.2 mg/L – greater than therapeutic).
- Fentanyl (detected: less than 0.03 mg/L – greater than therapeutic).
- Valproic Acid (approximately 4.8 mg/l – sub therapeutic).
- Midazolam (0.03 mg/L – therapeutic).
- Diazepam (detected: less than 0.05 mg/L – low therapeutic).
- Nordiazepam (detected – refer Diazepam).
- Lamotrigine (0.03 mg/L – sub therapeutic).
- Lignocaine (detected: less than 0.1 mg/L – sub-therapeutic).
- Phenytoin (1.7 mg/L – sub therapeutic).
- Propofol (approximately 0.6 mg/L – sub therapeutic).
- Paracetamol – 1.3mg/L – sub therapeutic).

166. In his oral evidence, Mr McLachlan-Troup stated that his laboratory (FSST) did not have methods to test for glyphosate, organophosphates, herbicides and doramectin.[210] Therefore, these results alone do not assist to determine whether Mr Ryan experienced a poisoning event.

167. It is to be observed that the large list of drugs additional to those shown in the earlier test represent the drugs given to Mr Ryan at the LGH for his treatment.

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[207] Transcript p568 lines 23-39
[208] Exhibit C6 p1
[209] Exhibit C6 p2
[210] Transcript p382 lines 25-31.

168. Forensic and Scientific Services Queensland was asked to test Mr Ryan's *ante-mortem pre-dialysis* samples of 7 January 2015 for MCPA and organophosphates. Reports from that laboratory dated 6 February 2015 and 18 December 2015 respectively, indicated that these substances were *not* present in Mr Ryan's sample.[211]

169. Forensic and Scientific Services Queensland was later asked by FSST to test for glyphosate in (a) Mr Ryan's ante-mortem blood samples taken on 7 January 2015 and 9 January 2015 and; (b) in his post-mortem blood and vitreous humour sample taken on 12 January 2015.[212]

170. The evidence of toxicologist Lorinda Swann was that the sample of ante-mortem blood from 7 January 2015 was insufficient in quantity to enable testing for glyphosate and that sample could not be tested. [213]

171. Ms Swann explained that no glyphosate was detected in the three remaining samples.[214] Her testing on this occasion was specifically in relation to glyphosate and no other substances. [215]

172. Carbamate pesticides were not tested for by either FSST or the Queensland laboratory.[216]

The testing of other items

173. Mr Ryan's white coffee cup and the 9 millilitres of fluid contained within it was tested by FSST. Mr Michael Manthey, forensic scientist, noted in his report that *"caffeine was indicated to be present in this item. No other chemical or restricted drug was detected"*. He stated that the test protocol detected common drugs and chemicals but did not detect all chemicals or restricted drugs.[217]

174. In his evidence, Mr Manthey highlighted the following points:

- MCPA was a target analyte but was not detected in the coffee.[218]
- Glyphosate was not a target analyte and therefore unable to be tested.[219]

[211] Exhibit C8 and Transcript p399.
[212] Exhibit C8
[213] Transcript p399 lines 29-36
[214] Transcript p396 lines 4-5
[215] Transcript p397 lines 16-19
[216] Exhibit C27, p4, lines 32-34
[217] Exhibit C7
[218] Transcript p387 lines 15-16
[219] Transcript p387 lines 18-20

- Organophosphates would likely be detected in the testing run if they were present.[220]
- Doramectin is not a molecule which was able to be detected due to its large size.[221]
- Paraquat is not a drug capable of being detected by his laboratory.[222]

175. A number of other items belonging to Mr Ryan were also tested.[223] They were:

- A Hills brand weed sprayer containing 2 millilitres of clear blue liquid.
- A yellow chemical bottle with handwriting *"Roundup 100ml spray pack"* containing 2 millilitres of clear blue liquid.
- A blue Camelbak water bladder.[224]

176. The items were specifically analysed for the presence of doramectin. The results of the testing indicated that doramectin was *not* present in the samples.[225] It was the only chemical his laboratory were asked to test for.[226]

177. The items were not received at the laboratory until 1 October 2019 and examination was not commenced until 18 December 2019. During further investigation of this case several years after Mr Ryan's death, these items were located in the property store of the Fingal Police Station. The significance of them had not been appreciated until that time.

178. Mr Craig Gardner, the forensic scientist conducting the testing, was uncertain as to the chemical half-life of doramectin.[227]

179. In an email from Mr Gardner to the Coroner's Associate dated 13 March 2020 he stated:

> *"It is very difficult to predict the stability of a compound over time as there are many factors that can contribute. Based on the structure, there is potential that this*

[220] Transcript p387 lines 22-25
[221] Transcript p387 lines 32-34
[222] Transcript p390 lines 34-35
[223] Exhibit C24
[224] Exhibit C22(a)(-c).
[225] Exhibit C24
[226] Transcript p401 lines 40-42
[227] Transcript p402 lines 1-3

compound would break down over time, especially in slightly acidic or basic conditions. If it were to break down, it would not be detectable as doramectin".[228]

180. At inquest, Mr Gardner again said that he was unable to say whether doramectin would have been detected after a four year period. [229]

181. While Mr Gardner said he was only asked to test for the presence of doramectin, his evidence was that the Hills weed sprayer and yellow chemical bottle *did* contain an indication for the presence of glyphosate but the Camelbak did not.[230] Mr Gardner outlined the process of testing using a system known as 'liquid chromatography-mass spectrometry'. He explained that because, in relation to this item, liquid chromatography could not occur, he was unable to positively confirm the presence of glyphosate. However, despite the more limited testing, he considered that if glyphosate had been present in the Camelbak then it would have been indicated. [231]

182. In relation to the testing of the soil and bitumen samples, Mr McLachlan-Troup, in an email to the Coroner's Office dated 24 September 2021, said:

"Unfortunately we have been unable to get our usual external contact to analyse the further submitted samples. Following discussions with Michael Manthey (Trace) and Craig Gardner (Tox) we believe that the vomit swab and the grass/soil samples would have a low likelihood of success due to the likely instability of the target compounds, particularly given the age of the samples and also given the acidic nature of vomit, and microbial nature of soil. A likely negative result may therefore be misleading and given undue weighting in considerations".[232]

183. Mr Ryan's clothing, worn at the time of his sudden illness, might ideally have been seized by investigators and retained for testing. However, it is likely that they had been destroyed by the time of notification of Ryan's death.

184. In evidence Dr Latt did not recall what was done to Mr Ryan's clothes and only assumed that they were removed and handed to the LGH staff because it was the norm to do so.[233] In Mrs Ryan's affidavit, she stated that at SMCHC she was told to

[228] Exhibit C24A
[229] Transcript p402 lines 16-22
[230] Transcript p403 lines 15-16. See also Transcript p405 lines 25-26
[231] Transcript p403 line 38 to page 404 line 25-27
[232] Exhibit C7A
[233] Transcript p294 (para20-40).

dispose of Mr Ryan's clothes (which had been cut from him by staff) and boots.[234] There is no reason to consider that Mrs Ryan's evidence was not accurate in this respect.

185. I also note that the inside of Mr Ryan's vehicle was not apparently considered for swabbing and sampling. Further, his backpack and a plastic container in the passenger footwell depicted in the photos were not the subject of scientific testing. I emphasise, however, that it is easier in hindsight to postulate how an investigation might have better taken place.

186. In any event, I am satisfied that all testing which was available with the samples or exhibits at hand as taken place. No farm chemicals were detected in any of the testing.

Glyphosate and MCPA

187. Associate Professor Gunja is an experienced clinical and forensic toxicologist whose evidence was comprehensive, knowledgeable and helpful. He said that when the chemical glyphosate is ingested in high concentration it can cause vomiting and corrosive injury to the gastrointestinal tract. Over subsequent days, the toxicity leads to lung inflammation, kidney failure, metabolic disturbances and seizures. Cardiovascular collapse ensues. In high concentrations, symptoms commence within 30 minutes and death within a few days.[235]

188. In relation to the herbicide MCPA Associate Professor Gunja gave evidence that early symptoms of poisoning include vomiting, abdominal pain and diarrhoea. Neurological signs such as hyperreflexia, clonus and seizures have been reported. Lung and renal complications, ultimately leading to death, have been reported in cases of high concentration.[236]

The case for glyphosate and/or MCPA

189. Associate Professor Gunja's ultimate position was that *"the most likely toxicological explanation for his early gastrointestinal symptoms, rapid clinical deterioration and post mortem examination is herbicide poisoning, from ingestion of either high concentration*

[234] Exhibit C11 p4
[235] Exhibit C27 p5 lines 12-16
[236] Exhibit C27 p6 lines 18-23

glyphosate or MCPA".[237] When asked in his evidence in chief which one of the two chemicals he would pick, he stated "*MCPA".*[238]

190. Associate Professor Gunja said that glyphosate causes an acid build up in the body and kidney failure, both of which Mr Ryan had.[239] He also noted that the chemicals actually identified as present on the farm were high concentrations of glyphosate and MCPA.[240]

191. Associate Professor Gunja said that glyphosate and MCPA generally do have an odour but not to the extent of organophosphate or carbamate pesticides. He said organophosphates are obvious to everyone.[241]

192. In his report, Associate Professor Gunja referred to the evidence that the vomit by the roadside being "blue/black" in colour which he said was most consistent with Roundup Ultra Max, which is a blue liquid containing glyphosate.[242]

193. Dr Jack Dale, an occupational physician who also provided a comprehensive report and gave evidence at inquest, described glyphosate as a clear blue odourless liquid.[243]

194. Dr Dale described the herbicide Agritone 750 (containing MCPA) as red-brown in colour with a *"strong ammonia-like odour".*[244] He considered it *"highly unlikely"* this substance could be ingested inadvertently.[245]

195. The herbicides glyphosate and MCPA are corrosive substances, particularly in high concentrations, and can cause oesophageal ulceration and irritation. This is consistent with the autopsy finding of oesophageal ulceration and necrosis.[246] Dr Parkes also described their corrosive effects in his evidence and their possible link with the oesophageal injury seen at autopsy. [247]

196. Dr Ritchey said that skin burns would not be seen in a person who ingested glyphosate. [248] Associate Professor Gunja explained that these chemicals are not

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[237] Exhibit C27 p7 lines 29-32
[238] Transcript p555 lines 35-36
[239] Transcript p557 lines 22-25
[240] Exhibit C27 p6 line 21
[241] Transcript pp555 line 38 to p556 line 6
[242] Exhibit C27 p6 lines 25-26
[243] Exhibit C32 p2 [par 8]
[244] Exhibit C32 p2 [par 13]
[245] Exhibit C32 p3 [par 21]
[246] Exhibit C27 p6 lines 30-33
[247] Transcript p310 lines 3-6
[248] Transcript p418 lines 18-19

effectively absorbed by skin or inhalation, hence poisoning needs to be through oral ingestion.[249]

197. Associate Professor Gunja ruled out the scenario that repeated exposure over a period of time could accumulate, resulting in a tipping point whereby symptoms such as those experienced by Mr Ryan would occur.[250]

198. Associate Professor Gunja stated that Roundup was not a product which could be inadvertently inhaled and result in poisoning.[251] Dr Dale agreed with this opinion. [252] He said an adult would need to ingest about half a cup, a mouthful of between 50-100ml to produce vomiting.[253] He went on to say that to produce all the symptoms of Mr Ryan's initial presentation - vomiting, profuse sweating and hypothermia - several hundred millilitres of Roundup would need to have been ingested – at least a cup full.[254] He also said that, in the case of intentional ingestion, one would need to ingest four mouthfuls in order to keep two down.[255]

199. Finally, Dr Dale's evidence was that a lethal quantity of Roundup, given Mr Ryan's weight and BMI, would be about 700ml if ingested orally. In contrast, he said 245ml of Agritone would be lethal if ingested. A quantity of 730ml of L1 700 surfactant would be lethal if ingested.[256] In terms of calculating the quantity of all three substances to produce vomiting, he considered that to be around 50-70% of those figures.[257]

The case against glyphosate and/or MCPA

200. Dr Anthony Bell, coronial medical consultant and experienced intensivist, did not consider that poisoning by glyphosate fitted Mr Ryan's clinical picture. He conducted significant research into this case, including a search of Toxinet (a Unites States government site regarding toxicology) which did not reveal any case of glyphosate causing bradycardia (slow heart rate) except in the terminal stages of life. He also considered the time scale and course of toxicity did not match a single overdose.[258]

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[249] Exhibit C27 p6 lines 33-35
[250] Transcript p575 line 5
[251] Transcript p570 lines 17-19
[252] Exhibit C32 p2 [par 8]
[253] Transcript p570 line 36 to p571 line 4
[254] Transcript p571 lines 6-18
[255] Transcript p572 lines 1-7
[256] Transcript p482 line 15 to p483 line 13
[257] Transcript p484 lines 16-20
[258] Exhibit C26 pp6-7 [par 34]

201. Associate Professor Gunja, who favoured glyphosate poisoning, conceded that there was a lack of toxicological evidence from the laboratories confirming the presence of agrochemicals in Mr Ryan's blood.[259]

202. Dr Ritchey was also concerned about the negative toxicological results. He noted that in the four cases in Tasmania in which people have died from glyphosate poisoning in this state, he was able to find glyphosate in the specimens contained at autopsy by toxicology.[260]

203. Associate Professor Gunja also conceded the low potassium levels in Mr Ryan's blood results is an indicator against glyphosate toxicity as one would typically expect to see *hyperkalaemia,* being high potassium concentration.[261] He suggested in evidence that that Mr Ryan's potassium levels could have been low due to him vomiting so much.[262]

204. Dr Dale also noted the low potassium levels.[263] He also said that glyphosate poisoning would also be difficult to find in the presence of hypokalaemia.[264] Overall, he considered glyphosate poisoning "unlikely".[265]

205. Regarding the possibility of glyphosate toxicity, the lack of ante-mortem pre-dialysis blood for analysis is unfortunate. Assuming it had been available and taken at hospital at an early time after arrival, the results would have been determinative of the presence of glyphosate or otherwise. As already noted, in relation to MCPA, the ante mortem pre-dialysis serum sample failed to detect MCPA but would have done if Mr Ryan had ingested a significant dose. [266]

Organophosphate and carbamate pesticides

206. Organophosphates and carbamate pesticides are chemical insect-killers that can cause serious toxicity to humans if ingested. They act on nerve cells throughout the body and can cause confusion, seizures, coma, salvation, vomiting, diarrhoea, urinary incontinence, bronchorrhea, fasciculations, hyperthermia and paralysis.

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[259] Exhibit C27 p7 lines 23-24
[260] Transcript p418 lines 34-37
[261] Exhibit C27 p6 lines 26-28
[262] Transcript p557 lines 25-33
[263] Exhibit C32 p5 [par 41]
[264] Exhibit C32 p6 [par 42]
[265] Exhibit C32 p6 [par 50]
[266] Exhibit C8 – see also exhibit C7A

207. Diagnosis of organophosphate and/or carbamate poisoning involves clinical evaluation and measurement of cholinesterase levels in the blood. Relevantly to this case, treatments may include antidotes such as atropine.

208. Whilst Mr Ryan's illness was considered by two or more of the medical experts to have all the hallmarks of organophosphate poisoning, there are two significant problems with this hypothesis. Firstly, the witnesses with knowledge of the property gave evidence that were no organophosphates on Malahide. Secondly, Mr Ryan's ante-mortem pre-dialysis sample did not contain organophosphates.[267]

209. Mr Barnes was unsure if any carbamates were used on the property.[268]

The case for organophosphate and/or carbamate toxicity

210. Dr Bell's evidence was that:

> "*The clinical presentation [at St Mary's hospital] of salivation, cramping, abdominal pain, urination, defection, gastric emesis, bronchorrhoea and confusion is suggestive of the cholinergic toxic syndrome due to either organophosphate or carbamate poisoning or both*".[269]

211. Dr Bell was of the opinion that:

> *"The presenting syndrome certainly met many of the characteristics of cholinergic toxic syndrome. The characteristic of which are salivation, lacrimation, urination, defecation, gastric emesis, bronchorrhea, bronchospasm and bradycardia".*[270]

212. Dr Bell regarded the plan to treat Mr Ryan with atropine as appropriate to the clinical situation. Dr Bell said that, critically, the failure of his heart rate to accelerate upon initial atropine administration indicates that the diagnosis was almost certainly correct.[271] He said that this phenomenon was a diagnostic indicator of poisoning with an acetylcholinesterase inhibitor such as an organophosphate or carbamate pesticide.[272]

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[267] See also exhibit C7A
[268] Exhibit C21 p2 [par9]
[269] Exhibit C26 p3 [par 10]
[270] Exhibit C26 p4 [par 14]
[271] Exhibit C26 p4 [par 15]
[272] Exhibit C26 p4 [par 16]

213. Acetylcholinesterase or cholinesterase is an enzyme essential for the normal functioning of the nervous system of humans, animals, birds and insects. When cholinesterase levels are low because they have been inhibited, the nervous system can malfunction and lead to death. Whilst this mode of action is successful in killing insects, can lead to poisoning in humans, ranging from mild to severe symptoms. The symptoms described above by Dr Bell, and called *cholinergic syndrome* occur because of the continual over excitation of nerve to nerve and nerve to muscle communication which is uninhibited by sufficient cholinesterase.

214. Dr Bell considered the presence of hypokalaemia and hypomagnesaemia as further indicators of organophosphate poisoning.[273] He also said that low potassium is a well-described phenomenon in organophosphate poisoning.[274]

215. Dr Parkes had the considerable advantage of being a member of Mr Ryan's treating team and observing his clinical signs. Dr Parkes agreed with the opinions and analysis of Dr Bell, and considered that Mr Ryan was suffering symptoms of organophosphate poisoning.[275]

216. Dr Parkes gave evidence at inquest about his process of forming a diagnosis of Mr Ryan's illness. He stated:

> *"….the things that would come to mind are obviously poisoning of some sort, whether or not that was inadvertent or intentional. The other major issue would be that of sepsis or infection, so an overwhelming severe infection. So this would be how infections such as meningococcal septic shock may present, very rapid onset of severe compromise. Of itself, this doesn't sound primarily cardiac in nature, it just seems to be too many other things going on. It doesn't seem to be primarily a neurologic event or a stroke or anything like that, so I could come down to poisoning or severe overwhelming infection".*[276]

I accept the evidence of Dr Parkes and Dr Bell that Mr Ryan's symptoms aligned closely with the diagnosis of organophosphate poisoning. However, I now discuss the difficulties with being able to make a finding to the requisite standard that Mr Ryan

[273] Exhibit C26 p4 [par 17]
[274] Transcript p456 lines 24-27
[275] Transcript p319 line 35 to p321 line 37
[276] Transcript p325 lines 1 to 12

ingested an organophosphate or carbamate and that such toxicity caused or contributed to his death.

The case against organophosphates and/or carbamates

217. Associate Professor Gunja ruled out organophosphate poisoning on three grounds. Firstly, there were none found on the property. Secondly, the clinical presentation did not fit. While Mr Ryan had vomiting and diarrhoea, he did not present with the other features of organophosphate poisoning.[277] Thirdly, the blood test results did not detect it. He said that usually organophosphates would be detected in the blood if they were, in fact, present.

218. Dr Ritchey discounted organophosphate toxicity (and other farm chemical toxicity) for several reasons:

- The absence of organophosphates (or other farm chemicals) being detected clinical samples obtained during hospitalisation.
- The evaluation of a patient with clinical signs and symptoms that suggest chemical or drug toxicity is complex and seldom encountered during routine clinical work.
- Although toxidromes are described in literature as distinct and easily identifiable entities, the real-life bedside evaluation is far more challenging.
- Various signs and symptoms said to characterise a particular drug or chemical intoxication are non-specific and can be easily misinterpreted or interpreted out of the correct context.
- Each patient's genetic and biochemical background are unique, resulting in the possibility that individual's toxidrome may not be typical or characteristic.
- Additionally, late in Mr Ryan's hospital course, he developed hyperreflexia, hyperthermia, and delirium, which is suggestive of serotonin toxicity. [278]

219. Dr Bell did concede that Mr Ryan's *"heart rate, pupil size and the blood pressure were slightly out of character for organophosphate poisoning"*.[279]

[277] Transcript p556 lines 28-36
[278] Exhibit C4 p11
[279] Exhibit C26 p7 [par 39]

220. Associate Professor Gunja describes organophosphates and carbamates as pungent chemicals. He said that ingestion and poisoning is almost always recognisable by first responders and hospital staff because of an offensive odour.[280]

221. Associate Professor Gunja considered the low dose of atropine administered to Mr Ryan that led to atropine toxicity also militates against the likelihood of organophosphate or carbamate poisoning.[281] He said that upon Mr Ryan being given a few milligrams of atropine, he developed atropine toxicity - meaning that very little atropine was needed before toxicity developed. If very little was required, he would have ingested only small amounts of organophosphate not capable of causing death.[282]

222. Significantly, he also said there are times when atropine does not result in physiological change; and that does not necessarily prove the occurrence of organophosphate poisoning. He gave the example in evidence of treating a patient with atropine (the day before he gave evidence) with no change resulting; and that patient did not have organophosphate poisoning but a heart problem. Associate Professor Gunja said that this *"happens all the time"*. [283]

223. Associate Professor Gunja said that low potassium and low magnesium is not necessarily an indicator of organophosphate poisoning. He explained that it may co-exist with low, normal, or high potassium and with low or normal magnesium.[284]

224. Associate Professor Gunja said that normally organophosphate ingestion results in a low heart rate and, at 70 bpm, Mr Ryan's heart rate was not low.[285]

225. Associate Professor Gunja also explained that oesophageal erosion would not occur with organophosphate ingestion and/or the addition of pharmaceutical substances. He emphasised that a corrosive element is needed to cause such damage. He said that substances with corrosive properties included acids and alkalis as well as glyphosate or an MCPA. [286]

226. Associate Professor Gunja was questioned specifically about Mr Ryan's oesophageal injury as found at autopsy. He did not consider that the injury as described in the

[280] Exhibit C27 p6 lines 21-23
[281] Exhibit C27 p6 lines 23-24
[282] Transcript p556 line 37 to p557 line 2
[283] Transcript p576 lines 14-16
[284] Transcript p577 lines 10-17
[285] Transcript p577 lines 39-40
[286] Transcript p602 lines 19-26

autopsy report would have been caused by Mr Ryan's ultimate multiorgan failure or any other physiological process or treatment. He considered that the injury was consistent with consuming corrosive chemicals. [287]

227. Finally, Dr Dale considered that significant organophosphate and carbamate exposure in the normal course of his work to be *"highly unlikely"*.[288] In relation to the exposure question concerning organophosphates, Association Professor Gunja commented *"it wouldn't cause you to become unconscious or seriously poisoned or die"*.[289] Further, a cupful orally ingested would be required to cause vomiting.[290]

228. There was no dispute on the evidence and, as a matter of logic, workers on the farm may be exposed to herbicides and pesticides by their external contact with hands or body or inhalation. This incidental contact in the course of usual farm duties could occur over a lengthy period. It may or may not result in symptoms depending upon the many variables. However, it is plain upon the evidence that there could be no occasion where a worker could orally ingest anything more than a minimal quantity of liquid pesticide or herbicide on any occasion without knowing they had done so.

Doramectin

229. Consideration of doramectin poisoning became relevant in this inquest because of the evidence given by Mr Woods - that he located a Dectomax drenching gun in the animal shed and conducted an experiment on grass outside the front gate. As already discussed, his evidence about how he himself had become unwell due to a previous encounter had been considered important but I have discounted it as being able to assist in determining the circumstances surrounding Mr Ryan's death.

230. Dr Dale said Dectomax is a solution of isopropyl alcohol, doramectin and triethanolamine. He described it as:

> *"A clear, light blue solution that is highly flammable and causes irritation of skin, eyes and gastrointestinal tracts. The active ingredient is doramectin, which has not been well studied in humans but is expected to cause headache, nausea, vomiting, dilation*

[287] Transcript p603 line 38 to p604 line 36
[288] Exhibit C32 p6 [par49]
[289] Transcript p589 lines 37-38
[290] Transcript p590 lines 15-16

of pupils, drowsiness and dizziness with low exposures. This usually prevents prolonged exposure to reach lethal levels".[291]

231. Dr Ritchey commented that diarrhoea and vomiting would be very likely early symptoms of drinking sheep drench.[292]

232. In relation to Dectomax, Associate Professor Gunja's evidence was as follows:

- It may produce an odour but not a particularly strong one.
- It would not produce a vapour which could lead to illness.
- There would need to be "mouthfuls" consumed before significant poisoning occurs.
- There have been few reported cases and although they get very sick, deaths have been extremely rare.
- The symptom trajectory for poisoning is likely similar to other chemicals - generally, vomiting, diarrhoea, serious sickness and death, assuming ingestion of "hundreds" of millilitres.
- He had never seen a case of doramectin poisoning and the collective experience around the world is limited.[293]

233. Finally, Associate Professor Gunja also said he would be surprised if doramectin caused oesophageal erosion due to the nature of the chemical, but he had no further knowledge of this possible effect.[294]

234. Dr Bell stated in his report that, upon the evidence, it is important to consider whether Mr Ryan suffered doramectin toxicity. However, consistently with Associate Professor Gunja, he stated that *"Doramectin is an unknown factor due to lack of human clinical evidence. The human product ivermectin is also under researched and association with the serotonin syndrome is unclear".*[295]

235. It seems that the known presence of doramectin and the proximity of Mr Ryan to it that morning caused Dr Bell to question whether organophosphate toxicity was a

[291] Exhibit C32 p4 lines [par28]
[292] Transcript p434 lines 30-41
[293] Transcript p582 line 14 to page 583 line 7
[294] Transcript p605 lines 5-6
[295] Exhibit C26 p7

certain diagnosis. Dr Bell concluded in his report *"The initiating intoxicating factor is unknown. Deliberate or passive intoxication is unknown."*[296]

236. As noted, testing for doramectin was conducted in 2019 but limited to the items belonging to Mr Ryan. The negative result does not greatly assist. In any event, I am able to find on the evidence that doramectin in the form of the Dectomax was present in the animal shed as a chemical used on Malahide as a matter of course for control of gastrointestinal worms and lice in animals. I will deal later with the weight to be placed on Mr Woods' evidence.

Atropine toxicity

237. The intended effect of the intravenous administration of atropine to Mr Ryan at SMCHC was to decrease secretions to a manageable level and to maintain heart rate at 90-100 bpm.[297] This treatment was clearly appropriate in the circumstances of Mr Ryan's presentation[298] and no counsel sought to submit otherwise.

238. There was, in the investigation and at inquest, significant focus upon whether an excessive quantity of atropine was administered to Mr Ryan resulting in atropine toxicity. The issue then also arose whether atropine toxicity and his treatment for that condition were material contributing factors in his death.

239. As previously outlined, at the LGH Mr Ryan was diagnosed with anticholinergic syndrome (or atropine toxicity).

240. Dr Bell noted that Mr Ryan suffered seizures in hospital consistent with atropine toxicity.[299] In his evidence at inquest, he outlined the symptoms of anticholinergic syndrome in more detail:

> *".. I was saying that you get a characteristic syndrome which is described as red as a beet, dry as a bone, hot as a hare, blind as a bat, and mad as a hatter. And these are the sort of five – oh and full as a flask is the other one because of the urinary retention. So that's the characteristic syndrome. None of those things are particularly fatal ah apart from the mad as a hatter when you have hallucinations and you cannot be in control of your facilities and lead to your accidental death. But other than that*

[296] Ibid.
[297] Exhibit C26 p4 [par 18]
[298] Ibid [par 19]
[299] Exhibit C26 p5 [pars 25-26]

um Dr Parkes is correct. It's not going to be a fatal. It is a well-recognised complication of using atropine ah or ah(sic) organophosphate carbamate poisoning".[300]

241. Dr Parkes considered it appropriate to have given Mr Ryan atropine. He gave helpful evidence that some poisons (such as organophosphates) stop the ability of the body to break down acetylcholine, a neurotransmitter critical to the proper working of the parasympathetic nervous system. Hence, such poisons are described as *anticholinesterase.* He said that, as a neurotransmitter, acetylcholine is released and in the normal course broken down very quickly. The administration of atropine assists in restoring this process and thus reversing the effects of the anticholinesterase poisoning.

242. Dr Parkes said in evidence *"it's still very possible that this was an anticholinesterase poisoning of some sort. Maybe not an organophosphate but something that inhibits the breakdown of acetylcholine".*[301]

243. Dr Parkes did not consider atropine toxicity to be a large contributor to Mr Ryan's subsequent deteriorating course.[302] Dr Parkes did not consider that any of the substances that *were* detected in post-mortem blood to be a cause of anticholinesterase poisoning.[303]

244. Dr Ritchey considered that Mr Ryan developed atropine toxicity after the administration of the drug. He said *"atropine toxicity may occur even at low doses and is characterised by hyperthermia and delirium-effects that mimic serotonin toxicity and possibly exacerbate serotonin toxicity. Limited information is available regarding the interaction of these two toxic conditions (atropine toxicity and serotonin toxicity)".*[304]

245. However, Dr Ritchey did not really consider atropine poisoning was significant in the cause of death, stating that he did not have any reason to believe that it contributed to Mr Ryan's death.[305]

246. Associate Professor Gunja formed the opinion that atropine toxicity was transient in Mr Ryan's case and did not have any substantive contribution to death.[306] He noted

[300] Transcript p447 lines 22-31
[301] Transcript p312 lines 29-31
[302] Transcript p318 lines 33-34
[303] Transcript p322 lines 8-10
[304] Exhibit C4 p11
[305] Transcript p414 lines 5-14
[306] Exhibit C27 p7 lines 32-33

that very little atropine was required in this case prior to development of toxicity and therefore doubted that there could have been much organophosphate in Mr Ryan's system. Moreover, if he did not have much organophosphate in his system he would not have died from its effects.[307] He said it was a low dose of atropine at 4.8 mg for a patient thought to have organophosphate or carbamate poisoning. He said that atropine has a short half-life and while it may have been present for several hours, it is unlikely to have altered Mr Ryan's clinical course of any chemical poisoning or contributed to his death.[308]

247. Similarly, Dr Parkes explained to the court that atropine does not represent the sole solution to a poisoning event (such as antivenom is for a snake bite). However, he said that it is effective to "buy time" whilst other treatments are ongoing.[309]

248. Finally, Dr Parkes considered that if someone was given *"a huge dose of atropine, then one would expect that to be survivable with appropriate care"*.[310]

249. Upon the consensus of medical opinion, I find that Mr Ryan experienced atropine toxicity with a modest dose of atropine. Mr Ryan's symptoms and clinical course justified this treatment in such doses. I accept the evidence of Dr Bell that atropine toxicity is well described in the literature and occurs in medical settings because of the difficulty in predicting the dose required when a person presents with apparent poisoning symptoms. He said that doctors are left to rely only upon "soft signs" of poisoning, with including secretion volume. In the circumstances, appropriate doses of atropine were given to Mr Ryan on the basis of symptoms that clearly resembled organophosphate poisoning.

250. Thus, the consensus of medical opinion is that the atropine toxicity experienced by Mr Ryan was a transient condition and did not in itself contribute to his death. However, Dr Bell suggests that the atropine toxicity contributed to the sequence of events leading to Mr Ryan's death, likely by drug treatment for the toxicity, but acknowledged the causal complexity of the situation.

[307] Transcript p556 line 37 to p557 line 2
[308] Exhibit C27 p7 lines 3-7
[309] Transcript p316 lines 16-29
[310] Transcript p302 lines 16-18

Serotonin toxicity

251. Serotonin toxicity, also known as serotonin syndrome, is a toxic state caused by excess serotonin (a neurotransmitter) in the central and peripheral nervous system.[311] It is known to be caused by particular drug interactions, particularly involving antidepressant medications in the category of selective serotonin uptake inhibitors (SSRIs). Paroxetine is one such SSRI.

252. Dr Bell set out the manifestations of serotonin syndrome in his report. The findings upon examination may include: hyperthermia, agitation, clonus (abnormal reflex response involving in voluntary and rhythmic muscle contractions), muscle rigidity, dilated pupils, dry mucus membranes, increased bowel sounds, flushed skin, and diaphoresis (sweating). He said that the neuromuscular findings are typically more pronounced in the lower extremities. Serotonin syndrome can manifest a wide range of clinical symptoms from mild tremor to life-threatening hyperthermia and shock.[312]

253. Mr McLachlan-Troup noted in his affidavit that the co-administration of fentanyl and paroxetine may lead to increased serotonergic effects.[313] Mr MacLachlan-Troup's evidence was consistent with that of Dr Bell in respect of serotonin syndrome (or serotonin toxicity). He outlined that it most commonly occurs when *"two or more serotonergic drugs which different mechanisms of action are administered either in combination or in close succession"*.[314]

254. There were differing medical opinions about whether Mr Ryan suffered serotonin syndrome at any time prior to his death and, if he did, whether it caused his death, either solely or as a significant contributor.

The case for serotonin toxicity

255. Dr Ritchey concluded that multiple organ failure due to serotonin toxicity (caused by paroxetine interaction) to be the cause of death.[315]

256. Dr Ritchey's opinion is that paroxetine is likely to be central to the underlying cause of toxicity. He said paroxetine has been reported to cause serotonin toxicity even when used as a single agent and not in an interaction with other drugs. He also

[311] Exhibit C4 p11
[312] Exhibit C26 p10
[313] Exhibit C6 p2
[314] Exhibit C6 pp2-3.
[315] Exhibit C4 p12

considered that the development of marked clonus, hyperthermia and delirium are all findings suggestive of serotonin toxicity.[316]

257. Dr Bell considered that the sequence of Mr Ryan's conditions to be:

(a) organophosphate poisoning followed by,

(b) atropine poisoning, caused by the need to treat the organophosphate poisoning, and,

(c) severe serotonin syndrome caused by Mr Ryan's prescription paroxetine interacting with hospital administration of medication.[317]

258. Dr Bell said there was no evidence of serotonin syndrome in Mr Ryan's initial presentation to SMCHC.[318] In particular, he said that hypothermia (abnormally low body temperature) is not associated with serotonin syndrome and there was no evidence that Mr Ryan was hypothermic when presenting at SMCHC.[319]

259. Dr Bell noted that due to persistent seizures, Mr Ryan was loaded with valproate 400 mg intravenously. Valproate is an anti-seizure drug. Dr Bell said:

> *"Valproate impairs re-uptake of serotonin from the synaptic cleft into the pre-synaptic neuron and may precipitate the serotonin syndrome in patients on treatment with SSRIs. The reaction is described as rare and may not exist".*[320]

260. Dr Ritchey also indicated that case reports suggest valproate may contribute to serotonin toxicity, but such cases are rarely encountered.

261. Dr Bell, in his examination in chief, confirmed that valproate as a cause of serotonin syndrome would be a *"rare event".*[321] However, he could not determine what other drugs, apart from valproate, would have contributed to Mr Ryan's condition in addition to paroxetine. [322]

262. Lamotrigine was detected in Mr Ryan's blood. It had been recently prescribed to Mr Ryan by Dr Gelston. Lamotrigine is an anti-convulsant drug used in the treatment of

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[316] Exhibit C4 p11
[317] Exhibit C26 p7 [par 41]
[318] Transcript p443 lines 16-17
[319] Transcript p443 lines 24-31
[320] Exhibit C26 p5 [par 26]
[321] Transcript p457 line 13
[322] Transcript p457 lines 32-33

seizures and is also a mood stabiliser for bipolar disorder. It acts by altering the sodium ion induction in brain cells and therefore reduces seizure activity. It is considered to have little to no effect on serotonin receptors. In cases of overdose, lamotrigine causes drowsiness, unsteady gait, cardiac arrhythmias, and seizures.[323]

263. None of the experts in this case considered that lamotrigine was likely to have contributed to any serotonin syndrome experienced by Mr Ryan.[324] However, Associate Professor Gunja noted that there are some rare cases of lamotrigine being involved in serotonin toxicity.[325]

264. Although Paroxetine, as an SSRI, might be involved in the development of serotonin syndrome, the evidence indicates that it is less toxic in overdose and has fewer significant side effects when compared to other anti-depressants. Paroxetine has been associated with uncommon reports of serotonin toxicity when interacting with other serotonergic medications.[326]

265. In evidence at inquest, Dr Bell elaborated upon his opinion regarding the manner of onset of Mr Ryan's serotonin syndrome whilst at the LGH:

> *"Well by um 21:35 on the 7th January, the patient was intubated, ventilated, sedated but had a very high temperature, which is part of the serotonin syndrome. And really it's it should be a temperature above 38 degrees Celsius, is [indistinct word(s)] recorded as 39 degrees Celsius. And they had to institute um external cooling on the patient. This ah they continued to treat his temperature as though it was a cerebral infection because of the seizures. But overnight, by 5 o'clock in the morning on the 8th January, the patient still required fever control, was sweaty, tremors, had developed dramatic clonus which is a a(sic) reflex seen in the serotonin syndrome. And it's hard to think it's something else that would be doing that um in this sort of situation. There was hyperreflexia in all limbs. Again consistent with the serotonin syndrome. All the supportive care was already in place. So there was not much else he could do, but the patient rapidly developed multi-organ failure which certainly has been seen in severe serotonin syndrome. The patient then went into multi-organ failure despite the excellent care provided at the hospital [indistinct word(s)]. Not ah unexpected. It can*

[323] Exhibit C27 p5 lines 24-28
[324] For example, Dr Bell's opinion in Exhibit C26 p1. (Sure)
[325] Transcript p554 lines 23-24
[326] Exhibit C27 p5 lines 29-32

um present this way. It can be very mild where you get a little tremor to this sort of life threatening hyperthermia and shock which is what he had.

And Dr Parkes said yesterday that normally when one sees serotonin syndrome it is – it is a slower and you would expect signs and symptoms. ….. Well, look, as I said before there is a lot of patients with serotonin syndrome it's actually hard to identify it, you have to be quite suspicious of all patients on these SSRI drugs. But there is this form that you get the severe temperature and shock and you die and you die quite rapidly. [327]

The case against serotonin toxicity

266. Associate Professor Gunja considered that it is unlikely that serotonin toxicity played any part in this case.[328] He gave detailed reasons in his report explaining his reasoning for excluding serotonin toxicity, namely:[329]

- Although paroxetine is a serotonergic drug, cases of serotonin toxicity related to paroxetine are rare and usually always an interaction with other serotonergic drugs.
- Neither lamotrigine nor valproic acid are serotonergic, and do not interact with paroxetine to cause serotonin toxicity.
- The clinical course of serotonin toxicity different to that seen in this case, which was rapid deterioration with multi-organ failure (especially renal, pulmonary and cardiovascular).
- Hyperreflexia and clonus (observed in serotonin toxicity) are non-specific and may also be seen with MCPA and glyphosate poisoning, as well as in hypoxic brain injury as a result of multi-organ failure.
- The oesophageal mucosal injury, severe renal impairment and profuse bronchial secretions seen in this case are not consistent with serotonin toxicity, and more likely a result of pesticide/herbicide poisoning.

267. Associate Professor Gunja gave evidence discounting serotonin toxicity in Mr Ryan's case:

"….it tends not to occur if you're just on paroxetine. You'd have to take either an overdose of paroxetine or you'd have to have paroxetine and another drug. If I can just

[327] Transcript p450 line 21 to p451 line 14
[328] Exhibit C27 p7 lines 33-34
[329] Exhibit C27 p7 lines 12-22

> *say that the serotonin toxicity seen here just does not fit anything. Um this is not the way people present with serotonin toxicity. And death from serotonin toxicity is extremely rare. Um to the point where I I've never seen a the(sic) death from serotonin toxicity. I've heard it described years ago, but it's it's extremely rare that it happens at all. Um and in this case none none of the um none of the features or the time pattern or the progression of of what happened in hospital fits with serotonin toxicity and er you wouldn't even think of it except for the fact that he's on paroxetine".*[330]

268. Dr Parkes, like Dr Gunja, did not consider that Mr Ryan suffered serotonin syndrome. Dr Parkes explained that the onset of Mr Ryan's symptoms was uncharacteristically sudden for this condition and fatalities occur in less than one percent of cases. Further, Dr Parkes said that Mr Ryan's medication doses (including his prescribed paroxetine) were all given in common therapeutic quantities. He said that, as a combination, paroxetine and lamotrigine were common. Dr Gelston had also considered, at the time of prescribing lamotrigine, that Mr Ryan would not be at risk of serotonin toxicity.

269. Dr Parkes explained that, in his opinion, Mr Ryan's mode of death was inconsistent with central nervous system problems. He would not have expected the severe acidosis and circulation failure, kidney failure, liver injury, muscle injury and failure to support circulation despite heart-lung bypass.

270. Dr Parkes gave evidence that if Mr Ryan had serotonin syndrome, he would have responded rapidly to supportive treatment – being intubation, sedation and seizure control.[331] He said in evidence "*I certainly wouldn't expect the vomiting, the fluid, the severe sweating and the subsequent presentation over the last two to three days of this gentleman's life".*[332]

271. Dr Gunja agreed with this general reasoning articulated by Dr Parkes.[333]

272. Dr Ritchey responded to the matters raised by Dr Parkes against serotonin toxicity, stating in evidence:

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[330] Transcript p578 lines 30-39
[331] Transcript p334-335 lines 35-4
[332] Transcript p326 lines 20-36
[333] Transcript p594 lines 17-33

> *"Not all serotonin toxicity is created equal and while it is fairly common for serotonin syndrome to be successfully treated there are very well-documented cases of fatal serotonin toxicity in the medical literature. Ah including um ultimately by a mechanism of multiple organ failure. I I just don't think that really helps".*[334]

273. Dr Dale also considered that serotonin syndrome as a result of paroxetine administration is *"quite rare"* and fatality is *"even more rare".* Nevertheless, he did consider Dr Ritchey's reasoning for arriving at the diagnosis as being reasonable.[335] He said the likelihood of serotonin syndrome being precipitated by the use of intravenous valproate is *"quite low".*[336]

274. Dr Dale considered, as a matter of logic, that the chances of Mr Ryan having both organophosphate poisoning and subsequently serotonin syndrome were very low. He said in his report:

> *"Therefore, although the conclusions are not impossible, they rely on a rare clinical syndrome being precipitated by intravenous valproate use as well as what would be a very unusual case of inadvertent organophosphate and carbonate poisoning without any organophosphate being seen on blood tests".*[337]

275. Dr Latt considered Mr Ryan's temperature to be too low for serotonin syndrome to have been present at the outset.[338] He also did not consider incontinence to be part of that syndrome.[339]

276. Moreover, Dr Gelston did not consider there was any real possibility of Mr Ryan developing serotonin syndrome given his long-term dose of paroxetine and that it was below the maximum dosage.[340] She also considered that one would not die quickly from this syndrome.[341] Dr Gelston said in evidence "*I think he would've had symptoms. He wouldn't have been getting out and driving the car then, and and picking up things and coming back…. and going to put things in the shed".*[342]

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[334] Transcript p423 line 32 to p424 line 18
[335] Exhibit C32 p5 [par 38]
[336] Exhibit C32 p5
[337] Exhibit C32 p5
[338] Transcript p291 lines 1-7
[339] Transcript p292 lines 2-5
[340] Exhibit 9B p3
[341] Transcript p45 lines 40-41
[342] Transcript p46 lines 25-32

Other possible causes of Mr Ryan's illness

277. Associate Professor Gunja's evidence was that, outside his own field of clinical toxicology, it is entirely possible that Mr Ryan had a non-toxicological cause of death. He speculated about the chance of a particular condition (using meningococcal infection as an example) not being detected in post-mortem examinations. However, he did not proceed to venture further into this area, stating that he was not a histologist. [343]

278. As outlined previously, Dr Parkes' thought that sepsis was the second most likely cause of Mr Ryan's illness (after chemical poisoning), stating in evidence:

> *"The other major issue would be that of sepsis or infection, so an overwhelming severe infection. So this would be how infections such as meningococcal septic shock may present, very rapid onset of severe compromise. Of itself, this doesn't sound primarily cardiac in nature, it just seems to be too many other things going on. It doesn't seem to be primarily a neurologic event or a stroke or anything like that, so I could come down to poisoning or severe overwhelming infection.*[344]

279. Dr Bell's view in relation to the possibility of infection (sepsis infection, meningococcal and /or septic shock) was that:

> *"They certainly can cause rapid death but usually the autopsy results post-mortem examination give you a much different picture as to the cause of death".*[345]

280. Dr Ritchey said the autopsy excluded sepsis as a cause of death: *"I'm satisfied the infection was not present".*[346] Dr Ritchey also did not see a particular source of meningococcal disease nor for septic shock.[347]

281. Apart from an infective source of Mr Ryan's illness, other causes of death were properly explored, but without there being any factual basis pointing in those directions.

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[343] Transcript p596 lines 18-28
[344] Transcript p325 lines 5-12
[345] Transcript p453 lines 37-40
[346] Transcript p413 lines 19-34
[347] Transcript p413 line 41 to p414 line 3

282. Associate Professor Gunja commented that people are very unlikely to die through drinking diesel or unleaded petrol.[348]

283. Associate Professor Gunja stated that it takes a week to die from paraquat.[349] He stated that paraquat poisoning can see an individual vomiting initially, and then nothing happens for a few days or a week, and then death would occur. Paraquat toxicity symptoms would be vastly different from the symptoms displayed by Mr Ryan, since causes lung and kidney problems, not issues with the brain, nor lowering of blood pressure.[350]

284. Associate Professor Gunja ruled out funnel-web spider bite poisoning because death was unlikely to result, there were no bite marks seen and the symptoms were not consistent with such an occurrence. [351] Dr Parkes did not consider Mr Ryan's circumstances to be characteristic of being bitten by any of the Tasmanian spiders.[352] On the other hand, Dr Latt thought it *"possible"* but his reasons were not explored.[353]

285. Associate Professor Gunja ruled out a paroxetine overdose as being inconsistent with Mr Ryan's presenting symptoms.[354] I note that the ante-mortem blood sample revealed a high therapeutic level of paroxetine in Mr Ryan's blood, which does not, in itself, enable a finding that he deliberately ingested an excessive quantity above that prescribed. Such a level may also be consistent with taking paroxetine in the usual prescribed quantity.[355] There was no other evidence in the police investigation that Mr Ryan had deliberately taken a very large overdose of paroxetine necessary to produce his symptoms, although the scene investigation was limited and delayed.

286. Dr Parkes ruled out a snake bite on the basis that the major feature of snake bites in Tasmania is disturbance of blood coagulation which was not present.[356] Dr Latt also thought it unlikely as he considered the bite marks would have been visible when washing down Mr Ryan's body.[357]

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[348] Transcript p597 lines 30-31
[349] Transcript p601 lines 5-9
[350] Transcript p602 lines 1-13
[351] Transcript p607 line 39 to p608 line 12
[352] Transcript p327 lines 16-20
[353] Transcript p290 lines 4-7
[354] Transcript p619 line 34
[355] Transcript p619 line 29-35
[356] Transcript p327 lines 1-3
[357] Transcript p289 lines 40-41

287. Dr Gelston considered a ruptured aneurysm.[358] Dr Parkes ruled out an aneurysm.[359] Dr Latt concurred.[360] Autopsy did not reveal any aneurysm.[361]

288. Dr Gelston raised the possibility of an ulcer.[362] Dr Parkes ruled out an ulcer, saying we would expect to have seen that.[363] Dr Latt concurred. [364] Autopsy did not reveal an ulcer as a cause of death.

289. Dr Gelston mentioned the possibility of Mr Ryan having suffered an anaphylactic reaction.[365] Dr Parkes also ruled out an anaphylactic reaction. He thought it was too severe and "out of keeping" for that to have been a cause.[366] Dr Latt concurred.[367]

290. Dr Parkes was also asked about viral gastroenteritis. He said there were no indicators in his high blood pressure of an acute viral infection and that it was just *"too sudden"*.[368]

291. Finally, Dr Parkes thought meningococcal infection was very unlikely as the cultures were negative.[369] Dr Ritchey was adamant in excluding an infectious cause of death, as that would have been detected in all of the post-mortem investigations.[370]

Whether any other person was involved in Mr Ryan's death

292. Although the circumstances of Mr Ryan's death were explored in detail, the evidence did not suggest that Mr Ryan was the victim of a homicide or, alternatively, that any other person negligently contributed to the circumstances of his death.

293. The evidence indicates that the farm the staff viewed Mr Ryan as quiet, a bit different, and had own way of doing things. He seemed to get on well with most people. There is no evidence that he had any enemies on the farm or issues with his work colleagues. There is no evidence at all that any person wished him harm.

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[358] Transcript p45 lines 32-35
[359] Transcript p327 line 22
[360] Transcript p290 lines 9-18
[361] Exhibit C4 p5 and p8
[362] Transcript p43 line 35
[363] Transcript p327 line 24
[364] Transcript p290 lines 23-33
[365] Transcript p45 lines 22-24
[366] Transcript p327 line 30
[367] Transcript p290 lines 35-36
[368] Transcript p327 lines 33-36
[369] Transcript p328 lines 15-18
[370] Transcript p413 lines 25-40 entries

294. Moreover, when Associate Professor Gunja was asked about the possibility of a third party giving Mr Ryan a lethal dose of glyphosate he answered:

> *".. if that was the case you would know that you're drinking something very strange and you would expect that he would know what glyphosate – I mean if he worked on a farm with chemicals all his life, he would know what that chemical smells like. He would know what herbicide smells like. He would know what Roundup smells like. And it would look, it wouldn't – it would look like a drink that you shouldn't drink. So if someone hands you a drink. It's not like you're at a bar and someone hands you a cocktail. You're out on a cattle station and someone offers you a drink that smells and tastes weird, the – that that goes into that whole um paradigm of accidental poisoning that I was talking about".*[371]

295. Given the quantity of the farm chemicals required to produce Mr Ryan's severe symptoms, it is fanciful to consider that he could have consumed such quantities without knowing he had done so.

The emergence of the diary and Mrs Ryan's credibility as a witness

296. Mr Ryan's diary was produced to the court by Mrs Ryan, nearly 7 years after her husband's death and after she had given her oral evidence at inquest. In her further oral evidence in December 2021 she said she packed up Mr Ryan's diary about three months after he died and did not get it back out again until the inquest finished (part-heard) in October 2021.[372] It is surprising that she did not apparently turn her mind to the potential importance of the diary in light of what she knew to be an ongoing and complicated investigation into her husband's death.

297. As submitted by counsel assisting, there are some concerning entries in the diary that were made by Mrs Ryan herself. When she was recalled to the witness box to give evidence about the diary, her explanations lacked credibility.

298. There was an entry made in the diary by Mrs Ryan for the date 2 December 2014 stating *"predicting tummy wog"*. Under questioning by counsel assisting, Mrs Ryan explained that she would often write in Mr Ryan's diary. She stated in respect of the

[371] Transcript p615 line 38 to p616 line 5
[372] Transcript p663 line 31 to p664 line 25

entry "*that was because obviously his dad had the gastro on the 29th so that's why I predicted that that's what we had.*[373]

299. However, when further questioned, Mrs Ryan said that the entry she made predicting that her husband would have a "tummy wog" was actually made *after* his death, within a period of about three months. As submitted by counsel assisting, this evidence was bizarre in nature. It defies normal human experience that one would retrospectively record a predicted event, especially an event of little objective importance, unless that record was made with a view to inducing a belief in anyone subsequently reading the diary that Mr Ryan's death was linked to that emerging illness.

300. Mrs Ryan said that she also made an entry on the following day, 3 December 2015. This entry stated *"Imogen turned one"* and three *"Xs"*. She gave evidence that she *would have* written that entry on the same day, explaining *"– cause like on the calendars and stuff I always wrote the kids birthdays and put kisses at the bottom of them so I'm guessing that's what I've done there"*.[374]

301. Counsel assisting questioned Mrs Ryan about the anomalous nature of her notes in her husband's diary, which was essentially a diary recording his farm work commitments. He also submitted that her use of the past tense in respect of their daughter's birthday suggests that the event had already occurred when she made the notation and was not written contemporaneously. There is some force to this submission.

302. Another entry was made by Mrs Ryan in the days leading up to 16 December 2015 relating to some farm work, called *backlining,* being done by Mr Ryan. In evidence, she could not explain what backlining was, stating that someone told her about it and she wrote it down. She said that she made the record after the work had been done. Mrs Ryan was at somewhat of a loss to explain why she made the entry, she stated "*I'm sorry I don't know why it was a long time ago"*.[375]

303. Mrs Ryan's manner of answering questions at inquest was histrionic and her answers to questions appeared dramatic and deliberately constructed. Much of the content did not accord with other objective evidence.

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[373] Transcript p670 line 15
[374] Transcript p670 line 2 to p671 line 7
[375] Transcript p672 line 39 to p673 line 25"

304. There is no reason at all to doubt Dr Latt's evidence that Mr Ryan, during his hospitalisation at SMCHC, remained confused and unable to provide crucial history to doctors about his symptoms and what happened to him. Similarly, LGH staff could not properly obtain a history from Mr Ryan himself due to his inability to communicate. Nevertheless, Mrs Ryan maintained that he was not confused, stating *"I actually don't remember him being confused at all, the whole time.*[376]

305. She stated that at the SMCHC that she asked her husband if he had been stung by a bee or bitten by a snake and he responded with words to the effect of *"No baby, the only thing that he had done differently was to pick up the chemicals"*. She then said to him *"you didn't drink them, did you?"* He responded *"don't be so fucken' stupid baby"*. This evidence had an air of unreality about it.

306. Mrs Ryan gave evidence about why she asked Mr Ryan whether he drank the chemicals, stating with "*I always think I'm a bit of a comedian and I have a little bit of a, never in a million years would I have thought that, it was just me. . I didn't know my husband was going to die. I expected him to come home, you know, I was just being a comedian. I walked in there, he's sitting up, he knew who I was, and I thought he was coming home. And no way in a million years, would I have thought that he'd done that. It's just me and my stupid sense of humour".*[377]

307. I do not accept that Mrs Ryan was able to receive coherent answers from Mr Ryan. Her questioning him about whether he drank chemicals, assuming that question was asked, suggests a genuine concern about whether he had attempted suicide. Mr Ryan was severely unwell and, at a time when the doctor and staff were attempting to urgently understand what happened, her evidence that she was joking with him seems implausible.

308. Counsel assisting questioned Mrs Ryan about her relationship with Mr Ryan. Again, her evidence came across as embellished and artificial. The following passage exemplifies the issue:

> *"MR LEE: Just in terms of your relationship with Robert, if I was to ask you on a scale of 1 to 10, what your relationship was like, 10, let's say 10 would be the best relationship of anyone in the world and 0 might be atrocious and need to leave, sort of thing, do you understand that scale?..... Yes, I do.*

[376] Transcript p123 line 41 to p124 line 15
[377] Transcript p123 lines 16-33, and p674 lines 34-39

So where would you rate your relationship with?..... 11.

11?..... Yep, it was pretty darn good." [378]

309. To score the relationship as an honest "11" was, I consider, an unhelpful answer. It was outside the requested rating parameters and inconsistent with the known reality of relationships. She went on to state that she loved spending time with him (even when he was at work), they never argued, and had no financial worries.

310. When questioned specifically about the negative aspects of her relationship, the only issue she described was that on one occasion *"he watched porn without me and I got really offended by it.…*[379] I do not accept her evidence that this was the single instance of tension in their relationship. Mr Ryan's diagnosis of bipolar disorder and his ongoing management of it must have presented challenges in the relationship to a greater or lesser degree. I do not understand why Mrs Ryan articulated such a matter in the public inquest into the death of her husband, even if she intended it to be amusing.

Was Mrs Ryan involved in Mr Ryan's death?

311. The hypothesis that Mrs Ryan intentionally poisoned Mr Ryan with an unknown substance, not necessarily a farm chemical, is required to be considered. I have outlined above that significant aspects of Mrs Ryan's evidence were bizarre and unsatisfactory. She was either unwilling or unable to give the court an accurate account of her relationship with Mr Ryan. Inexplicably, she also made, retrospective entries into his diary following his death.

312. It would seem that Mrs Ryan, if she had been so inclined, may well have had the opportunity of placing a lethal substance in her husband's coffee which he consumed in the morning of 7 January 2015 just before he became ill at the gates of Malahide. However, no lethal poison of any type was detected in his ante mortem blood. A high level of sophistication would be required to source a poison that would be undetectable in his blood. I accept the submission of counsel assisting that Mrs Ryan likely did not have the ability to execute such a plan.

313. There was no evidence of family violence between Mr and Mrs Ryan and there was no evidence from witnesses at the inquest about serious issues between them. Of course, it is possible that their relationship was far from happy, despite Mrs Ryan's evidence.

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[378] Transcript p125 line 32 to p126 line 12
[379] Transcript pp675-684

The reality of their relationship is known to Mrs Ryan and possibly to others but nothing emerged at inquest. I am unable to make any further findings about it.

314. Further, the inquest did not uncover a motive on the part of Mrs Ryan to kill her husband and, over many years of investigation, no witnesses have emerged to lend support to this theory.

315. It does seem, in fact, that Mrs Ryan had genuine affection for her husband and that she appreciated him after having formerly experienced a very unhappy and allegedly controlling relationship. [380] Indeed, in other coronial cases where the cause of death is unknown but less difficult, the hypothesis that a spouse in an unremarkable relationship might be involved in the death would be able to be discounted readily.

316. The strange evidence given by Mrs Ryan may be partly explicable in terms of her personality, ongoing grief and the stress of being in the witness box. I cannot determine exactly when she made the entries in the diary but she may have done so just prior to giving evidence. Mrs Ryan's evidence and diary entries may be thought to be consistent with covering up some knowledge on her part of suicidal intentions by Mr Ryan.

Did Mr Ryan die as a result of suicide?

317. The hypothesis that Mr Ryan deliberately ended his own life by ingesting a substance was a significant focus of this inquest.

318. Dr Gelston gave evidence that Mr Ryan had never expressed any suicidal ideation, either volunteered or upon questioning, at any of his appointments in 2014.[381] However, not uncommonly, suicide attempts and suicide itself occur unexpectedly without prior expression of intent.

319. Relevantly, Dr Gelston gave the following evidence regarding the likelihood of Mr Ryan dying by suicide:

> *"I was asked if he could've committed suicide. No, I don't think he would have committed suicide. He seemed quite happy when I saw him up until December. He seemed happy with his – he was happy with his job, um he seemed happy with his wife, he seemed happy with – had a daughter. He certainly got on well with his*

[380] Transcript p141
[381] Exhibit C9B p4

parents. My understanding was he was very close to his parents, got on well with them. I met them and assisted, they came over when he was in ICU. And um I would've very much doubted he'd have committed suicide".[382]

320. Dr Gelston's evidence was clear and considered. I have no doubt that she had good reasons as his treating Dr to consider that Mr Ryan was not, or not significantly, at risk of suicide. Mr Ryan certainly was not a patient who had a history of suicidal ideation or self-harm. He obviously suffered mood issues and it is entirely plausible that he suffered suicidal ideation that he did not disclose to others.

321. Mrs Ryan's evidence on this subject was as follows:

"Rob had been diagnosed with bipolar disorder prior to me meeting him. But apart from one time where he had been a bit flat which I had already mentioned in my previous affidavit, I don't ever recall a time that I would describe Rob as being depressed or in a state where he would have hurt himself or considered taking his own life. The thought of Rob taking his own life is just simply absurd. The whole time I have known him, there has never been any incident, time or comment that would make me think or suggest anything of the sort".[383]

322. Mrs Ryan maintained that her husband never mentioned suicide or self-harm.[384] She described him as being good at complying with his medication.[385]

323. I consider that it may well be the case that Mr Ryan did, in fact, speak of the possibility of suicide with his wife. I do not accept her denials at face value due to her unwillingness to provide credible evidence about their relationship or to countenance any suggestion that it was less than perfect in any respect. Not having the benefit of frank and honest evidence from the person closest to him, I can make no finding regarding the existence or extent of any suicidality. There is certainly no evidence that he had ever expressed suicidal ideation to any other person.

324. There was credible evidence regarding two instances of angry behaviour by Mr Ryan. Mr Barnes mentioned an instance 12 months before his death where Mr Ryan, in disciplining a working dog, scruffed it and drove it violently into the ground.[386] Mr Barnes also recounted an incident where Mr Ryan described driving his utility through

[382] Transcript p46 lines 1-9
[383] Exhibit C11A p4 [par20]
[384] Transcript p125 lines 24-30
[385] Transcript p129 lines 8-12
[386] Transcript p257

the head of a tree rather than moving the tree.[387] Whilst clearly Mr Barnes considered these instances to be unusual, the most to be gleaned from them is that he may have been susceptible to impulsive acts at times.

325. No note or writing by Mr Ryan was located in the investigation expressly or impliedly articulating an intention to end his life. This in itself does not rule out suicide. Furthermore, given the inadequacies in the investigation and the issues with Mrs Ryan's evidence, it is not beyond comprehension to consider that there may have been a note left but not disclosed in the investigation. It is also plausible that, if Mrs Ryan sought to conceal the fact of his suicide, she disposed of any receptacle used to ingest poison or any excess paroxetine.

326. Dr Parkes said that Mr Ryan's mental illness must have been very significant for him to have been taking paroxetine as well as lamotrigine as a mood stabilising agent.[388] It is clear that, in December with when Mr Ryan was prescribed lamotrigine, he was sufficiently was concerned about the stability of his mood to ask Dr Gelston to add another medication.[389] It does not appear to me that Mr Ryan was a person who regularly sought additional medications or unnecessary treatment if he did not consider it was warranted.

327. Dr Ritchey gave evidence that bipolar disorder is a risk factor for suicide.[390]

328. Mr Woods described the surreptitious behaviour of Mr Ryan around the animal shed before the onset of his sudden illness. This might be suggestive of Mr Ryan intending self-harm by accessing Dectomax from the animal shed and possibly consuming it at that place. The misplaced drenching gun lends some support to this hypothesis. Whilst Mr Woods was a credible and helpful witness, there should be caution in attributing particular meaning in hindsight to what might be an ordinary event. Gunja said that he considered someone would be more likely to just drink it than to use a drenching gun with applicator.[391] Although he had never encountered a case of self- harm using such a device, the applicator is designed to deliver the substance rapidly down the throat of cattle. The state of the evidence about the ease of delivering it to the human system was not fully explored and is unclear.

[387] Transcript p258 lines 9-30
[388] Transcript p331 lines 24-26
[389] Transcript p40
[390] Transcript p411 lines 25-26
[391] Transcript p618 lines 19-27

329. Associate Professor Gunja with made this observation about Mr Ryan verbalising nothing at all about deliberately consuming an poison:

> *-"This is the most baffling thing about this whole case for me is that he doesn't say any kind [indistinct word(s)] I took – I drank this thing. Um I don't understand that. I've never had a case like that where – doesn't matter, you you – I mean unless they they were so unconscious and comatose and you needed to intubate them, [indistinct word(s)] will eventually admit that they drank a chemical. And that's what I find very odd about this case…..*
>
> *… so that that's what's surprising to me. Um even when he's presented [indistinct word(s)] he was seemingly awake enough to give them a story and deny that. And we do have people who initially deny it but eventually tell you that they took something. Um so that's very strange and that's probably the main thing that goes against this being poison. That this is not a toxicological problem, it's that he never admits that he's taken something. Um apart from that, this very much appears to be a death from chemical poisoning".*[392]

330. Dr Parkes said nothing was conveyed to him by nursing staff in respect to deliberate self-harm. He said:

> *"When I was first involved with him he was unconscious and ventilated, but we had nothing from any of the previous treating teams or, indeed, from his family that that was likely to be an issue. There was no indication of that".*[393]

331. The fact that there was no evidence whilst Mr Ryan was being treated that he had made an attempt at suicide is yet another difficult aspect of this case. Experience suggests that suicide attempts are often known or suspected at an early stage and, in the case of death by suicide, shortly afterwards upon police investigation of the scene. The vast majority of suicide investigations present a coroner with toxicological, forensic, medical, scene and witness evidence pointing to an intention that the deceased intended to end his or her own life. This case did not at an early stage point in that direction. Even after many years of investigation, positive evidence of suicide has not been uncovered.

332. Counsel for Mrs Ryan, Mr Grey, strongly submitted that a finding of suicide could not be made upon the evidence. He submitted, persuasively, that it was unrealistic in the

[392] Transcript p613 line 30 to p614 line 3
[393] Transcript p 331 line 41 to p332 line 2

context of the ordinary morning of 7 January that Mr Ryan ingested poison with the intention of ending his life. Although possible, Mr Ryan had only a short window of time to ingest a significant quantity of a toxic substance and in an area where others were likely to be. Even if the suicide attempt was impulsive, there would be no guarantee that he would die, as opposed to using other methods. The difficulty of swallowing the substance would have been considerable, if it was possible at all.

Conclusion

333. After examining the evidence from many angles and against numerous hypotheses, the cause and circumstances surrounding of Mr Ryan's sudden and unexpected medical event at the gates of Malahide whilst he was working, remain a medical and factual enigma. I cannot make any finding about what caused his death.

334. All of the witnesses, except Mrs Ryan, gave good evidence and were credible. Malahide staff co-operated with and assisted the court to try and understand what happened to Mr Ryan.

335. In particular, all of the expert medical witnesses imparted a high degree of knowledge and expertise in order to try and assist the court to be able to make findings in this inquest. I am most grateful for their assistance.

336. The treating doctors and staff at both SMCHC and LGH were presented with a most complex and challenging case. The diagnosis of Mr Ryan's condition as chemical poisoning was the most plausible diagnosis to be made upon the scant history and facts. There was also appropriate consideration of other possible conditions. The treatment administered was of a high standard. As I have discussed above, his death could not have been reasonably prevented.

337. Each of the six medical experts and treating doctors giving evidence in this case were respectful of the opinions of the others, despite significant differences. All demonstrated excellent knowledge within their fields and beyond. The expert medical witnesses, in particular, acknowledged that elements of the evidence did not fit with each proposed hypothesis regarding cause of death. For example, Dr Ritchey said *"there are really large and important gaps in the scientific data that limit our ability to understand very thoroughly what's happened to this man"*.[394] Such a statement encapsulates the difficulties of the experts in providing their various opinions.

[394] Transcript p416 lines 29-31

338. The existence of disagreement between the medical experts, in my view, only serves to illustrate the factual and causal complexity of the case.

339. I have already in this finding set out my comments upon the various scenarios postulated as causes and circumstances of Mr Ryan's death. I have also made findings where necessary relating to the credit of witnesses and about the weight to be given to particular evidence.

340. In summary, the main difficulties with making factual findings regarding the manner and cause of Mr Ryan's death include the following:

- There is no unequivocal evidence of ingestion or overdose by Mr Ryan of any substance.
- There were no broken or damaged seals seen on the chemical containers at Malahide or any leakages or spills.
- The autopsy did not reveal any pathology indicating a cause of death.
- Mr Ryan's symptoms, whilst suggesting chemical poisoning, were similar to several other possible conditions.
- Toxicological and forensic testing of blood and scene exhibits provides no indication of cause of death.
- There was differing opinions regarding Mr Ryan's diagnosis/diagnoses from the experienced experts and treating medical practitioners.
- Mr Ryan appeared to be generally physically healthy before his death.
- Mr Ryan appeared to be happy and stable in mood throughout the morning before his illness.
- No other farm workers on Malahide suffered any poisoning symptoms or similar severe illness.
- There is no evidence of any unsafe work practices on Malahide relevant to the investigation.
- There was uncertainty about the types of farm chemicals kept at Malahide.
- Mr Ryan did not have a history of suicidal ideation, despite his diagnosed bipolar disorder.
- Mrs Ryan's evidence could not be relied upon, did not assist when it potentially could have done so and prompted further questions.
- No suicide notes or indications of suicide were found upon the evidence.

- No reliable history could be given by Mr Ryan to any treating medical professional due to his state of confusion.
- Incidental contact with the farm chemicals in question is unlikely to produce sudden and severe symptoms such as those experienced by Mr Ryan.
- Mr Ryan's sudden medical episode on 7 January 2015 was not reported until he later passed away. Therefore important evidence from the scene (including his house, utility and farm as a whole) may have been lost by the time the investigation commenced three days later.

341. I agree with the submission of counsel assisting who stated that, given the high calibre of medical witnesses who gave evidence in this case, and the complexity of the matter, I ought to be extremely reluctant to rule out any of their opinions. It is therefore necessary to assess the various possibilities regarding causes and circumstances in terms of which are plausible or possible to a greater or lesser degree.

342. Associate Professor Gunja, Dr Bell, Dr Latt and Dr Parkes all consider Mr Ryan had suffered some form of farm chemical poisoning. Dr Dale concluded that farm chemical poisoning by organophosphates, carbamates, glyphosate, MCPA and LI-700 was unlikely. Even taking into account differing responses of an individual to, there remains significant problems outlined in this finding of identifying the ingestion of a particular chemical with confidence. If a particular chemical cannot be identified, then other causes of Mr Ryan's illness require close consideration. In particular, Dr Ritchey's opinion that Mr Ryan suffered serotonin syndrome from the outset should not be dismissed, notwithstanding the difficulties. Dr Dale agreed that the possibility of serotonin syndrome as the initial cause explained several findings, despite it being rare.

343. In addition to the issues I have listed above, a summary of the most significant issues with a finding of poisoning by particular chemicals is as follows:

    a) MCPA, whilst available on the farm, was not detected upon testing with pre-dialysis blood. It is unlikely, therefore, that this chemical was involved in Mr Ryan's death.

    b) Organophosphates, not believed to be on the farm[395], were not detected upon testing with pre-dialysis blood. It is therefore unlikely that Mr Ryan

[395] However, note that Rametin (responsible for Mr Woods' toxicity in 2011) is classed as an organophosphate.

had organophosphate poisoning, despite his similar symptoms and positive response to atropine.

c) Carbamates, *not* believed to be on the farm, were not the subject of any testing. Like organophosphate poisoning, his symptoms and response to atropine suggested this is a possibility. However, the evidence of carbamate ingestion remains speculative.

d) Doramectin (found within the drench Dectomax) contained in the animal shed on the farm, was not the subject of blood testing or reliable testing upon exhibits, and there is little research upon poisoning with this substance. Incidental and inadvertent contact with doramectin during farm work would not produce sudden illness. Given Mr Ryan's possible handling of this chemical before his death, there is some plausibility to the hypothesis that he ingested this substance impulsively with the intention of ending his life. However, the evidence of the events and circumstances of the morning of 7 January 2015 (prior to his illness) do not of themselves point towards suicide.

e) Glyphosate, available on the farm as Roundup Ultra Max, was not detected in post-dialysis blood. It is possible that dialysis removed all traces of glyphosate but this conclusion is far from certain. It is quite plausible that, if a fatal dose of glyphosate was ingested, it would have been detected in the post-dialysis blood. Further, glyphosate poisoning is difficult to explain in the presence of Mr Ryan suffering hypokalaemia. Incidental and inadvertent contact with glyphosate during farm work would not produce sudden illness. There is some plausibility to the hypothesis that he ingested glyphosate with the intention of ending his life. However, as with my comments relating to doramectin, the factual circumstances do not point towards suicide.

f) Paraquat, a highly toxic blue chemical was present on the farm and likely in the animal shed, did not form part of the coronial investigation until inquest. Therefore, there was no testing or investigation into its possible relevance. There is no evidence that Mr Ryan used paraquat or had come into contact with it. There is no evidence that proper precautions were not followed relating to the storage of paraquat or any other chemical. Further, Mr Ryan's symptoms did not accord with those expected with

paraquat poisoning. Paraquat was not a target analyte in any of the forensic testing. Whilst it is speculative to consider that paraquat was involved, in light of the difficulties with the other hypotheses, I am reluctant to reject that possibility.

g) Diquat (within the herbicide Reglone) was likely present in the animal shed and may be blue in colour. These facts emerged only at inquest. There was no expert evidence regarding the potential toxicity of diquat and again, it is speculative to consider that it played a role in Mr Ryan's death. There was no evidence that he handled it. Diquat was not a target analyte in the forensic testing in this investigation.

344. Therefore, it should be apparent that, whilst Mr Ryan's illness appeared to the majority of the experts to be a farm chemical poisoning, it is far from clear what that chemical actually was and how his exposure occurred. If Mr Ryan had been exposed (other than by oral ingestion) to chemicals in the course of his work, symptoms would likely present over time and would not be suddenly lethal.

345. It might be possible that Mr Ryan came into inadvertent contact with a highly toxic chemical not the subject of evidence – whether at Landmark or on the farm – but there is no evidence that this occurred and no reasonable hypothesis fitting the circumstances. Although Mr Ryan worked regularly with drenching chemicals and possibly herbicides, there is no evidence that he had any symptoms that would indicate accumulated toxicity over time.

346. Counsel for Mrs Ryan submitted that it is possible that, with accumulated exposure, Mr Ryan accidentally ingested a small quantity of chemical which then triggered severe symptoms. He submitted that Mr Ryan's prescription medications may have also contributed to his symptoms. I would ordinarily reject such a hypothesis due to the insufficient evidence in the investigation generally and it being contrary to the weight of expert opinion. However, due to the very significant issues with every other postulated cause, I cannot completely discount such a scenario. It is, however, to be categorised as unlikely but possible.

347. I accept the evidence of Dr Dale that it would be impossible to drink such a large quantity of the main chemicals under consideration at inquest without knowing that they had been ingested. I am able, in respect of this one hypothesis, to discount that Mr Ryan died by *accidentally or inadvertently* drinking glyphosate, MCPA, organophosphates, carbamates or doramectin.

348. In relation to suicide by *intentional or deliberate* ingestion of a farm chemical, I have already discussed the main difficulties in positively making such a finding. There is no evidence of him making threats of self-harm or any attempts to do so. Both Mrs Ryan and Dr Gelston did not believe he was depressed and did not see it as a possible explanation for his death. His work colleagues did not appear to know he even suffered from mental illness. There was no note and no apology or admission. Despite the evidence suggesting Mr Ryan was confused and collateral history needing to be obtained from work colleagues, Mr Ryan did appear capable of talking initially at the front gate and at SMCHC albeit on a very limited basis. He specifically denied taking a poison to Dr Latt when he might be expected to provide a truthful answer. Despite the fact that the main chemicals considered at inquest required deliberate oral ingestion to be lethal, I consider the totality of evidence as falling short of allowing a finding of suicide. However, suicide remains a possibility.

349. An act of homicide using an unknown substance is a theoretical possibility but highly unlikely.

350. Serotonin toxicity as a cause of Mr Ryan's illness *from the outset* seems problematic. Death from this condition is rare and, for the reasons detailed, paroxetine-induced serotonin toxicity in similar circumstances would be considered extremely unlikely due to the absence of other serotonergic agents. Whilst Mr Ryan's sudden illness did not match the usual clinical course for serotonin syndrome, I cannot discount that he may have taken a greater than prescribed amount of paroxetine before the onset of his illness, which might have induced such a condition. The absence of scene and toxicological evidence of poisoning means that serotonin toxicity cannot be discounted as a cause of death.

351. It is doubtful, but possible, that Mr Ryan suffered a reaction to an insect bite for the reasons already discussed. There was no evidence of bite marks, no localised swelling and his symptoms did not appear to correspond to such an event. A snake bite would have been detected and I can discount this as a cause of death.

352. Mr Ryan developed atropine poisoning in hospital because of his treatment. It is unlikely, but possible, that it played some role in his deterioration and then his death.

353. Apart from serotonin syndrome being the initiating cause of Mr Ryan's illness, he may have developed serotonin syndrome in hospital due to treatment drug interactions and it may have played a role in Mr Ryan's death.

Findings

354. In accordance with section 28(1) of the Coroners Act 1995, I make the following findings:

    a) The identity of the deceased is Robert John Ryan;

    b) The circumstances surrounding Mr Ryan's death have been set out in this finding;

    c) Mr Ryan died due to multiple organ failure, although I cannot determine the cause of his multiple organ failure to the requisite standard; and

    d) Mr Ryan died on 9 January 2015 at the Launceston General Hospital.

355. I do not consider, in this case, that it is appropriate to make any recommendations pursuant to section 28(2) of the *Coroners Act* 1995.

Acknowledgements

356. I acknowledge the assistance provided by FSST and the officers of Tasmania Police involved in this investigation. I also acknowledge the assistance of all counsel, particularly counsel assisting, Mr Lee.

357. I am also grateful to the staff of the Coroner's Office and for the valuable assistance of intern Ms Gloria Jeziel.

358. I extend my condolences to the family and loved ones of Mr Ryan.

Dated: 30 January 2024, Hobart in the State of Tasmania

Olivia McTaggart
Coroner

"A"

LIST OF EXHIBITS

Record of investigation into the death of ROBERT JOHN RYAN

No.	TYPE OF EXHIBIT	NAME OF WITNESS
C1	REPORT OF DEATH	CONST J IRELAND
C2	LIFE EXTINCT AFFIDAVIT	DR S PARKES
C3	ID AFFIDAVIT	CONST C FREEMAN-FINN
C4	POST MORTEM REPORT	DR D RITCHEY
C5	INTERIM PM	DR D RITCHEY
C6	TOXICOLOGY REPORT	N MCLACHLAN-TROUP (FSST)
C7	TOXICOLOGY REPORT	DR M MANTHEY (FSST)
C7A	EMAIL FSST TESTING OF SAMPLES	N MCLACHLAN-TROUP (FSST)
C8	TOXICOLOGY REPORT - SPECIALISED TESTING	QUEENSLAND SCIENTIFIC SERVICES
C9	MEDICAL NOTES	DR S GELSTON
C9A	LETTER (12 July 2019)	DR S GELSTON
C9B	REPORT (12 August 2021)	DR S GELSTON

C10	**MEDICAL RECORDS**	**ST MARY'S HOSPITAL**
C11	**AFFIDAVIT (12 October 2016)**	**D RYAN (SNOK)**
C11A	**SUPPLEMENTARY AFFIDAVIT (28 November 2018)**	**D RYAN (SNOK)**
C11B	**TYPED NOTE**	**D RYAN (SNOK)**
C12	**AFFIDAVIT (10 January 2015)**	**E BEACHAM (PROPERTY MANAGER – 'MALAHIDE')**
C13	**AFFIDAVIT (25 November 2016)**	**A WOODS (ASSISTANT PROPERTY MANAGER – 'MALAHIDE')**
C13A	**SUPPLEMENTARY AFFIDAVIT (8 April 2019)**	**A WOODS**
C13B	**SUPPLEMENTARY AFFIDAVIT (23 April 2019)**	**A WOODS**
C13C	**ST MARYS HOSPITAL RECORDS**	**A WOODS**
C14	**EMAIL DATED 19/1/2017**	**L BENNETT**
C14A	**STATEMENT (UNDATED)**	**L BENNETT**
C14B	**AFFIDAVIT (UNDATED)**	**L BENNETT**
C15	**AFFIDAVIT (1 February 2017)**	**SGT S WARD**

C16	**AFFIDAVIT + PHOTOS (3 March 2017)**	**S/CONST P MCCARRON**
C17	**AFFIDAVIT + PHOTOS (22 February 2017)**	**S/CONST D STAFFORD**
C18	**MEDICAL RECORDS**	**LGH**
C18A	**MEDICAL CHARTS**	**LGH**
C19	**INVESTIGATION REPORT**	**WORKSAFE TAS**
C19A	**LETTER DATED 29/11/2018** **REPLY LETTER DATED 4/12/2018**	**S THOMPSON (DPP)** **M COCKER (WORKSAFE TAS)**
C20	**TRIBUNAL FILE**	**WORKERS REHABILITATION AND COMPENSATION TRIBUNAL**
C21	**AFFIDAVIT (21 April 2019)**	**R BARNES**
C22	**AFFIDAVIT (30 April 2019)**	**CONST P BERGERSEN**
C22A	**PHOTOGRAPH**	**CONST P BERGERSEN**
C22B	**PHOTOGRAPH**	**CONST P BERGERSEN**
C22C	**PHOTOGRAPH**	**CONST P BERGERSEN**
C23	**EMPLOYMENT CONTRACT (UNDATED)**	**R RYAN**
C24	**LABORATORY REPORT DATED 19.12.2019**	**DR C GARDNER (FSST)**

	AND EMAIL	
C24A	**EMAIL (13 March 2020)**	**CRAIG GARNER (FSST)**
C25	**MALAHIDE PROPERTY LAYOUT**	**CONST P BERGERSEN**
C25A	**MALAHIDE MAP**	**CONST P BERGERSEN**
C25B	**MALAHIDE AERIAL MAP**	**CONST P BERGERSEN**
C25C	**EXPLANATORY EMAIL**	**CONST P BERGERSEN**
C26	**REPORT (26 May 2021)**	**DR ANTHONY BELL**
C26A	**CURRICULUM VITAE**	**DR ANTHONY BELL**
C27	**REPORT**	**A/PROF. NAREN GUNJA**
C28	**TASTAFE CERTIFICATES**	**ROBERT RYAN**
C29	**AFFIDAVIT (17 September 2021)**	**PATRICK DARGAN**
C30	**MEDICAL RECORDS BRIDPORT**	**ROBERT RYAN**
C31	**AFFIDAVIT (9 August 2021)**	**MARK FORTEATH**
C32	**REPORT**	**DR DALE**
C32A	**SDS -IDENTIFICTION OF THE MATERIAL AND SUPPLIER**	
C32B	**SDS -ACCORDING TO WHS REGULATIONS**	
C32C	**SDS- DECTOMAX**	
C32D	**NUFARM SAFETY DATA SHEET FEB 2020**	
C33	**SITE PHOTOGRAPHS 1-14**	

C34	**AFFIDAVIT (21 October 2021)**	**DR DALE**
C35	**AFFIDAVIT (10 November 2021)**	**DR GELSTON**
C36	**AFFIDAVIT (17 November 2021)**	**STEPHEN ANDERSON**
C37	**AFFIDAVIT (4 November 2021)**	**ALLISTER WOODS**
C38	**AFFIDAVIT (14 November 2021)**	**SRGNT GENEVIEVE HICKMAN**
C39	**MANILLA FOLDER**	
C40	**DIARY OF ROBERT RYAN**	**DEBRA RYAN**
C41	**AFFIDAVIT & CARDS, NOTEBOOKS**	**DARRELL GRAY**
C42	**ANALYICAL REPORT (18.12.15)**	**QUEENSLAND FORENSIC AND SCIENTIFIC SERVICES**