IN THE MATTER OF THE INQUIRIES ACT 2014

AND IN THE MATTER OF A BOARD OF INQUIRY INTO THE MCCRAE LANDSLIDE

ENTITY: SOUTH EAST WATER CORPORATION

WITNESS STATEMENT OF JULIAN TULLY

I, **JULIAN TULLY**, Technical Director of Civil and Environmental Engineering, South East Water Corporation of 101 Wells Street, Frankston, in the State of Victoria say:

1. I am the Technical Director of Civil and Environmental Engineering of South East Water Corporation (**SEW**).

2. I have held this position at SEW since November 2022.

3. I have a Bachelor of Engineering (Civil), which I obtained in 1994 and a Graduate Diploma of Environmental Engineering, which I obtained in 2004.

4. I have over 30 years of experience in the water industry.

5. After graduating from University, I spent roughly two years working for a construction company doing mainly field work. Following this, I worked for around 15 years consulting with a water team in an engineering company that was bought and sold a number of times. During this time, I predominantly worked on designing pipes, pump stations and treatment plants.

6. I then worked for nearly 2 years as the Manager of Capital Delivery at a Victorian water authority, following which I returned to consultancy and worked for around 5 years in the company's water office.

7. I started working at SEW in May 2021 as a Design Manager, which had me managing a team of SEW's engineers. I began my current position of Technical Director of Civil and Environmental Engineering in November 2022, which sees me undertaking a range of tasks including recruiting of graduates, writing and reviewing technical standards, technical troubleshooting and running a Community of Practice.

8. On 23 May 2025 the Board of Inquiry into the McCrae Landslide served upon SEW's lawyers, a Request to Produce Second Witness Statement, which required SEW to provide a statement in response to the questions set out in that document.

9. The information in this Statement is based upon my personal knowledge, or information I have obtained from the business records of SEW or other employees where necessary. I believe the information to be true.

10. The information in this Statement responds to questions 11 and 12 set out in the Second List of Questions for South East Water Corporation (SEW). I address the questions in that order.

Question 11 – How much water was lost from the burst water main in front of the driveway at 23 Coburn Avenue on 14 November 2022 (2022 Burst Water Main). Did SEW inform the Mornington Peninsula Shire Council (Shire) of the 2022 Burst Water Main and, if so, when? Does SEW otherwise know whether and when the Shire was informed of the 2022 Burst Water Main?

11. On 14 November 2022, there was a burst water main within the traffic lanes of the road in the vicinity of 23 Coburn Avenue, McCrae. A record of this burst has been extracted from SEW's Works Management System, called Montage. The extract contains details of the notification, repair, reinstatement and photos. A copy of the Montage extract is **Exhibit 1: "1101383"** to this Statement.

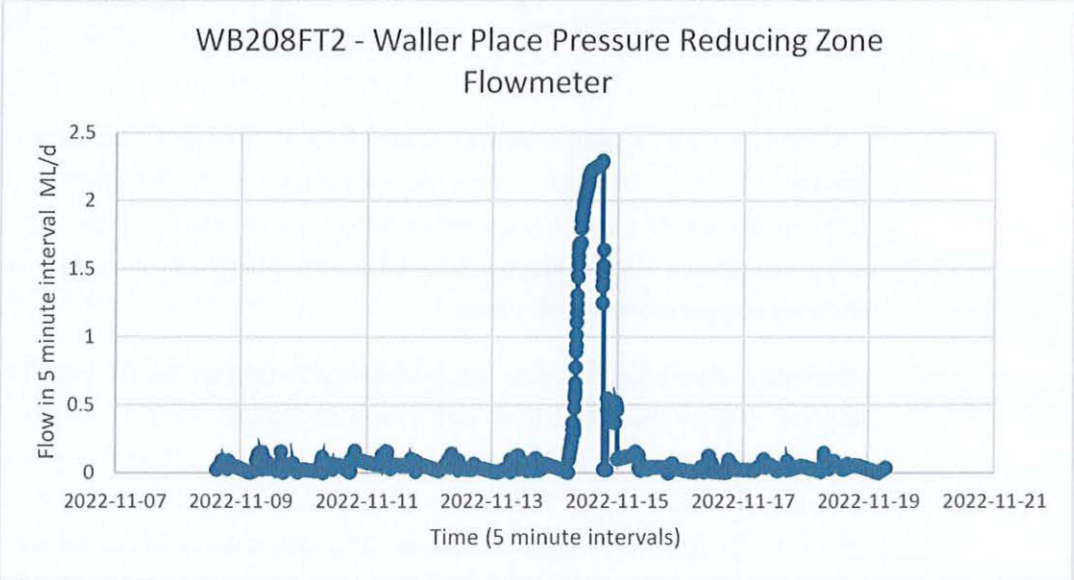
12. The McCrae water supply network consists of two mains zones, namely Parkes St Tank and Cook Street Tank. The Parkes St Tank zone is further divided into 3 subzones, namely Latrobe Parade, Waller Place and Flinders Street/Cinerama Street. In simple terms, a zone means all the customers within the zone receive water from the same location Therefore customers in the Parkes St Zone receive their water from the Parkes St tank. A sub-zone is when a zone is divided into a smaller part, so that the small part can be operated differently. In the case of the Waller Place sub-zone, water from the Parkes Street tank passes through a pressure reducing valve, so the water pressure is lowered to prevent damage to customer appliances and achieve other benefits. At the Waller Place pressure reducing valve, SEW also has a flowmeter. All water that enters the Waller Place sub-zone passes through the flowmeter and then to a network of pipes to customers. The 2022 Burst Water Main is in the Waller Place sub-zone.

13. A flowmeter is a device that measures how much water moves through a pipe. SEW does not have a flowmeter on every individual pipe in its water network, but has them at water tanks and other major assets within the water network. To be clear, SEW does not have a flowmeter that specifically measures the flow in the pipe that burst in 2022. However, SEW does have a flowmeter that measures flow into the Waller Place sub-zone that contains the burst pipe. During the burst, some of the water that entered the sub-zone escaped through the burst and some was used as normal by customers.

14. SEW has a data collection system, which is generically termed Supervisory Control and Data Acquisition (**SCADA**). To estimate the volume of the burst, I have downloaded the flowmeter data from SCADA for a 10 day period, that includes the time at which the 2022 burst occurred and put that data into a spreadsheet. A copy of this spreadsheet is **Exhibit 2: "2022 Burst volume"** to this Statement.

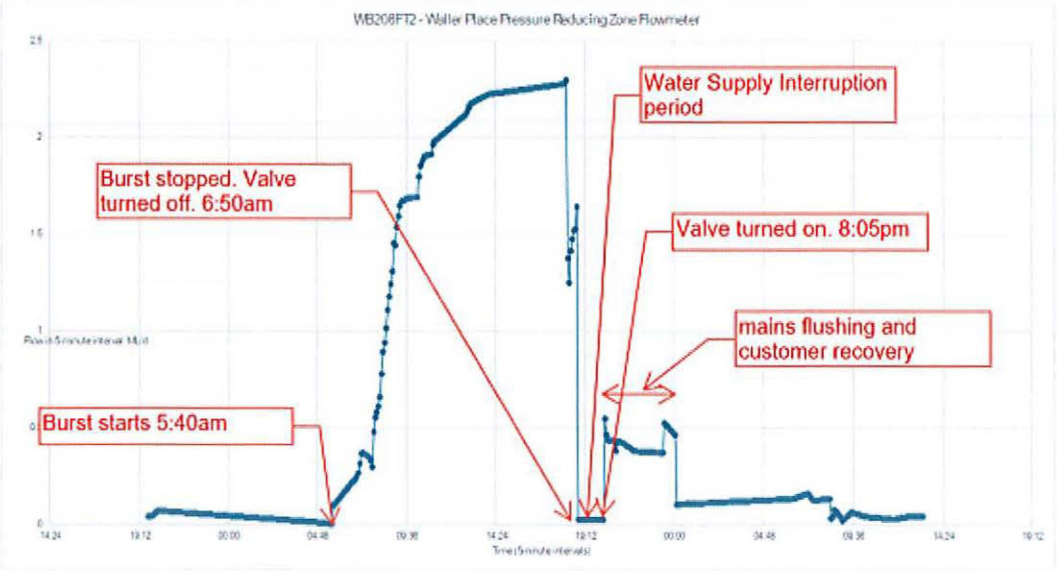
15. The data consists of the quantity of water that has passed through the flowmeter every 5 minutes. The units of measurement of the flowmeter is megalitres per day as an instantaneous flow rate. This is not total daily volume, but rather an 'instantaneous fow' (i.e. 1 megalitre per day is equivalent to 11.6 litres per second).

16. Within the spreadsheet, a graph of the data has been created and is shown below:



17. The graph shows that in a typical day, the flow through the flowmeter is quite small, with a maximum instantaneous flow of approximately 0.15 megalitres a day. The flow throughout the flowmeter fluctuates throughout the day as the customers vary their use of water. In the middle of the graph, there is a sudden increase in water flow, which indicates when the burst occurred. The maximum instantaneous flow of the burst was approximately 2.3 megalitres per day. Again, this is instantaneous flow rate and not volume.

18. The timing of the sudden increase of flow is consistent with SEW maintenance records. The spreadsheet shows a significant increase in water flow starting 5:40am on 14/11/2022 and finishing at 6:45pm on 14/11/2022. The Montage record referred to as Exhibit 1 of this Statement shows that a burst was reported at 13:46 on 14/11/2022 and Water Supply Interruption (being when the valves are turned off, i.e. the approximate time the burst flow ceased) actual start was at 6:50pm on 14/11/2022. I set out below a portion of the above graph, with key events labelled as recorded in Montage.



19. From the data, my calculation shows that from 5:40am to 6:45pm, 0.9 megalitres of water passed through the flowmeter. This is the time period that correlates with the large increase of water flow shown in the above graph. This amount is a slight overestimation of the actual amount of water that would have been lost from the burstas the amount also includes some customer water usage.

20. The nature of the physical failure is substantially different from the Bayview Road Burst in McCrae. The Bayview Road Burst was a small longitudinal split in a PVC pipe that grew to approximately 100mm in length; small in the sense that it was 100mm longitudinal split in a pipe length of typically 3m. This 2022 burst was a circumferential break in an asbestos cement (AC) pipe, which happened quickly. This means the 2022 burst reached a high flow rate quickly. Due to the 2022 burst reaching a flow rate many times larger than normal customer consumption and the burst being discovered promptly, it is not necessary for the calculation to allow for normal consumption or seasonal factors.

21. Ms Michelle Twaites of the Mornington Peninsula Shire Council (**MPSC**) reported the 2022 burst to SEW by email on 14 November 2022 at 1:41pm. Her email attached a photograph, which from the metadata appears to have been taken at 11:57am. The attached email and photograph triggered the creation of a job within Montage which was logged at 1:46pm that day. Copies of Ms Twaites' email and photograph are **Exhibit 3: "Email notification from Council"** and **Exhibit 4: "2022_11_14_T1101383_001_1101383_2293825"** to this Statement.

22. Exhibit 3 referred to above contains an email chain including an email from Ms Twaites of the MPSC that includes the original Council email notification, together with a photograph (downloaded from Montage) that was attached to Ms Twaites' email. The Montage record referred to in Exhibit 1 records that a job was Allocated at 1:48pm and a field crew was in

transit at approximately 1:59pm, and includes a photograph of the repaired pipe to which the photograph's metadata records as 8:02pm. A copy of this photograph is **Exhibit 5: "2022_11_15_T1101383_001_IMG_5132[1]_2294432"** to this Statement.

23. On 1 December 2022, SEW sent MSPC a report, which included the road reinstatement works to Coburn Avenue arising from the 2022 burst. A copy of this report is **Exhibit 6: "2022-12-01 A350 - Road Openings Detail Report"** to this Statement.

Question 12 – Has SEW attempted to calculate the proportion of water that did not travel to the green grated stormwater pit identified in SEW.9999.9999.0001 (Exhibit SEW-1) from the burst water main located in the vicinity of Bayview Road, McCrae? If so, please provide this information.

24. I am aware that on 31 January 2025, Mr Gary Loudon, the employee who discovered the Bayview Road burst, reported that the majority of water from the burst entered the grated stormwater pit. Information provided by the MPSC suggests this pit is numbered 10908901 (**Stormwater Pit 10908901**). A copy of the email chain that contains Mr Loudon's report is **Exhibit 7: "Burst Voume in Bayview rd McCrae"** to this Statement.

25. I believe there are three components to the question posed by the Board of Inquiry:

    a. How much water from the pipe made its way to the surface.

    b. How much water from the surface made its way to Stormwater Pit 10908901.

    c. How much water was observed flowing in the stormwater pit in front of 6 Waller Place, which is downstream from Stormwater Pit 10908901. Information provided by the MPSC suggests the pit in front of 6 Waller Place is numbered 10575370 (**Stormwater Pit 10575370**).

26. I address each of these components below.

Topic a.

27. SEW expects a high percentage of the water from the pipe made its way to the surface, but does not have the in-house capability to calculate this amount.

28. SEW is in the process of engaging an international expert to advise how much water from the Bayview Road burst pipe made its way to the surface.

Topic b.

29. SEW has engaged SMEC to undertake work to calculate the proportion of water that did not travel to Stormwater Pit 10908901 from the Bayview Road burst.

30. Pending SMEC's investigation and report, I have undertaken some calculations to further my own personal understanding of the circumstances. These calculations are contained within a spreadsheet. I am not experienced in this work, and therefore the work should not be relied upon by others. However, as I am asked to set out whether SEW has attempted to calculate the proportion of water that did not travel into Stormwater Pit 10908901, I set out the basis of my calculation below. A copy of the spreadsheet that contains my calculations is **Exhibit 8: "Horton and ILCL 30 May 2025"** to this Statement.

31. Australian Rainfall & Runoff: A Guide to Flood Estimation, 2019 (**ARR**) is the industry standard. ARR looks at a rainfall storm and how much of that rain ends up in stormwater pipes and waterways. Its primary use is to determine flood flows. The mechanisms discussed in ARR are broadly but not entirely applicable to this situation. Despite substantial research, the methods within ARR are not highly accurate for every circumstance.

32. I have done a simple calculation using two methods provided in ARR. One set of calculations used is the Horton method. The Horton method is based on soil type, rainfall quantity in preceding 5 days and the time taken for ground to become saturated. ARR provides tables from which the parameters can be selected. Soil samples taken from the 7th March 2025 leak near Bayview Rd at approximately 1m depth were laboratory tested and found to contain approximately 70% sand. Using guidance from US Department of Agriculture Part 620 Hydrology National Engineering Handbook, Group B soil was selected for soil with 50 to 90% sand. Recent rainfall of 0mm in preceding 5 days was used because this is the worst case. A k factor of 2 is used because this is recommended in ARR. The flow from the burst is distributed over an area calculated from the sand map prepared by SEW's land surveyor. The sand map shows the extent of the observable fine white sand found down contour of the burst site which is likely to represent the approximate extent of water surface flow. A copy of the sand map is **Exhibit 9: "250305_McCrae_v3 sand map"** to this Statement.

33. The formula results show that in 9 hours, steady state conditions are reached, which represents when the soil is fully saturated and infiltration reaches a constant rate. I understand that Mr Jonathan Crook has prepared a Statement setting out his calculations of the volume of the Bayview Road burst. My calculation suggests regardless of the volume of the Bayview Road burst, approximately 7ML of the water from the burst entered the soil. However, my calculation is dependent on the duration of the Bayview Road burst being 60 days.

34. The second method was to use the Initial Loss / Continuing loss method. The word 'loss', refers to rainfall that is lost, which means it doesn't become runoff. In this context the water loss is water that does not get to Stormwater Pit 10908901.

35. The ARR Data Hub (a website), provides suggested values of the initial loss and continuing loss. The initial loss is primarily due to the dry ground becoming saturated before runoff occurs, although there are additional causes. The continuing loss is due to keeping the ground saturated. My calculation suggests regardless of the volume of the Bayview Road burst, approximately 3ML of the water from the burst entered the soil. Again, my calculation is dependent on the duration of the Bayview Road burst being 60 days.

36. Again, my calculation should not be relied upon by others for the reason explained above.

Topic c.

37. As to the water that was observed flowing in Stormwater Pit 10575370, I have undertaken calculations ~~but I need to obtain additional data to improve my confidence in the accuracy of the results I have generated, as outlined below~~ to estimate the flow rate in the pit. A copy of the spreadsheet that contains my calculations is **Exhibit 10: "Drain flow ~~2June~~ 19 June 2025"** to this Statement.

38. A photograph was taken by SEW employee Jason Marsh on 30 December 2024 at 7:47am, before the Bayview Rd burst was discovered, of the water flow in Stormwater Pit 10575370. This pit receives flow from Bayview Rd, and it is downstream of Stormwater Pit 10908901

39. Australian Standard AS 2200 states "the Colebrook-White formula is regarded by many hydraulic design experts throughout the world as the most accurate basis for hydraulic design".

40. By estimating key parameters, including the width of water in the pipe, the internal diameter of the pipe and the slope of the pipe, the flow rate of water in the pipe can be calculated using the Colebrook White formula. Since February 2025, SEW has been gathering information to improve the accuracy of the estimate.

41. On 18th March 2025 SEW requested stormwater data from MPSC via the Freedom of Information Act 1982 (Vic), as the MPSC is the owner of the stormwater pipes. On 28 May 2025, SEW received useable information. However, this information contains multiple inaccuracies, including:

    a. The pipe upstream of Stormwater Pit 10575370 is marked as 675mm diameter but has been measured by SEW as approximately 600mm; and

    b. The plan view arrangement of pipes near 5 Waller Place is inaccurate.

42. ~~SEW is in the process of making arrangements with the MPSC to take additional measurements in June 2025, which will improve accuracy. My current estimate is 10L/s based on a 600mm internal diameter pipe and a pipe grade of 1 in 8.6. This is~~

~~approximately two thirds of the peak flow from the burst. A sensitivity analysis has been undertaken to show the affect the slight changes in the input parameters have on the answer. A small change in the measurements from the photograph can have a large impact on the calculated flow rate. Therefore, even with further measurements of pipe diameter and pipe slope, there will remain uncertainty with the flow rate~~ With the assistance of MPSC, SEW undertook additional measurements on 18 June 2025 of pit 1057577 which is located within a MPSC drainage reserve in line with the front fence of 5 Waller Place. Pit 1057577 (denoted Pit B in **Exhibit 10**) is upstream of Pit 10575370 (denoted pit A in **Exhibit 10**). The measurements confirmed the pipe diameter between the two pits as 600mm. My current estimate of the pipe flow at the time of the photo is 9 Litres per second, with a plausible range between 7L/s and 12L/s. A flow of 9L/s is approximately 60% of the peak flow from the burst. A sensitivity analysis has been undertaken to show the affect on the flowrate of slight changes in the input parameters. A small change in the measurements from the photograph and other parameters can have a large impact on the calculated flow rate.

Dated: ~~6 June 2025~~ 19 June 2025

Signatur Irrelevant / Sensitive ____ Witness: _____

Signature: _____ Witness: _____