



**CORONERS COURT
OF NEW SOUTH WALES**

Inquest:	Inquest into the death of Emily Warn
Hearing dates:	1 -3 June 2026
Date of final submissions by the parties:	28 July 2026
Date of findings:	22 September 2026
Place of findings:	Coroners Court of NSW, Lidcombe
Findings of:	Deputy State Coroner Carmel Forbes
Catchwords:	CORONIAL LAW – Boat capsize over the Penrith Weir- Subsequent drowning - Missing safety buoys barrier at the weir -Issues with the inspection and replacement of the buoys - Hazard signs at the weir - Training of maintenance officers responsible for the safety buoys - Communication between WaterNSW, Transport for NSW and Penrith City Council, the agencies responsible for safety at the weir.
File number:	2022/25356

Representation:	Mr. R Ranken SC with Ms. K Zielinski, Counsel Assisting, instructed by Ms. R Campbell, NSW Crown Solicitor's Office Mrs. B Warn, Emily's mother (unrepresented) Ms. P Dwyer SC for Water NSW, instructed by Ms. C Holt, Pinsent Masons Mr. C O'Neill for Transport for NSW, instructed by Mr. S Akon, Wotton Kearney Ms. E Sullivan for Penrith City Council, instructed by Mr. A Avery, Penrith City Council
Non-publication order:	Orders for non-publication have been made in this Inquest. The Orders may be found on the Registry file.
Findings:	Identity The person who died was Emily Warn. Date of death Emily Warn died on 26 January 2022. Place of death Emily Warn died at the Penrith Weir on the Nepean River Penrith NSW. Manner of death Emily Warn died after a boat on which she was a passenger capsized over the Penrith Weir, and she was ejected and became caught in a strong recirculating entrapment zone caused by the high-water flow rate on the Nepean River at the time. Cause of death The cause of Emily Warn's death was drowning.

Recommendations:	To the Chief Executive Officer of WaterNSW, the General Manager of Penrith City Council, and the Secretary of Transport for NSW: I recommend that: WaterNSW, Penrith City Council and Transport for NSW consider developing a framework or memorandum of understanding regarding the coordination of responses, and formalising of roles and responsibilities of each agency in relation to the management of the risks posed by Penrith Weir to the safety of river users. To the Chief Executive Officer of WaterNSW I recommend that: WaterNSW explore the feasibility of either removing or modifying the Penrith Weir for example by the installation of a Rock Ramp Weir, a Flip-lip spillway or a Stepped spillway to further mitigate or eliminate the risk of increased flows over the weir creating an entrapment zone of recirculating water immediately downstream of the weir.
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Table of Contents

REASONS FOR DECISION.....	6
INTRODUCTION.....	6
EMILY WARN	6
WEIRS	7
EVENTS OF 26 JANUARY 2022	9
CAUSE OF EMILY’S DEATH	12
OTHER INCIDENTS ON THE WEIR BETWEEN 1950 AND 30 JANUARY 2022	12
INDEPENDENT EXPERT REVIEW OF RISKS POSED BY THE WEIR	13
ORGANISATIONS RESPONSIBLE FOR SAFETY OF THE WEIR	14
WaterNSW	14
Transport for NSW, Maritime	15
Penrith City Council.....	16
MANAGING RISKS AT THE WEIR	17
February 2021- inspection.....	20
March 2021 – inspection.....	20
April 2021 – inspection	21
27 May 2021 – Minor inspection and Intermediate inspection (2 yearly).....	21
15 June 2021 –Minor inspection	22
September 2021 – Minor Inspection	23
October 2021 – Minor inspection.....	23
November 2021 –inspection.....	24
December 2021 - inspection.....	24
January 2022 – inspection	25
POLICIES, PROCEDURES AND PROTOCOLS RELATING TO THE PENRITH WEIR	25
ISSUES.....	30
Issue 1: Were there adequate hazard signs notifying the public of the dangers of the weir?	30
Issue 2: Why were there no safety buoys at Penrith Weir on 26 January 2022?.....	31
Steps Taken by WNSW since Emily’s death.....	34
Issue 3: Were the training and instruction to maintenance officers responsible for inspections at Penrith Weir adequate?.....	39
Issue 4: Was communication between the agencies concerned with safety on the river adequate?.....	44
CONCLUSION	48
FINDINGS PURSUANT TO <i>S.81 CORONERS ACT 2009 (NSW)</i>	50

Identity.....	50
Date of death	50
Place of death.....	50
Cause of death.....	50
Manner of death.....	50
RECOMMENDATIONS PURSUANT TO S.82 CORONERS ACT 2009 (NSW)	51
To the Chief Executive Officer of WaterNSW, the General Manager of Penrith City Council, and the Secretary of Transport for NSW:	51
To the Chief Executive Officer of WaterNSW	51

IN THE STATE CORONERS COURT NSW

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SECTION 81 *CORONERS ACT 2009*

REASONS FOR DECISION

INTRODUCTION

1. This is an Inquest into the sad death of Emily Warn. At the opening of the inquest Ms. Warn's mother requested that I refer to her as Emily. For this reason, throughout these findings, I will refer to her by that name.
2. Emily was only 33 years of age when she drowned at the Penrith Weir on Australia Day, 26 January 2022, after a boat on which she was a passenger capsized over the weir.
3. The primary role of a coroner is to make findings as to the identity of the person who died and the place, date, cause and manner of their death. A secondary function of a coroner is to make recommendations, arising from the evidence, in relation to matters of public health and safety.
4. The identity, date, place and cause of Emily's death are uncontroversial. The significant issue in this inquest is the manner or circumstances surrounding Emily's death and whether any lessons can be learnt from this tragic event to improve safety at the weir in the future. At the time the boat she was in capsized over the weir the safety buoys that warned of the presence of the weir had been washed away in floods. This inquest's primary focus has been on how it came about that the warning buoys were not present and why they hadn't been replaced.

EMILY WARN

5. Emily June Elliott Warn was born on 17 February 1988. She had two children, born in 2006 and in 2008. At the time of the accident, she was engaged to her partner David Saunders.

6. Emily's mother, Mrs. Warn, attended each day of this inquest. She described Emily as a beautiful person who had an energy for life that drew people to her and that she was a loving mother who was greatly needed by her children, one of her children has autism. The children now live with Mrs. Warn. The impact of losing Emily has changed every part of Mrs. Warn's life. She expressed the daily pain she suffers in losing a child and explained that the pain does not end and follows her at every moment, and in everything that should have included Emily but never will. She also witnesses the pain and confusion of the children who have lost their mum.
7. Mrs. Warn is concerned to see that an incident like this does not happen again to another family.

WEIRS

8. I have drawn from submissions by Counsel Assisting for the following non-contentious factual matters. I am grateful for this assistance.
9. Weirs are a common feature on Australian waterways. There are estimated to be over 3,000 weirs on rivers in New South Wales alone. Most weirs were originally built to provide a reserve of water for towns or properties to carry them through dry periods. Others were built to facilitate diversion of water into effluent streams or onto floodplains to spread productive benefits of water over a wider area. In more recent years, weirs have been built to help river operators manage release from dams or to increase water depth for pumps and diversion channels in major irrigation developments. In a few cases, weirs have been built for purely recreational or aesthetic purposes.
10. The Penrith Weir is 1.5 m high and 150 m long, spanning the width of the Nepean River. It is made from a concrete apron slab. Except for a short, lowered section immediately adjacent to a fish ladder on the eastern end, it has a fixed crest so is not operated to increase or decrease waterflow or change upstream water level. Instead, the upstream water level will

usually depend on the height of the weir crest and the amount of water that passes over the weir. Under certain high flow conditions, the weir will be “drowned out” by tailwater and will no longer control the water level upstream.

11. A sandbag weir was first constructed at the site of the weir in 1902, to provide a permanent water supply for Penrith. The original sandbag weir was thirteen feet wide by three hundred feet long and three feet six inches high (Australia then not having transitioned to the metric system).
12. In 1908, after the first weir was washed away, the present-day concrete gravity overflow weir was built by the Department of Works and was officially opened in 1909. Water was pumped from the weir to a reservoir on the corner of Parker Street and the Railway line and then reticulated through the town. The weir was a popular spot for swimming and picnicking. The area on the Emu Plains side of the weir became known as ‘Little Manly.’
13. To this day, the Nepean River at Tench Reserve remains a very popular spot amongst local community members to enjoy recreational fishing, boating and rowing.
14. Water from the Warragamba River flows into the Nepean River approximately 3.5 km downstream of the Warragamba Dam. The Warragamba Dam is a water supply dam responsible for water security for 5 million people in Sydney. When the dam is full, small releases of water are made at 100% to maintain this level to facilitate routine maintenance and avoid the main radial gates repeatedly opening and closing due to small increases in storage or wave action. Spills from the dam also occur during times of flood. The spills can be a source of flooding in the Hawkesbury-Nepean Valley
15. Under the regulatory framework governing Greater Sydney Dams, WaterNSW (WNSW) is not permitted to operate Warragamba Dam or any other Greater Sydney storage for flood mitigation purposes. During a flood, WNSW operates Warragamba Dam to ensure the safety of the structure. At the end of a flood, the dam’s storage is returned to its target level.

16. Relevantly, in the period from 14 November 2021, due to high rainfall there were daily spills of substantial quantities of water from Warragamba Dam. Over the two weeks leading up to and including 26 January 2022, there were daily spills of between 8,200 ML and 13,600 ML, with an average of 9,712 ML per day.

EVENTS OF 26 JANUARY 2022

17. On Australia Day 2022, Emily, her father, her two children and Mr. Saunders drove to the Nepean River. Mr. Saunders had extensive experience with boats. He had held a boat license for approximately thirty-five to forty years.
18. Towed to their car was Mr. Saunders' boat, a Quintrex 500 Freedom Bowrider which had been purchased second-hand by Mr. Saunders approximately 14 months prior. The boat was fitted with an Evinrude e-tec 75 outboard motor.
19. Shortly before 12:30 pm, the boat was launched into the river from the boat ramp at Tench Reserve. Tench Reserve is near the M4 Bridge which crosses the river. Approximately 2.8 km downstream of the M4 Bridge is Victoria Bridge. The Penrith Weir is situated further 592 m downstream from Victoria Bridge. The Nepean Rowing Club is located immediately south of the Victoria Bridge on the eastern side of the river.
20. They had planned to put the boat into the water and then find a spot to have a picnic and something to eat.
21. As at 26 January 2022, there were seven signs at the Tench Reserve boat ramp. Two of those signs were identical maps of the Nepean River from Warragamba Dam to the South to an area north of the Penrith Weir. There is no key to the map and, although the weir is marked on it in yellow as a hazard, it was not identified as a weir and the nature of the hazard was not otherwise described. None of the other signs at the Tench Reserve made any reference to the weir or its presence downstream of the boat ramp. These included a large sign that provided "Boating Safety Information".

22. Between the Boat Ramp and the weir, the only sign alerting users to the weir's presence was a single small sign placed on one of the pylons on Victoria Bridge which stated "DANGER – STRONG CURRENT AHEAD ALL CRAFT PASSNG THIS POINT MAYBE (sic) SWEPT OVER WEIR."
23. Most significantly, on that day there were no other markers such as safety buoys marking out any exclusion zone ahead of the weir.
24. Mr. Saunders was the only person who piloted the boat. He drove the boat in a northeast direction up the Nepean River in the direction of Castlereagh towards the Victoria Bridge, Nepean Rowing Club and the weir. At about 12:35 pm (according to the timestamp of CCTV footage obtained from the Nepean Rowing Club) the boat was travelling north-east towards the weir. Mr. Saunders told police he was going slowly as there were rowers in the water and just remaining idling when he could see the bridge. He claimed he slowed down to be cautious as he didn't know what was ahead as there were no signs, so he just went under the bridge and as he went under the bridge, he was going slowly.
25. There are witnesses who have said they saw him travelling at speeds well in excess of the 6-knot speed limit applicable to that portion of the river, such that the front of the boat was tilted upwards or 'on a plane' (that is, accelerating until the hull climbs over its own bow wave and skims across the water's surface rather than pushing through it) whilst it was accelerating.
26. After passing under Victoria Bridge, Mr. Saunders said he realised there was something in the water and it didn't immediately occur to him that a weir was ahead. He thought it may have been a tree in the water. When he was ten to fifteen metres away from it, he turned the boat. When the boat was sideways, he said it was pushed quickly towards the weir. Mr. Saunders recalls the boat engine revving when he was 'trying to give it some more' but nothing happened and it just continued to go sideways.
27. At some time between 12:35 pm and 12:40 pm, the boat capsized over the weir, ejecting all passengers on board the boat. Prior to the boat going over the weir, Emily was seated at the

front of the boat. Her father was in the passenger seat next to the driver's seat. Tyson was on the left rear side behind his grandfather. Chloe was on the right-hand side of the boat behind Mr. Saunders. All were wearing life jackets. Mr. Saunders estimated they had been on the river for 'probably ten minutes...fifteen minutes at the most' prior to the accident.'

28. Following the boat capsizing, Mr. Saunders and Emily's son made it ashore themselves, while Emily's father and her daughter were swept downstream and later rescued by a helicopter sometime after 1:41 pm.
29. Emily became trapped within the water flow immediately downstream of the wall of the weir. Constable Bevan described seeing Emily caught in the churning water, constantly being pulled underwater. Her colleague, Senior Constable Cook attempted to tie a rope around himself so that he could swim out to the weir, however their Sergeant told him to get out as it was too dangerous. At approximately 12:58 pm, Emily came free from the waterflow around the weir. At approximately 1:15 pm, she was winched into a rescue helicopter. Rescuers performed CPR immediately and over some time. Sadly, however, she was declared deceased at 1:50 pm.
30. Mr. Saunders had not consumed alcohol. He had taken what he described as his 'normal medications' including pain medication which 'releases five milligrams every hour or so.' Mr. Alen Lin, a Forensic Pharmacologist who examined Mr. Saunders blood sample was of the opinion that '... at the time of driving ... David Saunders was not under the influence of any drug detected to the extent [his] driving ability was impaired.'
31. Mr Saunders told the police that if there was a sign on the railway bridge that said 'don't go past this point' he wouldn't have gone.
32. Mr. Saunders was prosecuted in the Penrith Local Court for an offence of operating a vessel negligently causing death contrary to s 13(1)(a) of the *Marine Safety Act 1998*. Following a defended hearing in 2025, that charge was dismissed. Mr. Saunders passed away in November 2025.

33. On 4 February 2022, Mr. Saunders' boat was examined for mechanical defects or defaults which may have contributed to the accident. None were identified.

CAUSE OF EMILY'S DEATH

34. A postmortem was conducted on 1 February 2022. Dr Burger, Forensic Pathologist, determined that the cause of Emily's death was drowning.
35. Postmortem toxicology detected a moderately high concentration of methadone and a low concentration of codeine and morphine. Dr Burger noted in her Autopsy Report that lower concentrations of methadone have been associated with drug related deaths. She noted that it is impossible to say whether drug toxicity contributed to Emily's death as it would depend on her tolerance to the drug.
36. Given the high level of methadone detected in Emily's blood, additional material was obtained regarding her medical history. Emily had a history of drug use and had been a participant in the methadone maintenance program for many years. She was not opiate naive, and the concentration of methadone found in her blood was in keeping with her maintenance regime of 90mg per day and not in the fatal range. Expert evidence was obtained from independent toxicologist Professor Alison Jones to comment on what the effect of the drugs in Emily's bloodstream may have had on her motor skills and/or coordination. I accept the Professor's evidence that although individually the methadone and morphine may not have impaired driving type skills, together their presence would likely have impaired Emily's cognition, motor coordination and executive functions to some degree. As such, I find that while the level of methadone and morphine contained in Emily's bloodstream did not cause her death, on the balance of probabilities, it contributed to her drowning in that it likely impacted Emily's ability to cognitively and physically recover in the water from the capsize events at the weir.

OTHER INCIDENTS ON THE WEIR BETWEEN 1950 AND 30 JANUARY 2022

37. Historically, there have been drownings and near drownings at Penrith Weir. Those include:
- On 30 January 1950 three people were saved from drowning at the weir;

- On 8 February 1951 two people were washed over the weir and required rescue;
 - On 25 September 1952 a 22-year-old man drowned when he was swept through a gap in the weir; and
 - On 2 January 1953 an 18-year-old male was washed over the Penrith Weir and drowned.
38. More recently, at about 4:50 pm on 14 November 2021, a 43-year-old father and his 13-year-old son ‘entered the [River] in a small tin boat and approached the rapids caused by the weir.’ Approximately five minutes later, their boat was ‘pulled towards the rapids with the boat being dragged over the weir. As a result, the boat ... capsized’ and both father and son were ejected. Police, ambulance and fire rescue responded to a triple zero call by a person who witnessed the boat capsize. Both occupants were ultimately saved by helicopters winching them to safety.
39. Footage taken by the PolAir helicopter on 14 November 2021, records that no safety buoys were present upstream from the weir.
40. On 30 January 2022, four days after the Emily’s death, another boat capsized over the weir. On board that boat were three adults and two children (a five and six-year-old). After pushing off from the bank of the river, the boat’s motor would not start, and the current pushed the boat downstream before it capsized over the weir. Efforts to use the anchor to stop the boat from floating downstream were unsuccessful.
41. Considerable resources of the Police and other emergency services were engaged to rescue the five occupants of the boat, including rescue helicopters and police risking their own safety to extract the five-year-old and his father from waters downstream from the weir. On this day the safety buoys marking the exclusion zone before the weir were not in place.

INDEPENDENT EXPERT REVIEW OF RISKS POSED BY THE WEIR

42. Dr Anthony Ladson, Hydraulic Engineer with a specialty in surface water hydrology, river condition monitoring and flood risk assessment and management, provided an independent expert report on the risks posed by the Penrith Weir. In preparing his report, Dr Ladson sought to ascertain the range of flow rates at the weir that resulted in the presence of an entrapment zone of recirculating water. He collated many photographs of the weir at various flows where

there was an observable boil line. He determined on a preliminary basis that the phenomenon occurred when the flow rate was between 1,000 ML per day and 25,000 ML per day. Dr Ladson further explained that the strength of the recirculating water effect would tend to get stronger approaching the upper limit, and then as the flows reached the lower limit of where recirculation occurs, it would tend to peter out at least for a part of the length of the weir, although it may still occur at some areas along the width of the weir until the whole weir is submerged at which point the recirculation does not occur.

43. As at 26 January 2022, the flow rate was 10,000 ML per day. Dr Ladson is of the opinion that the recirculating effect at that flow rate would have been “quite strong”. He informed the court that during the 8-month period from early November 2021 to the end of June 2022, flows were persistently high and the flow was within the range that would cause dangerous conditions at the weir most of the time.
44. He identified the following two risks:
 - i. Boats inadvertently colliding with or going over the weir as the weir can be hard to see from upstream, and
 - ii. A person in the water who had gone over the weir may be unable to escape the entrapment zone.

ORGANISATIONS RESPONSIBLE FOR SAFETY OF THE WEIR

WaterNSW

45. WNSW is a State-owned corporation and is one of the main government agencies tasked with managing water in NSW. It operates the State’s dams, capturing and storing water, and then supplying it ready for distribution – for the environment, agriculture, industry and the community. There are 41 major dams, weirs, water supply infrastructure and recreational areas across NSW that WNSW is responsible for maintaining. As of May 2021, its state-wide network comprised 361 weir structures. The Penrith Weir is one of the weirs maintained by WNSW.
46. Its Upper Nepean maintenance team was responsible for five major dams and 11 weirs, together with the upper canal system and numerous auxiliary assets. The Penrith Weir was, at the relevant time, within the responsibility of that team.

47. WNSW's primary objective since this incident occurred has been to ensure that another such tragedy does not occur.
48. Senior staff members from WNSW, including Mr Jerome Douziech, Executive General Manager Built Infrastructure, Ms Marg Stinson, Head of People & Culture, Mr Ben Shine, Head of Government Relations and Communications, Ms Daniella Maffeo-Zuvela, Managing Counsel & Deputy Company Secretary and Ms Amanda Gombru, Legal Counsel, and Brian Mayhew, attended the Inquest and the court was informed that regular briefings and updates were provided to the Board and senior executives of WNSW, who sought to remain apprised of all matters arising in the course of this Inquest.
49. WNSW demonstrated a genuine engagement in the inquest and expressed its commitment to take any further steps that might ensure that a tragedy of this nature does not occur again.
50. WNSW also expressed its sincere condolences to Emily's family for their tragic loss.

Transport for NSW, Maritime

51. Transport for New South Wales Maritime (TfNSW) is responsible for patrolling navigable waterways in NSW including all vessels on the waterway. TfNSW enforced a 6-knot safety zone near the Nepean Weir and employed a boating officer who conducted regular patrols and monitoring of the Nepean River.
52. As of 26 January 2022, TfNSW did not own, and was not responsible for, any asset on the Nepean River between the M4 bridge and the Penrith Weir. All its aids to navigation were located upstream of the M4 bridge. The TfNSW boating officer gave evidence that it had been sometime since he had patrolled the weir-end of the river as approximately 90% of vessel activity from the Tench Reserve boat ramp occurred in the opposite direction from the ramp.
53. TfNSW's responsibility for signage was confined to signage concerned with the conduct of vessels. Mr. Davey, Principal Manager, Maritime gave evidence that TfNSW's functions derived from s 41 of the *Ports and Maritime Administration Act* and s 11 of the *Marine Safety Act*, and that its signage role was limited to signs concerned with the conduct of vessels, such as speed and wash; it did not extend to warning signs alerting river users to hazards such as the presence

or near presence of the weir. On the river, its responsibility was discharged through 6-knot speed signage and the map signs at the boat ramp.

54. After the incident TfNSW moved swiftly to install four warning/navigation buoys between the M4 bridge and the weir to assist in alerting boats to the presence of the weir.
55. TfNSW informed the Court that it is committed to ensuring the safety of all users of waterways in New South Wales, and not just to ensuring the safety of users in real time through boating officers, but also to working collaboratively with other stakeholders to ensure proactive measures are taken to keep users apprised of risk and to encourage users to enjoy water ways considerably and safely.
56. TfNSW extended their deepest condolences to Emily's mother and expressed its view that Emily's death was an outcome that no-one ever wanted and that it is committed to ensuring that events like those which led to Emily's death do not reoccur.

Penrith City Council

57. Penrith City Council's (Penrith CC) responsibilities concerned its land and assets around the river rather than the river itself. It was responsible for the construction and maintenance of the Tench Reserve Boat Ramp and signage at the ramp. The ramp was 3.2 km away from the weir. The Council's involvement in relation to signage was limited to the location of signs, not the wording or content.
58. As of 26 January 2022, Penrith CC closed the ramp at periods where the water level was high.
59. The decision to close the Boat Ramp was ultimately made by the City Presentation Manager at Council, following consultation with staff who had conducted visual inspections and reviewed data published by WNSW. The decision and reasons for the decision were then communicated to the Director of City Services and the general manager of Council by the City Presentation Manager via email.
60. Circumstances which would activate the closure of the boat ramp included:
 - a) high water levels in the Nepean River which restricted the safe access of cars and trailers onto the Boat Ramp.

- b) the presence of visible debris in the waterway on or around the Boat Ramp, such as trees, logs or rubbish
- c) damage to the Boat Ramp that would have made access unsafe.

- 61. Circumstances in which the Boat Ramp might be closed did not include the absence of the safety buoys at the weir.
- 62. Once a decision had been made to close the Boat Ramp, Council contacted its external security contractor and advised them to close the entry gates into the Tench Reserve. A Virtual Message Sign would then be placed near the entry gates advising the public that the Boat Ramp was closed.
- 63. The decision to re-open the boat ramp once the 'hazard' to users was removed was determined following a visual inspection of the Boat Ramp by Council staff. The decision to re-open the Boat Ramp rested with the City Presentation Manager.
- 64. Prior to 26 January 2022, Penrith CC had a procedure for the circumstances in which the Tench Reserve Boat Ramp would be closed, however, it was not documented and the relevant circumstances were confined to matters that presented a risk to the public when using the boat ramp itself rather than the river more generally.
- 65. Penrith CC expressed its deepest sympathies for the situation that occurred and informed the Court that it is very committed to assisting in whichever way it can try and ensure something like this doesn't happen again.

MANAGING RISKS AT THE WEIR

- 66. WNSW was predominantly responsible for safety in the immediate vicinity of the Nepean Weir.
- 67. As of 2022 the most important safety control implemented by WNSW was the installation of yellow warning safety buoys upstream of the weir that served to alert river users of the near presence of the weir. Prior to 2020, the safety buoys used by WNSW comprised of a chain line of connected small bright yellow buoys attached to the eastern and western banks of the river. However, from about 2020, the safety buoys were larger bright yellow cone like buoys spaced

evenly across the river but not connected to either side of the river or each other. Each safety buoy was “anchored” to the riverbed with a 40 kg clump weight.

68. Notwithstanding the weighted anchor, from time to time, these safety buoys were displaced and washed downstream, particularly in high flow or flood conditions.
69. Prior to 26 January 2022, WNSW had a process for routine monthly inspections of the Penrith Weir.
70. WNSW’s Enterprise Asset Management System (EAMS) automatically generated a work order for minor surveillance inspections of WNSW assets. These inspections were undertaken as part of the ongoing preventative maintenance program. The work orders for a monthly minor surveillance inspection at the Penrith Weir were generated through a pre-programmed maintenance sequence. The Maintenance Sequence applies to 63 weirs and small flow-regulating structures across New South Wales, including the Penrith Weir.
71. Each preventative maintenance work order for the minor surveillance inspections was generated with a high-level, generic “checklist” and an expected start and expected end date.
72. In EAMS, expected start dates were commonly scheduled for the first day of the month. These dates were intended as planning parameters only, to guide maintenance planners when scheduling work to maintenance officers. They did not indicate that an inspection is required to occur on the first day of each month.
73. After preventative maintenance work orders were generated, the maintenance planners, in consultation with the maintenance team leader, reviewed all the work orders and considered the available resources. At any given time, there were numerous work orders, for both preventative maintenance and corrective maintenance tasks, awaiting completion. The maintenance planner, in consultation with the maintenance team leader, selected work orders that would be included in the work program for a scheduled period. In making that selection, they considered the relative priorities of work orders awaiting completion.
74. The maintenance planner then prepared a schedule detailing the selected work orders and allocated maintenance officers for that scheduled period.

75. Schedule periods were typically weekly or fortnightly. Due to limited resources and extenuating circumstances (for example, urgent work required at other assets), monthly preventative maintenance work orders were not always scheduled within the expected start and end dates.
76. The finalised schedule was circulated to the maintenance team leader and maintenance officers ahead of the schedule period. The maintenance officers then undertook the works detailed in their respective work orders in accordance with the maintenance schedule.
77. For the minor surveillance of the Penrith Weir, the preventative maintenance work order checklist instructed the maintenance officer to *“Undertake visual surveillance as per Dam Safety Surveillance Team recommendations”*. That instruction was in accordance with instructions provided by the Dam Safety Surveillance Team to assist with WNSW’s compliance with the *Dam Safety Act 2015 (NSW)* (the Dam Safety Act).
78. Prior to March 2021, maintenance officers completed the checklist on a paper-based form.
79. After March 2021, the Dam Safety Surveillance Team provided their instructions through a separate application called DamGuard. DamGuard is a digital inspection checklist within the application. The maintenance officer completed the inspection records of their observations and comments in the digital checklist. They could also attach photos where useful to illustrate their observations.
80. Once a maintenance officer completed an allocated work order, they recorded the actual start and end dates and the hours worked and then marked the work order as “complete” within EAMS. If, during an inspection, the maintenance officer identified that additional work was required outside the scope of the work order, the maintenance officer was required to initiate a work request in accordance with the Initiate Work Order Procedure. A work request describes an asset defect, maintenance work, repairs or services that need to be performed.
81. Work requests were reviewed by the maintenance team leader to assess that the request was valid and contained the required information. If a work request was approved, it was reallocated back to the maintenance planners. The maintenance planner generated a separate work order for the work request. The resulting work order was then scheduled and undertaken in accordance with standard planning and resourcing procedures outlined above.

82. There were no safety buoys present on 26 January 2022, the day of Emily's death. There were also no safety buoys on 14 November 2021 or 30 January 2022 when the other boats went over the weir requiring emergency services to rescue their occupants.

February 2021- inspection

83. Work Order WO00072288 was automatically generated in EAMS with an expected start date of 1 February 2021 and an expected end date of 15 February 2021. The maintenance planner did not schedule the Work Order in February 2021. Instead, the Work Order was cancelled on 23 February 2021. The Team Leader added a cancellation reason comment "Monthly inspection missed due to critical works at Brownlow [weir]".
84. There was no documented information available to WNSW concerning the condition of the safety buoys in February 2021.

March 2021 – inspection

85. On 1 March 2021, Work Order WO00075519 was raised for a minor inspection of the weir. According to WNSW records, the inspection was conducted on 2 March 2021. An entry in the EAMS system at 3:29:29 pm that date included the completion comments, 'Inspection completed. Data added into DamGuard'.
86. The information recorded in DamGuard included an observation regarding the safety buoys, "Slight decrease or change of condition". However no other information or photographs were provided that might inform that observation. The inspection did not lead to any further action with respect to the buoys at that time.
87. There was major flooding on the Nepean River between 18 March and 28 March 2021.
88. Police satellite imagery taken on 26 March 2021 does not depict the buoys in place.

April 2021 – inspection

89. On 1 April 2021, Work Order WO00078818 was raised for a minor inspection of the Weir. According to WNSW records, the inspection was conducted on 12 April 2021. An entry in the EAMS system at 01:22:21 pm that date includes the completion comments, 'Inspected weir structure and surrounds. Work request raised for removal of flood debris.' No information was entered into the DamGuard system concerning any observations of the safety buoys or their observed condition.
90. Photographs taken on 6 April 2021 show a significant amount of dead tree branches directly on top of the fish ladder and the river flowing at a rapid rate. No safety buoys can be seen in the photographs, although it cannot be said the areas depicted in the photographs included the location where the safety buoys would be expected to be positioned. The Maintenance Officer has said he used photographs taken from a post-flood inspection for the monthly minor surveillance inspection at Penrith Weir as he was either told to do this by his team leader or he asked and was permitted to do this by his team leader.
91. The post-flood inspection does not appear to have been otherwise documented.
92. There was no definitive documented information available to WNSW concerning the condition of the safety buoys in April 2021.

27 May 2021 – Minor inspection and Intermediate inspection (2 yearly)

93. On 1 May 2021, Work Orders WO00078818 and WO00082971 were raised for both a minor inspection and a 2-yearly intermediate inspection to be conducted by a dam safety engineer. According to WNSW records, the inspection was conducted on 27 May 2021. An entry in the EAMS system at 06:36:12 pm includes the completion comments, "Inspected weir with dam safety engineers in attendance see attachments for work order and photos".
94. The work order report described the actual work done as: "Visually inspected weir with dam safety engineers present, also used drone to help see parts we cannot usually see. Discovered crack and leak in weir using drone some photos will be attached."

95. The two photographs that were uploaded depict a close-up image of a crack in the weir taken by a drone. No photographs were uploaded depicting the location where it may be expected the safety buoys would be positioned and no information was entered into the DamGuard system concerning any observations of the safety buoys or their observed condition.
96. There was no documented information available to WNSW concerning the condition of the safety buoys in May 2021.

15 June 2021 –Minor inspection

97. On 1 June 2021, Work Order WO00086551 was raised for a Minor Inspection of the weir. According to WNSW records, the inspection was conducted on 15 June 2021. An entry in the EAMS system at 01:13:33 pm includes the completion comments, Inspected weir and surrounds. All data entered into DamGuard.'
98. Notwithstanding these comments, no information was entered into the DamGuard system concerning any observations of the safety buoys or their observed condition. Two photographs were uploaded, one which shows an exclusion zone buoy with a clump weight attached to it washed up onto the edge of the river. The other photo was taken from a position downstream of the weir. No safety buoys can be seen on the river.
99. On the same date, Work Request RQ00013070 was raised for the replacement of the buoys. The work request included the following information:
- The buoys that make up the boat exclusion zone at Penrith weir have been carried away by flood waters.
 - There is currently nothing warning boats about approaching the weir.
 - Recommend contacting the Maintenance Team Leader for details about who installed the previous boom and organise to have new buoys put in place.
100. The Work Request was marked as Priority 2.
101. This work request was required to be approved by the Maintenance Team Leader, on the EAMS system before it progressed to the next stage of work, which was allocation to a Maintenance

Planner for further action and implementation. The Maintenance Team Leader commenced a period of annual leave after 18 June 2021, returning to work on 27 June 2021. He approved the Work Request on 29 June 2021.

102. A quotation was not sought until 27 July 2021. A quote was received on 28 July 2021, and a purchase order was not issued until 24 August 2021, over two months after the work request was first raised, and the buoys were not replaced until 27 September 2021. There were no safety buoys for a period of at least 6 months.

September 2021 – Minor Inspection

103. On 27 September 2021, the safety buoys were re-installed. The contractor installed:

- 12 x 600 mm yellow floating marker buoys, each spaced 8 – 10 m apart, totaling 110 m in length
- 'EXCLUSION ZONE' vinyl stickers were applied to all three sides of the float.
- The float closest to the riverbank was installed 10 m in from the bank at the request of WNSW to avoid public interference; and
- Each float was fitted with 4m length of 16mm galvanised chain and connected by a moused 16mm galvanised shackle to a 40 kg steel anchor weight.

104. These were essentially the same kind of safety buoys as those previously installed that had washed away.

October 2021 – Minor inspection

105. On 1 October 2021, Work Order WO00107070 was raised for a Minor Inspection of the Weir. According to WNSW, the inspection was conducted on 27 October 2021. An entry in the EAMS system at 12:22:59 pm the day after (28 October 2021) included the completion comments, 'Inspected weir and surrounds. Data entered into DamGuard.'

106. The information recorded in DamGuard included an observation regarding the safety buoys, “Nil change of condition”. Three photographs were also uploaded, one of which depicts 12 safety buoys present.

November 2021 –inspection

107. Despite a work order being automatically generated, an inspection was not conducted at the Weir in November 2021. The maintenance planner did not schedule the November 2021 Work Order. Instead, it was scheduled to occur on 22 December 2021.
108. There was no documented information available to WNSW concerning the condition of the safety buoys in November 2021.
109. As a result of the incident at the weir on the afternoon of 14 November 2021 in which the father and son had to be rescued after their boat was pulled over the weir and PolAir footage of the area shows that the safety buoys were not present on the river, having apparently been washed away.

December 2021 - inspection

110. On 1 December 2021, Work Order WO00114265 was raised for a Minor Inspection of the weir. According to the WNSW records, the inspection was conducted between 7:00 am and 8:00 am on 22 December 2022. An entry in the EAMS system at 02:05:13 pm included the completion comments, Surveillance inspection complete. All data entered into DamGuard.’
111. The information recorded in DamGuard included an observation regarding the safety buoys, “Nil change of condition”.
112. Four photographs taken that date were also uploaded. The safety buoys are not depicted in any of the photographs, although it cannot be said the areas depicted in the photographs included the location where the safety buoys would be expected to be positioned.
113. Given there was no inspection done by WNSW between 27 October 2021 – when the safety buoys were present – and 22 December 2021 and the fact of the safety buoys being plainly absent by 14 November 2021, the observation recorded in DamGuard that there was “Nil change of condition” of the safety buoys is incorrect.

114. The documented information available to WNSW concerning the condition of the safety buoys incorrectly suggested the safety buoys had remained in place since they were reinstalled in September 2021, when they had in fact been missing for at least 5 weeks. It also meant no corrective action was taken to ensure the missing safety buoys were replaced in a timely manner.

January 2022 – inspection

115. On 1 January 2022, Work Order WO0122542 was raised for a Minor Inspection of the Weir. According to WNSW records, the inspection was conducted between 11:00 am and 12:00 pm on 25 January 2022 – that is, the day immediately preceding the date on which Emily died. Further, the Maintenance Officer did not enter the information until the day after Emily died, 27 January 2022.
116. The information recorded in the EAMS System included the completion comments ‘at 12:45:02 pm, All data entered into DamGuard. Request raised to replace missing exclusion buoys.’ The information recorded in DamGuard included an observation regarding the safety buoys, ‘Significant increase or change of condition’. Two photographs were also uploaded, which depict that the safety buoys were not present at that time.
117. On 27 January 2022, Work Order Request RQ00015567 was raised for the replacement of the buoys. The request included the information that, ‘Recent flooding has dislodged the boat exclusion buoys in the vicinity of Penrith Weir. Buoys need to be replaced.’
118. On 31 January 2022, TfNSW installed four buoys approximately 35 m apart anchored by 300 kg dump weights and situated approximately 200 m upstream from the Weir. These markers were installed as additional Aid to Navigation. These four markers have remained in their original position to this day.

POLICIES, PROCEDURES AND PROTOCOLS RELATING TO THE PENRITH WEIR

119. Each agency had their own very specific responsibility when it came to the safety of the weir for river users at the time of the accident. There was effectively no communication or formal policy between each of the agencies responsible for the safety of users of the river about safety-related matters.

120. In mid-2019, TfNSW provided WNSW with a draft document entitled, “Guidelines for safety barriers, markings and signage on NSW water storages”. In 2020, these guidelines were subsequently updated, finalised and retitled, “Guidelines for installing Navigation Aids and Signage on Water Storages – managing potential hazards for safe vessel operation” (Guidelines). They were further updated in March 2023 and are entitled “Guidelines for Managing Potential Hazards on Water Storages in NSW” (Revised Guidelines).
121. At the time of the incident, the Guidelines were intended to act as a guide for water storage managers in NSW being, WNSW and non-government entities such as Snowy Hydro Limited to improve safe navigation on water storage facilities in NSW. They do not establish standards that must be met on all waterways, or by all existing safety and hazard minimisation infrastructure. The key purpose of the guideline was to improve safe navigation on water storage across NSW by establishing consistency with the installation of navigation aids and signage to clearly identify built hazards for identification. It also established a framework for waterway user education, asset maintenance, record keeping and interagency communication and incorporates the objectives and guiding principles of the Maritime Safety plan.
122. The guidelines provide general advice on the types of risks and non-exhaustive factors that should be considered when assessing risks to water storage users posed by built hazards and state that water storage/owners/managers should ensure a risk based management approach is adopted for the planning, installation, maintenance and modifications of any man-made structures and the safety management systems in place for those structures to prevent injuries, damage to property and interruption to supply of water or electricity. It notes that whilst it is understood that each agency or corporation will have its own corporate risk management processes it is expected that these will confirm to or exceed AS/NZS 4360:2004 – Risk Management and be conducted by a competent person familiar with that Standard.
123. The Guideline acknowledges that water storage structures are significant items of infrastructure and can pose hazards to waterway users, and has separated such built hazards into three categories: A, B and C. Weirs fall into the Category A description, namely, built structures that relate to the primary function of the water storage (such as weirs/dam wall, spillways and other major water outlet and/or intake pipes). An example of a risk posed by this hazard to waterway users includes the fact a vessel or person falling over the edge of a dam wall, spillway or weir

where water is flowing over it as such an event may result in damage to property and/or serious injury or death to waterway users.

124. It is then acknowledged that most risks associated with built hazards on NSW water storage are already appropriately mitigated through the types of measures which are outlined in the Guideline and noted that there are some differences in approach between the various entities and across the various locations, and some locations where improvements may be needed. Five levels of risk mitigation measures have been identified that have been and can be used to address risks on water storages and it is noted that in many cases a hazard (particularly a category A hazard) should ideally employ a combination of several levels of risk mitigation.

Levels of risk mitigation measures:

Level	Description	Hazard Category
Level 1	Physical Barrier at or near the hazard that seeks to physically prevent navigation to the hazard	Generally required for Category A hazards only
Level 2	Buoys, signage and other markings or advisory material on, at or near the hazard that make the dangers clear and obvious to those approaching the hazard (but do not physically prevent access to the hazard)	Category A hazards where Level 1 measures are unable to be used, or where Level 1 measures require an additional layer of mitigation
Level 3	Buoys marking a hazard where signs may not be required or practical, but that indicate the presence of a hazard and the line of that hazard	Required for Category B hazards
Level 4	Signage and other markings on the shoreline adjacent to or near the hazard that alert approaching vessels and waterway users to the hazard	Required for category A hazards and often advisable for Category B hazards
Level 5	Signage and other advisory material at relevant access points to the waterway (e.g. boat ramps) that alert waterway users to the hazard	Required for all hazard categories

125. The design and location of any installations and safety barriers, buoys and signage should also take into account local geography and conditions in order to ensure they are effective and visible.

126. Level 1 risk mitigation measures are generally required for Category A hazards only. It is recommended that a physical barrier such as a cable and floating buoy apparatus be at or near the hazard that seeks to physically prevent navigation to the hazard. It is further recommended that such a barrier should also be marked where possible with clear warning notices such as 'DANGER – NO ACCESS' (with associated international standard symbols) and in most cases supported by Level 4 and 5 measures and in some cases Level 2 measures.
127. Level 4 measures include signage and other markings on the shoreline adjacent to or near the hazard that alert approaching vessels and waterway users to the hazard.
128. Level 5 measures include signage and other advisory material at relevant access points to the waterway (eg. boat ramps).
129. Level 2 measures include buoys, signage and other markings or advisory material on, at or near the hazard (but do not physically prevent access to the hazard).
130. It is also recommended that the level 1 installation be constructed and installed in such a manner as to meet the following guidelines in conjunction with IALA Guideline 1066 – The Design of Floating Aid to Navigation Moorings and that:
- The apparatus include a continuous cable with a minimum of 6 yellow marker buoys of a size not smaller 300mm in diameter and spaced along the entire cable length not more than 5m apart and when boating is known to occur on waterways relevant to the guidelines between sunset and sunrise or where poor visibility might be expected, consideration should be given to installing yellow flashing lights on the barrier at appropriate intervals and warning signs at boat ramps and entry points to the waterway.
 - The cable and buoy apparatus should be a safe distance from the hazard to ensure that any water user (including swimmers and operators of passive craft or power vessels) approaching the apparatus unknowingly may alter their course of direction to avoid it without being impeded by water flow. This distance should be determined in consultation with technical experts and TfNSW, Maritime.
 - The cable and buoy system needs to be constructed of a material (normally a high strength steel cable and UPVC buoys) capable of enduring the maximum expected forces.

- The apparatus should be constructed in a way that the yellow marker buoys remain above the water surface at all times, so they are highly visible to any approaching waterway users, either floating on the water surface or suspended above the water.

131. The level 2 mitigation strategies should meet the following guidelines:

- Buoys should be coloured yellow and sit a minimum of 700mm above the water level. High flow buoys are also available for locations that experience extreme water flow or weather conditions. All buoys should have yellow reflectors attached on each side/face.
- Buoys should be secured with a suitable galvanised steel chain, shackles and swivel, with a length to be determined in order to ensure the buoys remain visible at all water storage levels
- Buoys should be anchored with a mooring block made from non-corrosive material of suitable weight to ensure they remain in place in all conditions (minimum 90 kg is recommended). This may increase depending on the current, depth, weather and reservoir bed condition. TfNSW may be consulted if necessary to determine appropriate buoy, accessories, location and spacing.

132. WNSW informed the court that the TfNSW Guidelines were not mandatory instruments and did not impose binding obligations upon WNSW, however WNSW informed the court that the following steps have been taken in compliance with the guidelines

- (i) Formal training has been conducted for asset maintenance officers responsible for procuring equipment, including the requirement to undertake risk assessments, prepare technical specifications, and obtain external advice, including by reference to relevant industry guidelines, to ensure that compliant and appropriate equipment is selected.
- (ii) The anchor weights of the cone buoys at the Penrith Weir have been increased from 40kg to 100kg, exceeding the minimum weight recommended in the TfNSW guidelines of 90kg, following a review of the buoy specification in the wake of the January 2022 incidents.

ISSUES

133. An issues list was prepared prior to the inquest commencing to provide structure to the hearing. Some of the issues are no longer of great relevance and other issues have emerged during the inquest. I have considered all the submissions made by the parties and I am of the view that the following matters are the relevant issues that require comment.

Issue 1: Were there adequate hazard signs notifying the public of the dangers of the weir?

134. At the time of the incident there were the following six signs at the Tench Reserve boat ramp:

- (iii) A map of the Nepean River from Warragamba Dam to the South to an area north of the Penrith Weir;
- (iv) A Boating Safety Information sign;
- (v) A sign which stated that 'Towing of persons prohibited on Nepean River before 9:30 am – Penalties apply';
- (vi) A sign which stated 'Warning, area used by rowers slow down and reduce wash – Penalties apply';
- (vii) A risk warning sign which listed various risks and hazards (none of which pertained or referred to the Weir) and noted the consequences of these risks and hazards are serious injury or death; and
- (viii) A sign which stated 'Swimming, diving and fishing prohibited'.

135. Of these signs, only the map made any reference to the weir. There was no key to the map and, although the weir is marked on it in yellow as a hazard, it was not identified as a weir, and the nature of the hazard was not otherwise described. This sign had been installed by TfNSW.

136. Signs (ii), (iii) and (iv) were also installed by TfNSW. Signs (v) and (vi) had been installed by Penrith CC and were directed at risks associated with the boat ramp itself.

137. There were speed limit signs on the river, which indicated that the speed limit was 6 knots. These signs had been installed by TfNSW who held responsibility for maintaining them.

138. There was a single small sign on the upstream side of one of the pylons on Victoria Bridge which stated “DANGER – STRONG CURRENT AHEAD ALL CRAFT PASSNG THIS POINT MAYBE (sic) SWEEP OVER WEIR.” This sign was marked “Dept of Water Resources”, a predecessor to WNSW. TfNSW Boating Safety Officer, Mr Anderson, gave evidence that he recalled there being two such signs; one on each of the two central pylons of Victoria Bridge. He did not recall ever seeing one missing, although it had been some time since he had been down that end of the river.
139. Accordingly, at the time of the incident, only one small sign on one of the pylons of Victoria Bridge alerted river users to the presence or near presence of the weir in clear terms.
140. Since Emily’s death, TfNSW acknowledged the deficit in the signage at the boat ramp and installed the following sign:
- “WARNING NEPEAN RIVER WEIR INFORMATION. WARNING. DANGEROUS CONDITIONS EXIST IN VICINITY OF WEIR. DO NOT PROCEED PAST VICTORIA BRIDGE”.
141. WNSW also replaced the small sign on the Victoria Bridge pylon with a large bright yellow sign which states, “WARNING – NAVIGATION HAZARD DANGEROUS WEIR”. This sign is highly visible and attention grabbing.
142. WNSW also installed a land-based sign closer to the weir which states “Warning: Navigation Hazard Weir Ahead 100m”.
143. The new signs and the regular, scheduled and documented inspection regime of the signs represent a vast and appropriate improvement to the previous signage.

Issue 2: Why were there no safety buoys at Penrith Weir on 26 January 2022?

144. Safety buoys are the most important method implemented to control the risks posed by Penrith Weir. They are placed upstream of the weir and are intended to alert river users of the near presence of the weir. As at the date of Emily’s death on 26 January 2022 the safety buoys were not present and had been washed away sometime prior to 14 November 2021.
145. The inspection and maintenance of the safety buoys was the sole responsibility of WNSW.
146. An inspection on 22 December 2021 had failed to identify that the buoys were missing.

147. At the time of the incident, and before the incident, as described by Dr Ladson, there were dangerous conditions at the weir most of the time.
148. The only thing notifying river users of the presence or near presence of the weir was a small sign on one of the Victoria Bridge pylons.

Safety Buoys in 2021 and 2022

149. It is apparent from Police satellite imagery that the buoys had been displaced in January 2021. A routine inspection in February 2021 was cancelled and the fact the safety buoys were missing was not recorded in respect of an inspection on 2 March 2021. In respect of the inspection on 12 April 2021, it is likely the buoys were still missing as no work request had been raised for their replacement in March 2021.
150. The safety buoys were not identified as missing until the next routine inspection performed by on 15 June 2021. Despite the maintenance officer raising a work request for their replacement that same day, this was not actioned until 29 June 2021, and a quotation was not sought until 27 July 2021. Although a quote was received on 28 July 2021, a purchase order was not raised until 24 August 2021, some two months after the work request was raised. The safety buoys were absent for a period of approximately nine months in 2021; the buoys were not replaced until 27 September 2021.
151. On 6 September 2021, the maintenance officer inspected the weir and recorded the condition of the safety boys in DamGuard as 'a significant increase or change of condition'. This was inaccurate because at that time the safety buoys had not yet been replaced. He had identified them as missing in June 2021. As such, the correct description should have been 'Nil change of condition'.
152. After his inspection on 27 October 2021, the maintenance officer recorded in DamGuard an observation regarding the safety buoys, "Nil change of condition". Three photographs were also uploaded, one of which depicts 12 safety buoys present. In his evidence, the maintenance officer acknowledged that there had been no change in the condition of the buoys since his previous inspection was not correct because by 27 October 2021, the missing safety buoys had been replaced.

153. These records relating to the inspections in September and October 2021 demonstrate how the available condition descriptions in DamGuard were not apposite to an assessment of the condition of the safety buoys and were apt to confuse and result in inaccuracies.
154. A scheduled inspection for November 2021 did not take place. The witnesses could not recall the reason the November inspection did not occur.
155. On 14 November 2021, when the father and his son entered the river in a boat and it was pulled towards the rapids and dragged over the weir (see para 38), the footage taken by the PolAir helicopter records that no safety buoys were present upstream from the weir.
156. On the morning of 22 December 2021, the maintenance inspector inspected the weir and later that day made an entry in EAMS that included the completion comments, 'Surveillance inspection complete. All data entered into DamGuard.' The information recorded in DamGuard included an observation regarding the safety buoys, "Nil change of condition".
157. Four photographs said to have been taken on that date were also uploaded. The safety buoys are not depicted in any of the photographs, although it cannot be said the areas depicted in the photographs included the location where the safety buoys would be expected to be positioned.
158. Given there was no inspection done between 27 October 2021 – when the safety buoys were present – and 22 December 2021 and the fact of the safety buoys being plainly absent by 14 November 2021, as evident from the PolAir footage, the observation recorded in DamGuard that there was "Nil change of condition" of the safety buoys is problematic. The maintenance officer said it was an error on his part but could not otherwise explain how that error occurred.
159. The documented information concerning the condition of the safety buoys incorrectly suggested there had been nil change in the condition of the buoys since they were reinstalled in September 2021, when they had in fact been missing for at least 5 weeks. No corrective action was taken to ensure the missing safety buoys were replaced in a timely manner.
160. It was not until the maintenance officer inspected the weir on 25 January 2022 – the day before the incident that claimed Emily's life – that the safety buoys were identified as missing.

161. The maintenance team leader for the Upper Nepean region agreed that the inspection procedure was not one that was set out in any specific document that said, “these are the steps that are to be gone through in relation to conducting inspections,” rather it was something that comprised of the various documents and paperwork that was required to be completed. He agreed that the instruction given to maintenance officers concerning the preparation for doing an inspection was fairly limited and it was not common practice for a maintenance officer to go back to previous inspection reports or work orders and look at that data. He acknowledged that it was very difficult for the maintenance officers to make an assessment about whether there had been any change in the location of the safety buoys when they did not have the information on hand about what had occurred during the previous inspection.

Steps Taken by WNSW since Emily’s death

162. WNSW accepts that, prior to January 2022, the systems and processes it had in place did not operate to ensure that the safety buoys always remained effective as safety control. WNSW acknowledges that there were periods where the displacement and deterioration of the buoys were not identified and rectified in a timely manner.
163. At the time, responsibility for the Penrith Weir sat with the Upper Nepean maintenance team. WNSW has since reallocated that responsibility to the Warragamba Dam maintenance team. This reallocation was undertaken with a view to improving the coherence and connectivity of the maintenance function, and to ensuring that responsibility for the weir is held by a team with a more direct operational relationship to it. Practically, the reallocation reduces the distance between the responsible maintenance team and the weir itself, which in turn makes it more straightforward to deploy maintenance officers to the site as and when required. In particular, the reallocation better positions the responsible team to manage the interrelationship between dam spills and conditions at the weir, which WNSW acknowledges was an area of disconnect under the previous arrangements.
164. WNSW is of the view that this structural change will address the organisational disconnect that existed between flood events and weir maintenance responsibilities and will also assist in the more effective allocation and management of resources directed towards the weir and improve practices.

165. There are now three sets of safety buoys between Victoria Bridge and the weir to alert River users to the weir's presence:
- (i) Four buoys with anchor weights of 300kg, situated approximately 200 metres upstream from the weir installed by TfNSW after the incident;
 - (ii) 12 cone shaped buoys with anchor weights of 100kg rather than the previous 40kg; and
 - (iii) a floating physical barrier of yellow spherical buoys connected by metal aluminium rods.
166. WNSW has also acquired a spare set of cone shaped buoys to reduce the time taken to reinstall the safety buoys when they are displaced.
167. WNSW also made the following changes to maintenance processes and inspection controls:
- (i) The introduction of an additional maintenance sequences in EAMS (Site Signage – Minor Inspection and Floating Barriers-Minor Inspection) to generate monthly work orders specifically requiring inspection of the buoys and signage at the Penrith Weir;
 - (ii) The development of a custom EAMS report highlighting incomplete routine dam surveillance work orders that remain outstanding after their expected completion date. This report can be reviewed monthly by the Dam Safety and Engineering Team and filter for the month before, so this can be followed up with the relevant site EAMS teams;
 - (iii) The Surveillance Field Manual has been updated to require maintenance officers to consider both dam safety and public safety risks during surveillance inspections, including a review of relevant controls as part of pre-inspection preparation; and
 - (iv) Formal training was conducted for Asset Maintenance personnel responsible for procuring equipment, in accordance with the WNSW Procurement Framework. This training included undertaking risk assessments of required items and preparing technical specifications or obtaining external advice to ensure suppliers provide and/or install appropriate and compliant equipment.

(v) There is also now a requirement that both prior to and following a forecasted flood event, daily inspections of the buoys at the weir occur, with four photographs sent to the Maintenance Team Leader.

(vi) Maintenance officers were issued work iPads in August 2022, which enabled them to complete work orders in the field and capture information in real time.

168. WNSW is in the final stages of implementing its revised Work Management Manual (WMM). The WMM is intended to promote consistency in the creation, completion and review of work orders across the organisation. Relevantly, it introduces more prescriptive requirements for the completion of work order checklists. Rather than merely initialing checklist items, maintenance officers will be required to record a substantive response against every checklist line, recorded as completed (Yes'), not applicable (N/A'), or not completed (No'), with blank entries defaulting to a 'No' response. Where a 'No' response is recorded, the Maintenance Officer must provide an explanation in the completion comments and raise a Follow Up Request.
169. In addition, in August 2022, WNSW implemented a further layer of oversight through its Field Services work order approval process. Under the revised system, a maintenance officer may mark a work order as complete, however the work order remains pending until it has been reviewed and approved by a Team Leader. This represents a significant change from the previous process, under which no such review was required. Where a Team Leader is not satisfied that the work has been appropriately completed, the work order is returned to the maintenance officer with comments identifying the matters requiring further attention and requiring further action before the work order can be approved.
170. This process provides an additional level of assurance that inspection activities have been properly undertaken and recorded and reduces reliance on individual discretion by introducing supervisory verification of completed work.
171. WNSW informed the court that DamGuard was a visual surveillance application used by maintenance officers to undertake inspections in accordance with the requirements of the Dam Safety Surveillance Team and to support WNSW's compliance with its obligations under the Dams Safety Act 2015 (NSW). WNSW is responsible for managing a significant and diverse portfolio of water infrastructure assets across New South Wales. The scale and diversity of that portfolio

require the deployment of standardised systems capable of operating across a broad range of asset types. DamGuard was designed and deployed within that organisational context.

172. DamGuard was not specifically designed to manage or monitor the condition of safety buoys as a public safety control. Its primary focus was the surveillance and management of water infrastructure assets from an operational and dam safety perspective. The safety buoys at the Penrith Weir are not dam safety infrastructure; they are a public safety control directed at protecting river users from the hazards associated with the weir.
173. The condition descriptions available within DamGuard were not well suited to the safety buoys and were apt to result in inaccuracies. Those descriptions were designed for dam and water infrastructure assets and did not contemplate the particular significance of buoy displacement or absence as a public safety matter. This was compounded by the absence of any procedure specifying how the condition of the safety buoys was to be assessed or how displacement, whether in whole or in part, was to be consistently recorded.
174. A further limitation of DamGuard was that it was designed principally as a data collection tool to enable engineers to make technical assessments of assets. It was not contemplated that maintenance officers themselves would need to review previously submitted inspection data as part of their inspection function. Consequently, maintenance officers had no practical alternative but to rely upon their memory of previous inspections when assessing change of condition, a shortcoming that had direct consequences for the accuracy and reliability of the records made.
175. The consequence was that the safety buoys were, in effect, monitored through the lens of a dam safety surveillance system that had not been configured to treat them as the distinct and critical public safety control that they were. WNSW acknowledged that the safety buoys fell through the gaps of a system not designed with their characteristics or significance in mind, in circumstances where no supplementary procedure or specific guidance existed to fill that gap.
176. Since the incident, WNSW has recognised these limitations and has moved the recording and monitoring of the safety buoys into EAMS, a system better suited to maintenance management and through the new dedicated work order. This has removed reliance on DamGuard as the primary mechanism for managing the condition of the safety buoys, and introduced a system

specifically directed to their inspection, monitoring and maintenance as a critical public safety control.

177. In practical terms, the effect in relation to the recording of inspections and monitoring of buoy conditions will be as follows:

- (i) A dedicated work order for the inspection of the safety buoys will be generated every month and must be marked as completed.
- (ii) If the inspection is not completed, the maintenance officer must provide an explanation in the completion comments. If required, the Team Leader can reschedule the missed inspection.
- (iii) The maintenance team leader now has the ability to send a “completed” work order back to a maintenance officer for further attention, which was not previously possible if the maintenance officer had marked the work order as completed.
- (iv) Rather than relying on memory, as was effectively required under the DamGuard system, a maintenance officer is able to view in EAMS the last completed work order for inspection of the buoys, which is readily accessible

178. WNSW accepts that it gave insufficient priority and attention to the timely replacement of the safety buoys following their identification as missing in June 2021.

179. To address the deficiencies that gave rise to that delay, WNSW has taken the following steps:

- (i) Work iPads were issued to maintenance officers in August 2022, enabling the completion of work orders and inspection records in the field in real time, which is designed to improve the accuracy and contemporaneity of recorded inspection outcomes.
- (ii) Criticality rating of 5, the highest available, has now been assigned to the safety buoys, which is designed to ensure that any future work request for their replacement is treated with the urgency it warrants.

(iii) Maintenance officers now allocate a priority rating 1 (Extreme) or 2 (High) on work requests (which is the highest on the scale of priorities) for the replacement or re-installation of marker buoys depending on the extent of the displacement of the buoys to ensure that the work is completed in a timely manner.³⁶ This system is formally documented in the draft WMM.

180. During the inquest consideration was given to whether a policy or procedure for inspections of the safety buoys should be formulated. WNSW submit that a more effective way to ensure appropriate inspections is by the EAMS work order checklist now used for routine inspections of the weir, rather than in a standalone policy or procedure.

181. WNSW informed the Court that this approach would be more reliable as the EAMS work management system is used daily by personnel undertaking inspections and forms part of its existing safety and operational processes. Embedding the instructions in EAMS will help ensure they are maintained, updated and communicated to relevant personnel over time. I accept this submission and I accept that while the system that was in place at the time of Emily's death was not designed to identify the significance of the safety buoys as a public safety control, that system has changed and I accept that WNSW is committed to ensuring that changes are implemented, documented and given practical effect.

Issue 3: Were the training and instruction to maintenance officers responsible for inspections at Penrith Weir adequate?

182. One of the maintenance officers for WNSW gave evidence that he conducted the monthly inspections of the Penrith Weir from 2019. He conducted these inspections despite not being accredited to complete such routine surveillance until 2022. He conducted these monthly inspections on his own, without anybody supervising him or giving him guidance. He received no training in respect of the inspections beyond his Dam Surveillance Training, which was concerned with dam inspections generally. He informed the court that he didn't ever recall being on site with anyone who told him how to go about doing an inspection of the Penrith Weir. He said he first became aware he was required to actually make observations of the safety buoys, and that they were WNSW assets, in 2019, when Penrith CC sent an email requesting that WNSW replace the buoys or advise whether it had a plan in place to do so.

183. Prior to March 2021, the inspections were recorded in a physical document. The maintenance officer did not recall whether the physical form specifically mentioned checking the position of the buoys. His practice at the time was to print off the work order from the EAMS system, fill this in and then attach it back into the work order within EAMS with any photos taken from the site. He said it was much more efficient to complete this paperwork in the office than remotely. His practice was to get the work orders for the week done and complete the paperwork later in the week, most likely on Thursday or Friday.
184. Sometime around March 2021, there was a change whereby the maintenance officers were given access to certain weirs on DamGuard. After the introduction of the DamGuard system, he was required to enter information relating to the buoys on the DamGuard app rather than on the physical form.
185. The visual surveillance entries required to be made separately into DamGuard were relatively generic. They allowed the user to select one of the following descriptions as to the state of the asset:
- (i) Nil change;
 - (ii) Slight decrease or change;
 - (iii) Slight increase or change; or
 - (iv) Significant increase, significant decrease or change of condition.
186. Each of these descriptions necessarily involved a comparative assessment of the condition of the weir at the time of the inspection with its condition at some earlier point in time. However, when asked how he made such a comparative assessment, the maintenance officer said he relied on his memory of the last time he had done an inspection rather than any records that he had kept or that had been entered into any system. That was so, even though it may have been some months since he previously inspected the weir. No one told him that was an appropriate way to make the assessment; it was a practice he had developed himself.
187. Completion comments could be entered in EAMS. For example, during a maintenance inspection on 15 June 2021, the maintenance officer wrote "Inspected weir structure and surrounds. All

data entered into DamGuard.” Despite this ability to provide an adequate description of the status of the safety buoys into the completion comments section in EAMS, the majority of such comments between March 2021 and February 2022 were typically generic, stating that the ‘data had been entered into DamGuard’. This is despite the fact that the buoys were missing on many of these occasions. Further, there were occasions when contrary to the completion comments entered in EAMS, no data was entered into DamGuard. This led to a system which did not allow for adequate monitoring of the safety buoys.

188. There was also a disconnect in the understanding of the purpose of initialling tasks on the Work Order Report form for the inspections, which was then uploaded to EAMS. The maintenance officer initially gave evidence that he would record his initials against the items at the time he was closing out the work order to record that he had undertaken each of the tasks recorded in the work order. However, it became apparent that he only initialed each of the tasks on the Work Order Report form because he understood it was a necessary step in order to close out the work order. For example, at one point in his evidence, he said, “I have a memory of, at some point during this period we’re talking about, having a little light bulb moment and thinking, ‘why are [we] initialing every step even though I can’t actually tell you what a Caloss tool is?’ so I have a memory of performing this just initialing every step, at a later point in time thinking ‘this is not a great idea to be initialing all of these steps’.” He acknowledged that when you look at the work order reports and see his initials against each of the items, they should not be read as indicating that he had in fact done each task.
189. The maintenance officer’s supervisor understood that the initials indicated that the maintenance officer had completed the checklist item. In court, he accepted that this disconnect between his understanding as to the purpose of initialing the tasks on the checklist was possibly caused by an absence of a documented procedure for the inspection process.
190. A second maintenance officer gave evidence that he conducted two inspections at the weir on 27 May 2021 and 4 August 2021 respectively. He had never received any formal training in relation to what was required as part of an inspection or the completion of records of what was observed when inspecting the weir. He could not recall whether the on-the-job training included any specific instruction relating to observations to be made of safety buoys. He knew they had to fill out the work orders and/or DamGuard on the monthly inspection. He rarely completed the

work order whilst in the field but would do so when he went back to the office. He was not trained in how to correctly rate the asset by using the four available descriptions on the DamGuard app. When asked how he would determine whether or not something was a slight decrease or a slight increase or a change of condition, he said he would use his best judgment. He was also unaware of the requirement to complete a work request if the safety buoys were missing and needed to be replaced. On his inspection of the weir on 27 May 2021, he did not record the fact that the safety buoys were missing as he did not know that he was required to do so.

191. WNSW had no specific protocol or procedure in place that provided any guidance to employees as to how they should conduct inspections of the safety buoys. There were also no procedures in place which allowed them to adequately record the fact that the safety buoys had been displaced. Further to this, insufficient training was provided to the employees responsible for conducting such inspections. These deficiencies led to extended periods of time where the presence of the weir and the risk it posed to river users was not made apparent to river users.
192. WNSW accepts that the training that was provided to the maintenance officers was not sufficiently specific to the inspection and management of the Penrith Weir safety buoys, and that there was no documented inspection procedure against which training could be benchmarked or an officer's understanding assessed.
193. The dam surveillance training completed by maintenance officers was a standardised program designed to apply across WNSW's portfolio of water infrastructure assets. It was not configured to address the particular significance of the safety buoys as public safety control, nor to equip maintenance officers with the specific knowledge required to inspect, assess and report on their condition. WNSW accepts that this represented a gap in its training framework that required and continues to require targeted remediation.
194. In direct response WNSW took the following steps:
 - (i) All maintenance officers responsible for declared dam and critical weir surveillance inspections have now completed the required Dam Safety Training accreditation, including asset-specific accreditation, so that no officer is conducting inspections without the requisite qualification.

- (ii) The dam safety surveillance field manual was updated to require maintenance officers to consider both dam safety and public safety risks during surveillance inspections, including reviewing relevant safety controls as part of pre-inspection preparation. As part of the accreditation process, maintenance officers are required to undertake verification of competency assessment for activities at specific dam or weir sites based on guidelines provided in the dam safety surveillance field manual.

195. In addition to the above, WNSW continues to identify and address training gaps through the following measures, which are at various stages of implementation:

- (i) WNSW's WMM rollout includes a workshop program tailored specifically to maintenance officers, which will set out work practice expectations for each relevant process step, reinforce expectations in relation to completing work orders and record-keeping, and provide practical guidance on how to respond to defects or conditions requiring corrective action.
- (ii) Within the training contemplated by the WMM, maintenance officers will receive instruction on expectations of how to raise a work request and assign the appropriate priority rating to the matter raised.
- (iii) WNSW proposes to amend the WMM to include missing safety buoys as an example of an extreme consequence category, so that maintenance officers are clearly directed as to the urgency with which such a work request must be treated.

196. WNSW acknowledges that the training program is not yet fully implemented and is committed to ensuring that its completion is treated as a matter of priority. WNSW accepts that the provision of adequate training and instruction to maintenance officers responsible for the Penrith Weir is a step that is plainly reasonably practicable, and that the absence of such training is a gap that must be addressed so that all relevant officers are equipped with the specific knowledge, documented guidance and practical instruction necessary to carry out their responsibilities effectively.

197. In developing that program, WNSW is committed to incorporating the learnings that have emerged from the evidence heard at this Inquest, which have provided a level of insight into the

practical experience of its maintenance officers, and the gaps in their training and instruction, that will meaningfully inform the design of any updated training framework. WNSW informed the court that it intends to undertake genuine and meaningful consultation with the relevant workers as part of the development process, so that the training program that is ultimately implemented reflects the realities of the role and is given lasting practical effect.

Issue 4: Was communication between the agencies concerned with safety on the river adequate?

198. Prior to Emily's tragic death there were no formal arrangements or communications in place between WNSW, Penrith CC and TfNSW concerning the safety on the river. There was no direct or formal notification procedure in place between the operators of Warragamba Dam and the Upper Nepean Maintenance Team, TfNSW or Penrith CC regarding anticipated spills or releases of water from the dam that might influence the flow of the Nepean River around Penrith.
199. WNSW informed the court that water leaving the dam during times of flood is most accurately characterised as a spill: a consequence of the reservoir reaching or exceeding its full supply level due to rainfall inflows, rather than a decision by WNSW to discharge water. From time-to-time small quantities of water are discharged for maintenance when the dam is at full capacity.

Early Warning Network

200. At the time of Emily's death public notification of spills and or releases from Warragamba Dam was available through the Early Warning Network (**EWN**), a platform operated by WNSW that provides alerts on dam and rainfall activities to registered users. Members of the public and agencies were, and remain, able to subscribe through the WNSW website to receive notifications relating to high regulated water releases and flood events relevant to Penrith Weir.¹⁷ The platform was designed to apply to a wide range of WNSW assets, to notify downstream communities about minor maintenance releases and spills from dams, and potential flood events,²⁰ rather than to provide specific guidance on the safe use of individual waterways or structures.
201. WNSW acknowledged that the information available did not clearly communicate to river users that increased river flows could render conditions at the Penrith Weir more hazardous. WNSW further acknowledges that public awareness of the platform was not sufficiently widespread to

ensure that the system reached those who could benefit from it. These were material limitations of the arrangements in place at the time.

202. Following Emily's death, WNSW undertook a broader public safety communications program directed at engaging more proactively with members of the public. This included:

- (i) the release of a public safety campaign, Stay Safe in the Great Outdoors, in December 2022, published on the WNSW website and distributed via brochures, which included a sign-up campaign for the EWN;
- (ii) the development and implementation of an annual external communications plan (the Public Safety Program Communications Plan), including the release of videos, animations and social media content directed towards promoting public safety awareness; and
- (iii) increased messaging placing emphasis on the 1800 number for reporting hazards.

203. These measures reflect an evolution in WNSW's approach to public communication, representing a transition from the predominantly subscription-based model to a more proactive program of public engagement across all WNSW assets, including the Nepean River. WNSW informed the court that it remains committed to reviewing and refining these measures to support the effective communication of safety information to the public.

204. There was no formal notification procedure in place to ensure that spills or releases were meaningfully conveyed in a way that would enable TfNSW and Penrith CC to address safety risks on the Nepean River in their respective roles.

205. The EWN was designed to apply to a wide range of WNSW assets, to notify downstream communities about minor maintenance releases and spills from dams, and potential flood events, rather than providing specific guidance on the safe use of individual waterways or structures. WNSW acknowledges that the information available through EWN did not clearly communicate to river users that increased river flows could render conditions at the Penrith Weir more hazardous. WNSW further acknowledges that public awareness of the EWN was not sufficiently widespread to ensure that the system reached those who could benefit from it.

206. The notification arrangements in place at the relevant time in respect of TfNSW and Penrith CC relied upon those agencies voluntarily enrolling in the EWN, rather than upon any proactive or direct system of communication by which WNSW ensured that relevant agencies were subscribed and receiving notifications as a matter of course. There was no formal notification procedure in place with either agency to ensure that spills from Warragamba Dam were meaningfully conveyed in a way that would enable those agencies to address safety risks on the Nepean River in their respective roles.
207. The practical limitation of the EWN as an inter-agency notification tool was that participation depended upon individual employees of relevant agencies taking independent steps to enrol, rather than upon a structured process of engagement between organisations. There was no process by which WNSW proactively ensured that TfNSW, Penrith CC or any other agency with relevant responsibilities was enrolled and receiving notifications. WNSW accepts that this was a significant gap in its inter-agency communication arrangements at the relevant time.
208. Since the incident, WNSW has taken steps to address that gap. In particular:
- (i) Penrith CC, as well as Sydney Water, NSW Health Water Quality, the Bureau of Meteorology, NSW State Emergency Service and TfNSW have been added to WNSW's EWN distribution list. The addition of Penrith CC to that list has specifically provided the Council with timely notifications from WNSW regarding potential dam spills and anticipated rainfall events, which Council uses as a trigger to consider closure of the Tench Reserve Boat Ramp; and
 - (ii) WNSW remains committed to ensuring that the relevant agencies, including the maintenance team, maintain their subscriptions to the EWN and that inter-agency communication in relation to dam spills and associated river conditions continues to be prioritized.

Water Level Alarm System

209. A Water Level Alarm System now sends an automated text message notification to two maintenance supervisors, the maintenance planner and the maintenance team leader for the Warragamba area when the river level at the Penrith Weir rises above 2.5 metres. Receipt of these notifications triggers an explicit instruction to visually inspect the status of the safety buoys at Penrith Weir to ensure that any displaced or missing buoys are promptly rectified.
210. The Water Level Alarm System notification is presently not documented in a formal written procedure; however, the Water Level Alarm System notification itself contains an explicit instruction to check the marker buoys at the weir, which provides a direct prompt to the maintenance team to undertake that inspection.

Working Group

211. At the suggestion of Mr. John Gordon, Penrith CC, a working group was established in March 2022 between the agencies that sought to improve safety for river users. Penrith CC informed the Court that it was not aware of the incident that had occurred on the river on 14 November 2021. (see para 38) The Council says that it was not aware of any specific risks associated with weir and not aware that the safety buoys were missing at any particular time. The Council said that at the time of Emily's death there was limited communication between WNSW and TfNSW regarding matters relating to safety of river users and the weir.
212. Initially the working group met monthly and discussed the responsibilities of each agency towards safety on the river and established a sharing of information.
213. In response to the issues identified in this Inquest, representatives of each agency also met on 9 July 2026 for the express purpose of progressing a coordinated approach to the management of the risks posed by the Penrith Weir and the formalisation of inter-agency arrangements. The court has been informed that the meeting was productive and conducted in a constructive and collaborative spirit, with all three agencies engaging meaningfully in relation to the issues raised by this Inquest. An item discussed during the meeting was the closure of the boat ramp procedure. The boat ramp closure procedure remains the responsibility of Penrith CC.

Tench Reserve Boat ramp

214. Penrith CC have been proactive in developing a written procedure outlining the process for closing the Tench Reserve Boat Ramp. The procedure is intended to clarify the responsibilities of those agencies with respect to the communication of information relevant to Penrith CC's decision-making concerning the circumstances in which the Boat Ramp is required to be closed. A specified trigger to close the boat ramp now includes separation or dislodgement of the safety buoys located above the weir.
215. This procedure was operative by July 2022, and I note that it is in the process of finally being formally agreed to by the three agencies.

CONCLUSION

216. Communication between the agencies has greatly improved since Emily's death and each of the agencies have indicated support for and willingness to engage in the development of a memorandum of understanding regarding the coordination of responses and formalizing of roles and responsibilities of each agency in relation to the management of the risks posed by Penrith Weir to the safety of river users. I propose making a recommendation in that regard.
217. A substantial number of improvements have been made by all the relevant agencies since January 2022. The inspection of the safety buoys is no longer reliant upon a maintenance officer independently identifying the need to undertake those checks during a broader inspection of the weir. There is now a separate monthly work order specifically requiring inspections of all the buoys. When there is a flooding event there is a daily inspection of the buoys. Since February 2022 the WNSW buoys have been washed away or displaced and then replaced on some 13 occasions.
218. I am satisfied that the system that is now in place can identify displacement of the buoys promptly and ensure swift reinstatement.

219. The independent expert Dr Ladson provided evidence that the danger posed by the weir could be eliminated as the weir could be modified. He said that a Rock Ramp Weir designed to have a drop of approximately two metres over a twenty to forty metre gradual slope would eliminate the dangerous conditions of the recirculating water. He informed the court that such a weir was constructed at South Dubbo after there had been two deaths in 2008 and 2011 at that weir. Any measure that holds out the prospect of reducing the risk of further deaths at the Nepean Weir is worthy of consideration. WNSW agrees and informs the court that any proposal to remove or modify the weir would appropriately be assessed having regard to a range of considerations, including technical feasibility, environmental and heritage constraints, stakeholder impacts, funding requirements and overall cost. WNSW proposes to undertake a pre-feasibility study as an initial step to assess whether options for the modification or removal of Penrith Weir are viable and warrant further investigation. A pre-feasibility study is an early-stage assessment process that considers whether a proposed infrastructure concept is practicable and capable of being progressed.
220. WNSW notes that a full feasibility study is a more detailed and resource-intensive process that involves rigorous evaluation of a preferred option and is typically undertaken to support funding decisions, approvals and potential construction. Should the pre-feasibility study identify a viable option for further development, WNSW would then progress to a full feasibility study.
221. I propose to make a recommendation that WNSW that WNSW explore the feasibility of either removing or modifying the Penrith Weir, for example, by the installation of a Rock Ramp Weir, a Flip-lip spillway or a Stepped spillway, to further mitigate or eliminate the risk of increased flows over the Weir creating an entrapment zone of recirculating water immediately downstream of the Weir.

CONCLUDING REMARKS

222. The participation in, and presence at the inquest of the three agencies involved in the safety on the river at the Penrith Weir demonstrates their real concern to uphold their responsibilities and their genuine desire to learn lessons from this incident so as to

create a safer river so that a death similar to Emily's will not occur again. Each agency expressed their sincere condolences to Emily's family, and it is evident that they wish to ensure that all recreational users of the river enjoy themselves and then return home safely.

223. I thank Mr. R Ranken SC with Ms. K Zielinski, Counsel Assisting and their instructing solicitor Ms. R Campbell for the work they put into assisting me in this inquest.

224. I would also like to acknowledge the work of the Officer in Charge, Detective Senior Constable Laura Mitchell, who conducted a thorough police investigation into this matter and compiled the police brief.

225. I express my sincere condolences to all of Emily's family, and to her mother and her children who are suffering so greatly with their loss.

FINDINGS PURSUANT TO *S.81 CORONERS ACT 2009 (NSW)*

Identity

The person who died was Emily Warn

Date of death

Emily Warn died on 26 January 2022

Place of death

Emily Warn died at the Penrith Weir on the Nepean River, Penrith NSW

Cause of death

The cause of Emily Warn's death was drowning

Manner of death

Emily Warn died after a boat on which she was a passenger capsized over the Penrith Weir, and she was ejected and became caught in a strong recirculating entrapment zone caused by the high-water flow rate on the Nepean River at the time.

RECOMMENDATIONS PURSUANT TO S.82 CORONERS ACT 2009 (NSW)

I am satisfied that the following recommendations arise out of the evidence and are desirable in accordance with s. 82 *Coroners Act 2009 (NSW)*

To the Chief Executive Officer of WaterNSW, the General Manager of Penrith City Council, and the Secretary of Transport for NSW:

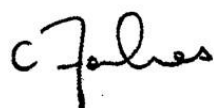
I recommend that:

WaterNSW, Penrith City Council and Transport for NSW consider developing a framework or memorandum of understanding regarding the coordination of responses, and formalising of roles and responsibilities of each agency in relation to the management of the risks posed by Penrith Weir to the safety of river users.

To the Chief Executive Officer of WaterNSW

I recommend that:

WaterNSW explore the feasibility of either removing or modifying the Penrith Weir for example by the installation of a Rock Ramp Weir, a Flip-lip spillway or a Stepped spillway to further mitigate or eliminate the risk of increased flows over the weir creating an entrapment zone of recirculating water immediately downstream of the weir.



Judge Carmel Forbes

Deputy State Coroner

Coroners Court of NSW, Lidcombe

22 September 2026