

## Form 20A

Version 2

### *Coroners Act 2003 (sections 45, 51 and 97(2))*

### Coroner's findings and notice of completion of coronial investigation

I have investigated the death of:

Name:

Clive Robert Bradburn

Address:

50 Robertson Street Kurrajong NSW 2758

Date of birth:

21/07/1946

Age:

61

Gender:



Male



Female

I find that:

This is how the person died (provide narrative of circumstances of death):

Clive Robert Bradburn and his wife Janet Margaret Bradburn were members of the Hunter Recreational Flying Club at Cessnock in NSW. Mr Bradburn owned a Zenair Zodiac CH601XL recreational aircraft, which was a kit plane he had purchased from the Zenith Aircraft Company in the USA and constructed between February 2006 and December 2007.

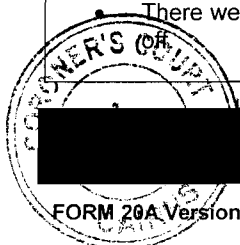
In July 2008, a number of aviators from the flying club, including Mr and Mrs Bradburn, undertook a flying safari to the Gulf country in Far North Queensland. The members who participated were responsible for their own aircraft which included all safety checks and mechanical maintenance during the trip.

Mr and Mrs Bradburn (with Mr Bradburn as the pilot in command) set off on the trip from Cessnock on 5 July 2008 in company with 11 other aircraft and a total of 22 participants.

The following flights were recorded:

- On 5 July 2008, the group departed Cessnock at 9.20 am and arrived at Moree at 11.35 am where the aircraft stopped for fuel. The group then departed Moree at 12.13 pm and arrived at Charleville at 2.40 pm, where the party spent the night.
- On 6 July 2008, the group departed Charleville at 7.24 am and arrived at Longreach at 9.40 am, where they stayed over night.
- On 7 July 2008, the group departed Longreach at 7.50 am and arrived at Cloncurry at 10.17 am. They departed at 11.15 am and arrived at Adels Grove at 12.32 pm where they stayed two nights.
- On 9 July 2008, the group departed Adels Grove at 8.00 am and arrived at Karumba at 9.47 am, where they spent two nights.
- On 11 July 2008, the group departed Karumba at 7.44 am and arrived at Georgetown at 9.37 am. They departed at 10.18 am and arrived at Atherton at 11.53 am where they stayed two nights.
- On Sunday, 13 July 2008, the group departed Atherton at 12.08 pm and travelled via way points of Mt Garnett at 12.34 pm, Wairuna at 12.55 pm; Camel Creek at 1.05; and Lassie Creek at 1.25 pm before the group landed at Charters Towers at 1.52 pm. The group had wanted to fly to Shute Harbour but the weather out of Atherton was closed in and cloudy so they couldn't take off until about midday. The wind was from the south-east at approximately 5 – 10 knots with a cloud base 1500 feet above ground level. There was six eighths cloud cover and fog was observed to the mounts to the east and west. The group decision was to fly inland to Mt Garnet and then to land in Charters Towers.

There were 5 planes which took off in one cluster which included Mr and Mrs Bradburn, whose plane was the fourth to take



### The Flight from Atherton to Charters Towers

The group followed normal radio procedures of using the area frequency allocated to the departure or arrival airport. After passing 3000 feet altitude, the group would monitor the area frequency used by all aircraft in the area. This was a standard air traffic radio procedure. Additionally, the group kept in touch with each other using what is known as a chat channel. This involved using frequency 123.45. As a rule, the members of the group would use this frequency every 15 minutes to report the position of each aircraft, distance to run, altitude and any other appropriate information. Members of the party recalled talking to Mr Bradburn on the radio because Mrs Bradburn's headset was not transmitting to other aircraft. Once they were all in the air, all aircraft started the 15 minute roll call.

Once the aircraft had crossed over the mountain range to the west, the group switched to their chat channel to ensure that everyone was okay and tracking in the correct direction. Mr Bradburn called in at that time. Once the party reached Mt Garnet, they changed track for Charters Towers and continued to repeat the radio checks every 15 minutes.

Approximately 20 – 30 minutes into the flight after taking off from Atherton, (i.e. approximately 12.30 – 12.35 pm) Mr Michael Roche, another pilot in the group, spoke to Mr Bradburn. This was in the vicinity of Mt Garnet. Mr Bradburn was approximately 5 miles ahead at the time and flying at a similar height.

At approximately 12.55 pm Mr Thomas Wedderburn-Bishop, one of the pilots in the group<sup>1</sup> heard Mr Bradburn report his position as close to him. Mr Wedderburn-Bishop was climbing through approximately 6000 feet at the time. He then had regular radio contact with Mr Bradburn until Mr Bradburn made visual contact of his aircraft. Mr Bradburn said to Mr Wedderburn-Bishop that he would like to take some photos. Mr Wedderburn-Bishop said he would like to take some video of him going past and would slow down to allow Mr Bradburn to overtake. He then slowed down to 85 knots and attempted to take some video of Mr Bradburn until about 1.05pm but he was unsuccessful due to turbulence and the need to control the plane rather than a camera. As Mr Bradburn flew to the left past Mr Wedderburn-Bishop's plane, Mr Bradburn said that he got some good photos of Mr Wedderburn-Bishop's plane. Mr Wedderburn-Bishop stated that "while in sight, I observed Mr Bradburn to be flying straight and level and no signs of any problems with the aircraft. Flying conditions were reasonably good."<sup>2</sup> Approximately 5 minutes later, Mr Wedderburn-Bishop recalled hearing a person on the radio say "has anyone heard from Clive?" as there had been no response from him.

Mr Bradburn's last official call in was at about 1.00 pm<sup>3</sup>. At about 1.08 pm, Ms Seve corrected herself on air to the other aircraft regarding the sighting of Lassie Creek air-strip. Other aircraft made jokes in response to her error. In particular, Mr Bradburn made a joke in response to her mistake. At about this time, Mr Kevin White, who was one of the five pilots flying with the group told police that the last visual he had of Mr and Mrs Bradburn's plane was around Princess Hill airstrip about 1 hour into the flight. Mr Bradburn overtook Mr White from below and about 1 nautical mile to his right at about 6500 feet. At this time, the aircraft were at about 6800 feet at a speed of 110 knots and around 45 nautical miles from Charters Towers. Cloud cover had decreased to three eighths and there was no turbulence at this height. There was a little tail wind and they were averaging about 95 knots with about a 2 knot tail wind. No aircraft had called with any problems or issues.

At about 1.15 pm, the aircraft started their roll call. Ms Seve heard 4 aircraft respond to her call but there was no call from Mr and Mrs Bradburn<sup>4</sup>. This was unusual because Ms Seve had just had a conversation with them and this was the regular contact. Mr Bradburn was known to be a stickler for keeping in contact. Attempts were made again to contact Mr Bradburn on the radio chatter channel and there was still no answer. Mr Seve then changed to area frequency 126.7 with no response. They assumed that Mr Bradburn's radio had malfunctioned. There was discussion about this with the other members of the party on the chatter channel. Members were asked if anyone could sight Mr Bradburn's aircraft but no one could see it at that point. Ms Seve then took out her mobile telephone and rang Mrs Bradburn's mobile telephone and left a message telling them that they could not hear any transmission from them. Ms Seve also tried to call Mr Bradburn's mobile telephone but the call failed. She then sent a text message to Mrs Bradburn's telephone at about 1.20 pm with no response. At this point, the group was almost at their destination and were about 10 nautical miles from Charters Towers. They then had to return to area frequency to give their inbound calls and begin their descent and approach.

After all the aircraft had landed it was clear that Mrs and Mr Bradburn were missing. Mr Seve contacted AUS Search and informed them of the missing aircraft. A search and rescue response was initiated.

### The Crash Scene

On Monday, 14 July 2008 an aerial search continued and at about 11.15 am, the crashed aircraft was located in bushland approximately 4 km north of Kangaroo Hill Station. The actual site location was 19°S and 145°E. A Blackhawk helicopter was deployed to the scene where a paramedic was lowered to the crash site, who confirmed life extinct. Police then secured the scene and preliminary investigations commenced. The following preliminary findings were made:

- The impact was high speed, vertical and spiral, with no evidence from the surrounding tree and ground area of a glided impact;
- The debris was found in close proximity to the aircraft wreckage, except for a map which was found approximately 800 metres over a ridge from the wreckage;
- There was no apparent signs of aircraft frame failure, all control mechanisms appeared intact, the fuel had evaporated from

<sup>1</sup> referred to in his statement, dated 14 July 2008, at page 4, paragraph 23-28

<sup>2</sup> Ibid at page 4, paragraph 32

<sup>3</sup> Statement of Ms Anne-Marie Seve, dated 14 July 2008 at page 5, paragraph 18

<sup>4</sup> Ibid, at page 5, paragraph 20.

the wing tanks and there was no fire. First inspection of the plane indicated that there was no loss of structural integrity to the wings, control cables or fuselage. However, canopy integrity could not be established at that time.

- A visual inspection of the engine revealed that the engine mounts to the firewall were intact; the spinner to the propeller was intact.
- Some instrumentation was removed from the site, including a GPS device, some instruments, and the carbon monoxide card, which showed that it had been exposed to carbon monoxide; however this card may not be reliable. The GPS instrumentation was sent away for data recovery. The ATSB later reported that data about the flight path of the aircraft was successfully downloaded and showed that it was tracking pursuant to the planned flight path.

The bodies of Mr and Mrs Bradburn were removed from the wreckage at the time and taken to Townsville where autopsies were conducted.

On 9 September 2008, investigators returned to the crash site and recovered the engine and canopy materials. Further inspection at the crash site of the canopy assembly located and revealed the canopy latching mechanism. The pilot's side latch was intact and the passenger side latch was broken which may indicate a midair canopy failure. It should be noted that Mrs Bradburn hand was clenched around the canopy seal.

#### Post Mortem Examination

On 16 July 2008 Professor Williams, Forensic Pathologist, conducted a post mortem examination on each body, including internal examination and made the following findings:

- Mr Bradburn had died of myocarditis. The body showed extreme destruction and distortion. The histological assessment showed that Mr Bradburn demonstrated a florid myocarditis in the heart. Toxicology results showed the presence of carbon monoxide <5% Hb saturation and the presence of paracetamol, approximately 6 mg/kg. The pathologist opined that the quantity of carbon monoxide and paracetamol was not significant.
- Mr Bradburn had died due to multiple injuries due to a micro light accident (passenger). The autopsy failed to reveal any significant natural disease. The body was severely injured and disrupted. Toxicology results showed the presence of carbon monoxide <5% Hb saturation. The quantity of carbon monoxide was not significant.

The pathologist opined that Mr Bradburn died of natural causes prior to impact and Mrs Bradburn died of injuries due to impact.

#### The Weather

During the flight from Mount Garnet to Charters Towers, there was conversation between the pilots that there was quite a bit of turbulence at the 4500 feet mark, so it was agreed that they would climb above the cloud base which was 5000 feet. This occurred approximately 5 nautical miles past Mt Garnet. The cloud was three-eighths stratocumulus with a base of approximately 4800 feet and tops at 7500 feet. Turbulence below the cloud base was described as moderate. The aircraft continued to climb into smoother air.

#### The Aircraft

The aircraft involved was a Zenith Zodiac 601XL which Mr Bradburn constructed himself. The kit came from the Zenith Aircraft Company in Missouri, USA. The aircraft has a 6 cylinder 120 horsepower Jabiru engine (fitted new), two fuel tanks located in the wings holding approximately 45 litres of AVGAS 100LL fuel. It is a low wing aircraft capable of a cruise speed of approximately 100 to 110 knots with an endurance travelling time of 4 hours with a 45 minute fixed reserve. Fuel consumption is 18 litres per hour and maximum take off weight per manufacturer classification of 600 kg<sup>5</sup>.

Owners of recreational aircraft are permitted to maintain their own aircraft, unlike commercial aviation where maintenance of an aircraft is regulated, requiring a qualified mechanic to undertake all maintenance. The aircraft maintenance log showed that the kit was delivered from Zenith Aircraft in the USA in February 2006. Construction was completed over a 23 month period and finalised in December 2007. The aircraft was presented for its airworthiness inspection in January 2007. The first flight took place on 20 January 2008. The last recorded maintenance was on 28 June 2008 when the aircraft underwent an early oil change, and oil filter due to upcoming 30+ hours and a planned trip.

Mr Paul Crowfoot, a self employed flying instructor and member of the Hunter Recreational Flying Club who also owned the same model aircraft as Mr Bradburn stated that he first saw Mr Bradburn's Zenith Zodiac aircraft when he brought it to Cessnock on a trailer where it underwent final assembly and testing. Mr Crowfoot then did testing in the aircraft with Mr Bradburn to familiarise him with the aircraft. Mr Crowfoot described Mr Bradburn's aircraft as "a terrific little aircraft. It was pretty light and sensitive in pitch and reasonably heavy in roll."<sup>6</sup>

<sup>5</sup> Statement of Edward Seve, dated 15 July 2008 at page 2, paragraph 7.

<sup>6</sup> Statement of Mr Paul Crowfoot, dated 28 July 2008 at page 2.

<sup>7</sup> Statement of Kevin White, dated 29 July 2008 at page 3, paragraph 10

<sup>8</sup> Statement of Christopher Hirst, dated 30 July 2008 at page 3, paragraph 16.

<sup>9</sup> Statement of Mr Paul Crowfoot at page 1.

<sup>10</sup> Ibid, at page 3, paragraph 9.

<sup>11</sup> Statement of Carol Richards, dated 6 August 2008 at page 12, paragraph 11.

<sup>12</sup> Statement of Kevin White, at page 3 paragraph 13

The aircraft had a total of 40 hours flight time logged as of 28 June 2008 not including the flight in the trip. The possibility of an inadequate seal of the cabin arose during the course of this investigation.

Mr Bradburn had complained to Mr Seve about the carbon monoxide card in the aircraft changing colour, indicating the presence of carbon monoxide. Mr Kevin White, another pilot from the party, told police that on Saturday 5 July 2008, Mr Bradburn mentioned that his carbon monoxide detector had changed to black, indicating the presence of carbon monoxide<sup>7</sup>. However, during the remaining flights neither Mr nor Mrs Bradburn mentioned the carbon monoxide problem again. Mr Christopher Hirst told police that he recalled Mr Bradburn talking to a group at Atherton about problems with carbon monoxide in his aircraft. He told the group that his carbon monoxide indicator had gone black very quickly and he discussed altering ways to seal the cabin and keep the carbon monoxide out and improve ventilation<sup>8</sup>.

In any event, Professor Williams has commented on the toxicological finding of carbon monoxide in the blood samples, stating that the level was not significant.

#### **The Pilot in Command**

Mr Bradburn took a full time course with a flying school at Holbrook to gain his pilot's certificate. He approached Mr Crowfoot for some training in the Jabiru aircraft, which Mr Crowfoot also owned. Mr Bradburn undertook his cross country and passenger endorsements with Mr Crowfoot in the Jabiru he owned at the time. Mr Crowfoot opined that

"[Mr Bradburn] was a competent pilot. He was very aware of any limitations that he had as a pilot and he would immediately come and get training if he felt that he needed to brush up on any issue. In relation to navigation I would rate [Mr Bradburn] as competent and his radio work was average. [He] was a safe pilot, he never took any risks."<sup>9</sup>

Colleagues from the Hunter Recreational flying club described Mr Bradburn as being an "average to experienced pilot"<sup>10</sup> who had been flying for 3 – 4 years. Most of his flying had been carried out in and around Cessnock in the Hunter Valley area of NSW. Mr Bradburn was observed to regularly carry out pre-flight checks on his aircraft before every flight. Mr Bradburn was described as being safety conscious. Another member of the group described Mr Bradburn as "very careful and I never saw him take any chances or do anything silly. He was a careful pilot who planned well and flew conservatively (not close to the ground or doing silly things)"<sup>11</sup>. A fellow pilot, who had observed Mr Bradburn's landings on numerous occasions, described them to have been very satisfactory even under difficult conditions. Mr Kevin White, a fellow aviator who had known Mr Bradburn for about 10 years, described Mr Bradburn's aviation judgement abilities as being "at the beginner level and this lack of developed skills was a cause of anxiety to Clive on some of the more challenging aspects of the flight around navigation and airport approach procedures"<sup>12</sup>. Mr White did not believe that Mr Bradburn was underqualified but as a new pilot on this kind of trip he was bound to face challenges.

Mr Bradburn had logged over 250 hours flying time in total. His last annual medical declaration was dated 27 August 2007 in which he declared that his health was equivalent to that required to hold a drivers licence and that he had no known heart conditions or suffered from epilepsy or diabetes.

Mr Bradburn was reportedly taking cough medicine for a chest cold during the trip and had finished a course of antibiotics for a lung infection just before the trip.

Mrs Bradburn held no pilot qualifications and assisted with navigation during the flights.

#### **Further Investigation and Review – Recreation Aviation Australia (RAA)**

The investigators were able to exclude any contribution to the loss of control and impact from the following factors:

- Fuel – the same fuel supply was used by other aircraft without incident;
- Engine – no evidence exists to support a finding that the engine was not operational at the time of impact;
- Controls – continuity and function were able to be established from inspection of the wreckage;
- Weight and Balance – the aircraft was close to its forward centre of gravity limit but within limits and close to its maximum take off weight;

The QPS report and RAA report refer to past incidents of possible canopy failure in this type of aircraft. Therefore, close attention was given to this possibility. Items of canopy were found at the impact site. The rail and latching mechanism for the canopy were found. Damage to the canopy rail indicates that the left side of the canopy was in the closed position at impact. However, the right hand side canopy was not in the closed position at impact due to the torsional dis-configuration of the rails and impact marks. The release mechanism for the canopy is positioned on the pilot's side and designed so that when operated, both pilot and passenger latches are released at the same time.

#### **The RAA investigator reports**

*"It is determined from investigation that the right side of the aircraft's canopy became open in flight disrupting the airflow over the aircraft control surfaces of the elevator and rudder.*

*The aircraft experienced turbulent airflow over the elevator disrupting pitch control while sections of the canopy failed under torsional load venting the cockpit to the outside airflow. This allowed the map to escape the cockpit at altitude. The location of the map in relation to the wreckage was consistent with a high altitude departure from the aircraft and may have occurred shortly after the aircraft departed control, one hour and twenty one minutes into the flight.*

*Unfortunately it cannot be ascertained if the medical condition led to a loss of control, which in turn, led to overstress of the airframe and canopy, initiating in-flight failure. Or it could be possible that an unintentional canopy release in flight leading to*

subsequent control difficulties contributed to the medical condition.

*The loss of control appears to have occurred suddenly as no contact was made by the pilot to the rest of the group. Although not trained as a pilot, the passenger had limited experience in manipulating the controls; however in a flight upset situation this would have been difficult to effect and most likely beyond her experience."*

I not the QPS Forensic Crash investigator concurs with the view of the RAA investigator.

I have carefully reviewed the evidence gathered during this investigation and considered the findings and opinions of the investigators. The material does not enable me to advance the understanding of the cause of the deaths beyond that established by the investigators. I am also of the opinion that there are no lines of further investigation open which might advance my understanding. In the circumstances, I accept the opinions of the investigators as to the likely possible causes of loss of control and impact of the aircraft with terrain. However, like the investigators, I am unable to find which of the two scenario's is more likely.

#### Conclusion

I find that Clive Robert Bradburn and Janet Margaret Bradburn died at a location in bushland approximately 4 km north of Kangaroo Hill Station, Ewun near Charters Towers on 14 July 2008. Clive Robert Bradburn died due to myocarditis and Janet Margaret Bradburn died due to multiple injuries due to a light aircraft accident (passenger).

I am satisfied that the circumstances of his death were adequately investigated, there are no suspicious circumstances and no further investigation is warranted. An inquest is unnecessary and will not be convened.

This is when the person died:

14/07/2008

This is where the person died (where possible this must include whether the person died in Queensland):

Kangaroo Hill Station, Ewun, Ingham QLD 4850

This is what caused the person to die (this will usually be the medical cause of death):

1(a) Myocarditis

An inquest was not held in relation to this death.

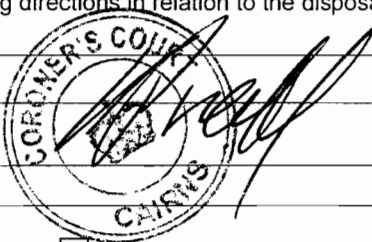
☒ I authorise the investigating officer to dispose of any property obtained in connection with this investigation according to law.

OR

☐ I make the following directions in relation to the disposal of property obtained in connection with this investigation:

Name:

Kevin Priestly



☐ State Coroner

☐ Deputy State Coroner

☒ Coroner

Signature:

Date: 2 June 2010

Place:

CAIRNS