Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 147

Program: N/A
Division/Agency: Airservices Australia
Topic: Recommendations made by Mr Greg Cavanagh SM in the 2013 Coronial inquest into the death of Kevin Taylor, Lena Yali and Gregory McNamara 011 [2013] NTMC 1
Proof Hansard Page: 92-93 (17 October 2016)

Senator McCarthy, Malrndirri asked:

Senator McCARTHY: Could I take you to some policies in relation to the firefighting area. You may recall in 2011 an accident in Darwin in the Northern Territory—
Mr Harfield: Correct.
Senator McCARTHY: and recommendations made by Coroner Greg Cavanagh in terms of the policies and procedures for Airservices Australia. I would like to ask you a few questions around that. The coroner identified that there were major shortcomings in the policies and the operating procedures and training protocols of Airservices Australia and that staff were ill-equipped to drive the ultra-large fire vehicle in emergency conditions and at speed with lights and sirens on a public road. Has Airservices Australia made attempts for those recommendations to be addressed?
Mr Harfield: Yes, we have, and I will ask Ms Bennetts, Executive General Manager, Aviation Rescue Fire Fighting, to give you the detail and assurance around that.
Ms Bennetts: Yes, in relation to training, at the time of the coroner's report we took a good look around the country and internationally at what other services do—state services as well as other emergency services providers—in relation to training their people and what policies and procedures they have in relation to driving under emergency conditions. Then we formulated a new policy framework around that and set about training our people in accordance with that policy framework.
Senator McCARTHY: What is the training that you provide?
Ms Bennetts: I would have to take the detail on notice, but it is things such as the rules around when they are approaching intersections, for example, and at what speed they can go through the intersection, and that they must stop before they proceed—those sorts of things. Then we would train them in those procedures. But if you are after more detail that that, I can certainly provide that on notice.
Senator McCARTHY: I guess what I would like to know is, given the tragedy in this particular situation and the recognition that the driver thought that everyone knew that he could drive through the lights—and there was certainly no mention that the driver was responsible in this case—that training that is required for all your staff who are driving these vehicles: is that something that you are doing nationally?
Ms Bennetts: Yes. We implemented a driver training program nationally. The first round of training all of our operational personnel was run out of Brisbane, and they all went, from memory, for a two-day course where they essentially drove the vehicles under emergency conditions where they could do it safely and they could be trained on that basis. That, from memory, was in 2010 to 2012. Our whole operational workforce of 900 went through that training. The training has now been revised for the second round of it, and I can provide you with that detail on notice.

Answer:

Airservices has delivered an extensive driver training program to all firefighting staff across all of its 26 locations.

Shortly after the accident, an external specialist organisation (Driving Management Australia - DMA) was engaged to design and deliver a focused training program. The program was designed in the following three stages:

1. A training pool of staff (representing each location) to become Emergency Vehicle Driving Instructors.

2. Instructors delivered a training package (developed by DMA) to all staff at their respective locations which focused on the basic operation of our firefighting vehicles.

3. All staff (in groups of approximately 12 at a time) attended a two day training course delivered by DMA at a dedicated driver training facility located at Brisbane or Perth. This program focused on the more advanced elements of driving vehicles under emergency response conditions (when using “lights and sirens”) and situational awareness.

An additional ongoing requirement has also been introduced that requires all staff to undertake refresher training and evaluation every 90 days in relation to off-airport driving.

Any new firefighters entering service are also required to undertake the program as described above.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Question no.: 154

Program: N/A
Division/Agency: Airservices Australia
Topic: Review and publication of Airservices procurement policies
Proof Hansard Page: 104 (17 October 2016)

Senator Sterle, Glenn asked:

Senator STERLE: Okay, so we have changed from 'quite often' or 'often' to 'do not know'—that is fine. Thank you. If you do not know, maybe someone else might—or Mr Harfield, who has been around a long time too. Can you tell us the last time you reviewed your procedures and procurement policies prior to this committee writing to the ANAO to seek an audit of Airservices?
Mr Logan: I do not know; I can find out.

Answer:

Prior to the Senate Rural and Regional Affairs and Transport Legislation Committee writing to the Australia National Audit Office in August 2015 to seek a performance audit of Airservices the:

- Airservices Finance Policy was last reviewed and issued by the Chief Executive Officer in February 2015; and
- Airservices Finance Manual was last reviewed and issued by the Chief Financial Officer in October 2014.

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 156

Program: n/a
Division/Agency: Airservices Australia
Topic: Membership of the Board of Airservices Australia at engagement of contractors through ICCPM
Proof Hansard Page: 104 (17 October 2016)

Senator O'Sullivan, Barry asked:

CHAIR: We will get to the Allens report, because there was a less than favourable reference made to it in terms of whether those involved were provided with all of the relevant information needed to allow them to properly make recommendations and findings. Thank you for all that, but it did not address the burden of my question. Door to door, house by house, what current members of the board were there when this was allowed to happen—by name?
Mr Harfield: The engagement of these two individuals in their capacity contracting through ICCPM first occurred in 2012, so I would have to have a look at who the board was at that particular stage in 2012.
CHAIR: You have no independent—
Mr Harfield: I am just trying to work through it. The chair of the board depends on the timing. The chair changed from David Forsyth to Angus Houston. Angus Houston was a member of the board. Dr Warren Mundy was the deputy chair. Ms Annette Kimmitt at some stage during 2012 came on board with Mr Paul Lucas, Ms Sam Betzien and Mr Tony Mathews. I would have to recollect to see who was there in 2012. There were some changes on the board during 2012.
CHAIR: I am loath to have you take things on notice.
Mr Harfield: We can look up annual reports—
CHAIR: Would you take that on notice? I am interested in the identity of board members at the time that these appointments were ratified by the board, acknowledged by the board and when the board was briefed about them and those who remain on the board today. So you understand the clarification of my question?
Mr Harfield: Yes, I do.

Answer:

Mr Bradford and Mr Pyke were first appointed on 9 July 2012 and 16 July 2012 respectively, authorised by the then Chief Executive Officer of Airservices Australia.

The Board of Airservices Australia was advised in July 2012 of the engagement of Mr Harry Bradford through the International Centre for Complex Project Management (ICCPM). There is no documentary evidence that Mr Pyke's engagement was reported to the Board at the time of his initial appointment.

The membership of the Board of Airservices Australia for the months of July 2012 and October 2016:

July 2012	**October 2016**
Angus Houston	Angus Houston
Warren Mundy	Tony Mathews
Samantha Betzien	Samantha Betzien
David Burden	David Marchant
Annette Kimmitt	Tim Rothwell
Paul Lucas	Fiona Balfour
Tony Mathews	John McGee
Judith Munro	Jason Harfield
Andrew Clark (Acting CEO – May 2012 – Oct 2012)	

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 159

Program: N/A
Division/Agency: Airservices Australia
Topic: Helicopter noise at Adelaide Airport
Proof Hansard Page: 108 (17 October 2016)

Senator Xenophon, Nick asked:

Senator XENOPHON: I have one final question to be put on notice in relation to that. I want to go to the question of helicopter noise at Adelaide Airport. Representations have been made to me about helicopter noise disturbances over Adelaide's western suburbs during curfew hours. I presume Airservices has a record of all operations in the vicinity of Adelaide Airport, or does a curfew not apply to helicopters?
Mr Harfield: The curfew applies to the landings and take-offs of certain categories of aircraft. I am sure you will be aware that aircraft do depart and land at Adelaide Airport outside the curfew hours—turboprops, some freighters. They do not meet the threshold. But we can provide you with the information reference.
Senator XENOPHON: Further to that, could you provide me please with a list of air movements outside the curfew hours for the past three months and whether helicopters are identified as part of that?
Mr Harfield: So you want operations during curfew hours and helicopter operations. Is that correct?
Senator XENOPHON: Just a list of air movements outside curfew. That might be a bit onerous, actually.
Mr Harfield: You are looking at movements that—
Senator XENOPHON: Helicopter movements. Presumably any other aircraft movements would have to comply with the curfew. I only need helicopters. Thank you very much, Chair.

Answer:

There were 79 helicopter movements during the curfew time period (23:00 PM to 6:00 AM) from 1 July to 30 September 2016. All movements were emergency services.

Details for the curfew restrictions at Adelaide Airport, including exemptions for emergency operations, are published on the Department of Infrastructure and Regional Development website (infrastructure.gov.au/aviation/environmental/curfews/AdelaideAirport/index.aspx).

Movement Data

Actual Date/Time	Type
3/07/2016 0:20	Emergency services
9/07/2016 0:20	Emergency services
11/07/2016 0:16	Emergency services
11/07/2016 3:53	Emergency services
15/07/2016 0:34	Emergency services
15/07/2016 4:20	Emergency services
16/07/2016 1:20	Emergency services
16/07/2016 3:31	Emergency services
16/07/2016 23:43	Emergency services
18/07/2016 0:13	Emergency services
18/07/2016 0:56	Emergency services
19/07/2016 5:20	Emergency services
22/07/2016 3:22	Emergency services
23/07/2016 23:49	Emergency services
24/07/2016 4:05	Emergency services
28/07/2016 23:33	Emergency services

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Actual Date/Time	Type
30/07/2016 0:38	Emergency services
30/07/2016 2:51	Emergency services
1/08/2016 23:00	Emergency services
2/08/2016 1:37	Emergency services
2/08/2016 2:41	Emergency services
2/08/2016 23:16	Emergency services
3/08/2016 23:02	Emergency services
4/08/2016 0:38	Emergency services
4/08/2016 3:41	Emergency services
5/08/2016 0:07	Emergency services
4/08/2016 23:42	Emergency services
5/08/2016 0:47	Emergency services
5/08/2016 3:08	Emergency services
5/08/2016 23:17	Emergency services
6/08/2016 0:51	Emergency services
6/08/2016 2:12	Emergency services
6/08/2016 23:36	Emergency services
7/08/2016 0:57	Emergency services
7/08/2016 2:07	Emergency services
7/08/2016 1:41	Emergency services
9/08/2016 4:45	Emergency services
11/08/2016 1:05	Emergency services
11/08/2016 5:43	Emergency services
12/08/2016 0:18	Emergency services
15/08/2016 0:03	Emergency services
15/08/2016 1:22	Emergency services
18/08/2016 1:16	Emergency services
21/08/2016 5:23	Emergency services
23/08/2016 23:40	Emergency services
26/08/2016 0:52	Emergency services
26/08/2016 2:08	Emergency services
27/08/2016 5:19	Emergency services
28/08/2016 1:35	Emergency services
28/08/2016 23:47	Emergency services
29/08/2016 5:45	Emergency services
1/09/2016 0:10	Emergency services
1/09/2016 0:23	Emergency services
2/09/2016 4:17	Emergency services
3/09/2016 0:07	Emergency services
4/09/2016 3:03	Emergency services
6/09/2016 23:07	Emergency services
7/09/2016 3:03	Emergency services
10/09/2016 0:07	Emergency services
10/09/2016 0:37	Emergency services
10/09/2016 3:37	Emergency services
11/09/2016 0:16	Emergency services
11/09/2016 0:42	Emergency services
11/09/2016 3:51	Emergency services
11/09/2016 23:48	Emergency services
12/09/2016 1:54	Emergency services
19/09/2016 0:01	Emergency services

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Actual Date/Time	Type
19/09/2016 3:25	Emergency services
20/09/2016 4:20	Emergency services
24/09/2016 0:22	Emergency services
24/09/2016 23:17	Emergency services
26/09/2016 0:21	Emergency services
26/09/2016 2:02	Emergency services
26/09/2016 3:08	Emergency services
26/09/2016 4:17	Emergency services
26/09/2016 4:37	Emergency services
27/09/2016 2:35	Emergency services
27/09/2016 4:57	Emergency services
28/09/2016 2:53	Emergency services

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 160

Program: N/A
Division/Agency: Airservices Australia
Topic: Noise monitoring of light aircraft at Jandakot Airport
Proof Hansard Page: 109 (17 October 2016)

Senator Back, Chris asked:

Senator BACK: But do you have noise-monitoring equipment that can be positioned around—let's call it this—a light aircraft airport such as Jandakot?
Mr Harfield: I would just have to take it on notice on where we have them placed in the Perth region, because it would be picking up noise around Jandakot anyway. We usually have noise monitors—I could get the numbers wrong—within, say, 30 kilometres or 50 kilometres of the actual main airport, which would capture the metropolitan airports. But I would have to confirm what radius it is.
Senator BACK: Could you let us know that on notice.
Mr Harfield: Yes.

Answer:

Airservices' Noise and Flight Path Monitoring System (NFPMS) captures and stores radar, flight plan and noise data. The NFPMS covers eight city regions around Australia. Aircraft noise data is collected daily from noise monitors strategically located around communities close to the major airports.

For the Perth region, noise data is captured by six noise monitors, also referred to as Environmental Monitoring Units (EMUs), located around Perth Airport. These EMUs are placed to capture noise from operations at Perth Airport; however, they will also capture other aircraft operations, such as those from Jandakot Airport, which are within the detection zone of the EMU.

Since 2011, Airservices has had a short-term noise monitoring program which can deploy additional EMUs at locations which are often not suitable for long-term noise monitoring. These have been used at secondary airports such as Jandakot Airport.

During 2016, four short-term EMUs were placed around Jandakot Airport for a period of 6 months in order to capture noise information specifically for Jandakot Airport. While in place, these EMUs and their noise level data was also visible on WebTrak Perth. A report was published in August 2016 which is available from the Airservices website www.airservicesaustralia.com/publications/noise-reports/short-term-monitoring

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 166

Program: N/A
Division/Agency: Airservices Australia
Topic: Western Sydney Airport – Flight Path Design 2
Proof Hansard Page: 112 (17 October 2016)

Senator Cameron, Doug asked:

Senator CAMERON: You provided advice that is fundamental to the future of Western Sydney airport, isn't it?
Mr Harfield: We provided, as I said, concept flight designs based on the operation of Western Sydney airport that allow that to operate as well as Kingsford Smith without touching the Kingsford Smith flight paths.
Senator CAMERON: You provided concept flight designs.
Mr Harfield: That is correct.
Senator CAMERON: Is this a normal international situation, that you provide concept flight designs? Do you ever get airports, when the airport is being built, where you lock in the flights?
Mr Harfield: This is probably our first time at a major greenfields airport and so, going through the environmental impact statement, we would provide advice to those that are setting up and have the responsibility for the environmental impact statement based on the parameters that they give us to do the design, and from a concept. That is not uncommon around other international practices. You have to do it how it may work. Once that is completed, then you will go through a process of refining the designs of the flight paths as the result of consultation et cetera.
Senator CAMERON: Could you provide me with details of the concept, that was put to, that determined how these flight paths would be—
Mr Harfield: We can provide you with the advice that we gave.
Senator CAMERON: The advice you gave is one thing—
Mr Harfield: The concept designs, correct.
Senator CAMERON: You can provide me that, but can you also provide me with the details of what was put to you—what were the restrictions, what were the parameters that you started designing your flight paths on?
Mr Harfield: Designed on the flight paths that—current airspace constraints as well as the flight paths of Kingsford Smith were not to be touched.
Senator CAMERON: There would be a document somewhere that says that. Can you provide me with that document or documents associated with the parameters that were put to you when you designed the flight paths?
Mr Harfield: Yes.

Answer:

Airservices advice in relation to flight paths was provided in a report titled *Western Sydney Airport Preliminary Airspace Management Analysis*.

The document is available on the Western Sydney Airport website: (www.westernsydneyairport.gov.au) and the assumptions and parameters that were agreed for this work are set out in the Disclaimer and further outlined in Section 4.

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 167

Program: N/A
Division/Agency: Airservices Australia
Topic: Western Sydney Airport – Flight Path Design 3
Proof Hansard Page: 112-113 (17 October 2016)

Senator Cameron, Doug asked:

Senator CAMERON: If a 747 is flying over an area that is fairly quiet you would hear that five kilometres away.
Mr Harfield: I am working on assumption. I assume so.
Senator CAMERON: Have you had any discussions about whether Kingsford Smith may close, eventually, and whether Western Sydney could carry the full capacity of incoming and outgoing flights for the Sydney Basin?
Mr Harfield: No.
Senator CAMERON: When you designed these parameters and the flights were taking off over Erskine Park, St Marys and some parts of Penrith why did you come to that position, to take over fairly densely populated residential areas?
Mr Harfield: I cannot answer that. You would have to take it on notice, how the concepts were put with those design parameters. I do not have that detail.

Answer:

The principal objective of the flight path design work undertaken by Airservices was to establish whether safe and efficient operations could be introduced at Western Sydney Airport through the development of indicative proof-of-concept air traffic management designs.

The Environmental Impact Statement sets out the process by which final flight paths will be determined.

Question no.: 168

Program: N/A
Division/Agency: Airservices Australia
Topic: Western Sydney Airport – Flight Path Design 4
Proof Hansard Page: 113 (17 October 2016)

Senator Cameron, Doug asked:

Senator CAMERON: What about the government putting out publications basically saying that there is going to be an eastern zone and a western zone away from the central zone, which is the three nautical miles, and you have had no input into that whatsoever. Is that correct?
Mr Harfield: We may have been asked questions, which I am not privy to, around certain parameters and we have provided advice but I have not had conversations around it.
Senator CAMERON: On notice, can you provide me with details of any discussions you have had about those alternate merge points?
Mr Harfield: Yes.

Answer:

See the answer provided to question 165.

Question no.: 169

Program: N/A
Division/Agency: Airservices Australia
Topic: Western Sydney Airport
Proof Hansard Page: 114 (17 October 2016)

Senator Cameron, Doug asked:

Senator CAMERON: You have had no consultation about these two merge points. What about a no-fly zone?
Mr Harfield: As I said previously, I have no knowledge of that and I am not sure what questions or information has been asked of us or what advice has been given, but we are providing this on notice to you.
Senator CAMERON: Okay. You can provide us with information on whether there has been discussion on no-fly zones. Is that correct?
Mr Harfield: We will provide you with what we have been asked to provide advice on

Answer:

As identified in the *Western Sydney Airport Environmental Impact Statement* (Volume 1: Chapter 7), the Orchard Hills Restricted Area exists to prevent aircraft overflying the Defence Establishment Orchard Hills. Airservices has not been involved in discussions in respect of other “no fly” zones.

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 170

Program: N/A
Division/Agency: Airservices Australia
Topic: Western Sydney Airport - Bradfield
Proof Hansard Page: 114 (17 October 2016)

Senator Cameron, Doug asked:

Senator CAMERON: Have you had any complaints about noise impacts of the current airport in Bradfield?
Mr Harfield: I will need to take that on notice but we have seen an increase in noise complaints from, I will call it, the Western Sydney and the Blue Mountains area.
Senator CAMERON: What about the electorate of Bradfield?
Mr Harfield: Not off the top of my head but I will take that on notice.
Senator CAMERON: The minister is based in Bradfield and I know that he has had a number of constituents raising issues and I am just wondering if the minister then raised that with you. Can you provide us with details of that?
Mr Harfield: Yes.

Answer:

Airservices has not received any representations from the Minister regarding complaints from Bradfield constituents.

Bradfield electorate: number of complainants
The number of complainants from suburbs in the Bradfield electorate has remained relatively steady over the last five years. The spike in 2013-2014 correlates with a peak in Mode 10 runway usage in August 2014 of nearly 60 per cent, caused by weather conditions.

Table: Number of complainants, Bradfield electorate suburbs, 2011-16

	2011-12	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Asquith	0	2	1	0	1
Gordon	4	0	1	2	1
Hornsby	4	4	1	1	1
Killara	5	7	15	4	2
Lindfield	2	2	7	1	0
North Turramurra	0	2	1	0	1
North Wahroonga	1	1	1	1	0
Pymble	5	4	6	6	6
Roseville	2	0	2	2	2
South Turramurra	0	1	10	1	1
St Ives	0	0	0	1	1
St Ives Chase	0	1	0	0	0
Turramurra	8	4	11	8	7
Wahroonga	6	9	23	6	11
Waitara	2	0	0	0	0
Warrawee	2	0	3	2	3
West Pymble	6	4	22	7	2
TOTAL	**47**	**41**	**104**	**42**	**39**

- Suburbs within the electorate not listed had no complainants.
- For annual 12 month periods, ending 20 October.
- In accordance with Aircraft Noise Ombudsman recommendations, Airservices reports on the number of complainants (that is, the number of individuals who contact Airservices Noise Complaints and Inquiry Service) rather than complaints.

Nature of noise impact
Suburbs within the electorate of Bradfield are affected by Mode 10 usage at Sydney Airport, specifically, arrivals from the north using the parallel runways.

Mode 10 is one of the two most-used runway modes (with Mode 9) because they are parallel runway modes. One of these two modes will be used in peak periods unless the wind conditions or other factors preclude it. The Sydney peak periods typically last for nine hours a day but may extend beyond this: 7.00 – 11.00am and 3.00 – 8.00pm.

Rural & Regional Affairs and Transport Legislation Committee
ANSWERS TO QUESTIONS ON NOTICE
Supplementary Budget Estimates 2016 - 2017
Infrastructure and Regional Development

Question no.: 171

Program: N/A
Division/Agency: Airservices Australia
Topic: Recommendations made by Mr Greg Cavanagh SM in the 2013 Coronial inquest into the death of Kevin Taylor, Lena Yali and Gregory McNamara 011 [2013] NTMC 2
Proof Hansard Page: 116-117 (17 October 2016)

Senator McCarthy, Malrndirri asked:

Senator McCARTHY: I wanted to go back, Mr Harfield, to my initial question from earlier this evening relating to the coroner's report. I would like to get a dollar figure for what Airservices is putting towards the education and training of staff in relation to those recommendations.
Mr Harfield: I do not have that figure off the top of my head, but we can take it on notice and provide the answer.

Answer:

$4.5 million in driver education and training through a program developed immediately after the 2011 accident.

Details of the program are included in the response to question SQ16-000362.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Question no.: 172

Program: n/a
Division/Agency: Airservices Australia
Topic: PFCs Gold Coast Airport
Proof Hansard Page: Written

Senator Rhiannon, Lee asked:

I understand that a stakeholder meeting, including Air Services Australia, was held in August about the potential contamination of the aquifer at the Gold Coast Airport and previous use of PFCs. At that meeting ASA identified ASA has done additional testing to that previously available from the 2008 report on the issue, and that ASA had yet to put the new information into a formal report which would be available for dissemination in early September to interested parties.

a) Please provide a full copy of that report.

b) Please specifically provide a copy of the Phase 1 investigation at Gold Coast Airport within the framework of the National Environment Protection (Assessment of site contamination) Measure 1999.

Answer:

a) In July 2016, Airservices Australia conducted further investigations at the Gold Coast Airport which included targeted soil, groundwater and surface water testing for perfluorinated compound (PFC) contamination.

The objective of this investigation was to assess potential migration of PFCs across the airport by collecting samples taken from 18 perimeter locations around the airport. A copy of this site investigation and sampling report for Gold Coast Airport completed in October 2016 is at Attachment A.

b) Airservices has previously provided your office with the Phase 1 Preliminary Site Assessment Report for Coolangatta Aviation Rescue Fire Fighting (ARFF) Drill Ground August 2008, which focused on the fire training ground. This was provided on 20 July 2016.

Attachments:

Attachment A: Airservices Australia – Gold Coast Airport Preliminary Site Investigation Report and accompanying Sampling Analysis Report – October 2016

Airservices Australia

Gold Coast Airport

Preliminary Site Investigation

October 2016

Executive summary

Airservices Australia (Airservices) engaged GHD Pty Ltd to conduct a Preliminary Site Investigation (PSI) at the Gold Coast Airport (GCA) with particular regard to the potential for contamination from per- and poly-fluorinated alkyl substances (PFAS).

Based on the review of available site history information, site inspection and site interviews, the following potential sources of PFAS have been identified:

- Areas in which Aviation Rescue Fire Fighting ARFF operate or have historically operated including:
  - The Fire Training Ground.
  - The Main Fire Station and surrounding area.
  - Fire station workshop.
  - The old fire station.
  - 'Crash remote' fire training in isolated areas of the site.
- Incidents that may have included the discharge of foam including:
  - A fuel leak at the end of the apron in 1996.
  - A helicopter crash in 2009 on the boundary with the Tugun Bypass.
  - A single light plane crash in approximately 1984 near the aircraft hangar.
- Other possible sources:
  - Tugun bypass tunnel fire suppression system.
  - Tugun and Boyd Street landfills and the Sewage Treatment Plant (STP).
  - Former airport landfills.
  - Queensland Fire and Rescue Service Coolangatta - Bilinga Fire Station.
  - Irrigation of vegetated areas of the site with the fire trucks.
  - Sediments and/or groundwater in the existing and former surface water drainage channels (possible secondary source).

The desktop review identified the following potential sensitive receptors:

- Site workers.
- Nearby residents using spear pumps.
- Consumers of seafood from the down gradient surface water receiving environment of the Pacific Ocean and Cobaki Broadwater.
- Recreational users of the Pacific Ocean (in the vicinity of the stormwater outfall) and Cobaki Broadwater.
- Flora and fauna in the hydraulically down-gradient marine surface water receiving environment of the Pacific Ocean and Cobaki Broadwater.
- Terrestrial fauna consuming impacted plant material.

Based on the data reviewed in this study and the CSM, the following summary is made:

- The primary source (use of PFAS containing AFFF) no longer exists. Secondary sources include residual soil and groundwater contamination.

- Soil results reported PFAS concentrations below the adopted human health and ecological guidelines, indicating that in the areas sampled, soils do not present an unacceptable risk to human health and ecological receptors.
- Groundwater results at the source of PFAS impacts including the fire training ground and the former fire station reported PFAS concentrations above the ecological guidelines that have the potential to be toxic to aquatic organisms as wells as exceeding the HISL and enHealth drinking water guidelines.
- Groundwater and surface water down gradient of the identified secondary sources and or other possible sources reported PFAS concentrations above the HISL and enHealth drinking water guidelines.
- Surface water samples from Cobaki Broadwater reported PFAS concentrations below the laboratory limit of reporting, however it is noted that the HISL for consumption of fish is lower than the laboratory limit of reporting.

This report should be read in accordance with the limitations set out in Section 10.

Table of contents

1. Introduction 1
   - 1.1 Background 1
   - 1.2 Objectives 1
   - 1.3 Scope 1
2. Data quality objectives 1
3. Site information 1
   - 3.1 Site location 1
   - 3.2 Site description 3
   - 3.3 Surrounding land uses 6
   - 3.4 Key stakeholders 6
4. Site conditions 7
   - 4.1 Topography 7
   - 4.2 Geology 7
   - 4.3 Hydrology 7
   - 4.4 Hydrogeology 8
5. Site history 9
   - 5.1 Aerial photographs 9
   - 5.2 Previous reports 11
   - 5.3 Operational responses system outputs 13
   - 5.4 Interviews 14
   - 5.5 Summary of site history 16
6. Preliminary and targeted sampling 18
   - 6.1 Scope of work 18
   - 6.2 Results summary 18
7. Conceptual site model 19
   - 7.1 Sources 19
   - 7.2 Pathways 20
   - 7.3 Receptors 20
   - 7.4 Potential source-pathway receptor linkages 21
8. Conclusions 24
   - 8.1 Conclusions 24
   - 8.2 Summary of preliminary sampling program 25
9. References 26
10. Limitations 27

Table index

Table 1 Data quality objectives 1
Table 2 Site identification 1
Table 3 Certificate of title lessee summary 2
Table 4 Historical aerial photograph summary 9
Table 5 ORS output summary 13
Table 6 PFAS contamination – potential pollutant linkages 21

Figure index

Figure 1 Site location 29
Figure 2 Possible PFAS impact areas 29
Figure 3a Conceptual site model, Section A 29
Figure 3b Conceptual site model, Section B 29
Figure 4 Conceptual site model pathways 29

Appendices

Appendix A - Figures
Appendix B – Certificates of Title
Appendix C – Site photographs
Appendix D – Geological mapping and Groundwater data search results
Appendix E – Historical aerial photographs
Appendix F – Interview transcripts
Appendix G – ORS Records

1. Introduction

Airservices Australia (Airservices) engaged GHD Pty Ltd (GHD) to conduct a Preliminary Site Investigation (PSI) at the Gold Coast Airport (GCA) with particular regard to the potential for contamination from per- and poly-fluorinated alkyl substances (PFASs).

1.1 Background

Aqueous film-forming foam (AFFF) has been used for fire-fighting purposes around Australia for decades. On airports, AFFF has been used at fuel depots, hangars and for operational and fire training purposes.

AFFF has not been used in the provision of aviation rescue and fire-fighting (ARFF) services by Airservices since 2010 but continues to be used around fuel depots, hangars etc, at many airports. AFFF products historically used on airport sites contained PFAS. Depending on the type of AFFF used, the principal PFAS constituents could have included perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and fluorotelomers such as 6:2 fluorotelomer sulfonate (6:2FtS) and 8:2 fluorotelomer sulfonate (8:2FtS).

PFAS are non-biodegradable chemicals that have not only contaminated the sites at which AFFF was employed but also the assets used to apply it. These PFAS are highly persistent in the environment, can bioaccumulate and can be harmful to animal and human health (US EPA 2014).

1.2 Objectives

The objective of this PSI was to identify where there is potential for PFAS contamination to be present at the GCA as a result of previous activities by ARFF and other AFFF users. A preliminary and targeted soil, groundwater and surface water sampling program was undertaken to validate and further investigate the desktop findings of the PSI.

The report also seeks to identify potential sensitive receptors and stakeholders that may be impacted by possible PFAS contamination arising from activities (both historic and current) utilising AFFF at GCA.

1.3 Scope

The scope of work for the PSI included:

- Review of historical aerial photographs to gain an understanding of site development over time and identify potential areas where AFFF may have been used.
- Review of current certificates of title and key lessees to identify site activities that may have included the use of AFFF.
- Review of published data on geology, hydrology and hydrogeology to gain an understanding of site conditions and identify sensitive receptors.
- Search of the groundwater bore database to understand beneficial uses for groundwater in the area.
- Review of historical reports provided by Airservices to provide some background to previous investigations and site conditions.
- A detailed site inspection to gain an understanding of site condition and inspect areas where there is potential for AFFF to have been used.

- Interviews with personnel who have an understanding of current and historical site activities to identify areas where AFFF may have been used.
- Preliminary and targeted soil, groundwater and surface water sampling program.
- Development of a Conceptual Site Model (CSM) demonstrating potential source, pathway, receptor linkages.
- Conclusions.

2. Data quality objectives

The Data Quality Objective (DQO) process was applied to the preliminary investigation as described below, to ensure that data collection activities were appropriate and achieved the stated objectives. The DQO steps have been addressed as follows.

Table 1 Data quality objectives

Step	
Step 1: State the problem.	Where was AFFF historically used on the Airport site? Do possible source, pathway, receptor linkages present an unacceptable risk?
Step 2: Identify the decision.	To address the problem set out in Step 1, the following decisions are required to achieve the task objective and to identify data gaps and additional information that may be required: • What activities have occurred at the site which may have used AFFF (PFAS containing foam)? • Where was AFFF stored on site? • What sensitive receptors are present at and surrounding the site?
Step 3: Identify inputs to the decision.	To inform the decisions and identify key data gaps and needs, the following information is considered necessary: • Review of site conditions • Review of available history information • Interviews with site personnel • Detailed site inspection • Development of a Conceptual Site Model.
Step 4: Define the study boundaries.	The Gold Coast Airport property boundaries.
Step 5: Develop a decision rule.	The key decision rules are: Are there areas of the site, outside the known fire station, former, and current fire training grounds, where PFAS may be present and does this present a potential unacceptable risk? • If NO – further investigations can be targeted in these known areas. • If YES – more extensive investigations may be required.
Step 6: Specify limits on decision error	There is potential for anecdotal information to not always be accurate or to be limited in nature, and it is also difficult to assess site activities from historical aerial photographs based on poor resolution. Where possible any possible sources of PFAS contamination will be cross checked through multiple lines of evidence.

Step	
	The two decision errors that exist include: • False positive – an area identified as potentially containing PFAS does not. • False negative – Areas containing PFAS are not identified. These can be managed through the implementation of a sampling program to confirm the PSI findings.
Step 7: Optimise the design for obtaining data.	The CSM design will be optimised through: • Identification of potential PFAS sources from existing information and investigations conducted by others. • A preliminary and high level review of the likely hydraulic characteristics of the upper aquifer to estimate the groundwater flow direction and seepage velocities at various locations of the site. • A review of the surface water pathways across and leaving the site.

3. Site information

3.1 Site location

The GCA straddles the border of Queensland and New South Wales and is located less than 1 km from the Pacific Ocean and Cobaki Broadwater.

The site location is outlined in Figure 1 in Appendix A and location details are provided in Table 2.

Table 2 Site identification

Street Address	Eastern Avenue, Bilinga, Queensland
Site Area	**Queensland** 128.54 ha **New South Wales** 270.5 ha
Title Identifiers	**Queensland** Lot 1 RP225692 Lot 222 RP839951 Lot 5 RP839952 **New South Wales** Lot 100 DP1120061 Lot 1 DP582467
Parish	**Queensland** Tallebudgera **New South Wales** Terranora
Local Government Area	**Queensland** City of Gold Coast **New South Wales** Tweed Shire Council
Current Land Use	Airport and associated commercial enterprises
Land Use Zoning	**Queensland** 90 – Special purpose 56 – Sportsground, racecourse, airfield 53 – Commonwealth **New South Wales** SP1 – Special activities - Airport

The current operating lease holder for the GCA is Gold Coast Airport Pty Ltd (GCAPL) with portions of the site sub-leased to several other entities including Airservices. The current properties within GCA and relevant lessees are summarised in Table 3 and current certificates of title are provided in Appendix B. The lessees identified are those that are considered to have a major presence on site and/or the potential to undertake activities that could cause contamination. Others are also included on the certificate of title which are not identified here based on their lesser relevance to this investigation.

Table 3 Certificate of title lessee summary

Lot	Owner	Lessee
Queensland		
Lot 222 RP839951	Commonwealth of Australia	Queensland Airports Limited
Lot 5 RP839952	Commonwealth of Australia	Hertz Australia Pty Ltd
		Ascot car and ute rentals Australia
		Queensland Airports Limited
		Gold Coast Airport Pty Limited
		Southern Cross University
Lot 1 RP 225692	Federal Airports Corporation	Airservices Australia
		Careflight Queensland Limited
		Queensland Airports Limited
		Seair Aviation Pty Ltd
		Coolangatta Airport Auto Affair Car Wash Centre Pty Ltd
		Gold Coast Airport Limited
		Helicopter Association of Australia Pty Ltd
		Southern Cross University
		Spotless Services Australia Limited
		Gold Coast Air Terminal Services Pty Ltd
		Air Gold Coast Pty Ltd
		Oceania Aviation Services Pty Ltd
		Australian Air Express Pty Ltd
		Gold Coast Hangars Pty Ltd
		Virgin Blue Airlines Pty Ltd
		Jetpoint Pty Ltd
New South Wales		
Lot 1 on DP582467	Commonwealth of Australia	Queensland Airports Limited
		Gold Coast Airport Limited
		Airservices Australia

Lot	Owner	Lessee
Lot 100 on DP1120061	Commonwealth of Australia	Queensland Airports Limited

3.2 Site description

A site inspection was completed by GHD (accompanied by Airservices) on 8 and 9 June 2016. A summary of the findings are provided below and site photographs are included in Appendix C.

Key site features are outlined on Figure 1 in Appendix A. They included:

- Runway.
- Terminal.
- Southern Cross University (SCU).
- Australian Federal Police (AFP).
- Aircraft hangars.
- Commercial precinct.
- Joint User Hydrant Installation (JUHI).
- Former JUHI and former fire station (FFS).
- ARFF workshop.
- Main Fire station (MFS).
- Fire training ground (FTG).
- Surface water drainage channels.

The areas surrounding the major infrastructure on the site are characterised by grass and a series of surface water drainage channels. Portions of remnant native vegetation are located in the south eastern and western portions of the site adjacent to the Pacific Highway / Tugun Bypass and Cobaki Broadwater.

Runway

The GCA includes one major runway, that runs in a north west to south east direction. There is also a minor runway (for smaller craft) which runs in a north to south direction. There are also a series of taxiways to the east of the major runway that support the runway. The runway apron is also located on the eastern side of the runway in the central portion of the site, directly adjacent to the terminal building.

Terminal

The terminal is located on the eastern portion of the site and includes both domestic and international terminals. Terminal short term parking is located to the east of the terminal and long term parking and car hire to the south east of the terminal. There is also some additional car hire services to the north east of the terminal, on the eastern side of Eastern Avenue. The terminal and car parking areas are characterised by hardstands with some garden beds on the perimeter of the car park, near the site entrance.

A number of freight facilities are located directly to the north east of the terminal.

Southern Cross University

Southern Cross University (SCU), Gold Coast Campus is located on the south eastern portion of the site. The campus includes car parking and two multi-story buildings, with a third currently under construction. There is a water body in the southern portion of the SCU lease area which is hydraulically connected to the airport surface water drainage system. It is understood that this water body will be filled as part of proposed expansion of the university for car parking facilities.

Scrapings from the recent resurfacing of the runway are stockpiled to the west of the university, adjacent to the stormwater drain. It is understood that GCAPL have completed laboratory analysis of this material (including PFAS) and that it has been assessed as suitable for reuse on the site.

Australian Federal Police

An Australian Federal Police (AFP) building is located between the SCU and airport terminal. This area was not inspected as part of the site reconnaissance though it is understood that this is an administration building.

Aircraft hangars

A series of aircraft hangars are located in the north eastern portion of the site. The hangars are leased by light aircraft and helicopter operators. Although a detailed inspection of this area was not undertaken, it is understood that the hangars do not contain stormwater collection or sullage tanks (based on discussion with GCA personnel). Firefighting equipment within the hangars is understood to be limited to handheld fire extinguishers. Old fire extinguishers were noted in the hangers at the time of the inspection that may contain AFFF.

The hangars and associated apron are characterised by sealed surfaces with small garden beds and grassed footpaths on the north eastern side, adjacent to Eastern Avenue.

During the site inspection it was noted that spray painting was being undertaken on the apron at one location.

Commercial precinct

A commercial centre is located to the east of the terminal, which is located on airport land. The commercial area includes the Queensland Airports offices, a service station and a number of food and beverage outlets.

There is a large grassed stormwater drain on the northern eastern perimeter of the site, adjacent to the Gold Coast Highway and some garden beds surrounding the commercial buildings. The remainder of the site is characterised by sealed surfaces.

Joint User Hydrant Installation (JUHI)

The new JUHI is located to the east of the fire station. A wetland area was reclaimed for the construction of the facility. It is understood that the JUHI contains a foam fire management system which includes 'fluorosurfactant-containing protein based' foams (FFFP).

Former JUHI and former fire station (FFS)

The former JUHI and FFS are located north east of the Regular Public Transport (RPT) Apron. All infrastructure has been removed from both facilities. The FFS building footprint and road ways are visible and the former JUHI is characterised by bare earth. GCAPL indicated that hydrocarbon remediation of the former JUHI has been undertaken.

Fire station workshop

The ARFF Workshop is located outside the security fence at the airport (landside), adjacent to the former fire station on Eastern Avenue. Anecdotal information indicates that the workshop has been located here since commencement of fire services at the airport. This area includes a shed and sealed concrete surfaces.

Main Fire Station (MFS)

The current MFS is located adjacent to the control tower, which is directly north of the runway apron. The MFS includes a one storey building, fire truck garage, hardstand and AST bunded area.

The fire truck garage is surrounded by hard stand which drains to a surface water collection system. Operation of the vehicle wash down hose triggers the surface water collection system to open. The system includes a collection trench and triple interceptor trap. All water from the hardstand that passes through the treatment system is discharged to sewer. The hose drying rack is located on a portion of the hardstand separate from the vehicle wash down. Water from the hose drying rack discharges directly to stormwater and does not pass through the treatment system used for vehicle wash down.

The north eastern portion of the hardstand includes two bunded areas for the storage of materials including a diesel AST. The bunds are connected via a valve operated underground drainage line that discharges to stormwater.

The MFS is surrounded by grass and open surface water drainage channels directly to the north, east and west.

Fire training ground (FTG)

The FTG contains the following:

- A hardstand with replica airplane.
- Smoke hut (a two storey brick building).
- A shipping container that have been converted to a fire behaviour training aide.
- Bunded kerosene tank.
- Waste water treatment system.
- Two cars and a small aircraft.

The bunded area contains a waste water collection system, which includes two tanks and a separator. All waste water from the bund is contained in the treatment system and discharged to sewer. The area immediately outside the bunded area is characterised by exposed soil with some grass.

The FTG is surrounded by trees to the north, south and east and a roadway and fence line to the west. There is a small surface water body directly north of the FTG, which appeared to be an expression of groundwater.

Surface water drainage channels

There is a series of surface water drainage channels that transect the site. These are considered to be expressions of groundwater. The main drainage channel is located adjacent to the runway and runs in north east to south west direction. There is also a series of minor open surface water drainage channels on the western side of the runway which divert surface water into the Cobaki Broadwater to the west. Further detail on these are provided in Section 4.3 and outlined in Figure 1 Appendix A.

3.3 Surrounding land uses

Land uses immediately surrounding the airport are summarised as follows and outlined in Figure 1 in Appendix A:

- **North** – Betty Diamond Sporting Complex (former Boyd Street landfill) followed by medium density residential development.
- **South** – Tugun Bypass, Tweed Heads Pony Club and medium density residential development.
- **East** – Gold Coast Highway followed by medium and high density residential development, with some commercial development (retail) and the Pacific Ocean. There are also a number of residential dwellings on the north eastern boundary of the airport on Adina Avenue.
- **West** – Tugun Bypass, followed by the Cobaki Environmental Precinct and the Cobaki Broadwater to the south west and the Desalination Plant and closed Tugun Landfill and Sewage Treatment Plan (STP) to the north west.

3.4 Key stakeholders

The following key stakeholders have been identified at the site:

- Site lessees.
- Nearby residents to the east.
- City of Gold Coast as owner of the Tugun Landfill and Betty Diamond parkland (former Boyd Street landfill) located to the north and north west.
- South East Queensland Water (SEQ Water) as owner and operators of the Tugun desalination plant located to the north west.
- Coolangatta-Bilinga, Queensland Fire and Rescue Service
- Commercial and recreational fisherman operating in Cobaki Broadwater.

4. Site conditions

4.1 Topography

The GCA is located on a coastal plain with generally flat topography and low elevation (less than 5 metres above Australian Height Datum - mAHD). The majority of the site has been built up compared to the natural ground level to establish a relatively consistent, flat site.

4.2 Geology

4.2.1 Regional geology

Regional geology is identified as Pleistocene-aged beach ridges characterised by sand and shelly sand (Queensland Digital Dataset, 2006).

The Queensland Government Minesonlinemap (https://minesonlinemaps.business.qld.gov.au/) Map Sheet 9541, MURWILLUMBAH (1968-1972: F Olgers, P Flood (BMR), A D Robertson (GSQ), 1998; L C Cranfield (GSQ)), indicated that the surface soil geology is comprised of gravel, sand, silt and man-made deposits generally associated with landfilling and levelling. A geological map is included in Appendix D.

4.2.2 Soil profile

Bore logs from previous reports indicated soils at the site are characterised by white and yellow sands and dark brown peaty sands in areas close to wetlands (GHD, 2008). Fill of varying thicknesses has also been identified in areas close to the terminal and other infrastructure. These observations are consistent with the published geological maps.

4.3 Hydrology

A major open surface water drainage channel is located on the eastern side of the runway, which is referred to as Coolangatta Creek. The drain runs parallel to the runway in a general north-south direction and directs water into series of stormwater retention basins south of the terminal building and adjacent to Southern Cross University. One of these basins will be infilled as part of future development at SCU. In high rainfall events surface water discharges through an open drainage channel from these wetlands into the Pacific Ocean. The drain is possibly an expression of groundwater.

There is also a series of minor open surface water drainage channels on the western side of the runway which divert surface water into the Cobaki Broadwater to the west.

Anecdotal information suggests that during high tides, salt water encroaches up to the southern surface water drain, adjacent to the runway apron on the GCA.

Stormwater from the runway and taxiways is directed into the stormwater drainage channels. Stormwater from the remainder of the site is diverted to Stormwater Quality Improvement Devices (SQIDs).

The remainder of the GCA comprises unsealed, grassed areas or bushland. Given the high permeability of the natural geology at the GCA, surface water in these areas is likely to infiltrate through the soil profile into the underlying shallow groundwater. Surface water runoff into the surface water drains can be expected in high intensity or prolonged rainfall events.

4.4 Hydrogeology

A search of the Department of Natural Resources and Mines 2015, *Groundwater Database – Bore Reports*, Queensland State Government, Brisbane, identified numerous bores within 1 km of the site. These were all associated with the Tugun Landfill and Desalination Plant location directly to the north west. The bores were all located within the shallow unconfined aquifer, characterised by sands and extended to a maximum depth of between 5 and 6 m below ground level (mbgl).

A search of the NSW Department of Primary Industries, registered bore database (2009), identified a number of groundwater monitoring bores on the south western portion of the airport (within NSW) and private bores throughout the residential and commercial development to the south and south east of the airport (within NSW). The closest of these was a private bore at the Border Park Raceway, located approximately 300 m from the southern boundary of the site. Dewatering bores were also registered, associated with the Tugun Bypass tunnel.

It is important to note that unregistered and private bores may also exist. The site inspection noted that a number of residents on Adina Avenue (which borders the northern portion of the GCA) displayed signs indicating they had spear pumps. Given the presence of shallow, fresh groundwater on the coastal fringes on the Gold Coast, residential spear pumps are very common.

Groundwater bore data and search results are provided in Appendix D.

Previous groundwater investigations undertaken at the GCA have identified groundwater within 1 m of the ground surface, with groundwater noted at the ground surface in remnant vegetation areas on the GCA. Open surface water drains that transect the GCA are also considered to be expressions of groundwater. Information provided by GCAPL indicated that groundwater at the GCA is at an elevation of approximately 4 mAHD and flows towards both the Pacific Ocean (northeast-wards) and Cobaki Broadwater (southwest-wards) suggesting a groundwater divide through the GCA. It is likely that the Pacific Ocean and Cobaki Broadwater are receiving environments of the groundwater and surface water leaving the GCA.

The extent of saltwater intrusion and tidal influence is largely not understood.

5. Site history

5.1 Aerial photographs

A review of historical aerial photographs between 1947 and 2015 was completed. A summary of the key findings is outlined in Table 4 and a copy of the photographs is provided in Appendix E.

Table 4 Historical aerial photograph summary

Date	Description
1947	There is visual evidence of three small runways, one of which is consistent with the current minor runway for small aircraft. The remainder of the site was characterised by uncleared bushland and wetland areas. An area of cleared land was also visible in the area of the former airport landfills. There was also some low density residential development along the coastline.
1955	The current runway alignment was visible, with one runway in a south east to north west direction. A roadway and cleared area were present where the existing terminal is located. A formalised drainage line had been constructed in a portion of the wetland that runs parallel to the ocean. There were a number of clearings and access tracks also visible across the site. None of these clearings appeared to align with the location of the current fire training ground or the former airport landfills. There was an increase in residential development along the coast line.
1963	Some small buildings were visible in the existing terminal area, which may also include the fire station, although this cannot be determined based on the resolution of the photograph. There appeared to be further clearing of vegetation surrounding the runway and a wide spread clearing running parallel to the shoreline in the southern portion of the site. The area around the existing fire training area was cleared of vegetation and there were a number of tracks that surrounded the area. The current pond was visible directly to the north of the fire training ground. There was an increase in residential development along the coast line and buildings were also visible on Adina Avenue, directly adjacent to the airport. Some cleared land was also visible to the north of the site in the location of the former Boyd Street landfill.
1971	A large amount of land clearing had occurred on the site since the 1963 aerial photograph. This included wide spread clearing in the area of the former airport landfills western side of the site. A runway expansion to the south was visible and a number of taxi ways around the terminal (consistent with the current location) had been constructed. There were also additional buildings within the terminal area and the former fire station building and workshop were visible. Some more formalised open surface water drainage channels had also been constructed on the southern portion of the site, one of which discharged to Cobaki Broadwater. Some of the current stormwater drains that run parallel to the runway were also visible.

Date	Description
	The majority of the land to the north, east, south and west of the fire training area had been cleared and there were more tracks surrounding the fire training area. There was further development along the coast line and within Adina Avenue. The waste water treatment plant ponds and Tugun landfill were also visible to the west and Boyd Street landfill to the north.
1980	It appeared that filling had occurred in the location of the existing terminal building and the current stormwater drains that run parallel to the runway were visible. No other major changes to the site were noted. There was evidence of ongoing landfilling to the west in Tugun landfill and north in Boyd Street landfill.
1985	In the 1985 historical aerial imagery, several upgrades at the airport are noted. A new terminal building has been built at the south-east of the main runway. Between the runway and the terminal are taxi runways and an open drainage channel running almost parallel to the runway. Further clearing of land was visible in the western portion of the site adjacent to Cobaki Broadwater. Structures and what appear to be soil stockpiles are visible in the fire training ground. The area where the current fire station is located had been cleared. The former fire station was visible, as was the Queensland Fire and Rescue Service (QFRS) building. Landfill appeared to have continued to the west in the Tugun landfill and sports field were visible to the north in the Boyd Street landfill.
1992	More filling and formalising of open drainage channels had occurred in the northern portion of the site. The apron had also expanded to the north. Further clearing of land was visible in the western portion of the site adjacent to Cobaki Broadwater. The current fire station building was also visible. One portion of the vegetation adjacent to Cobaki Broadwater has been cleared and two cells are visible. This is consistent with the area that is currently characterised by sparse vegetation.
2003	Clearing and filling of the site appeared to have ceased and vegetation appeared to be establishing in the western, southern and south eastern portions of the site. The terminal building had expanded and additional buildings were visible in the aircraft hangar area. The existing bunded training pad could be seen at the fire training ground.
2007	Further re-vegetation of the site was visible and further filling had been undertaken to the north of the current fire station area. The former fire station building was also gone and the area was characterised by vacant land. The terminal carpark had expanded to the east and earthworks associated with the construction of SCU were visible.

Date	Description
	The Tugun bypass tunnel and desalination plant, to the west of the site were also being constructed. The existing smoke hut was visible at the fire training ground.
2015	Further re-vegetation of the site was visible. Two buildings were visible at SCU as is the AFP building. The new JUHI was visible in the area to the east of the fire training ground. The open drainage channel discharging to Cobaki Broadwater was no longer visible.

5.2 Previous reports

A number of reports were provided by Airservices for review. These are outlined below with a summary of the key points. These historical investigations (excluding the AECOM 2011 investigation) were undertaken at the FTG (the drill ground) which is a known PFAS source and is likely to be the area most heavily impacted by PFASs due to the volume of AFFF used during historical training.

Parsons Brinkerhoff, 2006

***Soil and groundwater assessment, ARFF Fire Training Area, Coolangatta Airport, Tugun, Qld,* Parsons Brinckerhoff, 21 July 2006**

- Wastewater (comprising oily water generated from fire fighting training using kerosene and jet fuel) overflowed from the wastewater separator during treatment, resulting in hydrocarbon impact to the fire training ground.
- The investigation completed by Parsons Brinkerhoff estimated that an area of 150 m^3 had been impacted. These impacts extended to the water table.
- The analysis suite used for soil characterisation was limited to Total Petroleum Hydrocarbons.

Parsons Brinkerhoff, 2007

***Remediation and Validation Report, Fire Training Area, Gold Coast Airport, Coolangatta, Queensland,* Parsons Brinkerhoff, November 2007**

- Impacted soil from the waste water release in 2006 was excavated and placed on site in a bunded lined area.
- Soil was land farmed monthly using a backhoe.
- Four soil validation samples were collected from below the land farm pad following removal.
- Some localised dewatering was also completed within the soil excavation as part of remediation. This included some recirculation, aeration and pumping to sewer. Hydrogen peroxide was also introduced to assist with aeration at one point.
- The groundwater aeration pond leaked, and therefore use of the ponds ceased.
- Analysis was limited to hydrocarbons.

GHD, 2008

***Preliminary Site Contamination Assessment, Coolangatta ARFF Drill Ground, Gold Coast Airport,* GHD Pty Ltd, August 2008**

- The fire training ground is used to light kerosene fires and extinguish them using AFFF.
- Waste water from the fire training ground is passed through a separator on site before discharge to sewer.
- There is evidence of 'over spray' where foam extends outside the bunded area.
- The fire training area includes two kerosene ASTs (1,500L), three waste water USTs and rainwater tank.
- There is also a dis-used triple interceptor trap.
- Sources of contamination immediately surrounding the fire training area were identified as:
  - Landfill site for airport waste – south east of the fire training area.
  - Sand extraction for runway extension
  - South west corner of runway – uncontrolled fill
  - Control tower and fire station – uncontrolled fill for development
- Impacted soil from the waste water leak (PB 2006) was landfarmed on site and then re-instated around the USTs.
- Training in the fire training area can occur up to three times a week.
- Airservices are the only organisation who have used the training ground.
- AFFF 3M Light Water was used at the site for approximately 20 years.
- AFFF has reportedly been used in the fire training area and in areas where Airservices is required for emergencies.
- Training also historically occurred in the vegetated areas along the drainage line.
- The training ground was established in the 1930s.
- The waste water from the 2006 spill would also have included AFFF.

AECOM, 2011

***Limited Wastewater, Surface Water and Sediment Quality Assessment – Gold Coast Airport, Aviation Rescue and Fire Fighting (ARFF) Operations,* AECOM, 16 March 2011**

- Included surface water and sediment investigation in the following areas:
  - ARFF Fire Station – PFOS (<0.02 to 26.4 µg/L) and PFOA (<0.02 to 6.58 µg/L)
  - ARFF Fire Drill Training Ground – PFOS (3.44 to 14.3 µg/L) and PFOA (0.5 to 19.9 µg/L)
  - Drainage lines within the site – PFOS (0.02 to 2.27 µg/L) and PFOA (0.02 to 0.09 µg/L)
  - Sediments in drainage channels – PFOS (<0.0005 mg/kg to 4.78 mg/kg) and PFOA (,0.0005 mg/kg to 0.0228 mg/kg)
- Fire training equipment is cleaned at the fire station.
- Waste water is 'pre-treated' in holding tanks through a CPU (Coalescing Plate Separator) before being released to Coolangatta Creek (open drainage channel on the site). Sometimes the CPU is bypassed and water goes directly to Coolangatta Creek and the

wetland to the east of the Fire Station. The hose drying rack also drains directly into Coolangatta Creek.

- Fire trucks are periodically sent off site to the mechanical workshop. No cleaning is reportedly completed here, but there is draining infrastructure in place which should be assessed.

Parsons Brinkerhoff, 2014

***Groundwater Monitoring and Reporting – ARFF Drill Ground, Gold Coast Airport,* Parsons Brinckerhoff, Letter dated 15 January 2014**

- Groundwater sampling was conducted in 2013 at the fire training ground at monitoring wells BH6, BH7, BH9, BH12 and BH13.
- The analytical suite included TPH, BTEX, PAHs and PFOS, PFOA and 6:2 FTS.
- PFOS concentrations ranged from 12.6 to 2,280 µg/L and PFOA from 1.0 to 51.3 µg/L.
- The report also includes a summary of historical groundwater monitoring for hydrocarbons (TPH) from a number of monitoring wells in the fire training area (BH01, BH07, BH08, BH12 and BH13) between 1999 and 2011.
- PFOS, PFOA and 6:2 Fts was also included in one historical monitoring round in 2011.

Parsons Brinkerhoff, 2015

***Groundwater Monitoring and Reporting – ARFF Training Ground, Gold Coast Airport,* Parsons Brinckerhoff, Letter dated 1 May 2015**

- Groundwater sampling was conducted in 2015 at the fire training ground at monitoring wells BH6, BH7, BH9, BH12 and BH13.
- The analytical suite included TPH, BTEX, PAHs and PFOS, PFOA and 6:2 FTS.
- PFOS concentrations ranged from 17.9 17.9 to 527 µg/L and PFOA concentrations ranged from 2.23 to 37.1 µg/L.
- The report contains discussion of the groundwater results and trends in historical monitoring data.

A copy of this report is provided in Appendix G.

5.3 Operational responses system outputs

Airservices provided GHD with a copy of the ARFF operational response system (ORS) outputs for Gold Coast Airport. The ORS is used to document incidents and includes details of materials used, vehicles involved and actions taken. The recorded incidents and summary of the ORS outputs is provided in Table 5. A copy of the ORS records is provided in Appendix H.

Table 5 ORS output summary

Incident date	Incident location and description	Materials used	Actions taken
15 December 1999 (Incident Report 124)	Uncontrolled fire at Boyd Street landfill	14,000 L water 100 L foam[1]	Assist Queensland Fire and Rescue Service (QFRS) to extinguish the fire at the rubbish tip at Boyd Street, Tugun.

Incident date	Incident location and description	Materials used	Actions taken
17 July 2000 (Incident No. 161)	Vessel fire at Gold Coast Marina Coomera	1,350 L foam[1]	Delivered foam to incident site to assist QFRS to put out the fire of a large vessel.
26 August 2001 (Incident No. 231)	Taxi vehicle on fire at the Ansett Terminal entrance	9 kg dry chemical powder 400 L water 12 L foam[1]	ARFF extinguished the fire from the engine compartment of a taxi vehicle. The road way was washed down and debris from car removed.
15 September 2002 (Incident No. 311)	Fire at the Tugun landfill	50,000 L water[1] 140 L foam	ARFF assisted QRFS in combating the fire at the Tugun Landfill.
2 July 2009 (Incident No, 1320)	Helicopter crash to the west of Runway 32	320 L water 20 L foam[2]	ARFF attended crash site (300 m to the west of Runway 32) and deployed one foam line due to aviation gas leak from aircraft wreckage and applied a foam blanket to the area.

[1] – Based on Airservices foam use dates, foam used is likely to be 3M Lightwater

[2] – Based on Airservices foam use dates, foam is likely to be Ansulite

5.4 Interviews

Site interviews were conducted on the 8 and 9 June 2016 with the following personnel:

- Norbert Benton – Environment Manager – Gold Coast Airport
- Greg Hopgood – Project Environment Coordinator – Gold Coast Airport
- Peter Franks – Fire Station Manager – Airservices Australia

A summary of the key findings from the assessment are listed in Section 5.4.1 and 5.4.2. A transcript of the interviews is provided in Appendix F.

5.4.1 Gold Coast Airport Environmental Manager

Historically soil, groundwater and surface water investigations which included consideration of PFAS have been limited. More recently GCAPL have commissioned soil and groundwater investigations which included consideration of PFAS associated with the development of the Instrument Landing System (ILS) and Project LIFT (terminal and apron expansion) and a preliminary site investigation for the whole airport site. These reports were in draft at the time of the site interview, but GCAPL discussed the key findings of the investigations, which identified a number of possible sources of PFAS including:

- Fuel spill in 1996 at the end of the fuel line (end of apron).
- Helicopter crash in 2009.
- Light plane crash in mid-1980's (1984).
- Irrigation of the grass at the end of the runway (to facilitate establishment).

- Foam may also have been used in the Airport Emergency Plan conducted every two years. Although this cannot be recalled in the past 10 years.
- Tugun bypass tunnel.
- Queensland Fire and Rescue Service.
- Former airport landfills, located on the western boundary. GCAPL indicated that all waste in these landfills was removed from the site and relocated as part of the Tugun Bypass development.
- Anecdotal information from a site worker with over 50 years on the site indicated to GCAPL that 'crash remote' training occurred in a number of locations across the airport. The date time of these operations was unknown.

A Lockheed Lodestar also crashed at the site in March 1949, however, this was prior to the use of AFFF and is therefore not considered a possible source of PFAS.

Nothing else is noted on the register which only goes back to 2007.

Bulk earthworks associated with development of the airport typically included a large amount of importation of fill as well as large amounts of fill sourced from borrow pits on the site. It is also noted that Airservices water trucks were used to water establishing vegetation. GCAPL identified an area on the southern perimeter of the site where this occurred in 2007, but this practice is likely to be more wide spread.

There is no record of on-site surface water drains ever being de-silted. Vegetation is periodically cleared from the drains and stockpiled adjacent to the drain. During earthworks, water from surface water drains has been used for dust suppression and irrigation across the site.

Rainwater is harvested from the terminal building, AFP and SCU and stored in underground storage tanks for use in toilets and urinals at the site.

The new JUHI includes fluorosurfactant-containing protein based foam (FFFP).

5.4.2 Airservices Australia Fire Station Manager

Peter Franks, the ARFF Fire Station Manager noted that Airservices has an incident log that goes back to the 1990s detailing how much foam was discharged at each incident. During the interview, Peter Franks recalled the following incidents:

- A helicopter crash in 2009 where foam was discharged.
- A head on mid-air collision in 1988 – the crash site was outside the airport grounds in a remote location. While ARFF attended the scene it was managed by NSW Fire and Police and foam was not discharged.
- There was a fuel spill near the terminal in 1996, though there was no incident log recorded. Practice was typically to flood fuel spills with water and wash them into the surface water drainage system. Peter considered it possible that water was put on the fuel spill and that there would have been residual PFAS in the truck water tank. It was common practice to spike the water tank with a dose of foam directly into the water tank. However, by the 1990s, this process had ceased due to technological improvements in foam induction methods in the trucks.
- Peter also noted that the hydraulic fluid used in aircraft (Skydrol) contains PFAS. There may have been hydraulic fluid spills in the area of the fuel spill for many years that potentially contributed to the PFAS detections observed by GCAPL.

Historically, AFFF was delivered to the site in plastic 44 gallon drums where it was transferred into an on-site AST. It is considered likely that many of the empty drums were then transported

by Airservices staff to the local Tugun and Boyd Street landfill for disposal (though this was not confirmed). There were no formal records of AFFF storage, and no AFFF is stored by ARFF at the GCA now.

Peter indicated that 99% of fire training was undertaken at the FTG. It was confirmed that 'crash remote' training was also undertaken at isolated locations around the airport which would have included the discharge of foam. The location of the 'crash remote' training would not have been far from the MFS or FTG. Since the training ground was formally constructed (in the late 1990s) 'crash remote' training has been close to it in the southern portion of the GCA.

In addition, there was historically a daily foam test and a six monthly valve and foam consistency test which was completed on each vehicle. These former daily discharges were typically done in the area surrounding the fire station, while the latter discharges occurred in the grassed area to the east of the FTG.

Training at the FTG occurs approximately once every shift. Foam was always used in training until 2010, when training changed to water only releases. There are no records of the volumes of foam used during these exercises. The FTG is also used by the Queensland and NSW fire services approximately every three to six months. The bunded area at the training ground includes a waste water collection system that discharges to sewer.

Fire hoses are flushed at the FTG and general wash down of dirt from hoses and vehicles is completed at the fire station on the hardstand containing a waste water collection system.

5.5 Summary of site history

The site historical review indicates that the airport commenced operation prior to 1947, but major development appeared to have occurred from the 1950s onwards. Parts of the site appeared to have been progressively cleared and filled from the 1960s as the airport expanded. Land clearing and filling appeared to have slowed in the late 1990s, early 2000s and vegetation appeared to have re-established on the west, south and south eastern portions of the site.

GCAPL indicated that the airport historically disposed of waste materials on the site in three small landfills on the western side. It is unknown when landfilling in the area commenced and the historical aerial photographs do not provide any clear information on these. GCA indicated that all waste was removed from these landfills and relocated off-site as part of the construction of the Tugun Bypass. Council operated landfills are also located directly to the north and west. To the west, the Tugun Landfill operated from approximately the 1970s to 2010s. The Boyd Street landfill, to the north operated between the 1960s and 1980s.

Firefighting services have been present at the GCA since commencement of the airport. Airservices was established in 1995. The fire station was originally located on the eastern perimeter of the site adjacent to and north of the former JUHI site and the terminal building; the ARFF workshop is located opposite, landside and across the road. These buildings are present (based on historical aerial photographs) in the 1960s. The current fire station was constructed in 1992 and the former fire station was demolished some years later in late 2008 and the JUHI in early 2013.

Fire training has been undertaken at the current fire training ground location since fire services operated at the site. It is noted that clearing in this area is not visible until the 1960 historical aerial photographs. It is reported that approximately 99% of fire training is undertaken here. Historically, remote access training, involving the discharge of foam was also undertaken in isolated locations of the GCA in close proximity to the MFS and FTG. In addition, there was historically a daily foam test and 6 monthly valve and foam consistency test which was completed on each vehicle. These discharges were typically done in the area surrounding the fire station and the grassed area east of the FTG.

The FTG, current and former fire stations and possibly the fire station workshop are all considered potential sources of PFAS contamination due to the activities that have occurred here and the likely storage of AFFF.

There have been a number of incidents at the site which may have also resulted in discharge for foam including:

- A fuel leak at the end of the runway in 1996.
- A helicopter crash in 2009 on the western boundary.
- A single light plane crash in approximately 1984 near the aircraft hangar.
- 'crash remote' fire training in 44 gallon drums in isolated areas of the site.

The following other possible sources of PFAS contamination have also been identified at the site and in the immediate surrounding area:

- Tugun bypass tunnel fire suppression system – understood to use AFFF and has reportedly had at least one accidental discharge to the capture sumps.
- Tugun and Boyd Street landfills – records of waste disposal are not available, but PFAS-containing wastes including carpets and spent drums of foam concentrate are likely.
- QFRS Coolangatta - Bilinga Fire Station – Established in 1976. QFRS changed to fluorine-free foam in 2003.
- Irrigation of some areas of the site by the fire trucks (under instruction from GCAPL) to assist with establishment of vegetation, with the possibility of residual foam being present in the water released.

These are outlined in Figure 2 in Appendix A.

6. Preliminary and targeted sampling

6.1 Scope of work

Based on the outcomes of the PSI, a Sample Analysis and Quality Plan (SAQP) was developed for the investigation (GHD reference: 31/34071/252132).

The SAQP was prepared so that the field investigations and analyses were undertaken in a way that enabled the collection and reporting of reliable data on which to base any further soil, groundwater and surface water monitoring programs for specific areas of the site.

The historical investigations summarised in Section 5.2 were focused on the FTG which is one of the primary sources of PFASs at the GCA. The Preliminary Sampling program was designed to investigate potential migration pathways from the FTG and potential impacts at down gradient sensitive receptors (though did include limited additional sample collection at the FTG).

The GHD SAQP described drilling methods, sampling equipment, well development strategy, sample collection protocols, sample processing, field and laboratory sample analysis, equipment decontamination and quality-assurance and quality-control (QA / QC) procedures.

The scope of work undertaken, methodology adopted and results of the sampling program are provided in a Preliminary Sampling report (GHD, 2016a).

6.2 Results summary

The investigations completed as part of this scope of works reported the highest groundwater PFAS concentrations at groundwater wells at the FTG and the former fire station. PFOS results at these locations exceeded the ecological screening criteria for aquatic organisms. Groundwater sample locations on the south eastern portion of the site and western perimeter exceeded the adopted human health screening levels and the enHealth drinking water guidelines.

Surface water samples in the drainage channels downstream of the fire station and in the pond adjacent to the FTG also reported PFOS concentrations above the adopted human health screening levels for consumption of fish, but were below the adopted ecological screening values for aquatic organisms and the eHealth guideline for recreational waters. Surface water results from the Cobaki Broadwater reported PFAS and PFOA concentrations below the laboratory limit of reporting.

Full details of the scope of work undertaken, methodology and results are provided in the Preliminary Sampling report (GHD, 2016a).

7. Conceptual site model

Based on our understanding of the contamination issues and site setting a conceptual site model (CSM) has been generated as a basis for assessing the risk posed by any potential *source -> pathway -> receptor* linkages (or pollutant linkages).

The CSM assumes a commercial/industrial land use scenario consistent with the sites current use as an airport. A representation of the CSM using two cross-sections is included as Figure 3a and Figure 3b and CSM Pathways are shown in Figure 4 in Appendix A. A representation is also included in Chart 1.

7.1 Sources

The focus of this assessment is on the potential sources of PFAS on the GCA which are identified as the following:

- The FTG – routine discharge of foam in this area from 1980 to 2010.
- The MFS and surrounding area – wash down of vehicles and hoses, drainage associated with the bunded areas that contained foam, the daily and six-monthly foam discharges adjacent to the current AFFF fire station from 1992 to 2010.
- Fire station workshop.
- The old fire station adjacent to the old JUHI – activities consistent with those identified at the current fire station, with the use for AFFF from 1980 to 1992.
- Discharge of foam associated with a fuel leak at the end of the apron in 1996.
- Discharge of foam associated with a helicopter crash in 2009 on the boundary with the Tugun Bypass.
- Discharge of foam associated with a single light plane crash in approximately 1984 near the aircraft hangar.
- Discharge of foam as 'crash remote' fire training in 44 gallon drums in isolated areas of the site from 1980 to 2010.
- Tugun bypass tunnel fire suppression system.
- Tugun and Boyd Street landfills.
- Sewage Treatment Plant adjacent to the Tugun Landfill.
- Former airport landfills
- Queensland Fire and Rescue Service (QFRS) Coolangatta - Bilinga Fire Station.
- Irrigation of vegetated areas of the site with the fire trucks.
- Sediments and/or groundwater in the existing and former surface water drainage channels (possible secondary source).

The preliminary sampling program confirmed the following sources of PFAS at the site:

- FTG
- Current fire station
- Former fire station

This does not preclude the presence of the other potential sources of PFAS identified.

7.2 Pathways

7.2.1 Contaminant transport mechanisms

The key mechanisms for contaminant transport at the site have been identified as:

- *Surface water overland flow* – lateral overland flow and migration of contaminants via stormwater during rain events, causing re-deposition of contaminants on other areas of the GCA or off-site. There is the potential for migration of contaminated surface water / storm water from the source in open drainage channels.
- *Groundwater advection/dispersion* - horizontal and vertical migration of contaminants from the GCA soils into the underlying aquifer and through groundwater to the point of surface water discharge or via uptake in spear pumps on nearby residential properties.

7.2.2 Potential exposure mechanisms

Based on the identified receptors and the release and fate and transport characteristics of the contaminants of potential concern, contaminant uptake pathways through which receptors may become exposed to contamination include ingestion and dermal absorption.

- *Ingestion exposure pathway* - Ingestion of contaminants by site workers could occur during site works which will involve excavation and handling of site soils, stormwater, or groundwater. This is not considered to be of a concern for indoor site workers. Ingestion could also occur for nearby residents using spear pumps via direct contact or use of water for food production (vegetable gardens, chickens etc).

  Terrestrial and aquatic fauna may ingest contaminants potentially migrating off-site and discharging to the down gradient surface water receiving environment including the Pacific Ocean and Cobaki Broadwater.
- *Dermal exposure pathway* - Exposure may occur via sorption through biological membranes such as skin, based on animal studies. While this has not been confirmed for humans and despite PFOS having a low skin permeability constant, the exposure pathway may be complete as illustrated on the CSM.
- *Inhalation exposure pathway* – PFAS are not considered to be volatile so inhalation is not considered to be a viable exposure route.

7.3 Receptors

The site is located in a highly modified commercial/industrial site setting. The following are the key potential human health and ecological contamination receptors considered to be relevant in the context of the site's setting:

- Site workers whose activities may result in exposure to site soils, surface water and groundwater.
- Nearby residents using spear pumps.
- Consumers of seafood from the down gradient surface water receiving environment of the Pacific Ocean and Cobaki Broadwater who may ingest contaminants.
- Recreational users of the Pacific Ocean and Cobaki Broadwater that may ingest contaminants or have dermal exposure to contaminants.
- Flora and fauna in the hydraulically down-gradient marine surface water receiving environment of the Pacific Ocean and Cobaki Broadwater.

- Terrestrial flora and fauna; fauna through consumption of impacted plant or animal matter (e.g. grasses and worms), which may in turn impact their predators.

7.4 Potential source-pathway receptor linkages

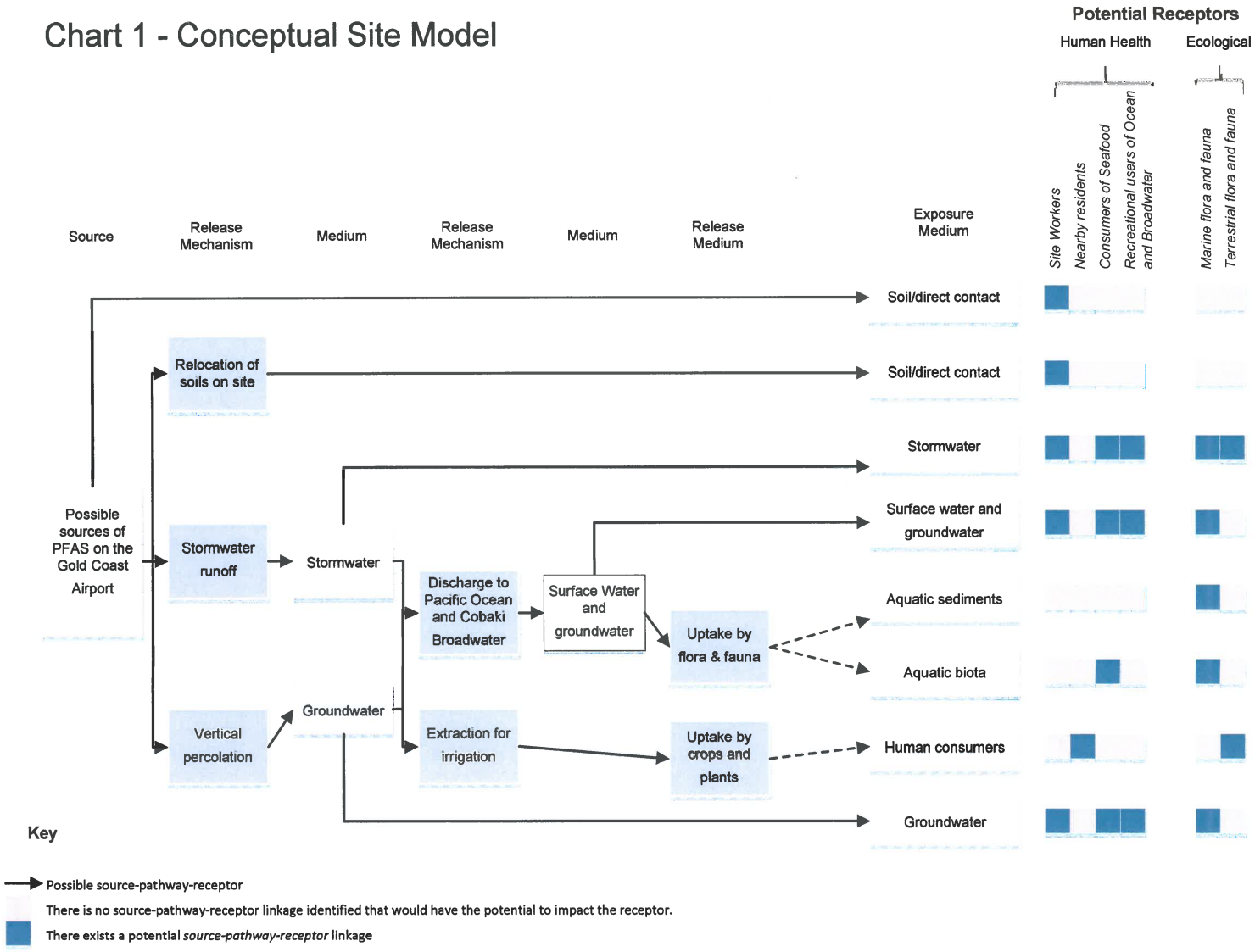
The CSM has identified a number of potential source-pathway-receptor pollutant linkages which are highlighted in Table 6. These are discussed below in the context of the GCA's setting.

Table 6 PFAS contamination – potential pollutant linkages

Potential pollutant linkages	Key exposure routes and risks
Potential human health risks	
Health risks to site workers who may come into contact with contaminated site media	Day to day activities are not likely to expose site personnel to these media. However, it remains a possibility where workers are involved with excavation and handling of contaminated soil, surface water or groundwater. It is expected that this can be managed through good hygiene practices and task-specific management plans.
Health risks to nearby residents who are exposed to potentially contaminated groundwater through spear pumps.	The main risk to human health is considered to be through consumption of extracted water and consumption of food produce irrigated by the extracted water. Consumption of impacted drinking water as well as vegetables, fruit or poultry irrigated with water contaminated by PFAS from a spear pump may lead to bioaccumulation of PFAS in humans. Dermal exposure has not been identified as a dominant exposure pathway for PFAS.
Health risks to consumers of contaminated seafood arising from migration of contaminants through surface water and groundwater to the Pacific Ocean and Cobaki Broadwater and bioaccumulation of contaminants in biota.	As PFAS are highly persistent and have a high propensity to bio-accumulate through the food-chain, the potential for human exposure to PFAS via consumption of contaminated seafood is an issue that needs further investigation.
Migration of contaminants through surface water and groundwater to the Pacific Ocean and Cobaki Broadwater resulting in human health impacts to recreational users of the Pacific Ocean and Cobaki Broadwater.	The main risk is through incidental ingestion of water. Dermal exposure has not been identified as a dominant exposure pathway for PFAS.
Potential ecological risks	
Impacts to the off-site marine ecosystem (flora and fauna) of the Pacific Ocean and Cobaki Broadwater from migration of contaminants through surface water and groundwater	There is the potential for PFAS contaminated surface water and groundwater to discharge to the adjacent marine ecosystem where marine biota (invertebrates and macrofauna) may be exposed. Predation of species can lead to a wider distribution of PFAS in the marine environment due to bioaccumulation.

Potential pollutant linkages	Key exposure routes and risks
Terrestrial ecology – take up of PFAS in plants and subsequent consumption by fauna plus impact to invertebrates via impacted soil	There is potential for prey species to ingest impacted flora or soil and then be predated by larger animals e.g. eagles, snakes, foxes.

Chart 1 - Conceptual Site Model



8. Conclusions

8.1 Conclusions

Based on the review of available site history information, site inspection and site interviews, the following potential sources of PFAS have been identified:

- The FTG – routine discharge of foam in this area from 1980 to 2010.
- The MFS and surrounding area – wash down of vehicles and hoses, drainage associated with the bunded areas that contained foam, the daily and six-monthly foam discharges adjacent to the current ARFF fire station from 1992 to 2010.
- Fire station workshop.
- The old fire station adjacent to the old JUHI – activities consistent with those identified at the current fire station, with the use for AFFF from 1980 to 1992.
- Discharge of foam associated with a fuel leak at the end of the apron in 1996.
- Discharge of foam associated with a helicopter crash in 2009 on the boundary with the Tugun Bypass.
- Discharge of foam associated with a single light plane crash in approximately 1984 near the aircraft hangar.
- Discharge of foam as 'crash remote' fire training in 44 gallon drums in isolated areas of the site from 1980 to 2010.
- Tugun bypass tunnel fire suppression system.
- Tugun and Boyd Street landfill.
- Sewage Treatment Plan adjacent to the Tugun Landfill.
- Former airport landfills
- Queensland Fire and Rescue Service Coolangatta - Bilinga Fire Station.
- Irrigation of vegetated areas of the site with the fire trucks.
- Sediments and/or groundwater in the existing and former surface water drainage channels (possible secondary source.

The following potential sensitive receptors have been identified:

- Site workers whose activities may result in exposure to site soils, surface water and groundwater.
- Nearby residents using spear pumps.
- Consumers of seafood from the down gradient surface water receiving environment of the Pacific Ocean and Cobaki Broadwater who may ingest contaminants.
- Recreational users of the Pacific Ocean (in the vicinity of the stormwater outfall) and Cobaki Broadwater that may ingest contaminants or have dermal exposure to contaminants.
- Flora and fauna in the hydraulically down-gradient marine surface water receiving environment of the Pacific Ocean and Cobaki Broadwater.
- Terrestrial fauna consuming impacted plant material e.g. grasses. This in turn may impact their predators.

8.2 Summary of preliminary sampling program

Based on the data reviewed in this study and the CSM, the following presents a summary of the findings:

- The primary source (use of PFAS containing AFFF) no longer exists. Secondary sources include residual soil and groundwater contamination.
- Soil results reported PFAS concentrations below the adopted human health and ecological guidelines, indicating that in the areas sampled, soils do not present an unacceptable risk to human health and ecological receptors.
- Groundwater results at the source of PFAS impacts including the fire training ground and the former fire station reported PFAS concentrations above the ecological guidelines that have the potential to be toxic to aquatic organisms as wells as exceeding the HISL and enHealth drinking water guidelines.
- Groundwater and surface water down gradient of the identified sources and or other possible sources reported PFAS concentrations above the HISL and enHealth drinking water guidelines.
- Surface water samples from Cobaki Broadwater reported PFAS concentrations below the laboratory limit of reporting, however it is noted that the HISL for consumption of fish is lower than the laboratory limit of reporting.

9. References

- AECOM, 16 March 2011: Limited Wastewater, Surface Water and Sediment Quality Assessment – Gold Coast Airport, Aviation Rescue and Fire Fighting (ARFF) Operations,
- Airports Act 1996.
- Airports (Environment Protection) Regulations 1997.
- Australian Standard AS 4482.1:2005: Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil.
- AS/NZS ISO 31000:2009: Risk management - Principles and guidelines.
- Australian Commonwealth Work Health and Safety Act 2011.
- Bureau of Air Safety Investigation, Mid-Air Collision Between Cessna 172-N VH-HIZ and Piper PA 38-112 VH-MHQ, Near Tweed Heads, NSW, 20 May 1988
- Commonwealth Work Health and Safety Regulations 2011.
- Department of Infrastructure and Regional Development (DoIRD, 2015): GEM 002 - PFC Management Actions Advice.
- GHD, 2008, Airservices Australia – Report for ARFF National Testing Program Preliminary Site Contamination Assessment - Coolangatta ARFF Drill Ground, Gold Coast Airport.
- GHD, 2015, Airservices Interim Contamination Management Strategy and Decision Framework for PFC contamination, June 2015 (the 'Interim Framework').
- GHD, 2016: Airservices Australia – Gold Coast Airport Sampling and Analysis Quality Plan.
- GHD, 2016a: Airservices Australia – Gold Coast Airport Preliminary Sampling Report, draft, October 2016.
- Environment Protection Act 1970.
- NEPC, 2013: National Environment Protection (Assessment of Site Contamination) Measure 1999 (the ASC NEPM).
- Parsons Brinckerhoff, 21 July 2006, Soil and groundwater assessment, ARFF Fire Training Area, Coolangatta Airport, Tugun, Qld.
- Parsons Brinckerhoff, November 2007, Remediation and Validation Report, Fire Training Area, Gold Coast Airport, Coolangatta, Queensland.
- Parsons Brinckerhoff, Letter dated 15 January 2014, Groundwater Monitoring and Reporting – ARFF Drill Ground, Gold Coast Airport.
- Tweed Local Environmental Plan 2014, Land Zoning Map – Sheet LZN_014.
- US EPA US EPA 2014, *Emerging Contaminants – Ferfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA)*, Emerging Contaminants Fact Sheet – PFOS and PFOA, http://www2.epa.gov/sites/production/files/2014-04/documents/factsheet_contaminant_pfos_pfoa_march2014.pdf, viewed 28 April 2015.

10. Limitations

This report: has been prepared by GHD for Airservices Australia (Airservices) and may only be used and relied on by Airservices for the purpose agreed between GHD and Airservices.

GHD otherwise disclaims responsibility to any person other than Airservices arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Airservices and others who provided information to GHD which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

Appendices

Appendix A - Figures

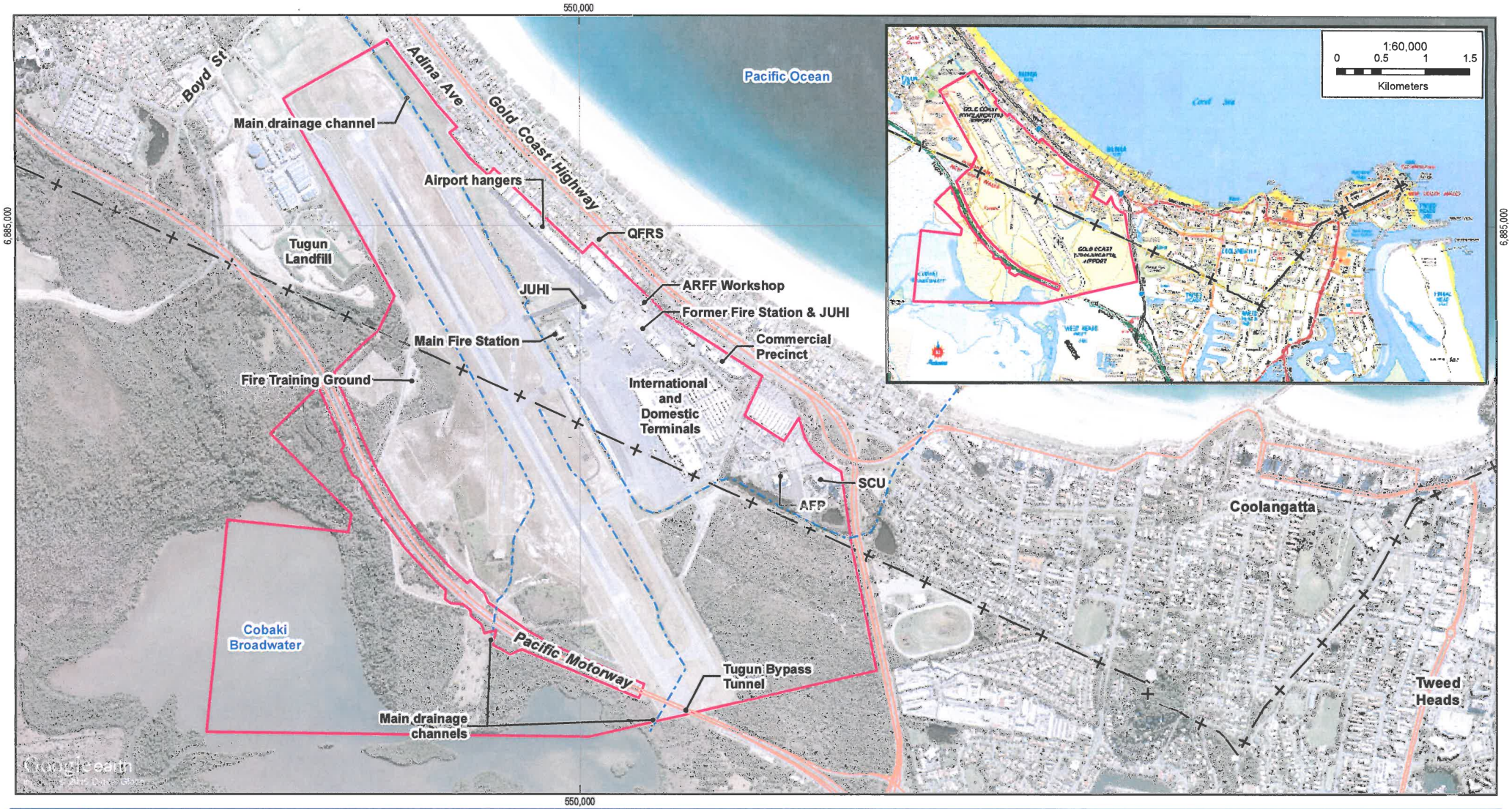
Figure 1 Site location

Figure 2 Possible PFAS impact areas

Figure 3a Conceptual site model, Section A

Figure 3b Conceptual site model, Section B

Figure 4 Conceptual site model pathways



1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

- Site Boundary (Coolangatta Airport)
- Main drainage channel
- Major Road
- Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

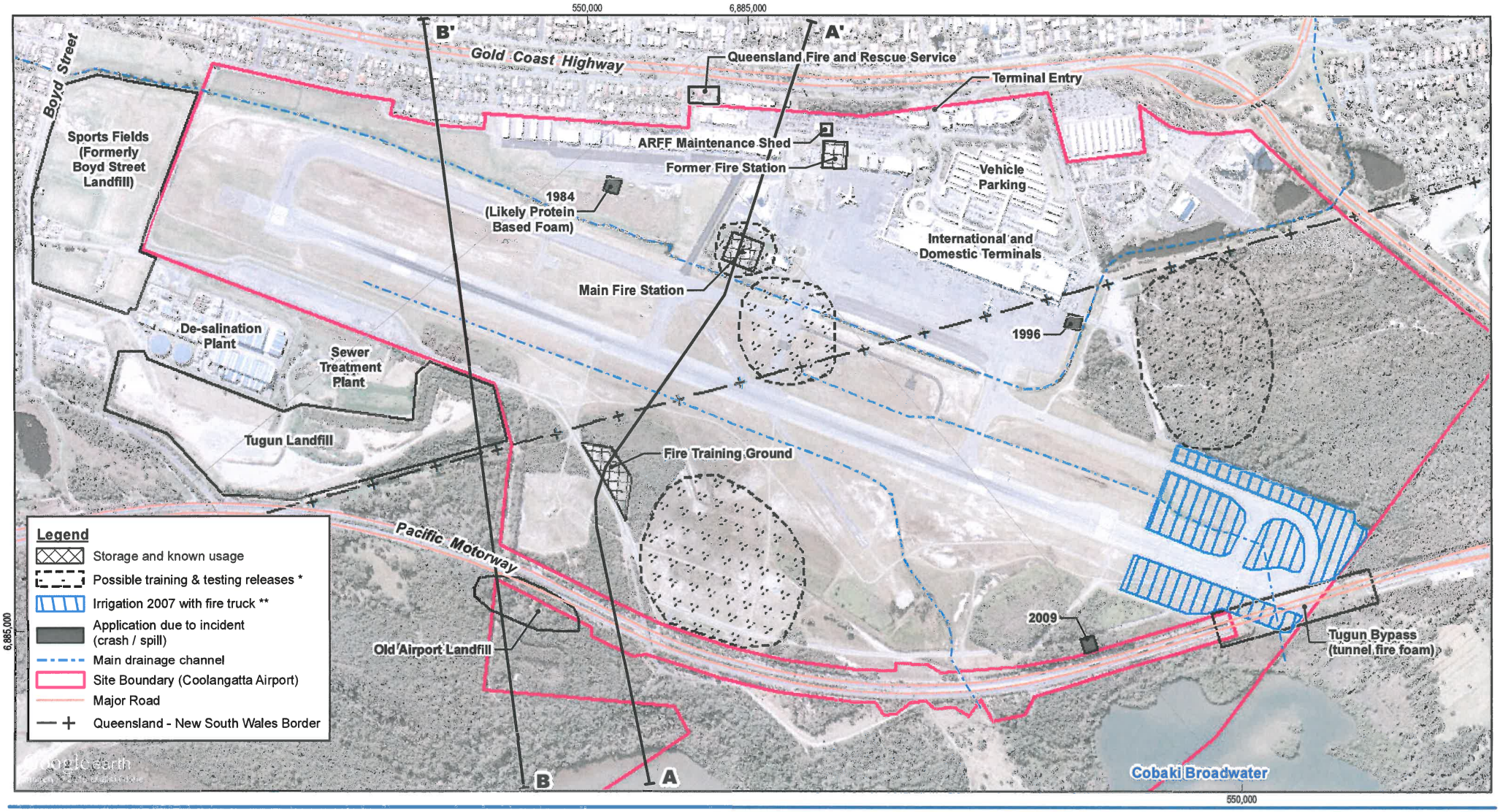
Site Locality

Figure 1

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-211_CgtLocality_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: Google Earth: imagery (May 2015, extracted March 2016). Created : jvc



1:12,000 (at A4)

0 100 200 300 400 500

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

* Training and testing foam release areas based on information from the ARFF Fire Station Manager and GCA Environment Manager

** Irrigation areas based on information from the GCA Environment Manager

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number 31-34071
Revision C
Date 4 October 2016

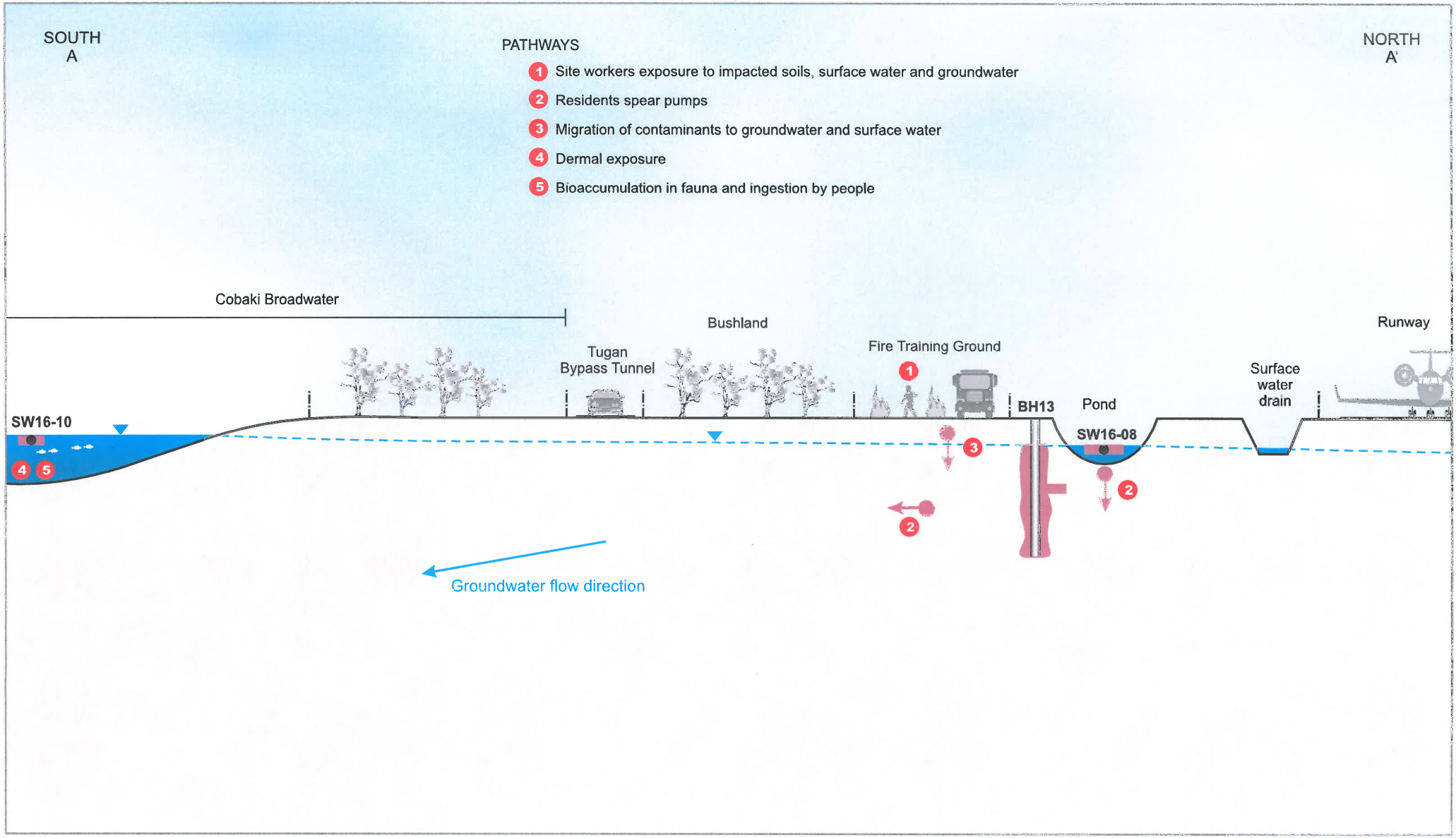
Possible Sites of PFAS

Figure 2

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-213_CgtSiteDetails_revB.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: Google Earth: imagery (May 2015, extracted March 2016). Created : jvc



LEGEND

- Sands
- Migration of contaminants
- Potential source of PFAS
- PFAS impact
- Standing water level (approximate)

NOTE

Conceptual diagram only - not to scale

Gold Coast Airport
Preliminary Site Investigation

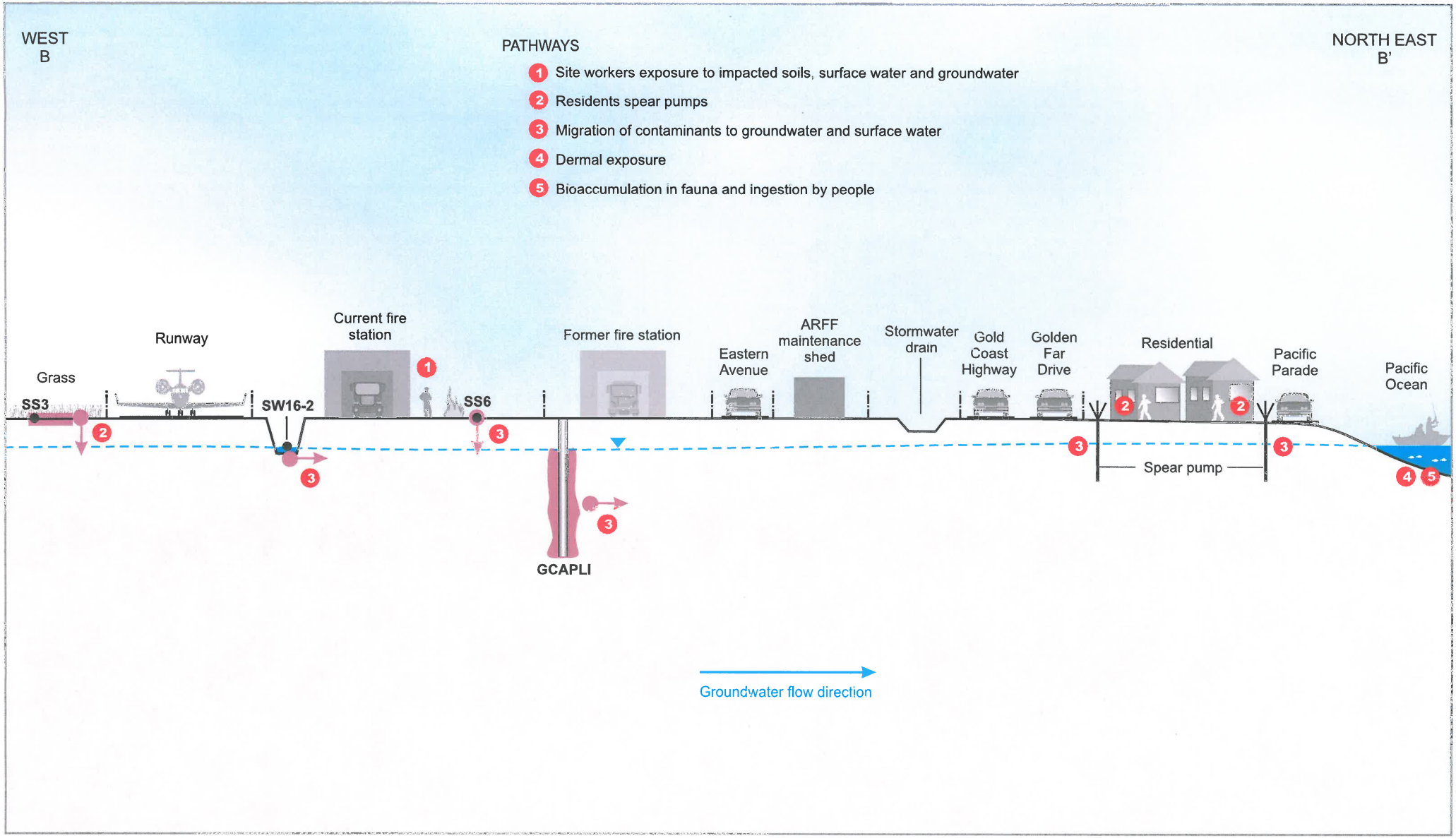
Conceptual Site Model (A-A')

Job Number	31-34071
Revision	A
Date	8 Sept 2016

Figure 3a

AU\Launceston\Projects\31\34071\3134071_LTN_04.cdr

8/180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com



LEGEND

- Sands
- Migration of contaminants
- Potential source of PFAS
- PFAS impact
- Standing water level (approximate)

NOTE

Conceptual diagram only - not to scale

Gold Coast Airport

Preliminary Site Investigation

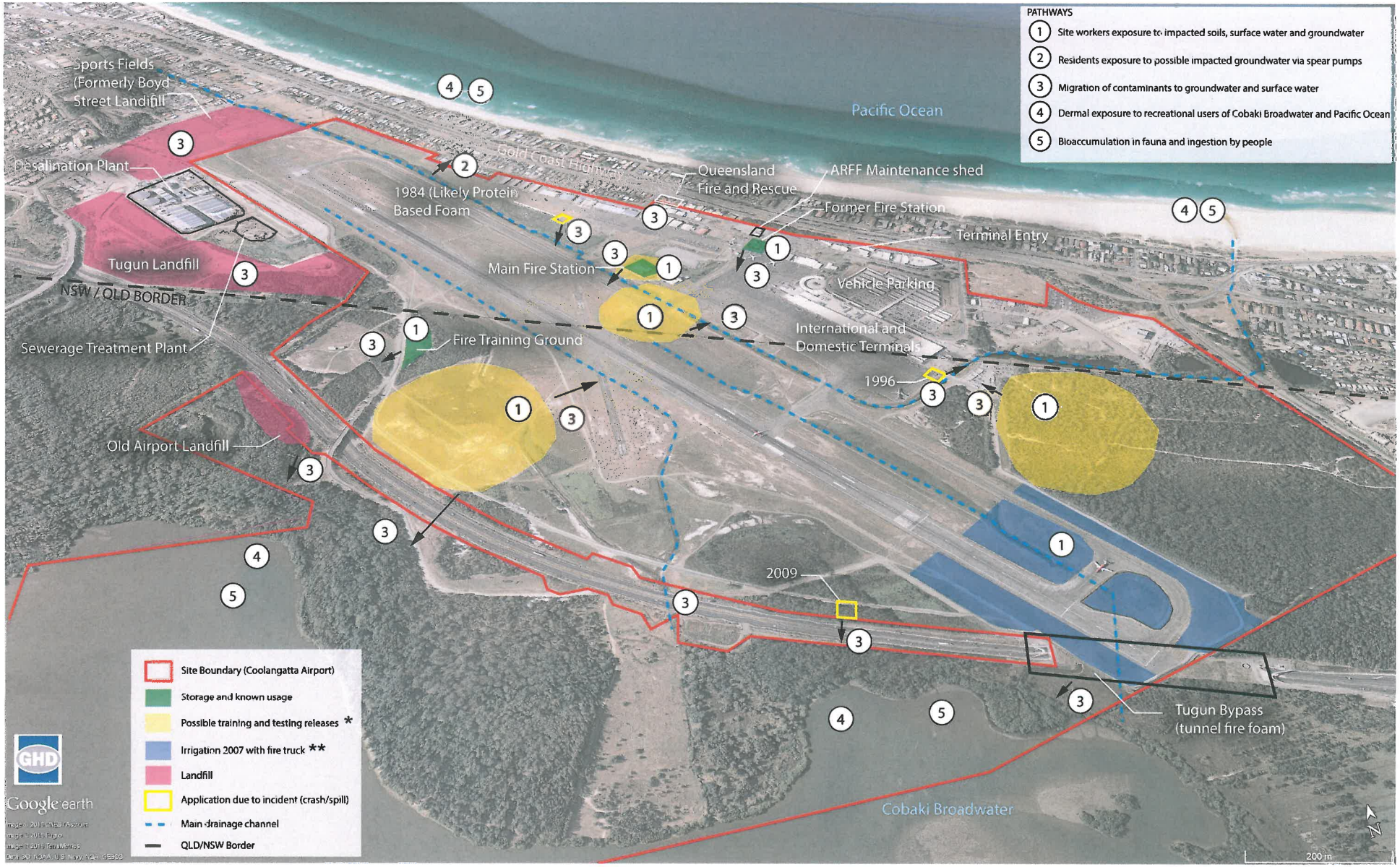
Conceptual Site Model (B-B')

Job Number	31-34071
Revision	A
Date	8 Sept 2016

Figure 3b

AU\Launceston\Projects\31\34071\3134071_LTN_05.cdr

8/180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com



Paper Size A4

* Training and testing foam release areas based on information from the ARFF Fire Station Manager and GCA Environment Manager

** Irrigation areas based on information from the GCA Environment Manager

Air Services Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number 31-34071
Revision C
Date 4 October 2016

Conceptual Site Model Pathways Figure: 4

S:\GIS\Projects\31-34071\maps\31_34071_GoldCoast_CSM_Pathways_rev_a.indd

145 Ann Street Brisbane QLD 4000 | T 61 7 3316 3000 | F 61 7 3316 3333 | E bnemail@ghd.com | W www.ghd.com

Appendix B – Certificates of Title

New local government areas were created following the declaration of the results of the local government elections held on 15 March 2008. The new local governments are recognised by the valuation business but local government data, including property records, cannot be formally transferred to the new local governments until all effective valuations in the new local government have a common date of valuation. The conversion for data purposes is scheduled to progressively occur from May 2008.

Property Status: Active
District: GOLD COAST
Office: GCST:GOLD COAST
LG/Div: 3430/01 GOLD COAST CITY (GOLD COAST) **Property ID:** 25002371 **WTR:** 27666 **Previous Ref:** 25002370

Property Name:
Property Addr: COOLANGATTA RD, BILINGA QLD 4225

Owner (VOLA): COMMONWEALTH OF AUSTRALIA
Service Addr:
Others: N

RPD: L1 RP225692 & L222 RP839951 & L5 RP839952:PAR TALLEBUDGERA
Area/Vol: 128.54 HA

Indicative Planning: 90 SPECIAL PURPOSES (GOLD COAST)
Primary Land Use: 56 SPORTSGROUND, RACECOURSE, AIRFIELD **Secondary Land Use:** 53 COMMONWEALTH (SECONDARY USE ONLY)
Property Type: NON-VALUED **Property Tenure:** FREEHOLD

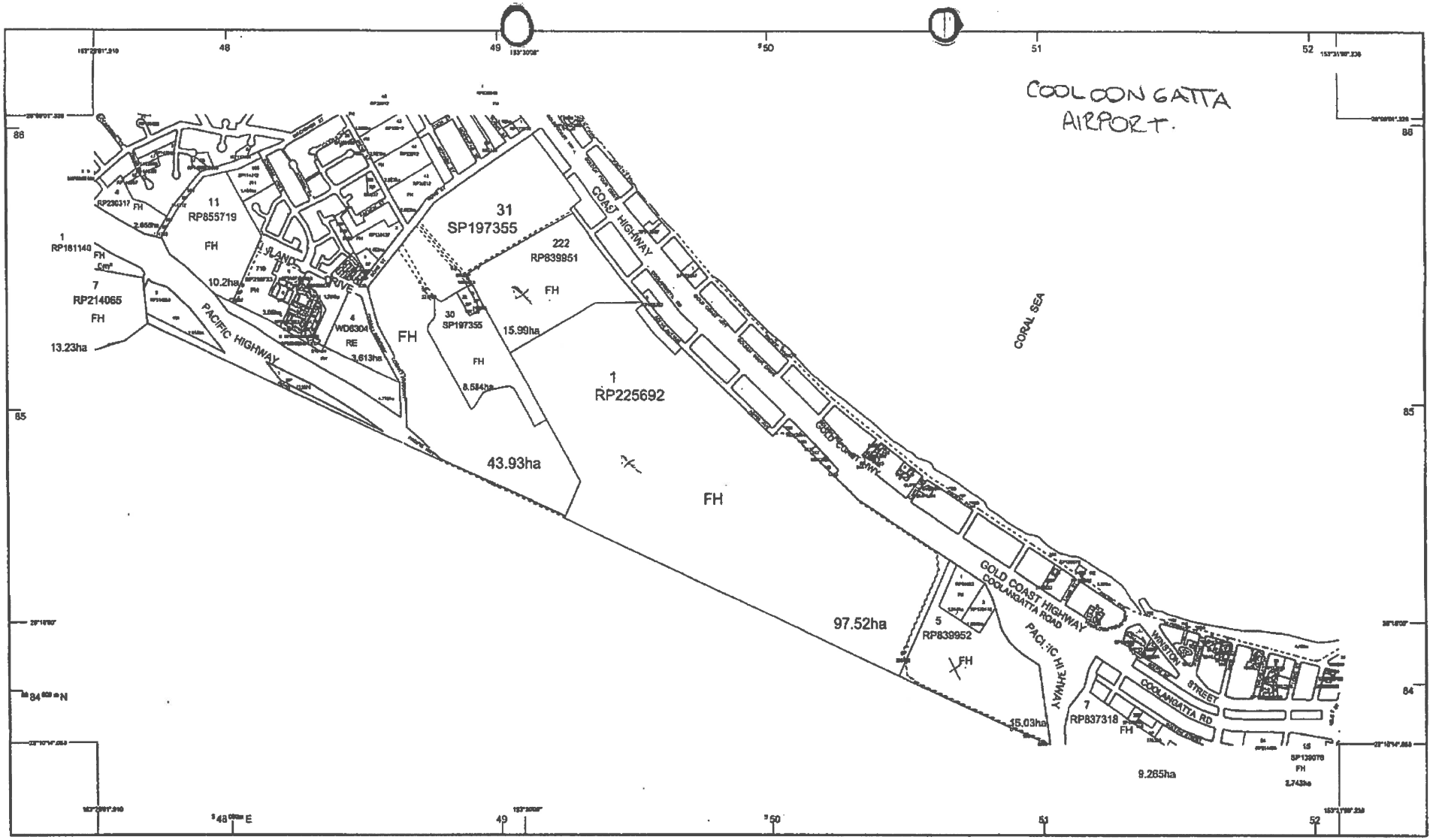
VALUATION INFORMATION

GENERAL PROPERTY INFORMATION

Sale Date: **Sale Price:** $0 **Sale Type:** NONE
Subleased: N

Number of Records Printed: 1

End of Report



STANDARD MAP NUMBER
9841-43434

MAP WINDOW POSITION & NEAREST LOCATION

GDA

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 13000

SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	No Lot/Plan Selected.
Area/Values	No Lot/Plan Selected.
Tenure	No Lot/Plan Selected.
Land Government	No Lot/Plan Selected.
Locality	No Lot/Plan Selected.
Parish	No Lot/Plan Selected.
County	No Lot/Plan Selected.
Segment/Parcel	No Lot/Plan Selected.

CLIENT SERVICE STANDARDS

PRINTED (dd/mm/yyyy) 15/02/2019

DCDB 15/02/2019 (Lots with an area less than 1500m² are not shown)

Users of the information recorded in this document (the information) accept all responsibility and risk associated with the use of the information and should seek independent professional advice in relation to dealings with property.

Despite Department of Environment and Resource Management(DERM)'s best efforts, DERM makes no representations or warranties in relation to the information, and, to the extent permitted by law, excludes or limit all warranties relating to correctness, accuracy, suitability, completeness or currency and all liability for any direct, indirect and consequential costs, losses, damages and expenses incurred in any way (including but not limited to that arising from negligence) in connection with any use of or reliance on the information

For further information on SmartMap products visit http://www.dnrm.qld.gov.au/property/property/smartmap

SmartMap
An External Product of Spatial Information Services
Based upon or extracting from the Digital Cadastral Data Base

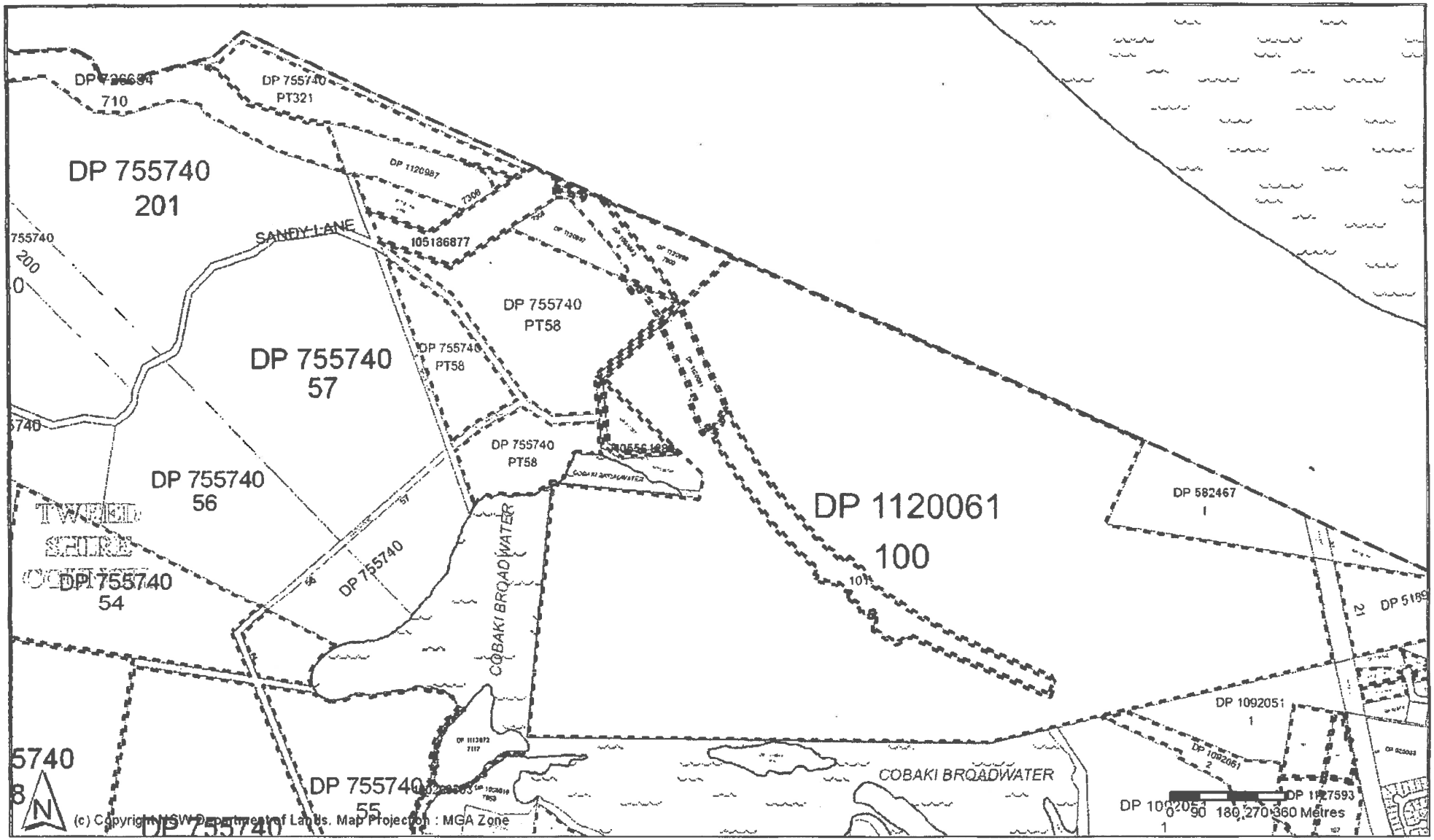
Queensland Government

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 102 DP 1120061 **Identified Parcel** : Lot 102 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS



Report Generated 6:03:19 PM, 18 February, 2010

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

	Status	Surv/Comp	Purpose
DP518902			
Lot(s): 21			
DP266190	REGISTERED	COMPILATION	EASEMENT
DP535537			
Lot(s): 1			
CA118368 - LOT 1 DP535537			
DP726654			
Lot(s): 710			
EX SUR 2004/27 - DP1075400. PART OF NORTH-WESTERN BOUNDARY OF LOT 710 DP726654. (NSW/QLD BORDER)			
DP755740			
Lot(s): 54, 55, 228			
DP1051024	REGISTERED	SURVEY	EASEMENT
Lot(s): 58, 321			
DP1093882	REGISTERED	SURVEY	ROADS ACT, 1993
DP837715			
Lot(s): 3			
DP1017336	REGISTERED	SURVEY	SUBDIVISION
DP1092051			
Lot(s): 2			
PA82104 - LOT 2 DP1092051			
NSW GAZ 31-03-2006 Folio : 1741			
Acquired for the Purposes of the Roads Act,1993 LOT 2 DP1092051			
DP1093704			
Lot(s): 670			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093882			
Lot(s): 4, 5, 6, 7			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ 10-02-2006 Folio : 771			
Reservation Of Crown Land Reserve No. 1011248 AND GAZ. 17.2.2006 FOL. 841 - ALSO SEE GAZ. 10.2.2006 FOL. 771			
NSW GAZ 26-05-2006 Folio : 3204			
Acquired for the Purposes of the Roads Act,1993 LOTS 4-8 DP1093882			
DP1094312			
Lot(s): 666			
DP610969	HISTORICAL	COMPILATION	SUBDIVISION
DP1120061			
Lot(s): 100, 101, 102			
DP535537	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1120987			
Lot(s): 7307			
DP1119883	REGISTERED	COMPILATION	CROWN LAND CONVERSION
DP1120989			
Lot(s): 7300			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ 10-02-2006 Folio : 771			
Reservation Of Crown Land Reserve No. 1011248 AND GAZ. 17.2.2006 FOL. 841 - ALSO SEE GAZ. 10.2.2006 FOL. 771			
DP1127593			
Lot(s): 105, 107, 108			
DP226067	HISTORICAL	SURVEY	ROAD OR MOTORWAY
Lot(s): 103, 104			
DP8655	HISTORICAL	SURVEY	UNRESEARCHED
SP77115			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1094312	REGISTERED	SURVEY	REDEFINITION
SP77153			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093704	REGISTERED	SURVEY	REDEFINITION
Road			
Polygon Id(s): 105186877			
PA82135 (LOTS 4-8 DP1093882)			

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 102 DP 1120061 **Identified Parcel** : Lot 102 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

	Status	Surv/Comp	Purpose
Polygon Id(s): 105561283			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ	26-05-2006		Folio : 3204
Acquired for the Purposes of the Roads Act,1993			
LOTS 4-8 DP1093882			
Water Feature			
Polygon Id(s): 160260553			
NSW GAZ	29-02-2008		Folio : 1394
Acquired for Council Purposes			
LOT 1 DP1104678			

Caution: For all **ACTIVITY PRIOR to SEPT 2002** you must refer to the RGs Charting and Reference Maps.

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

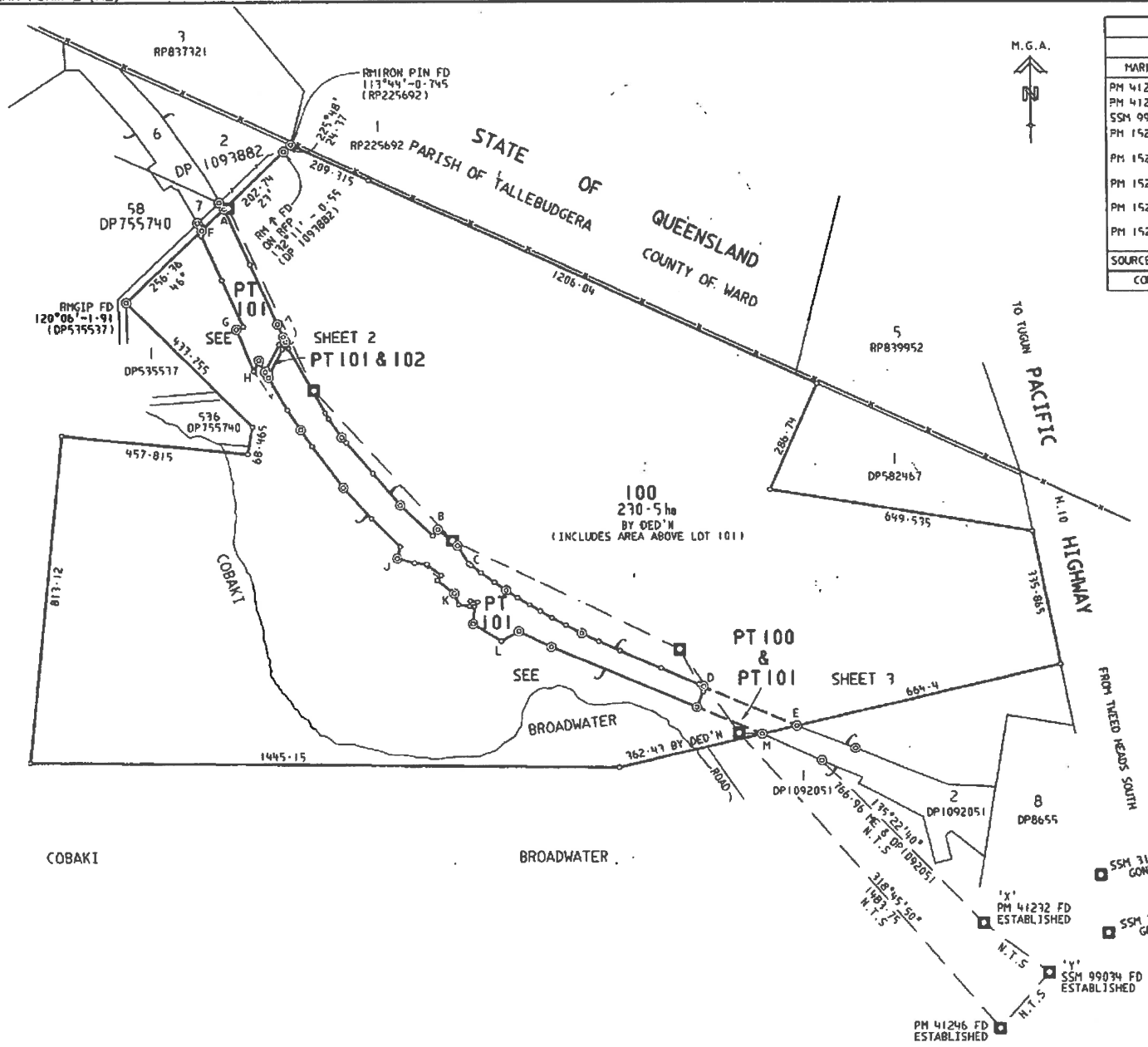
Requested Parcel : Lot 102 DP 1120061 **Identified Parcel** : Lot 102 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

Plan	Surv/Comp	Purpose
DP92695	COMPILATION	DEPARTMENTAL
DP226067	SURVEY	ROAD OR MOTORWAY
DP518902	SURVEY	SUBDIVISION
DP535537	SURVEY	RESUMPTION OR ACQUISITION
DP582467	SURVEY	OLD SYSTEM CONVERSION
DP615054	SURVEY	SUBDIVISION
DP726654	COMPILATION	CROWN FOLIO CREATION
DP755740	COMPILATION	CROWN ADMIN NO.
DP803197	SURVEY	SUBDIVISION
DP812023	SURVEY	SUBDIVISION
DP825038	SURVEY	SUBDIVISION
DP834646	SURVEY	SUBDIVISION
DP837715	SURVEY	SUBDIVISION
DP855362	SURVEY	SUBDIVISION
DP860569	SURVEY	SUBDIVISION
DP1058619	COMPILATION	DEPARTMENTAL
DP1092051	SURVEY	ROADS ACT, 1993
DP1093704	SURVEY	REDEFINITION
DP1093882	SURVEY	ROADS ACT, 1993
DP1094312	SURVEY	REDEFINITION
DP1113328	COMPILATION	DEPARTMENTAL
DP1113336	COMPILATION	DEPARTMENTAL
DP1113622	COMPILATION	DEPARTMENTAL
DP1113872	COMPILATION	DEPARTMENTAL
DP1113873	COMPILATION	DEPARTMENTAL
DP1113881	COMPILATION	DEPARTMENTAL
DP1120061	SURVEY	ROADS ACT, 1993
DP1120987	COMPILATION	CROWN LAND CONVERSION
DP1120989	COMPILATION	CROWN LAND CONVERSION
DP1127593	SURVEY	ROADS ACT, 1993
SP32100	COMPILATION	STRATA PLAN
SP35574	COMPILATION	STRATA PLAN
SP41028	COMPILATION	STRATA PLAN
SP41154	COMPILATION	STRATA PLAN
SP42079	COMPILATION	STRATA PLAN
SP43809	COMPILATION	STRATA PLAN
SP44469	COMPILATION	STRATA PLAN
SP44854	COMPILATION	STRATA PLAN
SP47097	COMPILATION	STRATA PLAN
SP48196	COMPILATION	STRATA PLAN
SP48761	COMPILATION	STRATA PLAN
SP49808	COMPILATION	STRATA PLAN
SP53129	COMPILATION	STRATA PLAN
SP53925	COMPILATION	STRATA PLAN
SP58390	COMPILATION	STRATA PLAN
SP77115	COMPILATION	STRATA PLAN
SP77153	COMPILATION	STRATA PLAN

DP1120061

PLAN FORM 2 (A2) WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION ePlan Sheet 1 of 4 sheets



M.G.A.

SURVEYING REGULATION 2006: CLAUSE 7(1)(b) AND 6(2)						
M.G.A CO-ORDINATES						
MARK	EASTING	NORTHING	CLASS	ORDER	METHOD	ORIGIN
PM 41232	551069·070	6882533·330	B	2	FROM SCIMS	SCIMS
PM 41246	551306·418	6882033·024	A	1	FROM SCIMS	SCIMS
SSM 99034	551331·438	6882253·744	B	2	FROM SCIMS	SCIMS
PM 152210	549084·875	6884447·560	D	N/A	CADASTRAL TRAVERSE	PLACED
PM 152211	549298·397	6883997·596	D	N/A	CADASTRAL TRAVERSE	PLACED
PM 152212	549627·404	6883627·248	D	N/A	CADASTRAL TRAVERSE	PLACED
PM 152213	550183·356	6883355·559	D	N/A	CADASTRAL TRAVERSE	PLACED
PM 152214	550328·744	6883148·393	D	N/A	CADASTRAL TRAVERSE	PLACED
SOURCE: M.G.A CO-ORDS ADOPTED FROM SCIMS 14-9-2007						
COMBINED SCALE FACTOR 0.999632 ZONE 56						

LOTS 100, 101 & 102

LOT 2 DP535537 - C.T.2/535537

CONNECTIONS

PM 41232 - SSM 99034
136°49'11" ~ 387·54 ME
136°49'11" ~ 387·554 MGA GROUND

SSM 99034 - PM 41246
186°28'06" ~ 222·22 ME
186°28'02" ~ 222·215 MGA GROUND

PM 41246 - PM 41232
334°37'16" ~ 553·944 ME
334°37'12" ~ 553·955 MGA GROUND

NOTES

THIS PLAN IS A STRATUM PLAN.

LOTS 100, 101 AND 102 ARE LIMITED IN HEIGHT AND DEPTH IN ACCORDANCE WITH THE FOLLOWING PLANS AND SECTIONS.

LEVELS ARE AUSTRALIAN HEIGHT DATUM
ORIGIN OF LEVELS: PM 41245 R.L.1·305 A.H.D.

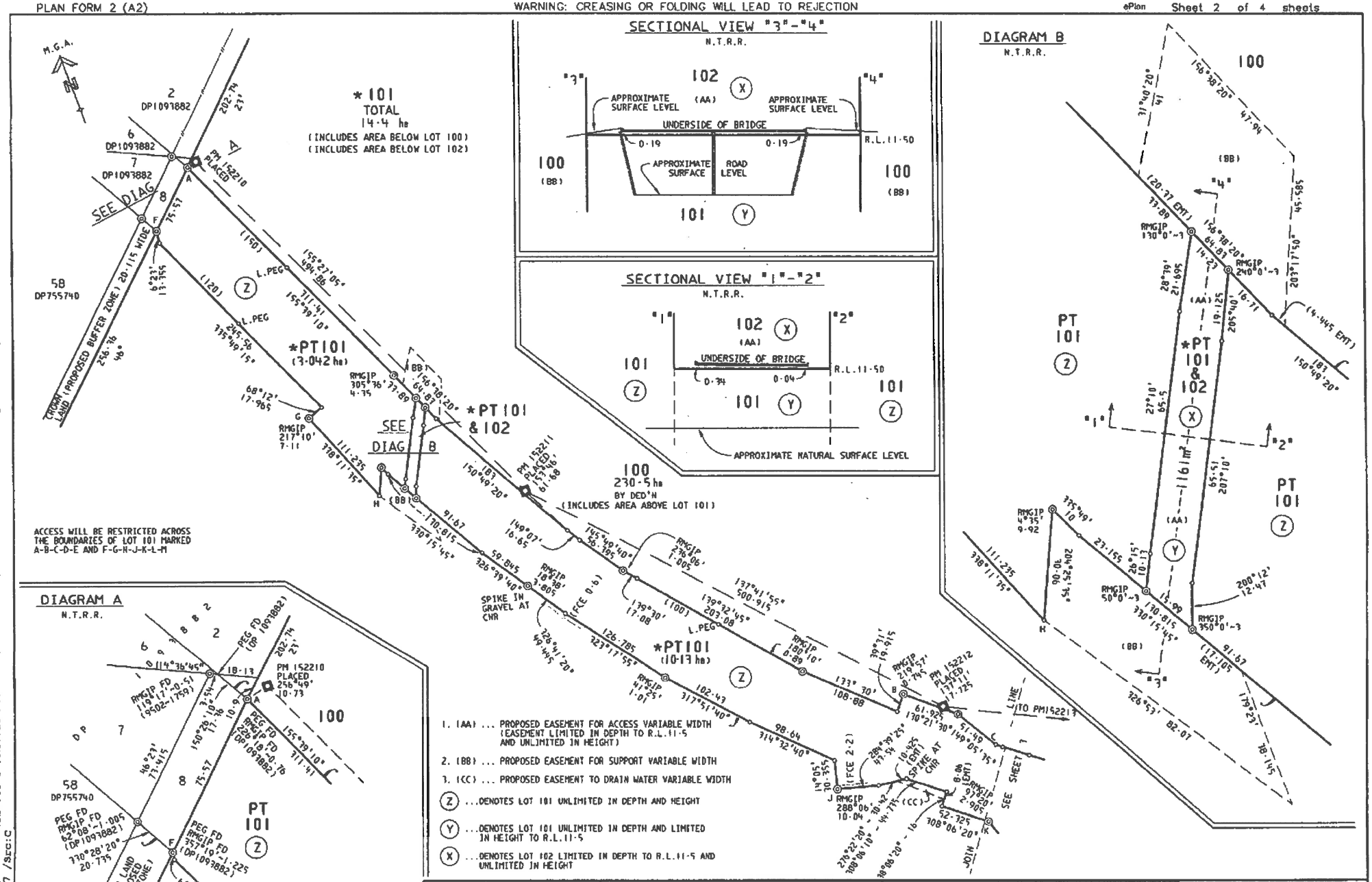
ACCESS WILL BE RESTRICTED ACROSS THE BOUNDARIES OF LOT 101 MARKED A-B-C-D-E AND F-G-H-J-K-L-M

Surveyor: BRIAN DARRYL RAAEN Date of Survey: 12/09/2007 Surveyor's Ref: T15315 / 16277C	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993	LGA: TWEED SHIRE Locality: TWEED HEADS WEST Subdivision No: Lengths are in metres. Reduction Ratio 1: 7000	Registered 22.11.2007	DP1120061

RTA FILE: 10/438.11077 RTA PLAN: 0010 438 SS 4046

Req:R163159 /Doc:DP 1120061 P /Rev:26-Nov-2007 /Sts:SG.OK /Prt:22-Feb-2010 09:46 /Pgs:ALL /Seq:1 of 6
Ref:266276857 /Src:C

PLAN FORM 2 (A2) WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION DP1120061 ePlan Sheet 2 of 4 sheets

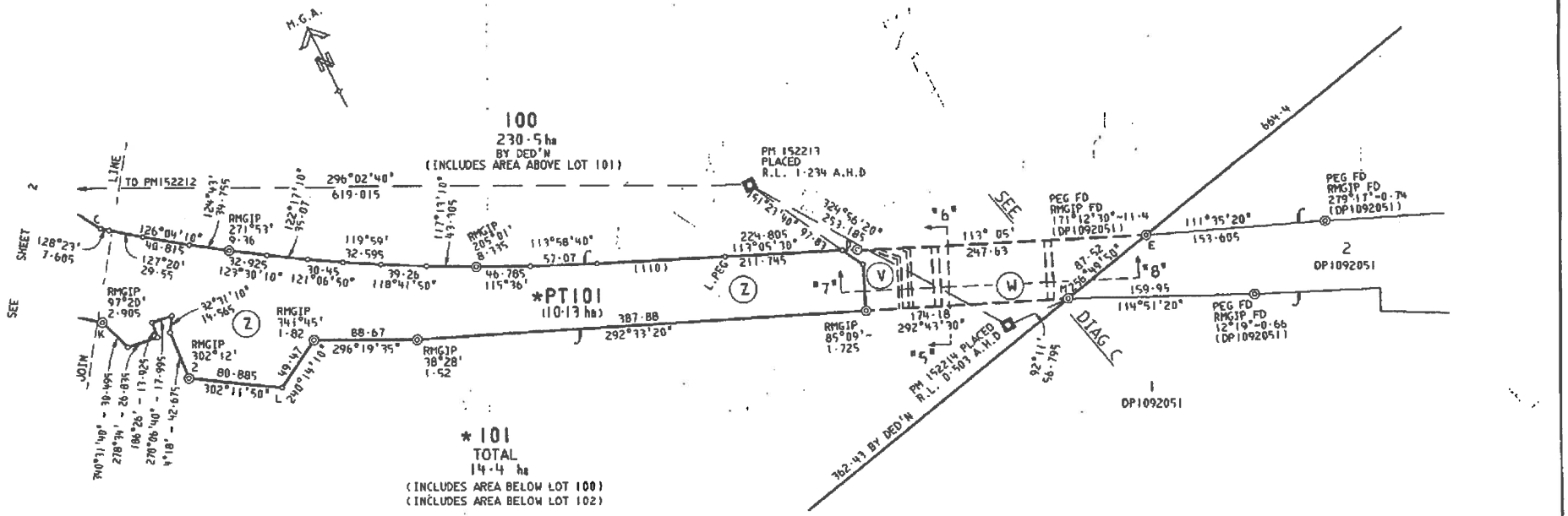


Surveyor: BRIAN DARRYL RAAEN Date of Survey: 12/09/2007 Surveyor's Ref: T15315 / 16277C	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993	LGA: TWEED SHIRE Locality: TWEED HEADS WEST Subdivision No: Lengths are in metres. Reduction Ratio 1: 2500	Registered 22.11.2007	DP1120061

RTA FILE: 10/438.11077 RTA PLAN: 0010 438 SS 4046

Rqq:R163159 /Doc:DP 1120061 P /Rev:26-Nov-2007 /Sts:SC.OK /Prt:22-Feb-2010 09:46 /Pgs:ALL /Seq:2 of 6
Ref:266276857 /Src:C

FOR DIAGRAM C
SEE SHEET 4



ACCESS WILL BE RESTRICTED ACROSS THE BOUNDARIES OF LOT 101 MARKED A-B-C-D-E AND F-G-H-J-K-L-M

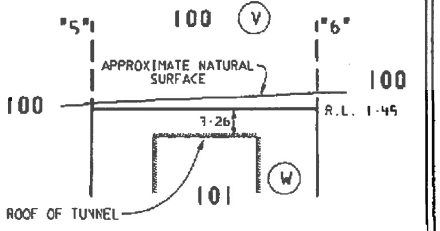
THE LEVELS AT THE CORNERS OF THE PLANE ARE SHOWN BOXED

(Z) ...DENOTES LOT 101 UNLIMITED IN DEPTH AND HEIGHT

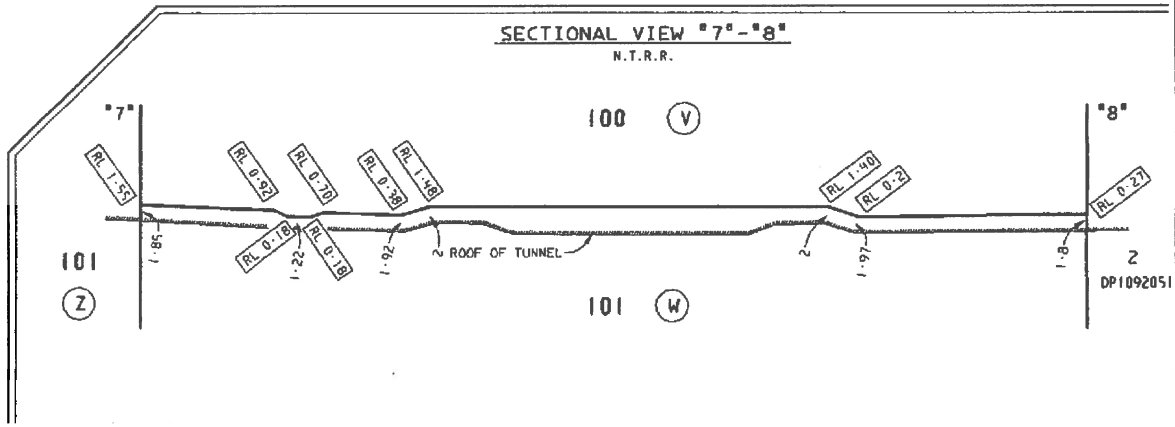
(W) ...DENOTES LOT 101 BEING THE STRATUM LYING BELOW LOT 100 AND IS UNLIMITED IN DEPTH AND LIMITED IN HEIGHT BY THE NOTED LEVEL PLANE AND BY REGULAR SLOPING PLANES FORMED BY THE DIMENSIONS AND/OR DIMENSIONED TRIANGLES.

(V) ...DENOTES LOT 100 AS SHOWN BEING LIMITED IN DEPTH BY THE NOTED LEVEL PLANE AND BY REGULAR SLOPING PLANES FORMED BY THE DIMENSIONS AND/OR DIMENSIONED TRIANGLES AND IS UNLIMITED IN HEIGHT

SECTIONAL VIEW "5"-"6"
N.T.R.R.



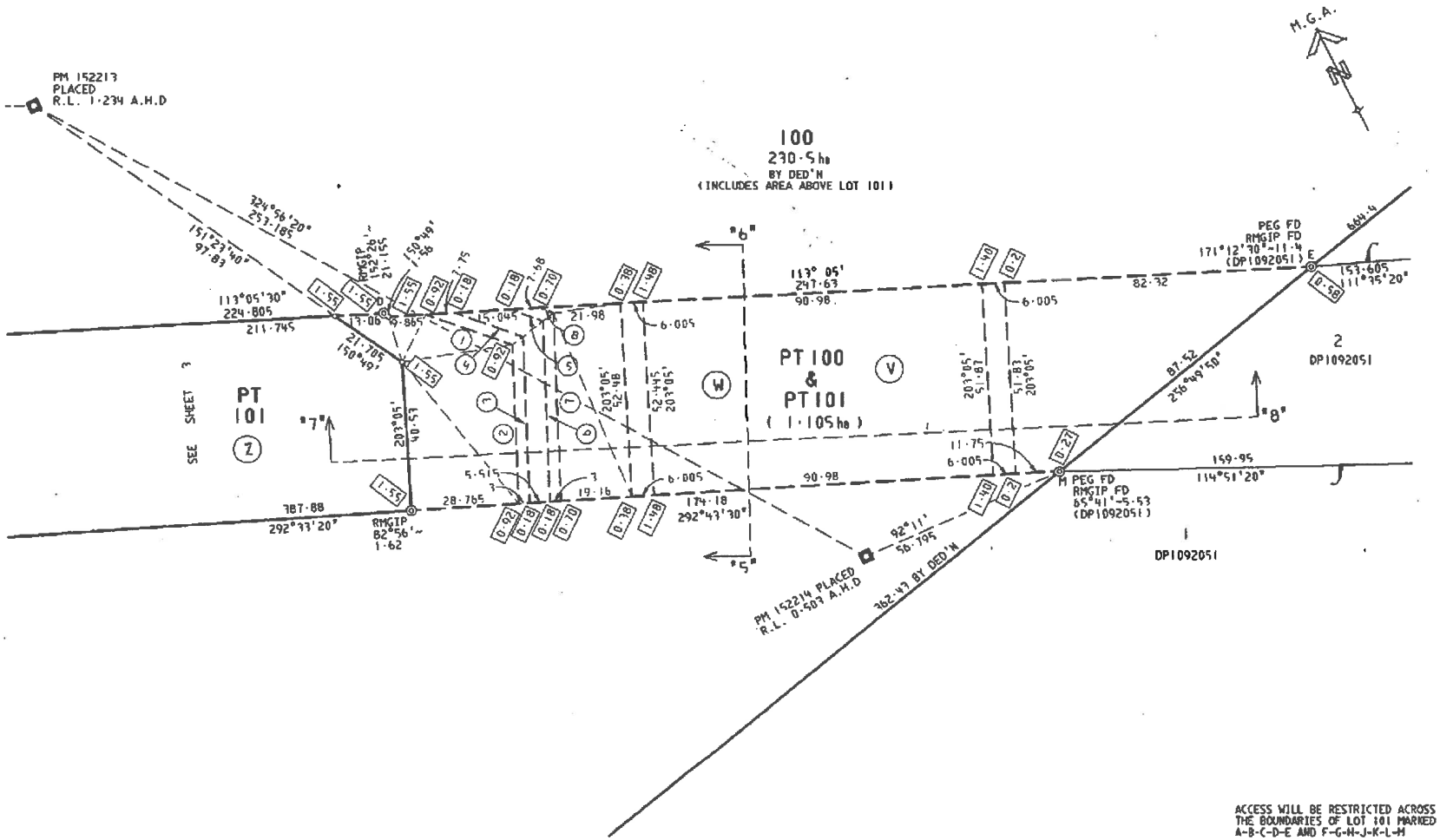
SECTIONAL VIEW "7"-"8"
N.T.R.R.



Surveyor: BRIAN DARRYL RAAEN Date of Survey: 12/09/2007 Surveyor's Ref: T15315 / 16277C	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993	LGA: TWEED SHIRE Locality: TWEED HEADS WEST Subdivision No: Lengths are in metres. Reduction Ratio 1: 2500	Registered 22.11.2007	DP1120061

RTA FILE: 10/438.11077 RTA PLAN: D010 438 SS 4046

DIAGRAM C



ACCESS WILL BE RESTRICTED ACROSS THE BOUNDARIES OF LOT 101 MARKED A-B-C-D-E AND F-G-H-J-K-L-M

THE LEVELS AT THE CORNERS OF THE PLANE ARE SHOWN BOXED ☐

(Z) ...DENOTES LOT 101 UNLIMITED IN DEPTH AND HEIGHT

(W) ...DENOTES LOT 101 BEING THE STRATUM LYING BELOW LOT 100 AND IS UNLIMITED IN DEPTH AND LIMITED IN HEIGHT BY THE NOTED LEVEL PLANE AND BY REGULAR SLOPING PLANES FORMED BY THE DIMENSIONS AND/OR DIMENSIONED TRIANGLES.

(V) ...DENOTES LOT 100 AS SHOWN BEING LIMITED IN DEPTH BY THE NOTED LEVEL PLANE AND BY REGULAR SLOPING PLANES FORMED BY THE DIMENSIONS AND/OR DIMENSIONED TRIANGLES AND IS UNLIMITED IN HEIGHT

FOR SECTIONAL VIEWS
SEE SHEET 3

SHORT LINES		
NO.	BEARING.	DIST.
1	135°51'40"	24·565
2	204°14'	43·17
3	24°14'	45·13
4	315°51'40"	19·455
5	316°04'	9·27
6	24°17'20"	49·01
7	24°17'20"	50·96
8	316°04'	4·23

Surveyor: BRIAN DARRYL RAAEN Date of Survey: 12/09/2007 Surveyor:	PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993	LGA: TWEED SHIRE Locality: TWEED HEADS WEST Subdivision No: T15315 / 16277C Lengths are in metres. Reduction Ratio 1: 800	Registered 22.11.2007	DP1120061

RTA FILE: 10/438.11077 RTA PLAN: 0010 438 SS 4046

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

LOT 101 IS REQUIRED FOR FREEWAY UNDER SECTION 48 OF THE ROADS ACT 1993.

LOT 102 IS TO BE ACQUIRED BY THE ROADS AND TRAFFIC AUTHORITY FOR ROAD PURPOSES.

ACCESS WILL BE RESTRICTED ACROSS THE BOUNDARIES OF LOT 101 MARKED A-B-C-D-E AND F-G-H-J-K-L-M.

*

DP1120061

Registered: 22.11.2007 *

Title System: TORRENS

Purpose: ROADS ACT 1993

PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993

* OFFICE USE ONLY

LGA:	**TWEED SHIRE**
Locality:	**TWEED HEADS WEST**
Parish:	**TERRANORA**
County:	**ROUS**

Use PLAN FORM 6A
for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

I.....In approving this plan certify
(Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown herein have been given.

Signature:.....
Date:.....
File Number:.....
Office:.....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed..... set out herein
(insert 'subdivision' or 'new road')

.....
* Authorised Person/General Manager/Accredited Certifier

Consent Authority: .....
Date of Endorsement: .....
Accreditation no: .....
Subdivision Certificate no: .....
File no: .....

* Delete whichever is inapplicable.

Surveying Regulation, 2006

I, .BRIAN DARRYL RAAEN.....
of B & P SURVEYS, PO BOX 327
TWEED HEADS NSW 2485.....
a surveyor registered under the *Surveying Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying Regulation, 2006* and was completed on:...12-09-2007.....
The survey relates to ...Part Lot 100 and Lots 101, 102 and Connections.....
.....
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature B. Raaen *Dated:* 27/9/07
Surveyor registered under the Surveying Act, 2002

Datum Line: PM41232 – SSM99034.....
Type: ~~Urban/Rural~~

Plans used in the preparation of survey/~~compilation~~

DP 1092051
DP 1093882
DP 535537
DP 854935

(If insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE: T15315 / 16277C

RTA FILE: 10/438.11077 RTA PLAN: 0010 438 SS 4046

DEPOSITED PLAN ADMINISTRATION SHEET Sheet 2 of 2 sheet(s)

PLAN OF LAND TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993

* DP1120061

* **Registered:** 22.11.2007

* OFFICE USE ONLY

Subdivision Certificate No: Date of Endorsement:

THIS PLAN IS EXEMPT FROM SUBDIVISION CERTIFICATION PURSUANT TO A DECISION BETWEEN DUAP, RTA AND LPI NSW - SEE 1997 M6 (Item 2) LAND IN THIS PLAN COMPRISES ONLY ROAD OR ROAD AND RESIDUE

Anthony Bamford 23/10/2007
(Authorised Officer, RTA NSW)

APPROVED:

MANAGER PROPERTY SERVICES
NORTHERN REGION OPERATIONS AND SERVICES
ROADS AND TRAFFIC AUTHORITY, N.S.W.

SURVEYOR'S REFERENCE: T15315 / 16277C

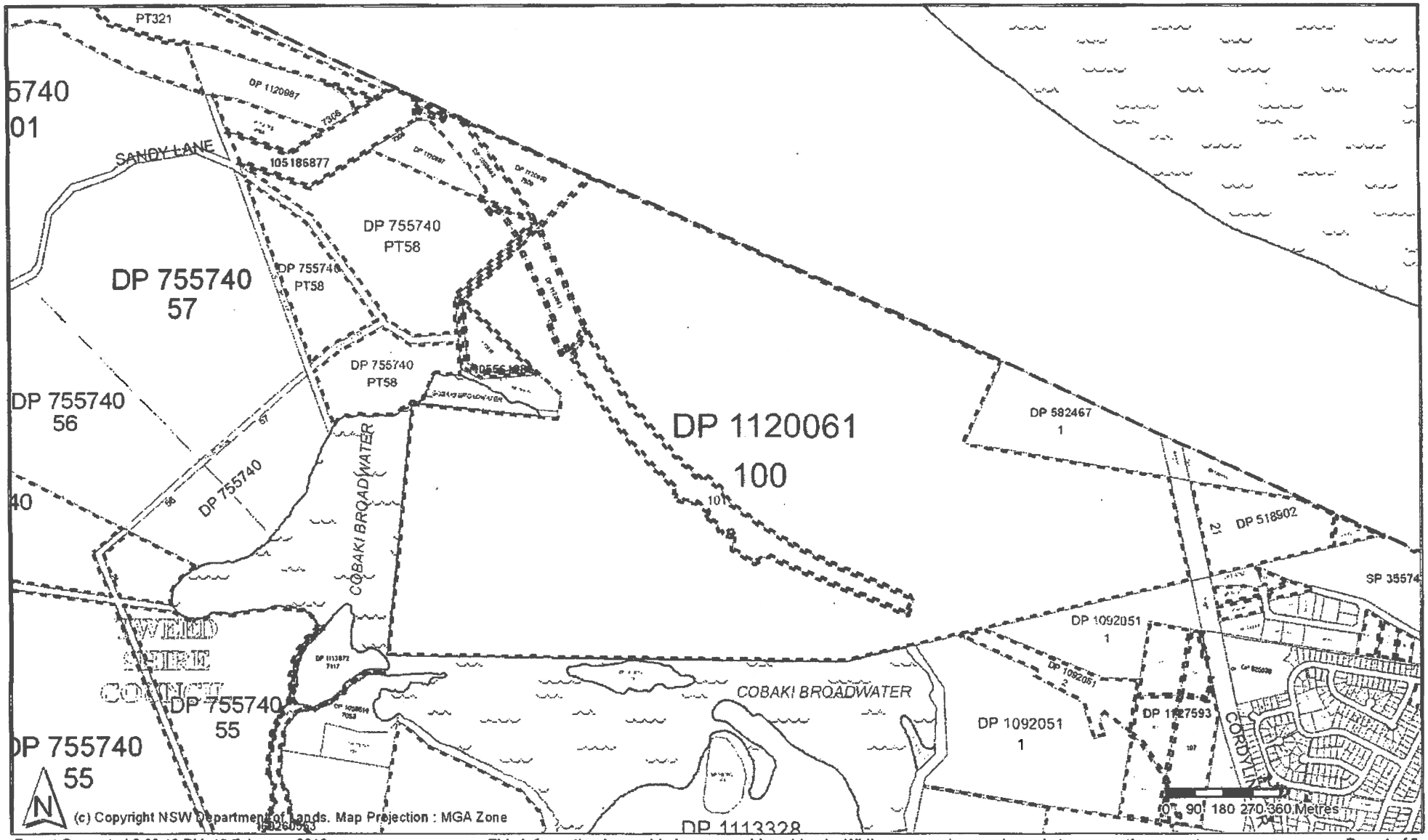
RTA FILE: 10/438.11077 RTA PLAN: 0010 438 SS 4046

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 101 DP 1120061 **Identified Parcel** : Lot 101 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS



Report Generated 6:03:13 PM, 18 February, 2010

	Status	Surv/Comp	Purpose
DP518902			
Lot(s): 21			
DP266190	REGISTERED	COMPILATION	EASEMENT
DP535537			
Lot(s): 1			
CA118368 - LOT 1 DP535537			
DP726654			
Lot(s): 710			
EX SUR 2004/27 - DP1075400. PART OF NORTH-WESTERN BOUNDARY OF LOT 710 DP726654. (NSW/QLD BORDER)			
DP755740			
Lot(s): 54, 55			
DP1051024	REGISTERED	SURVEY	EASEMENT
Lot(s): 58, 321			
DP1093882	REGISTERED	SURVEY	ROADS ACT, 1993
DP837715			
Lot(s): 3			
DP1017336	REGISTERED	SURVEY	SUBDIVISION
DP1011625			
Lot(s): 1			
DP607299	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1092051			
Lot(s): 2			
PA82104 - LOT 2 DP1092051			
NSW GAZ 31-03-2006 Folio : 1741			
Acquired for the Purposes of the Roads Act,1993 LOT 2 DP1092051			
DP1093704			
Lot(s): 670			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093882			
Lot(s): 4, 5, 6, 7			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ 10-02-2006 Folio : 771			
Reservation Of Crown Land Reserve No. 1011248 AND GAZ. 17.2.2006 FOL. 841 - ALSO SEE GAZ. 10.2.2006 FOL. 771			
NSW GAZ 26-05-2006 Folio : 3204			
Acquired for the Purposes of the Roads Act,1993 LOTS 4-8 DP1093882			
DP1094312			
Lot(s): 666			
DP610969	HISTORICAL	COMPILATION	SUBDIVISION
DP1102377			
Lot(s): 7			
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1114577			
Lot(s): 7			
DP259282	HISTORICAL	SURVEY	SUBDIVISION
DP1120061			
Lot(s): 100, 101, 102			
DP535537	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1120987			
Lot(s): 7307			
DP1119883	REGISTERED	COMPILATION	CROWN LAND CONVERSION
DP1120989			
Lot(s): 7300			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ 10-02-2006 Folio : 771			
Reservation Of Crown Land Reserve No. 1011248 AND GAZ. 17.2.2006 FOL. 841 - ALSO SEE GAZ. 10.2.2006 FOL. 771			
DP1121137			
Lot(s): 9			
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1102377	REGISTERED	SURVEY	SUBDIVISION

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 101 DP 1120061 **Identified Parcel** : Lot 101 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

	Status	Surv/Comp	Purpose
DP1127593			
Lot(s): 105, 106, 107, 108			
DP226067	HISTORICAL	SURVEY	ROAD OR MOTORWAY
Lot(s): 103, 104			
DP8655	HISTORICAL	SURVEY	UNRESEARCHED
SP47806			
DP266190	REGISTERED	COMPILATION	EASEMENT
SP60680			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
SP62509			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
SP63667			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
SP67145			
DP790029	HISTORICAL	SURVEY	SUBDIVISION
SP77115			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1094312	REGISTERED	SURVEY	REDEFINITION
SP77153			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093704	REGISTERED	SURVEY	REDEFINITION
SP80033			
DP822879	HISTORICAL	COMPILATION	CROWN FOLIO CREATION
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1102377	REGISTERED	SURVEY	SUBDIVISION
DP1121137	REGISTERED	SURVEY	SUBDIVISION
SP80305			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
Road			
Polygon Id(s): 105186877			
PA82135 (LOTS 4-8 DP1093882)			
Polygon Id(s): 105561283			
DP1143758	REGISTERED	SURVEY	SURVEY.INFORMATION ONLY
NSW GAZ 26-05-2006			Folio : 3204
Acquired for the Purposes of the Roads Act,1993			
LOTS 4-8 DP1093882			
Water Feature			
Polygon Id(s): 160260553			
NSW GAZ 29-02-2008			Folio : 1394
Acquired for Council Purposes			
LOT 1 DP1104678			

Caution: For all **ACTIVITY PRIOR to SEPT 2002** you must refer to the RGs Charting and Reference Maps.

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 101 DP 1120061 **Identified Parcel** : Lot 101 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

Plan	Surv/Comp	Purpose
DP23726	SURVEY	UNRESEARCHED
DP25241	SURVEY	UNRESEARCHED
DP30600	SURVEY	UNRESEARCHED
DP92695	COMPILATION	DEPARTMENTAL
DP226067	SURVEY	ROAD OR MOTORWAY
DP243479	SURVEY	SUBDIVISION
DP244220	SURVEY	SUBDIVISION
DP246488	SURVEY	SUBDIVISION
DP248924	SURVEY	SUBDIVISION
DP259282	SURVEY	SUBDIVISION
DP261249	SURVEY	SUBDIVISION
DP261250	SURVEY	SUBDIVISION
DP262417	SURVEY	SUBDIVISION
DP412404	SURVEY	UNRESEARCHED
DP518902	SURVEY	SUBDIVISION
DP529871	COMPILATION	SUBDIVISION
DP535537	SURVEY	RESUMPTION OR ACQUISITION
DP569304	SURVEY	SUBDIVISION
DP582467	SURVEY	OLD SYSTEM CONVERSION
DP588564	SURVEY	SUBDIVISION
DP603333	SURVEY	SUBDIVISION
DP615054	SURVEY	SUBDIVISION
DP617065	COMPILATION	SUBDIVISION
DP716288	SURVEY	SUBDIVISION
DP716289	SURVEY	SUBDIVISION
DP716290	SURVEY	SUBDIVISION
DP716291	SURVEY	SUBDIVISION
DP716292	SURVEY	SUBDIVISION
DP726654	COMPILATION	CROWN FOLIO CREATION
DP755740	COMPILATION	CROWN ADMIN NO.
DP774945	COMPILATION	SUBDIVISION
DP788912	COMPILATION	SUBDIVISION
DP790029	SURVEY	SUBDIVISION
DP801161	SURVEY	SUBDIVISION
DP803197	SURVEY	SUBDIVISION
DP812023	SURVEY	SUBDIVISION
DP819023	SURVEY	SUBDIVISION
DP825038	SURVEY	SUBDIVISION
DP828025	SURVEY	SUBDIVISION
DP834646	SURVEY	SUBDIVISION
DP837715	SURVEY	SUBDIVISION
DP841037	SURVEY	SUBDIVISION
DP842123	SURVEY	SUBDIVISION
DP855362	SURVEY	SUBDIVISION
DP856966	SURVEY	SUBDIVISION
DP860569	SURVEY	SUBDIVISION
DP866281	SURVEY	SUBDIVISION
DP866375	COMPILATION	CONSOLIDATION
DP1011625	SURVEY	SUBDIVISION
DP1058619	COMPILATION	DEPARTMENTAL
DP1084319	SURVEY	ROADS ACT, 1993
DP1092051	SURVEY	ROADS ACT, 1993
DP1093704	SURVEY	REDEFINITION
DP1093882	SURVEY	ROADS ACT, 1993
DP1094312	SURVEY	REDEFINITION
DP1102377	SURVEY	SUBDIVISION
DP1113328	COMPILATION	DEPARTMENTAL
DP1113336	COMPILATION	DEPARTMENTAL
DP1113622	COMPILATION	DEPARTMENTAL
DP1113872	COMPILATION	DEPARTMENTAL
DP1113873	COMPILATION	DEPARTMENTAL
DP1113881	COMPILATION	DEPARTMENTAL
DP1114577	COMPILATION	CONSOLIDATION
DP1120061	SURVEY	ROADS ACT, 1993
DP1120987	COMPILATION	CROWN LAND CONVERSION
DP1120989	COMPILATION	CROWN LAND CONVERSION
DP1121137	SURVEY	SUBDIVISION
DP1127593	SURVEY	ROADS ACT, 1993
SP13748	COMPILATION	STRATA PLAN

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 101 DP 1120061 **Identified Parcel** : Lot 101 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

Plan	Surv/Comp	Purpose
SP14160	COMPILATION	STRATA PLAN
SP15972	COMPILATION	STRATA PLAN
SP15973	COMPILATION	STRATA PLAN
SP15974	COMPILATION	STRATA PLAN
SP16260	COMPILATION	STRATA PLAN
SP16276	COMPILATION	STRATA PLAN
SP16693	COMPILATION	STRATA PLAN
SP17274	COMPILATION	STRATA PLAN
SP18206	COMPILATION	STRATA PLAN
SP18314	COMPILATION	STRATA PLAN
SP18383	COMPILATION	STRATA PLAN
SP18510	COMPILATION	STRATA PLAN
SP18532	COMPILATION	STRATA PLAN
SP18542	COMPILATION	STRATA PLAN
SP19142	COMPILATION	STRATA PLAN
SP19148	COMPILATION	STRATA PLAN
SP19363	COMPILATION	STRATA PLAN
SP19365	COMPILATION	STRATA PLAN
SP19492	COMPILATION	STRATA PLAN
SP19564	COMPILATION	STRATA PLAN
SP19799	COMPILATION	STRATA PLAN
SP19826	COMPILATION	STRATA PLAN
SP19852	COMPILATION	STRATA PLAN
SP19930	COMPILATION	STRATA PLAN
SP20022	COMPILATION	STRATA PLAN
SP20040	COMPILATION	STRATA PLAN
SP20124	COMPILATION	STRATA PLAN
SP20207	COMPILATION	STRATA PLAN
SP20389	COMPILATION	STRATA PLAN
SP20446	COMPILATION	STRATA PLAN
SP20485	COMPILATION	STRATA PLAN
SP21130	COMPILATION	STRATA PLAN
SP21465	COMPILATION	STRATA PLAN
SP21708	COMPILATION	STRATA PLAN
SP21874	COMPILATION	STRATA PLAN
SP21875	COMPILATION	STRATA PLAN
SP21964	COMPILATION	STRATA PLAN
SP30613	COMPILATION	STRATA PLAN
SP30637	COMPILATION	STRATA PLAN
SP31689	COMPILATION	STRATA PLAN
SP31897	COMPILATION	STRATA PLAN
SP31992	COMPILATION	STRATA PLAN
SP32028	COMPILATION	STRATA PLAN
SP32100	COMPILATION	STRATA PLAN
SP32113	COMPILATION	STRATA PLAN
SP32203	COMPILATION	STRATA PLAN
SP32289	COMPILATION	STRATA PLAN
SP32794	COMPILATION	STRATA PLAN
SP33714	COMPILATION	STRATA PLAN
SP35574	COMPILATION	STRATA PLAN
SP35809	COMPILATION	STRATA PLAN
SP36263	COMPILATION	STRATA PLAN
SP36298	COMPILATION	STRATA PLAN
SP37030	COMPILATION	STRATA PLAN
SP37876	COMPILATION	STRATA PLAN
SP37923	COMPILATION	STRATA PLAN
SP38152	COMPILATION	STRATA PLAN
SP41028	COMPILATION	STRATA PLAN
SP41154	COMPILATION	STRATA PLAN
SP42079	COMPILATION	STRATA PLAN
SP43809	COMPILATION	STRATA PLAN
SP44089	COMPILATION	STRATA PLAN
SP44469	COMPILATION	STRATA PLAN
SP44800	COMPILATION	STRATA PLAN
SP44854	COMPILATION	STRATA PLAN
SP47097	COMPILATION	STRATA PLAN
SP47806	COMPILATION	STRATA PLAN
SP48196	COMPILATION	STRATA PLAN
SP48761	COMPILATION	STRATA PLAN

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 101 DP 1120061 **Identified Parcel** : Lot 101 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

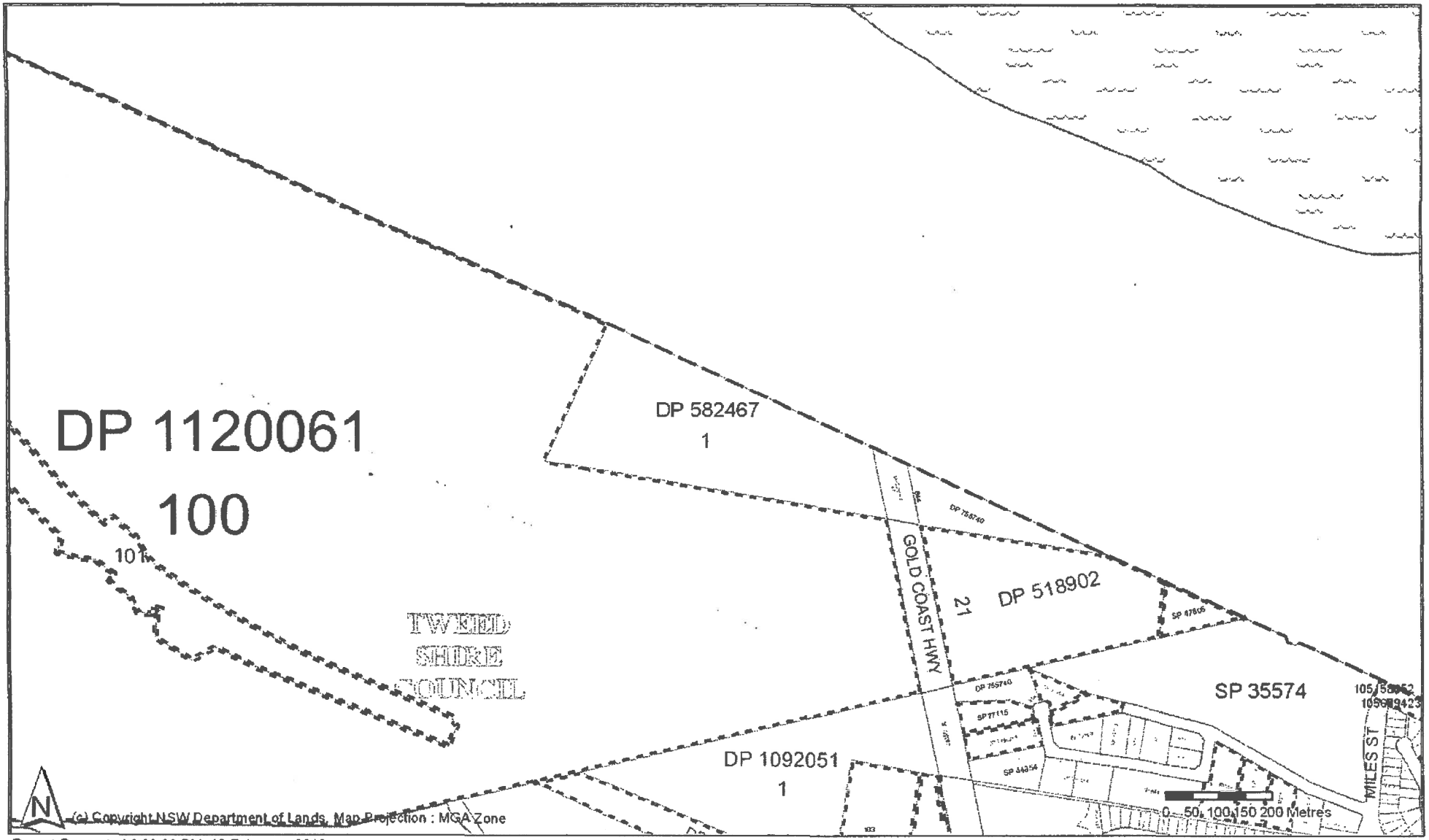
Plan	Surv/Comp	Purpose
SP49532	COMPILATION	STRATA PLAN
SP49808	COMPILATION	STRATA PLAN
SP50367	COMPILATION	STRATA PLAN
SP51452	COMPILATION	STRATA PLAN
SP53129	COMPILATION	STRATA PLAN
SP53925	COMPILATION	STRATA PLAN
SP58390	COMPILATION	STRATA PLAN
SP60680	COMPILATION	STRATA PLAN
SP62509	COMPILATION	STRATA PLAN
SP63667	COMPILATION	STRATA PLAN
SP67145	COMPILATION	STRATA PLAN
SP77115	COMPILATION	STRATA PLAN
SP77153	COMPILATION	STRATA PLAN
SP80033	COMPILATION	STRATA PLAN
SP80305	COMPILATION	STRATA PLAN

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 1 DP 582467 **Identified Parcel** : Lot 1 DP 582467

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS



Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 1 DP 582467 **Identified Parcel** : Lot 1 DP 582467

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

	Status	Surv/Comp	Purpose
DP31369			
Lot(s): 50			
DP268339	REGISTERED	COMPILATION	EASEMENT
DP518902			
Lot(s): 21			
DP266190	REGISTERED	COMPILATION	EASEMENT
DP1092051			
Lot(s): 2			
PA82104 - LOT 2 DP1092051			
NSW GAZ 31-03-2006			Folio : 1741
Acquired for the Purposes of the Roads Act,1993 LOT 2 DP1092051			
DP1093704			
Lot(s): 670			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1094312			
Lot(s): 666			
DP610969	HISTORICAL	COMPILATION	SUBDIVISION
DP1102377			
Lot(s): 7			
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1120061			
Lot(s): 100, 101			
DP535537	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1121137			
Lot(s): 9			
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1102377	REGISTERED	SURVEY	SUBDIVISION
DP1127593			
Lot(s): 105, 108			
DP226067	HISTORICAL	SURVEY	ROAD OR MOTORWAY
Lot(s): 103			
DP8655	HISTORICAL	SURVEY	UNRESEARCHED
SP47806			
DP266190	REGISTERED	COMPILATION	EASEMENT
SP77115			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1094312	REGISTERED	SURVEY	REDEFINITION
SP77153			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093704	REGISTERED	SURVEY	REDEFINITION
SP80033			
DP822879	HISTORICAL	COMPILATION	CROWN FOLIO CREATION
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1102377	REGISTERED	SURVEY	SUBDIVISION
DP1121137	REGISTERED	SURVEY	SUBDIVISION
Intersection			
Polygon Id(s): 105158652			
NSW GAZ 19-12-2003			Folio : 11467
TRANSFER OF CROWN ROAD TO TWEED SHIRE COUNCIL			
Road			
Polygon Id(s): 105659423			
NSW GAZ 19-12-2003			Folio : 11467
TRANSFER OF CROWN ROAD TO TWEED SHIRE COUNCIL			

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 1 DP 582467 **Identified Parcel** : Lot 1 DP 582467

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

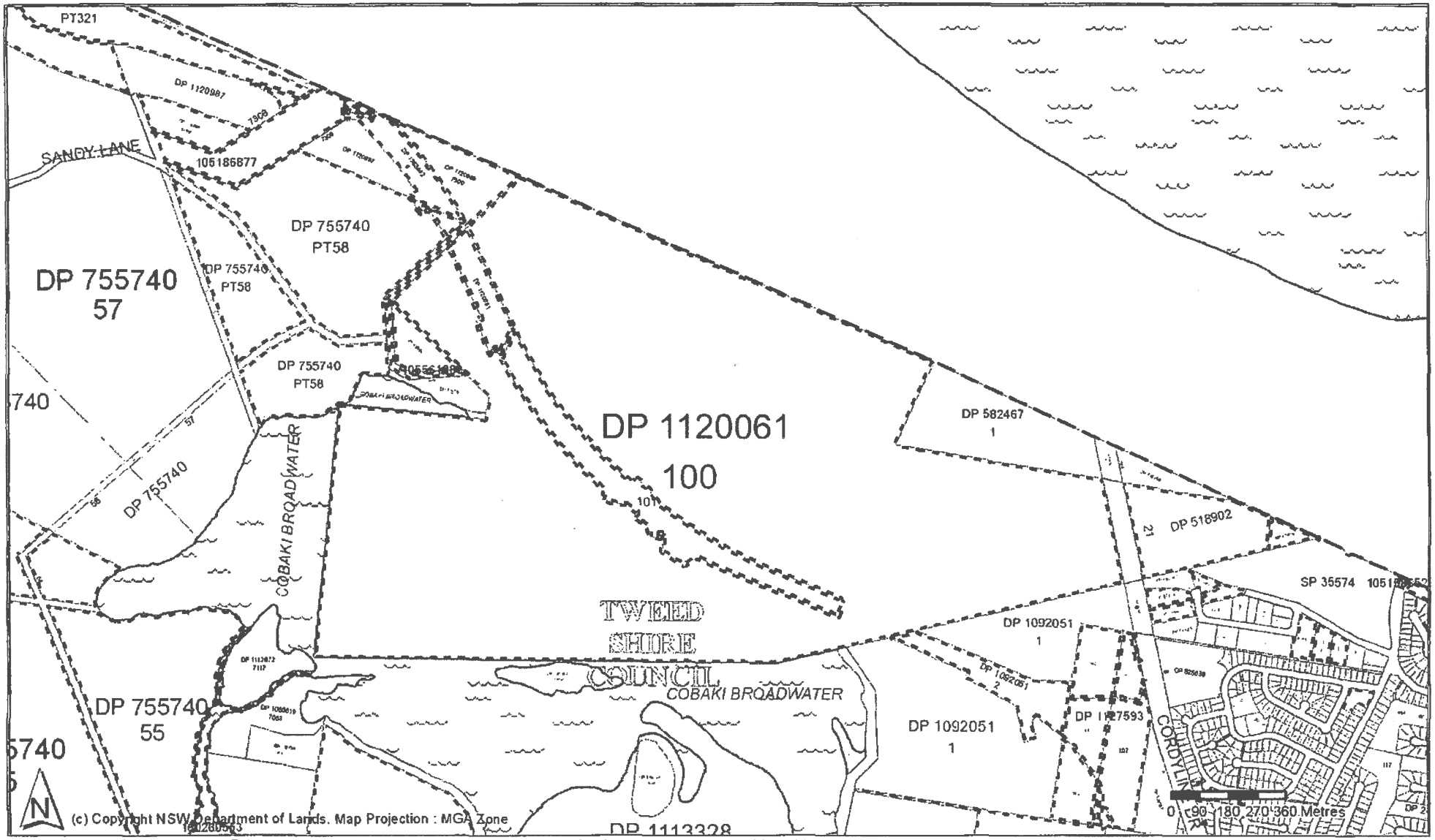
Plan	Surv/Comp	Purpose
DP31368	SURVEY	UNRESEARCHED
DP31369	SURVEY	UNRESEARCHED
DP226067	SURVEY	ROAD OR MOTORWAY
DP259282	SURVEY	SUBDIVISION
DP262417	SURVEY	SUBDIVISION
DP518902	SURVEY	SUBDIVISION
DP542273	SURVEY	SUBDIVISION
DP582467	SURVEY	OLD SYSTEM CONVERSION
DP603333	SURVEY	SUBDIVISION
DP615054	SURVEY	SUBDIVISION
DP755740	COMPILATION	CROWN ADMIN NO.
DP803197	SURVEY	SUBDIVISION
DP825038	SURVEY	SUBDIVISION
DP828025	SURVEY	SUBDIVISION
DP856966	SURVEY	SUBDIVISION
DP866375	COMPILATION	CONSOLIDATION
DP1092051	SURVEY	ROADS ACT, 1993
DP1093704	SURVEY	REDEFINITION
DP1094312	SURVEY	REDEFINITION
DP1102377	SURVEY	SUBDIVISION
DP1113873	COMPILATION	DEPARTMENTAL
DP1120061	SURVEY	ROADS ACT, 1993
DP1121137	SURVEY	SUBDIVISION
DP1127593	SURVEY	ROADS ACT, 1993
SP16693	COMPILATION	STRATA PLAN
SP18383	COMPILATION	STRATA PLAN
SP19852	COMPILATION	STRATA PLAN
SP19930	COMPILATION	STRATA PLAN
SP20207	COMPILATION	STRATA PLAN
SP20485	COMPILATION	STRATA PLAN
SP21130	COMPILATION	STRATA PLAN
SP21875	COMPILATION	STRATA PLAN
SP30378	COMPILATION	STRATA PLAN
SP31784	COMPILATION	STRATA PLAN
SP32100	COMPILATION	STRATA PLAN
SP35574	COMPILATION	STRATA PLAN
SP36263	COMPILATION	STRATA PLAN
SP38152	COMPILATION	STRATA PLAN
SP44854	COMPILATION	STRATA PLAN
SP47806	COMPILATION	STRATA PLAN
SP77115	COMPILATION	STRATA PLAN
SP77153	COMPILATION	STRATA PLAN
SP80033	COMPILATION	STRATA PLAN

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 100 DP 1120061 **Identified Parcel** : Lot 100 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS



Report Generated 6:02:45 PM, 18 February, 2010

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Cadastral Records Enquiry Report

Requested Parcel : Lot 100 DP 1120061 **Identified Parcel** : Lot 100 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

	Status	Surv/Comp	Purpose
DP31369			
Lot(s): 49, 50			
DP268339	REGISTERED	COMPILATION	EASEMENT
DP518902			
Lot(s): 21			
DP266190	REGISTERED	COMPILATION	EASEMENT
DP535537			
Lot(s): 1			
CA118368 - LOT 1 DP535537			
DP726654			
Lot(s): 710			
EX SUR 2004/27 - DP1075400. PART OF NORTH-WESTERN BOUNDARY OF LOT 710 DP726654. (NSW/QLD BORDER)			
DP755740			
Lot(s): 54, 55			
DP1051024	REGISTERED	SURVEY	EASEMENT
Lot(s): 58, 321			
DP1093882	REGISTERED	SURVEY	ROADS ACT, 1993
DP837715			
Lot(s): 3			
DP1017336	REGISTERED	SURVEY	SUBDIVISION
P1011625			
Lot(s): 1			
DP607299	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1092051			
Lot(s): 2			
PA82104 - LOT 2 DP1092051			
NSW GAZ 31-03-2006 Folio : 1741			
Acquired for the Purposes of the Roads Act,1993 LOT 2 DP1092051			
DP1093704			
Lot(s): 670			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093882			
Lot(s): 4, 5, 6, 7			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ 10-02-2006 Folio : 771			
Reservation Of Crown Land Reserve No. 1011248 AND GAZ. 17.2.2006 FOL. 841 - ALSO SEE GAZ. 10.2.2006 FOL. 771			
NSW GAZ 26-05-2006 Folio : 3204			
Acquired for the Purposes of the Roads Act,1993 LOTS 4-8 DP1093882			
DP1094312			
t(s): 666			
DP610969	HISTORICAL	COMPILATION	SUBDIVISION
DP1102377			
Lot(s): 7			
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1114577			
Lot(s): 7			
DP259282	HISTORICAL	SURVEY	SUBDIVISION
DP1120061			
Lot(s): 100, 101, 102			
DP535537	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1120987			
Lot(s): 7307			
DP1119883	REGISTERED	COMPILATION	CROWN LAND CONVERSION
DP1120989			
Lot(s): 7300			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ 10-02-2006 Folio : 771			
Reservation Of Crown Land Reserve No. 1011248 AND GAZ. 17.2.2006 FOL. 841 - ALSO SEE GAZ. 10.2.2006 FOL. 771			

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 100 DP 1120061 **Identified Parcel** : Lot 100 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

	Status	Surv/Comp	Purpose
DP1121137			
Lot(s): 9			
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1102377	REGISTERED	SURVEY	SUBDIVISION
DP1127593			
Lot(s): 105, 106, 107, 108			
DP226067	HISTORICAL	SURVEY	ROAD OR MOTORWAY
Lot(s): 103, 104			
DP8655	HISTORICAL	SURVEY	UNRESEARCHED
SP47806			
DP266190	REGISTERED	COMPILATION	EASEMENT
SP60680			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
SP62509			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
SP63667			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
SP67145			
DP790029	HISTORICAL	SURVEY	SUBDIVISION
SP77115			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1094312	REGISTERED	SURVEY	REDEFINITION
SP77153			
DP755740	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1093704	REGISTERED	SURVEY	REDEFINITION
SP80033			
DP822879	HISTORICAL	COMPILATION	CROWN FOLIO CREATION
DP856966	HISTORICAL	SURVEY	SUBDIVISION
DP1102377	REGISTERED	SURVEY	SUBDIVISION
DP1121137	REGISTERED	SURVEY	SUBDIVISION
SP80305			
DP866281	HISTORICAL	SURVEY	SUBDIVISION
Intersection			
Polygon Id(s): 105158652			
NSW GAZ	19-12-2003		Folio : 11467
TRANSFER OF CROWN ROAD TO TWEED SHIRE COUNCIL			
Road			
Polygon Id(s): 105186877			
PA82135 (LOTS 4-8 DP1093882)			
Polygon Id(s): 105561283			
DP1143758	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
NSW GAZ	26-05-2006		Folio : 3204
Acquired for the Purposes of the Roads Act,1993			
LOTS 4-8 DP1093882			
Polygon Id(s): 105659423			
NSW GAZ	19-12-2003		Folio : 11467
TRANSFER OF CROWN ROAD TO TWEED SHIRE COUNCIL			
Water Feature			
Polygon Id(s): 160260553			
NSW GAZ	29-02-2008		Folio : 1394
Acquired for Council Purposes			
LOT 1 DP1104678			

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 100 DP 1120061 **Identified Parcel** : Lot 100 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

Plan	Surv/Comp	Purpose
DP25241	SURVEY	UNRESEARCHED
DP30600	SURVEY	UNRESEARCHED
DP31368	SURVEY	UNRESEARCHED
DP31369	SURVEY	UNRESEARCHED
DP92695	COMPILATION	DEPARTMENTAL
DP226067	SURVEY	ROAD OR MOTORWAY
DP243479	SURVEY	SUBDIVISION
DP244220	SURVEY	SUBDIVISION
DP246488	SURVEY	SUBDIVISION
DP246854	SURVEY	SUBDIVISION
DP248924	SURVEY	SUBDIVISION
DP249155	SURVEY	SUBDIVISION
DP251298	SURVEY	SUBDIVISION
DP253826	SURVEY	SUBDIVISION
DP253915	SURVEY	SUBDIVISION
DP259282	SURVEY	SUBDIVISION
DP261249	SURVEY	SUBDIVISION
DP261250	SURVEY	SUBDIVISION
DP262417	SURVEY	SUBDIVISION
DP412404	SURVEY	UNRESEARCHED
DP518902	SURVEY	SUBDIVISION
DP529871	COMPILATION	SUBDIVISION
DP535537	SURVEY	RESUMPTION OR ACQUISITION
DP542273	SURVEY	SUBDIVISION
DP569304	SURVEY	SUBDIVISION
DP582467	SURVEY	OLD SYSTEM CONVERSION
DP588564	SURVEY	SUBDIVISION
DP603333	SURVEY	SUBDIVISION
DP615054	SURVEY	SUBDIVISION
DP617065	COMPILATION	SUBDIVISION
DP716288	SURVEY	SUBDIVISION
DP716289	SURVEY	SUBDIVISION
DP716290	SURVEY	SUBDIVISION
DP716291	SURVEY	SUBDIVISION
DP716292	SURVEY	SUBDIVISION
DP726654	COMPILATION	CROWN FOLIO CREATION
DP755740	COMPILATION	CROWN ADMIN NO.
DP774945	COMPILATION	SUBDIVISION
DP788912	COMPILATION	SUBDIVISION
DP790029	SURVEY	SUBDIVISION
DP801161	SURVEY	SUBDIVISION
DP803197	SURVEY	SUBDIVISION
DP812023	SURVEY	SUBDIVISION
DP819023	SURVEY	SUBDIVISION
DP825038	SURVEY	SUBDIVISION
DP828025	SURVEY	SUBDIVISION
DP834646	SURVEY	SUBDIVISION
DP837715	SURVEY	SUBDIVISION
DP841037	SURVEY	SUBDIVISION
DP842123	SURVEY	SUBDIVISION
DP855362	SURVEY	SUBDIVISION
DP856966	SURVEY	SUBDIVISION
DP860569	SURVEY	SUBDIVISION
DP866281	SURVEY	SUBDIVISION
DP866375	COMPILATION	CONSOLIDATION
DP1011625	SURVEY	SUBDIVISION
DP1058619	COMPILATION	DEPARTMENTAL
DP1084319	SURVEY	ROADS ACT, 1993
DP1092051	SURVEY	ROADS ACT, 1993
DP1093704	SURVEY	REDEFINITION
DP1093882	SURVEY	ROADS ACT, 1993
DP1094312	SURVEY	REDEFINITION
DP1102377	SURVEY	SUBDIVISION
DP1113328	COMPILATION	DEPARTMENTAL
DP1113336	COMPILATION	DEPARTMENTAL
DP1113622	COMPILATION	DEPARTMENTAL
DP1113872	COMPILATION	DEPARTMENTAL
DP1113873	COMPILATION	DEPARTMENTAL
DP1113881	COMPILATION	DEPARTMENTAL

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 100 DP 1120061 **Identified Parcel** : Lot 100 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

Plan	Surv/Comp	Purpose
DP1114577	COMPILATION	CONSOLIDATION
DP1120061	SURVEY	ROADS ACT, 1993
DP1120987	COMPILATION	CROWN LAND CONVERSION
DP1120989	COMPILATION	CROWN LAND CONVERSION
DP1121137	SURVEY	SUBDIVISION
DP1127593	SURVEY	ROADS ACT, 1993
SP12774	COMPILATION	STRATA PLAN
SP13748	COMPILATION	STRATA PLAN
SP13806	COMPILATION	STRATA PLAN
SP14160	COMPILATION	STRATA PLAN
SP15419	COMPILATION	STRATA PLAN
SP15972	COMPILATION	STRATA PLAN
SP15973	COMPILATION	STRATA PLAN
SP15974	COMPILATION	STRATA PLAN
SP16017	COMPILATION	STRATA PLAN
SP16260	COMPILATION	STRATA PLAN
SP16276	COMPILATION	STRATA PLAN
SP16693	COMPILATION	STRATA PLAN
SP16747	COMPILATION	STRATA PLAN
SP17164	COMPILATION	STRATA PLAN
SP17274	COMPILATION	STRATA PLAN
SP17863	COMPILATION	STRATA PLAN
SP18044	COMPILATION	STRATA PLAN
SP18176	COMPILATION	STRATA PLAN
SP18206	COMPILATION	STRATA PLAN
SP18314	COMPILATION	STRATA PLAN
SP18383	COMPILATION	STRATA PLAN
SP18510	COMPILATION	STRATA PLAN
SP18532	COMPILATION	STRATA PLAN
SP18542	COMPILATION	STRATA PLAN
SP19114	COMPILATION	STRATA PLAN
SP19142	COMPILATION	STRATA PLAN
SP19148	COMPILATION	STRATA PLAN
SP19363	COMPILATION	STRATA PLAN
SP19365	COMPILATION	STRATA PLAN
SP19492	COMPILATION	STRATA PLAN
SP19564	COMPILATION	STRATA PLAN
SP19799	COMPILATION	STRATA PLAN
SP19826	COMPILATION	STRATA PLAN
SP19852	COMPILATION	STRATA PLAN
SP19930	COMPILATION	STRATA PLAN
SP20005	COMPILATION	STRATA PLAN
SP20022	COMPILATION	STRATA PLAN
SP20040	COMPILATION	STRATA PLAN
SP20124	COMPILATION	STRATA PLAN
SP20207	COMPILATION	STRATA PLAN
SP20389	COMPILATION	STRATA PLAN
SP20446	COMPILATION	STRATA PLAN
SP20485	COMPILATION	STRATA PLAN
SP21130	COMPILATION	STRATA PLAN
SP21465	COMPILATION	STRATA PLAN
SP21708	COMPILATION	STRATA PLAN
SP21874	COMPILATION	STRATA PLAN
SP21875	COMPILATION	STRATA PLAN
SP21964	COMPILATION	STRATA PLAN
SP30378	COMPILATION	STRATA PLAN
SP30613	COMPILATION	STRATA PLAN
SP30637	COMPILATION	STRATA PLAN
SP31689	COMPILATION	STRATA PLAN
SP31784	COMPILATION	STRATA PLAN
SP31897	COMPILATION	STRATA PLAN
SP31992	COMPILATION	STRATA PLAN
SP32028	COMPILATION	STRATA PLAN
SP32085	COMPILATION	STRATA PLAN
SP32100	COMPILATION	STRATA PLAN
SP32113	COMPILATION	STRATA PLAN
SP32203	COMPILATION	STRATA PLAN
SP32289	COMPILATION	STRATA PLAN
SP32794	COMPILATION	STRATA PLAN

Department of Lands
Reliable from the ground up

Cadastral Records Enquiry Report

Requested Parcel : Lot 100 DP 1120061 **Identified Parcel** : Lot 100 DP 1120061

Locality : TWEED HEADS WEST **LGA** : TWEED **Parish** : TERRANORA **County** : ROUS

Plan	Surv/Comp	Purpose
SP33714	COMPILATION	STRATA PLAN
SP35574	COMPILATION	STRATA PLAN
SP35809	COMPILATION	STRATA PLAN
SP36263	COMPILATION	STRATA PLAN
SP36298	COMPILATION	STRATA PLAN
SP37030	COMPILATION	STRATA PLAN
SP37876	COMPILATION	STRATA PLAN
SP37923	COMPILATION	STRATA PLAN
SP38152	COMPILATION	STRATA PLAN
SP41028	COMPILATION	STRATA PLAN
SP41154	COMPILATION	STRATA PLAN
SP42079	COMPILATION	STRATA PLAN
SP43809	COMPILATION	STRATA PLAN
SP44089	COMPILATION	STRATA PLAN
SP44469	COMPILATION	STRATA PLAN
SP44800	COMPILATION	STRATA PLAN
SP44854	COMPILATION	STRATA PLAN
SP47097	COMPILATION	STRATA PLAN
SP47806	COMPILATION	STRATA PLAN
SP48196	COMPILATION	STRATA PLAN
SP48761	COMPILATION	STRATA PLAN
SP49532	COMPILATION	STRATA PLAN
SP49808	COMPILATION	STRATA PLAN
SP50367	COMPILATION	STRATA PLAN
SP51452	COMPILATION	STRATA PLAN
SP53129	COMPILATION	STRATA PLAN
SP53925	COMPILATION	STRATA PLAN
SP58390	COMPILATION	STRATA PLAN
SP60680	COMPILATION	STRATA PLAN
SP62509	COMPILATION	STRATA PLAN
SP63667	COMPILATION	STRATA PLAN
SP67145	COMPILATION	STRATA PLAN
SP77115	COMPILATION	STRATA PLAN
SP77153	COMPILATION	STRATA PLAN
SP80033	COMPILATION	STRATA PLAN
SP80305	COMPILATION	STRATA PLAN

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 18265246
Date Created: 07/02/1992

Previous Title: 14507118
15255211

REGISTERED OWNER

Dealing No: 703121067 19/01/1999

COMMONWEALTH OF AUSTRALIA

ESTATE AND LAND

Estate in Fee Simple

LOT 222 REGISTERED PLAN 839951
County of WARD Parish of TALLEBUDGERA
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Commonwealth by Conveyance No. 601285567 (K828645Y) (Lot 222 on RP 839951)

2. EASEMENT No 601285565 (K133792H) 20/12/1989
BENEFITING THE LAND
OVER LOTS 43 TO 46 ON RP32012 AND LOTS 13 TO 15 ON RP32013

3. LEASE No 703150372 03/02/1999 at 14:42
QUEENSLAND AIRPORTS LIMITED A.C.N. 077 200 821

4. MORTGAGE No 703222327 12/03/1999 at 16:00
NATIONAL AUSTRALIA BANK LIMITED A.C.N. 004 044 937
over
LEASE: 703150372

5. TRANSFER No 706709956 18/06/2003 at 11:16
MORTGAGE: 703222327
WESTPAC ADMINISTRATION PTY LIMITED A.B.N. 67 008 617 203

6. TRANSFER No 709444068 16/03/2006 at 15:07
MORTGAGE: 703222327
CBA CORPORATE SERVICES (NSW) PTY LIMITED A.B.N. 25 072 765 434

7. CHANGE OF NAME No 711164572 09/11/2007 at 09:18
LEASE: 703150372
GOLD COAST AIRPORT PTY LIMITED A.C.N. 077 200 821

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 18265246
Date Created: 07/02/1992

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

Requested By: External Supervisor

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41 Title Reference: 18287103
Date Created: 17/03/1992

Previous Title: 14505240
14515067
16367240
18074094

REGISTERED OWNER

Dealing No: 703121067 19/01/1999

COMMONWEALTH OF AUSTRALIA

ESTATE AND LAND

Estate in Fee Simple

LOT 5 REGISTERED PLAN 839952
County of WARD Parish of TALLEBUDGERA
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Conveyance No. 601285567 (K828645Y) (POR 87)
(Lot 263 on CP WD5115)

2. EASEMENT No 601285565 (K133792H) 20/12/1989
BENEFITING PART OF THE LAND
OVER LOTS 43 TO 46 ON RP32012 AND LOTS 13 TO 15 ON RP32013

3. EASEMENT IN GROSS No 601999459 (K567185X) 05/03/1991
BURDENING THE LAND
TO COUNCIL OF THE CITY OF GOLD COAST
OVER EASEMENT C ON CP WD6509 AND EASEMENT D ON RP215291

4. LEASE No 702577849 24/03/1998 at 13:46
HERTZ AUSTRALIA PTY LTD A.C.N. 004 407 087
OF PART OF THE LAND AS SHOWN IN SKETCH (SITE 403)

5. AMENDMENT OF LEASE No 711690194 02/06/2008 at 10:09
LEASE: 702577849
TERM: 01/10/1996 TO 30/09/2016 OPTION NIL

6. LEASE No 703150372 03/02/1999 at 14:42
QUEENSLAND AIRPORTS LIMITED A.C.N. 077 200 821

7. MORTGAGE No 703222327 12/03/1999 at 16:00
NATIONAL AUSTRALIA BANK LIMITED A.C.N. 004 044 937
over
LEASE: 703150372

8. TRANSFER No 709444068 16/03/2006 at 15:07
MORTGAGE: 703222327
CBA CORPORATE SERVICES (NSW) PTY LIMITED A.B.N. 25 072 765 434

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41 Title Reference: 18287103
Date Created: 17/03/1992

EASEMENTS, ENCUMBRANCES AND INTERESTS

9. SUB LEASE No 704537998 17/01/2001 at 11:04
LEASE: 703150372
W.T.H. PTY LTD A.C.N. 000 165 855
OF LEASE I ON SP132451

10. AMENDMENT OF LEASE No 711559459 08/04/2008 at 10:10
SUB LEASE: 704537998
TERM: 05/06/2000 TO 30/09/2016 OPTION NIL

11. SUB LEASE No 704553894 25/01/2001 at 11:03
LEASE: 703150372
JONDAY HOLDINGS PTY LTD A.C.N. 011 049 531
OF LEASE H ON SP113425

12. SUB LEASE No 704563536 01/02/2001 at 09:37
LEASE: 703150372
LUCENT TECHNOLOGIES AUSTRALIA PTY LIMITED A.C.N. 002 326 687

OVER LEASE C ON SP132455

13. TRANSFER No 705824314 26/07/2002 at 08:54
SUB LEASE: 704563536
SUB LEASE: 704565076
SUB LEASE: 704565079
HUTCHISON 3G AUSTRALIA PTY LIMITED A.C.N. 096 304 620

14. SUB LEASE No 709595684 16/05/2006 at 11:08
SUB LEASE: 704563536
H3GA PROPERTIES (NO. 3) PTY LIMITED A.C.N. 117 230 574
OF LEASE C ON SP132455
TERM: 01/12/2005 TO 03/05/2010 OPTION NIL

15. SUB LEASE No 704565076 01/02/2001 at 14:25
LEASE: 703150372
LUCENT TECHNOLOGIES AUSTRALIA PTY LIMITED A.C.N. 002 326 678

OVER LEASE C ON SP132455

16. SUB LEASE No 709595713 16/05/2006 at 11:10
SUB LEASE: 704565076
H3GA PROPERTIES (NO. 3) PTY LIMITED A.C.N. 117 230 574
OF LEASE C ON SP132455
TERM: 05/05/2010 TO 03/05/2015 OPTION NIL

17. SUB LEASE No 704565079 01/02/2001 at 14:25
LEASE: 703150372
LUCENT TECHNOLOGIES AUSTRALIA PTY LIMITED A.C.N. 002 326 687

OVER LEASE C ON SP132455

EASEMENTS, ENCUMBRANCES AND INTERESTS

18. SUB LEASE No 709595715 16/05/2006 at 11:10
SUB LEASE: 704565079
H3GA PROPERTIES (NO. 3) PTY LIMITED A.C.N. 117 230 574
OF LEASE C ON SP132455
TERM: 05/05/2015 TO 03/05/2020 OPTION NIL

19. SUB LEASE No 704586438 13/02/2001 at 10:06
LEASE: 703150372
TRAZBOARD PTY LTD A.C.N. 002 456 984 TRUSTEE

UNDER INSTRUMENT NO: 704586438.
OVER LEASE A ON SP132455.

20. SUB LEASE No 707452347 06/02/2004 at 12:40
LEASE: 703150372
ASCOT CAR AND UTE RENTALS AUSTRALIA PTY LTD A.C.N. 001 758 309
OVER LEASE J ON SP132452

21. SUB LEASE No 708014282 31/08/2004 at 09:03
LEASE: 703150372
HERTZ AUSTRALIA PTY LTD A.C.N. 004 407 087
OF LEASE X ON SP160631

22. AMENDMENT OF LEASE No 711690190 02/06/2008 at 10:09
SUB LEASE: 708014282
TERM: 01/01/2004 TO 30/09/2016 OPTION NIL

23. CHANGE OF NAME No 711164572 09/11/2007 at 09:18
LEASE: 703150372
GOLD COAST AIRPORT PTY LIMITED A.C.N. 077 200 821.

24. SUB LEASE No 711467844 29/02/2008 at 12:21
LEASE: 703150372
HERTZ AUSTRALIA PTY LTD A.C.N. 004 407 087
OF LEASE Z ON SP172329
TERM: 01/05/2005 TO 30/09/2006 OPTION 10 YEARS

25. AMENDMENT OF LEASE No 711661574 21/05/2008 at 10:12
SUB LEASE: 711467844
TERM: 01/05/2005 TO 30/09/2016 OPTION NIL

26. SUB LEASE No 711954334 30/09/2008 at 13:34
LEASE: 703150372
SOUTHERN CROSS UNIVERSITY
OF PART OF THE LAND (LEASES SCUA AND SCUB)
TERM: 01/03/2008 TO 25/05/2047 OPTION 48 YEARS

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 18287103
Date Created: 17/03/1992

EASEMENTS, ENCUMBRANCES AND INTERESTS

27. SUB LEASE No 712925496 10/12/2009 at 10:35
    LEASE: 703150372
    TRAZBOARD PTY LTD A.C.N. 002 456 984 TRUSTEE
    UNDER INSTRUMENT 712925496
    OF LEASE Y ON SP182235
    TERM: 19/04/2005 TO 18/04/2010 OPTION 5 YEARS

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

Requested By: External Supervisor

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 17457085
Date Created: 29/01/1990

Previous Title: 11719166
12118003
12840149
13220152
13220153

REGISTERED OWNER

Dealing No: 703121067 19/01/1999

COMMONWEALTH OF AUSTRALIA

ESTATE AND LAND

Estate in Fee Simple

LOT 1 REGISTERED PLAN 225692
County of WARD Parish of TALLEBUDGERA
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Commonwealth by
Conveyance No. 602364686 (10176) (POR 144)
Conveyance No. 602364687 (9957) (POR 84)
(POR 85)
(POR 86)
Conveyance No. 602364688 (B232406) (POR 49)
Conveyance No. 602364689 (G888133) (POR 63)

2. EASEMENT No 601285565 (K133792H) 20/12/1989
BENEFITING THE LAND
OVER LOTS 43 TO 46 ON RP32012 AND LOTS 13 TO 15 ON RP32013

3. EASEMENT IN GROSS No 601999459 (K567185X) 05/03/1991
BURDENING THE LAND
TO COUNCIL OF THE CITY OF GOLD COAST
OVER EASEMENT A ON RP205436

4. LEASE No 602364682 (L746204E) 30/11/1993
OF PART OF THE LAND
TO ANWAY PTY LTD
ORIGINAL TERM: COMMENCING 01 DEC 1989
TERMINATING 30 NOV 2009
OR OPTIONS AS MAY BE STATED

5. TRANSFER No 704541486 18/01/2001 at 15:58
LEASE: 602364682 (L746204E)
LEISA RENEE CLARK

6. AMENDMENT No 704702385 12/04/2001 at 10:35
LEASE: 602364682 (L746204E)

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

7. LEASE No 702482286 02/02/1998 at 11:39
   AIRSERVICES AUSTRALIA
   of part of the land as shown in sketch plan

8. LEASE No 702500558 11/02/1998 at 10:08
   AIRSERVICES AUSTRALIA
   OF PART OF THE LAND AS SHOWN IN SKETCH

9. LEASE No 702784976 14/07/1998 at 10:56
   SHERWELL HOLDINGS PTY LTD A.C.N. 005 651 525
   OVER PART OF THE LAND

10. TRANSFER No 705890296 22/08/2002 at 09:00
    LEASE: 702784976
    CAREFLIGHT QUEENSLAND LIMITED A.C.N. 010 316 462

11. LEASE No 703150372 03/02/1999 at 14:42
    QUEENSLAND AIRPORTS LIMITED A.C.N. 077 200 821

12. MORTGAGE No 703222327 12/03/1999 at 16:00
    NATIONAL AUSTRALIA BANK LIMITED A.C.N. 004 044 937
    over
    LEASE: 703150372

13. TRANSFER No 709444068 16/03/2006 at 15:07
    MORTGAGE: 703222327
    CBA CORPORATE SERVICES (NSW) PTY LIMITED A.B.N. 25 072 765 434

14. SUB LEASE No 705160267 02/11/2001 at 10:26
    LEASE: 703150372
    DUTY FREE STORES GOLD COAST PTY LTD A.C.N. 093 569 263
    OF PARTS OF THE GROUND FLOOR

15. SUB LEASE No 705166348 06/11/2001 at 10:26
    LEASE: 703150372
    SEAIR AVAITION PTY LTD A.C.N. 079 973 827 TRUSTEE
    UNDER INSTRUMENT 705166348
    OF LEASE M ON SP136954

16. SUB LEASE No 705192134 16/11/2001 at 09:27
    LEASE: 703150372
    THL COOLANGATTA PTY LTD A.C.N. 091 486 645
    OF LEASE K ON SP132454
    PRODUCED 09/10/2001 RECORDED ON 10/10/2001
    TO IDENTIFY SUB LEASE 705101120 PRODUCED 09/10/2001

17. SUB LEASE No 705444695 04/03/2002 at 14:18
    SUB LEASE: 705192134
    SUPERCHOOK PTY LTD A.C.N. 094 638 249
    OF PART OF THE GROUND FLOOR

EASEMENTS, ENCUMBRANCES AND INTERESTS

18. AMENDMENT OF LEASE No 711417456 12/02/2008 at 12:38
SUB LEASE: 705444695
TERM: 21/02/2001 TO 20/02/2011 OPTION 5 YEARS

19. TRANSFER No 711680873 28/05/2008 at 13:36
SUB LEASE: 705444695
SKYAN PTY LTD A.C.N. 129 943 666

20. SUB LEASE No 705448476 05/03/2002 at 14:35
SUB LEASE: 705192134
SUBWAY REALTY PTY LTD A.C.N. 009 277 374
PART OF THE GROUND FLOOR

21. AMENDMENT OF LEASE No 709762898 11/07/2006 at 15:00
SUB LEASE: 705448476
TERM: 07/06/2001 TO 06/06/2011 OPTION 5 YEARS

22. SUB LEASE No 705448508 05/03/2002 at 14:37
SUB LEASE: 705192134
COOLANGATTA AIRPORT AUTO AFFAIR CAR WASH CENTRE PTY LTD
A.C.N. 092 908 239
PART OF THE GROUND FLOOR

23. AMENDMENT No 707314691 18/12/2003 at 13:23
SUB LEASE: 705448508

24. AMENDMENT No 706138683 21/11/2002 at 15:57
SUB LEASE: 705192134

25. SUB LEASE No 706363848 17/02/2003 at 15:20
SUB LEASE: 705192134
GOLD COAST AIRPORT LIMITED A.C.N. 077 200 821
OF PART OF THE FIRST FLOOR

26. SUB LEASE No 708366777 17/01/2005 at 12:02
SUB LEASE: 705192134
GAME SHOW PROMOTIONS (AUSTRALIA) PTY LTD A.C.N. 101 197 200
OF PART OF THE GROUND FLOOR (TENANCY F8)
TERM: 15/11/2004 TO 31/03/2008 OPTION 5 YEARS

27. TRANSFER No 709639316 30/05/2006 at 15:51
SUB LEASE: 708366777
QUEENSLAND AIRPORTS LIMITED A.C.N. 077 200 821

28. SUB LEASE No 708589686 18/04/2005 at 12:26
SUB LEASE: 705192134
JAMES ROBERT KAY
PART OF THE GROUND FLOOR OF THE BUILDING

29. TRANSFER No 709911673 06/09/2006 at 08:45
SUB LEASE: 708589686
TENUTO PTY LTD A.B.N. 50 010 365 189

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

30. SUB LEASE No 708744374 17/06/2005 at 12:20
SUB LEASE: 705192134
OCEAN & EARTH AUSTRALIA PTY LIMITED A.C.N. 056 504 191
PART OF THE GROUND FLOOR

31. TRANSFER No 708838952 21/07/2005 at 10:17
SUB LEASE: 705192134
C & P PROPERTIES (QLD) PTY LTD A.C.N. 112 576 299
TRUSTEE 1/2
UNDER INSTRUMENT 708838952
C & P PROPERTIES (QLD) PTY LTD A.C.N. 112 576 299
TRUSTEE 1/2
UNDER INSTRUMENT 708838952

32. MORTGAGE No 708839026 21/07/2005 at 10:20
PERPETUAL TRUSTEE COMPANY LIMITED A.B.N. 42 000 001 007
over
SUB LEASE: 705192134

33. SUB LEASE No 709133146 14/11/2005 at 13:26
SUB LEASE: 705192134
ANNEDAN HOLDINGS PTY LTD A.C.N. 115 436 336
OF PART OF THE GROUND FLOOR
TERM: 01/06/2005 TO 31/05/2008 OPTION 3 X 3 YEARS

34. SUB LEASE No 709447346 17/03/2006 at 13:49
SUB LEASE: 705192134
MANORBROCK PTY LTD A.C.N. 099 965 214
OF PART OF THE GROUND FLOOR OF A BUILDING (TENANCY B8)
TERM: 23/09/2005 TO 22/09/2008 OPTION 3 YEARS

35. AMENDMENT OF LEASE No 711732826 19/06/2008 at 11:51
SUB LEASE: 709447346
TERM: 23/09/2005 TO 22/09/2009 OPTION NIL

36. SUB LEASE No 709447379 17/03/2006 at 13:53
SUB LEASE: 705192134
DUTY FREE STORES GOLD COAST PTY LTD A.C.N. 093 569 263
OF PART OF THE GROUND FLOOR OF A BUILDING
(TENANCY F13, F14 AND F15)
TERM: 14/11/2005 TO 13/09/2008 OPTION 2 YEARS

37. SUB LEASE No 709504170 07/04/2006 at 14:12
SUB LEASE: 705192134
BRIDGET GRAY
OF PART OF THE GROUND FLOOR OF A BUILDING (TENANCY B7)
TERM: 15/01/2006 TO 14/01/2009 OPTION 5 YEARS

38. TRANSFER No 710790643 06/07/2007 at 14:10
SUB LEASE: 709504170
MANAGEMENT STRATEGIES PTY LTD A.C.N. 115 054 441

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41 Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

39. SUB LEASE No 709513450 11/04/2006 at 15:46
SUB LEASE: 705192134
EAST COAST COMMUNITY CARE INCORPORATED A.R.B.N. 108 970 529
OF PART OF THE GROUND FLOOR (LEASE B4/B6)
TERM: 15/01/2006 TO 14/01/2007 OPTION 1 YEAR

40. SUB LEASE No 709531410 20/04/2006 at 13:33
SUB LEASE: 705192134
HELICOPTER ASSOCIATION OF AUSTRALASIA PTY LTD A.C.N. 002 579 580
OF PART OF THE GROUND FLOOR OF THE BUILDING (TENANCY D13)
TERM: 04/04/2006 TO 03/04/2009 OPTION 3 YEARS

41. SUB LEASE No 709723995 28/06/2006 at 13:51
SUB LEASE: 705192134
T & T BUILDING (PRESTIGE) PTY LTD A.C.N. 110 353 181
OF PART OF THE GROUND FLOOR (TENANCY F16)
TERM: 17/06/2006 TO 12/01/2008 OPTION 5 YEARS

42. SUB LEASE No 710165564 07/12/2006 at 14:40
SUB LEASE: 705192134
COMMONWEALTH OF AUSTRALIA
OF PART OF THE GROUND FLOOR (SUBLEASE F10 AND F17)
TERM: 03/04/2006 TO 02/04/2008 OPTION 1 YEAR

43. SUB LEASE No 710790545 06/07/2007 at 13:51
SUB LEASE: 705192134
KEYTE REALTY PTY LTD A.C.N. 111 068 421
OF PART OF THE GROUND FLOOR (TENANCY F1)
TERM: 01/06/2007 TO 31/05/2008 OPTION 3 YEARS

44. AMENDMENT OF LEASE No 711756593 27/06/2008 at 13:33
SUB LEASE: 710790545
TERM: 01/06/2007 TO 30/05/2011 OPTION NIL

45. SUB LEASE No 711406065 07/02/2008 at 14:01
SUB LEASE: 705192134
EAST COAST COMMUNITY CARE INCORPORATED A.R.B.N. 108 970 529
OF PART OF THE GROUND FLOOR (TENANCY B3 & B5)
TERM: 01/09/2007 TO 14/01/2009 OPTION 3 YEARS

46. SUB LEASE No 711471126 03/03/2008 at 12:21
SUB LEASE: 705192134
GLOBAL EDGE GROUP PTY LTD A.C.N. 086 732 809
OF PART OF THE GROUND FLOOR (TENANCY D10)
TERM: 01/03/2008 TO 28/02/2010 OPTION 2 YEARS

47. SUB LEASE No 712050784 17/11/2008 at 12:17
SUB LEASE: 705192134
ANGELA SMITH
OF PART OF THE GROUND FLOOR (TENANCY F6 AND F7)
TERM: 01/01/2008 TO 31/12/2010 OPTION 3 YEARS

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41 Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

48. SUB LEASE No 712146668 07/01/2009 at 12:49
SUB LEASE: 705192134
SOUTHERN CROSS UNIVERSITY
OF PART OF THE GROUND FLOOR (LEASE F11/12)
TERM: 01/03/2008 TO 28/02/2009 OPTION 1 YEAR

49. SUB LEASE No 712442436 29/05/2009 at 12:18
SUB LEASE: 705192134
ABORIGINAL AND TORRES STRAIT ISLANDERS CORPORATION FOR WELFARE, RESOURCE AND HOUSING
OF PART OF THE GROUND FLOOR (TENANCY F5 AND F9)
TERM: 12/05/2008 TO 11/05/2011 OPTION 3 YEARS

50. AMENDMENT OF LEASE No 712433311 26/05/2009 at 12:33
SUB LEASE: 712442436
TERM: 12/05/2008 TO 11/05/2013 OPTION 5 YEARS

51. SUB LEASE No 712687476 26/08/2009 at 13:01
SUB LEASE: 705192134
FRED KARL AZZARELLO
OF PART OF THE GROUND FLOOR - TENANCY E1
OF PART OF THE FIRST FLOOR - TENANCY E4
TERM: 01/06/2008 TO 06/01/2018 OPTION 10 YEARS

52. SUB LEASE No 712687486 26/08/2009 at 13:04
SUB LEASE: 705192134
AIRPORT TAVERN GOLD COAST PTY LTD A.C.N. 127 618 231
PART OF THE GROUND FLOOR TENANCIES D2, E, E2, E7, F2, F3, F4
PART OF THE FIRST FLOOR - TENANCY E3
TERM: 06/12/2007 TO 05/12/2011 OPTION 10 YEARS

53. SUB LEASE No 713039843 05/02/2010 at 13:30
SUB LEASE: 705192134
QUEENSLAND AIRPORTS LIMITED A.C.N. 104 121 824
OF PART OF THE FIRST FLOOR - TENANCY F19 & F21
TERM: 07/08/2007 TO 15/07/2011 OPTION 10 YEARS

54. SUB LEASE No 713039848 05/02/2010 at 13:30
SUB LEASE: 705192134
QUEENSLAND AIRPORTS LIMITED A.C.N. 104 121 824
OF PART OF THE FIRST FLOOR - TENANCY F20
TERM: 01/05/2008 TO 15/07/2011 OPTION 10 YEARS

55. SUB LEASE No 705319555 10/01/2002 at 15:30
LEASE: 703150372
HOPE'S BUS SERVICE PTY LTD A.C.N. 001 854 771
OF PART OF THE GROUND FLOOR

56. MORTGAGE No 709887866 29/08/2006 at 08:53
COMMONWEALTH BANK OF AUSTRALIA A.B.N. 48 123 123 124
over
SUB LEASE: 705319555

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

57. SUB LEASE No 706297284 23/01/2003 at 08:48
LEASE: 703150372
COMMONWEALTH OF AUSTRALIA
OVER LEASE N ON SP136959

58. SUB LEASE No 707194372 14/11/2003 at 10:04
LEASE: 703150372
SPOTLESS SERVICES AUSTRALIA LIMITED A.C.N. 005 309 320
OF PART OF THE GROUND FLOOR

59. SUB LEASE No 707446586 05/02/2004 at 09:40
LEASE: 703150372
SUNDOWN PASTORAL COMPANY PTY LTD A.C.N. 000 334 190
OVER LEASE Q ON SP144103

60. SUB LEASE No 707448151 05/02/2004 at 13:13
LEASE: 703150372
GOLD COAST AIR TERMINAL SERVICES PTY LTD A.C.N. 066 991 259
OVER LEASE R ON SP153201

61. SUB LEASE No 707463521 11/02/2004 at 09:19
LEASE: 703150372
AIR GOLD COAST PTY LTD A.C.N. 010 792 800
OVER LEASE W ON SP160630

62. SUB LEASE No 707674631 28/04/2004 at 09:59
LEASE: 703150372
OCEANIA AVIATION SERVICES PTY LTD A.C.N. 072 468 163
OCEANIA AVIATION MAINTENANCE PTY LTD A.C.N. 099 868 916
JOINT TENANTS
OF LEASE P ON SP144103
TERM: 04/12/2002 TO 03/12/2022 OPTION NIL

63. MORTGAGE No 712398162 11/05/2009 at 14:25
WESTPAC BANKING CORPORATION A.B.N. 33 007 457 141
over
SUB LEASE: 707674631
AGAINST THE INTEREST OF OCEANIA AVIATION SERVICES PTY LTD
A.C.N. 072 468 163

64. TRANSFER No 712712186 07/09/2009 at 14:34
SUB LEASE: 707674631
OCEANIA AVIATION SERVICES PTY LTD A.C.N. 072 768 163

65. SUB LEASE No 707743695 24/05/2004 at 10:09
LEASE: 703150372
AUSTRALIAN AIR EXPRESS PTY LTD A.C.N. 054 307 336
LEASE AAE ON SP160636

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41

Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

66. SUB LEASE No 707750720 26/05/2004 at 09:50
LEASE: 703150372
GOLD COAST HANGERS PTY LTD A.C.N. 103 791 480
LEASE S ON SP157946

67. SUB LEASE No 708586575 15/04/2005 at 12:34
LEASE: 703150372
VIRGIN BLUE AIRLINES PTY LTD A.C.N. 090 670 965
PART OF THE GROUND FLOOR

68. SUB LEASE No 708603758 22/04/2005 at 09:58
LEASE: 703150372
JETPOINT PTY LTD A.C.N. 086 471 132
OF LEASE JETP ON SP113421 AND LEASE Z ON SP172328
TERM: 01/01/2005 30/06/2008 OPTION NIL

69. SUB LEASE No 708829430 18/07/2005 at 12:09
LEASE: 703150372
OCEANIA AVIATION SERVICES PTY LTD A.C.N. 072 468 163
OF PART OF THE GROUND FLOOR

70. SUB LEASE No 709124227 10/11/2005 at 10:58
LEASE: 703150372
COMMONWEALTH OF AUSTRALIA
PART OF THE GROUND FLOOR

71. CHANGE OF NAME No 711164572 09/11/2007 at 09:18
LEASE: 703150372
GOLD COAST AIRPORT PTY LIMITED A.C.N. 077 200 821

72. SUB LEASE No 703955021 24/03/2000 at 11:29
LEASE: 702839463
RAYMOND JOHN BATTISTELLA
OF PART OF THE GROUND FLOOR

73. SUB LEASE No 704537886 17/01/2001 at 10:39
LEASE: 702839463
ANTHONY PERCY RANDALL TENANT IN COMMON 1/2
PATRICIA ANN RANDALL TENANT IN COMMON 1/2
OF PART OF THE GROUND FLOOR

74. SUB LEASE No 704568475 02/02/2001 at 16:31
LEASE: 702839463
ASIA PACIFIC MANAGEMENT CONSULTANTS (QLD) PTY LTD A.C.N. 063 876 273
OF PART OF THE GROUND FLOOR

75. TRANSFER No 705624099 16/05/2002 at 11:03
SUB LEASE: 704568475
AYMEYE PTY LTD A.C.N. 003 308 521

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 8609498
Search Date: 17/02/2010 10:41 Title Reference: 17457085
Date Created: 29/01/1990

EASEMENTS, ENCUMBRANCES AND INTERESTS

76. SUB LEASE No 705763230 03/07/2002 at 09:27
LEASE: 702839463
JAYLINNO PTY LTD A.C.N. 010 456 194
OF PART OF THE GROUND FLOOR

77. MORTGAGE No 705890306 22/08/2002 at 09:02
WESTPAC BANKING CORPORATION A.B.N. 33 007 457 141

78. SUB LEASE No 706154898 28/11/2002 at 10:22
LEASE: 702839463
MAXWELL JAMES BALDWIN
OF PART OF THE GROUND FLOOR

79. SUB LEASE No 706444043 17/03/2003 at 15:15
LEASE: 702839463
GRAEME JOHN BURKE
OF PART OF THE GROUND FLOOR

80. LEASE No 711783572 10/07/2008 at 12:20
KOVS PTY LTD A.C.N. 001 879 732
OF PART OF THE GROUND FLOOR OF A BUILDING (TENANCY D11)
TERM: 01/07/2008 TO 30/06/2009 OPTION 3 YEARS

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Corrections have occurred - Refer to Historical Search

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

Requested By: External Supervisor

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/582467

SEARCH DATE	TIME	EDITION NO	DATE
22/2/2010	12:59 PM	4	2/5/2008

LAND

LOT 1 IN DEPOSITED PLAN 582467
AT TWEED HEADS
LOCAL GOVERNMENT AREA TWEED
PARISH OF TERRANORA COUNTY OF ROUS
TITLE DIAGRAM DP582467

FIRST SCHEDULE

COMMONWEALTH OF AUSTRALIA (R 5065093)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 5340961 LEASE TO QUEENSLAND AIRPORTS LIMITED EXPIRES: 28/5/2048. OPTION OF RENEWAL: 49 YEARS.
5340962 MORTGAGE OF LEASE 5340961 TO NATIONAL AUSTRALIA BANK LIMITED
9630525 TRANSFER OF MORTGAGE 5340962 MORTGAGEE NOW WESTPAC ADMINISTRATION PTY LIMITED
AC917294 CHANGE OF NAME AFFECTING LEASE 5340961 LESSEE NOW GOLD COAST AIRPORT PTY LIMITED
AC917295 VARIATION OF MORTGAGE 5340962
AC917296 TRANSFER OF MORTGAGE 5340962 MORTGAGEE NOW CBA CORPORATE SERVICES (NSW) PTY LIMITED
2 AD927845 THIS EDITION ISSUED PURSUANT TO S.111 REAL PROPERTY ACT, 1900

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

266276857 PRINTED ON 22/2/2010

Provided on 22/02/2010 11:59 AM

Proprietary Notice: CITEC Confirm hereby certifies that the information contained in this document has been provided electronically by the Registrar-General in accordance with section 96-B (2) of the Real Property Act, 1900.

Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 100/1120061

SEARCH DATE	TIME	EDITION NO	DATE
22/2/2010	12:59 PM	1	30/5/2008

LAND

LOT 100 IN DEPOSITED PLAN 1120061
AT TWEED HEADS WEST
LOCAL GOVERNMENT AREA TWEED
PARISH OF TERRANORA COUNTY OF ROUS
TITLE DIAGRAM DP1120061

FIRST SCHEDULE

COMMONWEALTH OF AUSTRALIA

SECOND SCHEDULE (9 NOTIFICATIONS)

1 THE LAND ABOVE DESCRIBED IS LIMITED IN STRATUM IN THE MANNER DESCRIBED IN DP1120061
2 N319843 COVENANT AS REGARDS THE PART FORMERLY IN LOT 2 IN DP227199
3 2247659 LEASE TO AIRSERVICES AUSTRALIA OF PART BEING LOTS 1, 2 & 3 IN DP854935. EXPIRES 30/6/2034.
5340961 CONCURRENT LEASE
4 5340961 LEASE TO QUEENSLAND AIRPORTS LIMITED EXPIRES: 28/5/2048. OPTION OF RENEWAL: 49 YEARS.
5340962 MORTGAGE OF LEASE 5340961 TO NATIONAL AUSTRALIA BANK LIMITED
9630525 TRANSFER OF MORTGAGE 5340962 MORTGAGEE NOW WESTPAC ADMINISTRATION PTY LIMITED
AC917269 CHANGE OF NAME AFFECTING LEASE 5340961 LESSEE NOW GOLD COAST AIRPORT PTY LIMITED
AC917270 VARIATION OF MORTGAGE 5340962
AC917271 TRANSFER OF MORTGAGE 5340962 MORTGAGEE NOW CBA CORPORATE SERVICES (NSW) PTY LIMITED
5 AD962626 EASEMENT FOR ACCESS VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE PART SHOWN DESIGNATED (AA) IN THE TITLE DIAGRAM
6 AD962626 EASEMENT FOR SUPPORT VARIABLE WIDTH AFFECTING THE PART SHOWN DESIGNATED (BB) IN THE TITLE DIAGRAM
7 AD962626 EASEMENT FOR SUPPORT VARIABLE WIDTH AFFECTING THE PART SHOWN DESIGNATED (DD) IN PLAN WITH AD962626
8 AD962626 EASEMENT FOR SUPPORT VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE PART SHOWN DESIGNATED (DD) IN PLAN WITH AD962626
9 AD962626 EASEMENT TO DRAIN WATER VARIABLE WIDTH AFFECTING THE

END OF PAGE 1 - CONTINUED OVER

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 100/1120061 PAGE 2

SECOND SCHEDULE (9 NOTIFICATIONS) (CONTINUED)

PART SHOWN DESIGNATED (CC) IN DP1120061

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

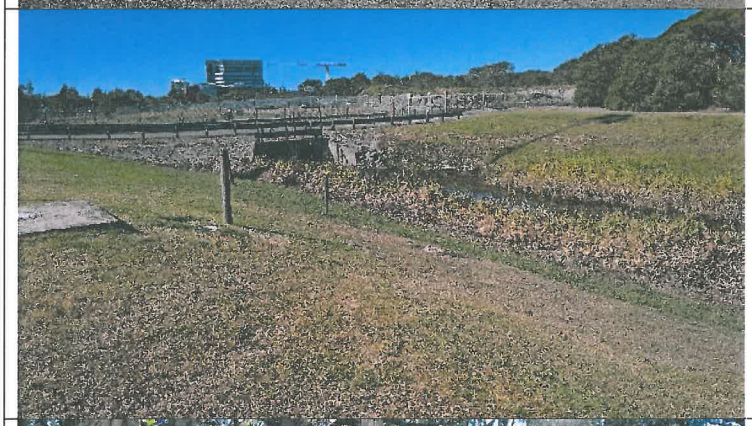
Provided on 22/02/2010 11:59 AM

Proprietary Notice: CITEC Confirm hereby certifies that the information contained in this document has been provided electronically by the Registrar-General in accordance with section 96-B (2) of the Real Property Act, 1900.

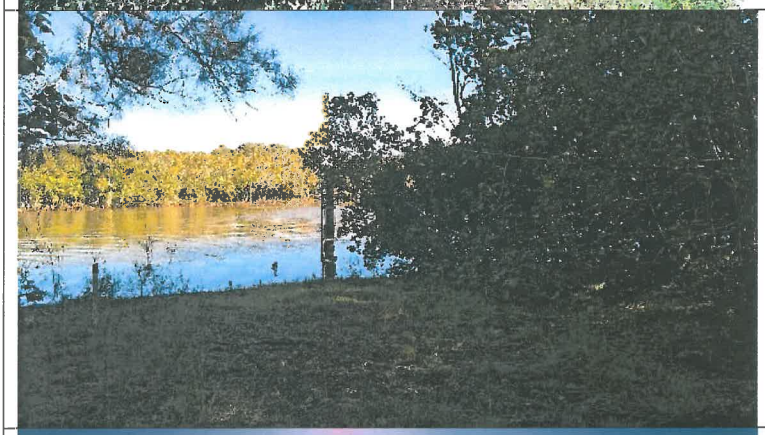
Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register.

Appendix C – Site photographs

Gold Coast Airport – Site inspection photographs 8 and 9 June 2016

	Plate 1 – Former Fire station area in foreground and existing fire station workshop in the background
	Plate 2 – Former JUHI
	Plate 3 – Location of 1996 fuel leak
	Plate 4 – Possible location of 2009 helicopter crash

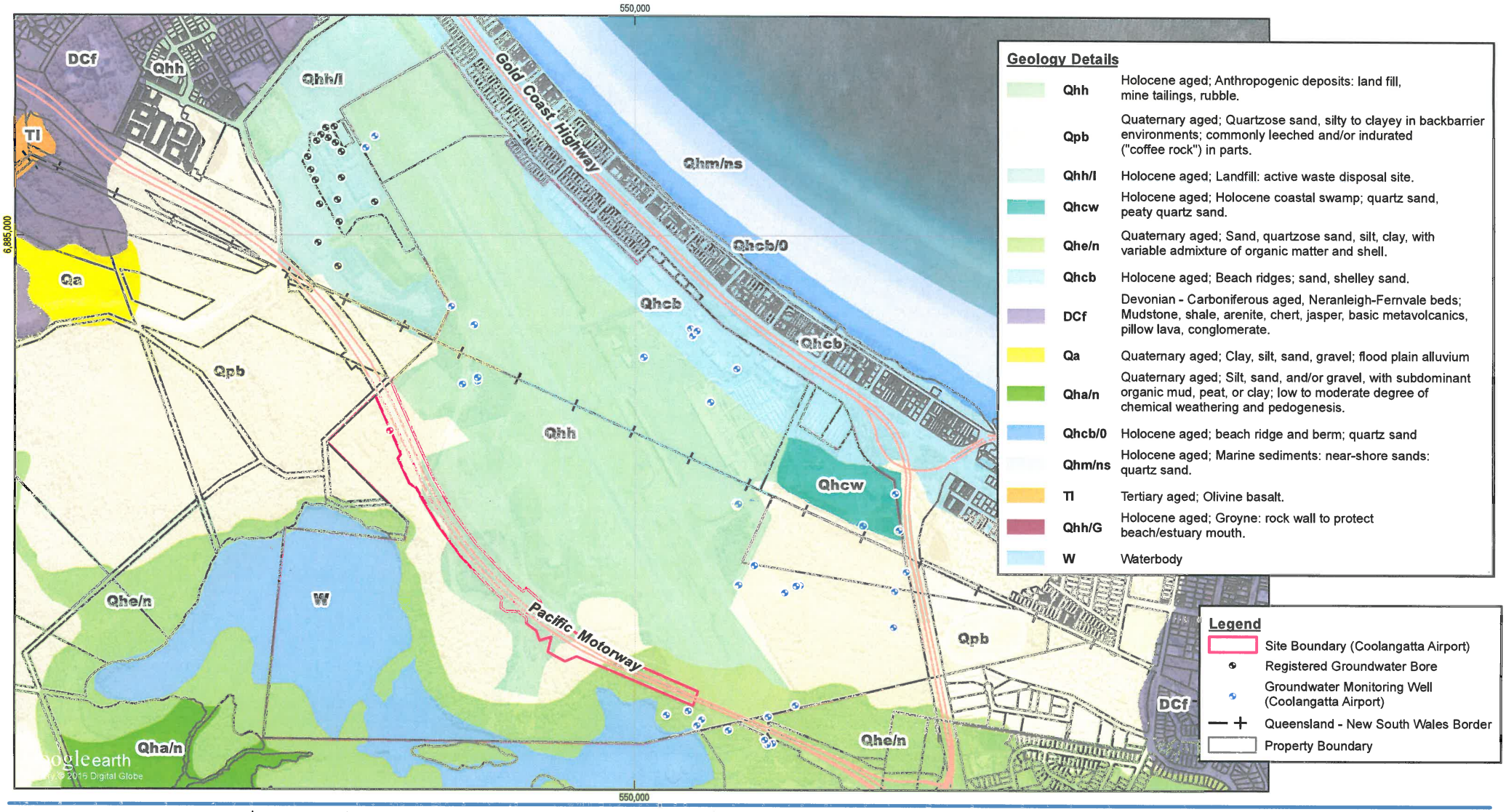
Gold Coast Airport – Site inspection photographs 8 and 9 June 2016

	Plate 5 – Fire training ground
	Plate 6 – Pond adjacent to fire training ground
	Plate 7 - Cobaki Broadwater from the western perimeter of the site
	Plate 8 – Surface water outflow to Pacific Ocean

Gold Coast Airport – Site inspection photographs 8 and 9 June 2016

	Plate 9 – Fire station hardstand
	Plate 10 – Fire station hose drying rack

Appendix D – Geological mapping and Groundwater data search results



1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD airservices

Airservices Australia Pty Ltd
Coolangatta Airport
Preliminary Site Investigation

Job Number 31-34071
Revision A
Date 15 Jun 2016

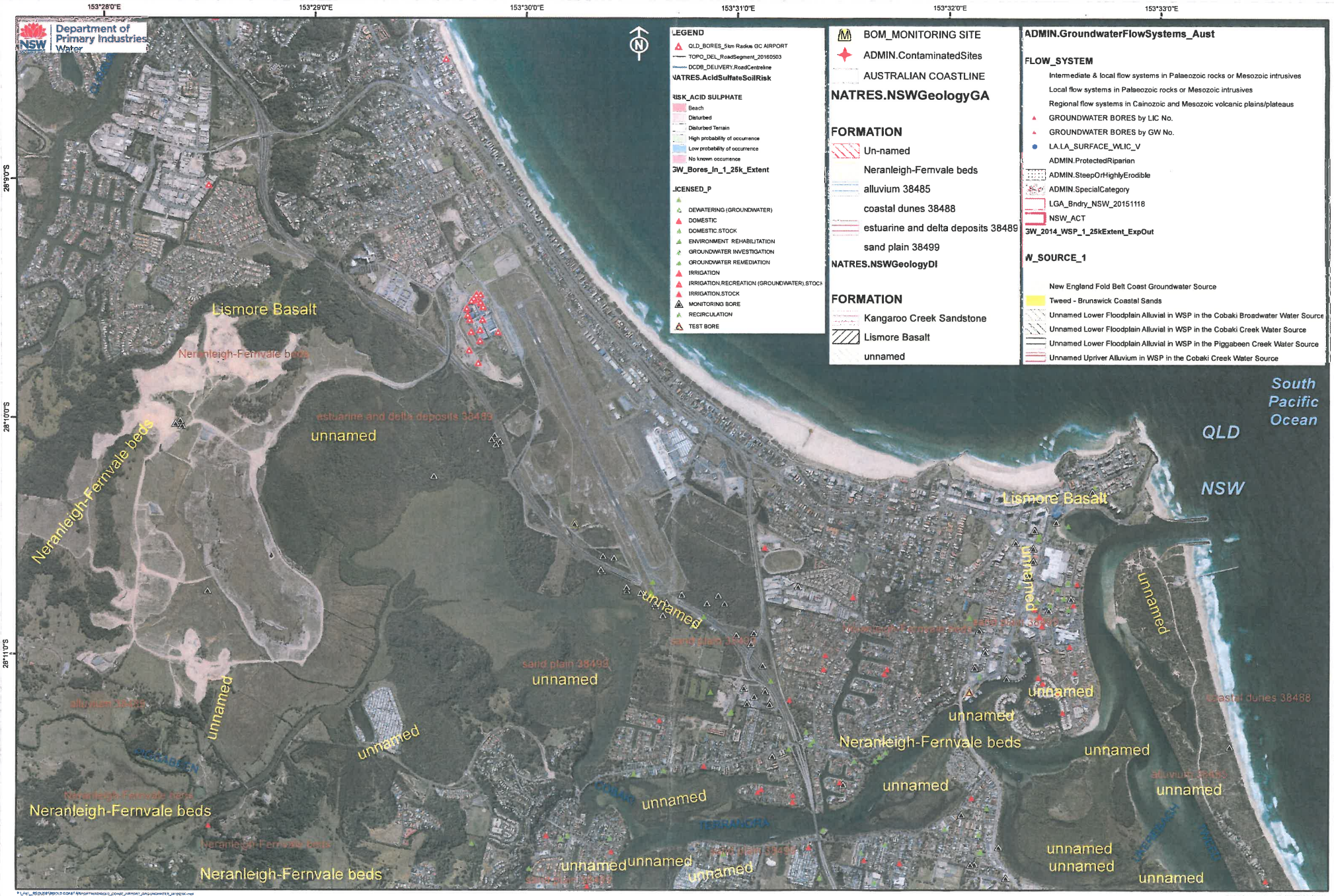
Local Geology

Figure 2

H:\Projects\31\34071\GIS\maps\31-34071-212_CgtGeology_revA.mxd

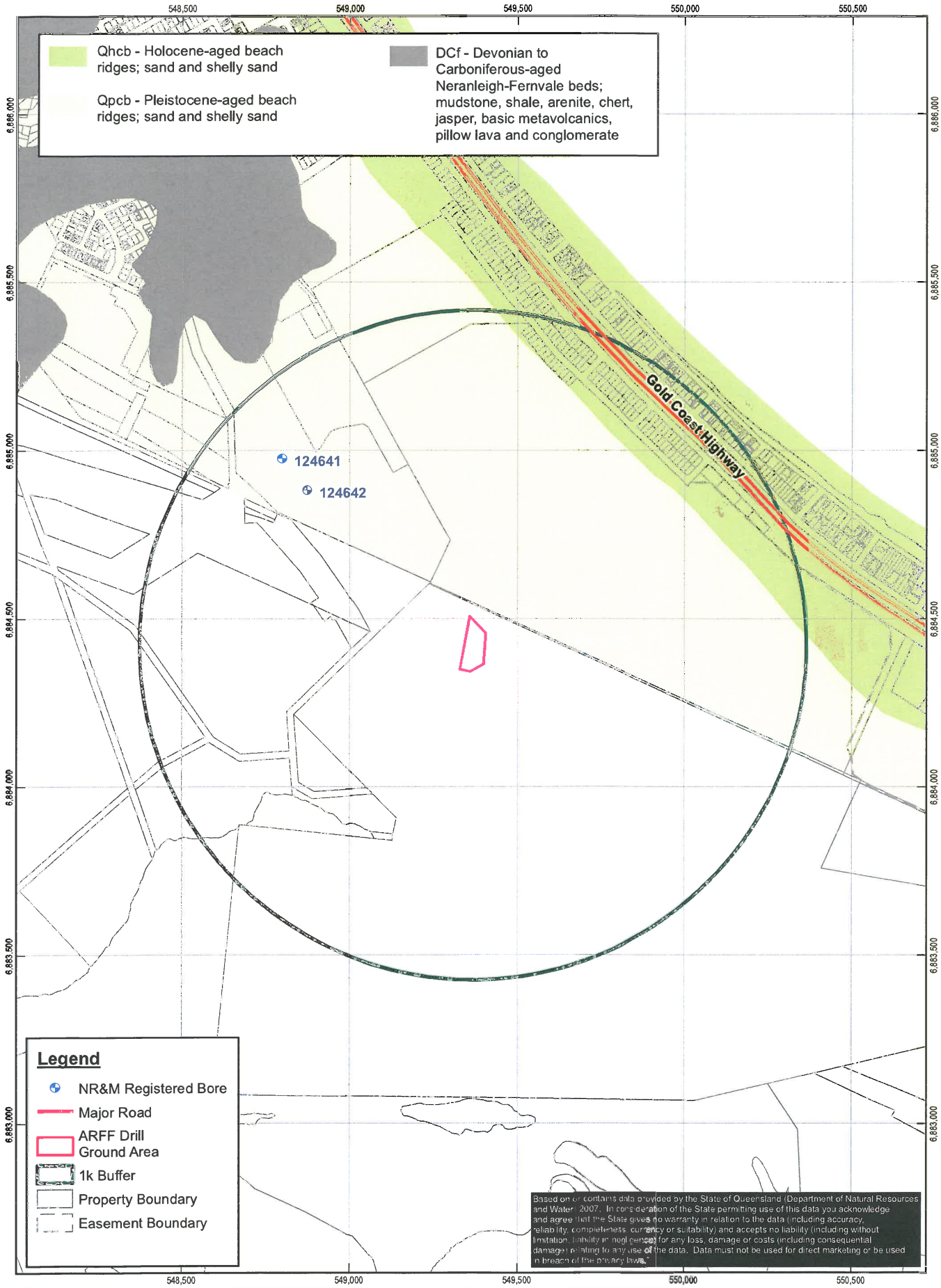
145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: Google Earth: imagery (May 2015, extracted March 2016). Created : jvc



AIR PHOTO IMAGERY IS LPI ADS40 Captured in September 2009
Minimum Elevation Contour Interval 2 metres; Maximum is 10 metres

GOLD COAST AIRPORT GROUNDWATER



1:15,000

0 100 200 300 400 500

Metres (A4)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N

AIRSERVICES AUSTRALIA
ARFF National Testing Project
Preliminary Site Contamination Assessment
Cairns ARFF Drill Ground
REGIONAL GEOLOGY

Job Number 41-20219
Revision A
Date 1 September 2008

Figure 2

G:\41\20219\GIS\Projects\SCA_June08\00_Cns_Fig2_Geology.mxd

201 Charlotte Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com.au W www.ghd.com.au

Data source: Dept NRW, DCDB and Geology, Nov 2007 :-:

Appendix E – Historical aerial photographs

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

1947 Historical Aerial

Figure A

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-201_Cgt1947aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: NSWgov: aerial photograph (1947). Created : jvc

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

GHD

airservices

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

1955 Historical Aerial

Figure B

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-202_Cgt1955aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: NSWgov: aerial photograph (1955). Created : jvc

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

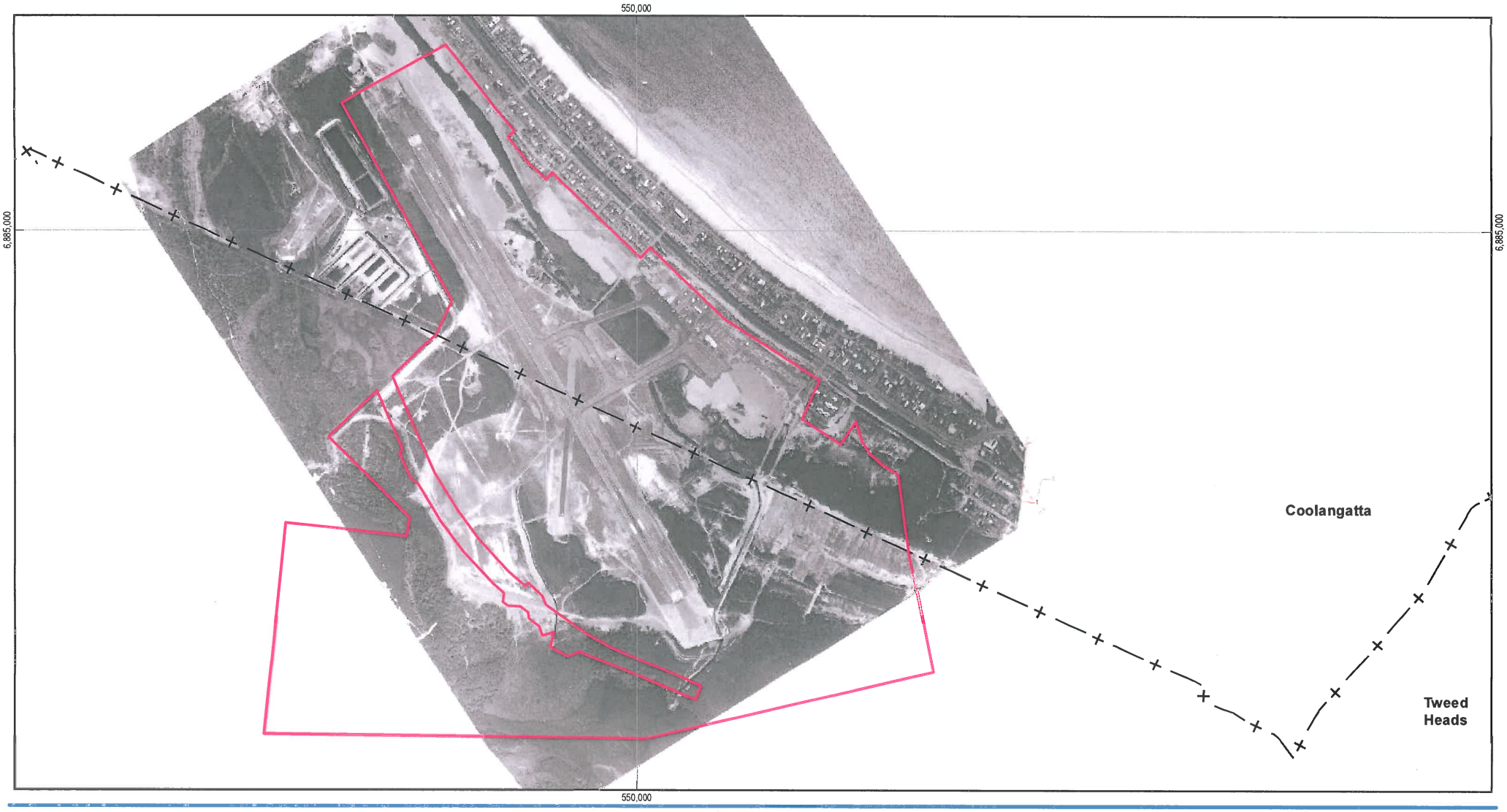
1963 Historical Aerial

Figure C

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-203_Cgt1963aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: NSWgov: aerial photograph (1963). Created : jvc



1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

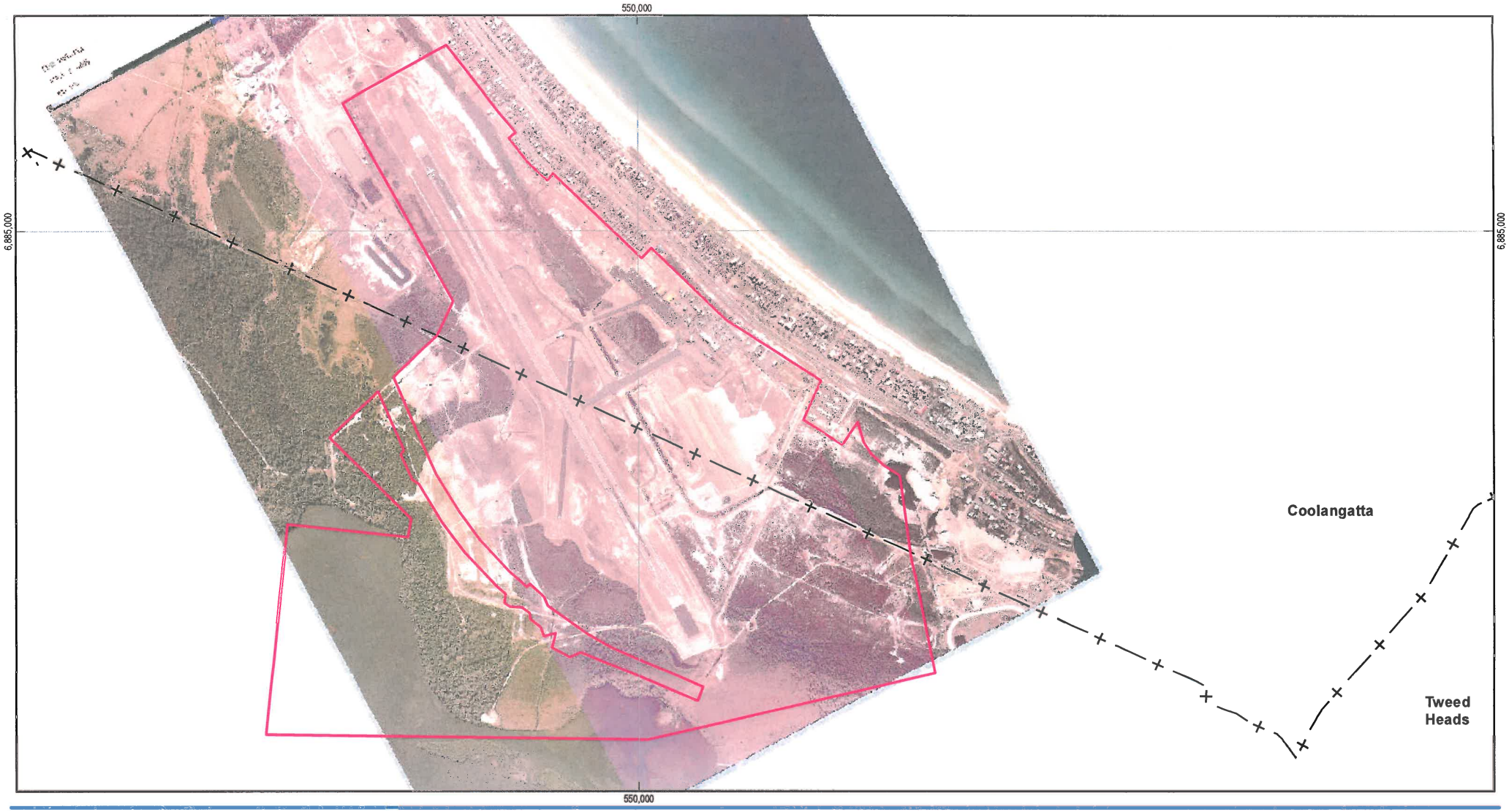
1971 Historical Aerial

Figure D

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-204_Cgt1971aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: NSWgov: aerial photograph (1971). Created : jvc



1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

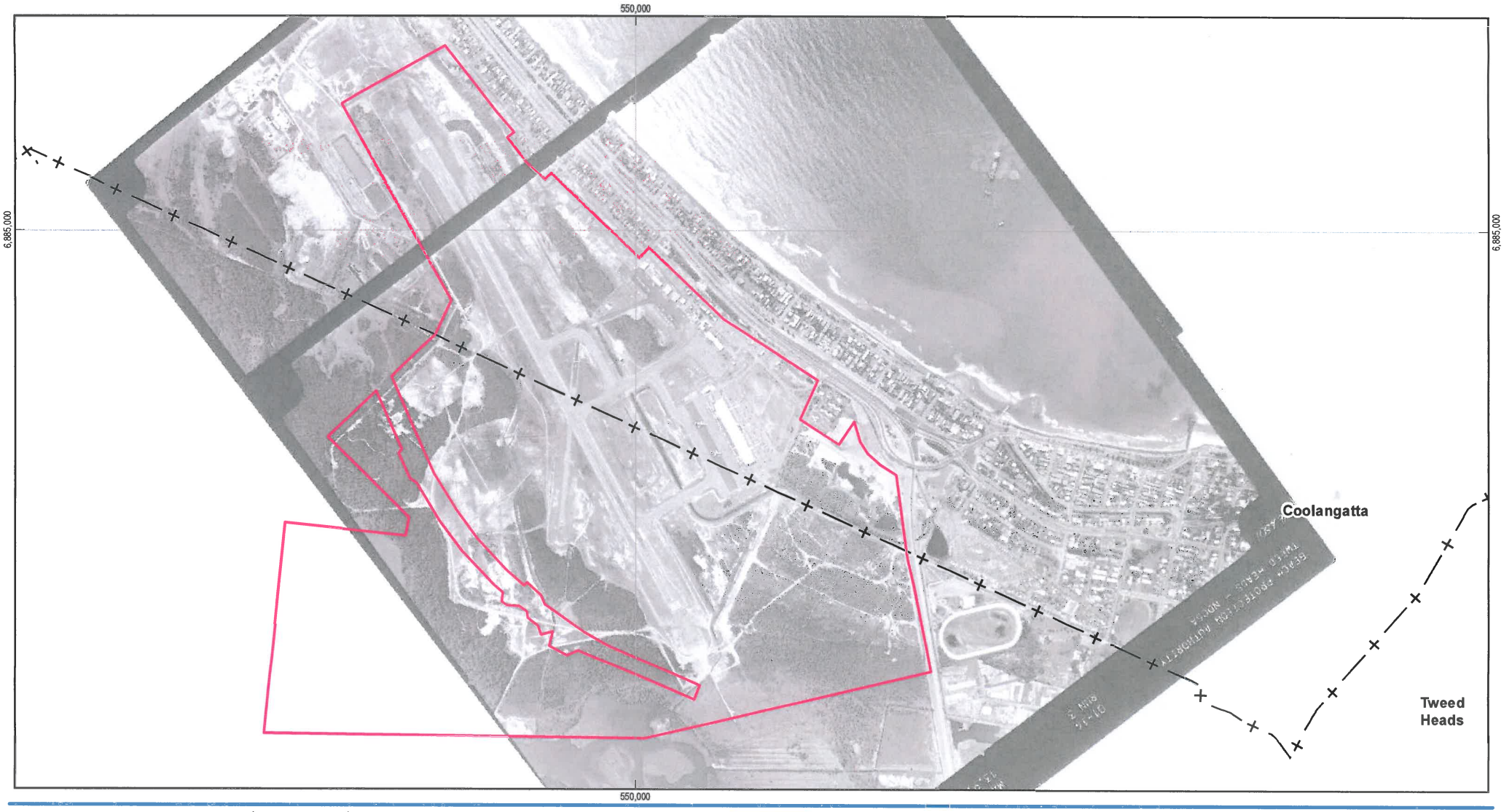
1980 Historical Aerial

Figure E

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-205_Cgt1980aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: NSWgov: aerial photograph (1980). Created : jvc



1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

1985 Historical Aerial

Figure F

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-206_Cgt1985aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: DNRM: aerial photograph (1985). Created : jvc

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

GHD airservices

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

1992 Historical Aerial

Figure G

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-207_Cgt1992aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: NSWgov: aerial photograph (1992). Created : jvc

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

2003 Historical Aerial

Figure H

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-208_Cgt2003aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: QASCO: aerial photograph (2003). Created : jvc

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

2007 Historical Aerial

Figure I

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-209_Cgt2007aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: DNRM: aerial photograph (2003). Created : jvc

1:20,000 (at A4)

0 200 400 600 800

metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Legend

Site Boundary (Coolangatta Airport)

Queensland - New South Wales Border

Airservices Australia Pty Ltd
Gold Coast Airport
Preliminary Site Investigation

Job Number	31-34071
Revision	A
Date	20 Jun 2016

2015 Historical Aerial

Figure J

H:\Projects\31\34071\GIS Brisbane by jvc\maps\31-34071-210_Cgt2015aerial_revA.mxd

145 Ann Street Brisbane QLD 4000 T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data source: Google Earth: aerial imagery(Apr 2015 extracted Jun 2016). Created : jvc

Appendix F – Interview transcripts

Interview with Peter Franks – Airservices Fire Station – 9 June 2016

Peter Franks – Airservices Australia

Craig Barnes – Airservices Australia

Imogen Bird - GHD

1 – Are you aware of any PFAS investigations and testing that have been undertaken across the wider Airport?

No

2. Is there an incident log that detailed where actual fires and fuel spills have been attended that require the use of firefighting foams.

There is an incident log that goes back to the late 1990s. The log will outline how much foam was discharged at an incident. It is noted that foam is not typically discharged unless required.

- Helicopter crash in 2009 – foam was discharged
- early or mid 1980s two light aircraft crash. The exact location of this crash needs to be confirmed. Peter assumed it was within the bushland in a remote, difficult to access location.
- Peter has no recollection of foam discharge associated with a fuel leakage near the terminal in 1996.

3. If there is not an inventory, can you recall any fires or fuel spills at the airport? Dates?

As above.

4. Is there an inventory of AFFF storage within the airport?

No.

The AFFF was delivered in plastic 44 gallon drums and dispensed into an on site AST.

The drums were historically disposed of to the local Tugun landfill by ARFF staff.

5. Are you aware of any AFFF use outside of the Airport but within the general vicinity?

- Tugun bypass tunnel
- Queensland Fire and Rescue Service
- The new JUHI includes protein based foam.

6. Is there any AFFF still stored within the Airport? If so, where and for what purpose?

Not aware of any

7. Has training involving AFFF (e.g extinguishers, AEP exercises) been undertaken in areas outside the current fire station and/or training ground?

Yes.

99% of the training occurs in the fire training ground. This area was bunded in the 1980s or early 1990s. Prior to this the area was characterised by unsealed ground.

A number of possible 'crash remote' sites were highlighted in the bush around the fire training ground of old fire station site. Peter indicated that these locations were more likely to be in bushland in close proximity to ARFF operations.

AEP is conducted at the training ground no knowledge of foam discharged as part of these operations.

8. What is the age of the current fire station and fire training ground? What was the previous use of these sites?

Current fire station constructed in the 1992, previous location adjacent to the former fuel depot. The former fire station was likely to be there since the 1960s. The old fire station was demolished between 2005 and 2007.

9. When AFFF was used in training, how often and for how long did this occur?

Training occurs at the training ground at least once per shift. During development training it may be more often.

There are no records of the volumes of foam used during these exercise. Foam was always used in training until 2010. Since 2010 all training is undertaken with water and foam only used once a year.

NSW Fire Service and QFRS also undertake training at the ARFF training ground. This occurs every 3-6 months. Foam is not used as part of these operations.

10. When AFFF was used in training, what volumes were used and what was the methodology for wash down of waste and equipment?

Hoses are flushed at the training ground, they are cleaned at the fire station to remove dirt and placed on the hose drying rack. Water from the wash down at the fire station goes into a contained treatment system that is disposed to sewer. Runoff from the drying rack drains to stormwater.

Foam used in the training ground is allowed to dissipate. Sometimes it will be blown around the fire training area up to approximately 100 metres away.

A daily test which includes the release of foam from each truck was undertaken in the area around the fire station.

Every 6 months valve and foam consistency testing was also undertaken in the area around the fire station.

11. How widely was the AFFF dispersed aerially? Photos?

Outlined above

12. Was wash down of the fire fighting equipment restricted to the fire training areas?

Trucks and hoses are cleaned at the fire station. All water from wash down on the hardstand at the fire station is collected in a UST where some hydrocarbon separation occurs. The water then passes through a triple interceptor trap and then pumped to sewer.

It is noted that the bund where AFFF was stored at the fire station contains a drain, which drains to the diesel tank bund. This discharged to stormwater through a valve operated pipe.

Water in the bunded area at the fire training ground goes into two phase UST where some hydrocarbon separation occurs, it then goes through a triple interceptor trap and is pumped to sewer.

13. Where did the wash down water end up? Do any drawings discharge off-site and, if so where?

As above question

14. Has there been any significant bulk earth works (relevant to AFFF use) on the site that resulted in soil being relocated from one area of the airport to another?

Hydrocarbon impacted soil associated with the waste water leak at the fire training ground included excavation of soils and remediation, then re-instatement.

Peter confirmed that the fire trucks are used for irrigation of grass around the airport as requested by the airport.

15. Have any activities associated with the airport even been undertaken at the pony club to the south of the site which will be used for the ILS?

No

16. How were spent drums or excess product disposed of?

Spent drums were disposed of to the local Tugun landfill by ASA staff.

17. Does groundwater 'daylight' in areas of the site?

Yes, in all drains

18. What was the location of the ARFF sites?

Covered above.

19. Is stormwater harvested within the Airport and if so, for what purposes and where?

Stormwater is not harvested at the fire station.

There is a small tank on the environment shed at the training ground, which is used to clean the separator filters.

20. Is groundwater abstracted within the Airport and if so, for what purposes and where?

No.

21. What activities have occurred in the cleared area directly to the west of the fire training ground.

NA.

Interview with Gold Coast Airport – 8 June 2016

Norbert Benton – Gold Coast Airport

Greg Hopgood – Gold Coast Airport

Craig Barnes – Airservices Australia

Imogen Bird - GHD

1 – Are you aware of any PFAS investigations and testing that have been undertaken across the wider Airport?

GCA provided a figure of previous elevated PFAS results identified in isolated groundwater and soil sample locations. Based on this it appears that previous investigation were limited in extent and scope.

More recently

- Environmental Earth Science undertook a PSI and SAQP as part of the Project LIFT and ILS.
- AECOM then undertook soil and groundwater investigations. This information is in draft and is not available at this stage. However, the groundwater PFAS contamination contour was sighted and a groundwater contour figure provided.
- Jacobs recently completed a PSI and risk assessment this has also not been finalised, but a copy of the key PFAS sources identified in the report was discussed.

2. Is there an incident log that detailed where actual fires and fuel spills have been attended that require the use of firefighting foams.

Key fuel spill and firefight events include:

- Significant fuel spill in 1996 at the end of the fuel line
- Helicopter crash in 2009
- Light plane crash in mid-1980's
- Lockheed Loadstar 1945
- Nothing else is noted on the register which only goes back to 2007.
- ASA also helped irrigate the grass at the end of the runway to assist with establishment for a period of time
- Foam may also have been used in the Airport Emergency Plan conducted every two years. However, Norbert has no recollection of foam being used in the past 10 years.

3. If there is not an inventory, can you recall any fires or fuel spills at the airport? Dates?

As above.

4. Is there an inventory of AFFF storage within the airport?

There is a fuel tank register.

Not known to hold AFFF in any other areas apart for fire station.

Not known to be in the hangers, however it is not known if the hangers include fire extinguishers.

It is also noted that it is not known where the hanger lessees undertake fire training and if this has even been completed on the site in the past.

5. Are you aware of any AFFF use outside of the Airport but within the general vicinity?

Tugun bypass tunnel:

Fire and spill management as part of the Tugun bypass includes AFFF foam. Water captured within the tunnel drains to sumps at either end of the tunnel, which is then pumped to treatment ponds and discharged. In the event of an incident (including release of AFFF) and if contaminated material enters the sump, this is sucked out and disposed off site, this water is not passed through the typical stormwater management system. GCA indicated that there had been a release of 'concentrate' which may include residual impacts.

Queensland Fire and Rescue Service:

The fire station has been present for a long time.

(It was noted during the site visit that QFRS was undertaking an exercise on the ASA training area.)

6. Is there any AFFF still stored within the Airport? If so, where and for what purpose?

The new JUHI includes 10,000 L of FFP (protein based foam)

7. Has training involving AFFF (e.g extinguishers, AEP exercises) been undertaken in areas outside the current fire station and/or training ground?

It is noted that the fire station relocated in 1992. The workshop has remained in the same area. The previous GHD investigation of the training ground (GHD 2008) indicated that the fire training ground was always present in the current area.

GCA provided anecdotal evidence from a site worker (Dan Boyd) who had undertaken work on the site for a period of over 50 years. While he could not confirm the timing (likely to be before 1994), he indicated that fire training had been completed in a number of specific locations across the site in 44 gallon drums. The areas were provided on a map by GCA.

8. What is the age of the current fire station and fire training ground? What was the previous use of these sites?

Current fire station constructed in the 1990s (1992), previous location adjacent to the former fuel depot. Prior to this the area was swamp land.

9. When AFFF was used in training, how often and for how long did this occur?

There was a requirement to test every truck (4 trucks) every day from 1978 to 2010[1].

10. When AFFF was used in training, what volumes were used and what was the methodology for wash down of waste and equipment?

There was no licencing around 'dark smoke agreement', which allowed dark smoke as part of training exercises. As part of this agreement a form was completed that outlined the volume of foam discharged. This register goes back to 1997[1].

11. How widely was the AFFF dispersed aerially? Photos?

NA

---

[1] Although this was the answer provided during the interview, it should be noted that it is not entirely relevant to the question.

12. Was wash down of the fire fighting equipment restricted to the fire training areas?

NA

13. Where did the wash down water end up? Do any drawings discharge off-site and, if so where?

NA

14. Has there been any significant bulk earth works (relevant to AFFF use) on the site that resulted in soil being relocated from one area of the airport to another?

- There were three former landfills located on the southern side of the Tugun bypass. This material was removed and disposed of to a licensed landfill as part of the bypass development.

- Material from the construction of the bypass was stockpiled on site, some near SCU.

- The 2006/2007 runway expansion the ground surface was stripped and this material was used in other areas of the site.

- Soil was imported to fill in the wetland for construction of the new fuel depot.

- There was some soil remediation for hydrocarbons associated with the old fuel depot.

- Soil scraped as part of the taxiway extension and stockpiled on site. This material has been characterised, including PFAS analysis.

- SCU drilling materials are stockpiled on the site and will be characterised.

- Drain silting has not been undertaken at the site, at least in the past 10 years.

15. Have any activities associated with the airport even been undertaken at the pony club to the south of the site which will be used for the ILS?

No

16. How were spent drums or excess product disposed of?

NA

17. Does groundwater 'daylight' in areas of the site?

Yes, in most but not all drains

18. What was the location of the ARFF sites?

Covered above.

19. Is stormwater harvested within the Airport and if so, for what purposes and where?

Rain water is harvested from roof tops and stored in underground tanks at the terminal, AFP and SCU. It is used for flushing toilets and urinals. May have also been used for irrigation.

20. Is groundwater abstracted within the Airport and if so, for what purposes and where?

Water from the stormwater drains, which includes groundwater has been used for dust suppression and irrigation as part of some previous construction activities.

21. What activities have occurred in the cleared area directly to the west of the fire training ground.

ASA instrumentation only.

Appendix G – Groundwater Monitoring Report

PARSONS BRINCKERHOFF

Parsons Brinckerhoff Australia Pty Limited

ABN 80 078 004 798

Level 3 Northbank Plaza
69 Ann Street
Brisbane QLD 4000
GPO Box 2907
Brisbane QLD 4001
Australia
Tel: +61 7 3854 6200
Fax: +61 7 3854 6500

www.pbworld.com

Certified to ISO 9001, ISO 14001, OHSAS 18001

1 May 2015

Darrel Spence
Facilities Manager
Airservices
NE NSW & Central - SE QLD
P&E FMS Property Services

Our ref: 2171302F-CLM-LTR001A
Airservices ARFF GME

Your ref: 4500008810 / 10

By email
darrel.spence@airservicesaustralia.com

Dear Darrel

Groundwater Monitoring and Reporting - ARFF Training Ground, Gold Coast Airport

1. Introduction

Parsons Brinckerhoff Australia (Parsons Brinckerhoff) is pleased to provide this letter report to Airservices Australia (Airservices) summarising the April 2015 groundwater monitoring event (GME) undertaken at the Aviation Rescue and Fire Fighting (ARFF) fire training ground, Gold Coast Airport, Bilinga, QLD (the site). The site location is shown on Figure 1, Attachment A.

ARFF is a division of Airservices Australia that conducts training exercises on site. Training exercises involve lighting controlled fires and then putting them out using water and surfactants. Kerosene is generally the fuel used to generate the controlled fire. Historically, aqueous film forming foams (AFFF), including Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA) and fluorotelomer sulfonate (6:2 FtS) were used to suppress the fires during training exercises.

Training exercises are undertaken on a purpose-built training facility comprised of a sunken, bunded concrete slab surrounded by a concrete skirt to prevent discharges of fluids to ground during training activities. Parsons Brinckerhoff understands that any excess fluid runoff from the concrete slab drains into a series of temporary holding tanks, into an oil/water separator, then into another temporary holding tank prior to discharge to sewer (through a trade waste permit).

2. Background

2.1 Oil/water separator release

In July 2006 the oil/water separator overflowed at the site, releasing an unknown volume of petroleum hydrocarbons into the receiving environment. It is understood that the release comprised mostly A1 Jet fuel. The release occurred due to the oil/water separator pump being switched from automatic to manual, resulting in the pump not turning on when the oil/water separator reached its maximum volume.

Parsons Brinckerhoff initially collected soil samples to delineate the extent of the affected area. Laboratory analytical results indicated concentrations of petroleum hydrocarbons were present in soil above the adopted soil assessment criteria. An investigation into groundwater contamination was also undertaken; laboratory analytical results indicated concentrations of petroleum hydrocarbons were also present in groundwater above the adopted groundwater assessment criteria, prompting the development of a remediation strategy.

2.2 Remediation of soil and groundwater

Remediation of soil and groundwater to remove petroleum related compounds was undertaken in 2007. Impacted soils were remediated by onsite land-farming of impacted soil. A pump and treat system was installed on site to treat impacted groundwater. The pump and treat system incorporated enhanced biodegradation and oxidation processes.

2.3 PFOS and PFOA

Laboratory analysis of groundwater samples for PFOS and PFOA was added to the sampling program in 2011, due to concerns relating to the historical use of these chemicals on site for training purposes, and the potential risks to human health and the environment posed by PFOS and PFOA.

The properties of PFOS and PFOA are summarised below:

- PFOS and PFOA are man-made chemicals comprising a carbon chain surrounded by fluorine atoms with an acid group at the end of the chain. They are also known as C8 perflurocarbons (PFCs), because molecule contains eight carbon atoms. PFCs have unique surfactant properties; they repel oil, grease and water. PFOS and PFOA are not naturally found in the environment. PFOS and PFOA are not volatile (ATSDR, 2009).
- PFOS and PFOA are resistant to biodegradation, photo-oxidation, direct photolysis and hydrolysis. They breakdown very slowly in air and are not known to breakdown in soil or water. They may undergo long-range transport and bio-accumulate within the food chain (ATSDR, 2009).

Products containing PFOS were known to cause detrimental impacts to the environment and a ban on the manufacture of PFOS was imposed in early 2000. In April 2003, the National Industrial Chemical Notification and Assessment Scheme (NICNAS) issued a PFOS alert and advised that AFFF products containing PFOS should not be used for training purposes.

PFOS and PFOA are listed on the Safe Work Australia, Hazardous Substances Information System (HSIS) as hazardous substances due to risks to human health.

3. Scope of works

The scope of works for the April 2015 GME comprised the following tasks:

- Preparation of a health, environment and safety plan (HESP) to protect human health and the environment during site works.
- Purging of groundwater monitoring wells using bailers and measurement of groundwater physiochemical parameters using a water quality meter.

- Collection of groundwater samples from five monitoring wells for laboratory analysis for the following contaminants typically associated with fire training activities:
  - Total petroleum hydrocarbons (TPH C_6-C_{36})
  - Benzene, toluene, ethyl benzene, xylenes (BTEX)
  - Polycyclic aromatic hydrocarbons (PAHs)
  - Methylene blue active substances (MBAS) (indicator of anionic surfactants)
  - PFOS, PFOA and 6:2 FtS.
- Preparation of this letter report summarising the works undertaken, methodology used, and analytical results, with findings and recommendations.

4. Methodology

Five existing groundwater monitoring wells (BH6, BH7, BH9, BH12 and BH13) were sampled on 2 April 2015 using the methodology summarised in Table 4.1. The approximate locations of the groundwater monitoring wells are shown on Figure 2, Attachment A.

Table 4.1 Groundwater assessment methodology

Activity	Details
Well Gauging	Monitoring wells were gauged using an oil/water interface probe (IP) prior to purging and sampling.
Sampling method	Dedicated disposable polyethylene bailers were used to collect groundwater samples. The 2013 NEPM which was finalised in April 2013 stipulates that use of low flow sampling is required for volatiles (i.e. TPH and BTEX). However due to the amount of water within the monitoring wells (less than 1m of water column), groundwater had to be sampled with bailers.
Well Purging	Wells were purged of five bore volumes, or until groundwater quality indicators stabilised after a minimum of three bore volumes were removed, or until the well was purged dry, whichever occurred first. Groundwater quality indicators were measured after removal of each bore volume.
Decontamination Procedure	All non-disposable sampling equipment (e.g. IP) was triple washed. The triple washing technique comprised washing equipment with water, scrubbing with phosphate free detergent (Decon 90) and potable water, followed by a final rinse with deionised water.
Sample Preservation	Samples were collected in laboratory supplied and appropriately preserved sample containers. Samples were stored on ice in a cooler while on-site and during transit to the laboratory. All samples were delivered and analysed within appropriate holding times.

5. Groundwater assessment criteria

Assessing the concentrations of contaminants of concern requires appropriate assessment criteria. The site is located on airport property and the primary environmental legislation applicable for the site is:

- Airport (Environment Protection) Regulation 1997 – Accepted limit for Fresh Water, Water pollution — accepted limits Schedule 2. Section 1.03 Table — accepted limits of contamination ("the Airport Regulation guidelines")

Assessment criteria for TPH and BTEX are provided in the Airport Regulation guidelines and are presented for two categories:

- acceptable limits for fresh water
- acceptable limits for marine water.

Electrical conductivity measured during the GME ranged from 101 µS/cm (BH7) to 352 µS/cm (BH12) suggesting fresh water; as such, the assessment criteria for fresh water were adopted.

Where criteria are not available in the Airport Regulation guidelines for a contaminant of concern, the following guidelines have been referenced:

- National Environmental Protection Council (2013), National Environmental Protection (Assessment of Site Contamination) Measure (NEPM), Groundwater Investigation Levels (GILs), Fresh Waters (A).
- Minnesota Department of Health (MDH) (2008) Chronic Health Risk Limits (HRLs) for PFOS and PFOA in drinking water.

A summary of the adopted assessment criteria is provided in Table 5.1.

Table 5.1 Groundwater assessment criteria

Analyte	Airport Regulations (1997) Freshwater (µg/L)	MDH (2008) HRLs (µg/L)	NEPC (2013) Freshwater GILs (µg/L)
TPH C_6-C_9	150	NR	NR
TPH C_{10}-C_{36}	600	NR	NR
Benzene	300	NR	NR
Toluene	300	NR	NR
Ethyl benzene	140	NR	NR
Xylene (o)	NC	NR	350
Xylene (p)	NC	NR	200
Total PAH	3	NR	NR
MBAS	NC	NC	NC
PFOS	NC	0.3	NR
PFOA	NC	0.3	NR
6:2 FtS	NC	NC	NC

(1) 'NC' No investigation criteria available

(2) 'NR' Indicates guideline not referenced for a particular analyte as criteria already adopted from the Airport Regulations (1997).

6. Investigation results

6.1 Groundwater physiochemical measurements

Groundwater levels measured in April 2015 had increased by 600 mm to 1100 mm compared to groundwater levels measured in the September 2014 event which is reflective of the heavy rain events that occurred prior

to sampling. Groundwater levels on site have historically fluctuated. Historical depths to groundwater are included with the groundwater analytical results in Table 1, Attachment B.

Groundwater physiochemical measurements, recorded during the GME, are summarised in Table 6.1.

Table 6.1 Summary of groundwater conditions

Condition	Comments
Depth to Groundwater	▪ Standing water levels ranged between 0.191 meters below top-of-casing (mBTOC) (BH12) and 1.296 mBTOC (BH13). ▪ No light non-aqueous phase liquids (LNAPLs) were encountered.
Groundwater Occurrence	▪ Based on historical bore log data collected during well installation, it is considered that the shallow aquifer occurs within the natural sand at the site and is assumed to be recharged through infiltration of rainwater. ▪ The site is considered to be tidally influenced given its proximity to Cobaki Broadwater and the Coral Sea, and the groundwater level fluctuations observed for each monitoring event.
Hydraulic Conductivity	▪ Based on the sandy soil types encountered, the hydraulic conductivity of the underlying aquifer is expected to range from 1 x 10^{0} to 1 x10^{-5} cm/s (Freeze and Cherry, 1979).
Groundwater quality	▪ **Electrical conductivity** ranged from 101 µS/cm (BH7) to 352 µS/cm (BH12) indicating the groundwater is, based on salinity, potentially suitable for potable uses. The recorded electrical conductivity is considerably less than what had been recorded in the previous GME indicating potential rainwater infiltration. ▪ **pH** ranged from 3.45 (BH6) to 6.36 (BH12) indicating that the groundwater is acidic. ▪ **Dissolved oxygen** ranged between 3.22 parts per million (ppm) (BH12) to 5.25 ppm (BH6) indicating low to moderate dissolved oxygen concentrations. ▪ **Redox potential** ranged between – 110 mV (BH12) and 181 mV (BH9) indicating strongly to moderately reducing conditions. ▪ **Temperature** ranged from 23.1 °C (BH7) to 27.3 °C (BH12).

6.2 Groundwater analytical results

6.2.1 Summary of groundwater analytical results

The number of primary samples collected, analytes tested for, minimum/maximum analyte concentrations and those samples that exceeded the adopted investigation levels are summarised in Table 6.2.

Table 6.2 Summary of groundwater analytical results

No. of primary samples	Analyte	Min. Conc. (µg/L)	Max. Conc. (µg/L)	Sample locations exceeding investigation levels
Hydrocarbons				
5	TPH C_6-C_9	<20	30	None
5	TPH C_{10}-C_{36}	<50	420	None
5	BTEX	<1	19	None
5	Total PAHs	<0.5	<0.5	None
Surfactants				
5	PFOS	17.9	527	BH6, BH7, BH9, BH12, BH13
5	PFOA	2.23	37.1	BH6, BH7, BH9, BH12, BH13
5	6:2 FtS	<0.1	<0.1	No assessment criteria
5	MBAS	<2	3	No assessment criteria

A summary of historical and current groundwater analytical results is included as Table 1, Attachment B. Copies of laboratory analytical certificates are included in Attachment C.

6.2.2 Discussion of groundwater analytical results

6.2.2.1 TPH

- The concentration of TPH C_6-C_9 detected was below the laboratory practical quantification limit (PQL), which is below the adopted assessment criteria, in all monitoring wells with the exception of BH7 during the April 2015 GME.
- In the previous GME, the concentration of TPH C_6-C_9 was below the laboratory PQL (which is below the adopted assessment criteria).
- The concentration of TPH C_6-C_9 has remained below PQLs in 4 of the 5 monitoring wells with 1 monitoring well (i.e. BH7) increasing since the previous GME.
- The concentration of TPH C_{10}-C_{36} detected in all monitoring wells was below the adopted assessment criteria
- In the previous GME, the concentrations of TPH C_{10}-C_{36} detected in monitoring wells BH9 and BH12 exceeded the adopted assessment criteria.
- The concentration of TPH C_{10}-C_{36} has decreased or remained below PQLs in monitoring wells BH9, BH12 and BH13, and increased in monitoring wells BH6 and BH7 since the previous GME.

6.2.2.2 BTEX

- In the April 2015 GME, toluene was detected in monitoring well BH7, however the concentration detected was below the adopted assessment criteria.
- In the previous GME the various BTEX compounds detected were below the laboratory practical quantification limits (PQLs), which were below the adopted assessment criteria, in all monitoring wells.

- The concentration of BTEX has increased in BH7 with the remaining 4 monitoring wells reporting below PQLs in all monitoring wells since the previous GME.

6.2.2.3 PAHs

- The concentration of PAHs was below the laboratory practical quantification limit (PQL) for all monitoring wells, which is below the adopted assessment criteria, in all monitoring wells for the April 2015 GME.
- In the previous GME, the concentrations of PAHs detected in monitoring wells BH12 and BH13 exceeded the adopted assessment criteria.
- The concentration of PAHs has decreased in monitoring well BH12 since the previous GME.

6.2.2.4 PFOS and PFOA

- The concentrations of PFOS and PFOA detected in all monitoring wells exceeded the adopted assessment criteria. The concentrations of PFOS and PFOA have exceeded the adopted assessment criteria in all previous GMEs.
- The detected concentrations of PFOS and PFOA decreased in monitoring wells BH9 and BH12 since the previous GME. The detected concentrations of PFOS and PFOA increased in monitoring wells BH6, BH7 and BH13 since the previous GME.

6.2.2.5 6:2 FtS

There is no assessment criterion with which to assess the concentration of 6:2 FtS.

- The concentration of 6:2 FtS was below the laboratory PQL in all monitoring wells.

6.2.2.6 MBAS – anionic surfactant concentrations

MBAS is colorimetric analytical test method that uses methyl blue to detect the presence of anionic surfactants. This test covers a broad range of anionic surfactants (including, but not limited to, PFOS and PFOA), however the detection limit is relatively high compared to other analytical test methods. There is no assessment criterion with which to assess the concentration of MBAS.

- MBAS concentrations have decreased in monitoring wells BH6, BH9 and BH12 since the previous GME.
- The MBAS concentration in monitoring wells BH7 and BH13 has remained below the laboratory PQL for the two most recent GMEs.

7. Quality Assurance and Quality Controls

In accordance with AS4482.1-2005, quality assurance and quality control (QA/QC) samples were collected. Quality assurance sampling is detailed below:

- **Blind Duplicates** – Blind duplicate samples were collected at a rate of one for every 20 samples collected. Blind duplicates are used to identify variation in analyte concentration between samples collected from the same sampling point and/or the repeatability of the laboratory analysis. The samples were submitted to the same laboratory for analysis. One blind duplicate was collected and submitted for analysis for this investigation.

- **Split Duplicates** - Split duplicate samples were collected at a rate of one for every 20 samples collected. Split duplicates are used to provide a check on the analytical proficiency of the laboratories. The samples were submitted to a separate laboratory for analysis. One split duplicate was collected and submitted for analysis for this investigation.
- **Rinsate Blanks** - Rinsate blanks are collected at a rate of one for each day of sampling. Rinsate blanks are used to provide confirmation cross-contamination of samples from sampling equipment has not occurred. One rinsate blank was collected and submitted for analysis for this investigation.
- **Trip Blanks** - Trip blanks are collected at a rate of one for each group of samples shipped. Trip blanks are used to identify and estimate the amount of contamination introduced during the transport and storage of samples from the time of sampling to the time of analysis. One trip blank was prepared and submitted for analysis for this investigation.

Samples were given unique identification numbers containing the sample location and the date and time the sample was collected. All samples were recorded on the chain-of-custody (CoC) form at the time of sampling. The CoC form remained with the samples at all times during storage and transport to the laboratory. Samples were stored and transported on ice within insulated coolers with appropriate packaging to prevent breakage of the sample containers. Internal laboratory QA/QC procedures are provided within the laboratory reports. Table 7.1 provides a summary of the QA/QC data validation.

Table 7.1 QA/QC data validation

Data quality indicator	Completed	Comments
Precision		
Laboratory matrix duplicate RPDs within acceptable limits	Yes	Laboratory matrix RPDs were acceptable limits.
Blind duplicate and split duplicate RPDs within acceptable limits	Yes	All blind duplicate and split duplicate RPDs were below 50% with the exception of split duplicate for TPH C_{15}-C_{28}, See Table 2, Attachment B. As reported the split duplicate result for TPH C_{15}-C_{28} is blow the adopted assessment criteria and as such it is considered not to affect the outcome of the GME.
Accuracy		
Laboratory control spike sample recoveries reported within prescribed limits	Yes	Laboratory control spike sample recoveries were reported with prescribed limits
Matrix spike sample results reported within prescribed limits	Yes	All matrix spike sample results were reported within prescribed limits, however matrix spike recovery was not determined for. Perfluorinated Compounds within sample BH6, as the background level was greater than or equal to 4x spike level.
Surrogate spike sample results reported within prescribed limits	Yes	Surrogate spike sample results were reported within prescribed limits.
Laboratory method blanks reported within prescribed limits	Yes	Laboratory method blanks were reported within prescribed limits
All analyses NATA accredited	Yes	All analysis was undertaken by a NATA accredited laboratory.
Representativeness		
Samples delivered to laboratory within sample holding times, chilled and with correct	Yes	All samples were compliant with requirements of the testing laboratories. The samples for MBAS were extracted outside the holding time. However, there is no adopted assessment

Data quality indicator	Completed	Comments
preservative		criteria to assess against and as such this will not affect the outcome of the GME.
Required number of field duplicates and sample blanks taken	Yes	The correct number of sample duplicates and sample blanks were collected and analysed.
Sample blanks reported results below detection limits	Yes	All sample blanks reported concentrations below laboratory detection limits
Samples collected in accordance with regulatory and Parsons Brinckerhoff procedures	Yes	Refer to the methodology section of this report.
Comparability		
PQLs below the adopted assessment criteria	Yes	Laboratory PQL's were below the Airport (Environment Protection) Regulations 1997.
Qualified sampler	Yes	Samples collected by a suitably qualified and trained environmental scientist.
Completeness		
All laboratory data reviewed and presented in this report (i.e. COCs, SRNs, COAs and QCRs)	Yes	All laboratory data represented in this report has been reviewed.
All sample results reported	Yes	Refer to result summary Table 1, Attachment B.
Sample blanks data reported	Yes	Refer to result summary Table 2, Attachment B.
Relative percent differences (RPDs) calculated	Yes	Refer to result summary Table 2, Attachment B.
NATA stamp on reports	Yes	All laboratory reports have a NATA stamp.

Parsons Brinckerhoff considers the sample collection, documentation; handling, storage and transportation procedures used in this investigation are of an acceptable standard. The analytical results provided by the laboratories (ALS and Envirolab) are deemed reliable based on the results of field and laboratory QA/QC samples which demonstrated an adequate level of precision and accuracy.

The analytical data reported is considered acceptable for the purpose of this report.

8. Duty to notify

With respect to the duty to notify, refer to the previous GME reports.

9. Summary and Conclusions

The following summary and conclusions are based on the findings of this GME:

- Detected concentrations of TPH C_6-C_9 are below the level of detection for all monitoring wells with the exception of BH7 which only marginally exceeded the detection limit since the previous GME. There were no exceedences of the adopted assessment criteria for TPH C_6-C_9.

- Detected concentrations of BTEX are below the level of detection for all monitoring wells with the exception of toluene in BH7 since the previous GME. There were no exceedences of the adopted assessment criteria for BTEX.
- The concentration of TPH C_{10}-C_{36} has decreased or remained below PQLs in monitoring wells BH9, BH12 and BH13, and increased in monitoring wells BH6 and BH7 since the previous GME. There were no exceedences of the adopted assessment criteria.
- The detected concentrations of PFOS and PFOA decreased in monitoring wells BH9 and BH12 since the previous GME. The detected concentrations of PFOS and PFOA increased in monitoring wells BH6, BH7 and BH13 since the previous GME. The concentrations PFOS and PFOA detected in all monitoring wells exceeded the adopted assessment criteria.
- The concentration of MBAS decreased and 6:2 FtS was below the detection limit in all monitoring wells.
- Detected concentrations of PAHs have decreased in monitoring well BH12 since the previous GME. The concentration of PAHs detected in all monitoring wells were below the detection limit which in turn are below the adopted assessment criteria.
- Concentrations of TRH C_{10}-C_{36}, PFOS, PFOA and PAHs are higher in monitoring wells located to the west of the fire training ground (BH9 and BH12) than they are in monitoring wells located to the east of the fire training ground (BH6, BH7 and BH13).
- Elevated concentrations of PFOS and PFOA, above the adopted assessment criteria, are present in all monitoring wells and the extent of which has not been delineated in any direction.
- Groundwater flow direction and tidal influences on the area have not been determined.
- Ongoing use of the site for fire training may be affecting the configuration and migration rate of the dissolved phase contaminant plume.
- The rain events that occurred prior to the GME may have influenced the contaminant concentrations as a result of the infiltration process.

10. Recommendations

Parsons Brinckerhoff recommends the following:

- Additional monitoring wells should be installed to delineate the extent of PFOS and PFOA impacts in the groundwater underlying the site.
- Six-monthly GMEs should be continued, to provide further information regarding the trends of PFOS PFOA, TPH C_{10}-C_{36} and PAHs concentrations.
- Surface water and sediment samples should be collected from the drainage ditch to the east of the site and assessed for PFOS/PFOA.
- The top-of-casing elevation (mAHD) and location (easting and northing) of monitoring wells at the site should be surveyed by a licensed surveyor so the groundwater flow direction can be determined.

Given that the PFOS and PFOA impacts identified in monitoring wells have not been delineated, Parsons Brinckerhoff recommends undertaking further works to identify the extent of the impact.

PARSONS BRINCKERHOFF

Yours sincerely

Michelle Pham
Senior nvironmental Scientist
Contaminated Land Management

Encl: Attachment A - Figures
Attachment B - Groundwater results and QA/QC results summary tables
Attachment C - Laboratory analytical certificates

11. References

- Airport (Environment Protection) Regulation 1997.
- ATSDR (2009), *Draft Toxicological Profile for Perfluroalkyls*, Agency for Toxic Substances and Disease Registry, May 2009.
- Department of Environment and Heritage Protection (EHP), August 2014, Guideline: Contaminated Land Professionals.
- EHP, July 2014, Contaminated Land Assessment Guideline.
- Environment Canada (2006) *Ecological Screening Assessment Report on Perflurooctane Sulfonate, Its Salts and Its Precursors that Contain the C8F17SO2 or C8F17SO3, or C8F17SO2N Moiety*.
- Minnesota Department of Health (2008) Health Risk Limits for Perfl uorochemicals, Report to Minnesota Legislature 2008, Final Report
- National Environment Protection Council (NEPC) National Environment Protection (Assessment of Site Contamination) Measure (NEPM), Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater, Amendment Measure 2013 (No. 1).
- Safe Work Australia, Hazardous Substances Information System (HSIS). (Available www.hsis.safeworkaustralia.gov.au, accessed 20 October 2014).
- U.S. Department of Health and Public Services, Agency for Toxic Substances and Disease Registry, Draft Toxicological profile for Perfluoroalkyls, May 2009. (Available www.atsdr.cdc.gov, accessed 20 October 2014).
- 3M (1999). The science of organic fluorochemistry. 3M Company, February 5, 1999.

12. Statement of limitations

12.1 Scope of services

This environmental site assessment report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and Parsons Brinckerhoff (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

12.2 Reliance on data

In preparing the report, Parsons Brinckerhoff has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, Parsons Brinckerhoff has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Parsons Brinckerhoff will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Parsons Brinckerhoff.

12.3 Environmental conclusions

In accordance with the scope of services, Parsons Brinckerhoff has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

12.4 Report for benefit of client

The report has been prepared for the benefit of the client and no other party. Parsons Brinckerhoff assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Parsons Brinckerhoff or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

12.5 Other limitations

Parsons Brinckerhoff will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Attachment A

Figures

PARSONS BRINCKERHOFF

airservices

Google earth

miles 1
km 2

Figure 1. Site Locality Map

PARSONS BRINCKERHOFF

airservices

Google earth

feet 200
meters 80

Figure 2. Groundwater Monitoring Well Locations

Attachment B

Groundwater results and QA/QC results summary tables

PARSONS BRINCKERHOFF

Table 1: Summary of historical and current data

Groundwater monitoring event
Fire Training Grounds, Gold Coast Airport, QLD
Current GME Date: 2 April 2015
Project No. 2171302F

Analytes				Total Petroleum Hydrocarbons					BTEX				PAHs	Surfactants			
Sample ID	Date Sampled	Casing Height (mAGL)	Depth to groundwater (mBTOC)	C6-C9 (µg/L)	C10-C14 (µg/L)	C15- C28 (µg/L)	C29-C36 (µg/L)	C10-C36 (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total Xylene (µg/L)	Total PAHs (µg/L)	PFOS (µg/L)	PFOA (µg/L)	MBAS (µg/L)	6:2 FtS (µg/L)
Airport (Environmental Protection) Regulations 1997				150	No Criteria			600	300	300	140	No criteria	3	No criteria	No criteria	No criteria	No criteria
Minessota Department of Health 2008				NR	NR			NR	NR	NR	NR	NR	NR	0.3	0.3	NR	NR
BH06	13/01/2009		0.690	<20	<50	<100	<50	<200	-	-	-	-	-	-	-	-	-
BH6	5/01/2011		0.543	<20	<50	<100	<50	<200	-	-	-	-	-	6.99	0.61	-	-
BH6	14/07/2011		0.840	<40	<50	<100	<100	<250	-	-	-	-	-	VB	VB	-	-
BH6	20/01/2012		0.555	<20	<50	<100	<50	<200	-	-	-	-	-	13.9	1.1	-	-
BH6	17/07/2012	0.13	0.464	<20	<50	110	<50	110	<1	<2	<2	<2	<0.5	18.2	1.72	2,500	<0.1
BH6	10/12/2012		1.175	<20	<50	<100	<50	<200	<1	<2	<2	<2	-	13.6	0.9	<100	<0.1
BH6	2/08/2013		0.645	<20	<50	110	<50	110	<1	<2	<2	<2	<0.5	24.5	3.35	<100	<0.1
BH6	12/12/2013		1.358	<20	200	320	80	600	<1	<2	<2	<2	<0.5	12.6	3.16	<100	<0.1
BH6	5/09/2014		1.079	<20	<50	<100	<50	<50	<1	<2	<2	<2	<0.5	5.2	0.40	500	<0.1
BH6	2/04/2015		0.278	<20	<50	160	110	270	<1	<2	<2	<2	<0.5	38.8	2.23	3	<1.0
BH7	19/09/1999		-	-	860	44,600	17,900	63,360	-	-	-	-	-	-	-	-	-
BH7	9/02/2000		-	-	80	4,350	1,910	6,340	-	-	-	-	-	-	-	-	-
BH7	6/07/2000		-	-	186	303	-	489	-	-	-	-	-	-	-	-	-
BH7	14/10/2003		-	26	60	767	578	1,405	-	-	-	-	-	-	-	-	-
BH7	15/10/2005		Well dry, no sample could be obtained														
BH7	24/03/2006		0.830	<20	<20	<100	<100	<220	-	-	-	-	-	-	-	-	-
BH7	7/07/2006		0.930	<5	<20	<20	<20	<60	-	-	-	-	-	-	-	-	-
BH7	3/05/2007		0.920	<20	55	<100	<100	55	-	-	-	-	-	-	-	-	-
BH7	11/12/2007		0.990	<20	<40	<100	<100	<240	-	-	-	-	-	-	-	-	-
BH7	19/06/2008		0.655	<20	<40	<100	<100	<240	-	-	-	-	-	-	-	-	-
BH7	13/07/2009	0.13	0.720	<20	<50	<100	<50	<200	-	-	-	-	-	-	-	-	-
BH7	11/02/2010		0.890	<20	<50	<100	<50	<200	-	-	-	-	-	-	-	-	-
BH7	11/02/2010		0.790	60	140	<50	200	340	-	-	-	-	-	-	-	-	-
BH7	14/07/2011		0.890	<400	<50	<100	<100	<200	-	-	-	-	-	17.4	0.86	-	-
BH7	20/01/2012		0.645	<20	<50	<100	<50	<200	-	-	-	-	-	3.36	0.51	-	-
BH7	17/07/2012		0.595	<20	<50	100	<50	100	<1	<2	<2	<2	<0.5	25	1.73	1,300	<0.1
BH7	10/12/2012		1.185	<20	<50	<100	70	70	<1	<2	<2	<2	-	38.8	1.29	<100	<0.01
BH7	2/08/2013		0.710	<20	<50	<100	<50	<200	<1	<2	<2	<2	<0.5	21.2	1.25	<100	<0.1
BH7	12/12/2013		1.455	<20	<50	<100	<50	<50	<1	<2	<2	<2	<0.5	36.1	1.00	<100	<0.1
BH7	5/09/2014		1.046	<20	<50	<100	<50	<50	<1	<2	<2	<2	<0.5	10.50	0.62	<500	<0.1
BH7	2/04/2015		0.449	30	<50	100	60	160	<1	19	<2	<2	<0.5	23.40	3.57	<2.0	<1.0
BH9	5/01/2011		0.539	<20	<50	<100	<50	<200	-	-	-	-	-	399	12.7	-	-
BH9	14/07/2011		0.970	<20	<50	<100	<100	<250	-	-	-	-	-	23.4	3.03	-	-
BH9	20/01/2012		0.645	<20	<50	<100	<50	<200	-	-	-	-	-	94.5	8.7	-	-
BH9	17/07/2012		0.456	<20	<50	<100	<50	<200	<1	<2	<2	<2	<0.5	379	2.78	500	<0.1
BH9	12/12/2012	-0.012	1.380	<20	<50	<100	<50	<200	<1	<2	<2	<2	-	24.2	2.79	<100	<0.01
BH9	2/08/2013		0.745	<20	<50	<100	<50	<200	<1	<2	<2	<2	<0.5	335	5.71	600	<0.1
BH9	12/12/2013		1.500	<20	<50	<100	<50	<50	<1	<2	<2	<2	<0.5	31.8	1.34	100	<0.1
BH9	5/09/2014		1.357	<20	330	360	<50	690	<1	<2	<2	<2	<0.5	526	9.08	1,300	0.5
BH9	2/04/2015		0.276	<20	<50	<100	<50	<50	<1	<2	<2	<2	<0.5	196	4.50	1	<1.0
BH12	11/10/2005		1.320	<20	200	168	<100	368	-	-	-	-	-	-	-	-	-
BH12	24/03/2006		2.500	<20	380	294	<20	674	-	-	-	-	-	-	-	-	-
BH12	7/07/2006		2.100	<5	250	297	<20	547	-	-	-	-	-	-	-	-	-
BH12	3/05/2007		1.350	<20	370	193	<100	563	-	-	-	-	-	-	-	-	-
BH12	11/12/2007		1.080	130	610	290	<100	900	-	-	-	-	-	-	-	-	-
BH12	19/06/2008		0.580	77	500	380	<100	880	-	-	-	-	-	-	-	-	-
BH12	13/01/2009		0.580	40	1,140	500	80	1,720	-	-	-	-	-	-	-	-	-
BH12	13/07/2009		0.680	30	360	500	70	930	-	-	-	-	-	-	-	-	-
BH12	11/02/2010		1.165	20	590	600	<50	1,190	-	-	-	-	-	-	-	-	-
BH12	5/10/2010	-0.07	0.470	30	320	220	<50	540	-	-	-	-	-	166	18.7	-	-
BH12	5/01/2011		0.448	<20	500	970	180	1,650	-	-	-	-	-	836	49.2	-	-
BH12	14/07/2011		0.890	<20	200	200	<100	400	-	-	-	-	-	580	64.6	-	-
BH12	20/01/2012		0.555	20	220	220	<50	440	-	-	-	-	-	190	13	-	-
BH12	17/07/2012		0.362	40	530	360	<50	890	<1	<2	<2	<2	8	1340	53.5	2,200	0.7
BH12	10/12/2012		1.290	50	440	400	<50	840	1	<2	22	<2	-	1280	54.1	2,200	7.7
BH12	2/08/2013		0.656	60	640	410	<50	1,050	2	<2	31	<2	47.7	1460	38.6	-	2.5
BH12	12/12/2013		1.410	20	690	1,150	90	1,930	<1	<2	12	<2	4.1	2280	51.3	1,700	1.7
BH12	5/09/2014		1.286	<20	280	550	90	920	<1	<2	<2	<2	10.8	2100	29.60	1,600	0.7
BH12	2/04/2015		0.191	<20	130	240	50	420	<1	<2	<2	<2	<0.5	527	15.00	1	<1.0
BH13	11/10/2005		1.670	220	340	129	<100	469	-	-	-	-	-	-	-	-	-
BH13	24/03/2006		1.000	90	140	<100	<100	140	-	-	-	-	-	-	-	-	-
BH13	3/10/2006		1.420	50	340	<100	<100	340	-	-	-	-	-	-	-	-	-
BH13	3/05/2007		1.250	<20	<20	<100	<100	<220	-	-	-	-	-	-	-	-	-
BH13	11/12/2007		1.330	<20	<40	<100	<100	<240	-	-	-	-	-	-	-	-	-
BH13	19/06/2008		0.945	22	<40	<100	<100	<240	-	-	-	-	-	-	-	-	-
BH13	13/01/2009		1.070	50	120	100	<50	220	-	-	-	-	-	-	-	-	-
BH13	13/07/2009		1.020	100	250	<100	<50	250	-	-	-	-	-	-	-	-	-
BH13	11/02/2010		1.290	50	<50	<100	<50	<200	-	-	-	-	-	-	-	-	-
BH13	5/10/2010	0.74	1.410	<20	<50	<100	<50	<200	-	-	-	-	-	-	-	-	-
BH13	5/01/2011		1.546	<20	440	380	190	1,010	-	-	-	-	-	11.6	6.83	-	-
BH13	14/07/2011		1.840	<100	<50	<100	<100	<250	-	-	-	-	-	7.38	1.23	-	-
BH13	20/01/2012		1.557	<20	<50	<100	<50	<200	-	-	-	-	-	9.22	2.24	-	-
BH13	17/07/2012		1.490	<20	220	200	<50	420	<1	<2	25	<2	<0.5	39.2	3.76	200	<0.1
BH13	10/12/2012		2.220	200	230	<100	<50	230	<1	<2	10	131	-	19.8	2.1	200	<0.1
BH13	2/08/2013		1.467	<20	100	130	<50	230	<1	<2	<2	3	<0.5	32.6	3.37	<100	<0.1
BH13	12/12/2013		2.385	320	4,880	2,610	150	7,640	18	<2	38	186	12.9	26.1	1.89	200	<0.1
BH13	5/09/2014		2.075	<20	130	280	140	550	<1	<2	<2	<2	<0.5	14.7	1.5	<200	<0.1
BH13	2/04/2015		1.296	<20	<50	120	80	200	<1	<2	<2	<2	<0.5	17.9	37.1	<2.0	<1.0

Notes
All units are in ug/L
mAGL metres above ground level
mBTOC metres below top of groundwater well casing
Results Items shaded and bold exceed Airport (Environmental Protection) Regulations 1997, Schedule 2 Freshwater
Results Items shaded and bold exceed Minnesota Department of Health, 2008
VB Indicates sample vessel broken
\- Indicates not analysed
NR Not referenced

Attachment C

Laboratory analytical certificates

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1516017**	Page	: 1 of 6
Client	: **WSP ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MR IVAN NERALIC	Contact	: Jodie Hancock
Address	: 1 GARDNER CLOSE MILTON QLD, AUSTRALIA 4064	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: ivan.neralic@wspgroup.com	E-mail	: Jodie.Hancock@alsenviro.com
Telephone	: +61 3368 6600	Telephone	: +61 7 3552 8654
Facsimile	: +61 07 33674399	Facsimile	: +61-7-3243 7218
Project	: Airservices GME Gold Coast Airport	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 2171302E	Date Samples Received	: 02-Apr-2015 16:15
C-O-C number	: ----	Date Analysis Commenced	: 07-Apr-2015
Sampler	: MICHAEL AITKEN	Issue Date	: 13-Apr-2015 12:42
Site	: ----		
		No. of samples received	: 8
Quote number	: ----	No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Matt Frost	Senior Organic Chemist	Brisbane Organics
Ryan Story	2IC Organic Instrument Chemist	Brisbane Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EP050 (Anionic Surfactants as MBAS): Samples BH7; BH13 were diluted due to matrix interference. LOR adjusted accordingly.
- EP231: Particular samples required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	BH6	BH7	BH9	BH12	BH13
			Client sampling date / time	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]
Compound	CAS Number	LOR	Unit	EB1516017-001	EB1516017-002	EB1516017-003	EB1516017-004	EB1516017-005
				Result	Result	Result	Result	Result
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	---	0.1	mg/L	3.4	<2.0	0.6	0.9	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	---	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	---	20	µg/L	<20	30	<20	<20	<20
C10 - C14 Fraction	---	50	µg/L	<50	<50	<50	130	<50
C15 - C28 Fraction	---	100	µg/L	160	100	<100	240	120
C29 - C36 Fraction	---	50	µg/L	110	60	<50	50	80
^ C10 - C36 Fraction (sum)	---	50	µg/L	270	160	<50	420	200
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	40	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	20	<20	<20	<20
>C10 - C16 Fraction	>C10_C16	100	µg/L	<100	<100	<100	200	<100
>C16 - C34 Fraction	---	100	µg/L	250	140	<100	220	170
>C34 - C40 Fraction	---	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	100	µg/L	250	140	<100	420	170

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH6	BH7	BH9	BH12	BH13
				Client sampling date / time	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]
Compound	CAS Number	LOR	Unit		EB1516017-001	EB1516017-002	EB1516017-003	EB1516017-004	EB1516017-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L		<100	<100	<100	200	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	19	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	---	1	µg/L		<1	19	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		38.8	23.4	196	527	17.9
PFOA	335-67-1	0.02	µg/L		2.23	3.57	4.50	15.0	37.1
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		26.6	26.5	27.2	27.5	27.0
2-Chlorophenol-D4	93951-73-6	1	%		62.6	68.4	68.1	67.7	67.3
2.4.6-Tribromophenol	118-79-6	1	%		87.1	94.8	90.5	99.5	99.3
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		63.2	68.0	72.5	77.4	72.8
Anthracene-d10	1719-06-8	1	%		75.5	79.6	81.4	84.6	83.2
4-Terphenyl-d14	1718-51-0	1	%		78.2	85.6	87.2	89.8	87.9
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		117	116	122	120	124
Toluene-D8	2037-26-5	2	%		94.5	93.0	92.6	94.7	89.0
4-Bromofluorobenzene	460-00-4	2	%		89.7	89.3	87.1	88.4	85.5

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC01a	QC02	QC03	----	----
				Client sampling date / time	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]	----	----
Compound	CAS Number	LOR	Unit		EB1516017-006	EB1516017-007	EB1516017-008	------	------
					Result	Result	Result	Result	Result
EP050: Anionic Surfactants as MBAS									
Anionic Surfactants as MBAS	----	0.1	mg/L		0.8	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		170	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		290	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		60	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		520	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		260	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		270	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		530	<100	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC01a	QC02	QC03	----	----
				Client sampling date / time	[02-Apr-2015]	[02-Apr-2015]	[02-Apr-2015]	----	----
Compound	CAS Number	LOR	Unit		EB1516017-006	EB1516017-007	EB1516017-008	------	------
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		260	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	----	----
PFOA	335-67-1	0.02	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		30.3	22.6	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		74.2	62.0	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		107	91.9	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		79.2	65.7	----	----	----
Anthracene-d10	1719-06-8	1	%		89.5	77.0	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		94.0	87.3	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		97.2	104	101	----	----
Toluene-D8	2037-26-5	2	%		81.8	95.5	94.5	----	----
4-Bromofluorobenzene	460-00-4	2	%		96.5	100.0	97.2	----	----

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 126267

Client:
WSP Environment & Energy QLD
1 Gardner Cl
Milton
QLD 4064

Attention: Michael Aitken

Sample log in details:

Your Reference:	**2171302E**	
No. of samples:	1 Water	
Date samples received / completed instructions received	09/04/15	/ 09/04/15

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	16/04/15	/ 16/04/15
Date of Preliminary Report:	Not Issued	

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference:	UNITS	126267-1
Your Reference	----------	QC01b
Date Sampled	----------	02/04/2015
Type of sample		Water
Date extracted	-	09/04/2015
Date analysed	-	10/04/2015
$TRHC_6$ - C_9	µg/L	<10
$TRHC_6$ - C_{10}	µg/L	<10
$TRHC_6$ - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	108
Surrogate toluene-d8	%	94
Surrogate 4-BFB	%	97

svTRH (C10-C40) in Water		
Our Reference:	UNITS	126267-1
Your Reference	----------	QC01b
Date Sampled	----------	02/04/2015
Type of sample		Water
Date extracted	-	10/04/2015
Date analysed	-	10/04/2015
$TRHC_{10}$ - C_{14}	µg/L	91
$TRHC_{15}$ - C_{28}	µg/L	140
$TRHC_{29}$ - C_{36}	µg/L	<100
$TRH>C_{10}$ - C_{16}	µg/L	130
$TRH>C_{10}$ - C_{16} less Naphthalene (F2)	µg/L	130
$TRH>C_{16}$ - C_{34}	µg/L	<100
$TRH>C_{34}$ - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	81

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	126267-1 QC01b 02/04/2015 Water
Date extracted	-	10/04/2015
Date analysed	-	10/04/2015
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	70

Miscellaneous Inorganics		
Our Reference:	UNITS	126267-1
Your Reference	----------	QC01b
Date Sampled	----------	02/04/2015
Type of sample		Water
Date prepared	-	16/04/2015
Date analysed	-	16/04/2015
M.B.A.S Methylene Blue Active Substances	mg/L	0.13

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Ext-044	Analysed by LabPoint NATA accreditation 11111.

Client Reference: 2171302E

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/04/2015	[NT]	[NT]	LCS-W1	09/04/2015
Date analysed	-			10/04/2015	[NT]	[NT]	LCS-W1	10/04/2015
$TRHC_6$ - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
$TRHC_6$ - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	117%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	115%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	109%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	109%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	109%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	100	[NT]	[NT]	LCS-W1	99%
Surrogate toluene-d8	%		Org-016	96	[NT]	[NT]	LCS-W1	100%
Surrogate 4-BFB	%		Org-016	96	[NT]	[NT]	LCS-W1	96%

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2015	126267-1	10/04/2015 || 10/04/2015	LCS-W1	10/04/2015
Date analysed	-			10/04/2015	126267-1	10/04/2015 || 10/04/2015	LCS-W1	10/04/2015
$TRHC_{10}$ - C_{14}	µg/L	50	Org-003	<50	126267-1	91 || 120 || RPD: 27	LCS-W1	93%
$TRHC_{15}$ - C_{28}	µg/L	100	Org-003	<100	126267-1	140 || 280 || RPD: 67	LCS-W1	85%
$TRHC_{29}$ - C_{36}	µg/L	100	Org-003	<100	126267-1	<100 || <100	LCS-W1	81%
TRH>C_{10} - C_{16}	µg/L	50	Org-003	<50	126267-1	130 || 170 || RPD: 27	LCS-W1	93%
TRH>C_{16} - C_{34}	µg/L	100	Org-003	<100	126267-1	<100 || 220	LCS-W1	85%
TRH>C_{34} - C_{40}	µg/L	100	Org-003	<100	126267-1	<100 || <100	LCS-W1	81%
Surrogate o-Terphenyl	%		Org-003	75	126267-1	81 || 71 || RPD: 13	LCS-W1	96%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2015	[NT]	[NT]	LCS-W1	10/04/2015
Date analysed	-			10/04/2015	[NT]	[NT]	LCS-W1	10/04/2015
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	71%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	70%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	70%

Client Reference: 2171302E

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	71%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	73%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	75%
Benzo(b,j+k) fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	93%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	70	[NT]	[NT]	LCS-W1	91%
QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			16/04/2015	126267-1	16/04/2015 || 16/04/2015	126267-1	16/04/2015
Date analysed	-			16/04/2015	126267-1	16/04/2015 || 16/04/2015	126267-1	16/04/2015
M.B.A.S Methylene Blue Active Substances	mg/L	0.1	Ext-044	<0.10	126267-1	0.13 || 0.14 || RPD: 7	126267-1	95%

Client Reference: **2171302E**

Report Comments:

MBAS analysed by LabPoint. Report No.NAA15-0611.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Appendix H – ORS Records

ARFF Incident Detail Report

Air Services Australia COOLANGATTA **Incident No:** 124

ARFF Incident Details for **Mutual Aid Call** **15/12/1999**

Incident Site:	BOYD ST RUBBISH TIP TUGUN	**Number of Lives Saved:**	0
Origin of Call:	IC from MFB	**Number of Deaths:**	0
Company:	QLD Emergency Services	**Number of Injuries:**	0
Est Damage Value:	$0	**Est Facility Value:**	$0

Incident Times (UTC)

Call Time:	15/12/1999 18:57:00	**Arrival Time:**	15/12/1999 19:05:00	**End Time:**	15/12/1999 19:38:00
Dispatch Time:	15/12/1999 19:00:46	**Control Time:**	15/12/1999 19:38:00	**Return Time:**	15/12/1999 19:52:46

Materials Used

DCP Used:	0.00 **kg**	**Foam Used:**	100 **litres**
WaterUsed:	14000 **litres**	**Other Used:**	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 5	1				

Staff in Attendance

Team Leader: **FSM:**

Other Staff:

Actions Taken

ARFF responded to a request for fire fighting assistancefrom QRFAat anuncontrolled fire at the Boyd St rubbish tipTugun. One vehicle wasdispatched which allowed ARFF to remain at Category 6 and cover allflights. A second vehicle was dispatched upon the return of the firstvehicle. The fire was eventually controlled and extinguished after heavyearth moving equipment was used to turn over the fire area.

ARFF Incident Detail Report

Air Services Australia COOLANGATTA **Incident No:** 161

ARFF Incident Details for **Mutual Aid Call** **17/07/2000**

Incident Site:	GOLD COAST MARINA COOMERA.	**Number of Lives Saved:**	0
Origin of Call:		**Number of Deaths:**	0
Company:	QLD Emergency Services	**Number of Injuries:**	0
Est Damage Value:	$0	**Est Facility Value:**	$0

Incident Times (UTC)

Call Time:	17/07/2000 14:20:00	**Arrival Time:**	17/07/2000 15:20:00	**End Time:**	17/07/2000 22:00:00
Dispatch Time:	17/07/2000 14:40:00	**Control Time:**	17/07/2000 22:00:00	**Return Time:**	17/07/2000 22:40:00

Materials Used

DCP Used:	0.00 **kg**	**Foam Used:**	1350 **litres**
WaterUsed:	**litres**	**Other Used:**	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1	ULFV 5	1		

Staff in Attendance

Team Leader: **FSM:**

Other Staff:

Actions Taken

QFRA requested quantity of AFFF delivered to a large vessel fireDOcontacted staff and despatched a ULFV5 with two crew. 1000 l of AFFFwas delivered to incident site in GUV and TO vehicle. ARFF crew remainedat incident site an assisted QFRA in fire fighting operations.

ARFF Incident Detail Report

Air Services Australia COOLANGATTA **Incident No:** 231

ARFF Incident Details for **Fire Non-Aircraft** **26/08/2001**

Incident Site:	ANSETT TERMINAL ROAD SIDE	**Number of Lives Saved:**	0
Origin of Call:	PABX	**Number of Deaths:**	0
Company:		**Number of Injuries:**	0
Est Damage Value:	$0	**Est Facility Value:**	$0

Incident Times (UTC)

Call Time:	26/08/2001 04:41:00	**Arrival Time:**	26/08/2001 04:43:05	**End Time:**	26/08/2001 04:46:55
Dispatch Time:	26/08/2001 04:41:35	**Control Time:**	26/08/2001 04:46:55	**Return Time:**	26/08/2001 05:21:00

Materials Used

DCP Used:	9.00 **kg**	**Foam Used:**	12 **litres**
WaterUsed:	400 **litres**	**Other Used:**	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1				

Staff in Attendance

Team Leader: **FSM:**

Other Staff:

Actions Taken

ARFF responded Ansett Terminal entrance where Yellow Cab No. T38-401 hadsmoke and flame issuing from the engine compartment.Fire attacked with 9kg DCP and hose reelfrom beneath before raising thebonnet and fully extinguishing the fire. Battery disconnected and LPGsystem turned off. Engine and LPG converter cooled with hose reel. Taxideemed safe and pushed away from the terminal entrance. Taxidriver arranged for a tow truck.Road way washed down and debris from car removed.QFRA responded and assisted in isolating gas cylinder.ARFF returned to station.Taxi owned by Professional Taxis 2/7 Hinde St Southport ph 0417 923 033driver Mark Williams 7/21 Alinjarra Drive Tugun Heights 0417 726 629.

ARFF Incident Detail Report

Air Services Australia COOLANGATTA **Incident No:** 311

ARFF Incident Details for **Mutual Aid Call** **15/09/2002**

Incident Site:	GOLD COAST CITY DUMP TUGUN	**Number of Lives Saved:**	0
Origin of Call:	Fire Line	**Number of Deaths:**	0
Company:		**Number of Injuries:**	0
Est Damage Value:	$0	**Est Facility Value:**	$0

Incident Times (UTC)

Call Time:	15/09/2002 03:58:00	**Arrival Time:**	15/09/2002 04:05:00	**End Time:**	15/09/2002 06:55:00
Dispatch Time:	15/09/2002 04:00:00	**Control Time:**	15/09/2002 06:55:00	**Return Time:**	15/09/2002 07:01:00

Materials Used

DCP Used:	0.00 **kg**	**Foam Used:**	140 **litres**
WaterUsed:	50000 **litres**	**Other Used:**	NIL

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 5	1				

Staff in Attendance

Team Leader: **FSM:**

Other Staff:

Actions Taken

FIRE ASSISTANCE WITH THE QRFS IN COMBATING A RUBBISH DUMP FIRE.

ARFF Incident Detail Report

Air Services Australia COOLANGATTA **Incident No:** 1320

ARFF Incident Details for **Aircraft - Crash** **02/07/2009**

Incident Site:	West of Runway 32 Undershoot area	**Number of Lives Saved:**	0
Origin of Call:	Crash Alarm	**Number of Deaths:**	1
Company:	OTHER - Company unknown	**Number of Injuries:**	0
Est Damage Value:	$250000	**Est Facility Value:**	$0

Incident Times (UTC)

Call Time:	02/07/2009 00:16:00	**Arrival Time:**	02/07/2009 00:20:00	**End Time:**	02/07/2009 05:59:00
Dispatch Time:	02/07/2009 00:17:00	**Control Time:**	02/07/2009 00:50:00	**Return Time:**	02/07/2009 06:12:00

Materials Used

DCP Used:	0.00 **kg**	**Foam Used:**	20 **litres**
WaterUsed:	320 **litres**	**Other Used:**	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
Police	1	Ambulance	1	MFB	1
Airport Safety	1	ULFV 8	2	FSM Vehicle	1
Aust Federal Police	1				

Staff in Attendance

Team Leader: KALENDRA, Paul G **FSM:** EVANS, Rodney J

Other Staff:

FRANKS, Peter R DAWSON, Steven J JOHNSTONE, Jonathon

ROSE, Warwick B REEVES, Mark B FISHER, William J

POWELL, Matthew D

Actions Taken

Incident 02/07/2009 00:16 -ATC activated crash alarm with nil details initially to FCC. FCC contacted ATC to confirm helicopter crash in vicinity SW area of the aerodrome.

Dispatch 02/07/2009 00:17 -Tenders 2 and 4 dispatched to area west of Runway 32 undershoot. Exact location unknown but ATC advised area west of southern secondary wind indicator. Airport ground staff directed ARFF to location of crash site south of airport perimeter fence and north of Tugun By-pass in swampy medium closed forest.

Arrival 02/07/2009 00:20 - ARFF on scene with Tender 4 adjacent crash site 300 metres west of Runway 32 on a narrow outer perimeter road via Gate 11. Tender 2 positioned 100 meters to the rear of Tender4 due to access difficulties. ARFF deployed one FB10x foam line due to Avgas leak from aircraft wreckage and applied foam blanket to area. ARFF gained access to R22 and extricated pilot to roadway. Resuscitation attempts were undertaken by ARFF. Fire Commander advised FCC that ARFF at Category 0.
00:26 Emergency services arrived and Qld Ambulance Service and Queensland Fire & Rescue Service staff took over resuscitation of pilot with Careflight doctor in attendance. Australian Federal Police, New South Wales Police in attendance and secured the crash site. SFC Evans on scene.
Resuscitation attempts continued for approximately 30 minutes and failed to revive the casualty. ARFF searched area around crash site and confirmed with ATC aircraft POB (one on board). Foam blanket reapplied as required.
Control 02/07/2009 00:50 -ARFF control time and Tender 2 returned to station with Category 6 restoration.
Tender 4 remained on scene with Police until ASTB arrival.

0520 ATSB arrived on scene

End 02/07/2009 05:59 -ARFF end time. Tender 4 left incident site

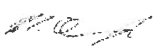
Return 02/07/2009 06:12 -Tender 4 returned to station. Category 8 restoration.

GHD

180 Lonsdale Street
Melbourne, Victoria 3000
T: (03) 8687 8000 F: (03) 8687 8111 E: melmail@ghd.com.au

N:\AU\Melbourne\Projects\31\34071\WP\251713.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev 0	B Ng I. Bird	M. Clough		I. Gregson		01/07/2016
Rev 1						22/08/2016
Rev 2						12/09/2016
Rev 3						22/09/2016
Rev 4						07/10/2016
Final	B.Ng I Bird	I. Gregson		M. Clough		12/10/2016

www.ghd.com

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Question no.: 173

Program: n/a
Division/Agency: Airservices Australia
Topic: PFCs Gold Coast Airport 2
Proof Hansard Page: Written

Senator Rhiannon, Lee asked:

A sampling strategy was then to be identified to clarify the extent of contamination off the Gold Coast aquifer.

a) Where is this up to?
b) Where is sampling being conducted in the area?
c) Is there a copy of the strategy available?

Answer:

See response to 172.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Question no.: 174

Program: n/a
Division/Agency: Airservices Australia
Topic: PFCs at Gold Coast Airport 3
Proof Hansard Page: Written

Senator Rhiannon, Lee asked:

Is there any early indication that contamination of the aquifer might be substantial?
a) If it is too early for such indications, what is the timeframe for receipt of the sampling results to inform those market gardeners, aquaculture and poultry/egg producers, including backyard producers, who might be affected?

Answer:

See response to 172.

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Question no.: 175

Program: N/A
Division/Agency: Airservices Australia
Topic: Number of noise complaints lodged with Airservices regarding Archerfield, Bankstown, Jandakot, Moorabbin and Parafield Airports.
Proof Hansard Page: 118 (17 October 2016)

Senator McCarthy, Malrndirri asked:

Senator McCARTHY: I have a list that I want to go through with you. Let me know if you are able to answer these questions now or if you would like to take them on notice. How many noise complaints have been lodged with Airservices for these airports for the following years—
Ms Spence: I think an individual year basis is a level of detail that we would need to get from Airservices, but we are happy to take that on notice.
Mr Mrdak: We will take it on notice.
Senator McCARTHY: So can I give you the years: 1995, 2000, 2005, 2010, 2011, 2012, 2013, 2014 and 2015. Will you take all of that on notice?
Mr Mrdak: We will take that on notice.

Answer:

Airservices assumed responsibility for noise complaint handling in 1996 and the available data on noise complaints is presented in the table below.

In accordance with Aircraft Noise Ombudsman recommendations, Airservices reports on the number of complainants (that is, the number of individuals who contact Airservices Noise Complaints and Inquiry Service) rather than complaints.

Number of Complainants

	1995*	2000	2005	2010	2011	2012	2013	2014	2015
Archerfield		**	27	45	28	57	60	126	136
Bankstown		51	17	132	105	91	79	82	79
Jandakot		**	59	113	118	158	167	174	155
Moorabbin		**	20	191	237	180	155	152	134
Parafield		**	87	127	91	144	88	110	76

*Pre-dates Airservices complaints' service
**Data was not collected separately for this airport

Rural & Regional Affairs and Transport Legislation Committee

ANSWERS TO QUESTIONS ON NOTICE

Supplementary Budget Estimates 2016 - 2017

Infrastructure and Regional Development

Question no.: 176

Program: N/A
Division/Agency: Airservices Australia
Topic: Total movements at Melbourne, Brisbane and Perth Airports for the years 2010, 2013, 2014 and 2015.
Proof Hansard Page: Written (27 October 2016)

Senator Sterle, Glenn asked:

How many movements between 11pm and 6am occurred at each of the following airports in the following calendar years?

a) 2010
b) 2013
c) 2014
d) 2015

How many total movements occurred at each of the following airports in the following calendar years?

e) 2010
f) 2013
g) 2014
h) 2015

The airports are:

- Melbourne Airport
- Brisbane Airport
- Perth Airport

Answer:

Table 1: Movements between 11pm and 6am

	2010	**2013**	**2014**	**2015**
Melbourne	16072	16539	17302	18065
Brisbane	12175	13200	13527	12804
Perth	14123	15667	15784	14856

Table 2: Total movements

	2010	**2013**	**2014**	**2015**
Melbourne	205880	221920	228499	235380
Brisbane	188769	223835	226335	219979
Perth	124092	150758	145544	137748