- GHD develop draft fact sheets and FAQ's to support Jervis Bay School sample results delivery.
- GHD develop supporting maps and advice to assist Defence communication of biota sample results to government stakeholders.
- GHD and Defence hold planning meetings for delivery and presentation of sample results for of 403 lands originally scheduled for 26 June 2018. Advice received late on the 22/06/2018 that a senior member of the Wreck Bay community had passed away. As a result WBACC was contacted and by agreement the planned meeting and informal community BBQ was postponed.
- Following cancelation of results delivery and presentation GHD and Defence rescheduled delivery of the 403 lands and residential garden results letters to 03/07/2018.
- GHD submit additional secondary biota samples from residential fruit and vegetable sampling and Mary Creek to validate primary sample results and support investigation dataset.
- Defence and auditor provide comment to Draft Waste disposal plan Rev A.
- Josh Jones (Defence EMOS contractor) advises automatic weather station project commences 27 July and will include disposal of DSI drilling waste soil and water following required approvals.

2.2 Previously raised items to be addressed

GHD identify all Factual Results Letters have been issued, grouped by sample type and area. The list of factual letters is provided below with basic summary:

- Factual Memo 1 to 5 - Combined media - Concrete core, Soil, Sediment, Surface water and Groundwater – HMAS Creswell and JBRF areas (On Site) (Issued 2017).
- Factual Letter 6, 7 and 10 - Water – lake McKenzie, Lake Windermere and Potable water storage tanks (JBTA infrastructure) (Issued 2017).
- Factual Letter 8, 9 and 12 - Black/grey water - Sewerage system JBRF, HMAS Creswell, Wreck Bay (Issued 2017).
- Factual Letter 11 - Water - JBRF – closed loop water systems associated with firefighting training school (Issued 2017).
- Factual Letter 13 - Terrestrial Ecology Biota – On Site – HMAS Creswell/JBRF areas (Issued 2018).
- Factual Letter 14 - Soil and Water - dry weather - off site – 403 lands (Issued June 2018).
- Factual Letter 15 - Soil and Water - wet weather - off site – 403 lands (Issued June 2018).
- Factual Letter 16 - Aquatic Ecology Biota – unnamed pools (403 land) (Issued June 2018).
- Factual Letter 17 - Aquatic and terrestrial ecology Biota – Lake McKenzie area (Issued June 2018).
- Factual Letter 18 - Terrestrial Ecology Biota – On Site – HMAS Creswell/JBRF areas (Issued June 2018).
- Factual Letter 19 - Biota Marine/estuarine/Freshwater – Flat Rock and Captains Lagoon (Issued June 2018).

- Factual Letter 20 - Biota Marine/estuarine/Freshwater – Mary's and Summercloud Creeks (Issued June 2018).
- Factual Letter 21 - Biota – Fruit and vegetable residential gardens – School, Wreck Bay, Village road (Issued June 2018).

3.0 Project progress

- The following items have been completed this reporting period:
  - 100% completion of on and off site biota sampling.
  - Receipt and validation of 98% of sample results.
  - Preparation and issue of factual results letters

3.1 Project impacts

- Onsite sample results (biota, soil, water) and potential for agency dietary advice.
- 403 land sample (biota, soil, water) results and potential for agency dietary advice.

3.2 Project meetings

Project meetings held this reporting period are presented in Table 1.

Table 1: Summary of meetings held during the June reporting period

Meeting date	Meeting title	Participants	Minutes circulated
Recurring Wednesday's	Weekly meetings	JBRF project team – Defence, GHD & Site auditor	Yes
19/06/2018	DSI and HHERA preliminary planning	JBRF project team – Defence, GHD & Site auditor	No
19/06/2018	PCG Monthly	Defence, GHD, Site auditor, Agencies and stakeholders	Yes
21/06/2018	WBACC results presentation planning	Defence, GHD	No
26/06/2018	Adhoc teleconference Jervis Bay School results	GHD/Defence/ ACT Government	No

3.3 Project deliverables submitted this period

Project deliverables submitted during this reporting period are presented in Table 2.

Table 2: Project deliverables submitted during the June reporting period

Document status	Title	Date submitted
Final	2126171_LET_Factual Letter 13 May 2018	30/05/18
Final	2126171_LET_Factual Letter 14 June 2018	07/06/18
Final	2126171_LET_Factual Letter 15 June 2018	07/06/18
Final	2126171_LET_Factual Letter 16 June 2018	04/06/18
Final	2126171_LET_Factual Letter 17 June 2018	19/06/18
Final	2126171_LET_Factual Letter 18 June 2018	29/06/18
Final	2126171_LET_Factual Letter 19 June 2018	29/06/18
Final	2126171_LET_Factual Letter 20 June 2018	29/06/18
Final	2126171_LET_Factual Letter 21 June 2018	29/06/18

Draft	2126171_LET_Draft Waste Disposal plan May 2018	29/05/18
Final	Results Letter 2 – Wreck bay 403 lands - 180626	26/06/18
Final	Results Letter – 14 Dhugan Close, Wreck Bay	26/06/18
Final	Results Letter – 5 Ngadjung Close, Wreck Bay	26/06/18
Final	Results Letter – 6 Ngadjung Close, Wreck Bay	26/06/18
Final	Results Letter – 69 Village Road, Jervis Bay	26/06/18
Final	Results Letter – 73 Village Road, Jervis Bay	26/06/18
Final	Results Letter – 79 Village Road, Jervis Bay	26/06/18
Final	Results Letter – 95 Village Road, Jervis Bay	26/06/18
Final	Results Letter –Village Road reserve, Jervis Bay	26/06/18
Final	Results Letter – Jervis Bay School	26/06/18

3.4 Project Milestones

The following project milestones were achieved in the June reporting period:

- 100% completion of on site and off site, biota, soil, sediment and water sampling.
- 98% receipt and validation of all sample results.
- Commencement of Detailed Site Investigation (DSI) report development.

4.0 Project Forecast

The updated project schedule is presented in the enclosed project schedule, dated 15 June 2018.

4.1 Schedule tracking forecast

- The project schedule originally impacted by the inability to access the Wreck Bay community land has been revised with investigation and reporting completion programmed for January 2019.

4.2 Project deliverables expected next period

- Completion off any additional sampling, as required.
- Sample result data analysis
- Preparation and issue of sample results

4.3 Technical Advisor forecast

The Technical Advisor's achievements and planned activities are presented in Table 3.

Table 3: Technical Advisor achievements and key activities during the June reporting period

Scope item	Achieved to date	Planned for next month
Monitor Project progress and provide comment	Yes	ongoing

5.0 Community enquiries

In this reporting period:

- No community independent enquiries were received via the Community Hotline (1800 987 618) and email (Jervisbay@ghd.com.au)
- There are 0 outstanding stakeholder enquires

6.0 Interaction with Government

Meetings and communications with government stakeholders are summarised in Table 4.

Table 4: Summary of interactions with Government during the June reporting period

Meeting date	Meeting title	Participants	Minutes circulated
15/05/2018	PCG 14 Monthly meeting	Defence, GHD, Site auditor, Agencies and stakeholders	Yes
26/06/2018	Adhoc teleconference Jervis Bay School results	GHD/Defence/ ACT Government	No

9.0 Requests for information from Defence

- All relevant reports and information associated with JBRF environmental assessments and contamination investigations have been provided to GHD by Defence.

10.0 Other Matters

- Nil

Yours sincerely

[redacted]

CC:

Enclosures: Project Milestone Schedule - Dated 15/06/2018

Project Milestone schedule, dated 15 June 2018

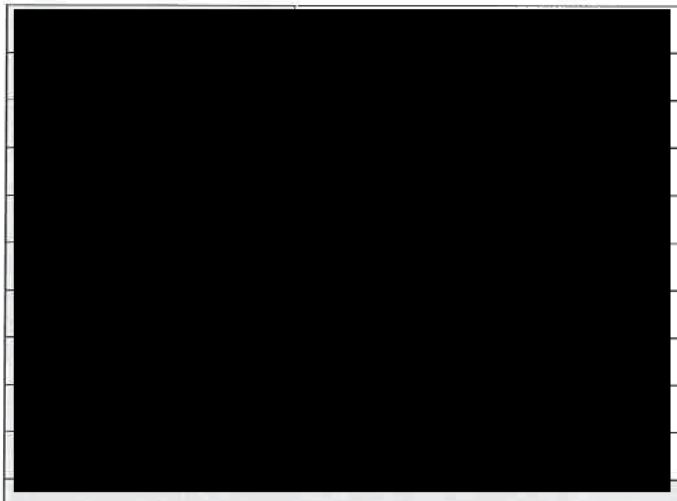
Item	Start	Finish	
DSI	**5/04/2017**	**28/08/2017**	**GHD**
Off-Site Groundwater Bore, Sediment and surface water sampling (Round 2)	18/04/18	20/05/18	GHD
Biota sampling	15/02/18	22/05/18	GHD
Laboratory analysis	12/02/18	26/06/18	ALS/NMI
Laboratory analysis of on hold samples (TBC)	TBC	15/07/18	ALS/NMI
Data analysis and interpretation	27/06/18	17/07/18	
DSI & Groundwater Model Reporting	**28/05/2018**	**25/10/2018**	**GHD/Defence/Agency/WBACC**
DSI and groundwater model report preparation	18/07/18	15/08/18	GHD
Defence and Auditor review of Draft DSI Report	16/08/18	12/09/18	Defence/Auditor
Update of Draft DSI Report	13/09/18	20/09/18	GHD
ACT & NSW State Agency & WBACC review of DSI Report	21/09/18	04/10/18	Agency/WBACC
Finalise DSI Report	05/10/18	25/10/18	GHD/Defence/Auditor
Human Health Risk Assessment (HHRA)	**24/08/2017**	**06/11/2018**	**GHD/Defence/Agency/WBACC**
HHRA (Human Health Risk) Draft report Preparation	8/07/18	4/09/18	GHD
Defence and Auditor review of Draft HHRA report	5/09/18	18/09/18	Defence/Auditor
Update of Draft HHERA report	19/09/18	2/10/18	GHD
ACT & NSW State Agency & WBACC review of HHRA	3/10/18	16/10/18	Agencies/WBACC
Finalise HHERA Report	17/10/18	6/11/18	GHD/Defence/Auditor
Ecological Risk assessment (ERA)	**18/07/18**	**4/12/18**	**GHD/Defence/Agency/WBACC**
ERA (ecological risk) Draft report Preparation	18/07/18	2/10/18	GHD
Defence and Auditor review of Draft ERA report	3/10/18	16/10/18	Defence/Auditor
Update of Draft ERA report	17/10/18	30/10/18	GHD
ACT & NSW State Agency & WBACC review of ERA	31/10/18	13/11/18	Agencies/WBACC
Finalise ERA Report	14/11/18	4/12/18	GHD/Defence/Auditor
PFAS Management Area Plan (PMAP)	**17/10/18**	**6/12/18**	**GHD/Defence/Auditor**

PMAP Briefing	17/10/18	17/10/18	GHD/Defence/Auditor
PMAP Draft Report preparation	18/10/18	07/11/18	GHD
Defence and Auditor review of Draft PMAP report	8/11/18	21/11/18	GHD/Defence/Auditor
PMAP report workshop	22/11/18	22/11/18	GHD/Defence/Auditor
PMAP Rev 0 workshop	23/11/18	6/12/18	Agency
Finalise PMAP Report			GHD/Defence
Community Information Sessions	**21/03/2017**	**25/05/2018**	GHD/Defence/Agency/Community
Community Information Session 3	TBC	TBC	To coincide with planned agency advisories
Community Information Session 4 (Post DSI/HHERA/PMAP finalisation)	7/12/18	7/12/18	GHD/Defence/Agency/Community
Stakeholder engagement reporting	19/12/2017	31/12/2018	GHD/Defence
Draft Stakeholder and engagement report	17/12/18	4/01/19	GHD
Finalise stakeholder engagement reports	14/01/19	18/01/19	GHD/Defence
Project Close out	**21/01/19**	**05/02/19**	**GHD/Defence**

Australian Government
Department of Defence
Estate and Infrastructure Group

PFAS Environmental Management Program
Monthly PCG Meeting (16) – JBRF

Administrative Details	
Date	17 July 2018
Time	**14:00hrs (AEDST)**
Venue	Teleconference
Dial-in Details	[redacted]ustralia Toll free Access code: [redacted]
Chair	[redacted]
Minutes	GHD
Attendees	
[redacted]	
[redacted]	
Stedman Andrew	Andrew.Stedman@act.gov.au
[redacted]	
Heath Chester	heath.chester@act.gov.au
David Clapham	David.Clapham@act.gov.au
[redacted]	
Lyndell Hudson	Lyndell.Hudson@act.gov.au
[redacted]	
[redacted]	



Agenda	
Introductions	
Investigation Progress	- **Detailed Site Investigation (DSI)** - DSI reporting and Numerical Groundwater Model - Factual memorandums
Future Stages (schedule)	- Human Health Risk Assessment (HHRA) - Ecological Risk Assessment (ERA) - PFAS Management Area Plan (PMAP)
Site Auditor	- Update from site auditor
Stakeholder Engagement	- Meetings and briefs - Community enquiries
Risks and Issues	
Other Business	
Close	

Australian Government
Department of Defence
Estate and Infrastructure Group

PFAS Environmental Investigation – Jervis Bay Range Facility
PROJECT CONTROL GROUP MEETING #15

Administrative Details	
Date	Tuesday 19 June 2018
Time	14:00 – 14:50
Venue	Teleconference
Dial-in Details	Toll ---- Toll-free Participant PIN
Chair	Defence Project Manager
Minutes	Taken by

ATTENDEES	
Defence	
Mr Benjamin Wickham (BW)	
Lead Contractor (LC), GHD	
Site Auditor (SA), AECOM	
Agencies	
David Clapham (DC – ACT)	ACT Government - Senior Policy Officer
Lyndell Hudson (LH)	ACT Health

Welcome and Conduct of PCG Meetings
[redacted] Defence PFAS -Welcomed attendees to the JBRF PFAS Investigation meeting.

Investigation Progress Detailed Site Investigation

1. ([redacted](GHD)) provided an overview of investigation progress.

- Site investigation sampling is complete with last samples collected and submitted 25 May 2018.
- Majority of the primary sample results have been received with QA samples and validation of the data outstanding.
- Secondary biota samples (fish whole bodies) have been submitted for analysis to support the ecological risk assessment.
- The current focus is to receipt and transfer all of the data into the ESDAT database for QA review and validation.
- Factual letters issued since last PCG meeting include:
  - Factual letter 13 – HMAS Creswell and JBRF terrestrial biota.
  - Factual letter 14 –Dry weather, off site soil, sediment and water
  - Factual letter 15 –Wet weather, off site soil, sediment and water.
  - Factual letter 16 – Unnamed ponds aquatic biota
  - Factual letter 17 – Lake McKenzie, Terrestrial and aquatic biota
- The remainder of sample results are expected to be issued by end of June, which will include marine results for Jervis and Wreck Bays and associated tributaries.
- A preliminary overview of results received that have not been issued as factual letters at this time include:
  - Marine Locations (Jervis bay and Wreck Bay) Majority of biota reporting "No Detect", with a couple of isolated samples reporting very low level detects.
  - Mary Creek
    - Sediment - some low level PFAS detections
    - Surface water – elevated PFAS levels between 0.7 - 10 µg/l
    - Biota – Detects in vertebrate and invertebrate with whitebait, bream and freshwater crayfish reporting PFAS detects.
  - Summercloud Creek
    - No Detect in freshwater crayfish.
    - Lower levels of detects in other vertebrate and invertebrate samples
  - Residential garden fruit and vegetable sampling was based on the produce available at the time and included lilly pilly, citrus, tomato and an egg. Non detections were reported across all properties, with exception of lilly pilly fruit from two of the five trees at Jervis bay School, which reported detects at the lowest level of reporting for PFHxA. These samples were confirmed through additional analysis at primary and secondary laboratories.

2. [redacted] In Summary the all the DSI sampling has been completed with few laboratory results outstanding. On completion of checks and reviews the factual letters will be issued.

3. **Comments Requested**
   - (DC-ACT) Awaiting factual letters for results to allow ACT Government to provide any Human Health advice to JBTA. ACT EPA and Health are collaborating with NSW EPA to review data and determine if any recommendations will be required for issue to the community by JBTA. PFAS contamination is receiving considerable scrutiny within the ACT and it is likely Jervis Bay results will receive increasing attention.
   - ([redacted]) GHD have conducted two iterations of the land a water use survey and acknowledge the difficulties associated with getting information from the community through traditional surveys. The information GHD were able to obtain involved the use of maps available at community events, with community members encouraged to indicate on the map where and what type of biota or land use was collected. The fruit and vegetables collected in the Wreck Bay area represent what GHD understand the community consume, such as lilly pilly and what was available at the time of sampling. GHD intends to seek approval to canvas further information from the community at the upcoming BBQ to support the human health risk assessment.
   - ([redacted]) Can NSW EPA be provided with a list of questions for the community BBQ to enable input into the questioning. ([redacted]) Agree, the questions will be simple in nature, noting the people attending the BBQ are likely from the same family groups, therefore gaining data from an entire cross section of the community is difficult.
   - ([redacted]) Noted the wet weather flows in Mary Creek were 10 fold the recreational guidelines, is this going to be raised with the community. ([redacted]) yes these results will be communicated at the WBACC meeting along with biota results. The normal protocol is to write a letter to the landholder and provide all the results, which in this case the letter will be provided to WBACC board. The letter will highlight exceedances and in addition the board will be briefed on the results.

Future Stages - Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)

1. ([redacted]) GHD have received majority of the sampling results and are in the process of reviewing and validating these results for use in the HHRA and ERA risk assessments.
   - The HHRA will consider three or four separate different community groups, including the Wreck bay community, Recreational fishing and other activity including tourists, outlying local community and the Defence base community.
   - The risk assessment will consider how and how often these groups are likely to be exposed exposed to the water, soil and biota.
   - The risk assessment will follow the NEPM and standard exposure parameters, where site specific parameters are not able to be developed, with a focus on site specific parameters where possible.
   - The HHRA is scheduled for Draft release to Defence and auditor early November
2. ([redacted]) GHD The ERA is quite complex with some of the data we have collected used for both the HHRA and ERA. The risk assessment will consider the two catchments north and south of JBRF, which effectively have different ecological systems and food webs.
3. ([redacted]) To confirm GHD will issue HHRA and ERA as separate documents. With the ERA following the HHRA as greater effort is required to develop. The HHRA is scheduled for issue to the PCG late November following Defence and auditor review.
4. [redacted] Stream monitoring is complete which supports the development of the groundwater numerical model which will form an annex to the DSI.
5. **Comments Requested**
   - Nil

Future Stages - PFAS Management Area Plan PMAP

1. ([redacted]) PMAP is in early stages with analysis of data and consideration of options which will consider source control, pathway and receptor management. The PMAP is scheduled for issue in November 2018.
2. ([redacted] With Defence reviews issue to PCG is likely towards the end of November.
3. **Comments Requested**
   - Nil

Site Auditor Update

1. ([redacted]) Awaiting results and data for review.
2. **Comments Requested**
   - Nil

Stakeholder Engagement

1. No activity or calls to the Community Information line or email inbox, noting the interactions with the WBACC board and support staff is ongoing.
2. [redacted] A meeting with the WBACC board was held on the 22 May 2018 to present the sampling results reported from 403 land prior to the 15 May 2018. The meeting presented a summary of results received (approximately 60% of total) both PFAS and non PFAS chemicals. Approximately 20% of the samples taken were tested for non PFAS chemicals such as PPH, BTEX, heavy metals and asbestos. The results biota, soil, sediment and water were split and discussed North and South of Bherwerre Ridge to allow WBACC to better understand the impacts to the Wreck bay community. A summary of the number of samples taken, number of detects and the number of samples that had exceeded guidelines as listed in NEPM or other sources. This summary provided to WBACC identified that biota and surface water in Mary Creek had the highest occurrence of exceedances of biota and recreational water.
3. ([redacted]) The remainder of the sample results data, which has now been received, is planned to be delivered to the WBACC board on the 26 June which includes the wet weather sample results taken after recent rainfalls. An informal community BBQ for the wider community is planned afterwards to explain the sampling process and what the results numbers may indicate. The informal BBQ is also planned to be used as an opportunity to informally gather additional information on land and water use within the area.
4. ([redacted]) A series of residential sample results letters will also be hand delivered on the 25/06/18 to the Wreck Bay and Village road properties were sampling of fruit and vegetable was undertaken. The hand delivery will allow residents to question and understand the results.
5. [redacted] The next upcoming formal community update is not scheduled at this time however Defence would like to align this with any advisories that may be released by agencies, to allow the community to hear the messaging first hand agencies to participate
6. **Comments Requested**
   - . (DC-ACT) requested a copy of the presentation provided to WBACC board
   - (DC-ACT) confirm the plan to have agencies attend a community session to coincide with release of advisories referred to, are those that would be produced by ACT health and issued to JBTA and not Defence advice. ([redacted] - Defence) Correct advisories developed by ACT health in collaboration with other agencies. This is considered opportune timing as it has been some time since a formal community information session has been held.
   - (DC-ACT) Confirm the update provided to WBACC board identified Mary Creek was identified as having contamination exceeding guidance levels, but no advice was provided in relation to those exceedances. ([redacted] - Defence) Correct and identified the data would be used in a detailed risk assessment and the data may be used by agencies to develop advisories. No detail on any specific species or advice that may be issued by specific agencies was identified. This same general messaging will be reinforced in the next results presentation.
   -

Community Enquiries

1. No activity or calls to the Community Information line or email inbox, noting the interactions with the WBACC board and support staff is ongoing.

Risks and Issues and Other Business

1. **Comments Requested** • (LG) Key risk involves maintaining the relationship with the Wreck Bay community.
Meeting Close - 14:50 PM
Actions
Nil

Williams, Jarrod (Health)

From: [redacted]@epa.nsw.gov.au>
Sent: Tuesday, 17 July 2018 11:45 AM
To: [redacted] Pengilley, Andrew (Health); Barr, Conrad (Health)
Cc: Danielle Playford
Subject: Currambene advice
Attachments: currambene-fishing-and-dietary-advice.pdf

Hello all,

Please feel attached the factsheet regarding Currambene Creek dietary advice.

The wording we used for those species where limited samples were caught is:

Recreational fishers should reconsider the need to consume multiple servings of freshwater species (like Australian Bass and Yabby) from the freshwater sections of Currambene Creek.

Cheers,

[redacted]

NSW GOVERNMENT | Department of Primary Industries

Currambene Creek fishing and dietary advice

Low levels of PFAS (per- and poly-fluoroalkyl substances) have been identified in fish species in Currambene Creek, likely related to past use of fire fighting foam in the area. The Department of Primary Industries has implemented the recommendations of the NSW PFAS Taskforce, and advises people who frequently catch fish from this area to limit the number of servings of individual species according to the table provided overleaf.

This advice is specific for fish sourced from Currambene Creek.

Catching fish from a variety of locations outside this area will assist in minimising exposure.

Fishers can still take fish within bag and size rules noting the dietary advice, or choose to practice catch and release.

Fishing is not permitted in Sanctuary Zones within the Jervis Bay Marine Park.

Dietary advice

The following advice in Table 1 relates specifically to PFAS detections in species caught in **Currambene Creek.**

Table 1: Maximum recommended weekly intake for species caught in Currambene Creek by frequent fishers

	Servings* per week	
Species	Children 2 to 6 years old	All other age groups
Eastern Sea Garfish	6	#
Estuary Perch	1	2
Luderick	4	#
Mulloway	1	2
Sea Mullet	4	#
Silver Trevally	1	2

* Adult serving size = 150 grams. Children serving size = 75 grams.
#Recreational fishers should reconsider the need to consume multiple servings of freshwater species (like Australian Bass and Yabby) from the freshwater sections of Currambene Creek.

Note:

- #No dietary advice is required based on the reported PFOS and PFHxS concentrations. Concentrations were below the adopted trigger values in the samples analysed.
- Consumption of offal in all species should be avoided.
- Species specific information is for when a single species of fish is eaten per week. Eating multiple species would result in a greater exposure, for example:
  - for a child eating fish caught in Currambene Creek - 1 serve of either Estuary Perch, Mulloway or Silver Trevally and 1 serve of any other species listed in the table in one week would exceed the recommended PFAS intake.
- Sand Whiting, Yellowfin Bream and Black Bream were also sampled and tested from Currambene Creek, but no dietary advice is necessary for these species.
- Leatherjacket, bluespot flathead and bonito were sampled in Jervis Bay, and PFAS was not detected in any of these samples. No precautionary advice is required for Jervis Bay.
- General fish and seafood consumption advice states that people should eat 2-3 serves of fish and seafood each week as part of a balanced diet.
- Independent of the site-specific advice related to PFAS above, pregnant women and women planning pregnancy should see the following fish consumption advice published by Food Standards Australia New Zealand (FSANZ) relating to mercury www.foodstandards.gov.au/consumer/chemicals/mercury/Pages/default.aspx.
- Fishing is not permitted in Sanctuary Zones within the Jervis Bay Marine Park

Additional PFAS information:

www.epa.nsw.gov.au/MediaInformation/pfasinvestigation.htm

14852APRIL18

Stedman, Andrew (Health)

From: [redacted]@ghd.com>
Sent: Wednesday, 25 July 2018 1:36 PM
To: [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@spotless.com.au; [redacted]@shoalhaven.nsw.gov.au; [redacted]@infrastructure.gov.au; [redacted]@environment.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@aecom.com; [redacted]@aecom.com; [redacted]@infrastructure.gov.au; Clapham, David; [redacted]@epa.nsw.gov.au; [redacted]@health.nsw.gov.au; Stedman, Andrew (Health); [redacted]Hudson, Lyndell (Health); [redacted]@shoalhaven.nsw.gov.au; [redacted]WO; [redacted]@defence.gov.au; [redacted]@defence.gov.au
Subject: JBRF PFAS Investigation - PCG Monthly meeting 16 minutes
Attachments: JBRF-PGC Meeting Minutes 16 - July 2018.pdf

ear JBRF PCG,

Please see attached the minutes from meeting 16, held on 16 July 18

Regards,

[redacted]

GHD ***Proudly employee owned***

[redacted]@ghd.com
Level 2, 57 Graham Street (PO Box 621) Nowra NSW 2541 Australia | http://www.ghd.com/
Water | Energy & Resources | Environment | Property & Buildings | Transportation

Australian Government
Department of Defence
Estate and Infrastructure Group

PFAS Environmental Investigation – Jervis Bay Range Facility
PROJECT CONTROL GROUP MEETING #16

Administrative Details	
Date	Tuesday 17 July 2018
Time	14:00 – 14:50
Venue	Teleconference
Dial-in Details	Toll ----- Toll-free ---- Participant PIN
Chair	Defence Project Director
Minutes	Taken by

ATTENDEES	
Defence	
Lead Contractor (LC), GHD	
Site Auditor (SA), AECOM	
Agencies	
David Clapham (DC – ACT)	ACT Government - Senior Policy Officer
Sashini Salgado (SS)	ACT Government
Heath Chester	ACT Construction, Environment and workplace protection

Lyndell Hudson (LH)	ACT Health
Andrew Pengilly (AP)	ACT Health
[redacted]	[redacted]

Welcome and Conduct of PCG Meetings

1. [redacted] Defence PFAS -Welcomed attendees to the JBRF PFAS Investigation meeting and introduced Michelle Barry as the JBRF investigation replacement Project Director, identifying he would stand aside to focus on development of PFAS Management Area Plans (PMAP) for various establishment investigations. [redacted] dentified while his focus would be on PMAP development he would remain in touch with the JBRF investigation to provide support to the incoming Project Director and the project.

Investigation Progress Detailed Site Investigation

2. [redacted] GHD provided an overview of the detailed site investigation project:

- With sampling completed and all primary results received GHD have issued the following factual letters to the PCG last month:
  - 18 – Marine areas of Jervis Bay and Wreck Bay - biota
  - 19 – Flat Rock Creek and Captains Lagoon - biota
  - 20 – Mary Creek and Summercloud Creek - biota
  - 21 – Home grown produce – biota and soil samples
- An overview of results issued as factual letters at this time include:
- Marine locations (Jervis Bay and Wreck Bay) majority of biota reporting "No Detect", with a couple of isolated samples reporting very low level detects (< / = 0.002 mg/kg for PFOS + PFHxS)
- Mary Creek - Biota – Detects in plants, invertebrates and vertebrates across the watercourse and adjacent lands. Species with reported elevated PFAS concentrations include prawns, whitebait, bream and freshwater crayfish.
- Summercloud Creek – low concentrations reported in 2 of 5 freshwater crayfish. Detections in other biota including bream, whitebait and ghost yabbies. Lower levels of detects in other vertebrate and invertebrate samples – Generally lower concentrations than those reported from Mary Creek.
- Flatrock Creek - detects in invertebrates and vertebrates across sampling area, with PFAS detected in mullet, white bait and yabbies. Note that 10 bream and one flathead caught with PFAS < LOR
- Captains Lagoon - Detects in plants, invertebrates and vertebrates across the water course and adjacent lands. Species with elevated concentrations include whitebait, bream, shrimp, worms.
- GHD have submitted additional biota samples to support the ERA. The samples include the remaining whole bodies (homogenised), minus the primary sample portion (fillet) which has previously been analysed and reported. The whole body results are due this week.
- The groundwater model preparation is being completed to feed into the DSI.
- During DSI development, data validation has identified some results from the primary laboratory may have reported possible false positives for PFAS analytes. These analytes (excluding PFOS/PFHxS or PFOA) were identified in a small percentage of the full data set (i.e. < 5%). To eliminate the potential for the reporting of false positives GHD have requested the laboratory confirm the detection and reporting of the analytes.
- GHD priority will focus on the completion of the DSI report to support and feed the HHRA and ERA development.

3. **Comments Requested**
   - [redacted] Defer to health for comment noting factual letters were received and are being considered. ACT Health are taking the lead with DIRDC (JBTA) requested support for any health advisories that may be required.
   - [redacted] Corresponding with NSW EPA regarding dietary advice and are awaiting quality assurance checks before proceeding.
   - [redacted] Sampling results are being considered to develop a broad human health risk assessment, as additional sampling would be required to support a specific risk assessment. This may be available towards the end of the week, which will enable some advice to be developed for the Jervis Bay/Wreck Bay community. The advice will likely identify fish and crustaceans from the Jervis and Wreck Bay tributaries.
   - [redacted] Identify additional samples; [redacted] The additional samples were the remaining whole body fish in sample storage from Wreck Bay, Summercloud, Captains Lagoon and Spiny crayfish from Mary Creek. The samples were selected as the primary (edible) fillet samples reported detects. The remaining whole body was homogenised and analysed to identify the total mass in the entire body to support the ecological risk assessment, as the edible fillets sample results are primarily considered by the HHRA.
   - [redacted] When are these results available and are they additional samples; (DM) They are not additional samples, rather the same sample (remaining whole body) from which the edible portion has been analysed and reported previously. The primary data results have been received, with the QA results expected later this week.
   - [redacted] The PCG can expect another factual letter for the 35 whole body samples when results are available.

Future Stages - Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)

1. [redacted] GHD are waiting for the DSI data to be validated and consolidated and have completed the toxicity assessment components of the HHRA and ERA. Further development will occur in parallel with the development of the DSI.
2. [redacted] Are there any issues encountered at this early stage? [redacted] No issues to report and GHD are comfortable with the dataset at this stage.
3. [redacted] The HHRA is scheduled to be issued to Defence 17/09/18 with issue to the PCG on the 10/10/18 following Defence and auditor reviews. The ERA is scheduled to be issued to Defence 02/10/18 with issue to the PCG on the 31/10/18. The delay between HHRA and ERA allows for the additional effort to complete the ERA and separates the review period for these reports.
4. **Comments Requested**
   - [redacted] Identified the factual letters going to the community are problematic and not well communicative of the risks, more like laboratory reports.
   - [redacted] The factual letters issued to the PCG do not go to the community. The factual results for sampling on private property are provided to the property owner and in this case were hand delivered with opportunity for discussion and interpretation assistance. The results for sampling on 403 lands have been provided to the WBACC Executive Board, with briefings to the board arranged to discuss the results and a commitment to provide an engagement session on the results with the community. The issue of the results to WBACC board prior to the presentation in discussion in this case was not ideal, however we are in close consultation with the Board and they have a direct line of communication.
   - [redacted] Identified the difficulties associated with developing a level of trust with the Board and the community over the past 18 months and as part of that process we are committed to be transparent with the results of the investigation as soon as they were available, rather than have the community wait for the results while the reports were developed. The results delivered were intended to be supported by a presentation to the entire board, however in this case the passing of a senior community member required the presentation to be postponed. The results were instead delivered to the CEO and Chairperson with the opportunity to discuss, which was appreciated. The Board is currently considering how best to convey the results and messaging back to the community and will work with the defence investigation team to achieve this goal.

5. **Comments Continued**
   - [redacted] Confirm ACT Health are working with ACT/NSW EPA to review biota data and present a health risk assessment separate from this process ? [redacted] ACT health's position is to provide public health advice to DIRDC through JBTA. The risk assessment will be based on the GHD data provided not separate assessment.
   - [redacted] Confirmed in his opinion, the current approach of providing the WBACC Board with unfiltered information as soon as possible is assisting to develop the relationship and level of trust.

Future Stages - PFAS Management Area Plan (PMAP)

1. [redacted] The PMAP is the final stages of the investigation project that identifies the potential PFAS management actions available to address the issues identified by the DSI, HHRA & ERA. Defence have developed a template for use on this project and a number of others and have created a specific section within the PFAS branch to review and finalise the various PMAP's for all sites.
2. [redacted] Ongoing development of the DSI, Groundwater Model, HHRA and ERA will inform the PMAP and at this stage limited consideration of the potential issues and options to manage the site has been achieved. The draft PMAP is scheduled for November 2018
3. **Comments Requested**
   - (DC-ACT) Have any PMAP for other sites been published? [redacted] No PMAP's have been published and all are currently under development. Defence have four initial drafts undergoing the review process by Defence and auditor. The conclusion sections of the PMAPs are receiving significant attention to review the options analysis, cost and value for money and the program for when management activities could commence. Finalisation of the first PMAP is likely 2 months away. The PCG will be provided the opportunity to review the Jervis Bay Territory PMAP.

Site Auditor Update

1. [redacted] No significant update from the last PCG, Awaiting reports for review.
2. **Comments Requested**
   - Nil

Stakeholder Engagement

1. [redacted] Provided an overview of the stakeholder interactions and activities:
   - One call registered during the period from a Wreck Bay Community member on the community information line regarding the informal community BBQ arrangements.
   - The presentation of results letter to WBACC Board, planned for 25 June and informal community BBQ was postponed to the 01 August, by request, due to the passing of a senior community member.
   - [redacted] and [redacted] met individually with residents who provided home produce samples to hand deliver the results. The Letters were also provided to WBACC Board CEO and JBTA (CB) as the land owners. The results delivered reported no detections in the fruit and vegetable sampled, however some low detections in the corresponding soil samples were reported.
   - [redacted] and [redacted] met with WBACC Chair [redacted], [redacted] (CEO) and [redacted] (Dep CEO) to present latest results letters for 403 and Booderee Park lands. The WBACC Board members were not shocked or surprised by the results and identified they would like some advice regarding physical warning signage.
   - An extraordinary Board meeting is scheduled on the 01 August to present and discuss the results.
2. [redacted] Highlighted that WBACC may require advice regarding warning signage and identified [redacted] had invited Rueban Ardler to inspect the Defence site and signage..
   - [redacted] Confirmed the invite to inspect the Defence site and did not recall the reference to signage, which is assumed to be a misunderstanding, as Defence do not currently have any physical PFAS warning signage.
   - [redacted] Identified when Mary Creek was originally closed (2016), JBTA provided advice for the language to be used on physical signage (similar to the language used for closures regarding E.coli etc).

Stakeholder Engagement Continued

- [redacted] Who has responsibility for the closing of Mary Creek?
- [redacted] JBTA provide closure advice to WBACC Board when the environmental testing results provided by ACT Government identify exceedances for recreational water quality. This closure advice is provided to Defence for Captains Lagoon, WBACC Board for Mary and Summercloud Creeks and to Parks for the campground waterways.
- [redacted] Confirm WBACC Board is responsible for the installation of physical signage? (CB) confirmed, WBACC is a Commonwealth corporate entity, funded by Prime Minister and Cabinet's Department of Indigenous Affairs and DIRDC, to provide for local government services and land council activities.
- [redacted] Has the physical signage been installed for advice provided by ACT health? [redacted] Confirmed the advice regarding the 2016 closure had been provided to WBACC and the physical signage was installed, however cannot confirm if the signage remains in place. [redacted] Identified he had recently received a question regarding the Mary Creek physical signage from a local community member and from the conversation assumed the signage may have been recently re-installed. [redacted] or GHD sampling teams have not observed the signage, noting there are areas of Mary Creek where access is not supported by the community.
- [redacted] Repeat messaging is not conducted by agencies, for example the Currambene Creek advice issued last holidays would be forgotten or not heard by new visitors. A message a week old is a message forgotten.
- [redacted] Defence may consider sponsoring physical signage and will explore how repeat messaging may be best achieved.
- [redacted] Regarding notification of results to the school could ACT Government provide and update.
- (DC-ACT) ACT Government has forwarded the results letter to the Director General of Education, with Defence and GHD holding a teleconference to discuss. ACT Health has performed an initial risk assessment and the advice provided to Department of Education is that there is no risk at this moment as the Lilly Pilly trees do not fruit until December. The question of management actions going forward is still to be determined. The preference for communication of the issue to the school community, is to have this specific messaging as an element of the broader community engagement and messaging in the upcoming community drop in sessions. A risk is that Department of Education may undertake to communicate the issue, if the timeline for wider community messaging does not align. At this time communication to the school principal has occurred, however not to the school community.
- [redacted] ACT Health confirmed the preference is to combine the school messaging with the broader messaging to provide a more complete picture of all PFAS contamination in the environment to the local community. The levels detected in the school's Lilly Pilly fruit is considered to have a much lower level of risk, when compared to the levels detected in the water and other biota, however the Department of Education may evaluate this risk differently and decide to communicate the risk or remove the trees as a precaution.
- [redacted] It is understood the health advice currently being prepared for JBTA, if available in time will be communicated to the WBACC Board at the meeting planned for 01 August. This advice will be communicated at a wider community information session in the near future, irrespective of the WBACC Board meeting. The community information session will be a joint engagement coordinated by Defence with Agency support.

3. **Comments Requested**

- [redacted] The ACT Government periodically receives media requests regarding Jervis Bay and PFAS which have increased in frequency in the past month and we are currently responding to a freedom of information request on this matter.

Risks and Issues and Other Business
1. **Comments Requested** • (DC-ACT) We need to develop clear health advice and work quickly to communicate this advice to community. • [redacted] Highlight the importance of the risk assessment and health messaging to include/consider repeat visitors to the territory • [redacted] Should this be discussed with the Parks Joint Management Board at the next routine meeting or do we need an extra ordinary session. • [redacted] Most of the Joint Board members are captured through theWBACC Board and community meetings so an extra ordinary meeting is not required and suggested we aim to present at the next scheduled meeting on the 22/23 August and will arrange a suitable timeslot and advise.
Meeting Close - 15:00 PM
Actions
Nil

Williams, Jarrod (Health)

From: [redacted]@epa.nsw.gov.au>
Sent: Wednesday, 25 July 2018 4:55 PM
To: Pengilley, Andrew (Health); Barr, Conrad (Health)
Cc: Danielle Playford
Subject: NSW EPA - Jervis Bay Territory suggested dietary advice
Attachments: Jervis Bay precautionary advice .docx

Hi Andrew and Conrad,

Please find the attached PFAS advice for the Jervis Bay Territory which has been developed using the NSW precautionary dietary approach. The NSW EPA recommends that the ACT government consider providing general dietary advice for the tributaries in Jervis Bay Territory due to the amount of data collected being insufficient for serving size advice. The NSW EPA also recommends that further biota is collected so specific dietary advice can be provided at species and tributary levels in the future.

The NSW EPA notes that Defence will be discussing the findings of the biota sampling at the Wreck Bay Aboriginal Community Council on 1 August 2018 and understands that the ACT government wish to provide dietary advice at that time. The NSW EPA emphasises the data gaps in the biota study that has been reviewed and the ACT should carefully consider the advice to be issued to the local community.

Please contact me if you have any questions.

Regards,

[redacted] – **NSW PFAS Strategy**
Hazardous Incidents and Environmental Health, NSW Environment Protection Authority
+61 [redacted]
[redacted]@epa.nsw.gov.au www.epa.nsw.gov.au @EPA_NSW
Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555

Dietary assessment for PFAS-impacted aquatic biota (seafood) from Jervis Bay Territory (ACT)

25 July 2018

NSW OEH Environment Protection Science, Contaminants and Risk (C&R)

Reporting: [redacted]
Contact: [redacted]
Reviewer: [redacted]

Background and Scope

The Department of Defence is investigating PFAS[1] contamination in the ACT Government Jervis Bay Territory (JBT), ACT originating from HMAS Creswell. The ACT Government, as the responsible jurisdiction for JBT (along with Commonwealth), has requested assistance from NSW EPA in the form of dietary assessment of PFAS contaminated aquatic biota, to support management actions to protect the local population, including the Wreck Bay Aboriginal Community. Specifically, this information will be used to determine if precautionary advice for the consumption of seafood is required.

NSW EPA have requested OEH Environment Protection Science, Contaminants and Risk (C&R) undertake the dietary assessment. Data for the dietary assessment has been obtained from GHD, which undertook the sampling and analysis of biota to support a Human Health and Environmental Risk Assessment (HHERA) for HMAS Cresswell, for the Department of Defence.

In related work, NSW Government previously has provided precautionary advice[2] for seafood species in Currambene Creek, which flows into Jervis Bay, as a result of the PFAS investigation at the HMAS Albatross Defence Site.

The dietary assessment described below has been prepared by C&R for NSW EPA, to allow NSW EPA to respond to the request from ACT Government.

Limitations

The sampling design, sampling methods and the quality of the analytical data supplied by GHD, were not reviewed or discussed as part of this assessment. The assessment assumed that the supplied analytical data are fit for purpose. Only the results in the ESDAT spreadsheet (Results_Biota_ESDAT_20180702) were included in this assessment, and it was assumed that all relevant biota data were made available, as advised by GHD (Email from GHD to PFASIM Jervis Bay, 02 July 2018).

Minimal information was supplied on which species are caught and consumed by the Wreck Bay Aboriginal Community (WBAC), and from where. Sampling was not consistent across the tributaries and insufficient sample numbers were collected for each species. These data gaps limit the degree to which specific dietary assessment could be made both in terms of species consumed and for different tributaries.

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[1] Per- and polyfluoroalkyl substances

[2] https://www.epa.nsw.gov.au/news/media-releases/2018/epamedia180507-dietary-advice-for-fish-from-currambene-creek

Key Conclusions

The dietary assessment for seafood was consistent with the NSW Government approach for finfish, except where specifically noted in the assessment below.

In the assessment, the marine/estuarine bays are referred to as Jervis Bay, Wreck Bay and Summercloud Bay. The creeks on Jervis Bay territory (JBT) land are referred to as the tributaries (Flatrock Creek, Captains Lagoon, Summercloud Creek and Mary Creek).

The results in this assessment can be used to indicate potential risk if locally caught aquatic biota are consumed by the local community, but sample numbers are not adequate to provide species-specific dietary advice.

The Bays

- No precautionary advice is recommended for seafood caught in Jervis Bay.
- When dietary assessment was made using the mean (average) of all available data for Wreck Bay, precautionary advice was not indicated for Wreck Bay.
- No biota data were available from Summercloud Bay, and the above advice for Wreck Bay can also be applied to Summercloud Bay until further sampling and analysis is undertaken.
- Additional sampling in Wreck Bay and Summercloud Bay should be undertaken due to low sample numbers and measured PFAS concentrations in some samples in Wreck Bay biota.

The JBT tributaries

- Precautionary advice is recommended for consumption of all seafood (fish, crustaceans and molluscs) in tributaries which receive runoff from HMAS Creswell in JBT ACT, until further information becomes available.
- Contamination levels in seafood differed between each tributary. With additional sampling it may be possible to provide more refined, tributary-specific and species-specific advice, and therefore potentially minimise impacts on the local communities. Any further sampling should consider key species and locations used by the local community.

Key Recommendations

- ACT Government should consider implementing precautionary advice for consumption of aquatic biota in the tributaries which receive runoff from HMAS Creswell.
- ACT Government could consider stakeholder engagement to communicate that consuming seafood from the Jervis Bay does not represent a risk due to PFAS exposure.
- ACT Government should discuss with relevant agencies on how to communicate the precautionary advice. This report provides technical advice, and is not intended to be used as direct communication with the community.
- Additional sampling/analysis of relevant biota from Wreck Bay, Summercloud Bay and the relevant tributaries in JBT is recommended to inform refined dietary assessment.
- Prior to any additional sampling, the local community should be consulted on the species generally consumed and the tributaries/locations where the species are caught. Refer to the email correspondence from the NSW EPA dated 25 June 2018 to GHD on recommendations for a dietary survey.
- ACT government should consider consulting NSW DPI Fisheries for additional information on what biota species should be targeted, and what sampling methods are appropriate.

Summary of the dietary assessment for PFAS-impacted aquatic biota (seafood) from Jervis Bay Territory (ACT)

Data source

The data spreadsheet, *Results_Biota_ESDAT_20180702*, provided by GHD (contracted by Defence for the HMAS Creswell HHERA) was used for this assessment. The data were considered appropriate for this dietary assessment as they were obtained to support a Human Health and Environmental Risk Assessment (HHERA) for HMAS Creswell.

Aquatic biota were caught from the Bays (Jervis Bay and Wreck Bay) and tributaries (Flatrock Creek, Captains Lagoon, Summercloud Creek and Mary Creek) in JBT (See Figure 1). Samples from Lake McKenzie were considered qualitatively below, but not included in the assessment as they were not likely seafood species.

Data limitations for the dietary assessment included:

- sampling was not consistent across the tributaries and insufficient sample numbers were collected for each species. Therefore, species-specific and tributary-specific advice was compromised.
- no information on where and which species are caught and consumed by WBAC was available. This is important information to consider for any dietary advice.

Approach

GHD provided data to the NSW EPA, and these data were used for a dietary assessment, consistent with the NSW Government approach for precautionary dietary advice relating to PFAS. The approach used in this assessment involved:

1. **Selection of aquatic food species:** aquatic biota (seafood species) likely to be consumed by the community were included
2. **A screening assessment** for PFOS+PFHxS and PFOA[3] **using the NSW dietary advice trigger value** for PFOS+PFHxS in finfish (developed by the NSW PFAS Taskforce). Screening was undertaken for the following seafood groups:
    a. Finfish
    b. Crustaceans
    c. Molluscs including other invertebrates
3. **A species-specific dietary assessment** where concentrations in biota exceeded the trigger values. Where sufficient sample number were available, the acceptable number of serves per week were calculated, based on standard serving sizes for fish (150 g for adults and 75 g for children).

[3] PFOS: perfluorooctane sulfonate, PFHxS: perfluorohexane sulfonate. PFOA: perfluorooctanoic acid

Sampling locations

Sample locations	Location on Map
Northern tributaries	
Captains Lagoon	A
Flatrock Creek	B
Southern Tributaries	
Mary Creek	C
Summercloud Creek	D
Lakes	
Lake McKenzie	E
Bays/ Estuaries	
Jervis Bay	F
Wreck Bay	G

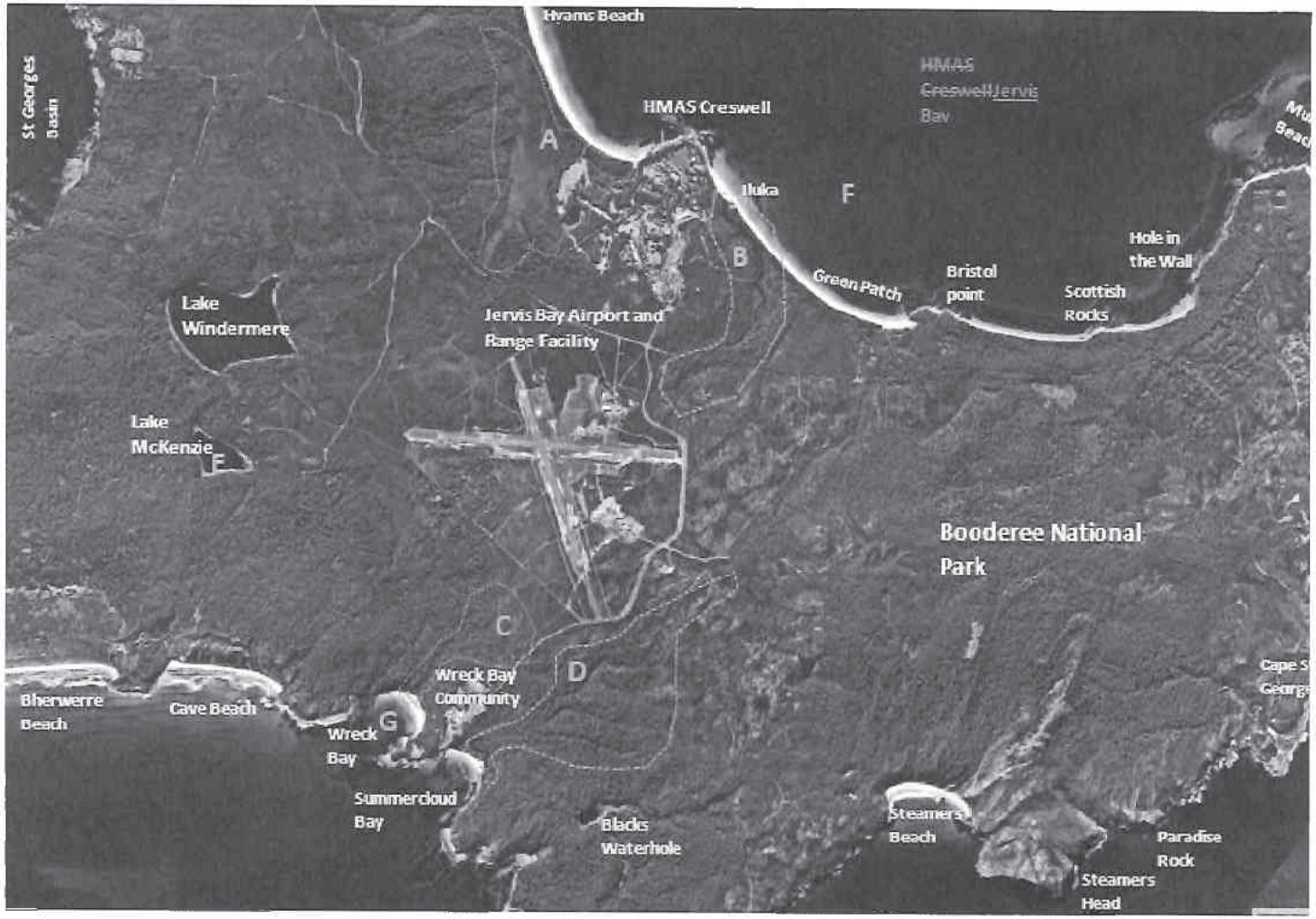

Figure 1: Aerial image of the Jervis Bay Territory showing sample locations (courtesy of Nearmap)

1. Selection of aquatic food species

The GHD data included biota relevant for both ecological and human health risk assessment, and relevant to terrestrial and aquatic organisms. Only aquatic biota considered to be a potential human food source were evaluated in this assessment. Species included in the assessment, and sample numbers, are included in Table 1.

Table 1. Aquatic biota data used in the screening assessment. #/# = number of results > limit of reporting versus the number of samples analysed.

	Species	Portion	Tributaries				Lake	Bays/ estuaries	
			Northern Tributaries		Southern Tributaries				
			Captains Lagoon	Flatrock Creek	Mary Creek	Summercloud Creek	Lake McKenzie	Jervis Bay	Wreck Bay
Finfish	Bream	fillet	**10/10**	0/10	-	**2/5**	-	-	-
	Mullet	fillet	**10/10**	0/5	-	0/5	-	-	-
		whole	-	**5/5**	**5/5**	-	-	-	-
	Whitebait	whole	**10/10**	**10/10**	**4/4**	-	-	-	-
	Dusky Flathead	fillet	-	0/1	-	-	-	-	0/2
	Blue spot Flathead	fillet	-	-	-	-	-	0/15	0/2
	Leatherjacket	fillet	-	-	-	-	-	0/15	-
	Bonito	fillet	-	-	-	-	-	0/5	-
	Tailor	fillet	-	-	-	-	-	0/10	**1/5**
	Sand Whiting	fillet	-	-	-	-	-	-	0/5
	Paradise Fish	fillet	-	-	-	-	-	-	0/5
Crustaceans	Shrimp	whole	**5/5**	-	-	-	-	-	-
	Nipper (Yabby)	whole	**1/1**	**8/8**	-	**3/5**	-	0/5	-
	Intertidal crab	whole	-	-	-	-	-	0/5	0/4
	Mud crab	claw	-	-	-	0/5	-	-	-
	Prawn	tail	-	-	**2/2**	0/4	-	-	-
	Spiny crayfish	tail	-	-	**5/5**	0/5	0/1	-	-
	Freshwater shrimp	whole	-	-	-	-	0/5	-	-
Molluscs	Squid	tube	-	-	-	-	-	0/5	0/5
	Oysters*	whole	-	**1/5**	-	-	-	0/10	0/5
	Bivalve	whole	-	-	-	0/5	-	-	-
	Urchin	whole, without mouthparts and spines	-	-	-	-	-	0/10	**1/5**
	Abalone	fillet	-	-	-	-	-	0/2	**1/3**
	Mud whelk	whole	-	**6/6**	-	-	-	-	-
	Conch	whole, without shell	-	-	-	-	-	0/5	-
	Polychaetes**	whole	**6/6**	-	**5/5**	0/5	-	-	-

* Oysters includes all species sampled

** Polychaetes include beachworms and other worms

2. A screening assessment using the NSW dietary trigger values for PFOS+PFHxS and PFOA for finfish

Screening value

FSANZ values for food were not considered sufficiently conservative for use in this screening assessment. This is because the FSANZ trigger values are based on 100% of the tolerable daily intake (TDI) and may not be protective for people exposed to PFAS from multiple pathways. The screening value used in this assessment (0.0026 mg/kg), is consistent with the value used by the NSW Government PFAS Taskforce when developing precautionary advice for PFAS in seafood. This value is based on exposure up to 50% of the tolerable daily intake (TDI) for PFOS+PFHxS, which allows for background (ambient) and other minor PFAS exposures. This trigger value was also conservatively applied to PFOA concentrations, noting the PFOA TDI is higher than the TDI for PFOS+PFHxS.

Data Analysis Protocol

- Biota were sorted into finfish, crustacean or mollusc. The purpose of separating data into groups was to allow for specific dietary advice based on different consumption rates, if required.
- For each taxonomic group (finfish, crustacean or mollusc), each individual species was assessed separately. Data for species was not combined because of the high variability in bioaccumulation of PFAS between different species in aquatic organisms.
- The finfish dietary trigger value for PFOS+PFHxS (0.0026 mg/kg) was applied to all species, including crustaceans and molluscs.
    - Generally, people consume fewer crustaceans and molluscs than finfish, hence a higher screening trigger value is justified. In this case, the lowest trigger value was used for all seafood groups as information on the dietary habits and consumption rates for the local population has not been supplied
- Fish were analysed either whole or as muscle fillets, and the data for each tissue type was considered separately. This is because different organs can accumulate PFAS at different levels, and results can significantly differ between fillet and whole fish samples. The relevance of a fillet and whole fish needs to be considered based on community consumption patterns.
- For each species, the number of samples, mean and maximum concentrations have been presented for the tributaries in the Jervis Bay Territory and the bays. If <3 samples were available, no statistical calculation was undertaken, and only the maximum value was reported.
- Duplicates (field and laboratory) were not included in the assessment.
- For concentrations reported as <LOR, half the Limit of Reporting (LOR) was used in calculations.
- Concentration estimates were screened against the dietary trigger values for a) all tributaries combined; and b) all bays combined
- Where dietary trigger values were close to 0.0026 mg/kg or higher, each tributary and bay was individually screened against the trigger value. This was because of the variability in biota concentrations between tributaries.

Screening assessment results

All PFOA concentrations were below the screening trigger value (0.0026 mg/kg). Therefore, exposure to PFOA was considered low risk, and did not require further assessment. All further discussion relates to concentrations of PFOS+PFHxS.

The results of the screening assessment are tabulated in Tables 2 to 7. Values coloured red exceed the screening value. Values in orange are below the trigger but sufficiently close in value (within a

factor of 3) that further assessment was conducted as a conservative measure, due to the limited sample numbers available for assessment. Values below the screening value and so considered not of concern.

The results can be used to indicate potential risk if the aquatic biota are consumed, but sample numbers are not adequate to provide dietary advice. The main reasons for this are:

- low sample numbers (<20 individuals for each species)
- inconsistent sampling of species between the different tributaries
- no information on dietary habits of people in the WBAC (where they catch aquatic biota, how much they consume, and if whole fish and/or fillets are generally consumed).

Finfish results

Initially the tributaries were combined for each species (presented in Table 2). The results show:

- Concentrations in finfish were generally below LOR in the bays, with the exception of one individual tailor in Wreck Bay which was above the dietary trigger value for PFOS+PFHxS (total sample number was 5 for tailor).
- In the tributaries the concentrations in all species were above the dietary trigger, with the exception of one flathead fillet sample (total sample number was 1).

Table 2. PFOS+PFHxS concentrations in finfish species. All values in mg/kg. Values in **red** text exceed the screening value.

Species sampled	Tributaries			Bays		
	Mean	Standard deviation	Max*	Mean	Standard deviation	Max
Bream (fillet)	0.010	0.016	0.07	-	-	-
Mullet (fillet)	0.005	0.004	0.02	-	-	-
(whole)	0.232	0.232	0.79	-	-	-
Whitebait (whole)	0.343	0.335	1.12	-	-	-
Dusky Flathead (fillet)	-	-	<LOR*	-	-	<LOR
Blue spot Flathead (fillet)	-	-	-	<LOR	-	<LOR
Leatherjacket (fillet)	-	-	-	<LOR	-	<LOR
Bonito (fillet)	-	-	-	<LOR	-	<LOR
Tailor (fillet)	-	-	-	0.001	0.001	0.004
Sand Whiting (fillet)	-	-	-	<LOR	-	<LOR
Paradise fish	-	-	-	<LOR	-	<LOR

*n=1

Concentrations in biota varied between the tributaries. Therefore, the data for those species above the screening value are presented individually for each tributary (Table 3). Of particular note, for the northern creeks flowing into Jervis Bay, the concentrations in biota in Flatrock Creek are lower than in Captains Lagoon. Unfortunately, there are insufficient data to adequately assess differences in the creeks flowing south into Wreck Bay and Summercloud Bay.

Because of the differences between tributaries, dietary advice based on combining all tributaries may not be appropriate (as in some instances it would result in not being sufficiently protective, and in other instances precautionary advice may be restrictive and not necessary). Dietary advice specific to individual tributaries should be developed if more data become available.

Table 3. PFOS+PFHxS concentrations in finfish species for individual water bodies. All values in mg/kg. Values in red text exceed the screening value. Values in orange are below but within a factor of 3 of the trigger value.

Species sampled	Mean	Standard deviation	Max
Northern Tributaries			
	Captains Lagoon		
Bream (fillet)	0.022	0.021	0.065
Mullet (fillet)	0.009	0.003	0.016
(whole)	-	-	-
Whitebait (whole)	0.57	0.26	1.12
	Flatrock Creek		
Bream (fillet)	<LOR	-	<LOR
Mullet (fillet)	<LOR	-	<LOR
(whole)	0.064	0.029	0.115
Whitebait (whole)	0.009	0.006	0.019
Southern Tributaries			
	Mary Creek		
Bream (fillet)	-	-	-
Mullet (fillet)	-	-	-
(whole)	0.39	0.22	0.79
Whitebait (whole)	0.61	0.13	0.78
	Summercloud Creek		
Bream (fillet)	0.005	0.004	0.011
Mullet (fillet)	<LOR	-	<LOR
(whole)	-	-	-
Whitebait (whole)	-	-	-
Bays			
	Jervis Bay		
Tailor (fillet)	<LOR	-	<LOR
	Wreck Bay		
Tailor (fillet)*	0.002	0.001	0.0035

*n = 5, where 4 out of 5 samples were <LOR

Crustacean results

The results for combined tributaries (Table 4) show:

- All crabs sampled were below the LOR
- Other crustaceans in the tributaries have concentrations above the dietary trigger, though sample numbers for individual species are insufficient for specific dietary advice.

Prawn and spiny crayfish concentrations differed between tributaries (Table 5), therefore advice would ideally be based on individual tributaries. For example:

- four prawn samples from Summercloud Creek were all below LOR, and the two prawn samples in Mary Creek were above the dietary trigger value
- five spiney crayfish samples from Summercloud Creek were all below LOR, and the five spiney crayfish samples in Mary Creek were above the dietary trigger value.

Due to the differences between tributaries, dietary advice based on combining all tributaries may not be appropriate (as in some instances it would result in not being sufficiently protective). Dietary advice specific to individual tributaries should be developed if more data become available.

Table 4. PFOS+PFHxS concentrations in crustacean species. All values in mg/kg. Values in red text exceed the screening value.

Species sampled	Tributaries			Bays		
	Mean ± SD	Standard deviation	Max	Mean ± SD	Standard deviation	Max
Shrimp	0.205	0.105	0.311	-	-	-
Nipper*	0.007	0.006	0.017	<LOR	-	<LOR
Intertidal crab	-	-	-	<LOR	-	<LOR
Mud crab	<LOR	<LOR	<LOR	-	-	-
Prawn	0.047	0.102	0.255	-	-	-
Spiny crayfish	0.054	0.112	0.353	-	-	-

* unclear if nippers are consumed. In the GHD spreadsheet these are referred to as yabbies

Table 5. PFOS+PFHxS concentrations in crustacean species for individual water bodies. All values in mg/kg. Values in **red** text exceed the screening value. Values in **orange** are below but within a factor of 3 of the trigger value.

Species sampled	Mean	Standard deviation	Max
Northern Tributaries			
	Captains Lagoon		
Shrimp	0.205	0.105	0.311
Nipper	-	-	0.01*
Prawn	-	-	-
Mud Crab	-	-	-
Spiny crayfish	-	-	-
	Flatrock Creek		
Shrimp	-	-	-
Nipper	0.009	0.006	0.017
Prawn	-	-	-
Mud Crab	-	-	-
Spiny crayfish	-	-	-
Southern Tributaries			
	Mary Creek		
Shrimp	-	-	-
Nipper	-	-	-
Prawn	-	-	0.255*
Mud Crab	-	-	-
Spiny crayfish	0.107	0.145	0.353
	Summercloud Creek		
Shrimp	-	-	-
Nipper	0.002	0.001	0.004
Prawn	<LOR	-	<LOR
Mud Crab	<LOR	-	<LOR
Spiny crayfish	<LOR	-	<LOR

* n<3

Molluscs and other invertebrates

PFOS+PFHxS concentrations for all tributaries combined are summarised in Table 6. The results show:

- Molluscs sampled from the bays were below the dietary trigger, except for one individual abalone (total sample number 3) in Wreck Bay.
- Mud whelks were only sampled in Flatrock Creek and were above the dietary trigger. Additional sampling and analysis is recommended for the other tributaries to allow screening of risk. Based on fish results, it is plausible biota concentrations will differ between creeks and that precautionary advice based on Flatrock Creek may be under-protective of other creeks.

The data for each tributary were also assessed individually (see Table 7).

Table 6. PFOS+PFHxS concentrations in mollusc and invertebrate species. All values in mg/kg. Values in red text exceed the screening value. Values in orange are below but within a factor of 3 of the trigger value.

Species sampled	Tributaries			Bays		
	Mean ± SD	Standard deviation	Max	Mean ± SD	Standard deviation	Max
Squid	-	-	-	<LOR	-	<LOR
Oyster*	0.001	0.001	0.0025	<LOR	-	<LOR
Bivalve	<LOR	-	<LOR	-	-	-
Urchin	-	-	-	0.001	0.0002	0.0015
Abalone	-	-	-	0.001	0.001	0.0025
Mud Whelk	0.16	0.10	0.33	-	-	-
Conch	-		-	<LOR	-	<LOR
Polychaetes**	0.06	0.07	0.24	-	-	-

* Oysters includes all species sampled

** Polychaetes include beachworms and other worms

Table 7. PFOS+PFHxS concentrations in mollusc and invertebrate species for individual water bodies. All values in mg/kg. Values in **red** text exceed the screening value. Values in orange are below but within a factor of 3 of the trigger value.

Species sampled	Mean	Standard deviation	Max
Northern Tributaries			
Captains Lagoon			
Mud Whelk	-	-	-
Polychaetes	**0.05**	**0.01**	**0.07**
Oyster*	-	-	-
Flatrock Creek			
Mud Whelk	**0.16**	**0.10**	**0.33**
Polychaetes	-	-	-
Oyster*	0.001	0.001	**0.0025**
Southern Tributaries			
Mary Creek			
Mud Whelk	-	-	-
Polychaetes	**0.13**	**0.10**	**0.24**
Oyster*	-	-	-
Summercloud Creek			
Mud Whelk	-	-	-
Polychaetes	<LOR	<LOR	<LOR
Oyster*	-	-	-
Southern Tributaries			
Wreck Bay			
Abalone	0.001	0.001	**0.0025**

* Oysters includes all species sampled

3. Species-specific dietary assessment

3.1 The Bays

PFOS+PFHxS concentrations in all seafood samples collected in Jervis Bay were below LOR (see Table 1 above). Therefore, no precautionary advice is required for Jervis Bay.

PFOS+PFHxS concentrations in all finfish samples collected in Wreck Bay were below LOR, except for one Tailor of the 5 sampled (Table 1). The concentration of the one fish above LOR (0.0035 mg/kg) was above the dietary trigger used (0.0026 mg/kg). The mean concentration for all five Tailor in Wreck Bay was 0.002 mg/kg (using ½ LOR in the calculation, for results below LOR). PFOS+PFHxS concentrations in all molluscs collected in Wreck Bay were below the dietary trigger, except for one

Abalone of the 3 sampled (Table 6). The mean concentration for all three Abalone in Wreck Bay was 0.001 mg/kg (using ½ LOR in the calculation, for results below LOR).

Though most biota sampled in Wreck Bay were <LOR, the few samples above LOR indicate that bioaccumulation of PFOS+PFHxS in seafood is occurring at that location. When all data available for Wreck Bay are considered, precautionary advice is not triggered.

However, due to the low number of individual samples collected, additional sampling and analysis should be undertaken to confirm seafood from Wreck Bay is safe for consumption. Because there were no samples collected in Summercloud Bay (which receives runoff from Summercloud Creek), it is recommended that additional sampling and analysis for Summercloud Bay is also undertaken. Ideally, 4 composites of 5 to 10 individuals per composite should be analysed to support more robust management decisions.

3.2 Tributaries

The PFOS+PFHxS concentration data (Tables 2 to 7) indicate that dietary assessment for seafood (finfish, crustaceans and molluscs) in the Jervis Bay tributaries is required.

Dietary assessment for finfish

Table 10 summarises the acceptable serves per week and recommended precautionary advice for finfish obtained from tributaries in JBT. The servings per week were calculated based on maximum PFOS+PFHxS concentration in biota for each tributary and only calculated for species where at least 10 samples per tributary were available. The maximum concentration value was used as a conservative measure due to low sample numbers (<20 individuals per species). Where sample numbers were <10 per species, dietary assessment was not considered appropriate.

The dietary assessment indicates that some form of dietary advice is recommended for Captains Lagoon and Flatrock Creek. Insufficient sampling in Summercloud Creek and Mary Creek means specific advice for these two tributaries cannot be determined. However, the limited available data suggest precautionary advice may be required at a broader scale, and for all the tributaries sampled.

The ACT Government advised that restrictions (including no fishing) are currently in place for Mary Creek due to elevated PFAS concentrations in the creek water. This assessment suggests the restriction on consumption of biota from Mary Creek should remain in place, and be extended to other tributaries in the Territory, until further information is available.

There are several other tributaries located in the Jervis Bay Territory, beyond those sampled for the Defence HHRA. This needs to be considered in any precautionary advice for the tributaries. For example, fish caught in Lake McKenzie (Gudgeon, Smelt, Galaxid) had measurable concentrations of PFOS+PFHxS. These fish were not considered edible for this assessment, however if a dietary survey suggested that fish are caught for consumption in Lake McKenzie, additional sampling and analysis would be required to support dietary assessment.

Table 8. Maximum recommended servings per week for finfish species caught in tributaries in the Jervis Bay Territory. NR = advice not required. ID = insufficient data. TV = dietary trigger value

Location and Species	Servings per week[1] Child – 2 to 6 years old	Servings per week[1] All other age groups	Recommended precautionary advice
Captains Lagoon			
Bream fillet [2]	0	0	Recommend precautionary advice not to consume finfish fillets or whole fish from Captains Lagoon
Mullet fillet [2]	1	2	
Whitebait whole fish	0	0	
Flatrock Creek			
Bream fillet [2]	NR	NR	Data indicates precautionary advice for Bream and Mullet fillets may not be required Consumption of whole fish from Flatrock Creek is not recommended
Mullet fillet [2]	ID (<LOR) [3]	ID (<LOR) [3]	
Whitebait whole fish	0	1	Consumption of whole fish and white bait is not recommended
Mary Creek			
Bream fillet	No data	No data	Further data is required. Whitebait data indicate precautionary advice may be required Consumption of whole fish from Mary Creek is not recommended
Mullet fillet	No data	No data	
Mullet whole fish	ID (>TV) [4]	ID (>TV) [4]	
Whitebait whole fish	ID (>TV) [4]	ID (>TV) [4]	
Summercloud Creek			
Bream fillet	ID (>TV) [4]	ID (>TV) [4]	Data indicates precautionary advice for Bream fillets and whole fish may be required
Mullet fillet	ID (<LOR) [3]	ID (<LOR) [3]	Data indicates precautionary advice for Mullet fillets may not be required
Whitebait whole fish	No data	No data	Further data is required, but based on other creeks, consider precautionary advice

[1] Adult Serving size = 150 grams; Child Serving Size = 75 grams.
[2] Dietary advice for fillets is not protective of people who consume whole fish, as concentrations in whole fish are likely to be higher. Consumption of offal in all species should be avoided.
[3] insufficient samples to adequately assess dietary advice, but all available fish fillet samples were below detection limit, indicating no accumulation in this species has occurred
[4] insufficient samples to adequately assess dietary advice, but samples showed detections above the dietary trigger, indicating advice would potentially be required

Dietary assessment for Crustaceans and Molluscs

Overall, sample size for crustaceans and molluscs in the tributaries were not adequate to support dietary assessment. The limited data for crustaceans and molluscs in the tributaries (see Tables 5 and 7) indicate that PFOS and PFHxS are bioaccumulating in the aquatic biota, and at concentrations above the dietary trigger for finfish. Until more information on dietary habits and consumption rates becomes available, the data support precautionary advice not to consume crustaceans and molluscs from tributaries in the JBT.

Gaps in the biota data survey

Specific gaps needing to be addressed to provide refined dietary advice include:

- Consumption patterns for aquatic biota (quantity and source) need to be determined, particularly for species that are likely to be consumed by the WBAC
- Sufficient sampling of all relevant crustaceans and molluscs should be undertaken (based on a dietary survey). For advice on sample species, numbers and sampling methods ACT government should consult NSW DPI Fisheries.
- Mud whelks were only collected from Flatrock Creek, yet are known to occur in all of the tributaries of the JBT region. The finfish data indicate different levels of impact across all four tributaries, and therefore it cannot be assumed that whelk data from Flatrock creek would represent the same level of risk as for other tributaries
- The samples labelled as "Yabby" in the GHD spreadsheet are more widely known as nippers. This was confirmed with GHD as part of previous discussions. Nippers are generally used as bait, rather than for direct consumption. However, it has been included in the assessment as a conservative measure. For future reference, the yabby samples should be re-named by GHD

Williams, Jarrod (Health)

From: [redacted]@epa.nsw.gov.au>
Sent: Thursday, 26 July 2018 11:45 AM
To: Pengilley, Andrew (Health)
Cc: Janina Beyer-Robson; Danielle Playford
Subject: Jervis Bay Territory clarification

Hi Andrew,

As discussed, based on the amount of data available for JBT, the EPA suggests that the no consumption advice in place at Marys Creek is extended to Captains Lagoon and precautionary advice to minimise consumption is put in place for Summercloud Creek and Flatrock Creek. For Wreck Bay and Summercloud Bay, more sampling is advised before any precautionary advice could be considered.

Regards,

[redacted] – **NSW PFAS Strategy**
Hazardous Incidents and Environmental Health, NSW Environment Protection Authority
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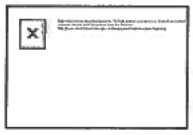
[redacted]@epa.nsw.gov.au www.epa.nsw.gov.au @EPA_NSW
Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555



Williams, Jarrod (Health)

From: Hudson, Lyndell (Health)
Sent: Monday, 30 July 2018 2:44 PM
To: Pengilley, Andrew (Health)
Subject: FW: Factual letter summary [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Hi Andrew

Summary of all the factual letters below.

Lyndell Hudson | Senior Manager Environment and Radiation Safety
Health Protection Service | health.act.gov.au
Phone (02) 6205 0956 | Mobile 0408 663 116

From: Clapham, David
Sent: Thursday, 28 June 2018 4:43 PM
To: Pengilley, Andrew (Health) <Andrew.Pengilley@act.gov.au>
Cc: Barr, Conrad (Health) <Conrad.Barr@act.gov.au>
Subject: FW: Factual letter summary [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Dear Andrew

Please see below a summary of the factual letters released so far by GHD/Defence

Let me know if you would like copies of these and I can forward through..

Thanks

David

From [redacted]@ghd.com]
Sent: Thursday, 28 June 2018 4:11 PM
To: Clapham, David <David.Clapham@act.gov.au>
Cc: PFASIM Jervis Bay <pfasim.jervisbay@defence.gov.au>
Subject: Factual letter summary

Hi David,

Confirming I have sent factual memo 2, factual letters 6 – 12 inclusive.

Letter summary

1. Combined media - Soil, Sediment, Surface water and Groundwater – HMAS Creswell and JBRF areas (On Site)
2. Combined media - Soil, Sediment, Surface water and Groundwater – HMAS Creswell and JBRF areas (On Site)
3. Combined media - Soil, Sediment, Surface water and Groundwater – HMAS Creswell and JBRF areas (On Site)
4. Combined media - Soil, Sediment, Surface water and Groundwater – HMAS Creswell and JBRF areas (On Site)
5. Combined media - Soil, Concrete core, Surface water and Groundwater –JBRF areas (On Site) and Potable water storage tanks (JBTA infrastructure)
6. Water – lake Mckenzie, Lake Windermere and Potable water storage tanks (JBTA infrastructure)
7. Water – lake Mckenzie, Lake Windermere
8. Black/grey water - Sewerage system JBRF, HMAS Creswell
9. Soil and water – Block 151 (JBTA Village road areas)
10. Black/grey water - Sewerage system JBRF, HMAS Creswell, Wreck bay sewer pump stations

11. Water - JBRF – closed loop water systems associated with firefighting training school
12. Black/grey water - Sewerage system JBRF, HMAS Creswell
13. Terrestrial ecology Biota – On Site – HMAS Creswell/JBRF areas
14. Soil and Water - dry weather - off site – 403 lands
15. Soil and Water - Wet weather - off site – 403 lands
16. Aquatic ecology Biota – unnamed pools (403 land)
17. Aquatic and terrestrial ecology Biota – lake Mckenzie area
18. Biota Marine – All locations (Jervis and Wreck bay) – To be issued to PCG early next week
19. Biota Marine/estuarine – Flatrock and captains lagoon (adjacent Creswell) – To be issued to PCG early next week
20. Biota Marine/estuarine – Mary's and Summer cloud Creeks (adjacent Wreck bay) – To be issued to PCG early next week
21. Biota – Fruit and vegetable residential gardens – **School**, Wreck Bay, Village road – To Be issued to PCG early next week (on advice from Defence PFAS team)

Regards,

[redacted]

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Water | Energy & Resources | Environment | Property & Buildings | Transportation

ACT Government
Health

To Whom It May Concern
Department of Infrastructure and Regional Development and Cities

Via:
Head of Service
Chief Minister, Treasury and Economic Development Directorate,
ACT Government

To Whom It May Concern

Dietary Advice regarding seafood collected from waterways in Jervis Bay Territory

As requested, please find below dietary advice regarding seafood collected from waterways in Jervis Bay Territory.

Testing program
The waterways examined include four creeks (tributaries) and the three bays into which they flow. The first two of these creeks, Captains Lagoon and Flatrock Creek, flow into Jervis Bay on the north side of the Territory. The remaining creeks, Mary Creek and Summercloud Creek, flow into Wreck Bay and Summercloud Bay respectively on the south side of the Territory. Mary Creek flows through the Aboriginal and Torres Strait Islander community living at Wreck Bay.

Samples of fish, crustaceans and molluscs were taken from the five waterways. Per- and poly-fluoro alkyl substances (PFAS) bioaccumulates in the food chain and so relatively low water levels can still produce measurable contamination in seafood.

There was inadequate sampling performed to provide species specific or quantitative dietary advice. There was inadequate representation of samples from different waterways to allow geographically specific advice in some cases.

Samples were assessed according to NSW screening guidelines, which are more conservative than the FSANZ total daily intake values to allow for people being exposed to PFAS from multiple sources. Of the PFAS, PFOA (Per fluoro octanoic acid) was below the limit requiring advisory warnings in all samples. All advice relates to PFOS (Per fluoro octane sulfate) and PFHx (Per fluoro hexanoate), which are similar substances included in the overall 'umbrella' definition of PFAS.

Dietary Advice

Mary Creek and Summercloud Creek

- Perfluoroalkyl Substances (PFAS) have been found in seafood in this area, including fish, molluscs, crayfish etc. Consumption of seafood collected from Mary Creek and Summercloud Creek should be avoided.

Captains Lagoon

- Perfluoroalkyl Substances (PFAS) have been found in seafood in this creek, including fish, molluscs, crayfish etc. Consumption seafood collected from Captains Lagoon should be avoided.

Flatrock Creek

- Perfluoroalkyl Substances (PFAS) have been found in seafood in this creek. Consumption of fish from Flatrock Creek should be minimised. Catching fish from a variety of locations outside this area will assist in minimising PFAS exposure.
- Consumption of other seafood (molluscs, crayfish etc.) collected from Captains Lagoon should be avoided as they are likely to have higher PFAS levels than fish.

Jervis Bay

- No advice required.

Wreck Bay and Summercloud Bay

- Perfluoroalkyl Substances (PFAS) have been found in seafood in this area, including fish, molluscs, crayfish etc. Consumption of seafood caught in Wreck Bay and Summercloud Bay should be minimised. Catching fish from a variety of locations outside this area will assist in minimising PFAS exposure.

General advice to Jervis Bay Territory Administration

- Relaxation of ACT Health advice regarding the use of waterways in JBT would require additional sampling data to quantify potential exposure of the community to PFAS.
- A representative environmental sampling program should be undertaken that is sufficient to allow species specific and quantitative dietary advice to be formulated.
- An assessment of land-use practices at Wreck Bay should be undertaken to determine the local consumption of particular species of flora or fauna to inform an assessment of dietary advice.

Please do not hesitate to contact my office on (02) 6207 1781 if you require any further clarification on any of the above information.

Yours sincerely,

Dr Kerryn Coleman
A/g ACT Chief Health Officer
Population Health

21 July 2018

Williams, Jarrod (Health)

From: [redacted]@infrastructure.gov.au>
Sent: Thursday, 9 August 2018 4:42 PM
To: Clapham, David
Cc: [redacted] PFASIM Jervis Bay [redacted] Pengilley, Andrew (Health); Kelly, Paul (Health)
Subject: RE: ACT Correspondence on PFAS [DLM=For-Official-Use-Only]

Hi David

Thanks for letting me know. Look forward to hearing from you tomorrow.

Kind regards

[redacted] | Jervis Bay Territory Administration
Territories Division
Department of Infrastructure, Regional Development and Cities
GPO Box 594, Canberra ACT 2601
[redacted]
[redacted]@infrastructure.gov.au | **w** www.infrastructure.gov.au

From: Clapham, David <David.Clapham@act.gov.au>
Sent: Thursday, 9 August 2018 3:42 PM
To: [redacted]@infrastructure.gov.au>
Cc: [redacted]@infrastructure.gov.au>; [redacted]@defence.gov.au>; [redacted]@defence.gov.au> [redacted]@infrastructure.gov.au>; [redacted]@infrastructure.gov.au>; PFASIM Jervis Bay <pfasim.jervisbay@defence.gov.au>; [redacted]@act.gov.au>; Pengilley, Andrew (Health) <Andrew.Pengilley@act.gov.au>; Kelly, Paul (Health) <Paul.Kelly@act.gov.au>
Subject: RE: ACT Correspondence on PFAS [DLM=For-Official-Use-Only]

Dea[redacted]

I apologise but it will not be possible to provide cleared responses by COB tomorrow. I am conferring with the relevant officers and will provide a timeline for response tomorrow.

Best

David

David Clapham | Manager - Intergovernmental Relations | **Policy & Cabinet Division**
☎ 02 6205 7261 | **Chief Minister, Treasury & Economic Development Directorate** | ACT Government
Level 4, Canberra Nara Centre | GPO Box 158 Canberra ACT 2601 | www.act.gov.au

CANBERRA REGION
CITY · COAST · ALPINE · TABLELANDS

From: [redacted]@infrastructure.gov.au]
Sent: Thursday, 9 August 2018 2:06 PM
To: Clapham, David <David.Clapham@act.gov.au>
Cc: [redacted]@infrastructure.gov.au>; [redacted]@defence.gov.au>; [redacted]@defence.gov.au>; [redacted]@infrastructure.gov.au>; [redacted]@infrastructure.gov.au>; PFASIM Jervis Bay <pfasim.jervisbay@defence.gov.au>
Subject: RE: ACT Correspondence on PFAS [DLM=For-Official-Use-Only]
Importance: High

Hi David

Please see below some points the Department of Defence have raised with us requiring clarification. We think it is important everyone is on the same page and would appreciate further information on these matters as soon as possible please.

Would it be possible to have this further information by COB tomorrow please?

Kind regards

[redacted] | Jervis Bay Territory Administration
Territories Division
Department of Infrastructure, Regional Development and Cities
GPO Box 594, Canberra ACT 2601
t 02 6274 6145
e [redacted]@infrastructure.gov.au | **w** www.infrastructure.gov.au

From: [redacted]@defence.gov.au> **On Behalf Of** PFASIM Jervis Bay
Sent: Thursday, 9 August 2018 10:45 AM
To: [redacted]@infrastructure.gov.au>
Cc: [redacted]@infrastructure.gov.au>; [redacted]@defence.gov.au>; [redacted]@defence.gov.au>
Subject: RE: ACT Correspondence on PFAS [DLM=For-Official-Use-Only]

For-Official-Use-Only

[redacted]

Clarification of the following would be helpful:

1. Further information on what screening guidelines were used to assess the sampling results provided
2. Further information on the rationale for using alternate screening guidelines to those provided in the PFAS National Environmental Management Plan (i.e. Department of Health's Health Based Guidance Values)
3. Further information on what the ACT Government considers to be adequate sampling to allow for species specific or quantitative dietary advice

4. Will the release of the Human Health Risk Assessment currently being undertaken as part of the Jervis Bay PFAS Investigation being undertaken by Defence be considered when reviewing the appropriateness or otherwise of the recommendations going forward?

Happy to discuss

[redacted] - Environmental Investigations
PFAS Investigation and Management Branch
Department of Defence
[redacted]

BP8-1
8 Brindabella Circuit
Brindabella Business Park
PO Box 7925 Canberra BC 2610

ED-HPS-Support

From: Barr, Conrad (Health)
Sent: Wednesday, 15 August 2018 4:47 PM
To: [redacted]
Subject: RE: Precautionary advice example [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Hi Corrie
Thanks very much.
Cheers
Conrad

ACT Government Health
Conrad Barr | Director
Health Protection Service | health.act.gov.au
Phone (02) 6205 4402

From: [redacted]@epa.nsw.gov.au]
Sent: Wednesday, 15 August 2018 4:00 PM
To: Barr, Conrad (Health) <Conrad.Barr@act.gov.au>
Subject: Precautionary advice example

Hi Conrad,

As discussed, please have a look at the below link as an example of strict precautionary advice for PFAS management.

https://www.epa.nsw.gov.au/working-together/community-engagement/community-news/raaf-williamtown-contamination/williamtown-precautionary-advice

Regards,

[redacted] **- NSW PFAS Strategy**
Hazardous Incidents and Environmental Health, NSW Environment Protection Authority
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[redacted]@epa.nsw.gov.au www.epa.nsw.gov.au @EPA_NSW
Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555
NSW EPA

Williams, Jarrod (Health)

From: [redacted]@epa.nsw.gov.au>
Sent: Thursday, 16 August 2018 11:45 AM
To: Pengilley, Andrew (Health)
Cc: Danielle Playford
Subject: NSW rationale for biota sample design
Attachments: Sample_size_simulation_paper_180518.pdf

Hi Andrew,

Further to our discussion regarding biota, Dr Matt Taylor from NSW DPI Fisheries has previously prepared a paper on robust biota sample design which has been used across NSW (please see attached). This rationale has been provided to the Department of Defence in relation to several NSW PFAS sites.

Matt is submitting the paper for publication shortly, so it would be appreciated if this version was not shared externally and used as an FYI. I will let you know once the paper has been approved.

Regards,

[redacted] – **NSW PFAS Strategy**
Hazardous Incidents and Environmental Health, NSW Environment Protection Authority
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[redacted]@epa.nsw.gov.au www.epa.nsw.gov.au @EPA_NSW
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NSW GOVERNMENT | Department of Primary Industries

SAMPLE SIZE REQUIRED FOR ROBUST PFAS AQUATIC BIOTA SAMPLING PROGRAMS

Version 18 May 2018, prepared by Matthew D. Taylor, Principal Research Scientist

Summary

Simulation analyses using PFAS concentrations in biota was conducted in early 2018 following receipt of Williamtown Data-gap Analysis data files from Department of Defence, to inform ongoing sampling design for dietary and human health risk assessment. Analyses used individual concentrations for animals sampled in Fullerton Cove (Mulloway, Dusky Flathead, and School Prawn) or Tilligerry Creek (Mud Crab). Balancing the outcomes from the different simulations conducted, it is recommended that collecting and testing **at least 20 samples per species, per location sampled**, is required to produce a reasonable estimate of the population mean of PFAS concentrations. However, analysis of >20 individual samples per species per location may be unreasonably expensive for biota sampling programs, and for this reason the PFAS Taskforce suggests pooling the tissue from these animals equally across four composites which are then submitted for analysis.

Background

There has been some recent discussion on the sample size required to confidently inform dietary advice and human health risk assessment for aquatic biota in areas contaminated by PFAS. Specifically, the NSW PFAS Expert Panel and NSW PFAS Taskforce have previously recommended a sampling design of 40 individuals per species per location, which has a basis in previous contaminant sampling programs which required targeted management action by the NSW Government. However, consultants to the Department of Defence have recently challenged this design, and the modified/reduced design that has been subsequently proposed (>20 individuals per species per location), and questioned the need for this sample size to inform risk assessment.

An informed debate requires some analysis of existing data, so a simulation study was conducted using data from the most comprehensive PFAS data set available – the Data-gap Analysis data set from Williamtown collected in early 2017 (including samples from Fullerton Cove and Tilligerry Creek). PFAS analysis of individual samples was specifically requested in this sampling program to facilitate such an evaluation and inform future sampling programs. Initial simulations to evaluate this were performed after raw data from the Data-gap Analysis were provided to NSW DPI-Fisheries in early 2018, to confirm the requirements for a robust aquatic biota sampling design (and this has been used to inform sampling recommendations since, specifically the reduced design). However, given the debate that has recently emerged it has become necessary to formalise these simulations to provide stakeholders with some quantitative justification for the sampling design that is usually requested by the NSW PFAS Taskforce.

Simulations

Simulations were conducted for four species for which individual data were available: Mulloway, Dusky Flathead, Mud Crab and School Prawn. PFAS concentrations for between 40-60 individuals were available from either Fullerton Cove (Mulloway, Dusky Flathead, and School Prawn) or Tilligerry Creek (Giant Mud Crab).

Sample data and associated variance were used to generate both a normal and a lognormal distribution for each data set. There is likely some difference of opinion as to which distribution is better (and on the basis of the data this is probably species specific). As a general comment, since data need to be constrained by zero, and is characterised by relatively infrequent observations of very high concentrations, a lognormal distribution probably provides a better characterisation of the patterns in the data in most cases. Sample data and the associated distributions were used to generate a sample dataset of 5000 fish. For each species, eight sets of simulations were conducted for scenarios which sampled n fish (n = 5, 10, 15, 20, 25, 30, 35, 40) from the sample dataset. Thirty (30) simulations were conducted for each set, where n individuals were randomly sampled from the dataset and used to calculate a mean.

For ease of interpretation, results are represented visually in Fig. 1, Fig. 2, Fig. 3 and Fig. 4. In each figure, original sample data (from Fullerton Cove or Tilligerry Creek) are presented as a histogram, and the normal and lognormal distributions generated are presented as lines (labelled according to the figure legend). The actual sample mean is included as a solid vertical black line, and the two vertical dashed lines represent ±20 % of the mean (which reflects the conservative QC threshold employed for PFAS analyses by most laboratories) and is employed here to represent what might be an acceptable deviation from the actual population mean. The simulated means for each set of simulations are presented as a horizontal series relative to these thresholds, and overlaid on the plots.

Interpretation

It is reasonable to assume that the closer the simulated means are to the actual mean the more robust the outcomes for the designated level of sampling, as it means the sample effort is more likely to approximate the actual population mean (assuming the actual mean of the data sets employed here is a good representation of the population mean). Generalising across species, for the normally distributed sample dataset, low sampling effort (5-20 individuals) can generate a substantial number of simulated means that lie outside the ±20 % threshold (dashed vertical lines). The proportion of estimated means falling outside of this threshold is summarised in Table 1. This implies that there is a greater chance that the estimated mean might represent an unacceptable deviation from the actual mean. For estimated means lower than the actual mean, this may result in dietary advice that is not protective of human health. For estimated means greater than the actual mean, this would lead to unnecessarily conservative/restrictive dietary advice. As sampling effort increases above 20 individuals, a greater proportion of simulated means fall within the ±20 % threshold, meaning that the sampling effort is more likely to provide an acceptable approximation of the actual mean. The situation is exacerbated by the lognormal distribution, and the right skew to the data means that a greater proportion of simulated means overestimate the actual mean for low sampling effort, often up to double to actual mean, and for School Prawn great than three times the actual mean. The simulations indicate that for data that are lognormally distributed, greater sampling effort is likely to be required.

On the basis of these analyses, and balancing the outcomes from the simulations using normal and lognormal distributions, it is recommended that collecting and testing at least 20 samples per species, per location sampled, is required to produce a reasonable estimate of the population mean of PFAS concentrations. However, the NSW PFAS Taskforce recognises that individually testing 20 or more individual samples per species per location can be unreasonably expensive, and for this reason it is recommended to pool the tissue from these animals equally across four composites, which are then submitted for analysis.

Table 1 Summary of simulation outputs showing the proportion of estimated means that fall outside the ±20 % threshold for a given sampling effort, for a given species. Outcomes are shown for where a normal and lognormal distribution is assumed

	Mulloway		Dusky Flathead		Giant Mud Crab		School Prawn	
Sampling effort (*n*)	Normal	Lognormal	Normal	Lognormal	Normal	Lognormal	Normal	Lognormal
5	0.47	0.47	0.47	0.60	0.67	0.50	0.60	0.60
10	0.30	0.47	0.40	0.33	0.53	0.37	0.43	0.50
15	0.17	0.30	0.27	0.33	0.40	0.33	0.20	0.33
20	0.17	0.23	0.23	0.40	0.20	0.20	0.17	0.17
25	0.13	0.33	0.10	0.30	0.10	0.17	0.13	0.40
30	0.03	0.17	0.10	0.27	0.17	0.17	0.07	0.27
35	0.03	0.13	0.10	0.10	0.10	0.20	0.07	0.40
40	0.07	0.17	0.07	0.17	0.10	0.10	0.10	0.20

Figures

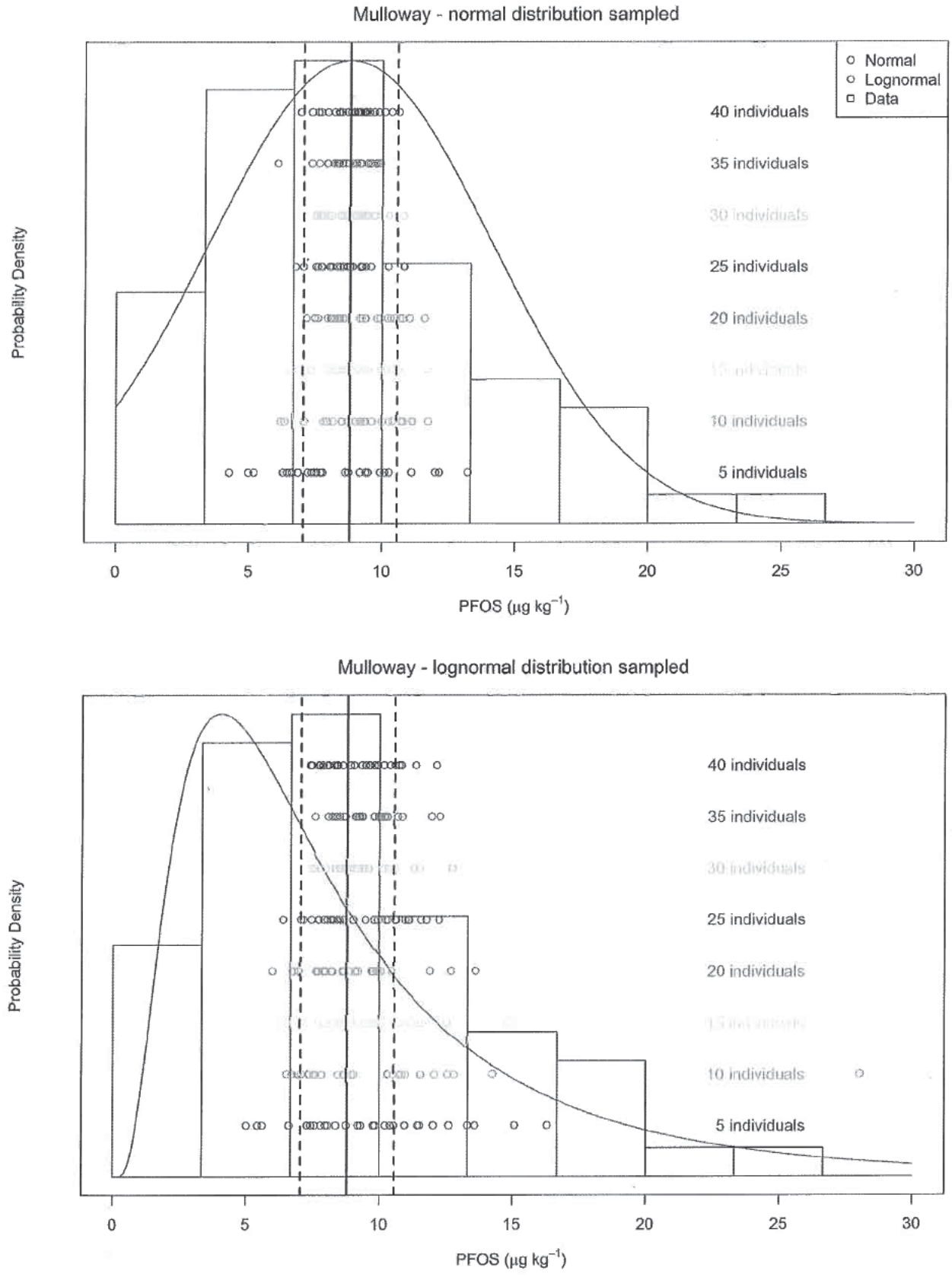

Figure 1 Simulation outcomes for Mulloway using data collected through the Data-gap Analysis Sampling Program in Fullerton Cove (samples collected in summer 2017). Description of figure content is provided in the text above. Simulations assuming a normal distribution are presented in the upper panel, and simulations assuming a lognormal distribution are presented in the lower panel. Legend is provided in the upper panel. Note that the *y*-axis values are arbitrary for coloured circles.

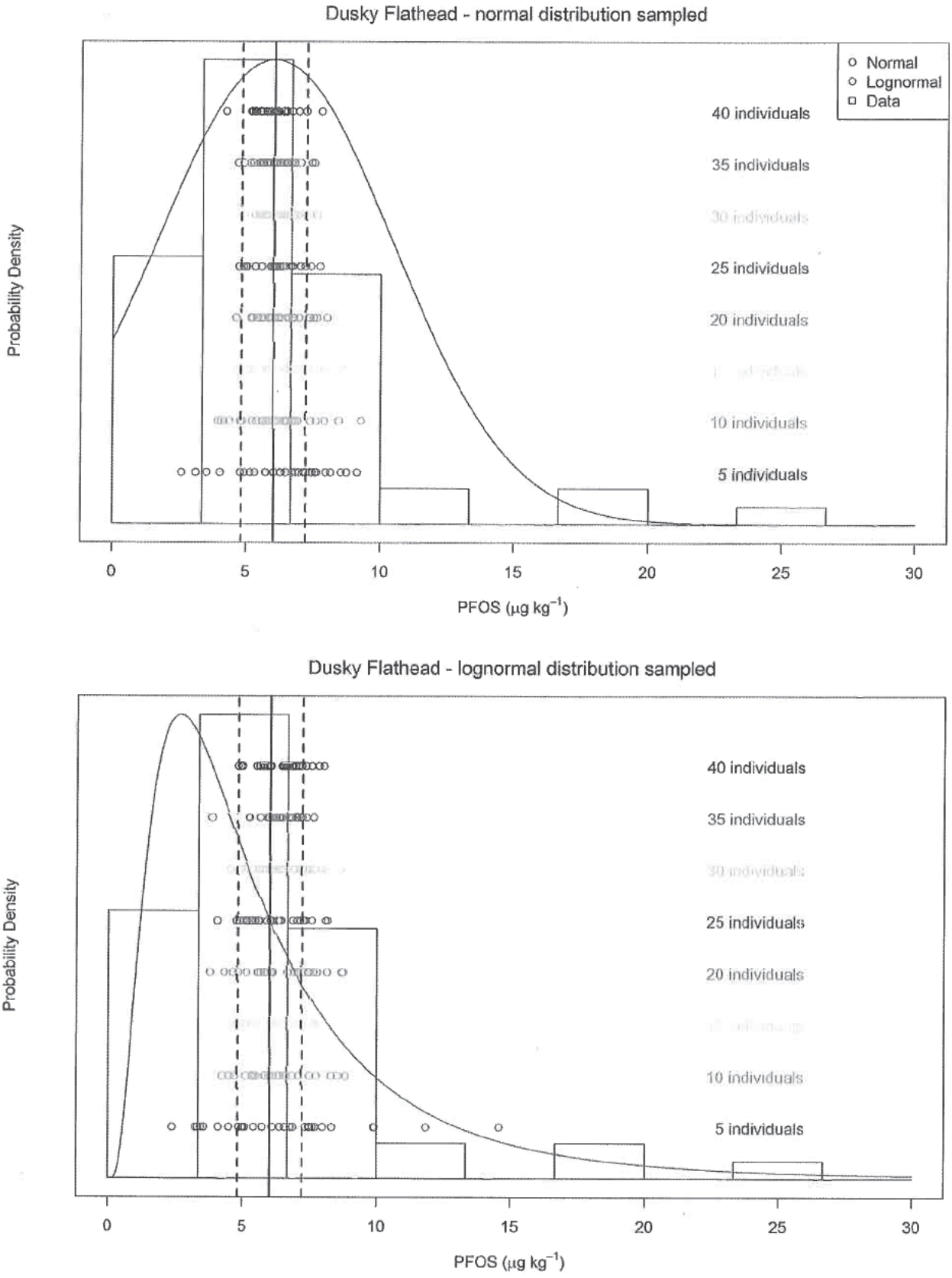

Figure 2 Simulation outcomes for Dusky Flathead using data collected through the Data-gap Analysis Sampling Program in Fullerton Cove (samples collected in summer 2017). Description of figure content is provided in the text above. Simulations assuming a normal distribution are presented in the upper panel, and simulations assuming a lognormal distribution are presented in the lower panel. Legend is provided in the upper panel. Note that the *y*-axis values are arbitrary for coloured circles.

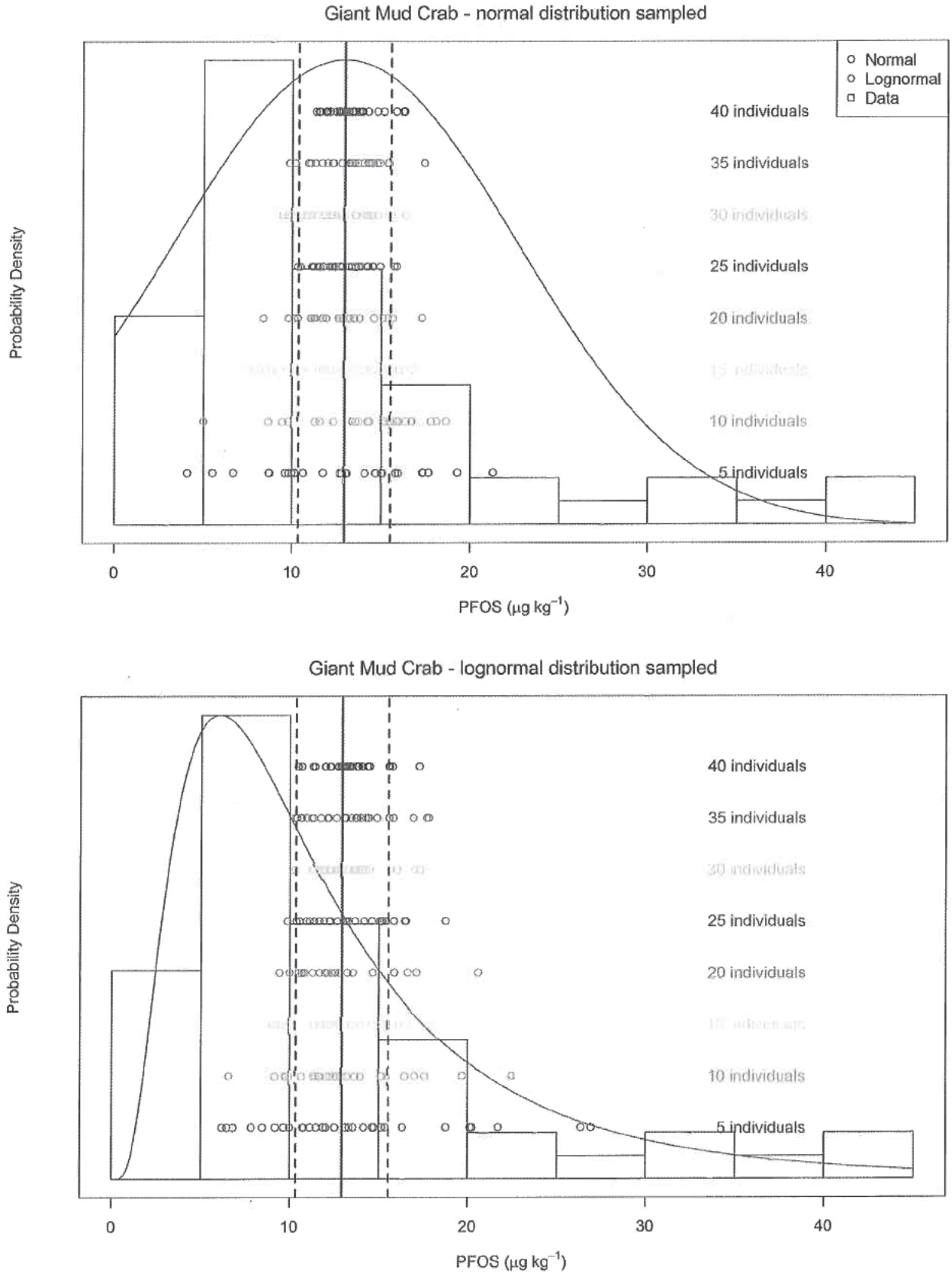

Figure 3 Simulation outcomes for Mud Crab using data collected through the Data-gap Analysis Sampling Program in Tilligerry Creek (samples collected in summer 2017). Description of figure content is provided in the text above. Simulations assuming a normal distribution are presented in the upper panel, and simulations assuming a lognormal distribution are presented in the lower panel. Legend is provided in the upper panel. Note that the *y*-axis values are arbitrary for coloured circles.

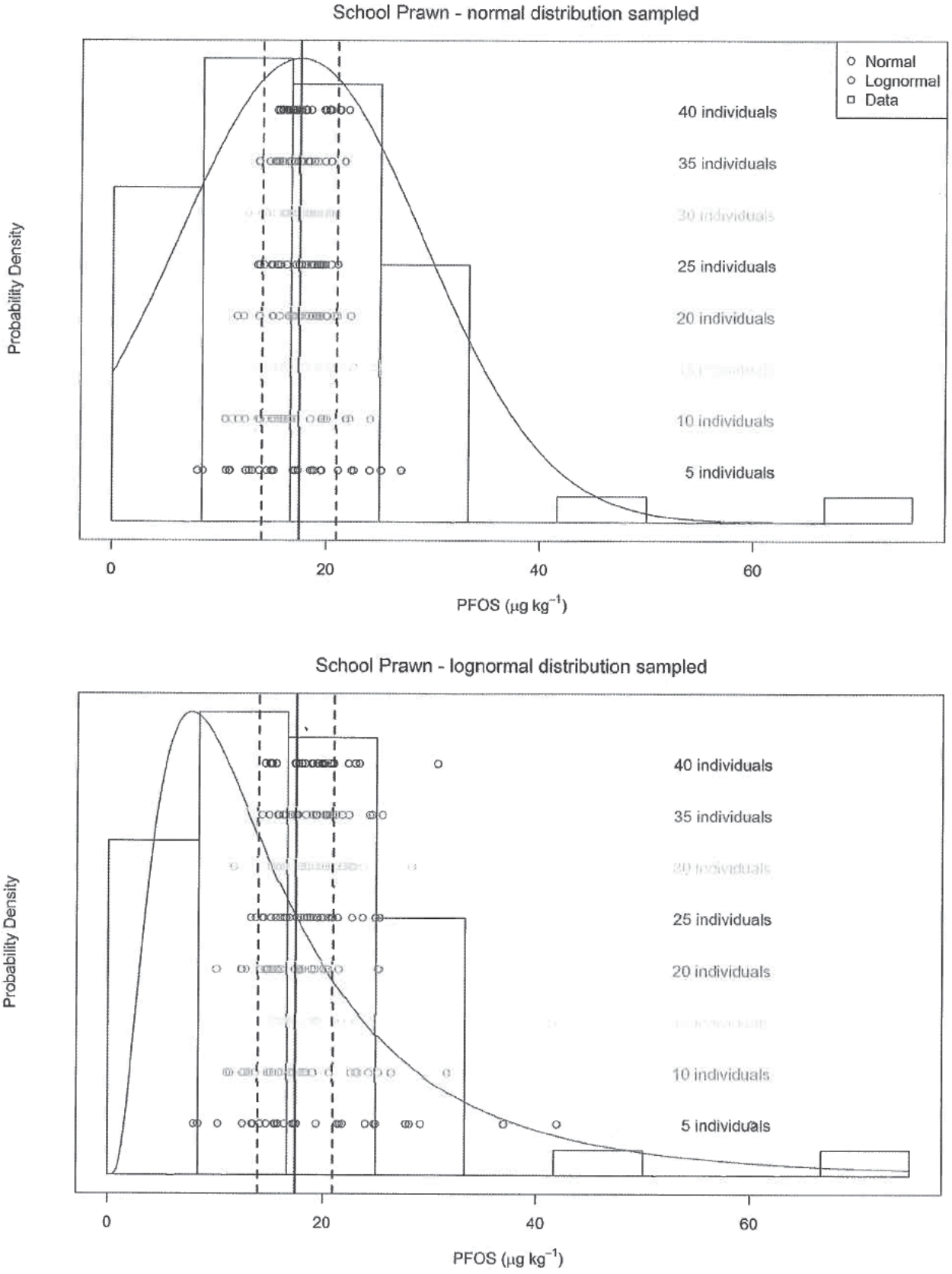

Figure 4 Simulation outcomes for School Prawn using data collected through the Data-gap Analysis Sampling Program in Fullerton Cove (samples collected in summer 2017). Description of figure content is provided in the text above. Simulations assuming a normal distribution are presented in the upper panel, and simulations assuming a lognormal distribution are presented in the lower panel. Legend is provided in the upper panel. Note that the *y*-axis values are arbitrary for coloured circles.

Williams, Jarrod (Health)

From: McNeill, Laura (Health) on behalf of Pengilley, Andrew (Health)
Sent: Thursday, 16 August 2018 12:08 PM
To: [redacted]
Subject: Accepted: JBT next steps meeting

Stedman, Andrew (Health)

From: [redacted]@ghd.com>
Sent: Thursday, 16 August 2018 3:41 PM
To: [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@spotless.com.au; [redacted]@shoalhaven.nsw.gov.au; [redacted]@infrastructure.gov.au; [redacted]@environment.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@aecom.com; [redacted]@aecom.com; [redacted]@infrastructure.gov.au; Clapham, David; [redacted]@epa.nsw.gov.au; [redacted]@health.nsw.gov.au; Stedman, Andrew (Health); [redacted] Hudson, Lyndell (Health); Peter Watson; [redacted]@shoalhaven.nsw.gov.au; [redacted]@defence.gov.au [redacted]@defence.gov.au
Subject: JBRF PFAS Investigation - July Monthly report and meeting 17 agenda
Attachments: 2126171_REP_July 2018 Monthly Report_PCG.pdf; JBRF PCG_MEETING 17 _AGENDA.pdf

Dear JBRF PCG,

Please see attached the July monthly report and Agenda for meeting 17 Agenda for our meeting Tue 21 August at 2:30 pm.

Please Note the meeting time change to 2:30 - 3:30 with apologies for the late notice on time change.
Meeting invite update to follow

Regards,

[redacted]

GHD ***Proudly employee owned***

[redacted]@ghd.com
Level 2, 57 Graham Street (PO Box 621) Nowra NSW 2541 Australia | http://www.ghd.com/
Water | Energy & Resources | Environment | Property & Buildings | Transportation

Australian Government
Department of Defence
Estate and Infrastructure Group

PFAS Investigation and Management
Monthly Report- Jervis Bay Range Facility

06 08 2018

[redacted]
BP8 Level 1
8 Brindabella Circuit
Brindabella Business Park
PO Box 7925 Canberra BC 2610

Re: Jervis Bay Range Facility Environmental Investigation – Progress Report July 2018

1.0 Introduction

The following progress report has been prepared by GHD Pty Ltd to provide a summary of activities for the Comprehensive Investigation of PFAS Site Conditions at Jervis Bay Range Facility, HMAS Creswell and surrounds for the period between 1 June 2018 and 30 July 2018.

2.0 Critical items

2.1 New items

- Defence advised that [redacted] will assume the Project Director role for the JBRF investigation [redacted] has moved across to Management in PFAS PMAP development, for various investigation sites.
- GHD issue residential sampling results letters on 03/07/2018, excluding Jervis Bay School results letter. WBACC were provided copies of the Wreck Bay letters, as the property owner. JBTA, were provided copies of Village Road letters, as the property owner. The letters were hand delivered to provide the residents the opportunity to discuss and interpret the results. During discussions, a Wreck Bay resident reported an issue with the tap water (odor) which was reported to JBTA for their attention.
- The planned delivery and presentation of results to WBACC board on 25 June 2018 was postponed by the Board. GHD attended a WBACC meeting on 03/07/2018 to deliver 403 land results letter and met with the CEO and the chairperson to discuss the results. The formal presentation of the results to the entire WBACC Board was rescheduled to 01/08/2018, with an informal community discussion session scheduled to follow that meeting.
- A Board member requested a tour of the Defence facilities, CAPT Huxtable (SADFO) extended a formal invitation to WBACC Board members for a windscreen tour of HMAS Creswell and the RANSSSS scheduled for 01/08/2018 prior to the Board meeting.
- GHD issued a DSI Summary of adopted PFAS assessment levels for auditor review, allowing a common understanding and agreement of the assessment criteria to be adopted for the DSI development.

- GHD retrieved all installed data loggers from JBRF wells for data download and development of groundwater model.
- GHD received whole body biota, laboratory results completing the investigation sampling dataset.

2.2 Previously raised items to be addressed

- GHD issued an updated master risk register for Defence review 17/07/2018.
- GHD issued a Waste Disposal Plan Rev 0 on 12/07/2018 and received endorsement from the defence base EMOS contractor, EMOS advised the JBRF investigation drilling waste disposal has been incorporated into the automatic weather station project at JBRF.

3.0 Project progress

- The following items have been completed this reporting period:
- 100% completion of on and off site biota sampling with laboratory results received.
- Preparation and issue of residential and 403 land results letters.

3.1 Project impacts

- Onsite sample results (biota, soil, water) and potential for agency precautionary dietary recommendation advice.
- 403 land sample (biota, soil, water) results and potential for agency precautionary dietary recommendation advice.
- Availability of WBACC Board during the December 2018 and January 2019 period as no Board sittings are planned during this time.

3.2 Project meetings

Project meetings held this reporting period are presented in Table 1.

Table 1: Summary of meetings held during the July reporting period

Meeting date	Meeting title	Participants	Minutes circulated
Recurring Wednesday's	Weekly meetings (telcon)	JBRF project team – Defence, GHD & Site auditor	Yes
17/07/2018	PCG Monthly (telcon)	Defence, GHD, Site auditor, Agencies and stakeholders	Yes
03/07/2018	WBACC results letter 2 delivery	[redacted]	No
03/07/2018	Residential sampling letter delivery	individual residents	No
30/07/2018	WBACC results presentation (telcon)	GHD/Defence	No

3.3 Project deliverables submitted this period

Project deliverables submitted during this reporting period are presented in Table 2.

Table 2: Project deliverables submitted during the July reporting period

Document status	Title	Date submitted
Draft	WBACC results presentation GHD format	20/05/18
Draft	WBACC results presentation Defence format	25/07/18
Draft	2126171-REP-REVC_DSI Waste Management	02/07/2018
Final	2126171-REP-REV0_DSI Waste Management	12/07/2018
Draft	2126171-LET- Results letter 3 WBACC lands	31/07/2018

3.4 Project Milestones

The following project milestones were achieved in the July reporting period:

- 100% completion of on site and off site, biota, soil, sediment and water sampling with sample results received.
- Commencement of Detailed Site Investigation (DSI) report development.

4.0 Project Forecast

The updated project schedule is presented in the enclosed project milestone schedule, dated 15 June 2018.

4.1 Schedule tracking forecast

- The project schedule originally impacted by the inability to access the Wreck Bay community land has been revised with investigation and reporting completion programmed for January 2019.

4.2 Project deliverables expected next period

- Sample results data analysis
- Preparation and issue of Draft DSI

4.3 Technical Advisor forecast

The Technical Advisor's achievements and planned activities are presented in Table 3.

Table 3: Technical Advisor achievements and key activities during the July reporting period

Scope item	Achieved to date	Planned for next month
Monitor Project progress and provide comment	Yes	ongoing
Review DSI assessment criteria and provide comment	Yes	Review Draft DSI

5.0 Community enquiries

In this reporting period:

- No community independent enquiries were received via the Community Hotline (1800 987 618) and email (Jervisbay@ghd.com.au)
- There are 0 outstanding stakeholder enquires

6.0 Interaction with Government

Meetings and communications with government stakeholders are summarised in Table 4.

Table 4: Summary of interactions with Government during the July reporting period

Meeting date	Meeting title	Participants	Minutes circulated
17/07/2018	PCG 1 Monthly meeting	Defence, GHD, Site auditor, Agencies and stakeholders	Yes

9.0 Requests for information from Defence

- GHD requested the following information from Defence that is pending or potentially unavailable:
    1. Borehole logs for some historic wells installed at HMAS Creswell.
    2. Detail for JBRF asbestos remediation conducted to the North of RANSSSS 2018.
- All other relevant reports and information associated with JBRF environmental assessments and contamination investigations have been provided to GHD by Defence.

10.0 Other Matters

- Nil

Yours sincerely

[redacted]

CC:

Enclosures: Project Schedule - Dated 15/06/2018

Project schedule, dated 15 June 2018

Item	Start	Finish	
DSI	**5/04/2017**	**28/08/2017**	**GHD**
Off-Site Groundwater Bore, Sediment and surface water sampling (Round 2)	18/04/2018	20/05/2018	GHD
Biota sampling	15/02/2018	22/05/2018	GHD
Laboratory analysis	12/02/2018	26/06/2018	ALS/NMI
Laboratory analysis of on hold samples (TBC)	26/06/2018	15/07/2018	ALS/NMI
Data analysis and interpretation	27/06/2018	17/07/2018	
DSI & Groundwater Model Reporting	28/05/2018	25/10/2018	GHD/Defence/Agency/WBACC
DSI and groundwater model report preparation	18/07/2018	15/08/2018	GHD
Defence and Auditor review of Draft DSI Report	16/08/2018	12/09/2018	Defence/Auditor
Update of Draft DSI Report	13/09/2018	20/09/2018	GHD
ACT & NSW State Agency & WBACC review of DSI Report	21/09/2018	4/10/2018	Agency/WBACC
DSI Workshop (if required)	04/10/2018	04/10/2018	GHD/Defence/Agency
Finalise DSI Report	5/10/2018	25/10/2018	GHD/Defence/Auditor
Human Health Risk Assessment (HHRA)	**24/08/2017**	**6/11/2018**	**GHD/Defence/Agency/WBACC**
HHRA (Human Health Risk) Draft report Preparation	8/07/2018	4/09/2018	GHD
Defence and Auditor review of Draft HHRA report	5/09/2018	18/09/2018	Defence/Auditor
Update of Draft HHERA report	19/09/2018	2/10/2018	GHD
ACT & NSW State Agency & WBACC review of HHRA	3/10/2018	16/10/2018	Agencies/WBACC

HHRA Workshop	16/10/2018	16/10/2018	GHD/Defence/Agency
Finalise HHERA Report	17/10/2018	6/11/2018	GHD/Defence/Auditor
Ecological Risk assessment (ERA)	**24/08/2017**	**4/12/2018**	**GHD/Defence/Agency/WBACC**
ERA (ecological risk) Draft report Preparation	18/07/2018	2/10/2018	GHD
Defence and Auditor review of Draft ERA report	3/10/2018	16/10/2018	Defence/Auditor
Update of Draft ERA report	17/10/2018	30/10/2018	GHD
ACT & NSW State Agency & WBACC review of ERA	31/10/2018	13/11/2018	Agencies/WBACC
ERA Workshop	13/11/2018	13/11/2018	GHD/Defence/Agency
Finalise ERA Report	14/11/2018	4/12/2018	GHD/Defence/Auditor
PFAS Management Area Plan (PMAP)	**17/10/2018**	**6/12/2018**	**GHD/Defence/Auditor**
PMAP Briefing	17/10/2018	17/10/2018	GHD/Defence/Auditor
PMAP Draft Report preparation	18/10/2018	7/11/2018	GHD
Defence and Auditor review of Draft PMAP report	8/11/2018	21/11/2018	GHD/Defence/Auditor
PMAP report workshop	22/11/2018	22/11/2018	GHD/Defence/Auditor
PMAP Rev 0 workshop	23/11/2018	23/11/2018	GHD/Defence/Agency
Finalise PMAP Report	TBC	TBC	GHD/Defence
Community Information Sessions	**21/03/2017**	**25/05/2018**	**GHD/Defence/Agency/Community**
Community Information Session 3	TBC	TBC	To coincide with planned agency advisories
Community Information Session 4	7/12/2018	7/12/2018	GHD/Defence/Agency/Community
(Post DSI/HHERA/PMAP finalisation)			

Stakeholder engagement reporting	19/12/2017	31/12/2018	GHD/Defence
Draft Stakeholder and engagement report	17/12/2018	4/01/2019	GHD
Finalise stakeholder engagement reports	14/01/2019	18/01/2019	GHD/Defence
Project Close out	**21/01/2019**	**5/02/2019**	**GHD/Defence**

Australian Government
Department of Defence
Estate and Infrastructure Group

PFAS Environmental Management Program
Monthly PCG Meeting (17) – JBRF

Administrative Details	
Date	21 August 2018
Time	**14:30 hrs (AEDST)**
Venue	Teleconference
Dial-in Details	**1-800-733-609** Australia Toll free Access code: [redacted]
Chair	[redacted]
Minutes	GHD
Attendees	
[redacted]	
Stedman Andrew	Andrew.Stedman@act.gov.au
[redacted]	
Heath Chester	heath.chester@act.gov.au
David Clapham	David.Clapham@act.gov.au
[redacted]	
Lyndell Hudson	Lyndell.Hudson@act.gov.au
[redacted]	

[redacted]	
Agenda	
Introductions	
Investigation Progress	- **Detailed Site Investigation (DSI)** - DSI reporting and Numerical Groundwater Model
Future Stages (schedule)	- Human Health Risk Assessment (HHRA) - Ecological Risk Assessment (ERA) - PFAS Management Area Plan (PMAP)
Site Auditor	- Update from site auditor
Stakeholder Engagement	- Meetings and briefs - Community enquiries
Risks and Issues	
Other Business	
Close	

Williams, Jarrod (Health)

From: [redacted]@infrastructure.gov.au>
Sent: Thursday, 16 August 2018 3:55 PM
To: [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@health.gov.au; [redacted]@health.gov.au; [redacted]@health.gov.au; [redacted]@environment.gov.au; [redacted]@environment.gov.au; [redacted]@environment.gov.au; [redacted] Pengilley, Andrew (Health); Clapham, David; Barr, Conrad (Health); Kelly, Paul (Health); [redacted]
Subject: JBT next steps meeting [DLM=For-Official-Use-Only]
Attachments: JBT meeting agenda.pdf

Colleagues

Please find attached an agenda for the meeting tomorrow on next steps for managing PFAS in the JBT.

The meeting will be held from 9.15am to 10.15am in the Department's ground floor board room at 62 Northbourne Avenue, Canberra. Alternatively teleconference lines are available.

If you have not already, please confirm by return email whether you will be attending in person or by teleconference.

Kind regards

[redacted] Jervis Bay Territory Administration
Territories Division
Department of Infrastructure, Regional Development and Cities
GPO Box 594, Canberra ACT 2601
t 02 6274 6145
e [redacted]@infrastructure.gov.au | **w** www.infrastructure.gov.au

and delete all copies of this transmission together with any attachments.

Australian Government
Department of Infrastructure, Regional Development and Cities

JBT PFAS Meeting

9.15am to 10.15am
Friday 17 August 2018

Ground Floor Board Room
Department of Infrastructure, Regional Development and Cities
62 Northbourne Avenue
CANBERRA ACT 2600

Agenda

1. Introduction
2. Analysis methodology discussion
3. Environmental and Human Health Risk Assessments
4. Options going forward/confirmation of next steps
   a. Further testing
   b. Community engagement
5. Other business

Teleconference Participants, please dial 1800 556 264 and use guest pin: 6394215#

Williams, Jarrod (Health)

Subject:	Canceled: ACT-Commonwealth Meeting - PFAS JBT
Location:	Nara Conference Room Level 4
Start:	Fri 17/08/2018 9:10 AM
End:	Fri 17/08/2018 10:10 AM
Show Time As:	Free
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Clapham, David
Required Attendees:	Pengilley, Andrew (Health) [redacted] Barr, Conrad (Health); Kelly, Paul (Health); [redacted]
Optional Attendees:	Hudson, Lyndell (Health); Stedman, Andrew (Health)
Importance:	High

Good afternoon

, ou should have by now received a conflicting invite for this meeting from the Department of Infrastructure and so I am removing this placeholder – please note that the meeting will now occur at the Department of Infrastructure building in Civic, Ground Floor Board Room, 62 Northbourne Avenue

Please don't hesitate to contact me with any issues.

Best

David

Afternoon all

There has been a request from the Commonwealth to meet as soon as possible to discuss the ACT's advice regarding PFAS in JBT and next steps. Thank you in advance for your late notice participation – please advise of a

RE: ACT Correspondence...

ny issues.

Best

David

David Clapham | Manager - Intergovernmental Relations | Policy & Cabinet Division
* 02 6205 7261 | Chief Minister, Treasury & Economic Development Directorate| ACT Government
Level 4, Canberra Nara Centre |GPO Box 158 Canberra ACT 2601 | www.act.gov.au <http://www.act.gov.au/>

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Williams, Jarrod (Health)

From: [redacted]@infrastructure.gov.au>
Sent: Wednesday, 15 August 2018 3:10 PM
To: [redacted]
Cc: [redacted] Clapham, David
Subject: RE: ACT Correspondence on PFAS [DLM=For-Official-Use-Only]

Dear [redacted] and David

As discussed with [redacted] on the phone this afternoon, I am coordinating an IDC to discuss next steps for the JBT following the ACT's analysis of the Defence PFAS test results and also providing involved agencies with an opportunity to discuss any further queries they might have with the ACT's analysis of the test results for the JBT. I am working toward a meeting at 9am on Friday 17 August, and would appreciate CMTEDD's assistance in coordinating appropriate senior officers from the ACT at this time. Could you please advise who would be appropriate to attend from the ACT and whether 9am Friday works?

Kind regards

[redacted] | Jervis Bay Territory Administration Territories Division Department of Infrastructure, Regional Development and Cities GPO Box 594, Canberra ACT 2601 t 02 6274 6145 e luke.slattery@infrastructure.gov.au | w www.infrastructure.gov.au

<https://infrastructure.gov.au/images/email-crest-dirdc.jpg>

<https://infrastructure.gov.au/images/email-stripe.jpg>

Williams, Jarrod (Health)

Subject:	JBT next steps meeting [DLM=For-Official-Use-Only]
Location:	Ground Floor Board Room, 62 Northbourne Avenue, Canberra, Department of Infrastructure, Regional Development and Cities.
Start:	Fri 17/08/2018 9:15 AM
End:	Fri 17/08/2018 10:15 AM
Show Time As:	Tentative
Recurrence:	(none)
Organizer:	[redacted]

Colleagues

The meeting concerning JBT next steps has been confirmed for 9.15am tomorrow. Further details including an agenda for the discussion will follow today.

For those who would prefer to participate by teleconference, please dial 1800 556 264 at the meeting time. The guest pin is 6394215#. Confirmation of your preference for attending in person or by teleconference would be appreciated.

Kind regards

[redacted]

This material contains information that, if disclosed inappropriately, may cause limited damage to national security, Australian Government agencies, commercial entities or members of the public. Recipients should ensure they handle and store this material appropriately.

ýÿ

Stedman, Andrew (Health)

From: [redacted]@defence.gov.au>
Sent: Monday, 20 August 2018 9:58 AM
To: Stedman, Andrew (Health); [redacted]@ghd.com'
Cc: Pengilley, Andrew (Health)
Subject: RE: JBRF - PFAS Investigation - Project Control Group Monthly Meeting [SEC=UNCLASSIFIED]

UNCLASSIFIED

Thanks Andrew S,

Dave are you happy to add Andrew P please.

Regards,
[redacted]

[redacted]
Project Manager – Investigations East
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [redacted] **E:** [redacted]@defence.gov.au

From: Stedman, Andrew (Health) [mailto:Andrew.Stedman@act.gov.au]
Sent: Monday, 20 August 2018 9:05 AM
To: [redacted]@ghd.com
Cc: Pengilley, Andrew (Health)
Subject: JBRF - PFAS Investigation - Project Control Group Monthly Meeting [SEC=UNCLASSIFIED]

Hi [redacted]

Is it possible to add Andrew Pengilley from ACT health to the invite list for these monthly meetings?

Andrew's email is: andrew.pengilley@act.gov.au

He is closely involved in ACT's response to various PFAS issues.

Thanks

Andrew Stedman | Public Health Officer | A/g Manager Environment and Radiation Safety
Phone: 02 6205 4404 | Mobile: [redacted] Email: andrew.stedman@act.gov.au
Health Protection Service | Population Health Protection and Prevention | ACT Health | ACT Government
25 Mulley Street, Holder ACT 2611 | health.act.gov.au/hps

Stedman, Andrew (Health)

From: [redacted]@ghd.com>
Sent: Monday, 20 August 2018 10:53 AM
To: Pengilley, Andrew (Health)
Cc: Stedman, Andrew (Health); PFASIM Jervis Bay
Subject: RE: JBRF - PFAS Investigation - Project Control Group Monthly Meeting [SEC=UNCLASSIFIED]

Hi Andrew,

I have added you to the Jervis Bay Investigation Project Control Group (PCG) meetings. Tomorrow's meeting is at 2:30 pm, thereafter the third Tuesday of each month at 2:00 pm.

Regards,

[redacted]

HD *Proudly employee owned*

[redacted]@ghd.com
Level 2, 57 Graham Street (PO Box 621) Nowra NSW 2541 Australia | http://www.ghd.com/
Water | Energy & Resources | Environment | Property & Buildings | Transportation

From: Stedman, Andrew (Health) <Andrew.Stedman@act.gov.au>
Sent: Monday, 20 August 2018 9:05 AM
To: [redacted]@defence.gov.au; [redacted]@ghd.com>
Cc: Pengilley, Andrew (Health) <Andrew.Pengilley@act.gov.au>
Subject: JBRF - PFAS Investigation - Project Control Group Monthly Meeting [SEC=UNCLASSIFIED]

[redacted]

Is it possible to add Andrew Pengilley from ACT health to the invite list for these monthly meetings?

Andrew's email is: andrew.pengilley@act.gov.au

He is closely involved in ACT's response to various PFAS issues.

Thanks

Andrew Stedman | Public Health Officer | A/g Manager Environment and Radiation Safety
Phone: 02 6205 4404 | Mobile [redacted] | Email: andrew.stedman@act.gov.au
Health Protection Service | Population Health Protection and Prevention | ACT Health | ACT Government
25 Mulley Street, Holder ACT 2611 | health.act.gov.au/hps

Williams, Jarrod (Health)

Subject: FW: JBRF - PFAS Investigation - Project Control Group Monthly Meeting
Location: Teleconference

Start: Tue 21/08/2018 2:30 PM
End: Tue 21/08/2018 3:30 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: [redacted]

Dear Andrew

Lyndell represents ACT Health on this group, you may wish to begin attending?

-----Original Appointment-----
From: [redacted]@ghd.com]
Sent: Monday, 20 August 2018 10:49 AM
To: [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@defence.gov.au; [redacted]@aecom.com; [redacted]@aecom.com; [redacted]@infrastructure.gov.au; Clapham, David; [redacted]@epa.nsw.gov.au; [redacted]@health.nsw.gov.au; [redacted]@environment.gov.au; Stedman, Andrew (Health); [redacted]@spotless.com.au; [redacted] Hudson, Lyndell (Health); [redacted]@shoalhaven.nsw.gov.au; [redacted]@infrastructure.gov.au; [redacted]@shoalhaven.nsw.gov.au; [redacted] Pengilley, Andrew (Health)
Cc: [redacted]@environment.gov.au; PFASIM Jervis Bay
Subject: JBRF - PFAS Investigation - Project Control Group Monthly Meeting
When: Tuesday, 21 August 2018 2:30 PM-3:30 PM (UTC+10:00) Canberra, Melbourne, Sydney.
Where: Teleconference

Welcome to the Monthly Project Control Group meeting for the Jervis Bay Range Facility - PFAS investigation.
This recurring meeting will be held every third Tuesday of the month at 14:00, (**this meeting 14:30**) via teleconference details below.
If you have any questions please contact:
Defence Project Manager [redacted]
Defence Project Director - [redacted]
GHD Project manager - [redacted]

Regards,

[redacted]

GHD
[redacted]@ghd.com
Level 2, 57 Graham Street (PO Box 621) Nowra NSW 2541 Australia | http://www.ghd.com/
Water | Energy & Resources | Environment | Property & Buildings | Transportation

[redacted]

Defence Project Manager - Environmental Investigations
PFAS Investigation and Management Branch
Department of Defence

T: [redacted]
E: [redacted]@defence.gov.au
A: BP8-1, 8 Brindabella Circuit, Brindabella Business Park
PO Box 7925, Canberra BC 2610

[redacted]

Department of Defence | Estate & Infrastructure Group
M: [redacted] **E:** [redacted]@defence.gov.au

-- Do not delete or change any of the following text. --

Join WebEx meeting
Meeting number: [redacted]

If you are a host, go here to view host information.

Join by phone
Call-in toll-free number [redacted] (Australia)
Call-in number: [redacted] (Australia)
Show global numbers
Participant Pin Code [redacted]

If using a GHD VoIP phone, please dial [redacted]

Please dial *0 if you experience audio difficulties during conference
Can't join the meeting? Contact support.

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