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[redacted]	[redacted]
[redacted]	[redacted]
Agenda	
Introductions	
Investigation Progress (DSI scope and schedule)	- **Detailed Site Investigation (DSI)** - SAQP & Conceptual Site Model (CSM) - Factual memorandums
Future Stages (schedule)	- Human Health and Ecological Risk Assessment (HHERA) - Numerical Groundwater Model
Site Auditor	- Update from site auditor
Stakeholder Engagement	- Meetings and briefs - Community enquiries
Risks and Issues	
Other Business	
Close	

Stedman, Andrew (Health)

From: [redacted]
Sent: Monday, 16 April 2018 3:43 PM
To: [redacted]; Clapham, David; Chester, Heath; [redacted] Stedman, Andrew (Health); [redacted]; Hudson, Lyndell (Health); [redacted]
Subject: RE: JBRF PCG Meeting No. 13 Agenda
Attachments: 2126171_REP_February 2018 Monthly Report.pdf

Dear JBRF PCG,

Please see attached the February 2018 monthly reports for your records.
Please join us for meeting Agenda for JBRF PCG meeting No. 13, tomorrow, 17 April at 2 pm.
Dial in Details are below.

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]

Regards,

[redacted]

GHD
[redacted]
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

20 03 2018

[redacted]
BP3-02-B091
26 Brindabella Circuit
Brindabella Business Park
PO Box 7925 Canberra BC 2610

Re: Jervis Bay Range Facility Environmental Investigation – Progress Report February 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 31 January 2018 and 28 February 2018.

2.0 Critical items

2.1 New items

- SAQP Rev 2.1 administrative update to SAQP Rev 3 as final version. Rev 3 update contains no changes to content from Rev 2.1, which was reviewed by Defence, auditor, agencies and WBACC 07/02/18.
- HHRA for RANSSSS closed loop water systems, Rev 2 issued as final to Defence incorporating response to auditor comments. HHRA recommends no changes to RANSSSS operations are required in response to interim risk analysis 08/02/18.
- GHD drafted permit conditions to conduct the investigation on 403 lands, which were reviewed and approved by WBACC. Formal permit application issued by GHD to WBACC 13/02/18.
- WBACC provide permit (GHD/DEF 0001/2018) under section 76 of the aboriginal land grant (Jervis Bay territory) by-laws 2016. Permit dated 15/02/18 authorises GHD to conduct investigation on 403 lands. Permit period covers investigation activity up to and including 01 March 2020.
- GHD accompany Defence feral animal control contractor receiving two fox and four rabbit samples from JBRF area on 9/02/18 and four rabbits samples from Creswell area on 22/02/18.
- Permit to collect biota and remove from Booderee National parks received.
- Defence environmental clearance certificate to conduct Biota sampling at HMAS Creswell and JBRF received.

- Meeting with WBACC CEO, Supervisor, Field assistant and Administration assistant held 10:00 – 11:45 on 27/02/2018 with positive outcomes including investigation planning and identification of cultural supervisors, field hands and administration assistants.
- Requirement for informal community BBQ identified by WBACC Sunday 11th March to inform the community of upcoming investigation activities.
- Auditor inspects on site sampling areas (27/28 February) and aquatic and terrestrial biota sampling team activities, with no issues identified to GHD.
- BNP permit issued which has triggered application to remove biota from National park, which is underway.
- Original permit for soil water sampling within BNP has expired and has been resubmitted by GHD.

2.2 Previously raised items to be addressed

- WBACC have engaged The University of Newcastle (UON), Global Centre for Environmental Remediation (GCER) to support reviews of the project documents and provide advice on the investigation. WBACC have advised that support for the issue of a permit will be provided in February 2018.

3.0 Project progress

- The following items have been completed this reporting period:
  - Commencement of on site biota sampling >40% of planned marine and terrestrial samples taken from JBRF, Creswell, Flatrock Creek and Captains Lagoon areas.
  - WBACC provide permit for access to conduct the investigation on 403 land.
  - WBACC employment opportunities identified with a meeting held to plan investigation and formally introduce cultural supervisors, field hand and administration assistants.

3.1 Project impacts

- Cultural supervisors and GHD sampling teams relationship and ability to conduct the required sampling within allocated timeframes.
- Unknown cultural sensitivities associated with planned sample locations.
- Rain event timing and low levels of surface water flows throughout Jervis Bay and wider area.

3.2 Project meetings

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

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

Meeting date	Meeting title	Participants	Minutes circulated
Recurring Wednesday's	Weekly meetings	JBRF project team – Defence, GHD & Site auditor	Yes
21/02/2018	PCG Monthly	Defence, GHD, Site auditor, Agencies and stakeholders	Yes
27/02/2018	WBACC cultural supervision	WBACC CEO, cultural supervisors, field hand, administration assistant and GHD	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 February reporting period

Document status	Title	Date submitted
Final	2126171-LET-1-HHRA RANSSSS_Rev 2	08/02/18

3.4 Project Milestones

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

- Receipt of WBACC permit to conduct the investigation on 403 lands.

4.0 Project Forecast

The project schedule is presented in the enclosed project schedule, dated 28 March 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

- All permits finalised to conduct the investigation within BNP.
- On site biota sampling.
- Finalise sewer system investigation.
- Commence 403 and BNP investigation activities

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 February reporting period

Scope item	Achieved to date	Planned for next month
Monitor Project progress and provide comment	Yes	ongoing
Site audit of biota sampling activities	Yes	complete

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 February reporting period

Meeting date	Meeting title	Participants	Minutes circulated
21/02/2018	PCG 11 Monthly meeting	Defence, GHD, Site auditor, Agencies and stakeholders	Yes

7.0 Defence Legal Support

The Office of Defence Special Council is assisting with the following items:

- Nil

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 28/03/2018

Project schedule, dated 28 march 2018

Item	Start	Finish	
SAQP - REV 3	30/03/2017	14/02/2018	
Off Site Access	**20/11/2017**	**01/03/2018**	**WBACC/Booderee/GHD/Defence**
Approval to conduct Off-Site Groundwater Bore Installation, Soil, Sediment, surface water & Biota sampling	20/11/2017	01/03/2018	WBACC
DSI	5/04/2017	28/08/2017	GHD
On-Site Groundwater Bore Installation, Soil, Sediment and surface water sampling (Round 1).	5/04/2017	09/05/2017	GHD
On-Site Groundwater Bore, Sediment and surface water sampling (Round 2).	TBC	TBC	GHD (rain event required)
Off-Site Groundwater Bore Installation, Soil, Sediment and surface water sampling (Round 1)	19/03/18	13/04/2018	GHD
Off-Site Groundwater Bore, Sediment and surface water sampling (Round 2)	TBC	TBC	GHD (rain event required)
Biota sampling	15/02/2018	10/05/2018	GHD
Laboratory analysis	12/02/18	18/05/18	ALS (rain event samples TBA)
Laboratory analysis of on hold samples (if required)	TBC	TBC	
Defence, GHD, Auditor results analysis workshop	21/05/18	21/05/18	
DSI Reporting	28/05/2018	27/08/2018	GHD/Defence/Agency/WBACC
DSI Report preparation	28/05/2018	29/06/2018	GHD
Defence and Auditor review of Draft DSI Report	02/07/2018	13/07/2018	Defence/Auditor
Update of Draft DSI Report	16/07/2018	23/07/2018	GHD
ACT & NSW State Agency review of DSI Report	24/07/2018	06/08/2018	Agency
WBACC Review of DSI report (If required)?	TBC	TBC	WBACC
Finalise DSI Report	07/08/2018	27/08/2018	GHD/Defence/Auditor
Groundwater Numerical Modelling	**30/03/18**	**27/09/18**	
Data capture, modelling, calibration and sensitivity analysis	14/04/18	16/08/18	GHD

Draft groundwater modelling report Preparation	17/08/18	30/08/18	GHD
Defence and Auditor review of Draft GWM Report	31/08/18	13/09/18	GHD/Defence/Auditor
Finalisation of groundwater modelling report	14/09/18	27/09/18	
Human Health and ecological risk assessment	**24/08/2017**	**30/09/2018**	**GHD/Defence/Agency/WBACC**
HHERA Recommendation	18/07/2017	21/07/2017	GHD
HHERA Plan draft	24/08/2017	01/09/2017	GHD
Defence and Auditor review of Draft HHERA Plan	01/09/2017	15/10/2017	Defence/Auditor
ACT & NSW State Agency review of HHERA Plan	20/11/2017	01/12/2017	Agency
Risk Workshop	16/07/2018	16/07/2018	GHD
HHERA Draft report Preparation	17/07/2018	10/09/2018	GHD
Defence and Auditor review of Draft HHERA report	11/09/2018	24/09/2018	Defence/Auditor
Update of Draft HHERA report	24/09/2018	08/10/2018	GHD
Agency review of HHERA	09/10/2018	22/10/2018	Agency
WBACC Review of HHERA report (If required)?	TBC	TBC	WBACC
Finalise HHERA Report	23/10/2018	12/11/2018	GHD/Defence/Auditor
PFAS Area Management Plan (PMAP)	**18/07/2018**	**12/11/2018**	**GHD/Defence/Auditor**
PMAP Template Workshop	28/09/2018	28/09/2018	GHD/Defence/Auditor
PMAP Draft Report preparation	01/10/2018	19/10/2018	GHD
Defence and Auditor review of Draft PMAP report	22/10/2018	02/11/2018	GHD/Defence/Auditor
PMAP report workshop	15/10/2018	15/10/2018	GHD/Defence/Auditor
Finalise PMAP Report	30/10/2018	12/11/2018	GHD/Defence
Community Information Sessions	**21/03/2017**	**14/11/2018**	
Community Information Session 3	TBC	TBC	GHD/Defence/Agency/Community
Community Information Session 4 (Post reporting)	14/11/2018	14/11/2018	GHD/Defence/Agency/Community
Stakeholder engagement reporting	19/10/2018	31/12/2018	GHD/Defence
Finalise stakeholder engagement reports	05/12/2018	11/12/2018	GHD/Defence
Meetings with Agencies	**TBC**	**TBC**	**GHD/Defence/Agency**
Project Close out	**12/12/2018**	**16/01/2019**	**GHD/Defence**

Stedman, Andrew (Health)

From: [redacted]
Sent: Monday, 23 April 2018 6:51 AM
To: [redacted]; Clapham, David; Chester, Heath; [redacted]; Stedman, Andrew (Health); [redacted] Hudson, Lyndell (Health); [redacted]
Subject: PCG Meeting 12 Minutes
Attachments: JBRF-PGC Meeting Minutes 13 - April 2018.pdf

Hi All,

Please see attached minutes from the JBRF PCG meeting held 17 April 18.

thank you for your support.

Regards,

[redacted]

GHD

[redacted]

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 #12

Administrative Details	
Date	Tuesday 17 April 2018
Time	14:00 – 14:50
Venue	Teleconference
Dial-in Details	Toll ----- [redacted] Toll-free ----- [redacted] Participant PIN: [redacted]
Chair	[redacted], Defence Project Manager
Minutes	Taken by [redacted]

ATTENDEES	
Defence	
[redacted]	Project Manager PFAS Branch
Lead Contractor (LC), GHD	
[redacted]	Service Line Leader - LC Project Director
[redacted]	Principal Environmental Consultant
[redacted]	Principal – Stakeholder Engagement
[redacted]	Stakeholder Engagement
[redacted]	Project Manager
Site Auditor (SA), AECOM	
[redacted]	Environment Defence appointed peer review
Agencies	
David Clapham (DC2)	ACT Senior Policy Officer - Intergovernmental Relations
Sashini Salgado (SS)	Act Government
[redacted]	NSW Health
[redacted]	Shoalhaven Council environmental unit
[redacted]	Senior Environmental Officer NSW EPA PFAS unit
[redacted]	NSW EPA
[redacted]	NSW EPA
[redacted]	ACT Construction, Environment and Workplace Protection
[redacted]	Spotless - Defence Estate Management Shoalhaven
Lyndell Hudson (LH)	ACT Health
[redacted]	Booderee National Parks

Welcome and Conduct of PCG Meetings
[redacted] Defence PFAS -Welcomed attendees to the JBRF PFAS Investigation meeting. [redacted] (GHD) notes apologies received from Peter Curtis, Glendon Lee, David Clapham
Investigation Progress Detailed Site Investigation

1. [redacted] (GHD) Provided an overview of the investigation:
   - For onsite areas which includes HMAS Creswell, JBRF, Flat Rock Creek and Captains Lagoon, GHD has generally completed all field works including the soil, sediment and water sampling conducted last year and the recently completed terrestrial and marine biota sampling. Some planned biota sample sites such as Flat Rock Creek freshwater were abandoned as no water or biota was available and in some cases specific species trophic levels in areas were unavailable. In summary the off site biota sampling obtained a satisfactory number of samples to represent each area.
   - GHD has also taken some additional onsite water samples in response to the results received from the Defence water quality monitoring program, to validate the results and incorporate these results into our investigation.
   - As discussed at the previous meeting GHD had commenced sampling offsite, which includes Wreck Bay, Mary's Creek, Summercloud Creek, various unnamed water bodies and sites within 403 land, the national park and Jervis Bay village.
   - The completed offsite fieldwork includes soil, sediment and surface water sampling and installation and sampling of groundwater monitoring wells, including two 30 m deep wells east of Lake Windemeere and various wells in and around Wreck Bay, Village Road and the National Park. GHD has also sampled the newly installed groundwater wells, undertaken slug testing and recovered data logger information from groundwater wells installed last year.
   - Offsite biota sampling is expected to be completed by the end of next week. This includes marine, estuarine and terrestrial biota sampling and sampling of residential gardens, with some sample locations adjusted to avoid culturally sensitive areas.
   - Residential garden sampling has been completed that targeted fruit and vegetables available at the time, this included citrus, common vegetables and Lillipillis from Wreck bay, Village road and the Jervis Bay school.
   - Remaining activities for the field investigation include:
     - Planning and identification of monitoring locations to support groundwater modelling.
     - Wet weather event surface water and sediment sampling, which is proving difficult to schedule noting the absence of significant rain event. GHD is looking towards a wet weather event in May and will prioritise catchments/areas based on the review of first round of results.
     - The field investigation teams have obtained biota samples from secondary sites that may be submitted for laboratory analysis should primary sample results identify information gaps.
   - There have been minor instances where GHD has been required to deviate from the SAQP due to the field conditions, such as no surface/ground water, lack of biota, physical access or cultural boundaries. In all cases the SAQP has been considered and alternative sites or species sampled to maintain planned objectives.
   - Results for onsite terrestrial and estuarine biota and Jervis Bay marine have started returning from the primary lab and following receipt of associated QA samples and review of the data by GHD, factual memos will be issued to the PCG. To better allow for review and interpretation, ten or more factual letters will be issued to allow logical grouping of the results by area, catchment and sample type.

2. [redacted](GHD) Continued:
   - •Early raw results received (which have not been validated) have indicated PFAS concentrations in some terrestrial and estuarine biota of JBRF, Creswell, Captains Lagoon and Flat Rock Creek. A positive sign is that the results received so far have not indicated a detectable level of PFAS in any of the biota from Jervis Bay either adjacent Creswell or the reference site in the vicinity of Point Perpendicular (northern headland for the bay).
   - WBACC cultural supervisors and assistants have been monitoring and supporting the GHD field teams, providing valuable local insight and experience along the way, which has allowed the sampling teams to target the popular biota species sites that the community may come in contact with.
3. [redacted] The departures from the SAQP have been required, in response to the on ground conditions, such as dry water courses.
4. [redacted] Some preliminary sample results which have not been verified have been provided to NSW and ACT EPA, at the request of NSW EPA, that included biota samples taken from marine areas of Jervis Bay which showed no detection of PFAS, however preliminary results have indicated the presence of PFAS in samples collected from estuaries adjacent Creswell. The proviso off actual results letters in that will be made available in the near term will enable ease of readability and understanding of the presence of PFAS in biota to inform the Human Health and Ecological Risk Assessment.
5. **Comments Requested**
   - [redacted] (NSW EPA) What is the timeframe for results data for the remaining biota that has been collected?
   - [redacted](GHD) This is dependent on the provision of the data by the laboratories. Essentially 95% of the biota samples have been collected and submitted for analysis with the remaining collection of biota still underway. Once received from the lab, a three to five day turnaround is required for results to review, validate and correlate the associated QA. GHD is expecting to be able to provide the first group of results towards the end of April, noting that the grouping of results by specific class, area or catchment requires all the sample results to be received to enable review and issue of factual letters.
   - [redacted] Defence seeks to better understand jurisdictional responsibilities between NSW EPA, ACT EPA and JBTA for any potential recommendations that may need to be acted on with Jervis Bay Territory biota results.
   - ([redacted](NSW/ACT EPA) The agencies will liaise later this week to identify a strategy of responsibility..
   - [redacted] (Auditor) Deviation from the SAQP requires communication to the auditor. GHD to provide advice to the auditor.
   - ([redacted](GHD) We would use the existing table from the SAQP and identify where objectives have been achieved or where required, identify deviations with justification and comment.
   - [redacted] (Auditor) Include details of any resultant data gap
   - [redacted] Advised GHD to couple SAQP deviations with rain event planning information, as the local rainfall forecast and associated planning challenges would like to be understood.

Future Stages - Human Health and Ecological Risk Assessment (HHERA)

Refer above in the DSI minutes for information on the HHERA (biota collection).

Site Auditor Update

6. [redacted] Awaiting results and any deviations from SAQP, with no specific comment from the auditor.
7. **Comments Requested**
   - Nil

Stakeholder Engagement

8. [redacted] A unique situation with Jervis Bay Territory is the Wreck Bay community, which has specific protocols required to enable the investigation to be conducted. Defence and GHD have been working with the WBACC for some time and have engaged some members of the community to support the investigation through cultural supervision, field and administration assistance, which has been working very well. Defence has committed to the community and the WBACC Board, to discuss any results prior to any recommendations or notifications being made. Defence seeks to protect the developing relationship with the Wreck Bay community, by ensuring there is an opportunity to share early results and prior to any advice issued by the EPA or other agencies in relation to the PFAS contamination at Wreck Bay and Jervis Bay.
9. [redacted] GHD has completed vegetable and soil sampling of residential properties, eight in total including Wreck Bay, Jervis Bay village residents, and Jervis Bay school and shop. Samples taken included citrus, vegetable, tomato and lilli pilly fruit with accompanying soil samples. The samples taken were as available on the day and while different to those identified in the SAQP represent the produce currently consumed. A property that reported a garden in the water use survey June 2017, no longer had produce to sample, instead an egg was collected for analysis.
10. Project team has been invited to present interim results to the WBACC Board at the next two Board meetings on 22 May and 25 June 2018.
11. Inclusion of the four members of Wreck Bay Community in the project team to support investigation activities continues to be received well.
12. [redacted] GHD to advise acceptance to the WBACC Board to attend the proposed May and June. Defence has committed to sharing sample results with the community. It is most important sample results from Wreck Bay and Jervis Bay territories are shared with the community prior to any agency notices in relation to those territories.
13. **Comments Requested**
    - [redacted] (NSW EPA) Jervis Bay and Currambene Creek data has been reviewed and in response dietary advice will be issued in the near future for Currambene Creek. NSW EPA will liaise with ACT EPA to manage notification process and will inform Defence of any planned information release with sufficient time to inform the Wreck Bay community. Agency attendance at Wreck Bay briefing may be required and will be confirmed in due course. It is expected the required notification will take place prior to 22 May.
    - [redacted] The dietary advice identified by [redacted] is related to the HMAS Albatross investigation not the JBRF investigation. The connection of Currambene creek to Jervis Bay has indirectly tied some aspects of the separate investigations.
    - [redacted] It is unlikely that ACT EPA will deviate from NSW EPA.
    - [redacted] Confirmed ACT and NSW EPAs will liaise and inform Defence of the planned management approach.
    - ([redacted] Reiterated the promise by Defence to inform the Wreck Bay community is the primary risk and concern and requests all parties place importance on this commitment.
    - [redacted] How long does it take to arrange formal engagement with WBACC.
    - [redacted] Advice to the community should go through the Board and potential exists to arrange an extra ordinary Board meeting if required.
    - [redacted] The local community members' (from the one family clan) involvement in the investigation field team has provided good opportunities for transparent communication and has assisted with building the level of trust, however cautioned this level of trust has been low for many years and any communication is very slow within the community. Any information to the Board or community team members may take a long time to disseminate between different family members and may not necessarily reach a wide audience.
    - [redacted] Defence is interested to understand the delineation of authority between JBTA, NSW and ACT with respect to advisory notices.
    - [redacted] In absence of a representative from JBTA to respond, ACT and NSW agencies act in a service provider capacity, providing recommendations for Department of Regional Infrastructure to action
    - ([redacted] Echoed previous comments that any messaging takes time and communications with the Board are not necessarily communicated to the wider community.

Community Enquiries
14. No activity or calls to the Community Information line or email inbox.
Risks and Issues
15. [redacted] Issue of public notices or information without consultation, impacting WBACC level of trust and relationship.
PFAS investigation results
16. New investigation results have not been validated at this time and when confirmed will be issued as factual letters as soon as practical to all members of the PCG.
Other Business
17. [redacted] GHD would be interested to receive Curambene Creek data to compare to JBRF results. • [redacted] Defence is responsible for Currambene data, with EPA supporting data share providing the information stays confidential within the closed PCG group.
Meeting Close - 14:50 PM
Actions
Nil

White, Sarah-Jane (Health)

From: [redacted]
Sent: Monday, 14 May 2018 9:56 AM
To: Barr, Conrad (Health); Clapham, David; Hudson, Lyndell (Health)
Cc: Salgado, Sashini
Subject: RE: Consumption Calculations [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Thanks Conrad,

I have had a few discussions with Defence about the additional data which is going to be available in the next few weeks. Our team is quite busy at the moment but we will be able to start having a look at the ACT numbers from next week.

Please give me a ring if you have any questions.

Thanks,

[redacted]

[redacted] – **NSW PFAS Strategy**
Hazardous Incidents and Environmental Health, NSW Environment Protection Authority
[redacted]
[redacted]pa.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

From: Barr, Conrad (Health) [mailto:Conrad.Barr@act.gov.au]
Sent: Friday, 11 May 2018 4:58 PM
To: Clapham, David <David.Clapham@act.gov.au>; [redacted]u>; Hudson, Lyndell (Health) <Lyndell.Hudson@act.gov.au>
Cc: Salgado, Sashini <Sashini.Salgado@act.gov.au>
Subject: RE: Consumption Calculations [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Hi[redacted]
Thanks for your offer of help on this. I trust David's email makes things clear in relation ACT and JBT?
Noting that you advised during the teleconference that you had copies of the JBT sampling results, please let us know if you need anything else from us at the moment to assist in the running of the dietary intake calculations etc.
The most recent biota data we have is attached above, please let us know if you have a different data set.
Thanks again for your willingness to help and collaborate on this.
Regards
Conrad

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

From: Clapham, David
Sent: Wednesday, 9 May 2018 8:06 AM
To: [redacted]; Barr, Conrad (Health) <Conrad.Barr@act.gov.au>
Cc: Salgado, Sashini <Sashini.Salgado@act.gov.au>
Subject: RE: Consumption Calculations [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Hi[redacted]

Responsibility in the sense of final authority and decision making ability will always rest with the Commonwealth. JBTA has asked the ACT for our advice on whether health guidance advice is required in the JBT, based on the current data – NSW EPA assistance in analysing the data to develop our advice is gratefully appreciated. The ACT will then make recommendations to JBTA for them to action as the governing authority. This, in turn, may involve JBTA further authorising the ACT to take precautionary action in JBT.

Happy to discuss if there are any issues – I'm away from the office for meetings most of today but can call you after 2:30 if you like?

Thanks

David

David Clapham | A/g 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]
Sent: Tuesday, 8 May 2018 5:04 PM
To: Clapham, David <David.Clapham@act.gov.au>; Barr, Conrad (Health) <Conrad.Barr@act.gov.au>
Cc: Salgado, Sashini <Sashini.Salgado@act.gov.au>
Subject: RE: Consumption Calculations [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Hi David,

Have JBTA officially transferred responsibility over to ACT?

Thanks,

[redacted]

[redacted] – **NSW PFAS Strategy**
Hazardous Incidents and Environmental Health, NSW Environment Protection Authority

[redacted]
[redacted]a.nsw.gov.au www.epa.nsw.gov.au @EPA_NSW
Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555

From: Clapham, David [mailto:David.Clapham@act.gov.au]
Sent: Tuesday, 8 May 2018 5:00 PM
To: [redacted]@epa.nsw.gov.au>; Barr, Conrad (Health) <Conrad.Barr@act.gov.au>
Cc: Salgado, Sashini <Sashini.Salgado@act.gov.au>
Subject: Consumption Calculations [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Dear [redacted] and Conrad

I understand that one of the outcomes of the teleconference on Friday was an offer from NSW EPA to assist ACT with consumption calculations based on the raw biota data for JBT. From further discussions I understand that ACT would like to accept NSW's offer.

I'm writing to e-connect you two as they key people to facilitate this; I'd appreciate being copied in but will rely on Conrad from ACT Health to liaise with NSW EPA to determine next steps and what needs to be done.

Let me know of any issues or details I've missed. I'd also like to thank you again Corrie for your collaborative approach on this issue.

All the best

David

David Clapham | A/g 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

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Stedman, Andrew (Health)

From: [redacted]
Sent: Monday, 14 May 2018 5:29 AM
To: [redacted]; Clapham, David; Chester, Heath; [redacted]; Stedman, Andrew (Health); [redacted] Hudson, Lyndell (Health); [redacted]
Subject: JBRF PCG Meeting 14 Agenda - Tuesday 15 May - 2pm
Attachments: JBRF PCG_MEETING 14_AGENDA.pdf

Dear JBRF PCG,

Please see attached agenda for the JBRF PFAS investigation monthly meeting to be held on Tuesday 15th May at 2pm.
Dial in details are provided below.

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]

Regards,

[redacted]

GHD
[redacted]
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 Management Program
Monthly PCG Meeting (14) – JBRF

Administrative Details	
Date	15 May 2018
Time	**14:00hrs (AEDST)**
Venue	Teleconference
Dial-in Details	[redacted] Australia Toll free Access code: [redacted]
Chair	[redacted]
Minutes	GHD
Attendees	
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
Stedman Andrew	Andrew.Stedman@act.gov.au
[redacted]	[redacted]
Radomir Krsteski	radomir.krsteski@act.gov.au
Heath Chester	heath.chester@act.gov.au
David Clapham	David.Clapham@act.gov.au
[redacted]	[redacted]
[redacted]	[redacted]
Lyndell Hudson	Lyndell.Hudson@act.gov.au
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
Agenda	
Introductions	
Investigation Progress	- **Detailed Site Investigation (DSI)** - SAQP & Conceptual Site Model (CSM) - Factual memorandums
Future Stages (schedule)	- Human Health and Ecological Risk Assessment (HHERA) - Numerical Groundwater Model
Site Auditor	- Update from site auditor
Stakeholder Engagement	- Meetings and briefs - Community enquiries
Risks and Issues	
Other Business	
Close	

Stedman, Andrew (Health)

From: [redacted]
Sent: Wednesday, 30 May 2018 11:01 AM
To: james.mclachlan@defence.gov.au; charles.huxtable@defence.gov.au; [redacted]; Clapham, David; Chester, Heath; [redacted]; Stedman, Andrew (Health); [redacted]; Hudson, Lyndell (Health); [redacted]
Cc: PFASIM Jervis Bay
Subject: Factual letter 13 - Terrestrial biota result on site sampling
Attachments: 2126171_LET_factual letter 13_ Rev 2_May 2018.pdf

JBRF PCG,

Attached is factual letter 13, which reports the laboratory sampling results received for terrestrial biota, taken on Defence estate between February and April 2018.

If you have any questions please contact:
Defence Project Manager - [redacted]
Defence Project Director - [redacted]
GHD Project Manager - [redacted]

Regards,

[redacted]

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

29 May 2018

2126171_LET_factual letter 13

[redacted] – JBRF & HMAS Creswell
PFAS Investigation and Management Branch
Department of Defence

Dear [redacted]

JBRF & HMAS Creswell- Environmental investigation: Preliminary sampling results Terrestrial ecology sampling results from onsite investigations (processed by 27 April 2018)

1 Introduction

GHD Pty Ltd (GHD), on behalf of the Department of Defence (Defence), is undertaking the Environmental Investigation in and around Jervis Bay Range Facility (JBRF) and HMAS Creswell, within the Jervis Bay Territory (JBT) (the Site). This report includes data that has been collected and processed as at 27 April 2018 for the terrestrial biota sampling program within the Site.

It should be noted that these data are provided for information purposes only and that the use of these data should take into account factors that have been used to develop the conceptual site model (as presented in GHD's Sampling, Analysis and Quality Plan).

GHD will continue to provide results from further sampling, following the processing of the data.

2 Purpose

The purpose of the provision of preliminary data is to allow Defence and other stakeholders, including NSW and ACT Governments to view the data prior to its use in the technical reports for the Environmental Investigations.

3 Laboratory Analysis

Upon collection, the samples were sent under Chain of Custody (CoC) conditions to the following National Association of Testing Authorities (NATA) accredited laboratories:

- ALS Environmental, 277-289 Woodpark Road Smithfield, NSW, 2164
- National Measurement Institute (NMI), 105 Delhi Road, North Ryde, NSW 2113

4 Preliminary Results Tables

The preliminary results are provided in the attached tables.

GHD Pty Ltd ABN 39 008 488 373
Level 15, 133 Castlereagh Street Sydney NSW 2000 Australia
T 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

The data is not for public distribution.

5 Closure

GHD trusts the above information is suitable for Defence requirements.

Yours Sincerely
GHD Pty Ltd

[redacted]

Enclosures:

Figure 1: Biota Sample Locations

Figure 2A: Concentrations of PFHxS + PFOS (Sum) - Invertebrates

Figure 2B: Concentrations of PFHxS + PFOS (Sum) - Plants

Figure 2C: Concentrations of PFHxS + PFOS (Sum) - Mammals

Table 1: Biota Results - JBRF

Table 2: Biota Results – HMAS Creswell

Table 3: Co-located Soil Results – JBRF and HMAS Creswell

Paper Size A3

0 345 690 1,380 2,070

Metres

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

N

LEGEND

- Investigation Area Extent
- Jervis Bay Range Facility
- HMAS Creswell
- Water Bodies
- Drainage Areas
- Major Waterways
- Minor Waterways / Drainage Lines
- Minor Waterways / Drainage Lines (Defence)
- Estaurine Species Sampling Location
- Freshwater Species Sampling Location
- Terrestrial Species Sampling Location
- Marine Species Sampling Area (Approximate)

Department of Defence

Job Number	21-26171
Revision	A
Date	27 Apr 2018

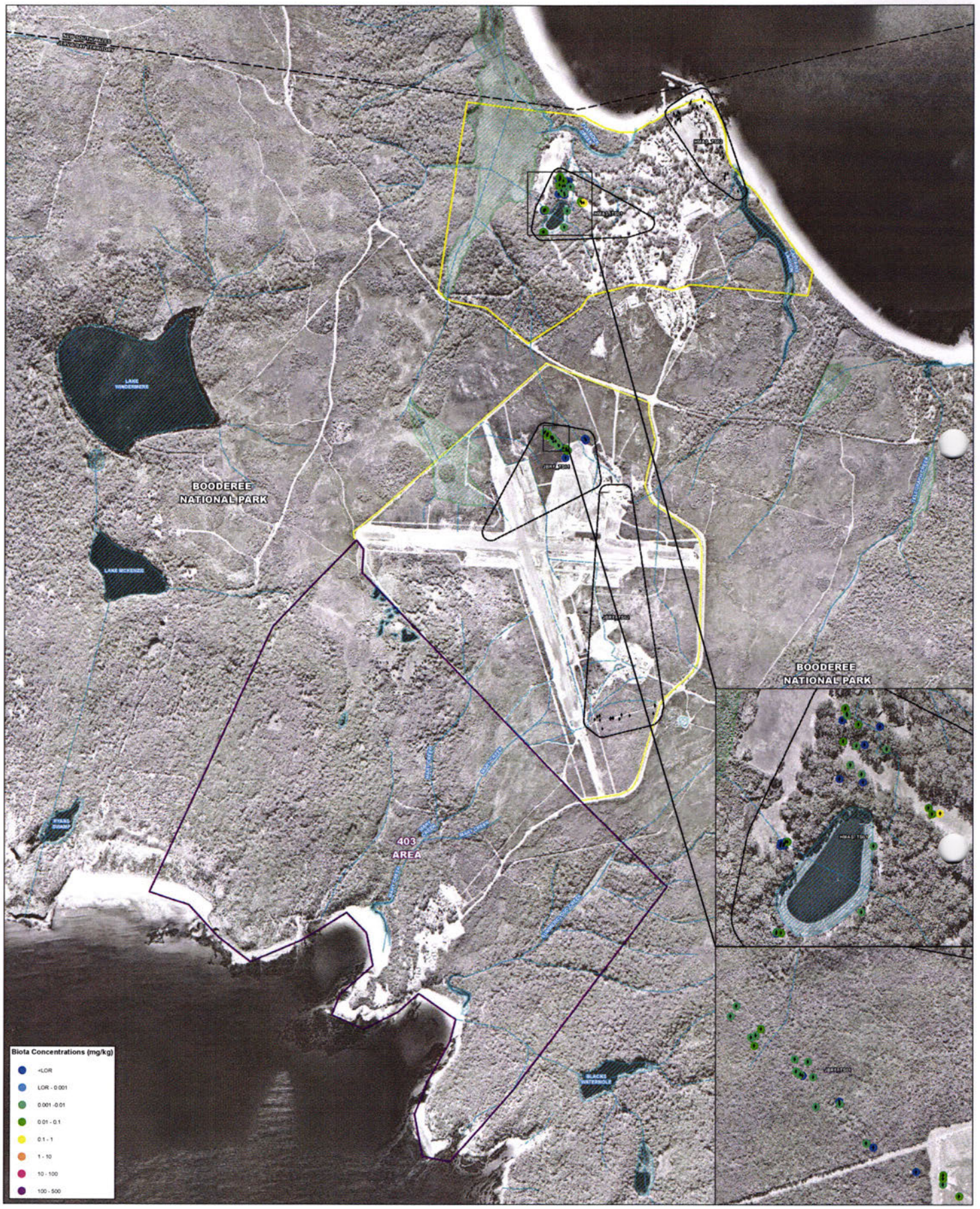
Biota Sample Locations

Figure 1

G:\21\26171\GIS\Maps\Deliverables\21_26171_Z020_EcologyMarine.mxd

Data source: Imagery - Land and Property Information (Imagery Extracted: 2017/09/21); Streets, Waterways - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by: mweber

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



LEGEND

HMAS Creswell / JBRF Boundary
Major Waterways
Ecology Sampling Area
Collected Invertebrate Samples
Water Bodies
Drainage Areas

0 50 100 200 300 400 500 600 700 800
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD nearmap.com

Department of Defence
HMAS Creswell and Jervis Bay Range Facility

Concentrations of PFHxS + PFOS (Sum) - Invertebrates

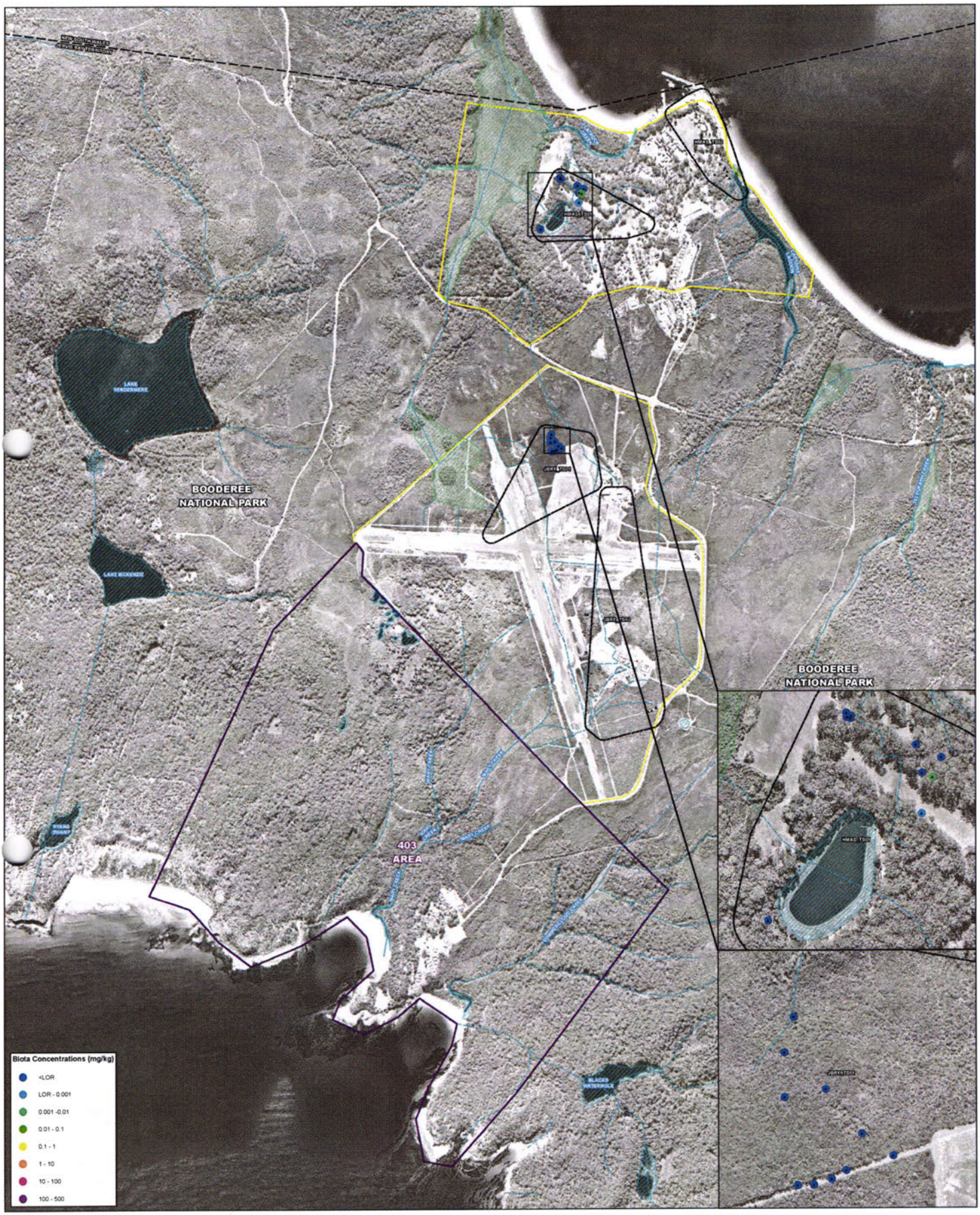
Job Number 21-26171
Revision A
Date 08 May 2018

Figure 2A

G:\21\26171\GIS\Maps\Deliverables\Concentrations\21_26171_Z023_Biota_TS_Invertebrate_Concentrations.mxd

Data source: Imagery - Land and Property Information (2017); Streets, Waterways, Contours - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by: mweber

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



LEGEND

HMAS Creswell / JBRF Boundary
Major Waterways
Ecology Sampling Area
Collected Plant Samples
Water Bodies
Drainage Areas

0 50100 200 300 400 500 600 700 800
Metres

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

Department of Defence
HMAS Creswell and Jervis Bay Range Facility

Concentrations of PFHxS + PFOS (Sum) - Plants

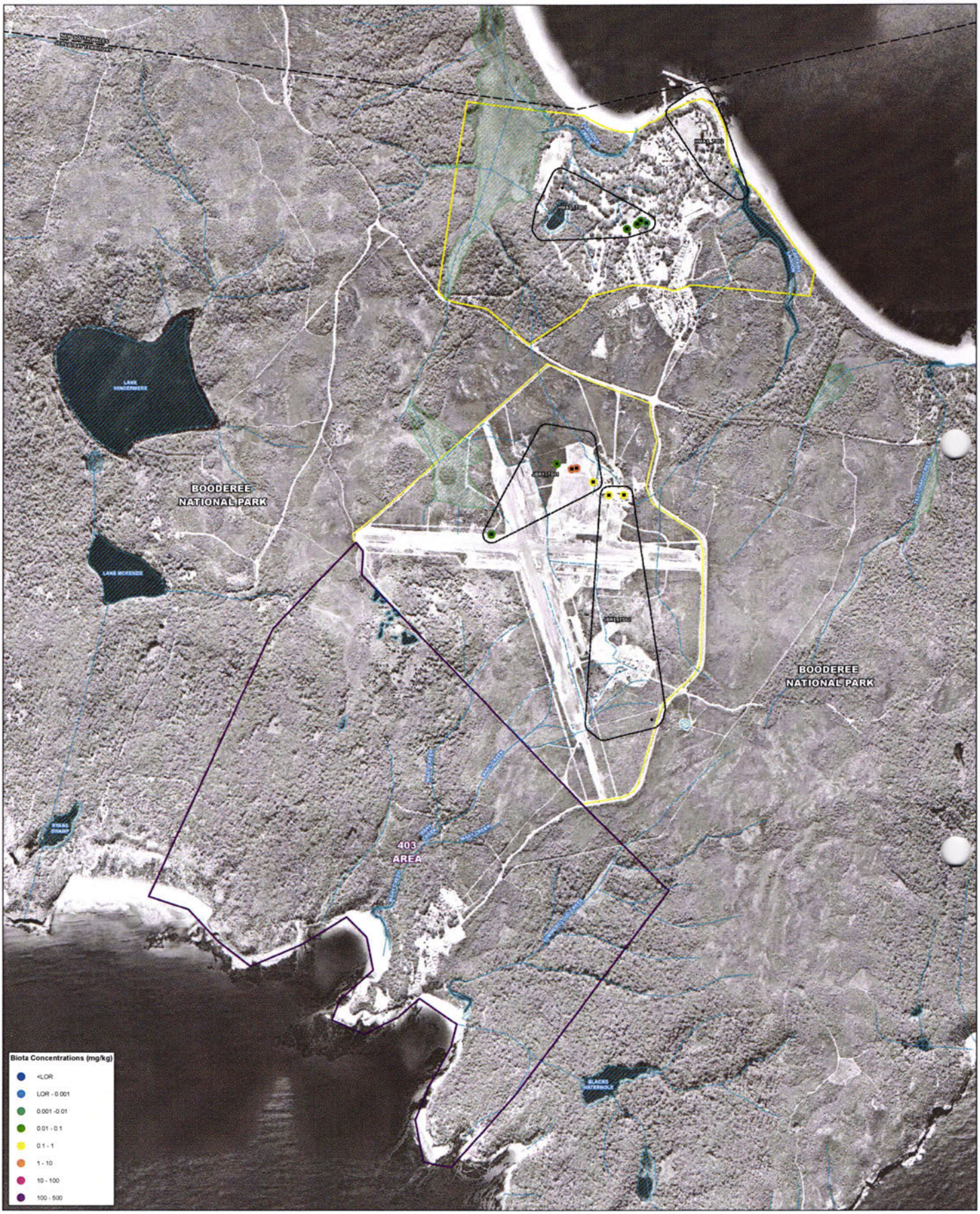
Job Number 21-26171
Revision A
Date 08 May 2018

Figure 2B

G:\21\26171\GIS\Maps\Deliverables\Concentrations\21_26171_2024_Biota_TS_Plant_Concentrations.mxd

Data source: Imagery - Land and Property Information (2017); Streets, Waterways, Contours - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by: mweber

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



LEGEND

- HMAS Creswell / JBRF Boundary
- Ecology Sampling Area
- Water Bodies
- Drainage Areas
- Major Waterways
- Collected Vertebrate Samples
- Collected Scat Samples

0 50100 200 300 400 500 600 700 800
Metres

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

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GHD nearmap.com

Department of Defence
HMAS Creswell and Jervis Bay Range Facility

Concentrations of PFHxS + PFOS (Sum) - Vertebrate

Job Number	21-26171
Revision	A
Date	09 May 2018

Figure 2C

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

Data source: Imagery - Land and Property Information (2017); Streets, Waterways, Contours - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by: mweber

Table 1: Biota Results - JBRF

Date	Field ID	Sample Type	Matrix Type	Matrix Description	N-Methyl perfluorooctane sulfonamidoethanol MeFOSA	N-Ethyl perfluorooctane sulfonamidoacetic acid	Perfluoroheptane sulfonic acid	10:2 Fluorotelomer sulfonic acid	4:2 Fluorotelomer sulfonic acid	Perfluorobutane sulfonic acid	N-Methyl perfluorooctane sulfonamidoacetic acid	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS) - Branched	Perfluoropentanoic acid	8:2 Fluorotelomer sulfonic acid	N-Ethyl perfluorooctane sulfonamide	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid	Perfluorobutanoic acid	Perfluorodecanoic acid	Perfluorodecane sulfonic acid	Perfluorododecanoic acid	Perfluoroheptanoic acid	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	PFAS (Sum of Total)	Weight of Sample Prepared	Perfluorooctane sulfonic acid (PFOS) - Linear
					PFAS																														NA	
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	mg/kg
EQL					0.002	0.001	0.001	0.002	0.002	0.0005	0.001	0.0005	0.0005	0.0005	0.0005	0.002	0.002	0.005	0.0005	0.0003	0.001	0.005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0003	0.005	0.002	0.002	0.0005	0.001	0.1	0.0005
26/02/2018	JBRF_TS01_I001_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.002	2.7	0.002
26/02/2018	JBRF_TS01_I002_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	7.2	0.0008
26/02/2018	JBRF_TS01_I003_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.002	2.9	0.002
26/02/2018	JBRF_TS01_I004_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	5.3	0.0009
26/02/2018	JBRF_TS01_I005_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.002	2.7	0.002
26/02/2018	JBRF_TS01_I006_180226	Normal	Biota	Snail, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	2.2	<0.0005
26/02/2018	JBRF_TS01_I007_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.082	<0.005	<0.002	<0.002	<0.001	0.082	1.3	0.075
26/02/2018	JBRF_TS01_I008_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.01	<0.005	<0.002	<0.002	<0.001	0.01	1.9	0.009
26/02/2018	JBRF_TS01_I009_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.009	<0.005	<0.002	<0.002	<0.001	0.009	3.1	0.008
26/02/2018	JBRF_TS01_I010_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	0.002	<0.002	<0.001	<0.001	<0.001	0.006	<0.005	<0.002	<0.002	<0.001	0.008	1.6	0.006
26/02/2018	JBRF_TS01_I011_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.012	<0.005	<0.002	<0.002	<0.001	0.012	2.0	0.01
21/02/2018	JBRF_TS01_I012_180221	Normal	Biota	Moth, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	0.3	0.003
26/02/2018	JBRF_TS01_I012_180226	Normal	Biota	Moth, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.053	<0.005	<0.002	<0.002	<0.001	0.053	0.2	0.052
26/02/2018	JBRF_TS01_I013_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	4.9	0.003
26/02/2018	JBRF_TS01_I014_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	4.0	0.002
28/02/2018	ST23_QC109_180228	Field_D	Biota	Invertebrate						<0.0005		0.0017		<0.0005	<0.0005				<0.0005	<0.0003			<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	0.011				<0.0005			
26/02/2018	JBRF_TS01_I015_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.004	<0.005	<0.002	<0.002	<0.001	0.004	3.4	0.003
26/02/2018	JBRF_TS01_I016_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	3.1	0.003
26/02/2018	JBRF_TS01_I017_180226	Normal	Biota	Bush coackroach, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	1.9	0.002
27/02/2018	JBRF_TS01_I018_180227	Normal	Biota	Fly, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	8.3	<0.0005
27/02/2018	JBRF_TS01_I019_180227	Normal	Biota	Fly, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	2.7	<0.0005
27/02/2018	JBRF_TS01_I020_180227	Normal	Biota	Fly, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	0.4	<0.002
27/02/2018	JBRF_TS01_I021_180227	Normal	Biota	Earthworm, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	6.5	<0.0005
27/02/2018	JBRF_TS01_I022_180227	Normal	Biota	Beetle, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	0.8	<0.0005
28/02/2018	JBRF_TS01_I023_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.004	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.024	<0.005	<0.002	<0.002	<0.001	0.024	2.4	0.02
28/02/2018	JBRF_TS01_I024_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.018	<0.005	<0.002	<0.002	<0.001	0.018	3.1	0.013
28/02/2018	JBRF_TS01_I025_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.004	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.019	<0.005	<0.002	<0.002	<0.001	0.019	2.0	0.015
28/02/2018	JBRF_TS01_I026_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.009	<0.005	<0.002	<0.002	<0.001	0.009	11.3	0.009
26/02/2018	JBRF_TS01_P001_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	30.4	<0.0005
26/02/2018	JBRF_TS01_P002_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	39.5	<0.0005
27/02/2018	ST17_QC104_180227	Field_D	Biota	Banksia ericifolia, Plant						<0.0005		<0.0005		<0.0005	<0.0005				<0.0005	<0.0003			<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0003				<0.0005			
26/02/2018	JBRF_TS01_P003_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	31.3	<0.0005
26/02/2018	JBRF_TS01_P004_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	37.9	<0.0005
26/02/2018	JBRF_TS01_P005_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	66.8	<0.0005
27/02/2018	JBRF_TS01_P006_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	6.8	<0.0005
27/02/2018	JBRF_TS01_P007_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	9.8	<0.0005
27/02/2018	JBRF_TS01_P008_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	3.2	<0.0005
27/02/2018	JBRF_TS01_P009_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	5.4	<0.0005
27/02/2018	JBRF_TS01_P010_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	3.8	<0.0005
27/02/2018	ST18_QC105_180227	Field_D	Biota	Epacris Micropylla, Plant						<0.0005		<0.0005		<0.0005	<0.0005				<0.0005	<0.0003			<0.001		<0.0005	<0.0005	<0.0005	<0.0005	<0.0003				<0.0005			
13/02/2018	JBRF_TS01_VL001_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	0.011	<0.002	<0.002	<0.001	<0.001	0.016	0.0560	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.471	<0.005	<0.002	<0.002	<0.001	0.499	32.7	0.415
13/02/2018	JBRF_TS01_VL002_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.0010	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.022	<0.005	<0.002	<0.002	<0.001	0.022	29.8	0.0210
13/02/2018	JBRF_TS01_VL003_180209	Normal	Biota	Fox, Male	<0.002	<0.001	0.037	<0.002	<0.002	<0.001	<0.001	0.101	0.15	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	0.002	<0.005	0.003	0.015	<0.002	<0.001	<0.001	<0.001	2.57	<0.005	<0.002	<0.002	0.002	2.73	65.4	2.42
13/02/2018	JBRF_TS01_VL004_180209	Normal	Biota	Fox, Female	<0.002	<0.001	0.022	<0.002	<0.002	<0.001	<0.001	0.084	0.0500	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	0.003	<0.005	0.003	0.014	<0.002	<0.001	<0.001	<0.001	1.62	<0.005	<0.002	<0.002	0.002	1.75	136	1.57
13/02/2018	JBRF_TS01_VM001_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.005	<0.002	<0.002	<0.001	0.001	32.6	0.0009
13/02/2018	DH01_QC101_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.001	0.0007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.005	<0.005	<0.002	<0.002	<0.001	0.006	40.9	0.0043
13/02/2018	DH02_QC201_180209	Normal	Biota	Rabbit, Female						<0.0005				<0.001	<0.0005				<0.0005	<0.0003		<0.005			<0.0005	<0.0005	<0.0005	<0.0005	0.033				<0.0005			
13/02/2018	JBRF_TS01_VM002_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.0010	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.011	<0.005	<0.002	<0.002	<0.001	0.011	56.6	0.0100
13/02/2018	JBRF_TS01_VM003_180209	Normal	Biota	Fox, Male	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.006	0.0007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.011	<0.005	<0.002	<0.002	<0.001	0.017	53.4	0.0103
13/02/2018	JBRF_TS01_VM004_180209	Normal	Biota	Fox, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.007	0.0007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.014	<0.005	<0.002	<0.002	<0.001	0.021	49.8	0.0133
23/02/2018	JBRF_TS02_VL009_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	0.014	<0.002	<0.002	<0.001	<0.001	0.033	0.129	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	0.002	<0.002	<0.001	<0.001	<0.001	0.626	<0.005	<0.002	<0.002	<0.001	0.675	39.4	0.497
23/02/2018	JBRF_TS02_VL010_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	0.01	<0.002	<0.002	<0.001	<0.001	0.078	0.051	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.284	<0.005	<0.002	<0.002	<0.001	0.372	8.4	0.233
23/02/2018	JBRF_TS02_VM009_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	45.8	0.002
23/02/2018	JBRF_TS02_VM010_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.003	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.005	14.3	0.002
27/02/2018	JBRF_TS01_Scat_180227	Normal	Biosolid		<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	0.0005	0.0008		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0114	<0.0002	<0.0005	<0.0002	<0.0002	0.0127		

Table 2: Biota Results – HMAS Creswell

				PFAS																													NA	
				N-Methyl perfluorooctane sulfonamidoethanol (MeFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid	Perfluoroheptane sulfonic acid	10:2 Fluorotelomer sulfonic acid	8:2 Fluorotelomer sulfonic acid	Perfluorobutane sulfonic acid (PFBS)	N-Methyl perfluorooctane sulfonamidoacetic acid	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS) - Branched	Perfluoropentanoic acid	6:2 Fluorotelomer sulfonic acid	N-Ethyl perfluorooctane sulfonamide	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide	4:2 Fluorotelomer sulfonic (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid	Perfluorobutanoic acid	Perfluoroheptanoic acid	Perfluorodecane sulfonic acid	Perfluorododecanoic acid	Perfluoroheptanoic acid	Perfluorotetradecanoic acid (PFHxA)	Perfluorononanoic acid	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	PFAS (Sum of Total)	Weight of Sample Provided	Perfluorooctane sulfonic acid (PFOS) - Linear
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	mg/kg
EQL				0.002	0.001	0.001	0.002	0.002	0.0005	0.001	0.0005	0.0005	0.0005	0.0005	0.002	0.002	0.005	0.0005	0.0003	0.001	0.005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0003	0.005	0.002	0.002	0.0005	0.001	0.0005
Date	**Field ID**	**Sample Type**	**Matrix Type**	**Matrix Description**																															
19/02/2018	HMAS_TS01_I001_180219	Normal	Biota	Ant, Invertebrate	<0.0002	<0.001	<0.001	0.006	<0.002	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.016	<0.005	<0.005	<0.002	<0.001	0.022	2.2	0.015
19/02/2018	HMAS_TS01_I002_180219	Normal	Biota	Ant, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.002	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.022	<0.005	<0.005	<0.002	<0.001	0.022	2.4	0.02
19/02/2018	HMAS_TS01_I003_180219	Normal	Biota	Ant, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.002	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.027	<0.005	<0.005	<0.002	<0.001	0.027	3.1	0.025
19/02/2018	HMAS_TS01_I004_180219	Normal	Biota	Ant, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.002	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.022	<0.005	<0.005	<0.002	<0.001	0.022	2.0	0.02
19/02/2018	HMAS_TS01_I005_180219	Normal	Biota	Ant, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.007	<0.005	<0.005	<0.002	<0.001	0.007	6.6	0.007
19/02/2018	HMAS_TS01_I006_180219	Normal	Biota	Beetle, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.005	<0.005	<0.002	<0.001	0.001	1.8	0.001
19/02/2018	HMAS_TS01_I007_180219	Normal	Biota	Millipede, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	<0.005	<0.005	<0.002	<0.001	0.006	1.6	0.005
19/02/2018	HMAS_TS01_I008_180219	Normal	Biota	Fly, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.005	<0.005	<0.002	<0.001	0.002	0.7	0.001
20/02/2018	HMAS_TS01_I009_180220	Normal	Biota	Snail, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	10.7	<0.005	<0.005	<0.002	<0.001	<0.001	10.7	<0.0005
20/02/2018	HMAS_TS01_I010_180220	Normal	Biota	Spider, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.002	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.023	<0.005	<0.005	<0.002	<0.001	0.023	3.1	0.021
20/02/2018	HMAS_TS01_I011_180220	Normal	Biota	Moth, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	0.8	<0.0005
20/02/2018	HMAS_TS01_I012_180220	Normal	Biota	Spider, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.028	<0.005	<0.005	<0.002	<0.001	0.028	1.5	0.027
21/02/2018	HMAS_TS01_I013_180221	Normal	Biota	Snail, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	1.8	<0.005	<0.005	<0.002	<0.001	1.8	<0.001
20/02/2018	HMAS_TS01_I014_180220	Normal	Biota	Snail, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	3.9	<0.005	<0.005	<0.002	<0.001	3.9	<0.0005
20/02/2018	HMAS_TS01_I015_180220	Normal	Biota	Snail, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	4.7	<0.005	<0.005	<0.002	<0.001	4.7	<0.0005
20/02/2018	HMAS_TS01_I016_180220	Normal	Biota	Snail, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	8.5	<0.005	<0.005	<0.002	<0.001	8.5	<0.0005
20/02/2018	HMAS_TS01_I017_180220	Normal	Biota	Spider, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.005	<0.005	<0.002	<0.001	0.005	2.4	0.004
20/02/2018	HMAS_TS01_I018_180220	Normal	Biota	Spider, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.005	<0.005	<0.002	<0.001	0.005	5.9	0.004
20/02/2018	HMAS_TS01_I019_180220	Normal	Biota	Beetle, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	3.6	<0.005	<0.005	<0.002	<0.001	3.6	<0.0005
20/02/2018	HMAS_TS01_I020_180220	Normal	Biota	Spider, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.003	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.03	<0.005	<0.005	<0.002	<0.001	0.03	2.0	0.027
20/02/2018	HMAS_TS01_I021_180220	Normal	Biota	Spider, Invertebrate	<0.0002	<0.001	0.001	<0.002	<0.005	0.003	<0.001	0.002	0.093	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.102	<0.005	<0.005	<0.002	<0.001	0.108	2.6	0.009
21/02/2018	HMAS_TS01_I022_180221	Normal	Biota	Earthworm, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.005	<0.005	<0.002	<0.001	0.005	0.7	0.005
23/01/2018	HMAS_TS01_I037_180223	Normal	Biota	Fly, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	1.3	<0.005	<0.005	<0.002	<0.001	1.3	0.0008
23/01/2018	HMAS_TS01_I038_180223	Normal	Biota	Beetle, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.007	<0.005	<0.005	<0.002	<0.001	0.007	1.3	0.0008
28/02/2018	HMAS_TS01_I050_180228	Normal	Biota	Fly, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.005	<0.005	<0.002	<0.001	0.005	0.6	0.004
28/02/2018	HMAS_TS01_I051_180228	Normal	Biota	Beetle, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	0.3	<0.0004
28/02/2018	HMAS_TS01_I052_180228	Normal	Biota	Fly, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.005	<0.005	<0.002	<0.001	0.001	0.2	<0.0005
2/03/2018	HMAS_TS01_I056_180302	Normal	Biota	Earthworm, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.002	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.022	<0.005	<0.005	<0.002	<0.001	0.022	2.2	0.02
2/03/2018	HMAS_TS01_I057_180302	Normal	Biota	Beetle, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.007	<0.005	<0.005	<0.002	<0.001	0.007	0.7	<0.0005
2/03/2018	HMAS_TS01_I058_180302	Normal	Biota	Earthworm, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.009	<0.005	<0.005	<0.002	<0.001	0.009	5.1	0.009
2/03/2018	HMAS_TS01_I059_180302	Normal	Biota	Earthworm, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.005	<0.005	<0.002	<0.001	0.003	4.9	0.003
2/03/2018	HMAS_TS01_I060_180302	Normal	Biota	Fly, Invertebrate	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	3.4	<0.0005
21/02/2018	HMAS_TS01_P001_180221	Normal	Biota	Pteridium Esculentum- Bracken, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	56.2	<0.005	<0.005	<0.002	<0.001	56.2	<0.0005
21/02/2018	HMAS_TS01_P002_180221	Normal	Biota	Pteridium Esculentum- Bracken, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	27.1	<0.005	<0.005	<0.002	<0.001	27.1	<0.0005
21/02/2018	HMAS_TS01_P003_180221	Normal	Biota	Pteridium Esculentum- Bracken, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.005	<0.005	<0.002	<0.001	0.002	101	0.002
21/02/2018	HMAS_TS01_P004_180221	Normal	Biota	Pteridium Esculentum- Bracken, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.005	<0.005	<0.002	<0.001	0.001	15.8	0.001
21/02/2018	HMAS_TS01_P005_180221	Normal	Biota	Pteridium Esculentum- Bracken, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	33.3	<0.0005
21/02/2018	HMAS_TS01_P006_180221	Normal	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	19.4	<0.005	<0.005	<0.002	<0.001	19.4	<0.0005
23/02/2018	ST1Q_QC103_180223	Field_D	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	10.0	<0.005	<0.005	<0.002	<0.001	10.0	<0.0005
21/02/2018	HMAS_TS01_P007_180221	Normal	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	12.6	<0.005	<0.005	<0.002	<0.001	12.6	<0.0005
21/02/2018	HMAS_TS01_P008_180221	Normal	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	6.6	<0.005	<0.005	<0.002	<0.001	6.6	<0.0005
21/02/2018	HMAS_TS01_P009_180221	Normal	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	4.5	<0.005	<0.005	<0.002	<0.001	4.5	<0.0005
26/02/2018	HMAS_TS01_P010_180221	Normal	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	13.5	<0.005	<0.005	<0.002	<0.001	13.5	<0.0005
22/02/2018	HMAS_TS01_P011_180222	Normal	Biota	Eustrephus Latifolius - Wombat berry, Plant	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	3.3	<0.005	<0.005	<0.002	<0.001	3.3	<0.0005
23/02/2018	HMAS_TS01_VL005_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	0.002	<0.001	0.004	<0.001	<0.001	0.007	<0.005	<0.005	<0.002	0.013	35.4	0.006
23/02/2018	HMAS_TS01_VL006_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.002	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.014	<0.005	<0.005	<0.002	<0.001	0.014	7.2	0.012
23/02/2018	HMAS_TS01_VL007_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.003	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.014	<0.005	<0.005	<0.002	<0.001	0.014	9.8	0.011
23/02/2018	HMAS_TS01_VL008_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.017	<0.005	<0.005	<0.002	<0.001	0.017	31.2	0.016
23/02/2018	HMAS_TS01_VM005_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	12.5	<0.0005
23/02/2018	CHD7_QC101_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	26.4	<0.0005
23/02/2018	HMAS_TS01_VM006_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	10.7	<0.0005
23/02/2018	HMAS_TS01_VM007_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	20.4	<0.0005
23/02/2018	HMAS_TS01_VM008_180223	Normal	Biota	Rabbit, Male	<0.0002	<0.001	<0.001	<0.002	<0.005	<0.0005	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.002	<0.001	<0.001	34.7	<0.0005

Table 3: Co-located Soil Results – JBRF and HMAS Creswell

				PFAS																																Inorganics	NA	
				PFOS/PFHxS (Sum of Total) - Lab Calc	N-Methyl perfluorooctanesulfonamidoethanol (MeFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid	Perfluoroheptane sulfonic acid	10:2 Fluorotelomer sulfonic acid	4:2 Fluorotelomer sulfonic acid	Perfluorobutane sulfonic acid	N-Methyl perfluorooctane sulfonamidoacetic acid	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS) - Branched	Perfluoropentanoic acid	8:2 Fluorotelomer sulfonic acid	N-Ethyl perfluorooctane sulfonamide	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid	Perfluorobutanoic acid	Perfluorodecanoic acid	Perfluorododecane sulfonic acid	Perfluorododecanoic acid	Perfluoroheptanoic acid	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Moisture (%)	Weight of Sample Prepared	Perfluorooctane sulfonic acid (PFOS) - Linear
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	g	mg/kg
EQL				0.0002	0.0005	0.0002	0.0002	0.0005	0.0005	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002	0.1	0.1	0.0005
Date	**Field ID**	**Sample Type**	**Matrix Type**																																			
21/02/2018	HMAS_TS01_Soil001_180221	Normal	soil	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	3.1		
21/02/2018	HMAS_TS01_Soil002_180221	Normal	soil	0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	0.0005	3.7		
26/02/2018	JBRF_TS01_Soil001_180226	Normal	soil		<0.0002	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			116	<0.0005

Stedman, Andrew (Health)

From: Clapham, David
Sent: Wednesday, 30 May 2018 11:10 AM
To: Barr, Conrad (Health); Sargent, Narelle
Cc: Hudson, Lyndell (Health); Chester, Heath; Stedman, Andrew (Health)
Subject: FW: Factual letter 13 - Terrestrial biota result on site sampling [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]
Attachments: 2126171_LET_factual letter 13_ Rev 2_May 2018.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Narelle and Conrad

Please find attached a factual letter relating to terrestrial biota results.

To be factored into our advice to DIRD.

Thanks

David

From: [redacted]
Sent: Wednesday, 30 May 2018 11:01 AM
To: [redacted]; Stedman, Andrew (Health) <Andrew.Stedman@act.gov.au>; [redacted] Hudson, Lyndell (Health) <Lyndell.Hudson@act.gov.au>; [redacted]
Cc: PFASIM Jervis Bay <pfasim.jervisbay@defence.gov.au>
Subject: Factual letter 13 - Terrestrial biota result on site sampling

Hi JBRF PCG,

Attached is factual letter 13, which reports the laboratory sampling results received for terrestrial biota, taken on Defence estate between February and April 2018.

If you have any questions please contact:
Defence Project Manager - [redacted]
Defence Project Director - [redacted]
GHD Project Manager - [redacted]

Regards,

[redacted]

GHD

[redacted]

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

29 May 2018

2126171_LET_factual letter 13

[redacted]
Project Director – JBRF & HMAS Creswell
PFAS Investigation and Management Branch
Department of Defence

Dear [redacted]

JBRF & HMAS Creswell- Environmental investigation: Preliminary sampling results Terrestrial ecology sampling results from onsite investigations (processed by 27 April 2018)

1 Introduction

GHD Pty Ltd (GHD), on behalf of the Department of Defence (Defence), is undertaking the Environmental Investigation in and around Jervis Bay Range Facility (JBRF) and HMAS Creswell, within the Jervis Bay Territory (JBT) (the Site). This report includes data that has been collected and processed as at 27 April 2018 for the terrestrial biota sampling program within the Site.

It should be noted that these data are provided for information purposes only and that the use of these data should take into account factors that have been used to develop the conceptual site model (as presented in GHD's Sampling, Analysis and Quality Plan).

GHD will continue to provide results from further sampling, following the processing of the data.

2 Purpose

The purpose of the provision of preliminary data is to allow Defence and other stakeholders, including NSW and ACT Governments to view the data prior to its use in the technical reports for the Environmental Investigations.

3 Laboratory Analysis

Upon collection, the samples were sent under Chain of Custody (CoC) conditions to the following National Association of Testing Authorities (NATA) accredited laboratories:

- ALS Environmental, 277-289 Woodpark Road Smithfield, NSW, 2164
- National Measurement Institute (NMI), 105 Delhi Road, North Ryde, NSW 2113

4 Preliminary Results Tables

The preliminary results are provided in the attached tables.

GHD Pty Ltd ABN 39 008 488 373
Level 15, 133 Castlereagh Street Sydney NSW 2000 Australia
T 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

The data is not for public distribution.

5 Closure

GHD trusts the above information is suitable for Defence requirements.

Yours Sincerely
GHD Pty Ltd

[redacted]

Enclosures:

Figure 1: Biota Sample Locations

Figure 2A: Concentrations of PFHxS + PFOS (Sum) - Invertebrates

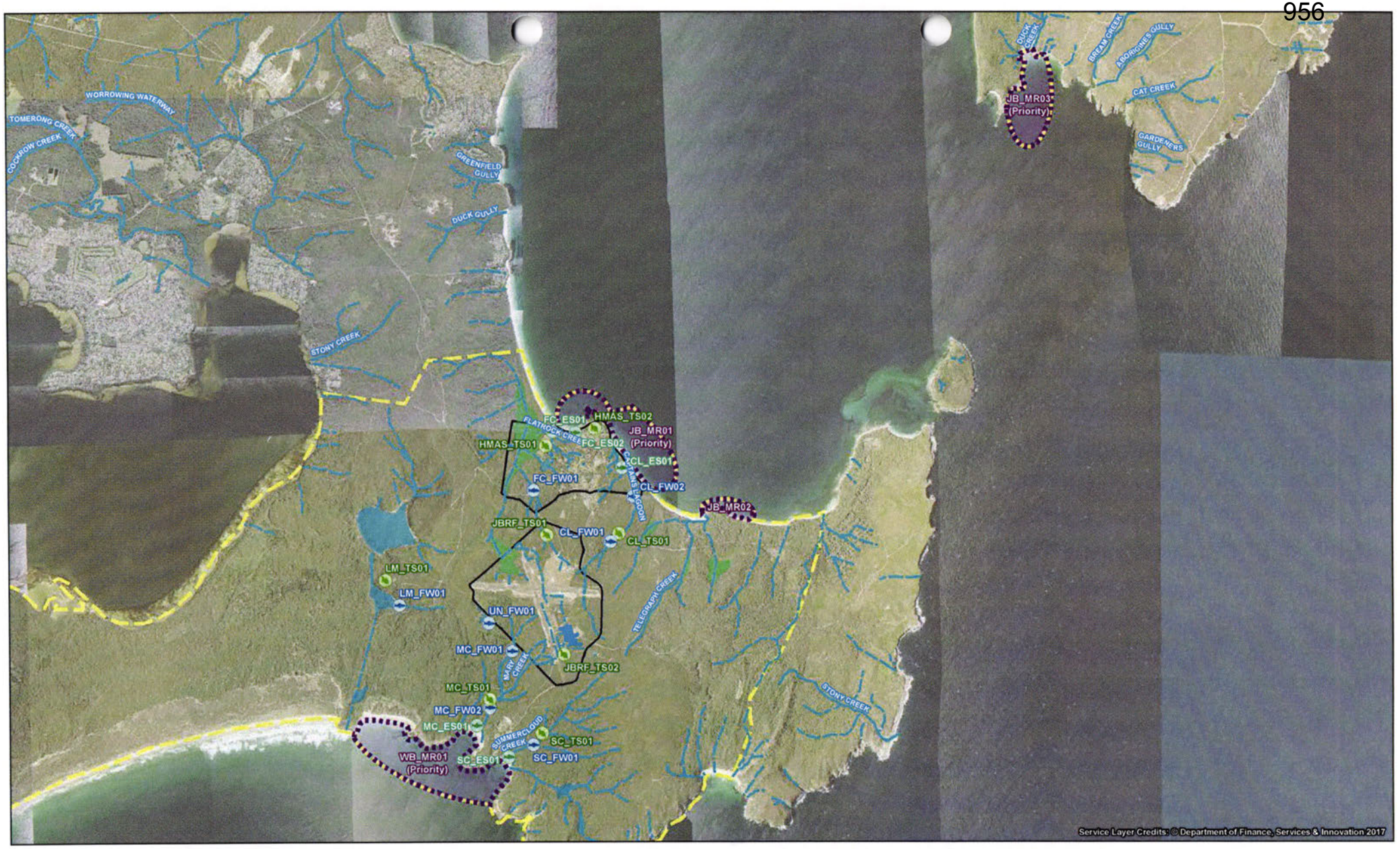
Figure 2B: Concentrations of PFHxS + PFOS (Sum) - Plants

Figure 2C: Concentrations of PFHxS + PFOS (Sum) - Mammals

Table 1: Biota Results - JBRF

Table 2: Biota Results – HMAS Creswell

Table 3: Co-located Soil Results – JBRF and HMAS Creswell



Paper Size A3

0 345 690 1,380 2,070

Metres

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

N

LEGEND

- Investigation Area Extent
- Jervis Bay Range Facility
- HMAS Creswell
- Water Bodies
- Drainage Areas
- Major Waterways
- Minor Waterways / Drainage Lines
- Minor Waterways / Drainage Lines (Defence)
- Estaurine Species Sampling Location
- Freshwater Species Sampling Location
- Terrestrial Species Sampling Location
- Marine Species Sampling Area (Approximate)

Department of Defence

Job Number	21-26171
Revision	A
Date	27 Apr 2018

Biota Sample Locations

Figure 1

G:\21\26171\GIS\Maps\Deliverables\21_26171_Z020_EcologyMarine.mxd

Data source: Imagery - Land and Property Information (Imagery Extracted: 2017/09/21); Streets, Waterways - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by mweber

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

LEGEND

HMAS Creswell / JBRF Boundary
Major Waterways
Ecology Sampling Area
Collected Invertebrate Samples
Water Bodies
Drainage Areas

0 50100 200 300 400 500 600 700 800
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD nearmap.com

Department of Defence
HMAS Creswell and Jervis Bay Range Facility
Concentrations of PFHxS + PFOS (Sum) - Invertebrates

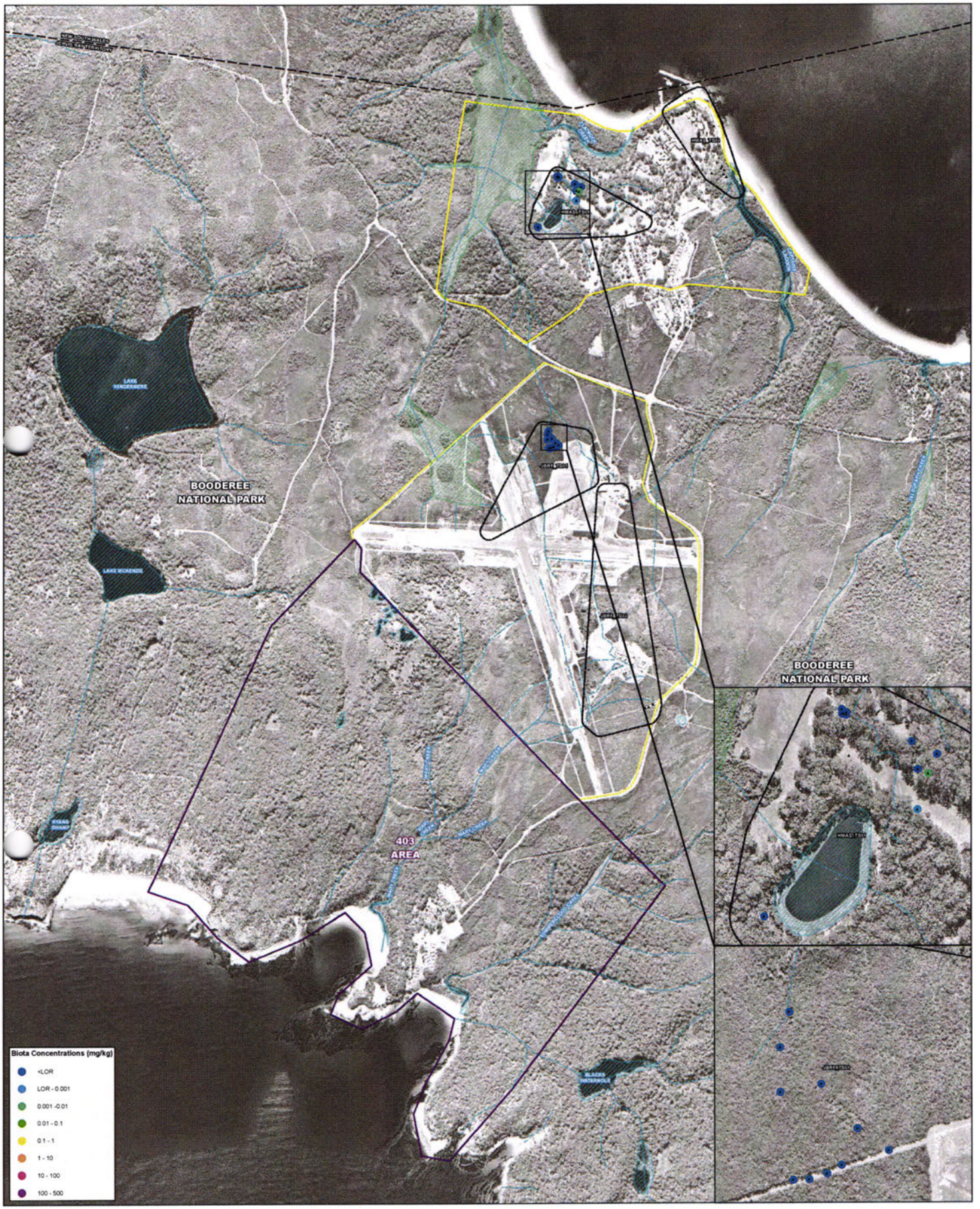
Job Number	21-26171
Revision	A
Date	08 May 2018

Figure 2A

G:\21\26171\GIS\Maps\Deliverables\Concentrations\21_26171_Z023_Biota_TS_Invertebrate_Concentrations.mxd

Data source: Imagery - Land and Property Information (2017); Streets, Waterways, Contours - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by mweber

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



LEGEND

HMAS Creswell / JBRF Boundary
Major Waterways
Ecology Sampling Area
Collected Plant Samples
Water Bodies
Drainage Areas

0 50100 200 300 400 500 600 700 800
Metres

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

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Department of Defence
HMAS Creswell and Jervis Bay Range Facility

Concentrations of PFHxS + PFOS (Sum) - Plants

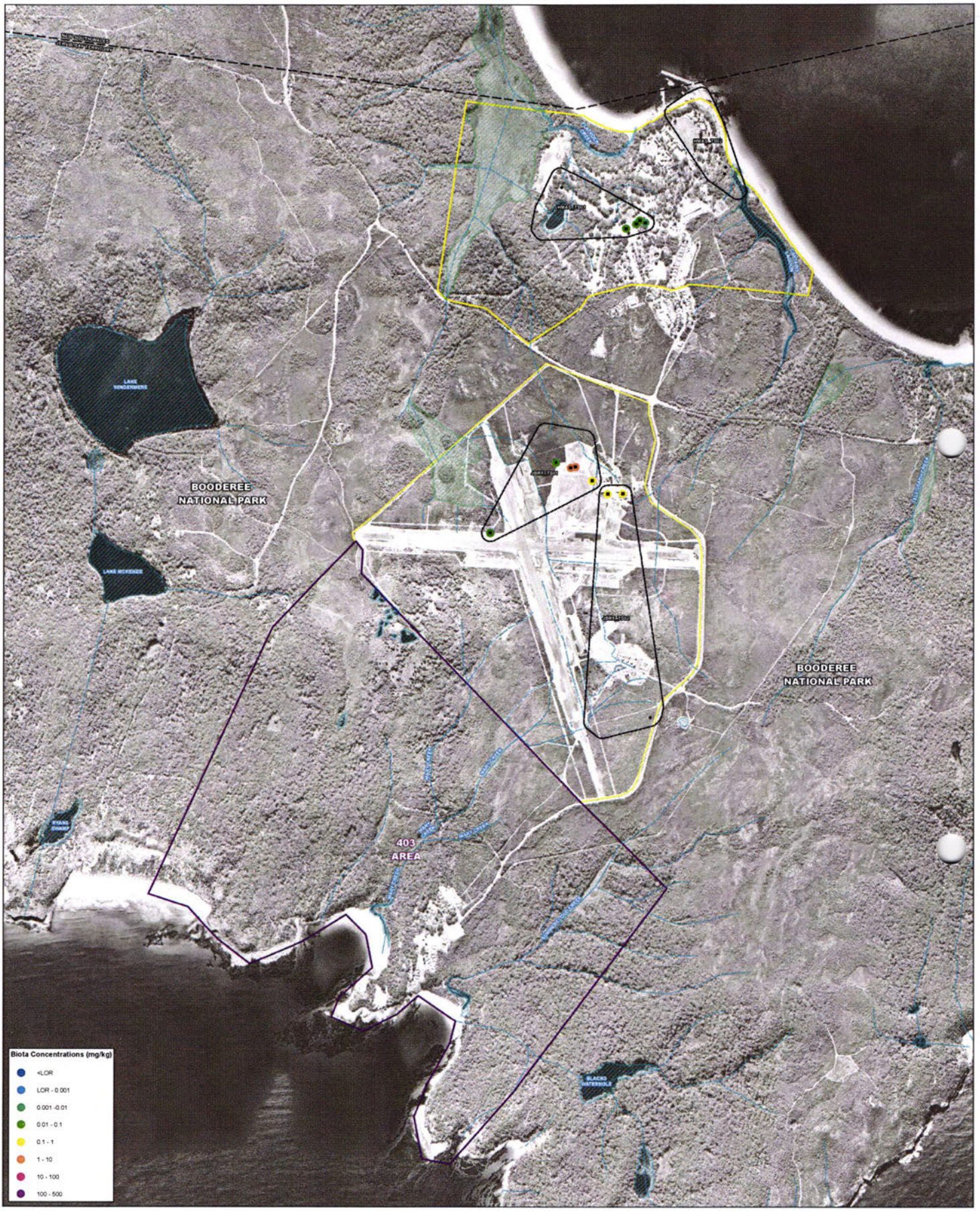
Job Number 21-26171
Revision A
Date 08 May 2018

Figure 2B

G:\21\26171\GIS\Maps\Deliverables\Concentrations\21_26171_Z024_Biota_TS_Plant_Concentrations.mxd

Data source: Imagery - Land and Property Information (2017); Streets, Waterways, Contours - NSW LPI 2015 DTDB; Contours - NSW LPI 2016. Created by mweber

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au



LEGEND

- HMAS Creswell / JBRF Boundary
- Ecology Sampling Area
- Water Bodies
- Drainage Areas
- Major Waterways
- Collected Vertebrate Samples
- Collected Scat Samples

0 50100 200 300 400 500 600 700 800
Metres

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

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Department of Defence
HMAS Creswell and Jervis Bay Range Facility

Concentrations of PFHxS + PFOS (Sum) - Vertebrate

Job Number	21-26171
Revision	A
Date	09 May 2018

Figure 2C

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

Table 1: Biota Results - JBRF

					PFAS																										NA	
					N-Methyl perfluorooctane sulfonamidoethanol MeFOSA	N-Ethyl perfluorooctane sulfonamidoacetic acid	Perfluoroheptane sulfonic acid	10:2 Fluorotelomer sulfonic acid	4:2 Fluorotelomer sulfonic acid	Perfluorobutane sulfonic acid	N-Methyl perfluorooctane sulfonamidoacetic acid	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS) - Branched	Perfluoropentanoic acid	8:2 Fluorotelomer sulfonic acid	N-Ethyl perfluorooctane sulfonamide	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid	Perfluorobutanoic acid	Perfluorodecanoic acid	Perfluorodecane sulfonic acid	Perfluorododecanoic acid	Perfluoroheptanoic acid	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	PFAS (Sum of Total)	Weight of Sample Prepared	Perfluorooctane sulfonic acid (PFOS) - Linear
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	mg/kg
EQL					0.002	0.001	0.001	0.002	0.002	0.0005	0.001	0.0005	0.0005	0.0005	0.0005	0.002	0.002	0.005	0.0005	0.0003	0.001	0.005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0003	0.005	0.002	0.002	0.0005	0.001	0.1	0.0005
Date	Field ID	Sample Type	Matrix Type	Matrix Description																																
26/02/2018	JBRF_TS01_I001_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.002	2.7	0.002
26/02/2018	JBRF_TS01_I002_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	7.2	0.0008
26/02/2018	JBRF_TS01_I003_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.002	2.9	0.002
26/02/2018	JBRF_TS01_I004_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	5.3	0.0009
26/02/2018	JBRF_TS01_I005_180226	Normal	Biota	Ant, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.002	2.7	0.002
26/02/2018	JBRF_TS01_I006_180226	Normal	Biota	Snail, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	2.2	<0.0005
26/02/2018	JBRF_TS01_I007_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.082	<0.005	<0.002	<0.002	<0.001	0.082	1.3	0.075
26/02/2018	JBRF_TS01_I008_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.01	<0.005	<0.002	<0.002	<0.001	0.01	1.9	0.009
26/02/2018	JBRF_TS01_I009_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.009	<0.005	<0.002	<0.002	<0.001	0.009	3.1	0.008
26/02/2018	JBRF_TS01_I010_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	0.002	<0.002	<0.001	<0.001	<0.001	0.006	<0.005	<0.002	<0.002	<0.001	0.008	1.6	0.006
26/02/2018	JBRF_TS01_I011_180226	Normal	Biota	Spider, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.012	<0.005	<0.002	<0.002	<0.001	0.012	2.0	0.01
21/02/2018	JBRF_TS01_I012_180221	Normal	Biota	Moth, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	0.3	0.003
26/02/2018	JBRF_TS01_I012_180226	Normal	Biota	Moth, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.053	<0.005	<0.002	<0.002	<0.001	0.053	0.2	0.052
26/02/2018	JBRF_TS01_I013_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	4.9	0.003
26/02/2018	JBRF_TS01_I014_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	4.0	0.002
28/02/2018	ST23_QC109_180226	Field_D	Biota	Invertebrate						<0.0005		0.0017		<0.0005	<0.0005				<0.0005	<0.0003			<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	0.011				<0.0005			
26/02/2018	JBRF_TS01_I015_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.004	<0.005	<0.002	<0.002	<0.001	0.004	3.4	0.003
26/02/2018	JBRF_TS01_I016_180226	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	3.1	0.003
26/02/2018	JBRF_TS01_I017_180226	Normal	Biota	Bush coackroach, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	1.9	0.002
27/02/2018	JBRF_TS01_I018_180227	Normal	Biota	Fly, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	8.3	<0.0005
27/02/2018	JBRF_TS01_I019_180227	Normal	Biota	Fly, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	2.7	<0.0005
27/02/2018	JBRF_TS01_I020_180227	Normal	Biota	Fly, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	0.4	<0.002
27/02/2018	JBRF_TS01_I021_180227	Normal	Biota	Earthworm, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	6.5	<0.0005
27/02/2018	JBRF_TS01_I022_180227	Normal	Biota	Beetle, Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	0.8	<0.0005
28/02/2018	JBRF_TS01_I023_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.004	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.024	<0.005	<0.002	<0.002	<0.001	0.024	2.4	0.02
28/02/2018	JBRF_TS01_I024_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.018	<0.005	<0.002	<0.002	<0.001	0.018	3.1	0.013
28/02/2018	JBRF_TS01_I025_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.004	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.019	<0.005	<0.002	<0.002	<0.001	0.019	2.0	0.015
28/02/2018	JBRF_TS01_I026_180228	Normal	Biota	Invertebrate	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.009	<0.005	<0.002	<0.002	<0.001	0.009	11.3	0.009
26/02/2018	JBRF_TS01_P001_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	30.4	<0.0005
26/02/2018	JBRF_TS01_P002_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	39.5	<0.0005
27/02/2018	ST17_QC104_180227	Field_D	Biota	Banksia ericifolia, Plant						<0.0005		<0.0005		<0.0005	<0.0005				<0.0005	<0.0003			<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0003				<0.0005			
26/02/2018	JBRF_TS01_P003_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	31.3	<0.0005
26/02/2018	JBRF_TS01_P004_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	37.9	<0.0005
26/02/2018	JBRF_TS01_P005_180226	Normal	Biota	Banksia ericifolia, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	66.8	<0.0005
27/02/2018	JBRF_TS01_P006_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	6.8	<0.0005
27/02/2018	JBRF_TS01_P007_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	9.8	<0.0005
27/02/2018	JBRF_TS01_P008_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	3.2	<0.0005
27/02/2018	JBRF_TS01_P009_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	5.4	<0.0005
27/02/2018	JBRF_TS01_P010_180227	Normal	Biota	Epacris Micropylla, Plant	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001	3.8	<0.0005
27/02/2018	ST18_QC105_180227	Field_D	Biota	Epacris Micropylla, Plant						<0.0005		<0.0005		<0.0005	<0.0005				<0.0005	<0.0003			<0.001		<0.0005	<0.0005	<0.0005	<0.0005	<0.0003				<0.0005			
13/02/2018	JBRF_TS01_VL001_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	0.011	<0.002	<0.002	<0.001	<0.001	0.016	0.0560	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.471	<0.005	<0.002	<0.002	<0.001	0.499	32.7	0.415
13/02/2018	JBRF_TS01_VL002_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.0010	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.022	<0.005	<0.002	<0.002	<0.001	0.022	29.8	0.0210
13/02/2018	JBRF_TS01_VL003_180209	Normal	Biota	Fox, Male	<0.002	<0.001	0.037	<0.002	<0.002	<0.001	<0.001	0.101	0.15	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	0.002	<0.005	0.003	0.015	<0.002	<0.001	<0.001	<0.001	2.57	<0.005	<0.002	<0.002	0.002	2.73	65.4	2.42
13/02/2018	JBRF_TS01_VL004_180209	Normal	Biota	Fox, Female	<0.002	<0.001	0.022	<0.002	<0.002	<0.001	<0.001	0.084	0.0500	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	0.003	<0.005	0.003	0.014	<0.002	<0.001	<0.001	<0.001	1.82	<0.005	<0.002	<0.002	0.002	1.75	136	1.57
13/02/2018	JBRF_TS01_VM001_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.005	<0.002	<0.002	<0.001	0.001	32.6	0.0009
13/02/2018	DH01_QC101_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.001	0.0007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.005	<0.005	<0.002	<0.002	<0.001	0.005	40.9	0.0043
13/02/2018	DH02_QC201_180209	Normal	Biota	Rabbit, Female						<0.0005				<0.001	<0.0005				<0.0005	<0.0003		<0.005			<0.0005	<0.0005	<0.0005	<0.0005	0.033				<0.0005			
13/02/2018	JBRF_TS01_VM002_180209	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.0010	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.011	<0.005	<0.002	<0.002	<0.001	0.011	56.6	0.0100
13/02/2018	JBRF_TS01_VM003_180209	Normal	Biota	Fox, Male	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.006	0.0007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.011	<0.005	<0.002	<0.002	<0.001	0.017	53.4	0.0103
13/02/2018	JBRF_TS01_VM004_180209	Normal	Biota	Fox, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.007	0.0007	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.014	<0.005	<0.002	<0.002	<0.001	0.021	49.8	0.0133
23/02/2018	JBRF_TS02_VL009_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	0.014	<0.002	<0.002	<0.001	<0.001	0.033	0.129	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	0.002	<0.002	<0.001	<0.001	<0.001	0.626	<0.005	<0.002	<0.002	<0.001	0.675	39.4	0.497
23/02/2018	JBRF_TS02_VL010_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	0.01	<0.002	<0.002	<0.001	<0.001	0.078	0.051	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.284	<0.005	<0.002	<0.002	<0.001	0.372	8.4	0.233
23/02/2018	JBRF_TS02_VM009_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.003	<0.005	<0.002	<0.002	<0.001	0.003	45.8	0.002
23/02/2018	JBRF_TS02_VM010_180223	Normal	Biota	Rabbit, Female	<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	0.003	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	0.002	<0.005	<0.002	<0.002	<0.001	0.005	14.3	0.002
27/02/2018	JBRF_TS01_Scat_180227	Normal	Biosolid		<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	0.0005	0.0008		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0114	<0.0002	<0.0005	<0.0002	<0.0002	0.0127		

Table 2: Biota Results – HMAS Creswell

																	PFAS																NA	

Table 3: Co-located Soil Results – JBRF and HMAS Creswell

				PFAS																																Inorganics	NA	
				PFOS/PFHxS (Sum of Total) - Lab Calc	N-Methyl perfluorooctane sulfonamidoethanol MeFOSA	N-Ethyl perfluorooctane sulfonamidoacetic acid	Perfluorohexane sulfonic acid	10:2 Fluorotelomer sulfonic acid	8:2 Fluorotelomer sulfonic acid	Perfluorobutane sulfonic acid	N-Methyl perfluorooctane sulfonamidoacetic acid	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS) - Branched	Perfluoropentanoic acid	6:2 Fluorotelomer sulfonic acid	N-Ethyl perfluorooctane sulfonamide	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid	Perfluorobutanoic acid	Perfluorodecanoic acid	Perfluorooctane sulfonic acid	Perfluorododecanoic acid	Perfluoroheptanoic acid	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Moisture (%)	Weight of Sample Received	Perfluorooctane sulfonic acid (PFOS) - Linear
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	g	mg/kg
EQL				0.0002	0.0005	0.0002	0.0002	0.0005	0.0005	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002	0.1	0.1	0.0005
Date	**Field ID**	**Sample Type**	**Matrix Type**																																			
21/02/2018	HMAS_TS01_Soil001_180221	Normal	soil	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	3.1		
21/02/2018	HMAS_TS01_Soil002_180221	Normal	soil	0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	0.0005	3.7		
26/02/2018	JBRF_TS01_Soil001_180226	Normal	soil		<0.002	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		116	<0.0005

Moroney, Rebecca (Health)

From: [redacted] sw.gov.au>
Sent: Monday, 4 June 2018 10:28 AM
To: Barr, Conrad (Health)
Subject: FW: JBTA - additional biota consumption information required [SEC=UNCLASSIFIED]
Attachments: 2126171 -Water Use Survey Findings report_DRAFT.PDF

From: [redacted] **On Behalf Of** PFASIM Jervis Bay
Sent: Wednesday, 30 May 2018 2:10 PM
To: [redacted]
Cc: [redacted]
Subject: RE: JBTA - additional biota consumption information required [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi [redacted],

For the Defence investigation, please find attached our findings from the water use survey (which also takes into account consumption from the territory where information was provided) we conducted with the community. It falls short of your questions below however.

This report was provided to the PCG and WBACC.

Regards,

[redacted]
(Contractor to Defence)
Project Manager – Investigations East
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [redacted] **E:** [redacted]

From: [redacted]
Sent: Tuesday, 29 May 2018 2:36 PM
To: [redacted]

Cc: [redacted]>; [redacted]>
Subject: JBTA - additional biota consumption information required

Hi [redacted],

NSW EPA met with ACT gov this afternoon and were pointed in your direction. In order to mostly accurately calculate dietary advice for PFAS in JBTA, the NSW EPA requires additional information regarding the consumption of biota by the local Wreck Bay Aboriginal community – how much of their diet consists of sampled biota, what part of the organisms are consumed and where do they source these organisms from?

Main aquatic organisms captured in the current sampling regime include:

A) Fish (Bream, Mullet, Whitebait, Leatherjacket, Bonito, Flathead)
B) Crustacea (Shrimp, Yabby)
C) Bivalves (oysters)
D) Gastropods (mud whelk and abalone)
E) Echinoderm (sea urchin)
F) Polychaetes (marine worms)
G) Aquatic plants (Macrophyte, Kelp, Ribbonweed, Neptunes Necklace)

Key questions:

- Fish – what parts do they typically eat (the whole fish or just fish fillets)? - how much do they typically consume per serve and what % of their diet is fish? – where do they source these from (I am guessing for the most part these are caught from the bay)?
- Crustacea, bivalves, gastropods, echinoderms, polychaetes – how much of their diet consists of these? - where do they usually source these from (I am guessing shrimp, urchins, oysters and abalone are sourced from the bay)?
- Aquatic plants – do they consume these? - If so what is their intake quantity?

Terrestrial organisms captured in sampling regime include:

A) Fox
B) Rabbit

- Do they eat these mammals? If so, what portions and how much of their diet consists of these?

If you could please let me know if JBTA holds this sort of information that would be appreciated, or if you can point me in the direction of someone who does.

Regards,

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

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Stedman, Andrew (Health)

From: [redacted]
Sent: Thursday, 7 June 2018 7:53 AM
To: [redacted]; Clapham, David; Chester, Heath; [redacted]; Stedman, Andrew (Health); [redacted] Hudson, Lyndell (Health); [redacted]
Subject: JBRF PFAS Investigation Factual Letters
Attachments: 2126171_LET_factual letter 16_June 2018.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Dear PCG,

Attached for your information is Factual letter 16 Preliminary sampling results Aquatic ecology from the unnamed ponds.

To follow this email are Factual letters 14 and 15, of larger file size. Please contact me if you do not receive factual letters 14 and 15 and I will arrange file transfer.

Regards,

[redacted]

GHD

[redacted]

Level 2, 57 Graham Street (PO Box 621) Nowra NSW 2541 Australia | http://www.ghd.com/

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