

Algal bloom wildlife post-mortem report



Government
of South Australia

Department for
Environment and Water

Species – Sub-Antarctic fur seal

Date collected – 5 September 2025

Location – Basham Beach

History relating to the animal

A juvenile female sub-Antarctic fur seal (*Arctocephalus tropicalis*) was found dead on Basham Beach on 5 September 2025.

Clinical examination

The animal was already dead and so could not be examined prior to death.

Necropsy

The necropsy (looking at the whole body) revealed that the animal was in poor body condition, weighing 16.2kg and was 1m in length. The subcutaneous (under the skin) fat was minimal, with a metacestode (immature tapeworm) identified in the fatty tissue. There was a small 5mm graze in the skin below the right eye.

The stomach contained no food, but several ascarids (gut parasites) were found. There was scant, pasty brown food material in the small intestines, and no faeces in the rectum.

Tissues were collected for histopathology (looking at tissues under the microscope for more detailed information), testing for *Mycobacterium tuberculosis* (*MTb*) complex and *Mycobacterium avium* (*M. avium*) complex organisms, and brevetoxins and other algal biotoxins (a possibility due to the algal bloom).

Histopathology

Samples from every major body system were examined under the microscope. Examination of the lung revealed mild, acute (recent) pulmonary hyperaemia (increased blood) and pulmonary congestion (lung tissues full of fluid, usually from circulation problems). Sections of the liver revealed mild hepatic lipidosis (fat within the liver cells - seen with starvation and breakdown of fat reserves for energy). There was moderate autolysis (decomposing after death) of the gastrointestinal (gut) sections. There were no other significant findings within the other collected tissues.

Bacteriology

Polymerase chain reaction (PCR) testing for *MTb* complex and *M. avium* complex organisms was negative.

Brevetoxins

No samples were above the limits of reporting.

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Other biotoxins

No other algal biotoxins were above the limits of reporting.

Tetrodotoxin (TTX) (a paralytic marine toxin) was detected in the stomach contents (3.0mg/kg) and the intestinal contents (0.60mg/kg), the kidney (0.02mg/kg), the liver (0.18mg/kg), and the spleen (0.04mg/kg).

Summary

A juvenile female sub-Antarctic fur seal was found dead. The animal was underweight. Laboratory examination could not determine the cause of death or weight loss of this animal. Parasites (worms) found in this animal are likely to be incidental findings (not contributing to disease), as they are commonly found in seals, dolphins and whales.

Testing for tuberculosis (*Mycobacterium tuberculosis* (MTb) complex and *Mycobacterium avium* (*M. avium*) complex organisms) was negative. Brevetoxin and other algal biotoxin testing was negative. Tetrodotoxin (TTX) (a paralytic marine toxin found in several fish and invertebrate species, including pufferfish and octopus) was found within the contents of the stomach and intestines, and at lower levels in the kidney, liver and spleen of this seal.

Tetrodotoxin is a potent neurotoxin (affecting the nervous system) that can cause a range of clinical signs, including numbness, nausea, and diarrhoea, progressing to generalised muscle paralysis, cardiac arrhythmias (abnormal heart rhythms), and potentially death due to respiratory failure (inability to breathe as a result of muscle paralysis) in humans.

There is limited information regarding TTX poisoning in marine mammals, however, based on its known mechanism of action, a similar spectrum of clinical signs as seen in people following exposure may be expected. TTX exposure may have contributed to the illness and death of this animal, however, as the animal was not observed prior to death, any such association remains speculative.

PATH RESULTS: SUBARTIC FUR SEAL, (Ma) {SUBARTIC SEAL} [REDACTED]

From [REDACTED]

Date Thu 11/09/2025 3:30 PM

To [REDACTED]

[REDACTED]

Tested on 06/09/25
Reported on 11/09/25 16:00
Referred on 05/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SUBARTIC FUR SEAL
BASHAMS BEACH

Animal/s: SUBARTIC SEAL
Marine Mammal

DOB: N/A

Collected: 05/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

All Tests Complete

SUMMARY DIAGNOSIS

No diagnosis is concluded

SUMMARY COMMENTS

The cause of chronic weight loss and death are not found by laboratory testing.

[REDACTED]

Validated by [REDACTED]

[REDACTED]

Tested on 06/09/25
Reported on 11/09/25 16:00
Referred on 05/09/25 by: [REDACTED]

[REDACTED]

Owner:
SUBARTIC FUR SEAL
BASHAMS BEACH

Animal/s: SUBARTIC SEAL
Marine Mammal

DOB: N/A

Collected: 05/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

All Tests Complete

HISTOPATHOLOGY FROM NECROPSY

REF: [REDACTED]

CLINICAL HISTORY

Please refer to the clinical history on the request form and the email sent on 5/9/2025. A brief summary of the clinical history;

The sub-antarctic fur seal, found dead on Basham beach (-35.5198300, 138.6966976), was believed to be the same seal that was seen on Monday 1/9/25 on Dump beach and on Basham beige yesterday 4/9/25

One dead female juvenile Sub-antarctic fur seal, *Arctocephalus tropicalis*

MACROSCOPY

Cassettes contain the following tissues;

A: spinal cord and cerebellum

B: medulla

C: midbrain

D: occipital cortex

E: parietal cortex

F: thalamus

G: frontal cortex

H: spleen, heart, bronchial lymph node

I: lung and liver

J: adrenal gland, liver, skeletal muscle

K: metacestode, jejunum, stomach, pancreas, duodenum

L: ileum, caecum, colon; Ae GK

MICROSCOPY

Lung: There is diffuse mild hyperaemia / congestion expanding the capillaries of the alveolar interstitium. (Mild, diffuse, acute

hyperaemia / congestion)

Liver: Widespread hepatocytes contain intracytoplasmic vesicles (lipid).
(Mild hepatic lipidosis)

There is moderate autolysis of alimentary sections. Aside from this artifact there are no other significant findings.
Those tissues not described are unremarkable.

DIAGNOSIS

Lung: Mild, diffuse, acute hyperaemia / congestion

[REDACTED]

Tested on 06/09/25
Reported on 11/09/25 16:00
Referred on 05/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SUBARTIC FUR SEAL
BASHAMS BEACH

Animal/s: SUBARTIC SEAL
Marine Mammal

DOB: N/A

Collected: 05/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

All Tests Complete

Liver: Mild hepatic lipidosis

COMMENTS

There is mild pulmonary hyperaemia / congestion. This could be an agonal process. Brevetoxin are reported to cause vascular changes. Samples are stored if brevetoxin / biotoxin testing is required.

The mild hepatic lipidosis is a minor finding, and simply indicates relocation of triglycerides to the liver. This can occur in cases of ill thrift.

There are no findings to explain the chronic weight loss. Could decreased feed abundance be a contributing factor ?

[REDACTED]

Validated by [REDACTED]

[REDACTED]

Tested on 06/09/25
Reported on 11/09/25 16:00
Referred on 05/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SUBARTIC FUR SEAL
BASHAMS BEACH

Animal/s: SUBARTIC SEAL
Marine Mammal

DOB: N/A

Collected: 05/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

All Tests Complete

NECROPSY REPORT
ADDITIONAL FINDING 11/9/2025

CLINICAL HISTORY

Please refer to the clinical history on the request form and the email sent on 5/9/2025. A brief summary of the clinical history;

The sub-antarctic fur seal, found dead on Basham beach (-35.5198300, 138.6966976), was believed to be the same seal that was seen on Monday 1/9/25 on Dump beach and on Basham beige yesterday 4/9/25

SAMPLES SUBMITTED

One dead female juvenile Sub-antarctic fur seal, *Arctocephalus tropicalis*

NECROPSY FINDINGS

The animal is in poor body condition weighs 16.2 kg and there is minimal subcutaneous and abdominal fat. The animal is approximately 1 m long and the circumference of the body just behind the pectoral flippers is 58cm. There is a small graze, approximately 5 mm across, below the right eye.

Within the subcutaneous fat in the ventral abdomen there is a pale white metacestode, approximately 5mm across..

There is scant brown fluid in the stomach with moderate numbers of small ascarids (20-40mm long). There is scant pasty brown ingesta in the intestinal tract and the rectum contains no faeces.

GROSS SUMMARY

Chronic weight loss

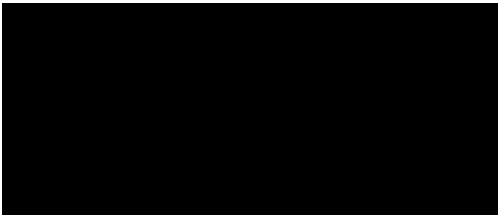
SAMPLES COLLECTED & TESTING

Formalin fixed tissues will be processed for histopathology.

Triplicate samples (2 x 5ml and 1 x 200ml containers) for liver, spleen, heart, lung, kidney, and brain, 1 x stomach contents (5ml), 1x intestinal contents (2ml) and 1 x oropharyngeal swab in virus transport medium are stored frozen for 6 months.

COMMENTS

There are no gross findings to explain the cause of chronic weight loss. Gastric ascarids (likely *Anisakis* sp. and *Contracaecum* sp.) are incidental findings.



Tested on 06/09/25
Reported on 11/09/25 16:00
Referred on 05/09/25 by:



Owner:
SUBARTIC FUR SEAL
BASHAMS BEACH

Animal/s: SUBARTIC SEAL
Marine Mammal

DOB: N/A

Collected: 05/09/25 00:25

Subm.No:



Lab No.:

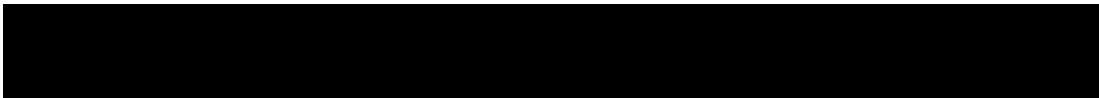


Samples tested as received

All Tests Complete

11/9/2025

The decription of the metacestode is added to the gross findings. This was left off from the original report. Metacestodes, Phyllobothrium spp., are common incidental findings in seals, dolphins and whales.



Specialist Veterinary Anatomic Pathologist



Validated by



PATH RESULTS: SEAL SUBANTARCTICFUR, (Ma) [REDACTED]

From [REDACTED]

Date Mon 22/12/2025 12:30 PM

To [REDACTED]

[REDACTED]

Tested on 10/12/25
Reported on 22/12/25 13:00
Referred on 05/09/25 **by:** [REDACTED]

[REDACTED]

Owner:

SEAL SUBANTARCTICFUR
BASHAMS BEACH
PORT ELLIOT 5212

Animal/s:

Marine Mammal

DOB: N/A

Collected: 05/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

REFERRED TEST

Disease/Test : Mycobacterium avium complex Taqman

Specimen Type: Lung Tissue

RESULT : Negative

Comment : NATA/RCPA accreditation does not cover the performance of this service

This test was performed by: Australian Centre for Disease Preparedness (CSIRO)
NATA accreditation number: 13546

REFERRED TEST

Disease/Test : Mycobacterium tuberculosis complex IS6110 - TaqMan Assay

Specimen Type: Lung Tissue

RESULT : Negative

Comment : NATA/RCPA accreditation does not cover the performance of
this service

This test was performed by: Australian Centre for Disease Preparedness
(CSIRO)
NATA accreditation number: 13546

REFERRED TEST

Disease/Test : Pan-Mycobacterium Taqman
Specimen Type: Lung Tissue

RESULT : Negative

Comment : NATA/RCPA accreditation does not cover the performance of
this service

This test was performed by: Australian Centre for Disease Preparedness
(CSIRO)
NATA accreditation number: 13546

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CERTIFICATE OF ANALYSIS

Customer: [REDACTED]
Address: [REDACTED]

Submission Description: [REDACTED] Fur Seal
Sample Received Date: 11/03/2026
Contract Number: [REDACTED]
Client Order Number: [REDACTED]

Sample(s) analysed as received. Sampling date and time data supplied by the client. The document shall not be reproduced except in full.

Additional information relating to this submission can be found in the sample receipt notification.

This report supersedes any previous reports with this submission number.

Many tests specify a holding time which gives the recommended timeframe by which a sample should be preserved/extracted and/or analysed after the sample is taken.

Holding time information can be found on the AST website <https://analyticalservices.tas.gov.au/our-services/containers-samples-and-submissions>.

Whilst every effort is made to analyse samples within these timeframes, situations can occur where this is not possible.

Where a test has been conducted outside the recommended sample holding time this should be taken into account when interpreting results.

The results in this report were authorised by:

Name	Position
[REDACTED]	Section Head - Organic Chemistry

Test Information:

Method ID	Test Description	Date Commenced:
3411	Lipophilic Toxins in Shellfish by LC-MS/MS	23-03-2026
3411A	Brevetoxins in Shellfish by LC-MS/MS	20-03-2026
3416	PST in Biota by LC-MS/MS (Boundy Method)	24-03-2026

*Sample Comments***Sample Number: 439581****3416 PST in Biota by LC-MS/MS (Boundy Method)**

The sample was found to contain tetrodotoxin (TTX) as a concentration of 3.0 mg/kg on a wet matter basis

Sample Number: 439582**3416 PST in Biota by LC-MS/MS (Boundy Method)**

The sample was found to contain tetrodotoxin (TTX) as a concentration of 0.60 mg/kg on a wet matter basis

Sample Number: 439585**3416 PST in Biota by LC-MS/MS (Boundy Method)**

The sample was found to contain tetrodotoxin (TTX) as a concentration of 0.02 mg/kg on a wet matter basis

Sample Number: 439586**3416 PST in Biota by LC-MS/MS (Boundy Method)**

The sample was found to contain tetrodotoxin (TTX) as a concentration of 0.18 mg/kg on a wet matter basis

Sample Number: 439587**3416 PST in Biota by LC-MS/MS (Boundy Method)**

The sample was found to contain tetrodotoxin (TTX) as a concentration of 0.04 mg/kg on a wet matter basis

IS- Insufficient Sample

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)			STOMACH CONTENT	INTESTINAL CONTENT	BRAIN	HEART	KIDNEY	LIVER	SPLEEN	LUNG
Sample Description			05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00
Sampled Date/ Time			05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00
Method ID	Analyte	Units	439581	439582	439583	439584	439585	439586	439587	439588
3411	AZA1	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	AZA2	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	AZA3	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	Domoic Acid	mg/kg WMB	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*IS*
	DTX1 Free	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	DTX1 Total	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	DTX2 Free	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	DTX2 Total	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	GYM	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	Homo-YTX	mg/kg WMB	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	OA Free	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	OA Total	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	PnTx-G	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	PTX2	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	SPX1	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	Total DST	OA eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	YTX	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
3411A	Brevetoxin 1	mg/kg WMB	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*
	Brevetoxin 2	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*
	Brevetoxin 3	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*
3416	C1	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	C2	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	C3	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	C4	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	dcGTX1	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*
	dcGTX2	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	dcGTX3	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	dcGTX4	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*

IS- Insufficient Sample

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)		Sample Description	STOMACH CONTENT	INTESTINAL CONTENT	BRAIN	HEART	KIDNEY	LIVER	SPLEEN	LUNG
		Sampled Date/ Time	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00	05/09/25 0:00
Method ID	Analyte	Units	439581	439582	439583	439584	439585	439586	439587	439588
3416	dcNEO	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	dcSTX	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	doSTX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*
	GTX1	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	GTX2	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	GTX3	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	GTX4	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	GTX5	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	GTX6	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	NEO	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	*IS*
	STX	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*IS*
	Total PST	STX.2HCl eq. mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	*IS*

IS- Insufficient Sample

* NATA accreditation does not cover this result