

Algal bloom wildlife post-mortem report



Government
of South Australia

Department for
Environment and Water

Species – Australian sea lion

Date collected – 18 September 2025

Location – Seal Bay, Kangaroo Island

History relating to the animal

A juvenile male Australian sea lion (*Neophoca cinerea*) was found dead at Seal Bay on 18 September 2025.

Clinical examination

The animal was already dead and so could not be examined prior to death. The animal appeared to be in good body condition.

Necropsy

The necropsy (looking at the whole body) revealed that the sea lion weighed 17.2 kg and was moderately autolysed (decomposing). There were two scars on the back just in front of the hindlimbs (back legs). The subcutaneous (under the skin) fat was 2.5 cm thick, with some red discolouration to the fat over the abdomen.

There was 80-100 mL of pink, cloudy fluid within the abdomen. The mesentery (supports the intestines and contains blood vessels) had regions that were thickened, opaque (not clear) and had bubbles within the tissues. The intestines appeared roughened and dull. There was a perforation (hole/tear) within the duodenum (first part of the small intestine), with no surrounding inflammation or fibrous adhesions (attachment) to the surrounding tissue.

The stomach was empty, and there was scant, pasty, opaque, yellow material within the small intestines. There were no faeces within the rectum. The liver was tan and markedly enlarged with rounded edges. Two flat, pale pink lesions were noted on the surface of the liver, approximately 2 cm diameter.

Tissues were collected for histopathology (looking at tissues under the microscope for more detailed information) and testing for *Mycobacterium tuberculosis* (MTb) 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. There was moderate autolysis (decomposing after death) of the liver, lung and gut. Examination of the liver revealed mild hepatocyte (liver cell) loss and necrosis (cell death), with intracytoplasmic lipid vacuoles (fat droplets within the cells). There were small numbers of small lymphocytes and plasma cells (inflammatory cells) present in the mesentery, mainly around normal fat tissue. There was mild, diffuse congestion (fluid build-up) in the lungs, with increased numbers of

Algal bloom wildlife post-mortem report



Government
of South Australia

Department for
Environment and Water

inflammatory cells. There was degeneration of fat within the connective tissues of the pancreas.

Bacteriology

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

Brevetoxins

No samples were above the limits of reporting.

Other algal biotoxins

No samples were above the limits of reporting.

Summary

A male juvenile Australian sea lion was found dead. Laboratory examination did not reveal a cause of death in this animal. There was a hole in the intestines, but based on the lack of bleeding, infection or inflammation, this likely occurred after death. The sea lion was in good body condition, but the breakdown of fat seen in the pancreas could reflect acute starvation. There were lesions (abnormal tissue) in the liver which could be due to a number of things, including an acute decrease in food intake. Testing for tuberculosis (*Mycobacterium tuberculosis* and *Mycobacterium avium* complex organisms) was negative. Brevetoxins and other algal biotoxins were also not detected.

PATH RESULTS: SEA LION AUSTRALIAN, (Ma) [REDACTED]

From [REDACTED]

Date Mon 22/09/2025 4:30 PM

To [REDACTED]

[REDACTED]

Tested on 22/09/25
Reported on 22/09/25 17:00
Referred on 18/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SEA LION AUSTRALIAN

SEAL BAY 5223

Animal/s:
Marine Mammal

DOB: N/A

Collected: 18/09/25 00:25 **Subm.No:** [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

[REDACTED]

CLINICAL HISTORY

ASL pup found deceased at Seal Bay 18/09/25. Apparently good body condition and no visible injuries. Has been refrigerated overnight. Couriered by [REDACTED] (plane).

SAMPLES SUBMITTED

One whole seal carcass, juvenile male, 17.2kg

NECROPSY FINDINGS

The carcass is moderately autolysed. The abdomen is markedly distended with gas.

Numerous maggots were distributed on the head and neck region. The cranial portion of the mouth and tongue is covered with sand. Two scars were present dorsally (just cranial to the hindlimb) (crescent-shaped

11x9cm; cross shaped 10x8cm).

The carcass is in good condition. The ventral fat (xiphoid region) is 2.5cm thick. Abdominal subcutaneous fat showed diffuse pale-red discoloration.

Abdominal cavity contained approx 80-100mL of pink, cloudy fluid, with bubbles within the mesentery (emphysema). The intestinal serosa is roughened and dull. Multifocally the mesentery is thickened and opaque. One full thickness 2x2cm perforation was identified at duodenum. The lesion is not associated with inflammation or fibrous adhesions.

The stomach is empty. The intestines contain scant pasty opaque light yellow material. The rectum does not contain any faeces. The liver is tan and markedly enlarged with rounded margins (suspected hepatomegaly). Two flat pale pink lesion were noted on the surface (approximately 2x2cm), one of them with a central indentation.

Both tarsal joint and glenohumeral joints were grossly unremarkable.

The organs not mentioned were examined thoroughly and were grossly unremarkable: thoracic cavity, trachea, lungs, heart (including valves), brain, intestine, testes, kidney, adrenals, thyroid, oesophagus.

[REDACTED]

Tested on 22/09/25
Reported on 22/09/25 17:00
Referred on 18/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SEA LION AUSTRALIAN

SEAL BAY 5223

Animal/s:
Marine Mammal

DOB: N/A

Collected: 18/09/25 00:25 **Subm.No:** [REDACTED] **Lab No.:** [REDACTED]

Samples tested as received

GROSS DIAGNOSIS
Moderate autolysis
Peritonitis - suspect fibrinosuppurative
Hepatomegaly

SAMPLES COLLECTED & TESTING
Fixed tissue - for histopathology

Brain, spleen, heart, liver, lung and tracheal swab in VTM - store at
Molecular

5ml (Brain, spleen, heart, liver, lung, thyroid), yellow top pots
(urinary bladder, liver, skin lesion, lung, kidney, heart, spinal cord,
repro, spleen, stomach, brain, eye, adrenal, mesentery, pancreas, liver
lesion, trachea, intestine) - Hold at -80 degrees Celcius

Gel swabs (rectal content, peritoneal) - Hold at 4 degrees Celcius

Comments
There is a marked abdominal effusion here. I am suspecting that is
fibrinosuppurative, and it is likely to be of bacterial in origin. There
is a focal perforation at the level of the duodenum that could be
artefact or the cause for the suspected peritonitis. Please await
histology results.

[REDACTED]

Pathology Resident.

Validated by



PATH RESULTS: SEA LION AUSTRALIAN, (Ma) [REDACTED]

From [REDACTED]

Date Wed 01/10/2025 6:00 PM

To [REDACTED]

[REDACTED]

Tested on 22/09/25
Reported on 01/10/25 18:30
Referred on 18/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SEA LION AUSTRALIAN

SEAL BAY 5223

Animal/s:
Marine Mammal

DOB: N/A

Collected: 18/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

All Tests Complete

HISTOPATHOLOGY

REF: [REDACTED]

CLINICAL HISTORY

Australian sea lion pup found deceased at Seal Bay 18th September 2025. Apparently good body condition and no visible injuries. Has been refrigerated overnight. Couriered by [REDACTED] (plane).

MACROSCOPY

A = duodenal lesion + mesentery + pancreas
B = skin, brain
C = liver
D = liver, kidney, spleen, heart, spleen muscle
E = intestinal

MICROSCOPY

GI tract: There is moderate to marked autolysis. The segment with the perforation had no clear evidence of inflammation and there was no serositis or adhesion of intestinal contents on the serosal surfaces. There were mild numbers of small lymphocytes and plasma cells within the mesentery, often surrounding normal adipose tissue.

Liver: Moderate autolysis is present. There is moderate hepatocyte loss and necrosis, which extends from the centrilobular area to the midzonal region. The sinusoids were also expanded in this region. The intact centrilobular hepatocytes often contain intracytoplasmic clear and punctate vacuoles (lipid vacuoles). Mild EMH was present (normal for this age).

Haired skin: The surface is multifocally mildly thickened by orthokeratotic hyperkeratosis, within which cellular debris was seen.

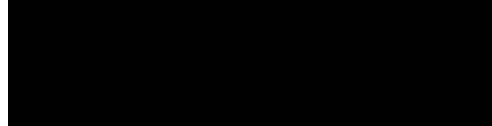
Lung: There is moderate autolysis. Mild diffuse congestion in the alveolar septa. Increased numbers of alveolar macrophages in the alveolar lumens admixed with strands of eosinophilic material (possibly serous fluid).

Spleen: The red pulp contained extramedullary haematopoiesis (normal for this age).

Pancreas; the adipose tissue in the interstitial tissue contained fat degeneration (possibly due to acute starvation). Some of the pancreatic cells appear to be apoptotic, though this could be a feature of autolysis.



Tested on 22/09/25
Reported on 01/10/25 18:30
Referred on 18/09/25 by:



Owner:
SEA LION AUSTRALIAN

SEAL BAY 5223

Animal/s:
Marine Mammal

DOB: N/A

Collected: 18/09/25 00:25 **Subm.No:**  **Lab No.:** 

Samples tested as received

All Tests Complete

The following organs are moderately to markedly autolysed but otherwise microscopically normal: brain, kidney, skeletal muscle, cardiac muscle, tongue

DIAGNOSIS

Liver: Moderate centrilobular to midzonal hepatocyte vacuolation with individual cell loss

Pancreas; fat necrosis

COMMENTS

I suspect that the perforation seen in the intestinal tract at necropsy was a post-mortem lesion since there is no evidence of peritonitis which should have occurred if intestinal perforation was the cause of death. The edges of the perforation did not contain the haemorrhage and inflammation expected in a pre-mortem lesion. The perforation may have occurred due to gas buildup.

The fat degeneration seen in the interstitial tissue of the pancreas could reflect acute starvation in the terminal phase. The hepatic lesions are non-specific as to cause but appeared fairly recent. They are not pathognomonic for starvation but an acute decrease in food intake could be the cause.

The organs otherwise appeared in fairly good condition which fits your clinical assessment of the pup being in good body condition. The cause of the suspect starvation is not evident in the sections.

[REDACTED]
SPECIALIST VETERINARY PATHOLOGIST.

[REDACTED]
01/10/2025

Validated by [REDACTED] Veterinary Pathologist.

PATH RESULTS: SEA LION AUSTRALIAN, (Ma) [REDACTED]

From [REDACTED]

Date Tue 23/12/2025 11:00 AM

To [REDACTED]

[REDACTED]

Tested on 22/09/25
Reported on 23/12/25 11:30
Referred on 18/09/25 **by:** [REDACTED]

[REDACTED]

Owner:
SEA LION AUSTRALIAN

SEAL BAY 5223

Animal/s:
Marine Mammal

DOB: N/A

Collected: 18/09/25 00:25

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

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

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 : 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

This email is confidential and may contain legally privileged information and copyright material. You may not disclose, copy, distribute, rely on, modify or use this email except as authorised by [REDACTED]. If you have received this message in error, please notify us immediately by return email and delete this email. Any opinions expressed in emails are those of the individual author of the email and do not necessarily represent the views of [REDACTED]. The sender is not responsible for any changes made to this email other than those made by the sender, or for the effect of any such changes on the meaning of the email. It is the responsibility of the recipient to virus check this email and any attachments.

CERTIFICATE OF ANALYSIS

Customer:		Submission Description:	Sea Lion
Address:		Sample Received Date:	11/03/2026
Contact:		Contract Number:	
		Client Order Number:	

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
	Section Head - Organic Chemistry

Test Information:

Method ID	Test Description	Date Commenced:
3411	Lipophilic Toxins in Shellfish by LC-MS/MS	30-03-2026
3411A	Brevetoxins in Shellfish by LC-MS/MS	27-03-2026
3416	PST in Biota by LC-MS/MS (Boundy Method)	30-03-2026

Chemistry Test Results (Biota - Food)

Sample Description			BRAIN	KIDNEY	LIVER	SPLEEN	HEART	LUNG
Sampled Date/ Time			22/09/25 0:00	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00
Method ID	Analyte	Units	439652	439653	439654	439655	439656	439657
3411	AZA1	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	AZA2	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	AZA3	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Domoic Acid	mg/kg WMB	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DTX1 Free	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	DTX1 Total	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	DTX2 Free	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	DTX2 Total	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	GYM	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Homo-YTX	mg/kg WMB	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	OA Free	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	OA Total	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PnTx-G	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	PTX2	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SPX1	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Total DST	OA eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	YTX	mg/kg WMB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
3411A	Brevetoxin 1	mg/kg WMB	<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*
	Brevetoxin 3	mg/kg WMB	<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
	C2	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	C3	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	C4	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	dcGTX1	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*
	dcGTX2	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	dcGTX3	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	dcGTX4	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)		Sample Description	BRAIN	KIDNEY	LIVER	SPLEEN	HEART	LUNG
		Sampled Date/ Time	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00	22/09/25 0:00
Method ID	Analyte	Units	439652	439653	439654	439655	439656	439657
3416	dcNEO	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	dcSTX	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	doSTX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*
	GTX1	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	GTX2	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	GTX3	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	GTX4	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	GTX5	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	GTX6	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	NEO	STX.2HCl eq. mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	STX	STX.2HCl eq. mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Total PST	STX.2HCl eq. mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

* NATA accreditation does not cover this result