Algal bloom wildlife post-mortem report

Government of South Australia
Department for Environment and Water

Species – Australian sea lion

Date collected – 11 September 2025

Location – Seal Bay, Kangaroo Island

History relating to the animal

An adult male Australian sea lion (*Neophoca cinerea*) was found dead and collected from Seal Bay on the 11 September 2025.

Clinical examination

According to ranger observations, the animal appeared healthy on the day preceding its discovery. It was found dead the following day and was not examined clinically before death.

Necropsy

The necropsy (looking at the whole body) revealed that the animal was in moderate body condition and weighed 190kg. The subcutaneous (under the skin) fat was approximately 20mm over the ventral abdomen (the underside of the body) and the dorsal midline (middle of the back). The animal was 1.95m long. There were moderate post-mortem autolytic change (decomposition after death).

The stomach contained four round stones (normal for sea lions) approximately 40-50mm in diameter; there were no other stomach contents. There was scant brown ingesta (food material) in the intestines and scant faeces in the rectum. The remaining examination was unremarkable.

Tissues were collected for histopathology (looking at tissues under the microscope for more detailed information) and testing for 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 were moderate autolytic changes (post-mortem decomposition) to all tissues, with severe autolysis within parts of the brain. There were abundant extracellular (outside the cells) large spore-forming rods (rod-shaped bacteria) in the liver and within some areas of the brain.

Examination of the brain (the thalamus, the frontal, occipital, and parietal cortexes) revealed a non-suppurative (without pus) meningoencephalitis (inflammation of the brain and protective membranes) with multifocal malacia (softening) and vascular fibrinoid degeneration (death of cells in small blood vessels).

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Bacteriology

Brain tissue was examined using special stains. Gram stain of brain tissue demonstrated abundant gram-variable (mix of gram-positive and gram-negative staining) bacterial bacilli (rod-shaped bacteria) throughout the brain tissue consistent with post-mortem (after death) overgrowth, but no pathogens (bacteria or fungi) were identified with special staining.

Microscopy (looking at tissues under the microscope for more detailed information) revealed small numbers of leukocytes (white blood cells) and epithelial cells (cells lining parts of the brain), and a small number of gram-positive cocci (a type of spherical bacteria).

Microbial culture (seeing what bacteria or fungi grow from a sample) of the brain tissue did not isolate any pathogens (no disease-causing bacteria were identified).

Brevetoxins

No samples were above the limits of reporting.

Other algal biotoxins

Domoic acid (an amnesic shellfish toxin) was detected in the brain at 0.22mg/kg.

Gonyautoxin (dcGTX1) (a paralytic shellfish toxin) was detected in the heart (0.05mg/kg), kidney (0.02mg/kg), and lung (0.05mg/kg).

Summary

An adult male Australian sea lion was found dead at Seal Bay on Kangaroo Island. The animal was observed by rangers the day before being found dead and appeared outwardly normal.

Domoic acid (an amnesic shellfish toxin) was detected in the brain and gonyautoxin (dcGTX1), a type of saxitoxin (a paralytic shellfish toxin), was detected in the heart, kidney, and lung. Domoic acid and saxitoxins are potent neurotoxins (toxins affecting nervous tissue) produced by some marine organisms (including algal species) that can accumulate in shellfish and other aquatic animals. Domoic acid can cause amnesic shellfish poisoning (ASP) and saxitoxins can cause paralytic shellfish poisoning (PSP) in humans and can also pose a risk to animals when ingested.

The presence of these toxins in the sea lion's tissues may have contributed to its illness and death. However, interpretation of these findings is limited by the absence of clinical signs prior to death and by histological findings in the brain that were not consistent with domoic acid–associated neuronal degeneration, noting the brain was significantly decomposed, which limited laboratory examination. Given these limitations, any association between domoic acid and gonyautoxin exposure and this animal's illness and death should be interpreted with caution and remains speculative.

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The likely cause of death in this animal was meningoencephalitis (inflammation of the brain and protective membranes), based on the changes seen in the brain which were consistent with a bacterial, fungal, protozoal or (less likely) viral infection, and were not consistent with neuronal degeneration (death of nerve cells) typically seen with domoic acid toxicity.

Outlook

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

From [redacted]
Date Fri 12/09/2025 6:00 PM
To [redacted]

[redacted]

[redacted]

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

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received

NECROPSY REPORT
CORRECTED COMMENTS 12/9/2025
Apologies, as you requested, we will contact Analytical Services Tasmania and ask for a quote for biotoxin and brevetoxin testing.

CLINICAL HISTORY
Please refer to the clinical history on the request form.

One adult male Australian sea lion was found deceased at Seal Bay on 11/9/2025. The animal was in apparently good body condition.

SAMPLES SUBMITTED
One dead adult male Australian sea lion, Neophoca cinerea

NECROPSY FINDINGS
The animal is in moderate body condition and weighs 190 kg. The subcutaneous adipose tissue is approximately 20 mm over the ventral abdomen and the dorsal midline. The animal is 1.95m long.

There are moderate post-mortem autolytic changes.

There are 4 round stones approximately 40 to 50 mmm in diameter in the stomach and no other stomach content. There is scant brown ingesta in the intestines and scant faeces in the rectum.

GROSS SUMMARY
Unremarkable gross findings

SAMPLES COLLECTED & TESTING
Fixed tissues will be processed for histopathology as requested.

Duplicate fresh liver, kidney, spleen, heart, lung, brain are stored in 5ml containers (x 2) are stored if Avian influenza testing is required.

Analytical Services Tasmania will be contacted and a quote requested for biotoxin and brevetoxin testing of liver, spleen, heart, lung, kidney, brain.

Oropharyngeal swab in virus transport medium collected at the necropsy, and nose and mouth swab in virus transport medium and whiskers collected by NPWS staff are stored frozen.

[redacted]

[redacted]

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

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received

COMMENTS
The cause of death is not determined. The moderate autolysis will limit microscopic interpretation of some organs but histopathology is still recommended for all organs and will be completed.

[redacted]
Specialist Veterinary Anatomic Pathologist
[redacted]

Validated by [redacted]

Outlook

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

From [redacted]
Date Wed 19/11/2025 7:00 PM
To [redacted]

[redacted]

[redacted]

Tested on 12/09/25
Reported on 19/11/25 19:30
Referred on 11/09/25 **by:** [redacted]

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

HISTOPATHOLOGY FROM NECROPSY

19/11/2025
ADDITIONAL COMMENTS
Please contact the laboratory if bacterial culture of the stored brain is required. Additional charges will apply.

Please note that the significant inflammatory meningoencephalitis is not characteristic of domoic acid poisoning which is often primary degenerative with little inflammation. [redacted] If microbiological cultures are unremarkable for this animal, Toxoplasma gondii PCR could be considered.

NOTE: Supplementary information has been added to the original histopathology report. Please discard any previously issued report/s.

Reason for supplementary report: Additional findings

REF: [redacted]
CLINICAL HISTORY
Please refer to the clinical history on the request form.

One adult male Australian sea lion was found deceased at Seal Bay on 11/9/2025. The animal was in apparently good body condition.

One dead adult male Australian sea lion, Neophoca cinerea

MACROSCOPY
Cassettes contain the following tissues
Brain and spinal cord
A: cervical spinal cord and cerebellum
B: occipital cortex
C: midbrain
D: thalamus
E: parietal cortex
F-G: basal gangla
H: frontal cortex

I: jejunum, ileum, caecum, colon

[redacted]

[redacted]

Tested on 12/09/25
Reported on 19/11/25 19:30
Referred on 11/09/25 **by:** [redacted]

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

J: lung, adrenal gland, skeletal muscle
K: liver, spleen
L: stomach, duodenum
M: heart, kidney; Ae GK

MICROSCOPY
There are moderate autolytic changes across all tissues including abundant extracellular large spore forming rods in the liver.

There are no remarkable findings in the organs examined.

DIAGNOSIS
Unremarkable histological findings

COMMENTS
There are no remarkable gross or histopathological findings to explain the death of this animal.

Taking into account the autolytic changes, in the organs examined, there are no findings consistent with disease due to Mycobacterium sp. including M. pinnipedi. Please note, Ziehl Neelsen stain for Mycobacterium sp. was not done because there are no foci of inflammation to target. Based on testing it cannot be excluded the animal was a subclinical carrier for Mycobacterium pinnipedi.

[redacted]

Specialist Veterinary Anatomic Pathologist
[redacted]

SUPPLEMENTARY REPORT
CLINICAL HISTORY
Additional history from [redacted] Dept Environment and Water SA
22/10/2025
The male sea lion was apparent healthy the day before he died. This is based on observations by rangers at Seal Bay.

MACROSCOPY
N: thalamus and hippocampus
O: thalamus and hippocampus
P: thalamus and hippocampus

[redacted]

[redacted]

Tested on 12/09/25
Reported on 19/11/25 19:30
Referred on 11/09/25 **by:** [redacted]

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

Q: thalamus and hippocampus (the section of hippocampus is very fragmented)
R: frontal cortex with dark brown focus (likely putrefactive change but the section is submitted to exclude inflammation); [redacted]

The additional sections are submitted because 0.05mg/kg of dcGTX1 [redacted] was detected in the lung and heart.

The examination of the hippocampus is based on findings from Californian sea lions exposed to domoic acid (Lefebvre et al (2010) Harmful algae 9: 374-383).

As explained to [redacted] the interventricular septum of the heart was not sampled at necropsy. This is another site of injury (cardiomyopathy) associated with domoic acid exposure [redacted].

MICROSCOPY
In multiple regions of the brain there are foci of perivascular cuffing, and in some areas (occipital cortex, thlamaus) the meninges are expanded by cellular infiltrates, sometimes accompanied by fibrinoid degeneration of the vessels. There is an extensive region of malacia within the frontal cortex, with infiltration by macrophages and suspected neuronal necrosis. Abundant bacillary bacteria consistent with Clostridia are present throughout the tissue, but no other micro-organisms are identifiable.

DIAGNOSIS
Frontal cortex, occipital cortex, thalamus, parietal cortex:
Non-suppurative meningoencephalitis with multifocal malacia and vascular fibrinois degeneration

COMMENTS

The brain is severely autolysed with bacterial overgrowth, but some sections retain sufficient cellular detail to identify an inflammatory process, with foci of inflammation within multiple regions of the cortex and thalamus, accompanied by meningitis and malacia of the neuropil. The findings are suggestive of an infectious cause, but apart from the bacteria that were suspected to be post-mortem overgrowth a pathogen could not be clearly identified. Additional stains are pending for further evaluation. Potential differentials in this case include viral infection such as morbillivirus and herpesvirus (although the latter has not been reported in Australian fur seals to my knowledge), protozoa such as Toxoplasma, fungal infection, or bacterial meningoencephalitis

[redacted]

[redacted]

Tested on 12/09/25
Reported on 19/11/25 19:30
Referred on 11/09/25 **by:** [redacted]

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

due to agents such as Salmonella, Brucella, Erysipelothrix, or even Listeria. Further stains may help with identification of some of these pathogens, but PCR for viral agents and Toxoplasma may be worthwhile, and bacterial culture could also be considered if fresh tissue was retained (although bacterial overgrowth may significantly interfere with growth of pathogens). Non-infectious causes such as trauma or domoic acid toxicity are less likely to be the cause for the lesions identified, as inflammation is typically not as proiminent with these conditions.

[redacted]
Specialist Veterinary Anatomic Pathologist
[redacted]
27/10/2025

SUPPLEMENTARY REPORT
Gram stain demonstrated abundant Gram-variable bacterial bacilli throughout the brain tissue (consistent with post-mortem overgrowth), but no pathogens were identified on Gram- or PAS-stained sections.

[redacted]
Specialist Veterinary Anatomic Pathologist
[redacted]
6/11/2025

Validated by [redacted]

Outlook

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

From [redacted]
Date Mon 08/12/2025 11:00 AM
To [redacted]

[redacted]

[redacted]

Tested on 24/11/25
Reported on 08/12/25 11:30
Referred on 11/09/25 **by:** [redacted]

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

MICROBIOLOGY **SPECIMEN:** Tissue

MICROSCOPY
Scanty leucocytes. Scanty epithelial cells.
A small number of gram positive cocci.

CULTURE
1. Moderate growth of mixed environmental flora isolated.

COMMENT: No pathogens isolated.

Final Report

28/11/2025

Validated by [redacted] Laboratory Scientist.

Tasmanian Government

ANALYTICAL SERVICES TASMANIA

18 St Johns Avenue New Town 7008 TAS
03 6165 3300
enquiries@ast.tas.gov.au
www.analyticalservices.tas.gov.au

Submission Number: [redacted]
Report Number:
Issue Date: 10/10/2025
Status: Final

CERTIFICATE OF ANALYSIS

Customer: [redacted]
Address:
Contact:

Submission Description: Sea Lion
Sample Received Date: 25/09/2025
Contract Number:
Client Order Number: [redacted]
Program/Quote Reference: Sea Lion, GS Turtle and Dolphin analysis

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	08-10-2025
3411A	Brevetoxins in Biota by LC-MS/MS	09-10-2025
3416	PST in Biota by LC-MS/MS (Boundy Method)	08-10-2025

Chemistry Test Results (Biota - Food)

		Sample Description	HEART	KIDNEY	LUNG	BRAIN	LIVER	SPLEEN
		Sampled Date/ Time	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00
Method ID	Analyte	Units	353642	353643	353644	353645	353646	353647
	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	0.22	<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
3411	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 2	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*
	Brevetoxin 3	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*
	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
3416	dcGTX1	STX.2HCl eq. mg/kg	0.05*	0.02*	0.05*	<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*
	dcNEO	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)

Method ID	Analyte	Units	Sample Description	HEART	KIDNEY	LUNG	BRAIN	LIVER	SPLEEN
			Sampled Date/ Time	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00	12/09/25 0:00
				353642	353643	353644	353645	353646	353647
3416	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

Tasmanian Government

ANALYTICAL SERVICES TASMANIA

18 St Johns Avenue New Town 7008 TAS
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enquiries@ast.tas.gov.au
www.analyticalservices.tas.gov.au

Submission Number: [redacted]
Report Number:
Issue Date: 14/11/2025
Status: Final

CERTIFICATE OF ANALYSIS

Customer: [redacted]
Address:
Contact:

Submission Description: Australian Sea Lion (Seal Bay KI)
Sample Received Date: 30/10/2025
Contract Number:
Client Order Number: [redacted]
Program/Quote Reference: Biotoxins and brevetoxins in Sea Lion samples

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]	**Chemist**

Test Information:

Method ID	*Test Description*	*Date Commenced:*
3411	Lipophilic Toxins in Shellfish by LC-MS/MS	13-11-2025
3411A	Brevetoxins in Shellfish by LC-MS/MS	13-11-2025
3416	PST in Biota by LC-MS/MS (Boundy Method)	13-11-2025

Chemistry Test Results (Biota - Food)

		Sample Description	Faeces
		Sampled Date/ Time	12/09/25 0:00
Method ID	Analyte	Units	367559
3411	AZA1	mg/kg WMB	<0.01*
	AZA2	mg/kg WMB	<0.01*
	AZA3	mg/kg WMB	<0.01*
	Domoic Acid	mg/kg WMB	<0.05*
	DTX1 Free	mg/kg WMB	<0.01*
	DTX1 Total	mg/kg WMB	<0.01*
	DTX2 Free	mg/kg WMB	<0.01*
	DTX2 Total	mg/kg WMB	<0.01*
	GYM	mg/kg WMB	<0.01*
	Homo-YTX	mg/kg WMB	<0.02*
	OA Free	mg/kg WMB	<0.01*
	OA Total	mg/kg WMB	<0.01*
	PnTx-G	mg/kg WMB	<0.01*
	PTX2	mg/kg WMB	<0.01*
	SPX1	mg/kg WMB	<0.01*
	Total DST	OA eq. mg/kg	<0.01*
	YTX	mg/kg WMB	<0.01*
3411A	Brevetoxin 1	mg/kg WMB	<0.10*
	Brevetoxin 2	mg/kg WMB	<0.02*
	Brevetoxin 3	mg/kg WMB	<0.02*
3416	C1	STX.2HCl eq. mg/kg	<0.01*
	C2	STX.2HCl eq. mg/kg	<0.02*
	C3	STX.2HCl eq. mg/kg	<0.02*
	C4	STX.2HCl eq. mg/kg	<0.02*
	dcGTX1	STX.2HCl eq. mg/kg	<0.02*
	dcGTX2	STX.2HCl eq. mg/kg	<0.02*
	dcGTX3	STX.2HCl eq. mg/kg	<0.02*
	dcGTX4	STX.2HCl eq. mg/kg	<0.02*

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)

		Sample Description	Faeces
		Sampled Date/ Time	12/09/25 0:00
Method ID	Analyte	Units	367559
3416	dcNEO	STX.2HCl eq. mg/kg	<0.02*
	dcSTX	STX.2HCl eq. mg/kg	<0.01*
	doSTX	STX.2HCl eq. mg/kg	<0.01*
	GTX1	STX.2HCl eq. mg/kg	<0.01*
	GTX2	STX.2HCl eq. mg/kg	<0.01*
	GTX3	STX.2HCl eq. mg/kg	<0.01*
	GTX4	STX.2HCl eq. mg/kg	<0.01*
	GTX5	STX.2HCl eq. mg/kg	<0.02*
	GTX6	STX.2HCl eq. mg/kg	<0.02*
	NEO	STX.2HCl eq. mg/kg	<0.02*
	STX	STX.2HCl eq. mg/kg	<0.01*
	Total PST	STX.2HCl eq. mg/kg	<0.10*

* NATA accreditation does not cover this result

Outlook

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

From [redacted]
Date Wed 24/12/2025 11:30 AM
To [redacted]

[redacted]

[redacted]

Tested on 12/09/25
Reported on 24/12/25 12:00
Referred on 11/09/25 **by:** [redacted]

Owner:
AUSTRALIAN SEA LION
SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

Collected: 11/09/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

ADDITIONAL FINDINGS 29/11/2025

SUMMARY DIAGNOSIS
Meningoencephalitis

SUMMARY COMMENTS
The cause of morbidity was meningoencephalitis. Please contact the laboratory if bacterial culture of the brain is required.

Domoic acid was detected in the brain but not in the faeces. Saxitoxin was detected in the kidney, lung and heart (0.05mg/kg) .

The clinical significance of the domoic acid detection will be interpreted cautiously for the following reasons
a) there is no history of clinical signs for this animal prior to death (the animal appeared healthy the day before)
b) there is no available historic data of domoic acid levels in wild sea lion populations on Kangaroo Island
c) there is very little peer reviewed literature on tissue levels of

domoic acid in sea lions suffering from domoic acid poisoning.
d) the histological findings in the brain are consistent with bacterial / fungal / protozoal or less likely viral (e.g. phocic morbillivirus / herpesvirus) infection. The histological findings are not consistent with domoic acid neuronal degeneration.

There was no neuronal loss consistent with domoic acid exposure, as described by Lefebvre et al (2010) Harmful algae 9: 374-383
As explained in the necropsy report, there are significant post mortem putrefactive changes in the tissues and this may limit interpretation of the findings in the hippocampus.

The interventricular septum of the heart, another site of injury associated with domoic acid exposure in sea lions, was not sampled at necropsy.

29/11/2025
Microbial cultures did not identify a pathogen (see the related report [redacted]). Gram positive cocci were seen on Gram stain but they were not viable on culture. You could speculate that the organisms are Strep phocae and Strep phocae was the cause of the necrotizing meningitis.
[redacted]

[redacted]

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[redacted]

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SEAL BAY

Animal/s:
Marine Mammal

DOB: N/A

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Samples tested as received All Tests Complete

[redacted].

For completeness you may consider Toxoplasma gondii PCR (please contact the laboratory for the cost of this test and to request this interstate laboratory test) and if approved by the CVO, pinniped morbillivirus PCR at ACDP. Does the CVO approve pinniped morbillivirus testing ?

[redacted]

Specialist Veterinary Anatomic Pathologist
[redacted]

Validated by [redacted]