Tasmanian Shellfish Quality Assurance Program

Biotoxin Management Plan

Version 5
4th December 2017

Department of Primary Industries, Parks, Water and Environment

Tasmanian Government

Document Acceptance and Release Notice

This document is version 5 of *TSQAP Biotoxin Management Plan*.

This is a managed document. For identification of amendments, each page contains a release number and a page number. This document is authorised for release once all signatures have been obtained.

AUTHORISED:  Date: 04/12/2017

(for acceptance) Katrina Wilson

Manager (Tasmanian Shellfish Quality Assurance Program)

Version Control

Version	Date	Author	Reason	Sections
1.0	January 2014	TSQAP	Release following endorsement	All
2.0	April 2014	TSQAP	Updated sampling strategies	
2.1	April 2014	TSQAP	Clarify dates and correct sampling strategy	5
2.2	May 2014	TSQAP	Consistent place names and sampling arrangements for major holidays	5, 6, Appendix 1, 3
3.0	October 2014	TSQAP	Updated sampling strategies	
3.1	September 2015	TSQAP	Annual review	All
4	March 2017	TSQAP	Annual review Clarification of relay conditions and re-call responsibilities.	All
5	November 2017	TSQAP	Updated regarding change of preferred laboratory by Industry to Analytical Services Tasmania Updated terminology and clarification.	4,5,6 1,2,7

Next Review – 2018

Table of Contents

1 Executive Summary

The Tasmanian Biotoxin Management Plan (BMP) is primarily based on analysis of shellfish meat for biotoxins supplemented by surveillance for potential harmful algal bloom species.

Tasmania has experienced relatively regular bloom events over more than two decades caused by the introduced species, *Gymnodinium catenatum*. Since 2012 Tasmania has also experienced annual blooms of *Alexandrium tamarense* and *Dinophysis acuminata which have resulted in shellfish growing area closures.*

The BMP is designed to address these known risks and also provide surveillance for any potential new species.

2 Introduction

Some species of algae may produce natural toxins that adversely affect humans. These toxins can be concentrated in the tissues of filter feeding shellfish (e.g. oysters, mussels, scallops and clams) at levels which may become potentially harmful if ingested.

There are four major classes of human illnesses caused following the ingestion of shellfish containing these toxins. They are: Paralytic Shellfish Poisoning (PSP), Diarrhetic Shellfish Poisoning (DSP), Amnesic Shellfish Poisoning (ASP) and Neurotoxic Shellfish Poisoning (NSP). The toxins causing these illnesses are in turn identified as Paralytic Shellfish Toxins, (PSTs), Diarrhetic Shellfish Toxins, (DSTs), Amnesic Shellfish Toxin (AST or domoic acid) and Neurotoxic Shellfish Toxins (NSTs).

2.1 Biotoxins in Tasmania

The toxic dinoflagellate *Gymnodinium catenatum* has been present in Tasmania since at least 1979. It is a causative agent of PSP. The first major bloom of *G. catenatum* occurred in south-eastern Tasmania in 1986 resulting in prolonged closures of shellfish marine farms in the areas involved. Since then *G. catenatum* blooms have become annual occurrences in southern Tasmanian waters.

Following the bloom in 1986, a biotoxin management plan (BMP) was established by the Tasmanian Government to routinely test for the levels of PST's in shellfish from marine farms in southern Tasmania. The biotoxin management plan was conducted as a component of the Tasmanian Shellfish Quality Assurance Program (TSQAP). Algal monitoring was added to the BMP in the mid-1990s, to provide an early warning of *G. catenatum* blooms.

Following a review of biotoxin management in Australia in 2001 (Todd, 2001) the BMP was expanded to ensure all shellfish growing areas in Tasmania were being sampled for algae on a regular basis.

In the spring of 2012 a widespread bloom of the PST producing alga *Alexandrium tamarense* occurred on the east coast of Tasmania. The initial event and impact on shellfish products was missed by the BMP in operation at the time. The widespread presence of this organism subsequently caused closures of marine farms and wild shellfish harvesting in all east coast growing areas from Ansons Bay to Blackman Bay, as well as in several growing areas in the south east of the state.

The Tasmanian Government and the shellfish aquaculture industry commissioned an independent and expert review of the event. The report and recommendations (Campbell et al., 2013) were delivered in September 2013. Following this the TSQAP BMP was reviewed to ensure that the recommendations were adequately adopted.

2.2 The Objective of the TSQAP Biotoxin Management Plan

The key risks in Tasmania are the PST producers, *G. catenatum* and *A. tamarense*. Several other species of potentially toxic algae have also been identified at levels that could be of concern. These include the:

- PST producers: *Alexandrium catenella, A. ostenfeldii, A. minutum*,
- DST producers: *Dinophysis fortii, D. acuta, D. acuminata, D. caudata*, *Prorocentrum lima,* and
- AST producers: *Pseudo-nitzschia seriata* and *Pseudo-nitzschia delicatissima* groups.

While potential NST producers have been identified occasionally they have rarely been detected at significant levels.

In light of the likely risk profile for Tasmania, this BMP aims to ensure that the products of shellfish aquaculture meet the minimum food safety standards required for market access and protection of seafood consumers.

It will achieve this by routine biotoxin testing for PST, AST and DST in the shellfish from growing areas. This will be supplemented by a monitoring program for algal species with the potential to produce PST, AST, DST and NST. NST biotoxin testing will be conducted when necessary on the basis of the routine phytoplankton results.

3 Legislation

The maximum acceptable levels of biotoxins in shellfish for human consumption are prescribed in the *Australia New Zealand Food Standards Code - Standard 1.4.1 - Contaminants and Natural Toxicants*.

The Tasmanian Shellfish Quality Assurance Program (TSQAP) administers the TSQAP Biotoxin Management Plan.

TSQAP manages the opening and closing of growing areas using the provisions of the Tasmanian *Primary Produce Safety (Seafood) Regulations 2014*. In order to provide access for Tasmanian shellfish products to local and interstate markets, the TSQAP must meet the requirements of the Australian Shellfish Quality Assurance Program (ASQAP) Operations Manual (2016). In order to gain access to export markets the TSQAP must also meet standards relating to shellfish harvested for export provided in the *Export Control (Fish and Fish Products) Orders 2005*, administered by the Commonwealth Department of Agriculture and Water Resources (DAWR).

The *Australia New Zealand Food Standards Code - Standard 4.2.1 - Primary Production and Processing Standard for Seafood* states that shellfish businesses comply with the Standard if they comply with the conditions of the ASQAP Manual or conditions recognised by the relevant authority. Compliance with the ASQAP Manual is verified through audits conducted under supervision of the Product Integrity Branch of the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

The *Australia New Zealand Food Standards Code* is incorporated in Tasmanian law under the *Primary Produce Safety Act 2011* (PPSA) and given effect by the *Primary Produce Safety (Seafood) Regulations 2014*.

Public health concerns are managed under the *Public Health Act 1997*, and product recalls are managed under the *Food Act 2003* and relevant state and federal laws.

The *Living Marine Resources Management Act 1995* provides for the licensing of marine farms for shellfish and the harvest of shellfish from wild fisheries (such as clams and scallops). The Act is administered by the Marine Farming Branch and the Wild Fisheries Management Branch of DPIPWE.

4 Responsibilities

4.1 Tasmanian Shellfish Quality Assurance Program (TSQAP)

TSQAP is responsible for preparing and implementing the BMP in all Tasmanian commercial bivalve shellfish growing areas (with the exception of commercially harvested wild scallops). These areas may be either marine farming or wild harvest areas. In the implementation of this BMP, TSQAP has the following responsibilities:

- The oversight of the sampling program, including, ensuring appropriate sampling equipment is maintained in each growing area and determining the locations and frequencies for the collection of algal and shellfish meat samples from marine farms/wild harvest areas on a regular basis.
- Appointing and training samplers to an appropriate level.
- The implementation of closures and re-openings of growing areas affected by potentially toxic algae and biotoxins, including the notification of all parties concerned, maintaining records of these closures and re-openings.
- Advising growers/wild harvesters as well as relevant authorities including DAWR, DPIPWE and DHHS of any circumstances which may require the recall or withdrawal of shellfish product from marketplace.
- Liaising with agencies, businesses and other entities collecting relevant algal and/or algal toxicity information (for example, Huon Aquaculture, CSIRO and other research institutions).
- Conducting an annual review of the performance of each growing area including a review of the biotoxin risk status.
- Reviewing the BMP annually to ensure appropriate sampling regimes, ongoing compliance with relevant food safety and market access standards and international best practice for biotoxin management.

4.2 Marine Farming Branch (DPIPWE)

The Marine Farming Branch issues marine farming licenses and has a responsibility for ensuring the conditions of the license are met. It is a standard condition of all shellfish marine farming licenses that "the license holder will only harvest shellfish from the premises to which this license relates for human consumption or for on-growing for human consumption in accordance with the Tasmanian Shellfish Quality Assurance Program".

4.3 Primary Produce Safety Program (DPIPWE)

The Primary Produce Safety Program (PPSP), oversees the compliance of shellfish businesses or individuals with their respective food safety management systems, which includes ensuring that they do not harvest for human consumption during biotoxin closures. The PPSP is responsible for gathering information and ensuring businesses comply with the recall requirements in their food safety management system as described in an agreement on the *Regulatory Management and Coordination of Food Recalls in Tasmania*. This agreement was developed between DHHS, DPIPWE and the independent Tasmanian Dairy Industry Authority in July 2014 to reduce regulatory burden during a recall event. This processes described in this agreement are applied state wide regardless as to the industry involved in the recall.

4.4 Licensing and Administration Branch (DPIPWE)

The Licensing and Administration Branch of DPIPWE issues commercial fishing licences for the harvesting of wild shellfish. It is a condition of these licence types "that the licence holder must comply with the requirements of the Tasmanian Shellfish Quality Assurance Program".

4.5 Public Health Services (DHHS)

The Food Safety team sits within Public Health Services (PHS) in DHHS. Under the aforementioned MOU this team is responsible for conducting the risk assessment to determine whether a food recall (both consumer and trade) is required, overseeing all food recalls and liaising with relevant parties, including FSANZ, regarding any recall action undertaken. The Director of Public Health is responsible for the instigation of public health warnings after receiving advice from the Manager TSQAP and or Manager of Primary Produce Safety Program.

4.6 Shellfish Marine Farmers and Wild Harvesters

In relation to the proper implementation of the BMP, shellfish marine farmers and wild harvesters of bivalve shellfish (excluding scallops) have the following responsibilities:

- Providing algal and shellfish meat sampling in their respective shellfish growing or harvesting areas by nominated marine farmers/wild harvesters.
- Ensuring sampling frequency is maintained at the prescribed rate and that any additional samples are collected when requested by TSQAP.

- The coordination of the analysis of algal and shellfish meat samples with appropriate laboratories including:
    - managing the performance of those laboratories by way of agreement;
    - arranging sample transportation to laboratories; and
    - reporting results to the regulatory authority (TSQAP) in a timely manner.
- The transport of TSQAP staff around marine farms/wild harvest areas for the purpose of sample collection when required.
- Maintaining a recall plan and capability to implement it.

5 Algal and Shellfish Sampling

5.1 Sample Sites

Algal sample sites have been selected on the basis that they are areas where toxic cells are most likely to appear first, and be at greatest concentrations. Consideration has been given to depth, predominant currents, tidal and riverine influences and the practical issues of accessing the sites.

In several growing areas with a history of toxic algae occurrences, secondary sampling sites have been identified that may provide for monitoring during blooms. Secondary sites exist in Big Bay, Moulting Bay, Okehampton Bay and Port Esperance.

A list of all algal sample sites in the state with their co-ordinates is given in Appendix 1. Algal sites are shown pictorially in more detail in each growing area management plan.

Shellfish meat sampling is provided from those parts of the growing area that are currently being harvested.

5.2 Samplers

Samplers have been trained and deemed competent in algae sampling (either integrated sampling or bottle sampling depending on the area) through training provided by Seafood Training Tasmania or TSQAP staff. Sampling methods, sampler techniques and sampling equipment are checked by Departmental staff through periodic audits.

5.3 Sampling Strategy

Management decisions for growing areas are principally made on the basis of meat biotoxin testing. Algal assessment is only used for management decisions where meat biotoxin samples are absent. For this reason the sampling strategy is based on frequent meat biotoxin testing, with the frequency based on biotoxin risk assessment for the growing area (Appendix 3). This is supplemented by algal sampling for basic surveillance of algal assemblages.

All of the sampling strategies have as their basis a risk assessment that has been applied across all growing areas. The following criteria were used:

- ***Low risk*** - areas have no history of biotoxins, potentially toxic algae or toxic algal cysts being present at levels of concern.
- ***Medium risk*** - areas may have had biotoxins detected in the shellfish, toxic cysts (e.g. *G. catenatum*) identified in the sediments, or toxic cells present in the water column. These areas

may have been affected by blooms in the past. Such blooms have been infrequent (once every 5–10 years) and some closures have occurred.

- ***High risk*** - areas have experienced frequent biotoxin closures at least once in every 5 years. Usually these are areas where *G. catenatum, A. tamarense or D.acuminata* blooms are initiated and where there is a history of high toxin levels in the shellfish during algal blooms.

The risk assessment for each growing area is reviewed annually and incorporates information on the performance of the growing area and any new risks that are experienced. The current risk levels of Tasmanian shellfish growing areas are provided in Appendix 2.

The TSQAP Manager can modify the BMP sampling regime based on new information and refinements to the risk assessment of growing areas. Amendment of the sampling regime and the rationale for change must be documented.

5.3.1 Shellfish Meat

The minimum frequency for shellfish meat sampling in growing areas is:

- Low risk areas - monthly,
- Medium and High risk areas – weekly.

Areas that solely produce juvenile oysters for relay/on-growing elsewhere will be sampled monthly, at a minimum.

5.3.2 Algae

Algal samples will be provided on a monthly basis from each growing area when open.

The monitoring of algae provides an early alert tool, to supplement shellfish meat testing for ASTs, DSTs and PSTs. Shellfish samples will be analysed for NSTs if high levels of potential NST producing algae are detected in the samples.

If toxic cells are present or biotoxins detected, sampling frequency may be altered at the discretion of the TSQAP Manager.

5.4 Event Sampling

During an event and/or the closure of an area due to biotoxins, the sampling frequency may be varied to provide for surveillance of the progress of the bloom.

If biotoxin meat sampling has not occurred at the prescribed frequency during a closure period, regardless of the reason for the closure (i.e. biotoxin, environmental, seasonally inactive), meat biotoxin testing must be conducted and results received before an area can be considered for re-opening.

5.5 Ensuring Sample Frequency

TSQAP will develop a sampling schedule for both shellfish meat and algal samples. The schedule will nominate a sampling event that must be conducted within a target week. The schedule will be provided to TSQAP approved samplers for implementation.

It is the responsibility of industry to ensure that the sampling frequencies in the timetable are met. TSQAP monitors compliance with the sampling table for biotoxins and algae through the job summaries provided as samples are received by the laboratories.

TSQAP must be notified of any failure to submit samples on the nominated week.

5.5.1 Missed or Delayed samples

In the event a sample is not submitted to the laboratory within the nominated week of collection, the growing area will be closed 17:00hrs on Friday of the nominated week until an appropriate sample result is obtained unless the following circumstances occur together:

- An algal sample from the area has been submitted and analysed within the agreed time frame and no toxic algal species exist in numbers above trigger levels; and
- The previous meat sample did not contain levels of biotoxins greater than 25% of the maximum limit for that group of biotoxins (e.g. Results must be ≤ 0.2 mg/kg PST when the regulatory limit is 0.8 mg/kg).

In the event that the above two conditions are met, the time allowance before closure may be extended to enable sample submission for the next scheduled analytical run by the laboratory. There may be situations, such as extreme weather conditions, when samples are unable to be collected during the nominated week. In such circumstances, the sampler must advise TSQAP within 24 hours of the event and arrange for an appropriate sample to be collected and submitted to the laboratory for the next scheduled laboratory analysis.

When a closure is implemented by TSQAP because of the lack of sample collection within the scheduled time frame, the closure will remain in place until a representative shellfish meat sample is collected, analysed and the result found to comply with the limits set in the Food Standards Code.

5.6 Sampling Methods

5.6.1 Shellfish Samples

Samples are collected from the leases in a manner that ensures the samples represent those shellfish most likely to be harvested.

At least one dozen shellfish (minimum of 100g shellfish meat) of each species authorised on a licence to be marine farmed or harvested must be collected from each sample site. The shellfish should be delivered chilled (with ice or ice pack) to the laboratory. Although fresh samples are preferred, samples may be frozen whilst awaiting transport if there is likely to be any time delay.

Where leases are harvesting more than one species of shellfish, all species will be tested for biotoxins unless there is conclusive evidence to show that one species bio-accumulates toxins more and at a faster rate than the other species. In this situation and with TSQAP approval, the species capable of bio-accumulating the fastest/most biotoxin may be used as the test species on its own. If the toxin levels in the shellfish meat of this species exceed the limits prescribed in the Food Standards Code (Standard 1.4.1) then all species will be included in the closure.

5.6.2 Algae Samples

Algal samples will be taken using either an integrated tube sampler where depth allows, or are sampled using a bottle method in inter-tidal growing areas. Both methods are provided in TSQAP 2017 and the sampling method for each growing area is listed in Appendix I

A 20 micron plankton net-tow may be requested as it can be a useful tool for determining the presence/absence of algae species, rather than for reliable quantitative enumeration. Net-tows are normally used in areas adjacent to a bloom for investigative purposes only as they can detect cells at low levels not normally detected in bottle or integrated samples.

6 Methods of Analysis and Laboratories Used

6.1 Shellfish Meat

In late 2017, Analytical Services Tasmania was selected by Industry as the service provider for routine TSQAP biotoxin samples. Analytical Services Tasmania provides routine analysis for PSTs, ASTs and DSTs, and NST analysis may be conducted upon request. Symbio Laboratories (formerly Advanced Analytical Australia) conducted all TSQAP biotoxin analyses until this transition occurred (July 2012 to November 2017).

Toxin	Method	Lower Limit of Reporting
PST group STX, GTX1,4, Neo, GTX2,3, dcSTX, dcNeo, dcGTX2,3, C1,2, C3,4, GTX5	PST screening by LC-FLD (Lawrence Method)*	0.025 mg/Kg
	PST confirmation by LC-FLD AOAC 2005.06 (Lawrence Method)*	0.025 mg/Kg
DST group AZA1, AZA2, AZA3, total DTX1, free DTX1, total DTX2, free DTX2, Total OA, free OA, Gymnodimine, PTX2, Spirolide, YTX	LCMSMS (McNabb, P., Selwood, A.I., Holland, P.T. (2005). J. AOAC Int. 88(3), 761-772.)	0.025 mg/Kg
AST Domoic Acid	LCMSMS (McNabb, P., Selwood, A.I., Holland, P.T. (2005). J. AOAC Int. 88(3), 761-772.)	0.025 mg/Kg
NST group PbTx-2, PbTx-3	LCMSMS (McNabb, P., Selwood, A.I., Holland, P.T. (2005). J. AOAC Int. 88(3), 761-772.)	0.025 mg/Kg

**For the PST group of toxins the laboratory is able to carry out a rapid screening test whereby the analysis does not separate all the various toxins belonging to the PST group but detects some of them as a group. Individual toxins within this group have differing toxicities but for the purpose of a rapid assay all members of the group are assumed to be as toxic as the most toxic member of the group and the level of toxin in the sample calculated on that basis. The total toxin level so determined is therefore likely to be an over estimation of the actual toxin level so in the event that the 'screen" level exceeds FSANZ standards a second assay (PST confirmation assay) which separates and analyses separately the various members of the group may be necessary. This confirmatory method is more time consuming and thus more expensive so is not routinely used.*

Other services and service providers include:

- Symbio Laboratories in Sydney can conduct all toxicity tests, using the chemical confirmatory and screening test methods.
- Cawthron Institute in New Zealand can conduct all toxicity tests, using the chemical confirmatory and screening test methods.

6.2 Algal Analysis and Reporting Results

6.2.1 Algal Analysis

An algal "species present" list is obtained from the fresh sample, and a concentrate of the preserved sample is analysed to provide identification and enumeration information for each potentially toxic species detected. Results for all potentially toxic species listed in the Phytoplankton Action Level (PAL) table (Appendix 3) are reported. Additional sample information and species results which may be of interest or concern are also reported by the laboratory as necessary.

Analytical Services Tasmania provides routine algal identification and enumeration services for TSQAP purposes. If required, Microalgal Services can provide additional identification and enumeration services. Both laboratories are NATA accredited.

6.2.1 Reporting and Alert Levels

The alert levels of toxic or potentially toxic algae numbers that may trigger extra shellfish meat testing are given in Appendix 3. These alert levels have been determined with the use of data collected locally over a period of many years or, in the absence of appropriate local data taken from, interstate or overseas results with the assumption that the species concerned are toxic.

There may be circumstances whereby species new to Tasmanian waters are assumed to be potentially toxic from overseas data. Initially a precautionary approach will be used with a low trigger level that may then be reviewed as necessary.

TSQAP will be notified by the laboratory immediately by phone or email should toxic algae be found in numbers of concern in the fresh sample (see Appendix 3). TSQAP will also be notified if algal numbers exceed any of the triggers for flesh testing given in Appendix 3.

TSQAP will immediately notify the sampler/grower/harvester if algae species listed in the schedule of Appendix 3 are identified to exceed the alert or action levels, unless a simultaneous meat sample (i.e. taken within the same week/7day period of the algal sample) is available and at the lab. In this case TSQAP will seek verbal confirmation of meat biotoxin levels and issue an alert on the basis of these results.

6.3 Turnaround Time

Industry is responsible for managing the turnaround time (TAT) between the time of sampling to the time at which results are available to TSQAP.

Typically samples for algal and biotoxin analysis are collected early in the week from all growing areas.

- Shellfish meat samples are consigned directly to AST by Monday or Wednesday. Analysis and reporting of results generally occur before close of business on Wednesday or Friday respectively.
- Algal samples are consigned directly to the laboratory. Initial alerts can generally be provided from Wednesday and written reports by Friday afternoon or the following Monday.

Where an algal alert at or above the level of closure pending meat testing is received, and there is a simultaneous meat sample available, and at the lab, TSQAP will leave the area open pending the biotoxin results.

TSQAP compiles the biotoxin and algal reports weekly and issues an email report (the *Tasmanian Biotoxin News*) that goes to an unrestricted mailing group that includes all growers and harvesters as well as regulators, processors and researchers.

7 Management of Closures

The TSQAP Manager is responsible for the closure of shellfish marine farming or wild harvest areas. This will involve:

- Determining the closure criteria for growing/harvest areas due to excessive biotoxin levels or excessive toxic algal numbers,
- Notification of all appropriate marine farmers/wild harvesters by telephone/SMS followed by email,
- Notification of all other appropriate bodies as listed below by email,
- Advising marine farmers/harvesters if a product recall is required as determined by the Program Manager (Primary Produce Safety) in association with DHHS,
- Initiating re-opening procedures when appropriate,
- Communicating regularly with other relevant stakeholders and/or sectors in regard to closures and levels of algae and biotoxins that may be relevant to adjacent growing areas or fisheries.

7.1 Closure Criteria

Marine Farms may be closed due to biotoxins when:

- Marine biotoxins are present in shellfish meat over the regulatory levels listed in Appendix 4.
- Cases of human illness consistent with case definitions for PSP, NSP, DSP, and ASP (Appendix 5) have resulted from the consumption of shellfish from a particular area.
- TSQAP determines a closure is necessary for any other reasons, including but not limited to, toxins in samples at closure levels in adjacent areas, lack of current sampling, or presence of new potentially toxic algae in area.
- Potentially toxic algae are present in levels above those listed in Appendix 3 and there is no simultaneous data on toxin levels in shellfish meat.

7.2 Notification

When the closure of a growing area is warranted for either an exceedance of the maximum level of biotoxins in shellfish or algal levels in water the TSQAP Manager or an authorised officer will notify the marine farmers/wild harvesters in the affected growing area as soon as possible. Additional groups, listed in points (b) to (e) below, will also be notified of the closure(s) as part of this process. Contact details for the Harmful Algal Bloom Emergency Management Group, Tasmanian Government and Australian Government are available in Appendix 6).

(a) Marine farmers/wild harvesters

All marine farmers/wild harvesters in the affected growing areas will be immediately notified of closures by SMS and email.

The current status of growing areas can also be checked from the TSQAP website (http://dpipwe.tas.gov.au/biosecurity-tasmania/product-integrity/food-safety/seafood/shellfish-quality/harvest-area-status) and a via a recorded message service (03 6166 0726). Typically these services are updated within two hours during normal office hours.

(b) The Harmful Algal Bloom Emergency Management Group

The Harmful Algal Bloom Emergency Management Group (HAB EM Group) is an inter-agency and industry group that can escalate the management of a HAB event to an Incident Management Team.

(c) Processors

TSQAP maintains a list of Shellfish Processors. This group is notified by email at the same time as marine farmers/wild harvesters are notified of closures.

(d) Tasmanian Government

Contacts include the Public Health and Food Safety areas of the Department of Health and Human Services (DHHS) and the Marine Farming and Product Integrity areas of the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

(e) Australian Government

The principal contact is the area with responsibility for food export in the Department of Agriculture.

7.3 Public Announcement

When any marine farming/wild harvest area is closed by TSQAP for biotoxin reasons or public health concerns, the TSQAP website is updated with the details of current closures (http://dpipwe.tas.gov.au/biosecurity-tasmania/product-integrity/food-safety/seafood/shellfish-quality/harvest-area-status) which is also available for public viewing.

When a biotoxin outbreak is widespread and the Director of Public Health is of the opinion that there is a risk to recreational harvesters of shellfish, a public announcement will be made. The Director will be responsible for the instigation of such announcements after receiving advice from the Manager TSQAP.

An example of a DHHS Public Health press release is given in Appendix 7.

If a public health warning is released the Public Health Services (PHS) may also:

1. Send an e-mail/fax stream to alert General Practitioners in the affected area
2. Notify relevant emergency departments
3. Inform representatives from the salmon industries and request they alert employees to the warning
4. Arrange for warning notices to be erected in the affected area
5. Contact indigenous groups in the affected area
6. Inform DPIPWE Marine Farming Branch and Wild Fisheries Management Branch of media releases
7. Upload alerts to the web in addition to the permanent advisories and information contained within the PHS website (http://www.dhhs.tas.gov.au/publichealth/public_health_home).

7.4 Recall of Shellfish

Recalls are designed to protect public health and safety and the reputation of the business concerned. It is a legal requirement under Tasmanian law for food businesses to have systems in place to ensure the recall of unsafe food, to document the system and to comply with it when recalling food.

Product recall is primarily the responsibility of the producer (grower), however, the Director of Public Health (DHHS) has mandatory recall powers where a serious public health and safety risk exists. Ideally recalls are managed by the producer using a pre-existing recall plan, in collaboration with the Primary Produce Safety Program Manager (DPIPWE) and the State Recall Officer (DHHS) to ensure compliance with the recall system.

Further details on preparing and implementing a recall plan are available in the FSANZ Food Industry Recall Protocol (www.foodstandards.gov.au/industry/foodrecalls).

Recall action may be required if there is a reasonable possibility that use or consumption of shellfish would cause adverse health consequences as indicated by the safe minimum levels for environmental contaminants and biotoxins.

Producers are required to maintain traceability records. In the case of seafood businesses this must be sufficient written records to identify the immediate supplier and immediate recipient of seafood for the purposes of ensuring the safety of seafood.

7.4.1 General Advice on When a Recall May Be Required

Product in the market place may be required to be recalled if shellfish have been harvested and shipped from a harvest area in the open status and:

- Meat samples collected on or before the harvest date demonstrate the presence of toxins exceeding the maximum level allowable under the Food Standards Code; or
- Health surveillance links illnesses to the consumption of shellfish from the growing area.

In either situation the TSQAP Manager will close the affected growing area and require the business concerned to implement their recall plan.

The specific level of recall action and scope (the amount of product affected) will be determined in the first instance by the business concerned in consultation with the TSQAP Manager, Primary Produce Safety Program Manager (DPIPWE), State Recall Officer (DHHS), and FSANZ.

Where product may have been exported from Australia, the Australian Government Department of Agriculture will also need to be advised and involved. These contact details are listed in Appendix 6.

The scope of the recall will in the first instance include all product harvested from the affected area from the date of the non-compliant shellfish sample result but may extend back to include product harvested before that date and/or up to the day after the last compliant shellfish sample result.

Determining the actual scope and type of recall is influenced by a number of factors including:

1. The existence of corroborating information such as the notification through surveillance systems of any illness related to the harvested shellfish,
2. The length of time between samples (e.g. a week, 10 days, a fortnight, a month) and the levels reported from each sample and any previous flesh samples from the area concerned,
3. The existence of any other sampling conducted between the routine TSQAP sampling,

4. Toxin levels present in shellfish in any adjacent areas and recent algal results and evidence of increases/decreases of potentially harmful algae,
5. The likelihood that contaminated product is still in the market place or in consumers' homes,
6. The ability or inability of the business concerned to rapidly identify and quickly remove affected product from sale.

At the conclusion of a formal recall event, the business is responsible for preparing a written report that details all aspects of the recall process including the amount of product unable to be retrieved and provide this to FSANZ.

7.4.2 Product Recall Levels

There are two levels of food recall described in the FSANZ recall protocol.

Trade Recall: When a recall is required and product is still in the wholesale chain only (i.e. not for sale at the general public level) a "trade level" recall may be implemented by the shellfish harvester/grower. In this circumstance no formal public messages are required, but government recall coordinators and FSANZ must be notified of the recall.

Consumer Level Recall: When product requiring recall has reached or is likely to reach the consumer level (i.e. at retail level) a "consumer level" recall is required. A consumer level recall is much more extensive and requires direct public messaging to ensure that potential consumers know about the recall and the safety issues associated with the product.

A formal recall is an action taken to remove from distribution, sale and consumption, food which is likely to pose a health and safety risk to consumers. Recall action may be required if there is a reasonable possibility that use or consumption of the food would cause adverse health consequences or even death.

The FSANZ recall protocol also details product 'withdrawals' which are less onerous than formal recalls and which may be employed to address product quality issues, or as a precautionary measure while formal product tests are being undertaken to confirm toxin levels.

7.5 Re-opening Criteria

The re-opening of a growing/harvest area following a biotoxin closure event will only occur on the basis of shellfish meat test results. Where leases are harvesting more than one species of shellfish, all species must be included in testing for reopening. Algal results may be used to qualify meat testing requirements.

If biotoxin tests on at least two successive meat samples collected 7 days apart show that the concentrations of biotoxin in the shellfish tissue are below the maximum level (Appendix 4) then re-opening may occur.

The re-opening of a growing/harvest area after a non-biotoxin related closure (e.g. voluntary closure) where routine biotoxin sampling has not been conducted will also occur on the basis of shellfish meat results. In this instance one biotoxin sample must be collected and results below the maximum levels received before the harvest area can be considered for re-opening. Additional biotoxin testing may be required if biotoxin levels exceed the 'TSQAP alert levels' upon confirmation or if there are adjacent

growing areas impacted by biotoxins. If additional sampling is deemed to be necessary, then a second sample collected 7 days after the first must be analysed and return results below the maximum levels for re-opening to occur.

7.7 Re-opening Procedure

Re-opening will be carried out by a reversal of the closure procedure. All those notified of the closure will be notified of the re-opening by SMS and email.

7.8 Relay of Shellfish during a Biotoxin Closure

Shellfish relayed from a growing/harvest area that is closed due to biotoxins, must be held in the receiving area for a minimum of 60 days unless two clear flesh tests below the regulatory limit taken 7 days apart demonstrates that relayed shellfish have been adequately cleansed of biotoxins .

The marine farmer is responsible for the cost of analysis associated with relaying activities.

For the purpose of this activity a single batch is defined as a relay of shellfish over a 7 day period that spans TSQAP routine weekly monitoring from the source area.

The Marine Farmer is responsible for ensuring all shellfish movements are in accordance with their TSQAP Relay/Receive Permit, including maintaining records of all results to be made available for audits conducted by or on behalf of the Primary Produce Safety Program. Further information regarding relay/receive activities are outlined in the *TSQAP Relaying Shellfish Policy* and *TSQAP Fact Sheet on Relaying Shellfish*.

8 References

ASQAAC (2016) *Australian Shellfish Quality Assurance Program Operations Manual* http://safefish.com.au/wp-content/uploads/2016/07/Australian-Shellfish-Quality-Assurance-Program-Operations-Manual-2016.pdf

Campbell, A., Hudson, D., McLeod, C., Nicholls, C. and Pointon, A. (2013) *Review of the 2012 paralytic shellfish toxin event in Tasmania associated with the dinoflagellate alga Alexandrium tamarense* FRDC Project 2012/060

Todd, K. (2001) *Australian Marine Biotoxin Management Plan for Shellfish Farming* FRDC Project No. 1999/332, Cawthron Report No. 645

TSQAP (2017) *A Guide to Standard Protocols and Procedures for Water Quality and Shellfish Tissue Sampling*.

Appendix 1: Algal Sample Sites

Site	South (degrees)	East (degrees)	Growing Areas Represented	Sample type
Sea Elephant River	39.48	144.06	Sea Elephant River	Bottle
Montagu	40.79	144.90	Montagu, Big Bay	Bottle
*Big Bay	40.75	145.02	Big Bay	
Duck Bay	40.80	145.10	Big Bay, Duck Bay, Kemps Bay	Integrated
Port Sorell	41.21	146.58	Port Sorell	Integrated
Ansons Bay	41.05	148.28	Ansons Bay	Bottle
*Moulting Bay Zone 1	41.32	148.28	Moulting Bay	
Moulting Bay Zone 5	41.29	148.29	Moulting Bay	Integrated
Moulting Bay Zone 6	41.30	148.32	Moulting Bay	Bottle
*Moulting Bay Zone GB2	41.29	148.32	Moulting Bay	
Great Oyster Bay	42.13	148.22	Great Oyster Bay	Integrated
Great Swanport	42.08	148.18	Great Swanport East, Great Swanport West	Bottle
Little Swanport	42.32	148.01	Little Swanport, Little Swanport Zone 6C	Integrated
*Okehampton Bay	42.53	147.98	Spring Bay	
Spring Bay Growing Area	Bound by 42.59 147.97 – 42.57 148.00 – 42.57 148.03 – 42.62 148.00 – 42.61 147.97			Integrated
*Spring Bay Lighthouse	42.56	147.93	Spring Bay	
*Triabunna	42.54	147.92	Spring Bay	
Blackman Bay	42.88	147.86	Blackman Bay, Blackman Bay East, Little Boomer Bay	Bottle
Fulham Island	43.25	148.48	Dunalley Bay	Integrated
King George Sound	42.96	147.82	King George Sound	Integrated
Norfolk Bay	43.01	147.83	Eaglehawk Bay, Garfish Bay/Dart Island, Little Norfolk Bay	Integrated
Pitt Water	42.80	147.49	Pitt Water	Integrated
Island Inlet	42.82	147.60	Island Inlet Zone 4, Island Inlet Zone 5	Bottle
Pipe Clay Lagoon	42.97	147.52	Pipe Clay Lagoon	Bottle
Great Bay	43.19	147.36	Great Bay, Great Bay sub-tidal, Fleurty's Point,	Integrated
Fleurty's Point	43.25	147.25	Fleurty's Point,	Bottle
Little Taylors Bay	43.38	147.20	Little Taylors Bay	Bottle

Site	South (degrees)	East (degrees)	Growing Areas Represented	Sample type
Cloudy Bay Lagoon	43.43	147.20	Cloudy Bay Lagoon	Bottle
Gardners Bay	43.18	147.10	Gardners Bay	Bottle
Port Esperance	43.33	147.01	Port Esperance	Integrated
*Port Esperance River	43.20	146.59	Port Esperance	
Hastings Bay	43.43	146.93	Hastings Bay	Integrated
Recherche Bay	43.31	146.54	Recherche Bay	Integrated

*These sites are not routine monitoring sites, but are secondary sites used when potentially toxic algae are found elsewhere in the growing area.

Appendix 2: Risk Ranking of Growing Areas

Growing Area	Current Risk Rating*	Comment
Sea Elephant River	Low	
Montagu	Low	Not currently open for direct sales
Big Bay	Low	
Duck Bay (incl Kemps Bay)	Low	
Port Sorell	Low	
Ansons Bay	High	Inactive
Moulting Bay (Zones 1, 2, 4, 5, 6A, GB1 & GB2)	High	
Great Swanport (Zones East & West)	High	
Great Oyster Bay	High	
Little Swanport (Zones 6AB & 6C)	High	
Spring Bay	High	
Blackman Bay (incl Little Boomer Bay & Blackman Bay East)	High	
Dunalley Bay (Zones A & B)	High	
Eaglehawk Bay (incl Garfish Bay/Dart Island, Little Norfolk Bay)	High	Little Norfolk Bay is a nursery only area
King George Sound	High	Inactive
Pitt Water (Zones 1, 2, & 3)	Medium	
Island Inlet (Zones 4 & 5)	High	
Pipe Clay Lagoon (Zones 1 & 3)	High	
Great Bay (Zones inter-tidal and sub-tidal)	Medium	
Fleurty's Point	Medium	
Little Taylors Bay	Medium	
Cloudy Bay Lagoon	Medium	
Gardners Bay	High	Nursery only area
Port Esperance (Zones 1B)	High	
Hastings Bay	High	
Recherche Bay	Medium	

* based on the current risk rating which is annually reviewed in the annual or triennial report for the growing area

Appendix 3: Phytoplankton (Algal) Action Level Table (PALT)

The following table summarizes the algal levels (in cells/L) that trigger management action.

Micro-algae species	Type of toxin	Alert Level for lab to contact TSQAP immediately by phone (cells/L)	Alert Level for TSQAP to contact growers (cells/L)	Alert Level to initiate closure pending flesh testing results (cells/L)
Alexandrium catenella[1]	PST	100	200	500
Alexandrium minutum[1]	PST	100	200	500
Alexandrium tamarense[1]	PST	100	200	500
Alexandrium ostenfeldii[1]	PST	100	200	500
Gymnodinium catenatum	PST	200	1000 mussels 2000 (other)	5000
Dinophysis acuminata	DST	200	1000	
Dinophysis acuta	DST	200	1000	
Dinophysis caudata	DST	500	1000	
Dinophysis fortii	DST	200	1000	
Prorocentrum lima	DST	500	500	
Pseudo-nitzschia seriata group[2] *Pseudo-nitzschia delicatissima* group[2]	AST AST	50,000 100,000	50,000 500,000	500,000
Karenia brevis *Karenia/Karlodinium/Gymnodinium* group[3]	NST NST	500 100,000	1000 250,000	5000 300,000

The cell levels within each toxin group are cumulative, e.g. 600 cells/L of both *D. acuta* and *D. fortii* would mean a total count of 1200 cells/L, exceeding the critical level to initiate flesh testing.

[1] *Alexandrium* species may be difficult to identify when numbers are low. If any doubt exists, they should be treated as potentially toxic.

[2] Species within the *Pseudo-nitzschia* groups are difficult to identify. The toxic species of most concern in each group are listed below for those laboratories that have capacity to identify these algae to species level. Otherwise all algae within these size based groups should be considered potentially toxic. The *Pseudo-nitzschia seriata* group includes *P. australis, P. pungens* and *P. multiseries.* The *Pseudo-nitzschia delicatissima* group includes *P. turgidula, P. fraudulenta, P. delicatissima, P. pseudodelicatissima* and *P. multistriata*.

[3] The *Karenia/Karlodinium/Gymnodinium* group includes *Karenia bidigitata, Karenia brevisulcata, Karenia mikimotoi, Karenia papilionacea, Karenia selliformis, Karlodinium micrum* and *Gymnodinium impudicum*. If there is evidence of fish kills near the growing area, NST testing should be considered.

The following potentially toxic algae are also watched for: *Karenia cf brevis, Phalacroma rotundatum, Prorocentrum cordatum, Protoceratium reticulatum,* and *Protoperidinium crassipes.*

Other species were removed due to questionable toxicity. It would be of interest to conduct toxicity testing when numbers of these species are extremely high: *Dinophysis sacculus, D. tripos* and *D. truncata.*

If algal taxonomy is uncertain, the use of 'sp. cf" will be used between the genera and species names, designating this uncertainty. TSQAP will apply PALs of the species that it appears similar to and will include this information in communications. TSQAP will also apply the PALs if a genera which includes a potentially toxic species is reported as 'sp. or spp.' e.g. *Karenia* sp.

Appendix 4: Marine Biotoxin Regulatory Closure Levels

A harvesting area must be closed for the harvesting of shellfish when toxins in shellfish are found to be above the levels prescribed in the Australia and New Zealand Food Standards Code, Standard 1.4.1, shown below.

Toxin group	Maximum Level
Paralytic Shellfish Toxin (Saxitoxin equivalent)	0.8 mg/kg
Amnesic Shellfish Toxin (Domoic Acid equivalent)	20 mg/kg
Diarrhetic Shellfish Toxin (Okadaic Acid equivalent)	0.2 mg/kg
Neurotoxic Shellfish Toxin	200 MU/kg

DST includes okadaic acid, dinophysistoxins and pectenotoxins. It does not include pectenotoxin 2-secoacid, yessotoxins, gymnodimine or azaspiracid.

Note 1: From November 2001 the EU set a regulatory limit for all DSTs, with the exception of yessotoxin, of 0.16 mg/kg. The regulatory limit for yessotoxin was set at 1.0 mg/kg.

Note 2: The regulatory level for neurotoxic shellfish toxins (NSTs) provided in the Australian and New Zealand Food Standards Code (ANZFSC) is for the mouse bioassay method of analysis (MU/kg). Currently there are no laboratories within Australia that can perform this test. NSTs may now also be measured using chemical methodology (LCMS/MS). However, no mg/kg equivalence value or guidance is provided within the ANZFSC. The US Food and Drug Authority acknowledge that 0.8 mg/kg brevetoxin-2 is equivalent to 200MU/kg. Therefore TSQAP may choose to impose a maximum level of 0.8mg/kg NST if they are unable to use the currently accepted method of analysis

Appendix 5: Case Definitions for Toxic Poisoning Syndromes

The following case definitions, extracted from Todd, K. (2001) *Australian Marine Biotoxin Management Plan for Shellfish Farming* FRDC Project No. 1999/332, Cawthron Report No. 645 ISBN 0 473 08391 4

Paralytic shellfish poisoning (PSP)

Causative toxins: Saxitoxins (STXs), Gonyautoxins (GTXs) and C toxins (CTXs)

Microalgal sources: *Gymnodinium catenatum*, *Alexandrium* species (including *A. minutum, A. catenella, A. tamarense, A. fundyense, A. ostenfeldii*, plus others), *Pyrodinium bahamense* var. *compressum*, also freshwater species such as *Anabaena* spp., and *Microcystis* spp.

Associated Health Hazards: This group of toxins affects the nervous system by causing blockage of the sodium channels. In humans the peripheral nervous system is particularly affected; symptoms include tingling and numbness of extremities, progressing to lack of muscular co-ordination, respiratory distress, and muscular paralysis leading to death by asphyxiation in extreme cases. The fatality rate can be up to 10%. There is no known antidote.

Clinical Case Definition: The following neurological symptoms occurring within 12 hours of consuming shellfish:

- neurosensory;
- paraesthesia, i.e. numbness or tingling around the mouth, face or extremities;
- and one of the following neuromotor/neurocerebellar symptoms:
    - weakness such as trouble rising from seat or bed
    - difficulty in swallowing
    - difficulty in breathing
    - paralysis
    - clumsiness
    - unsteady walking
    - dizziness/vertigo
    - slurred/unclear speech
    - double vision

Amnesic Shellfish Poisoning (ASP)

Causative toxins: Domoic acid (DA)

Microalgal sources: *Pseudo-nitzschia* species including *P. australis, P. multiseries, P. delicatissima, P. fraudulenta, P. pseudodelicatissima* plus others.

Associated Health Hazards: Domoic acid affects the brain. A mild case of ASP causes nausea, vomiting, diarrhoea and abdominal cramps within 3-5 hours of consumption. Severe cases have a decreased reaction to deep pain, dizziness, hallucinations, confusion, short-term memory loss and seizures. The most severe cases have been found to have selective memory loss, particularly short-term memory loss. There appears to be a close association between memory loss and age: those

people under 40 years old are more likely to have diarrhoea and those over 50 to have memory loss.

Clinical Case Definition: Vomiting or diarrhoea or abdominal cramps within 24 hours of consuming shellfish;

- and no other probable cause identified by microbiological examination of a faecal specimen from the case or microbiological testing of left-over food;
- and/or one or more of the following neurological signs/symptoms occurring within 48 hours of consuming shellfish:
    - confusion
    - memory loss
    - disorientation
    - seizure
    - coma

Diarrhetic Shellfish Poisoning (DSP)

Causative toxins: Okadaic acid (OA), Dinophysistoxins (DTXs), Pectenotoxins (PTXs), Yessotoxins (YTXs) and Azaspiracids (AZAs). NB. The human toxicity of pectenotoxins and yessotoxins is currently unknown, until proven non-toxic to humans they will continue to be regulated for as DSP toxins. Azaspiracids are not yet confirmed to be in this group.

Microalgal sources: *Dinophysis* species including *D. acuminata, D. acuta, D. caudata, D. fortii, D. norvegica* plus others, *Prorocentrum lima, Protoceratium reticulatum* (YTX)

Associated Health Hazards: Okadaic acid and the dinophysistoxins cause diarrhoea, vomiting, nausea and abdominal pain. The symptoms usually start between 30 minutes to a few hours after consumption. There is concern that okadaic acid and dinophysistoxins also cause longer term health effects. These possible human health effects have been associated with tumour producing, mutagenic and immunosuppressive effects shown in animals. These human health concerns have yet to be epidemiologically qualified and quantified.

There has been some debate as to whether pectenotoxins cause human health effects. However, there has now been a documented illness outbreak in New South Wales that involved pipis. Fifty-six persons became ill with vomiting and diarrhoea and the pipis were found to contain PTX2sa (Quilliam et al. 2000). Another 50 cases were thought to be involved in a similar NSW outbreak, associated with recreational harvest of pipis.

There is no epidemiological evidence of human health effects from yessotoxin. However it is lethal to mice when administered intraperitoneally, and causes damage to heart muscles and livers in mice.

Azaspiracids cause vomiting and diarrhoea in humans. In animal tests, these toxins have caused neurotoxic effects and severe damage to the intestine, spleen and liver tissues. The microalgal source is currently unconfirmed.

Clinical Case Definition: Vomiting or diarrhoea occurring within 24 hours of consuming shellfish and no other probable cause identified by microbiological examination of a faecal specimen from the case or microbiological testing of leftover food.

Neurotoxic Shellfish Poisoning (NSP)

Causative toxins: Brevetoxins (BTX's)

Microalgal sources: *Karenia brevis* (=*Gymnodinium breve*), *K. cf brevis* (=*Gymnodinium cf breve*), plus potentially *K. papilionacea* (=*Gymnodinium papilionaceum*), *K. mikimotoi* (=*Gymnodinium mikimotoi*) and similar species; *Chattonella* species, *Heterosigma akashiwo* and *Fibrocapsa japonica*.

Associated Health Hazards: The symptoms occur within 3-5 hours and are chills, headache, diarrhoea, muscle weakness, joint pain, nausea and vomiting. There can be altered perceptions between hot and cold, difficulty in breathing, double vision, trouble in walking and swallowing.

Clinical Case Definition: Two or more of the following neurological symptoms occurring within 24 hours of consuming shellfish:

- neurosensory:
  - paraesthesia, i.e. numbness or tingling around the mouth, face or extremities
  - alternation of temperature sensations such as a prickly feeling on the skin during a bath/shower or exposure to sun, or difficulty distinguishing hot or cold objects
- neuromotor/neurocerebellar:
  - weakness such as trouble rising from seat or bed
  - difficulty in swallowing
  - difficulty in breathing
  - paralysis
  - clumsiness
  - unsteady walking
  - dizziness/vertigo
  - slurred/unclear speech
  - double vision

Further information and case definitions for toxic poisoning syndromes can be found at:

http://emergency.cdc.gov/agent/biotoxins/

www.whoi.edu/science/B/redtide/illness/illness.html

http://www.whoi.edu/redtide/impacts/human-health

Appendix 6: Contacts for Notification of Closure

Group	Role	Name	Phone	Mobile	Email
HAB EM Group/DPIPWE	General Manager, Biosecurity and Product Integrity (Chair, HAB EM)	Lloyd Klumpp	03 6165 3077	0407 060 922	lloyd.klumpp@dpipwe.tas.gov.au
HAB EM Group/DPIPWE	General Manager, Water and Marine Resources	Fionna Bourne	03 6165 3219	0407 828 360	Fionna.Bourne@dpipwe.tas.gov.au
HAB EM Group/DHHS	Director of Public Health	Mark Veitch	03 6166 0657	0408 865 254	mark.veitch@dhhs.tas.gov.au
HAB EM Group	CEO, Tasmanian Seafood Industry Council	Julian Harrington	03 6224 2332		jharrington@tsic.org.au
HAB EM Group	Industry Member	Hayden Dyke	03 6257 7566	0438 577 566	haydendyke@bigpond.com
HAB EM Group	Industry Member	Phil Lamb	03 6257 3554	0412 386 111	plamb@springbayseafoods.com.au
HAB EM Group	Industry Representative	Sue Grau		0458 601 057	management@oysterstasmania.org
DHHS - Public and Environmental Health	State Manager, Environmental Health	Paul Hunt	03 6166 0698	0439 276 991	paul.j.hunt @dhhs.tas.gov.au
DHHS - Public and Environmental Health	State Recall Officer	Stuart Quinn	03 6166 0703	0401 566 186	eric.johnson@dhhs.tas.gov.au
DPIPWE - Marine Farming Branch	Manager	Graham Woods	03 6165 3124	0419 120 030	graham.woods@dpipwe.tas.gov.au
DPIPWE - Product Integrity Branch	Manager	Chris Lyall	03 6777 2197	0418 140 658	chris.lyall@dpipwe.tas.gov.au
DPIPWE - Product Integrity Branch	Manager Primary Produce Safety Program	Owen Hunt	03 6165 3091	0418 131 214	owen.hunt@dpipwe.tas.gov.au
DPIPWE – Marine Resources	Director	Rob Gott	03 6165 3043	0419 001 104	robert.gott@dpipwe.tas.gov.au
DPIPWE – Wild Fisheries Management Branch	Manager	Grant Pullen	03 6165 3032	0408 379 197	grant.pullen@dpipwe.tas.gov.au
DPIPWE – Wild Fisheries Management Branch	Principal Fisheries Management Officer (Crustaceans & Scallops)	Hilary Revill	03 6165 3036	0419 364 405	hilary.revill@dpipwe.tas.gov.au
Department of Agriculture	Director Dairy, Eggs and Fish Export Program	Shayne Daniels	03 8308 5045	0417 460 944	Shayne.Daniels@agriculture.gov.au
Department of Agriculture	Assistant Director Dairy, Eggs and Fish Export Program	Shelly Alderman	02 6272 4978	0477 709 719	shelly.alderman@agriculture.gov.au
Department of Agriculture	Dairy, Eggs and Fish Export Program				dairyeggsfish@agriculture.gov.au
Scallop Fishermen's Association of Tasmania	Scallop Industry Representative	Bob Lister		0427 278 270	boblister22@bigpond.com
Tasmanian Abalone Council	Abalone Industry Representative	Dean Lisson	03 6231 1955	0419 599 954	deanlisson@tassie.net.au
Tasmanian Abalone Council	Abalone Industry				admin@tasabalone.com.au

Appendix 7: Example DHHS Press Release

Tasmanian Government	**Government Media Statement**

Date: XXX

Dr Mark Veitch

Director of Public Health

HEALTH WARNING ON WILD SHELLFISH

Members of the public are being warned against collecting and eating wild shellfish from a number of XXX Tasmanian waters.

The warning came today from the Director of Public Health and Environmental Health, Dr Mark Veitch, following the rapid development of toxic algal blooms that cause shellfish to become temporarily toxic to humans.

"People should not collect and eat wild shellfish from the XXX area," he said. "The areas involved include all that north of South Point."

Dr Veitch said the warning did not apply to shellfish farms in the affected areas, nor does it apply to abalone or rock lobster.

"These farms have currently stopped harvesting, so there is no danger in consuming shellfish purchased through appropriate retail outlets," he said. "I also want to assure people that there is no danger to swimmers in the affected areas."

Dr Veitch said that while his warning was specific to these areas, Tasmanians should always be careful about where they collect shellfish from and should not consume them from the Derwent or Tamar Estuaries at any time.

"Toxic algal blooms have been regular events in XXX Tasmanian waters and the current bloom is not unexpected," he said. "The Department of Health and Human Services will continue to monitor the bloom situation closely, and will keep Tasmanians advised of developments."

For more information, go to www.publichealthalerts.tas.gov.au or call the Public Health Hotline on 1800 671 738.