

Resource Recovery Order under Section 286A of the Protection of the Environment Operations Act 1997

The processed oyster shell order 2024

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 286A of the Protection of the Environment Operations Act 1997 (POEO Act), imposes the requirements that must be met by suppliers of **processed oyster shell** to which 'The processed oyster shell exemption 2024' applies. The requirements in this order apply in relation to the supply of **processed oyster shell** for application to land as a **liming agent**.

1. Waste to which this order applies

- 1.1. This order applies to **processed oyster shell**. In this order, **processed oyster shell** means **oyster shell** that:
 - (a) has been generated from **normal operating conditions** or from a **mass mortality event** at **NSW oyster aquaculture leases**;
 - (b) has not been generated from **NSW oyster aquaculture leases** that contain **tar posts**; and
 - (c) has been subject to a process of **desiccation** and **size reduction**.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies **processed oyster shell** that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of **processed oyster shell** to a **consumer** for land application at a premises for which the **consumer** holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

3.1. This order commences on XX MONTH 2024 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. **Processor 1 requirements**

The EPA imposes the following requirements on **Processor 1** who carries out the **desiccation** process on **oyster shell** prior to the supply of desiccated **oyster shell** to **Processor 2**.

Oyster shell stockpiling and desiccation process

- 4.1. **Processor 1** must generate a stockpile of **oyster shell** in a **clean**, **dry and outdoor environment**. If more than one stockpile is present, stockpiles of **oyster shell** must be generated so that one stockpile does not mix with other stockpiles of **oyster shell**.
- 4.2. **Processor 1** must ensure that the **oyster shell** does not contain **oyster flesh**.
- 4.3. **Processor 1** must ensure that the stockpile of **oyster shell** is less than 2 metres in height.
- 4.4. **Processor 1** must ensure that the stockpile of **oyster shell** has completed the process of **desiccation** prior to supply of **oyster shell** to **Processor 2**.
- 4.5. **Processor 1** must ensure that the following information is presented on a signpost at the base of each stockpile of **oyster shell**:
 - 4.5.1. A unique batch identifier (e.g. a stockpile number/code);
 - 4.5.2. The approximate dimensions of the stockpile of **oyster shell** in metres;
 - 4.5.3. The date that the stockpile of **oyster shell** commenced the **desiccation** process;
 - 4.5.4. The date that marks 90 days following the commencement of the **desiccation** process; and
 - 4.5.5. Instructions that no further **oyster shell** can be added to the stockpile of **oyster shell** once the **desiccation** process has commenced.
- 4.6. Following the completion of the desiccation process, Processor 1 must wash the stockpile of oyster shell with freshwater to remove any residual unwanted contamination or salt build-up, prior to supplying the oyster shell to Processor 2.

Notification

- 4.7. On or before each transaction, **Processor 1** must provide the following to **Processor 2**:
 - a written statement of compliance certifying that all the requirements set out in Clause 4 of this order have been met.
 - a copy of 'The processed oyster shell order 2024'; and
 - a copy of 'The processed oyster shell exemption 2024'.

Record keeping and reporting

- 4.8. **Processor 1** must keep a written record of the following for a period of six years:
 - Unique batch identifiers of stockpiles as required under clause 4.5.1;
 - Documentation and records demonstrating that the **desiccation** process has completed;
 - The quantity (in m³) of **oyster shell** supplied to **Processor 2**;
 - All written statements of compliance as required under clause 4.7.
- 4.9. **Processor 1** must notify the EPA within seven days of becoming aware that it

has not complied with any requirement in clauses 4.1 to 4.6.

5. Processor 2 requirements

The EPA imposes the following requirements on **Processor 2** who carries out the **size reduction** process on desiccated **oyster shell**, prior to the supply of **processed oyster shell** to the **consumer**.

Size reduction process

- 5.1. **Processor 2** must implement controls to ensure **physical contaminants** are not present in the **oyster shell** prior to **size reducing** the **oyster shell**.
- 5.2. **Processor 2** must process the **oyster shell** via **size reduction** so that the maximum particle size of **oyster shell** is 2 mm, to generate **processed oyster shell**.

Sampling and testing of processed oyster shell

- 5.3. Prior to the supply of **processed oyster shell**, **Processor 2** must carry out the following:
 - 5.3.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for **processed oyster shell**.
 - 5.3.2. Undertake sampling and testing of **processed oyster shell** in accordance with the written sampling plan that aligns with the requirements in clauses 5.3.3 to 5.7.
 - 5.3.3. Assign a unique batch identifier to each stockpile of **processed oyster shell.**
 - 5.3.4. Record the quantity (in m³) of each stockpile of **processed oyster shell** against the corresponding unique batch identifier.
 - 5.3.5. Undertake sampling by collecting one **composite sample** per 50 m³ (or part thereof) from each stockpile of **processed oyster shell** generated.
 - 5.3.6. Sampling must be undertaken in a way that ensures that the **composite sample** collected is representative of the material from the entire stockpile.
 - 5.3.7. Undertake testing by sending the **composite sample**/s of **processed oyster shell** to a laboratory to test for the chemicals and/or attributes listed in rows 1-4 of Column 1 of Table 1, using the methods described in clause 5.7.
 - 5.3.8. Store the **processed oyster shell** appropriately until the test results from clause 5.3.7 are validated as compliant with the absolute maximum concentration or other value listed in Column 2 of Table 1.

Chemical and other material requirements

- 5.4. **Processor 2** must not supply **processed oyster shell** to any person if, in relation to any of the chemical and other attributes of **processed oyster shell**:
 - 5.4.1. The chemical concentration or other attribute of any sample collected and tested as part of the testing of **processed oyster shell** exceeds the absolute maximum concentration or other value listed in Column 2 of Table 1.
- 5.5. The absolute maximum concentration or other value of that attribute in any **processed oyster shell** supplied under this order must not exceed the absolute

maximum concentration or other value listed in Column 2 of Table 1.

Table 1

Column 1	Column 2
Chemicals and other attributes	Absolute maximum concentration ('AMC') (mg/kg 'dry weight' unless otherwise specified)
1. pH	N/A ¹
2. Electrical conductivity	1 dS/m
3. Sodium (total)	1%
4. Calcium carbonate equivalent ²	≥80% ³

Note:

¹ Not applicable.

² Also known as Neutralising Value (NV).

³ A result of 80% or greater (e.g. 85% or 92%) meets the absolute maximum concentration for calcium carbonate equivalent.

Test methods

- 5.6. **Processor 2** must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 5.7. **Processor 2** must ensure that the chemicals and other attributes (listed in Column 1 of Table 1) in the **processed oyster shell** it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
 - 5.7.1. Test method for measuring pH:
 - 5.7.1.1. Sample preparation by mixing 1 part **processed oyster shell** with 5 parts distilled water.
 - 5.7.1.2. Analysis using Method 4A1 Electrical Conductivity (EC) from Soil Chemical Methods – Australasia, Rayment and Lyons 2011, or an equivalent analytical method.
 - 5.7.1.3. Report pH in pH units.
 - 5.7.2. Test method for measuring electrical conductivity:
 - 5.7.2.1. Sample preparation by mixing 1 part **processed oyster shell** with 5 parts distilled water.
 - 5.7.2.2. Analysis using Method 3A1 Electrical Conductivity (EC) from Soil Chemical Methods – Australasia, Rayment and Lyons 2011, or an equivalent analytical method.
 - 5.7.2.3. Report electrical conductivity in dS/m at 25°C.
 - 5.7.3. Test method for measuring sodium (total):
 - 5.7.3.1. Sample preparation using USEPA SW-846 Method 3050B Acid digestion of sediments, sludges and soils.
 - 5.7.3.2. Analysis using US EPA SW-846 Method 6010C inductively coupled plasma optical emission spectrometry, or an

equivalent analytical method.

- 5.7.3.3. Report sodium as % dry weight.
- 5.7.4. Test method for calcium carbonate equivalent:
 - 5.7.4.1. Analysis using Method 19B2 Calcium Carbonate Percentage from Soil Chemical Methods – Australasia, Rayment and Lyons 2011, or an equivalent analytical method.
 - 5.7.4.2. Report calcium carbonate equivalent as % dry weight.

Notification

- 5.8. On or before each transaction, **Processor 2** must provide the following to each person to whom **Processor 2** supplies **processed oyster shell**:
 - a written statement of compliance certifying that all the requirements set out of this order have been met;
 - the test results from clause 5.3.7 for the relevant stockpile of **processed oyster shell** intended to be supplied;
 - a copy of 'The processed oyster shell order 2024'; and
 - a copy of 'The processed oyster shell exemption 2024'.

Record keeping and reporting

- 5.9. **Processor 2** must keep a written record of the following for a period of six years:
 - The sampling plan required to be prepared under clause 5.3.1;
 - All controls implemented as required under clause 5.1;
 - All test results in relation to **processed oyster shell** supplied (including all laboratory reports, laboratory chain of custody documentation, and laboratory sample receipts in relation to **processed oyster shell**);
 - The quantity (in m³) of any processed oyster shell supplied;
 - The name and address of each person to whom Processor 2 supplied processed oyster shell; and
 - All written statements of compliance as required by clause 5.8.
- 5.10. **Processor 2** must notify the EPA within seven days of becoming aware that it has not complied with any requirement in clauses 5.1 to 5.7.
- 5.11. **Processor 2** must provide any sampling results for **processed oyster shell** supplied to any **consumer** of **processed oyster shell**.
- 5.12. **Processor 2** must make any information available to the EPA upon request that relates to this order.

6. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

clean, dry and outdoor environment means an outdoor location for the stockpiling of

oyster shell, where the oyster shell is stored on:

- a dedicated raised mat or mesh structure that optimises aeration of the **oyster shell**; or
- a dedicated surface with low permeability (e.g. asphalt or concrete) that easily drains and is away from existing drainage lines. This excludes storing **oyster shell** directly on soil.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply, **processed oyster shell** to land.

daily global solar exposure means the total solar energy for a day falling onto a horizontal surface. **Daily global solar exposure** is measured from midnight to midnight. **Daily global solar exposure** data is available on the Australian Government Bureau of Meteorology website.

desiccation means a process of drying **oyster shell** outdoors. **Desiccation** must be carried out for:

- a minimum period of 90 days; and
- at least 30 days where the daily global solar exposure is greater than 18 MJ/m².

If the minimum period of 90 days does not lead to at least 30 days where the **daily global solar exposure** is greater than 18 MJ/m², the oyster shell must continue drying until the **oyster shell** has been exposed to at least 30 days where the **daily global solar exposure** is greater than 18 MJ/m².

disease outbreaks means the occurrence of disease cases more than normal expectancy, and can be caused by viruses, bacteria and/or protozoa such as (but not limited to):

- Marteilia sydneyi causing QX disease;
- Ostreid herpesvirus -1 microvariant causing Pacific Oyster Mortality Syndrome (POMS);
- Bonamia roughleyi causing winter mortality;
- Polydora websteri (Mudworm); and
- Imogine mcgrathi (Flatworms).

liming agent means any **soil amendment** containing calcium carbonate, magnesium carbonate or other materials used to neutralise soil acidity and furnish calcium and magnesium for plant growth.

mass mortality event means predation, disease outbreaks, water temperature fluctuations and flooding events that cause widespread oyster death.

normal operating conditions means the harvesting and processing of oysters. This involves the collection of oysters from the bags, baskets or trays where they are grown and **shucking** of oysters to remove the **oyster flesh** from the **oyster shell**.

NSW oyster aquaculture leases means oyster leases holding NSW aquaculture permits where oysters are bred and raised for their **oyster flesh** and related products (e.g. pearls).

oyster flesh means the portion of the oyster that is removed from the **oyster shell** for human consumption.

oyster shell means the shell waste generated from Sydney Rock Oysters (Saccostrea glomerata), Pacific Oysters (Crassostrea gigas), Native Flat Oysters (Ostrea angasi)

and Akoya Pearl Oysters (*Pinctada imbricata*). The **oyster shell** may contain remnants of the abductor muscle still attached to the shell.

physical contaminant means any natural or anthropogenic material other than **oyster shell**, and includes materials such as plastic, glass, metal, rubber, bitumen, paper, cloth, paper or wood.

processor 1 means a person who processes oyster shell via desiccation prior to supply to Processor 2.

processor 2 means a person who processes desiccated oyster shell (that has been received from Processor 1) via size reduction.

shucking means the process of opening an oyster using an oyster knife or an automated oyster shucker to wholly remove the **oyster flesh** from the **oyster shell**.

size reduction or **size reducing** means a process in which the particle size of a solid is made smaller using methods such as hammer milling, crushing or grinding. Size reduction must not be used as a method of managing **physical contaminant** loading.

soil amendment means any material that is applied to soil to enhance plant growth or improve soil physical, chemical or biological properties or processes. Amendments may contain important fertiliser elements, but the term commonly refers to added materials other than those used primarily as fertilisers (e.g. **liming agent**s, compost, animal manures, crop residues).

tar posts means posts that have been coated by liquid tar to increase the durability of the post including to protect it from wood-boring marine organisms.

transaction means:

- in the case of a once-off supply, the supply of processed oyster shell;
- where the supplier and recipient have an arrangement for more than one supply of processed oyster shell, over a defined period (not exceeding two years), the first supply of processed oyster shell as required under the arrangement.

HELEN PRIFTI

A/Director Technical (Chemicals, Land and Radiation) Regulatory Practice and Environmental Solutions Division

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of the **processor** to ensure it complies with all relevant requirements of the most current order.

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies **processed oyster shell** should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of **processed oyster shell** remains subject to other relevant environmental regulations in the POEO Act and Protection of the Environment Operations (Waste) Regulation 2014. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the requirements for asbestos waste (s. 144AAB), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet.

Failure to comply with the conditions of this order constitutes an offence under section 286A of the Protection of the Environment Operations Act 1997.