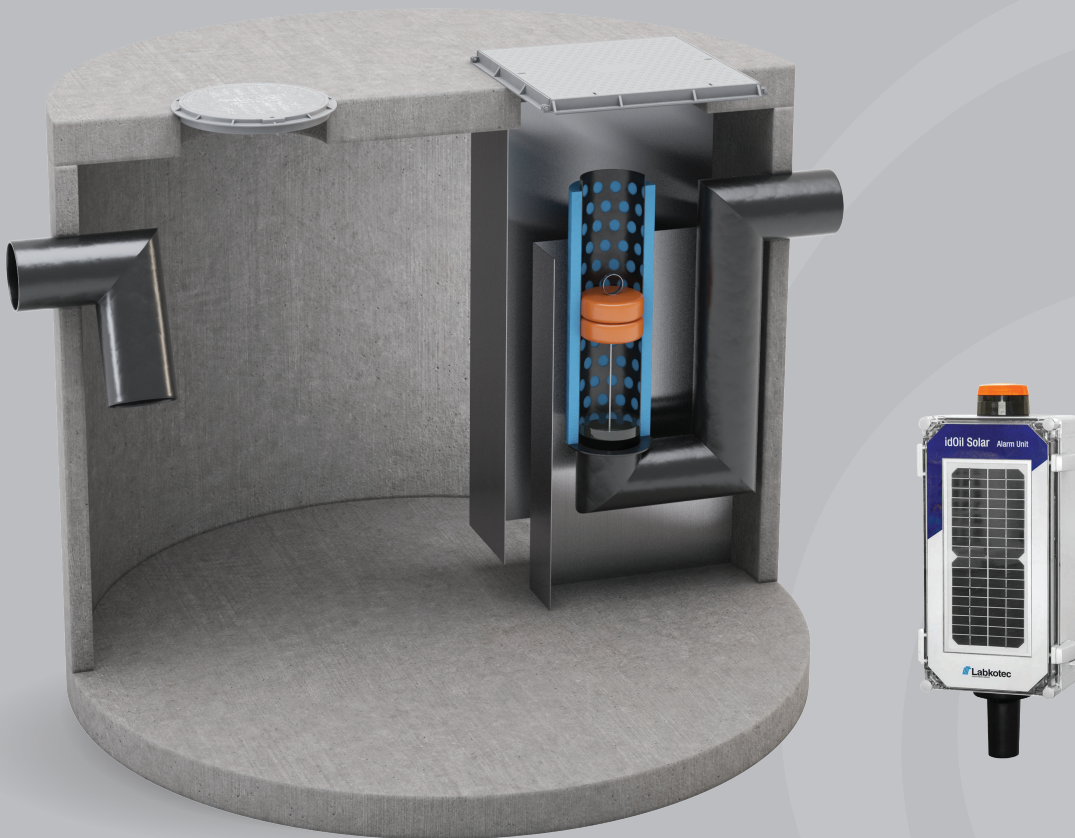


ESK™ Oil/Water Separator with solar powered remote alarm

Commissioning Guide



Stopping Pollution Entering Waterways



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Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways. Monitoring and maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site.

This document has been designed to provide a guide to the commissioning of the solar powered oil monitoring alarm for the ESK™ Oil/Water Separator (hereafter referred to as the ESK™).

The ESK™ is designed and sized to meet stringent hydrocarbon regulatory requirements. It captures free oil and hydrocarbons at both low concentrations and also at higher spill volumes as required under the EN 858 standard that most Australian Authorities require. For more information on the ESK™ refer to the *ESK™ Oil/Water Separator Technical Design Guide*.

IMPORTANT:

The ESK™ is a 'fail-safe' environmental device.

It has a shut off valve that is designed to activate whenever the conditions within the device are outside of the normal operation. Once shut the valve and the system needs to be serviced. Rain events during a fail-safe condition could result in localised flooding. Alternative emergency flow paths should be designed in when possible and practical.

What is the oil sensor?

The oil sensor monitors the build-up of hydrocarbons within the ESK™ and sounds an alarm when this volume exceeds the set volume. It is essentially an early warning system that is used to monitor major spills or lack of maintenance.

The system comprises of a probe mounted in the ESK™ chamber which senses when the designed volume of light liquids has accumulated and sends a signal to the electronic control unit activating a red warning light and an audible alarm.

This alarm would indicate that hydrocarbons have been slowly accumulating over time or that a major spill event has occurred and that inspection and maintenance should be undertaken as soon as practical.

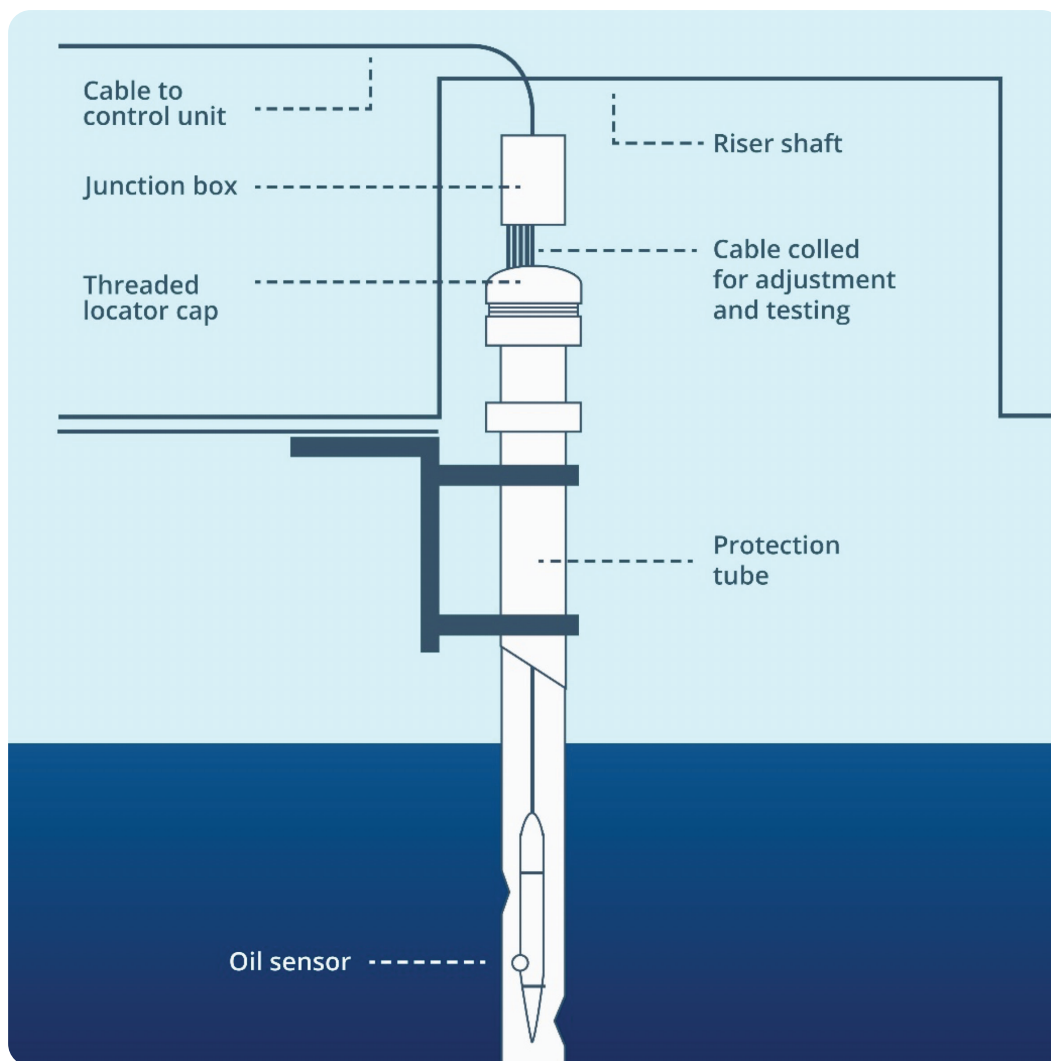
Adhering to the inspection and maintenance schedule of each stormwater treatment device is essential to ensuring that it functions properly throughout its design life. For more information on inspection and maintenance of the ESK™ refer to the *ESK™ Oil/Water Separator Operations & Maintenance Manual*.



How does the oil sensor and alarm work?

The oil sensor continuously measures the amount of hydrocarbon build up within the ESK™ chamber.

The sensor is suspended inside a protection tube within the ESK™ separator as per the picture below:



When the oil-layer or depth of hydrocarbons reaches the predetermined level, the top of the probe will be immersed in the hydrocarbon, breaking the circuit and activating the alarm. It is a ‘fail-safe’ system providing complete assurance that it is operating correctly. If a fault occurs it will immediately alarm.

An alarm therefore indicates that any of the following has occurred:

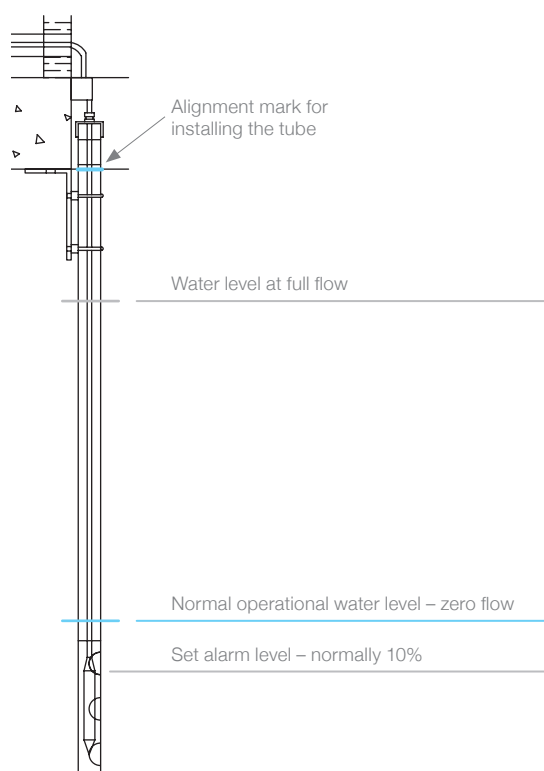
- A major oil spill event has occurred within the catchment – requiring immediate confirmation
- Minor spills have accumulated over time and this accumulated hydrocarbon is now at a volume that requires maintenance to be performed
- The sensor is malfunctioning and should be inspected

To ensure optimum water quality output, the system and sensor should be inspected when an alarm is raised.

Installing the Oil Sensor

The sensor protection tube, where possible, will be preinstalled within the ESK™ or supplied loose along with the Oil sensor kit.

The protection tube and bracket (if not pre-installed) needs to be secured and positioned with the alignment mark matching the concrete soffit as per the picture below:



Specific dimensions can also be found on the site specific drawings.

The dimensions on the drawing are calculated to ensure that the alarm is activated when the light liquids reach approximately 10% of the storage volume of the ESK™.

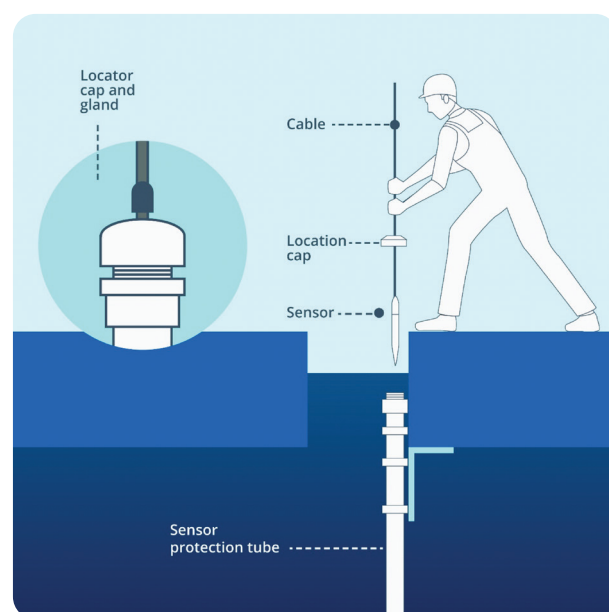
The protection tube can be extended to match the proposed finish surface level making access to the sensor cap easier. Extended tubes should be requested at time of ordering.

Remove the cap from the protection tube and the sensor and cable from the sensor kit and feed the cable through the cap gland until the mark on the cable matches up with the base of the gland. Tighten the gland to secure the cable and sensor length.

When the cap is screwed into place the sensor is suspended at the correct level.

NOTE:

It may be necessary to loosen the gland to screw on the protection tube cap – so as to avoid excessive twisting of the remaining cable length. Placing an additional mark above the gland will aid in correctly locating the sensor after cap placement.



Electrical Connection

Electrical installation should be done in accordance with the instructions and local regulations.

Below is a general summary. Refer to the *OEM idOil Solar installation and operating instructions* for more detail.

Solar Control display unit

- 1 Mains voltage connection is not required**

The operations are controlled by the Battery control unit. The Battery is charged by the built in solar panel. A flashing beacon is mounted to the top of the solar enclosure and will flash every 10 seconds when alarmed.
- 2 Solar Control unit/sensor junction box connection**

Wiring from the solar control unit to the sensor junction box in the ESK chamber requires a 3-core screened 0.75mm core section cable. A 20 m length of this cable is supplied with the control unit. For greater distances please purchase additional cable - Maximum cable length: 300 meters
- 3 Sensor connection**

A 3-core cable is supplied as part of the sensor (5 m length).

After all connections have been made, the cables should be secured by tightening each entry gland.

Sensor

The 3-core cable is connected into the junction box mounted in the riser access shaft (or in rare occasions through a penetration in the ESK™). The 5 m cable is provided to suit variation in finish ground levels and to assist with locating the junction box at a convenient location.

The excess cable should be coiled near the junction box so that the sensor can be easily removed and inspected without the need to disturb the electrical connections.

Important note:

In all cases good, standard electrical practice should be followed and the installation should conform to the Australian Wiring Rules – AS 3000 *Wiring Rules 2018*.

Certificate of conformity

The alarm device has been approved to be used in explosion-hazardous areas. The control display unit and sensor are approved according to *ATEX Directive 2014/34/EU*. This allows the sensor to be installed in Zone 0 - continuously explosion-hazardous.

The control display unit must be located in a safe area, but it can be connected to the probe without any barrier.

Commissioning

Ensure that the sensors have been installed and connected in accordance with the OEM instructions.

Turn on the mains switch and hold the Test and reset button for 10 seconds to power up the system.

Follow *Step 6.1* of the OEM instructions. If correctly installed the sensor will be identified and the light becomes green.

Commissioning can also be done through the WLAN connection – see *section 7.3*

Functionality testing

The function can be tested by lifting the sensor within the protection tube exposing the sensor to air.

After 10 seconds the audible alarm will sound and a red light will show on the display.

Both relays release.

Push the RESET button - the buzzer goes off and the relay will pull in.

When the probe is placed in water again, the relay pulls in and the red light should go out.

Touching the reset/test button to wake up the system and then holding the reset/test button for 3 seconds will also simulate an alarm condition.

Cable break and short circuit

If there is a cable fault or a short circuit, the yellow light on the display unit will be lit.

Installation

It is important that the installation should be carried out by a licensed technician.

Commissioning

A pre-commissioning check sheet should be completed shortly after the installation and connection of all pipe work to and from the ESK™ and the subsequent installation of the access manholes, sensor, sensor control display unit and associated cabling and connections.

The check sheet is a simple tick box page that ensures all standard components are installed and allows the installer to record the details of the equipment installed.

A copy of this form should be sent to Ocean Protect so that it can be recorded in the project folder and a certificate issued for inclusion in the project commissioning and compliance documents.

The form records the appropriate installers contact details and the specific site details and also has the option to request an additional commissioning inspection from Ocean Protect – if required.

Maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the ESK™.

Service Type	Description of Typical Activities	Frequency
Inspection	Visual Inspection of the primary and secondary chambers Dipping of the accumulated oil level and sediment level Perform minimal rectification works (if required)	Every 6 Months
Minor Service	Wash-down of coalescing foam, into primary chamber Removal of accumulated floating hydrocarbon (if required) Removal of accumulated sediment (if required) Check correct operation of sensor and alarm (if fitted) If necessary, cleaning of the sensor can be done with diluted washing up liquid and a cloth	Every 12 Months
Major Service	Replacement of coalescing foam	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Inspection

The purpose of the inspecting the ESK™ is to assess the condition of the primary and secondary chambers and the accumulation of hydrocarbons from minor spills. When inspecting the chambers, particular attention should be taken to ensure that the sensor (if fitted) is operational and the float valve is in the correct position. It is also an optimal opportunity to gauge the degree of accumulated hydrocarbon and sediment within the device – allowing for appropriate timing of minor servicing requirements.

Minor Service

This service is designed to ensure the ongoing operational effectiveness of the ESK™, whilst also assessing the condition of the coalescing foam and the float control valve.

Major Service (replacement of coalescing foam or float valve)

For the ESK™, a major service is reactionary process based on the outcomes from the minor service, specifically the evaluation of the condition of the coalescing foam and float valve.

Trigger Event from Minor Service	Maintenance Action
Coalescing foam has lost structure or has accumulated fine sediment build up within the pore structure that is not being removed in the rinse stage	Replace Coalescing foam ^[1]
Float valve is shutting off prematurely or appears to be damaged	Replace Float valve ^[2]

^[1] Multiple assessment methods are available, contact Ocean Protect for assistance

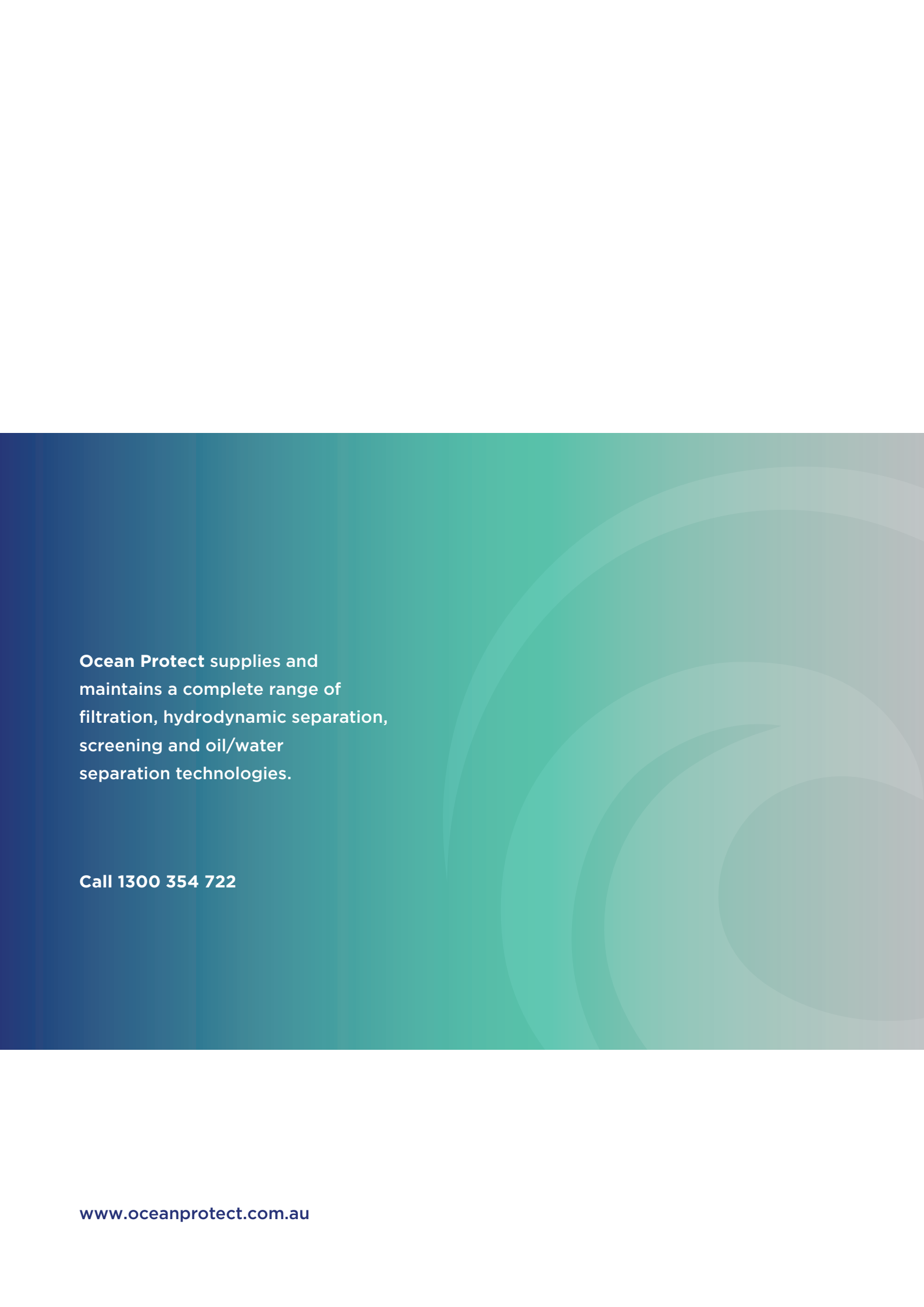
^[2] Replacement coalescing foam and components are available for purchase from Ocean Protect

Maintenance Services

With over a decade and a half of maintenance experience Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of the ESK™, we offer long term pay-as-you-go contracts or pre-paid once off servicing.

For more information please visit www.oceanprotect.com.au

The background of the page features a series of concentric circles in shades of teal and green, centered on the right side. On the left side, there are vertical stripes in varying shades of blue and teal. The text is positioned on the left, overlaid on these stripes.

Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722