Oil Spill Contingency Plan

Broads Navigation Area

December 2021
Version 5.2

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Contents

1. Introduction and Policy

1.1. Purpose of the Plan

This Oil Spill Contingency Plan is intended to guide Broads Authority personnel and those of other responsible organisations through the processes required to manage an oil spill into waters within the navigable parts of the Norfolk and Suffolk Broads rivers system (see Section 1.4) including Breydon Water, the lower reaches of the River Waveney and the lower reaches of the River Bure to a line across the River Yare at TG 51870781 and TG 51960786

This Oil Spill Contingency Plan does not apply to spillages occurring within waters which are under the navigational jurisdiction of the Great Yarmouth Port Authority. Spillages into those waters are dealt with under Great Yarmouth Port Authority's statutory Oil Spill Contingency Plan.

The statutory navigational jurisdiction of the Broads Authority extends to its 'Navigation Area' as defined by Norfolk and Suffolk Broads Act 1988. This includes the great majority of the main rivers and broads, but there are many side dykes, basins and some substantial areas of open water (e.g. Wroxham Broad) which are regarded as 'private water' outside the Authority's formal jurisdiction. Included in these 'private waters' are many boatyard and marina basins where boats are moored in large numbers and in which refueling and repairing operations take place and which are therefore at comparatively high risk of oil spillage. In such waters, whilst the Authority is the registration authority, the navigational byelaws do not extend to these waters. However, it is considered impractical to distinguish between these waters and the formal Navigation Area for the purposes of Oil Spill Contingency Planning. This Contingency Plan is intended to cover the formal public navigation and the adjoining 'private' dykes, basins and navigable waters.

1.2. Consultation

This Oil Spill Contingency Plan has been compiled in consultation with the following statutory bodies and authorities:

Environment Agency (EA)

Natural England (NE)

Marine Management Organisation (MMO)

Norfolk Resilience Forum

Great Yarmouth Port Company Ltd (GYPC) Peel Ports.

In addition, in view of the very high conservation value and importance of the Broads wetland eco-system and the fact that much of the rivers system is contained within sites designated for their nature conservation importance (including designations as SSSI, SPA, SAC, Ramsar etc.) additional consultation has taken place with:

Royal Society for the Protection of Birds (RSPB)

Norfolk Wildlife Trust (NWT)

Suffolk Wildlife Trust (SWT)

National Trust (NT)

Water Management Alliance (WMA)

Essex and Suffolk Water (ESW)

East Suffolk Council

Suffolk County Council

The Broads are also an internationally important resource for boating recreation. Consultation has therefore taken place with:

Broads Hire Boat Federation (BHBFB)

Norfolk and Suffolk Yachting Association (NSYA)

British Marine Federation (BMF)

1.3. Appropriate Assessment

The Oil Spill Contingency Plan has been assessed in accordance to the EU Habitats Directive. The requirement to assess plans or projects is outlined in Article 6(3) and (4) of the European Communities (1992) Council Directive 92/43/EEC of the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the 'Habitats Directive'). The Habitats Directive was implemented in the UK through the Conservation (Natural Habitats &c) Regulations 1994, updated by the Habitat Regulations 2010. The Regulations are responsible for safeguarding designated European Sites and therefore protecting the habitats and species listed in the Annexes of the Directive.

The screening with Natural England has concluded that the Plan and respective actions contained would have no likely significant effect on the European sites within the Broads. Thus an Appropriate Assessment is not required.

1.4. Area of Application

This plan applies to the navigable sections of the Broads rivers and their navigable branches from their respective heads of navigation (listed below) to the boundary of the Broads Authority's jurisdiction with that of Great Yarmouth Port Authority:

River Bure: Horstead Lock to Bure Mouth Gt. Yarmouth.

River Ant: Dilham Staithe and Smallburgh Junction to Ant Mouth.

River Thurne: Hickling Staithe, Horsey Staithe, Waxham Bridge and West Somerton Staithe to Thurne Mouth.

River Yare: Trowse Mill to 100 metres downstream of Bure Mouth including Breydon Water.

River Wensum: New Mills Yard to Trowse Eye. River Chet: Loddon Basin to Chet Mouth.

River Waveney: Geldeston Lock to Turntide Jetty Oulton Dyke and Oulton Broad.

The above waters comprise approximately 130 miles of tidal rivers and Broads.

1.5. Responsible Authority

The Broads Authority is pursuant to Norfolk and Suffolk Broads Act 1988 the statutory harbour and navigation authority for the waters to which this plan applies and is the authority responsible for compliance with the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998.

1.6. Identification of the Roles and Responsibilities

Within the UK there is an adopted structure and procedure for response to marine oil spills, which clearly defines the roles and responsibilities of industry, UK Government (including environmental agencies) and local maritime authorities. Each statutory body has a designated area of jurisdiction within zones extending from the High Water mark to 200 nm or the UK Territorial Limit.

The competent national authority designated to oversee all matters pertaining to the OPRC convention under the Merchant Shipping Act 1995 and the Merchant Shipping and Maritime Security Act 1997 is the Maritime and Coastguard Agency (MCA).

1.6.1. StatutoryJurisdiction

AUTHORITY	HWS LWS 1NM 3NM 6NM 12NM
Broads Authority	(all operations within Broads limits)
Local Authority[1]	(Oil Spill Response out of Broads/Ports Limits)
MCA	(Oil Spill Response - Monitoring, advise)
MCA (HMCG)	(Search and Rescue)
NE/JNCC[2]	(Conservation of the natural heritage) (JNCC)
MMO[3]	(Marine Management Organisation)
EA[4]	(Water Quality)
HMC & E	(Import Duty)

[1]Local Authority	*under a duty of care the Local Authority undertakes the obligation to prepare and/or implement an oil spill contingency plan for response to a spill from HWS to LWS*
[2]NE/JNCC	*NE requires to be notified up to 12nm. JNCC's remit extends from 12nm up to 200nm*
[3]MMO	*approves dispersants and their use in shallow water and advises on their use in deeper waters - e.g. at least 1nm beyond the 20 metres contour.*
[4]EA	*Requires to be notified on water quality issues up to 3nm.*

1.7. Document Control and Plan Revision

This plan is a controlled document, control being by means of numbered copies.

The distribution of numbered copies is as shown at Appendix I. All document holders are assigned a specific numbered copy.

Any changes in the situation, changes to the plan or other updates will be issued as amendments to all holders of the plan within three months of such change.

The plan will be reviewed annually or in light of lessons learned from exercises and incidents. The plan will be revalidated every five years, which will be accomplished in co-operation with statutory consultees.

1.8. Memorandum of Understanding with Environment Agency

There is a potential overlap of responsibility for dealing with oil spilled into inland rivers and waterways between the harbour or navigation authority and the Environment Agency. The Broads Authority co-operates with and works closely with the Environment Agency in the

event of any reported pollution incident. Based on past experience in such circumstances the Broads Authority and Environment Agency have evolved a joint understanding as to which Organisation will be principally responsible for:

- Investigating reported oil spills.
- Putting in hand containment and clean-up operations.
- Enforcing oil pollution legislation by prosecution.

The Broads Authority accepts principal responsibility if the source of the spillage is 'marine' in nature including:

- Pollution/spillage coming from a vessel under way.
- Pollution from a vessel by discharge of oily bilge or other oily discharge whether moored or underway.
- Pollution/spillage from a vessel sinking, damaged or on fire.
- Spillage from a vessel during refueling operations.

The Environment Agency will be principally responsible for dealing with incidents emanating from an 'on-shore' source including:

- Pollution/spillage from vehicles, plant or machinery on land.
- Pollution/spillage from boats on land (e.g. in boatyards)
- Pollution/spillage from on-shore oil storage tanks/oil storage facilities.

1.9. Description of the Broads Navigation and Navigational Activity

The Norfolk and Suffolk Broads system comprises six principal rivers: Bure, Ant, Thurne, Yare, Chet and Waveney. These are all tidal rivers, which drain to the sea through the Port of Great Yarmouth. There are no barriers, locks or other structures to prevent inward surges from the sea or to retain or control fluvial waters. (There is a sea lock at Mutford Lock, Oulton Broad, but this is a branch of the River Waveney. The main river discharges to sea unimpeded through Breydon Water and Great Yarmouth harbour).

The total length of navigable tidal rivers is approximately 130 miles (200 km). The tidal regime is semi-diurnal, although rainfall, wind and barometric conditions exert strong influence so that at times the tidal pattern can be heavily disguised or distorted. The fluvial regime is mainly ebb-dominated: the ebb stream runs in most places an hour or more, longer than the flood and usually more strongly. Time of high and low water is later the further up river, so that for example HW at Reedham is 2½ hours after Gt. Yarmouth, Acle

about 3½ hours after, Norwich and Wroxham 4½ hours after and Coltishall and Stalham 5 hours after.

Tidal range is greatest at and near Great Yarmouth with Spring Tide range approximately 2.20 metres. The tidal range decreases further up river. At Norwich the extreme spring range is approximately 1.50 metres. In the northern part of the system (Rivers Bure, Ant, Thurne) tidal ranges are smaller, a matter of a few inches and frequently distorted or masked by rainfall and meteorological conditions. Tidal streams likewise are strongest in the lower reaches: streams of up to 4 knots are common in the lower reaches of the River Yare and the narrow stretches of the River Bure in Gt. Yarmouth. In the middle reaches (above Reedham on the Yare, St. Olaves on the Waveney and Acle on the Bure) streams seldom exceed 2 knots.

The rivers connect a number of larger open water bodies or shallow lakes – the "broads". In some cases (e.g. Barton Broad) the main river flows through the broad, but most broads are connected to the main river by a side dyke. 12 broads are connected to the rivers system and open for navigation. A number of others are connected but are not open for navigation and some broads are not connected to the rivers system at all.

River and channel widths vary from around 70 metres in the widest reaches of the River Yare down to about 15 metres in the narrowest parts of the River Chet and some navigable dykes. Some private dykes and basin entrances are narrower.

The banks and channel edges of the rivers and broads also vary widely. In the lower reaches the rivers flow mainly between man-made flood embankments, the marshes beyond being lower than the rivers with marsh water levels being maintained by pumping into the rivers. The area between the flood embankment and the river edge is known as the rond. Rond widths vary. In the lower reaches, where salt-water inundation is more common the ronds are of a salt-marsh nature, frequently with an exposed muddy foreshore at low water, and subject to ongoing erosion. Where, through prolonged tidal scour, wave action and exposure to boat wash the rond has been eroded, often on the outside of river bends, so far that the flood embankment is threatened, commonly steel sheet piling has historically been installed to contain the river and protect the flood embankment.

Further up river reduced tidal range and less frequent saltwater inundation makes for traditional Norfolk reed ronds, often with 'reedswamp' fronting them. These ronds and their fringing reed are of particularly high conservation and landscape importance. In many areas, however, historical erosion and declining water quality has resulted in loss of emergent reedswamp and undermining of the rond edge which has prompted 'hard' engineering treatments of the channel edge, including steel sheet piling, timber sheet piling, alder pole piling and various experimental bank treatments including fascine mattresses, gabions and geo-textile applications.

Further upriver again, in the upper reaches of the navigable system, incursion of scrub and trees into the historically open reed marsh landscape has led to the river banks being heavily treed, with overhanging vegetation, exposed tree roots, heavy erosion between trees and much fallen vegetation.

In villages and settlements, river edging is mainly of timber or steel sheet piling.

1.9.1. Broads Authority Management and Presence around the Broads System

The Broads Authority is the statutory harbour and navigation authority and is also a special statutory authority with powers very similar to those of a national park authority. Because the Broads area developed very early as a major holiday destination, particularly for self-drive boating holidays and continues to be busy and heavily used for this purpose, as well as private recreational boating, the Authority has traditionally maintained a high level of patrolling presence of both river and shore-based staff.

The Authority's team of twelve full time and an additional five seasonal Rangers together with voluntary Rangers operate eight patrol launches based at Wroxham, Irstead, Ludham (2 launches), Burgh Castle, Burgh St. Peter, Hardley and Thorpe St. Andrew. The Rangers patrol the Broads seven days weekly during summer season according to defined attendance/service levels. Winter season patrolling is also carried out on a less frequent basis. The patrol launches are equipped with on-board supplies of oil sorbent pads, sorbent booms, disposal bags and personal protective equipment, so as to be able to immediately commence containment and removal of minor spillages.

The Authority also operates a maintenance team who undertake general river maintenance projects. The works teams operate from well-equipped workboats similarly provided with sorbent booms, pads, disposal bags and personal protective equipment. The Authority also maintains one trailer-borne Rigid Inflatable Boat for rapid/emergency response and a shallow draught and highly maneuverable weed cutter/litter collection barge, which is suitable for application and recovery of containment booms and sorbent booms, sheets etc. or deployment of skimming equipment.

1.9.2. Radio Control and Communications

The Authority's vessels when patrolling or engaged in river works, and the Authority's shore-based Rangers and other staff maintain permanent VHF radio and/or mobile phone contact with the Broads Authority Broads Control radio base at Yare House, Norwich. Broads Control has a dedicated private VHF channel (Channel 33 with anti-interference/scrambling facility) for contact with Authority staff/vessels. All field staff/Rangers also carry mobile phones. Hire craft are not fitted with VHF radios but many private craft are so fitted. The majority of private craft and very many hire craft now carry mobile phones and signal strengths are good throughout the major part of the system.

In combination, these communications facilities mean that any sighting of spilled oil can be and in practice always is very quickly and easily reported to the Authority, and will be

investigated by the Authority's navigation staff very quickly, either by boat or by land/vehicle as appropriate. Any reported spillage during working hours in summer would usually receive attendance or investigation within one hour. At night or on winter weekends (when risk of oil spillage is comparatively low) the telephones at Broads Control are remotely monitored. Environment Agency, Police, Coastguard, and Fire Service have contact numbers for Operations section staff for emergency call-out at these times.

The Authority maintains additional stocks of oil sorbent pads, sorbent booms, inflatable containment boom, disposal equipment, personal protective equipment and associated damage control gear at its Dockyard Operation in Thorpe and also in an oil-spill response trailer based at the Dockyard depot in Thorpe St Andrew. (see Section 10, Resources Directory).

1.9.3. Boating Activity

The Broads system is very heavily used by recreational craft, including large numbers of self-drive hire craft which include motor cruisers of up to 14m length.

Each year the Broads Authority registers approximately 13,000 recreational vessels. Annual boat registrations are approximately:

Vessel type	Number of boat registrations
Hire Motor Cruisers	909
Private Motor Cruisers	5,059
Hire Sail Yachts	190
Private Sail Yachts	3010
Launches and Dayboats	1200
Sailing Dinghies, Canoes, Rowing Craft etc.	3,200

There are also approximately 15 MCA Certificated Passenger Vessels of length up to approximately 25 metres operating mainly from Wroxham, Potter Heigham, Norwich and Oulton Broad. Additionally, there are various dredging pontoons, mud wherries, and workboats used for maintenance of the system and operated by two principal contractors (Broads Authority from their dockyard at Thorpe and Broadland Environmental Services Ltd, flood defence contractors for the Environment Agency, from their depot at Haddiscoe).

There are a handful of smaller workboats operated by small local piling and riparian maintenance contractors.

2. Risk Assessment – Spillage from Vessels

2.1. Risk Assessment: Spillage from Vessels

Spillage from vessels may take place in the following principal circumstances:

2.2. Spillage While Refueling

There are over 90 locations around the Broads where vessels take fuel (almost exclusively diesel oil) by hose from an onshore storage tank via a conventional dispenser pump. These are located in boatyards and marinas principally in the main boating centres. Established boatyard refueling facilities are listed in Appendix 9.

In all such locations delivery is via a conventional vehicle forecourt type hose and nozzle with automatic backpressure shut-off.

Most owners of larger inboard powered boats will refuel from boatyard or marina pumps. The prices charged for fuel can however be very high and a minority of owners, particularly those at un-serviced and low-cost moorings of which there are many round the system, may bring fuel in cans. There is a significant risk of spillage by fueling from cans. However, the difficulty of handling fuel in cans means that the maximum size is 25 litres, and in the worst case of a full open can being lost overboard that is the most that is likely to be lost. 25 litres of diesel oil will spread an oily iridescent sheen over a very large area of water or, if held into a corner or confined area by wind or stream or containment, will cause a thick red diesel slick, which it will be possible to remove by use of sorbents or skimming equipment.

There will be immediate local damage and soiling to river edge vegetation etc., and possibly oiling to waterfowl if they are for any reason trapped in dense oil, but it will not cause severe lasting damage to the eco-system or habitats. In very many cases refueling by can will be of small diesel engines which use very modest amounts of fuel and where the containers used may very likely be 5 or 10 litre cans.

Some sailing yachts and a minority of small motor cruisers have inboard petrol engines. There are very few locations where boats may take petrol from onshore delivery pumps. The majority of such refueling will be by cans. However, restrictions on storage and transporting of petrol and on the size of container which can be filled at petrol service stations means that most such refueling will also be from 5 litre or 10 litre cans. The risks of pollution by spillage are correspondingly reduced. More significant is the risk of fire or explosion whilst filling petrol tanks from cans.

A possible area of concern is the frequent refueling from cans of dayboat hire operations, where intensive use of a number of boats from a single base location may lead to repeated very small spillages which may combine in dykes or still waters to make a discernible slick.

Experience over the past decade has indicated that spillages from refueling have very seldom if ever approached the worst case 25 litre volume. Individual spillages are frequent but they are almost always much smaller: seldom more than 0.5 litre.

A particular cause of spillage, which has taken place several times in recent years, has been mistaken filling of the fuel tank with a freshwater hose, leading to fuel being displaced and overflowing into the river. This is usually the result of inexperience on the part of boat hirers, despite the fact that hire craft fillers are clearly marked. The oil spilled comes out diluted with large quantities of water, so that it tends to spread widely in a thin iridescent sheen.

The three most significant spillages of oil into the navigable Broads system in the past decade have been from boatyard oil storage installations, but not during the course of refueling. In one instance a drain valve on a shore storage tank at ankle level was knocked open, presumably accidentally, allowing a significant quantity of diesel to leak into boatyard dykes off the main river at Wroxham. This was dealt with by containment and removal of oil by absorbent sheets. In the second incident negligent removal/relocation of a boatyard diesel storage tank allowed oil to enter Hobro's Dyke, Brundall, from underground pipework which had not been properly drained. The offenders were prosecuted by the Environment Agency and heavily fined. Lastly, a driver delivering hydraulic oil to a shore storage compound in a boatyard inadvertently knocked a valve on an oil storage container which allowed oil to escape onto the unmade floor of the compound and to seep through the ground into the boatyard basin. Such incidents can best be controlled by regulation of design and condition of shore storage and dispensing facilities, including bunding of storage tanks. The Broads Authority does not have statutory power to regulate on-shore oil storage facilities, but the Environment Agency does have such powers. All non-domestic non-waste (and non-agricultural) oil tanks above 200 litres are required to have secondary containment to contain any spill, including valves, filler pipes etc. The Environment Agency is responsible for enforcing these regulations.

2.3. Spillages Resulting from Fire, Explosion or Navigational Incident

Sinking or flooding of boats within the Broads occurs from time to time. On average about five or six sinkings each year involve cabined boats with inboard engine installations. This is usually as a result of inexperienced helmsmen colliding with river banks or, very occasionally, because of failure of watertight integrity of the hull or sometimes other vessels. Experience has shown in these circumstances that there will be initial light pollution from oily bilge water and contents of engine drip trays, followed sometimes by a slow discharge of oil from the fuel tank vent pipe if that is submerged. Such spillage is usually easily dealt with by sorbent booms and sheets, and vessels are ordinarily recovered promptly and before significant amounts of oil have entered the river. The great majority of hire craft (which are at greatest risk of incident) have diesel fuel tanks of between 120 litres and 240 litres capacity.

The Broads, especially the rivers Yare and lower Waveney, are however also used by significant numbers of larger modern seagoing motor yachts, based mainly at Brundall and Oulton Broad. The largest of these may have two diesel tanks each of around 900 litres capacity. Such tanks are always of steel construction and are not integral to the hulls of the vessels, so that risk of breaching of tanks in the event of collision is very small.

Oil spillage may also take place as a consequence of fire or explosion. Historical records in the Broads indicate a consistent pattern wherein annually two or three vessels are the subject of major fires, which result in their becoming a total loss. The worst case of boat fire in memory was when eleven hire cruisers closely moored in a boatyard basin in Horning were burned out, probably as a result of arson, and the risk remains that in a dense boatyard or marina mooring situation a fire in one vessel may spread to adjacent craft. Experience has shown that boat fires, even particularly violent fires, give rise only to moderate local pollution, wherein a small amount of oil pollution is mixed with charred material and debris, and which can be managed by containment booming around the affected vessel and the use of absorbent booms and sheets, together with manual removal of debris. Very seldom is there a large-scale escape of fuel oil from the vessel's tanks, although if the burned vessel sinks there may be slow leakage via vent pipes etc., and the condition of the wreck may be such that recovery or removal may be delayed.

2.4. Summary of Risk Assessment

Very small spillages of less than 1.00 litre of oil or oil in water are frequent. Where these are isolated, wind or tidal streams usually disperse the oil such that containment or removal is not practicable. Prevention by education, good housekeeping and appropriate regulation is more relevant.

There is a comparatively high risk of spillage of up to about 25 litres of oil associated with refueling from cans.

There is a very much smaller risk of spillage of up to about 2,000 litres of oil in the event of a serious navigational incident to a large private motor yacht. Although historically no such large spillage has occurred it remains a possibility and an adequate response procedure is required.

2,000 litres are also a potentially likely volume of oil which might enter the waters as a result of serious mishap or equipment failure at a boatyard fuel storage installation.

2.5. Tiered Response Strategy

The MCA Oil Spill Contingency Plan Guidelines require that the internationally recognised three-tier oil spill classification system form the basis of the response strategy.

Tier One:
Small operational spills that can be dealt with immediately utilising local resources. A Tier One spill is not likely to require resources held outside the area or mobilisation of external incident response arrangements (except for purposes of notification).

Tier Two:
Medium sized spills, which will be handled by Broads Authority personnel and nominated oil spill response contractor or other external assistance and resources as detailed in this plan. The Authority has in place contracted Tier Two response cover with Ambipar Response Ltd.

Tier Three:
Larger spills or serious failure of containment which will require full involvement of other authorities and possible mobilisation of national stockpiles and resources. It is considered extremely unlikely that spillage from pleasure vessels or boatyards in the Broads could ever approach a Tier Three incident.

For the purpose of this OSCP the oil spill tiers are defined as:

Tier One: Up to 200 litres diesel/marine gas oil.

Tier Two: Up to 10,000 litres diesel/marine gas oil.

Tier Three: In excess of 10,000 litres diesel/marine gas oil.

2.6. Minor Spillages/De Minimis Provision

There will be a certain de minimis level of spillage, referring to the frequent very minor spillages which occur around the system, which cannot practicably prompt the mobilisation of this Oil Spill Contingency Plan. Given the ability of a small volume of oil to spread a visible iridescent sheen over a very large area of water it is always very difficult to judge the quantity of oil or oily water which has entered the river, dyke or basin. Also, the location and circumstances of the spillage greatly affect the visibility of the spill, the practicability of containment and removal, the likely speed of natural dispersion and biodegradation and the potential environmental consequences. However, it is concluded that any spill estimated to be of less than 5.00 litres of oil should be regarded as being too small to justify mobilization of this Oil Spill Contingency Plan.

For the avoidance of doubt: a spill of 5.00 litres or less may well be visible and capable of containment and removal. In those circumstances the practice is, and will continue to be, that Broads Authority staff (especially Rangers and Operations Maintenance Teams) will notify the spillage in accordance with this plan but will proceed promptly to deal with it, using the sorbent booms and pads carried on Authority vessels and back-up supplies (including containment boom) kept at the Authority's Dockyard.

3. Environmental and Economic Impacts

3.1. Nature Conservation Designations

The Broads area is of extremely high international importance for nature conservation and hosts a very wide range of habitats and species many of which are protected under European law. This is reflected in the large number of designated nature conservation sites, which either form part of (such as Barton, Hickling Broads and Heigham Sound) or are adjacent or close to the navigable waterways (such as Martham, Cockshoot Broads as well as the fen, reedbed and grazing marsh).

In consultation with Natural England it has been concluded that the sites principally at risk in the event of an oil spill are those which are waterways or fen or reedbed in direct connection to the waterways and are 'undefended', that is not protected from inundation by flood embankments. 'Defended' sites, being those protected by flood embankments, would only generally be at risk if a serious oil spill coincided with a severe storm surge which involved widespread overtopping or breaching of the flood embankments, which would be an extremely unlikely event. However, there are several river water intakes that supply freshwater to designated wetlands, such as the Stracey intake on the Bure and South Fen intake on the Ant for example. Should these intakes be supplying water to these wetlands at the time of an oil spill these 'defended sites' would also be at risk of environmental degradation.

Natural England has identified the following designated sites as being potentially at risk from an oil spillage within the Broads Navigation system:

SSSIs:

Broad Fen, Dilham

Ant Broads and Marshes

Upper Thurne Broads and Marshes Bure Broads and Marshes

Burgh Common and Muckfleet Marshes Trinity Broads

Cantley Marshes

Yare Broads and Marshes Hardley Flood

Stanley and Alder Carrs

Sprat's Water and Marshes, Carlton Colville SSSI

Halvergate Marshes SSSI (directly the ronds only, indirectly the whole SSSI through the IDB intake))

All of the above SSSIs are components of the following European Sites:

The Broads SAC

Broadland SPA

Broadland Ramsar

Part of Breydon Water is also designated as a Local Nature Reserve by Great Yarmouth Borough Council:

Breydon Water SSSI

Breydon Water Ramsar

Breydon Water SPA

Maps and Citations for all of the above designated sites are at Appendix 8.

3.2. General Strategy

On every occasion when an oil spill affects or is likely to affect a designated conservation site or nature reserve Natural England and the organisation/land manager responsible for management of the site or reserve will be contacted and kept fully informed of the extent of the spill, of the consequences as they become apparent and of progress and proposed methods for dealing with the spill.

3.3. Environment Group

In the event of a more serious spill of Tier Two volume (over approximately 200 litres of oil spilled), whether or not the spill is directly threatening any designated conservation site, reserve or equivalent conservation interest to a SSSI 'sites of high conservation value', an immediate step would be to establish an Environment Group, the purpose of which would be to guide the Broads Authority and its appointed Tier Two response contractors through the process of oil recovery and clean-up with minimum immediate or prospective harm to the natural environment, wildlife and ecology.

The Environment Group would consist of officers of the Broads Authority (BA are SEG members but not core members so will be called upon when required), East of England Environment Group, Environment Agency, Public Health, and non-governmental conservation organisations whose property or interest might be threatened. The East of England Environment Group have already produced a Marine Pollution Contingency Plan which covers the area from Gibraltar Point to Kessingland. This included MMO, Environment Agency, Natural England, the Norfolk Wildlife Trust, Norfolk County Council, Royal Society for the Protection of Birds, Health Protection Agency, and the Maritime Coastguard Agency. This is a group ready set up in case of a spill.

3.4. Principal Strategy for Response, Containment and Clean–up

The area of operation of this plan is extremely large, with a very wide range of natural conditions and circumstances which may be encountered. It is not possible in this plan to describe in detail the intended response and actions to be taken in particular scenarios or

circumstances. However, it is possible to set down certain principles that should govern the actions taken in response to spills which might affect areas of high conservation value and designated areas.

(a) The aim will be to contain and limit the spread of oil with priority on preventing oil or its effects spreading into areas of high conservation value/designated areas.

(b) Booming and containment sites will, so far as is practicable, be chosen to give effect to this priority (see Appendix 11).

(c) Particular attention will be given to preventing oil from reaching locations where river water is abstracted for maintaining appropriate water levels in marsh dykes, or other conservation management purposes. If it is not possible to keep oil away from water abstraction pumps etc., steps will be promptly taken to ensure that abstraction is suspended while the threat of oil pollution remains. Priority will also be given to excluding oil from dykes which run into designated areas, nature reserves or other areas of conservation significance, especially where no water control structure exists. (examples being dykes connecting to the Reedham Marshes are of How Hill, Hoveton Great Broad to the main river, dykes draining into the north side of Ranworth and Malthouse Broads, the Dykes system around White Slea on Hickling and many other similar locations).

(d) The aim will be to remove as much as is possible of the oil from the environment by use of skimming equipment and absorbents. Use of chemical treatments or dispersants will not be appropriate.

(e) Removal of spilled oil will be undertaken by means which cause minimum damage to the natural environment. In particular, damage to ronds, reedbeds and reed fringes will be avoided. Access for oil recovery will be limited to locations which will minimise damage to the environment and to habitats. Emphasis will be placed on recovery of oil by vessels.

(f) Where removal of spilled oil would cause damage to the natural environment it may be preferable to allow it to degrade naturally. The Authority's response in such circumstances will be undertaken in consultation with the Environment Agency and relevant conservation organisations, having regard also to the effects of spilled oil and removal/clean-up operations on amenity, recreation and navigation.

The conduct and management of the clean-up and oil removal operation and the storage and disposal of oil removed will be undertaken in accordance with best practice and the terms of licences, conditions and directions issued by the Environment Agency.

4. Response in the Event of Oil Spill

4.1. Responsibility and Incident Control Arrangements

The response team will be led by the Navigation Officer or in their absence by the Head of Safety Management or Head of Construction, Maintenance and Environment and may involve the Rivers Engineer and Senior Rangers.

A Marine Response Centre will be established at the Broads Authority's principal office, Yare House, 62-64 Thorpe Road, Norwich. In the event of a major spill, especially in the River Thurne or Ant, the Marine Response Centre may be located at the Broads Authority Dockyard, Thorpe or on the River Waveney at Island Cottage, Beccles.

The Navigation Officer (Head of Ranger Services), or in their absence the Head of Safety Management or Head of Construction, Maintenance and Environment, will act as Incident Controller/On scene Commander.

Broads Authority Rangers will be involved as clean-up operators.

4.2. Environment Group

In the event of a more serious spill of Tier Two proportions (more than 200 litres of oil spilled) an Environment Group would be formed (see Section 3.3)

4.3. Dispersant Use

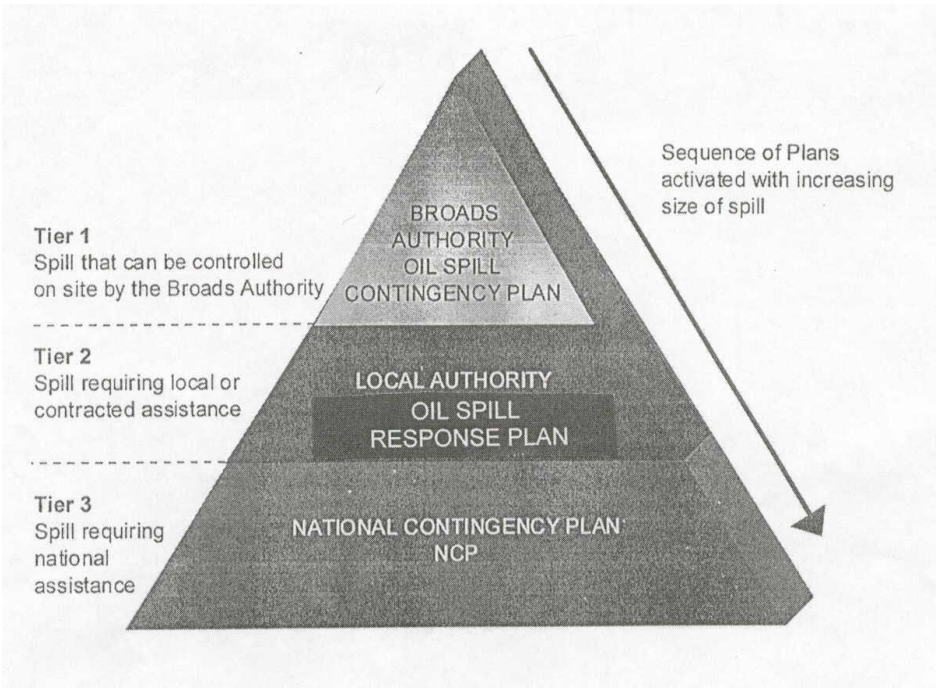
After due consultation dispersant would be used within the area covered by this plan only in circumstances when its use would be essential to avoid genuine risk to human health or safety. It would not be the Broads Authority's policy to allow the use of dispersant unless a genuine risk requiring its use could be established. Approval from MMO would be sought before applying dispersants unless urgent application were needed to avoid risk to public health or safety.

Under the terms of the Marine and Coastal Act 2009 and the Marine Licensing (Exempted Activities) Order 2011 , it is a legal requirement that oil treatment products may only be used in English or Welsh waters if they have been formally approved for this purpose by MMO, in addition, specific permission from MMO must be obtained before any such products are used in shallow waters – these are defined as any area of the sea which is less than 20 metres deep, or within one nautical mile of such an area. This includes any use in tidal estuaries and rivers such as the Broads system.

4.4. Interface with other Contingency/Emergency Plans

This plan will be used in conjunction with Great Yarmouth Port Authority's OSCP, Environment Agency's Incident Plan, Norfolk Resilience Forum Coastal Pollution Plan, Suffolk Resilience Forum (SRF) Marine Plan https://www.suffolkresilience.com/multi-agency-plans and the East of England Environment Group which has been set up and would offer advice on a Tier 2 or 3 incident. Please follow the Link to the National Contingency Plan -

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/638623/170817_NCP.pdf for more information.



4.5. Internal Alerting and Call-out Procedures

An initial spill report will come, in the first instance, to the Broads Authority Office. There is a possibility that reports could come from members of the public or boatyard staff, Environment Agency, Norfolk County Council offices, Suffolk County Council; East Suffolk Council or the Police. The information received must be passed immediately to the Head of Rangers Services, or in their absence, to the Head of Safety Management or Head of Construction, Maintenance and Environment. Police and HM Coastguard are provided with a pager numbers for the standby manager who can call the above staff. The lead officer will do their best to confirm the incident details and determine the level of clean- up operation necessary and the requirements as to whether to activate the Broads Authority Response Team. All calls and decisions made must be recorded, and an Oil Spill report form raised.

4.6. Communications and Reporting

4.6.1. **Reporting of Oil Pollution**

It is essential that all spills are reported by whatever means as quickly as possible.

(a) Responsibility for reporting of oil pollution rests with the Master in all cases involving a vessel and with the berth operator in the case of a berth or quayside incident. In cases involving a vessel alongside both parties are equally responsible.

(b) Any person either ashore or afloat, seeing oil pollution on the water within the Broad Authority's jurisdiction or liable to pose a threat to it, should report it whether or not the source is known.

(c) The Navigation Officer is responsible for ensuring statutory notifications are made.

4.6.2. **Communications**

Initially reports will be passed by telephone both landline and mobile (consideration should be given when using mobiles for security reasons). Broads Authority maintains VHF sets which would be issued to supervisors once a clean-up strategy had been established.

In the event of a clean-up operation a shift system will be instituted to ensure the office is manned on a 24-hour basis.

4.6.3. **Records**

It is essential that all events occurring during an incident are logged and recorded (sheet shown in Appendix 4). This will provide assistance if liability, compensation or reimbursement issues arise as a result of the incident. To achieve this, all key personnel must keep logs. Entries in the log should detail as a minimum, events, actions taken, communications with outside agencies, decisions made and points relevant to the operations.

These logs should be forwarded to the Navigation Officer once the incident has ended to form part of the final incident report and provide the basis for a 'wash-up' meeting.

4.7. Notification Matrix

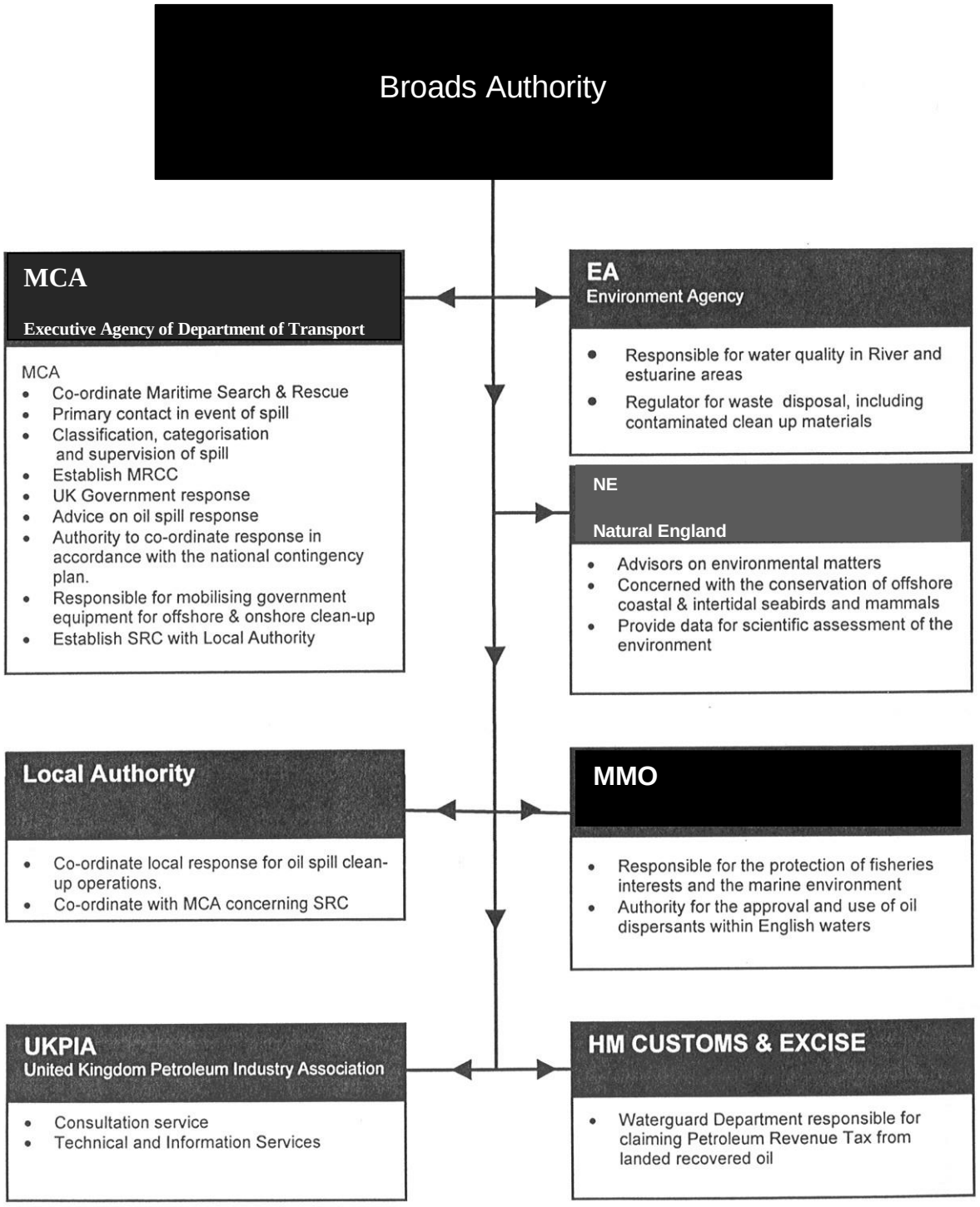
	Oil Spill Tier			**For contact numbers see Section 9 Contact Directory**	
Organisation	**1**	**2**	**3**	**Method**	**Remarks**
Chief Executive	✓☎	☎	☎	Telephone	
MCA (HMCG)	☎	☎	☎	Telephone Email	Initial contact to MRCC, Humber followed by submitting a POLREP to zone10@hmcg.gov.uk
Natural England	✓☎	☎	☎	Telephone, Email	Fax all spills. Contact in every case of spillage.
Environment Agency	☎	☎	☎	Telephone, Pager	Contact in every case of spillage.Confirm by email
MMO	✓☎	☎	☎	Telephone, Email	Annual report provided for Tier 1
Oil Spill Contractor		☎	☎	Telephone	Contact the 24-hour contact number and ask for the Duty Manager.

☎ Notify immediately by phone

✓☎ Notify during normal working hours.

4.8. Liaison Procedures with Other Agencies

Rapid passing of information to other affected agencies is essential for effective response. Shown below are agencies concerned and their roles.



4.9. Operational Response

The operational response in the event of an oil spill incident will depend on a large number of factors:

i. The seriousness of the spill: Tier One, Two or Three.

ii. Location of the spill.

iii. Wind, tide and natural conditions.

iv. Whether there is risk to life or health of persons.

v. Whether there is risk of pollution to nature conservation sites, nature reserves or important habitats.

vi. The level of risk to creatures (especially birds/waterfowl and fish).

vii. Whether there is risk of serious landscape damage or damage to property.

viii. Whether there is risk to convenience or amenity of persons (including navigational convenience or amenity).

ix. The type, extent and thickness of spilled oil.

x. Whether containment and removal are possible.

xi. Whether access is possible for oil recovery (from land or boat).

xii. Practicality of temporary storage and onward licensed disposal.

xiii. Whether wind or tide has caused or will cause the spillage to disperse or spread widely.

xiv. Whether attempted containment/recovery will cause further environmental damage

xv. Whether and how quickly the spilled oil will disperse or biodegrade through action of wind, tide, oxidisation or, as appropriate, agitation.

xvi. Particular weather or environmental conditions e.g. ice cover, very strong winds, extremes of heat or cold, surge conditions or very high fluvial flows etc.

With such a large range of potential factors and having regard to the very wide range of conditions and circumstances to be encountered throughout the Broads system it is not possible to prescribe in this plan a detailed operational response for every particular hypothetical spillage incident in any particular location.

It is possible however to plan for such events and to set out a range of operational response actions and the principles according to which they would be applied:

4.9.1. Oil Dispersants

It is not the Authority's policy to use oil dispersants.

4.9.2. Containment Booming

Where it is possible to contain spilled oil with prospect of being able to recover a significant part of the spillage the Authority will endeavour to do so.

Whether it is practicable or worthwhile to contain spilled oil depends on many factors including tidal streams and weather conditions, tidal rise and fall, the width of the waterway, accessibility and working space for assembling and deployment of booms and for recovery of oil, availability of relatively still water areas for deflection, containment and removal of oil, ability to secure and seal containment booms to banks, availability of space for temporary holding/storage tanks and effects on other persons including delays or closures to navigation.

Oil booming may be worthwhile in locations where recovery cannot practicably be achieved; to prevent or deflect oil from entering nature conservation designated areas, nature reserves, water abstraction points etc.

In very many instances, especially where relatively small amounts of oil have been spilled into the main river, tidal streams may have dispersed oil by the time the spill is investigated so that containment is no longer practicable and the oil may be lying so thinly on the water over so large an area that recovery using absorbents is not practicable or worthwhile. This widely dispersed but thin skim of oil usually manifests itself as the typical multi-coloured iridescent sheen, which is very obvious to the observer. Oil of this thickness will disperse and biodegrade by natural action, especially in warm and bright conditions and may be assisted in doing so by wind and wave action, or by artificial agitation by boat wash etc.

If the spillage is into a boatyard basin or side dyke it may not so quickly disperse by wind or tidal action. In these conditions it may, if it is disturbed and becomes mixed with water, take on a milky or opaque appearance (especially if it is lubricating or hydraulic transmission oil). Although this is less obvious than the coloured sheen, it may indicate a higher concentration or thickness and correspondingly greater prospect of containing and recovering significant amounts of oil. Likewise, spillages of diesel or marine gas oil into an undisturbed basin or still water dyke may result in the oil building up to considerable thickness on the water surface. In these circumstances it may be possible to install effective containment booms at the mouth of the basin or dyke to prevent the oil dispersing out into the main river (perhaps on turn of tide or change of wind), and also to prevent boats entering the oil with the effect of firstly breaking up the thick and hence easily removable oil, and secondly spreading oil by it attaching to their hulls.

In circumstances where oil has accumulated to considerable thickness removal by disc skimmer or oleophilic mop will be particularly effective.

Therefore, the Authority will install containment booms especially across the entrances of boatyard and marina basins and side dykes where that will operate to contain oil for removal and prevent spread of oil out into the rivers system.

While there are hundreds of side basins and small dykes where containment booming might become appropriate, there are a number of locations where frequency or intensity of boatyard and re-fueling activity suggests that preparation for emergency booming should be a priority (for example Hobro's Dyke, Brundall or Daisy Broad, Wroxham). Such locations are listed in Appendix 11.

4.9.3. Management of River Traffic

The Broads rivers are very heavily used by large numbers of recreational craft, both hire and private. Boat traffic census information indicates in excess of 1,000 boat movements per day (0900 to 1800) at busy locations in the northern part of the system in summer. Of these movements about 80% are self-drive hire craft of different kinds. Sustained delay or interruption to boating traffic on the main rivers can have severe operational and commercial consequences for boat hire operators and is therefore not to be undertaken lightly. Closures of the main rivers to navigation for dredging or river maintenance work usually takes place only out of season and after publication of Notices to Mariners, and is usually limited to overnight or very short period closures. However, the Authority has the powers to close the river to navigation in the event of emergency and those powers would be used in the event of a major oil spill, especially where:

- There might be risk to health or safety from continued boat traffic through the affected area.
- Cross-river containment booming was required to prevent a major spill entering or affecting a designated nature conservation area, nature reserve or important habitat.
- Cross-river containment booming was required to prevent a major spill entering or affecting a village or urban area where there was serious threat to the amenity of riverside residences or properties.
- Passage of vessels through the affected area might exacerbate the effects of the oil spillage (e.g. by effects of boat wash) or might hinder or delay clean-up operations.

It should be noted however that the Authority has no means of communicating directly with the majority of boats circulating in the system and that emergency closure of any section of the system can only be achieved by direct communication to vessels from the Authority's patrol launches. Closure for periods of more than a few hours can be communicated by social media email to boatyards and marinas (the Authority maintains an up to date contact list) and by direct leafleting of craft at moorings, especially those near the closed section.

It should be further noted that in the frequent case of small spillages of oil which have become well dispersed so as to be beyond practicable containment, the passage of vessels with attendant wash and agitation may be beneficial in promoting break up, dispersion and biodegradation of spilled oil.

4.9.4. Potential Temporary Waste Oil Storage Sites

There are a great many possibilities for siting temporary waste oil holding tanks, including over one hundred boatyard sites (subject to owners' permission) which all have good road access.

The Broads Authority also owns/operates over sixty public mooring areas, although not all these have road access.

There are also a large number of Riverside Pubs with good road access where, subject to permission of the proprietors, temporary oil storage tanks could be established in car parks etc.

Temporary waste oil holding tanks would need an exemption from the Environmental Permitting regulations. Any waste oil can be stored at the place it is produced under a non-waste framework directive (NWFD) 2 exemption which doesn't need to be registered.

4.10. Information to be obtained as initial Spill Report

Date:

Time:

1. **Name of person reporting incident:**

   _____

2. **Job title:**

   _____

3. **Details of company/organisation or address:**

   _____

4. **Call back number:**

   _____

5. **Location of incident:**

   _____

6. **Estimated quantity of spilled oil** **litres/tonnes**

7. **Type of oil spilled:**

   _____

8. **Action taken to prevent further spillage:**

   _____

9. **Other relevant information:**

   _____

4.11. Action Sheet

In the event of a call out requirement, the following action sheets should be used as a check list to ensure proper cover of all aspects of response.

Navigation Officer

No.	Action	Refer to
1.	Obtain all available information. Ensure that an Incident Log has been started and POLREP Report Form filled in.	
2.	Determine initial level of manpower and equipment resource mobilisation required.	Tiered Response and Section 10
3.	Establish communication with all concerned parties and ensure that statutory reporting requirements have been carried out.	Statutory Notification Section 4.6 and 4.7
4.	Determine level of response that has been initiated and inform MCA, EA and NE of intended response. Determine level of response required from duty personnel.	Tiered Resources
5.	Contact/Call out Response Team personnel as appropriate.	Mobilisation Procedure
6.	Ensure that a sample of spilt oil is taken in accordance with the Police and Criminal Evidence Act, especially when the origin of the spill is unknown or legal proceedings are liable to be taken. This will ensure that it could be used in a court of law if required (e.g. continuity of evidence)	MCA's STOP Notice 4/2001 Appendix 5.

Tier 1 Spill Response

No.	Action	Refer to
7.	Call out additional personnel as required to handle spill notifications.	Statutory Notification Section 4.6
8.	Monitor situation. Obtain regular briefings from Clean-up Supervisor on progress of clean up.	

No.	Action	Refer to
9.	Determine likely impact of incident. Consider deployment of booms to shut off waterways. Complete and log a full report.	
10.	If it appears that the spill has escalated, proceed for Tier 2 incident.	

Tier 2 Incident

No	Action	Refer to
11.	Contact Response Contractor and agree primary level of response required.	Section 9
12.	Start and maintain an accurate log of all communications with contractor.	
13.	Establish communication link with the contractor's Response Manager and issue a call back number.	
14.	Determine extent of incident in terms of: • any casualties; • any safety hazard; • damage to facilities; • extent of pollution; • results of any actions taken so far.	
15.	Brief Response Supervisor of actions as appropriate.	
16.	Establish review/planning meetings. Continue normal communications and ad hoc briefings.	
17.	When incident stood down confirm incident closure with all agencies involved.	
18.	Complete incident log and ensure receipt of report from response supervisor.	

4.12. Escalation of Response

In the event that a response escalates to Tier 2 level, sufficient office-based personnel must be mobilised to establish a Marine Response Centre. A room must be made available to meet with personnel from external agencies.

The Navigation Officer will retain the position of on-Scene Commander unless any change is agreed with the Government Agencies involved.

If the response is likely to become protracted, the Navigation Officer must make arrangements for the Marine Response Centre to be managed and run according to the needs of the response team. This may entail providing catering and accommodation arrangements locally.

In the event that outside contractors are employed to assist with the clean-up, due notice must be taken of the Health and Safety Policy contained in Section 7 of this plan.

4.13. Broads Authority, Chief Executive

The Chief Executive should be ready to assist if deemed necessary by the Navigation Officer and must be in a position to make corporate decisions regarding media reporting, liaising with underwriters and agreeing contracts.

Chief Executive

No.	Action	Refer To
1.	Obtain briefing from Navigation Officer with situation report and then relocate to Head Office if required.	
2.	Assess incident in terms of: • people; • environment; • damage to facilities • disruption to business.	
3.	Approve outline response strategy.	Response Strategy
4.	Approve immediate and future contracted equipment requirements.	Tiered Resources Section 10
5.	Arrange initial public relations programme.	Utilise advice and pro-forma statement Section 8.3

No.	Action	Refer To
6.	Attend review meetings in Marine Response Centre.	

5. Waste Disposal Operations

5.1. Relevant Legislation

The safe handling and disposal of recovered oil is governed by relevant sections in the following legislation:

(a) Environmental Permitting Regulations 2016

(b) Hazardous Waste Regulations 2005

If oily waste material is produced as a result of a pollution incident then the polluting party (operator) has a duty of care to ensure that the waste is handled, transported and ultimately disposed of in an appropriate manner. If the material is to be handled by contractors then the operator (to reduce liabilities to a minimum) has to ensure that each contractor has the relevant waste transportation and disposal licenses.

Natural England should be consulted on any proposal to dispose of or store waste material to ensure that sensitive wildlife areas and designated/protected sites are not affected. The Environment Agency must also be consulted to ensure any storage of waste does not cause risk to the Environment and is within the Environmental Permitting requirements– see section 4.9.4.

It is vitally important that the waste streams are kept separate, rather than being mixed together to enable the waste to be recycled or reused effectively.

In addition, HMRC must be notified if recovered oil is brought ashore by dedicated oil recovery vessels. Landing should not be hindered by the absence of an official from HMRC; however, the Operator should maintain a careful log on quantity and nature of the recovered oil.

The options for waste disposal or treatment of material, be it oily liquids or oiled solids are:

(a) temporary store, clean, stabilise and then recover or re-use;

(b) temporary store and then take to appropriate disposal site for burial;

(c) take to a refinery/incinerator (mainly for oily liquids only);

(d) take to appropriate disposal site.

Each disposal option will be examined in turn with various points for consideration highlighted.

(a) Temporary Storage/Clean, Treat, Stabilise, Recover, Re-use

This option aims to store temporarily the material and then, slowly over the ensuing period, to clean it or stabilise it and then to recover or reuse it.

In most cases this is the best environmental option. It avoids the risk of changing what was a marine oil pollution problem into an inland surface pollution problem or groundwater pollution problem.

From temporary storage the contaminated material can be stabilised with cement, lime, clay, organic binders, asphalt and composting. The characteristic of each product needs to be considered when determining the ultimate disposal route or any perceived end use. It is important to note that the treatment of wastes also comes under the waste management licensing system. Therefore, any strategy to deal with the waste in this manner can only be developed through close liaison with the local authority concerned and the Environment Agency.

(b) Temporary Storage and Appropriate Disposal Site for Burial

The reasons for constructing a temporary storage site are as follows:

1. There is no immediate disposal outlet for large quantities of oil/sand mixture or for oil/water mixtures and clean-up cannot be allowed or stopped.
2. The equipment used to clean beaches is usually labour intensive and therefore requires an immediate transfer area adjacent to the site to be provided.
3. The nature of the roads precludes high traffic densities.
4. The in-situ treatment of contaminated material is often preferable to removing large quantities of material from the shoreline.

Under the Environmental Permitting Regulations 2016, any waste oil can be stored at the place it was produced under a non-waste framework Directive (NWFD) 2 Exemption which does not need to be registered. https://www.gov.uk/guidance/waste-exemption-nwfd-2-temporary-storage-at-the-place-of-production--2.

Each site will have to be constructed in a specific manner. It is therefore essential that the construction of temporary storage sites be done through close liaison with the local authority concerned and the Environment Agency.

(c) Take to a Refinery/Incinerator (mainly for oily liquids only)

This material should be removed from site by a licensed waste handling company who will then arrange for its disposal in an appropriate manner. If there is suitable access, oily liquids produced from a shoreline clean-up operation can be removed from site by road tanker.

If the oily liquids are on-board a dedicated recovery vessel following an at sea containment and recovery operation then it can be transferred across the quay, at a suitable berth, to a

road tanker or other suitable waste reception facility. Alternatively, this waste can be fed directly into the reception facility at a marine terminal of an oil refinery. It is the responsibility of the ship's Master to ensure that this waste is disposed of appropriately. However, the Broads Authority must confirm that any contractors have the necessary licences and permits to handle and dispose of the waste. The disposal route should also be agreed with the Environment Agency to ensure it meets with their satisfaction.

(d) Direct to Appropriate Disposal Site

All disposal sites require an Environmental Permit. The permit is specific to the type of material that can be disposed of at the site. There are only a few sites that are permitted to receive organic or chemically polluting materials (includes oily waste). There will be a charge levied by the site operator for depositing material at the site. In addition, there is landfill tax/levy applied to all waste deposited in a landfill.

5.2. Hazardous Waste Transportation

Furthermore, waste oil is likely to be classified as a Hazardous Waste and should be treated as such until otherwise determined. It would therefore be subject to the Hazardous Waste Regulations (2005). Mixes of oil/sand and oil/seawater etc. would probably be considered as Hazardous Waste if the percentage of carcinogenic compounds is above 0.1%. It is therefore likely that oily beach materials and oil/water liquids would have to be handled as Hazardous Waste.

The transportation of Hazardous Wastes generally requires that the Environment Agency (EA) be informed before the waste is removed. This is done by filling in parts A, B and D of a Consignment Note, available from the EA website, which is sent to the Department responsible for the receiving facility. This should be done at least three clear working days before the waste is to be moved. https://www.gov.uk/dispose-hazardous-waste However, in the event of an "emergency" the EA may waive the requirement for pre- notification. The licensed waste carrier completes part C of the Consignment Note and takes it with the load to the receiving facility. The licensed operator of the receiving facility then signs the consignment note to say that they have accepted the load and that they are authorised to manage it properly.

The requirement for pre-notification generally does not apply to hazardous waste from ships. Therefore, oil recovered at sea by a dedicated Oil Recovery Vessel could be discharged within a harbour to an appropriate waste reception facility without having to pre-notify the EA. However, a consignment note will have to be supplied with each load sent for disposal.

To ensure that oily waste material is transported and disposed of in an appropriate manner, a licensed waste carrier and disposal company should be contracted. The Operator and Waste Disposal Company should then liaise with the EA to confirm that the disposal route identified meets with their satisfaction.

5.3. Disposal Plan

Waste Oil is classed as a hazardous waste, and should be treated as such. It would therefore be subject to the Hazardous Waste Regulations 2005. Mixes of oil/sand and oil/seawater may be considered hazardous waste if the percentage of carcinogenic compounds is above 0.1%. It is likely that oily beach materials and oil/water liquids would have to be handled as Hazardous waste.

It is not necessary to contact the Environment Agency before transport of hazardous waste. An appropriate contractor would be required to remove the waste from its initial storage site and they would then become the waste producer. All hazardous waste producers are required to register as a hazardous waste producer at the Environment Agency and the contractor should be asked to provide proof that they are registered.

A member of the Broads Authority should be present when the waste is removed to ensure that waste is removed appropriately.

5.4. Waste Disposal Action Checklist

Waste Generated from a Shoreline Clean-up Operation

(a) Temporary Storage/Clean, Treat, Stabilise, Recover, Re-use

1. Discuss requirement to establish temporary storage sites along the river bank with EA, Natural England (NE) and the Local Authority, when on or adjacent to an SSSI.
2. If agreed, identify temporary storage sites in close liaison with EA, NE and Local Authority.
3. Instruct Oil Spill Response Contractors to construct temporary storage sites. Area to be isolated, outlets and drains plugged, membrane laid, bunded area created, skips set or lagoons lined.
4. Confirm treatment methods and ultimate disposal with EA and Local Authority.
5. In close liaison with the Oil Spill Response Contractors agree course of action and assist with the necessary arrangements where necessary.

(b) Temporary Storage and then to Appropriate Disposal Site for Burial

1. Discuss requirement to establish temporary storage sites along the riverbank with EA, NE and the Local Authority.
2. If agreed, identify temporary storage sites in close liaison with EA, NE and Local Authority.
3. Instruct Oil Spill Response Contractors to construct temporary storage sites. Area to be isolated, outlets and drains plugged, membrane laid, bunded area created, skips set or lagoons lined.

4. Identify suitably licensed waste carrier to remove material from site.

5. Confirm with waste carrier the disposal route and ultimate disposal site. Liaise with EA to ensure that the disposal strategy is acceptable.

6. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.

(c) Take to Refinery/Incinerator (mainly for oily liquids only)

1. Identify suitably licensed waste carrier to remove material from site.

2. Identify suitable facility to receive the waste.

3. Confirm with waste carrier the disposal route and ultimate disposal site. Liaise with the Regulator to ensure that the disposal strategy is acceptable.

4. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.

(d) Direct Transportation to Appropriate Disposal Site for Burial

1. Identify suitably licensed waste carrier to remove material from site.

2. Confirm with waste carrier the disposal route and ultimate disposal site. Liaise with the EA to ensure that the disposal strategy is acceptable.

3. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.

6. Training and Exercise Policy

6.1. Training Policy

In order to familiarise personnel in the use of this Oil Spill Contingency Plan and comply with MCA guidelines, Oil Spill Response training courses will be held for all appropriate employees of the Broads Authority and river operators with an identified role within the plan. In addition, there will also be awareness briefings with other river users and the Agencies who were involved in the consultation process.

After initial training, instruction will be specific; with the use of Tier 1 and Tier 2 oil spill response equipment located at the Dockyard and on-board the Broads Authority's launches. This will be tested and deployed using those personnel who will be responsible for operating this equipment in the event of a spill.

In order to meet the minimum levels as recommended in the MCA guidelines, the training and exercising of key personnel is detailed below.

Training in the use of this plan

Position	Timing	Type of Training
The Navigation Officer and Head of Safety Management, Head of CM&E	At plan approval	MCA level 4p
Broads Authority designated staff	At plan approval plus annually	MCA level 1
Chief Executive	At plan approval	Contingency Plan Familiarisation briefing

6.2. Exercise Programme

To ensure that the Oil Spill Contingency Plan is "user friendly" and understood by all those involved in its use, communications and practical exercises will be undertaken on an annual basis.

The Navigation Officer will hold a record of all Personnel Training and Contingency Plan Exercises. Post exercise/incident reports to be forwarded to the Counter Pollution and Salvage Officer.

Exercises designed to evaluate the plan

Exercise Type	**Frequency**
Notification exercise	Twice per year
Mobilisation exercise	Twice per year
Table-top Exercise (may incorporate mobilisation and deployment of local response equipment)	Once per year
Incident Management Exercise (will incorporate mobilisation and deployment of resources up to Tier 2 level	Once every 3 years

7. Health and Safety

7.1. Statutory Duties

Applicable Statutory Law and its Implications

The Health and Safety at Work etc. Act 1974 places a clear duty on all employers and persons responsible for premises to ensure that the workplace is safe and in the case of the employer, to have a safe system of work. This duty is placed regardless of whether the workers are employees; sub-contract workers, temporary workers or self-employed persons.

Implementation of the Management of Health and Safety at Work Regulations 1999 requires that all employers carry out suitable and sufficient Risk Assessments of all tasks to be undertaken in the workplace. Where five or more employees are employed then the Assessment is to be recorded and those at particular risk must be informed according.

These same regulations require that the employer executes a Safety Management System and that measurement of performance against standards is made. All employees must receive adequate training, information and supervision.

Additionally, there is a requirement for all employees to receive suitable and sufficient health surveillance to ensure that they are fit to carry out the work and that the work conditions do not cause them adverse effect.

The Provision and Use of Work Equipment Regulations 1998 requires that all equipment provided for use at work is safe and fit for purpose. The persons using the equipment must be adequately trained in its use and the operation must be properly supervised.

The Personal Protective Equipment Regulations 1992 requires that all equipment provided is fit for purpose and does not cause adverse effect. That all personnel are trained in its use and that all associated risks are recorded, controlled and pointed out to those affected.

The Manual Handling Regulations 1992 requires that all work where lifting, pulling and pushing is involved, is assessed and all risks to the health and safety of those involved are reduced to a level as low as reasonably practicable.

The Control of Substances Hazardous to Health Regulations 2002 requires that all substances to which a worker may be exposed, including dusts and gasses are properly assessed and the risks to health reduced to a safe and acceptable level.

7.2. Site Safety Assessment

To achieve a Safe Operation, those in charge of the Response must follow those generalised parts of the Contingency Plan, which apply in all circumstances.

Additionally, they must have available the means to prepare those elements of the plan which are Site and Response Specific.

The Site Safety Assessment is intended to prevent uncontrolled incidents occurring which may cause further damage to the environment or loss due to damage, injury or illness. The Site Safety Assessment should comprise the following sections:

A. Site Survey

B. Operations Analysis

C. Site Control

D. Logistics and Supplies

E. Personnel.

Each section should be addressed jointly and severally before work commences and the appropriate steps taken to ensure that requirements are adequately met.

(a) Site Survey

A Site Survey Form should be available, which when followed correctly will add all of those site unique details which assist in the decision making process and remind staff of essentials which might otherwise be omitted.

The Site Survey should address the safety of those personnel taking part in the clean-up as well as those members of the public who may also be involved.

The following list indicates a few of those subjects which should be addressed, assessed and reported in the survey. The list is by no means exhaustive.

- communications requirements;
- exposure to temperature;
- feasibility of handrails or ropes;
- hazards to the eyes;
- lack of or shelter from weather;
- lighting conditions;
- machinery usage;
- maneuverability;
- manual handling;
- pedestrian traffic;
- requirement to access confined spaces;

- sample collection;
- terrain surface and incline;
- vehicle traffic;
- visibility;
- water hazards.

(b) Operations Analysis

Having surveyed the site and assessed the aspects which are influenced by the terrain, water conditions, and other pertinent factors, the On-Scene Commander will assess the way in which the operation is to be conducted.

The intention to use the following facilities should be stated and the reasons for and priorities of each facility established.

- cranes;
- boats;
- breathing apparatus;
- dispersants
- fork lifts;
- hoses and pumps;
- low loaders;
- motor vehicles;
- raking and sweeping gear.

(c) Site Control

It is essential that those in charge of the spill clean-up have control of the site as soon as possible and before any significant part of the clean-up operation beings. Access to the site must be restricted to those personnel who are essential to the clean-up operation.

Arrangements must be made for the area to be barriered, closed and policed such that no one can enter the work area without reporting to the site supervisor. No workers should be allowed onsite until they have received the full vetting and briefing with respect to the Safety Plan.

(d) Logistics and Supplies

Specifically, with respect to safety, it should be ensured that the appropriate equipment, materials and substances are available at the required times.

Particular attention should be paid to the availability of the various sizes of protective clothing required. This sometimes cannot be established until the members of the workforce have been detailed and their individual roles and tasks decided.

Consideration must be given for a prolonged clean-up operation, possibly stretching to 24-hour operations. In this case shelter, accommodation, feeding, refreshment, rest areas, sanitation and first aid must be available.

Where training has to be delivered prior to work commencing, the necessary instructors and equipment must be available before work commences. It is an error to allow experienced workers to commence work while others are waiting for training.

Protective Clothing. If the weather is at all inclement, the protective clothing issued to workers must be warm, water and chemical-proof. It should include coveralls, gloves, boots, eye protection and headgear. If the weather is warm, the use of the same protective clothing may be necessary, but the requirements for ventilation and cooling will be greater.

Personal Protective Equipment (PPE)

PPE includes;

- breathing apparatus including respirators;
- flotation suits and vests;
- gloves/gauntlets;
- protective clothing;
- goggles, visors and safety glasses;
- hard hats;
- insulated clothing;
- reinforced boots, shoes and gloves.

First Aid. The Health and Safety (First Aid) Regulations 1981, together with the New Code of Practice on First Aid lay down the requirements for trained first aiders and the equipment that must be provided. A foreshore clean-up is considered as a special circumstance and the appropriate extra provisions should be taken into account.

(e) Personnel

Selection of personnel to carry out the clean-up must be dominated by safety considerations.

7.3. Safety on the Foreshore

During the execution of a foreshore Site Survey, access to the area to be cleaned must be carefully assessed. Account needs to be taken of low and high tides and the need for workers to access inlets, cliffs and terrain difficult to navigate. Tide tables should be consulted as well as the taking of advice from those with knowledge.

Where necessary and appropriate, the use of equipment such as handrails, ropes and ladders should be considered.

Where workers are, by necessity, required to work out of sight of one another, communication between them and the supervisor is essential.

The provision and use of Personal emergency Beacons and Distress Flares by appropriate personnel should be considered.

7.4. Safety on the Water

Agreements with the Coastguard should be reviewed and complied with. At the very least, they should be informed of the vessels operating in their area together with all necessary detail of vessel capability and persons on board (POB).

Protective Clothing. Workers operating from seagoing vessels should be equipped with harnesses built to BS 1397. They should, at all times, wear a self or automatic inflating lifejacket and should be protected by a survival suit.

7.5. Safe Operations

Risk Assessment

Hazard Identification. The identification of all hazards at a worksite or spill location is a singular task that should be done by involvement of the people who are expected to carry out the work. The supervisor responsible for co-ordinating the risk assessment should ensure that all hazards are identified before the next step in the process is attempted. A hazard is an object, place, processor circumstance with the potential to do harm in the form of injury, damage, delay or pollution.

7.6. Decontamination

Conditions requiring decontamination. Where workers have been wearing waterproof and protective clothing it is likely that the clothing will become contaminated by crude oil or chemicals that might have been used during the clean- up operation. The clothing needs to be cleaned to prevent further contamination.

Facilities for such cleansing should be made available either near to rest or feeding areas or close by, but clear of the work site

Personal hygiene practices on the job. Workers should be instructed on the dangers of ingesting hydrocarbons and chemicals through contact of contaminated equipment or clothing, such as gloves via the mouth and nose. Facilities for removing protective clothing and washing before consuming food or smoking should be made available.

Decontamination area drainage. The decontamination area where clothing and personal equipment is cleansed should be arranged so that cleansing water and contaminants are drained into tanks. Care should be taken to ensure that contaminated waste does not drain into either the normal drainage system or into the soil under the decontaminated area.

Disposal of contaminated clothing. Clothing which is not fully washable or capable of having all traces of contaminant removed may need to be disposed of safely. Such clothing may comprise Hazardous Waste. If incineration facilities do not exist at the site, the clothing may need to be delivered to the local authority or to a Hazardous Waste Contractor.

8. Press and Public Information

8.1. Media and Information Policy

In the event of a pollution incident, it will be necessary for an efficient and comprehensive information service to be brought into action so as to:

- Deal professionally with the representatives of the media.
- Co-ordinate and release information to the general public regarding the pollution incident and the Broads Authority's response to it.
- Keep staff and Authority members informed of developments regarding the progress of the incident; insofar as it affects their responsibilities.
- Minimise the pressures on those directly concerned with combating the spill.

Responsibility for media relations will be dealt with by the Broads Authority's Public Relations Office (PRO). All enquiries are to be forwarded to the Broads Authority's PRO.

8.2. For guidance it would be expected as follows:

Tier 1 spill - Broads Authority involvement only

Tier 2 spill - Broads Authority, Norfolk County Council's and East Suffolk

Council involvement

Tier 3 spill - not applicable.

It is essential that the media are provided with a 'balanced' view of the incident and actions taken. Remarks like 'No comment' only increase rumour and fuel unnecessary speculation. Below is the format of an Initial Press Statement that can be used by a responsible Broads Authority representative pending full details becoming available and a press release issued.

8.3. Initial Press Statement

"The Broads Authority confirms that an incident has occurred *(state where and give brief description)* ……. at approximately *(give time)* …… hours today.

Emergency response procedures have been initiated and relevant authorities (*have been/are being*) advised. All support services are being co-ordinated through the Authority's incident response team and every possible effort is being made both to minimise risk to personnel at the scene and to contain and mitigate any effects.

Further information will be released, (*as it becomes available/at a press conference scheduled for ….. time)* today".

9. Contact Directory

Broads Authority

Head Office, Yare House, Norwich, NR1 1RY

Reception Tel: 01603 610734

Broads Control: Yare House (9am to 6pm April to Oct, 9am to 5pm Nov to March)

Tel: 01603 756056

email: broads.control@broads-authority.gov.uk

Standby Manager (out of hours) Pager: 07623 979686

Maritime and Coastguard Agency Operations Room (Humber)

Tel: 01262 672317

email: Zone10@hmcg.gov.uk

Environment Agency

Regional Control Room (24 hour) 0800 807060

email: incident@environment-agency.gov.uk

Marine Management Organisation

Emergency Contact dedicated Spill Response number

Tel: 0870 785 1050 If there is no reply call the 24hr Duty Room on: 0845 051 8486

email: info@marinemanagement.org.uk

Helpline: 0300 123 1032

Natural England

National Marine Incidents line Tel: 0300 060 1200

email Marine.Incidents@naturalengland.org.uk

Peel Ports (Great Yarmouth Port Company)

Harbour Office Tel: 01493 335501

24 Emergency Tel: 01493 335511

email gyharbouroffice@peelports.com

HMRC

Tel: 0300 200 3700

Norfolk Resilience Forum

Tel: 01953 424 866

Email nrf@norfolk.pnn.police.uk

RSPB

Regional Office, 65 Thorpe Road, Norwich. NR1 1UD

Tel: 01603 660066

Strumpshaw Reserve Tel: 01603 715191

email strumpshaw@rspb.org.uk

Berney Marshes Reserve
Tel: 01493 700645
(if office not manned - for emergency ring Strumpshaw)

Norfolk Wildlife Trust
22 Thorpe Road, Norwich NR1 1RY
Tel: 01603 625540
email: info@norfolkwildlifetrust.org.uk

Ted Ellis Trust
Warden Wheatfen Reserve Tel: 01508 538036
Email: info@wheatfen.org

National Trust
Regional Headquarters at Blakeney
Tel 01263 740241

Warden Horsey
Tel: 07885 581 070
email: stephen.prowse@nationaltrust.org.uk

Norwich City Council
Customer Services: 0344 980 3333
Out of Hours: 01603 412180

North Norfolk District Council
Customer Services: Tel: 01263 513811
Out of Office Hours: Tel: 01223 849782

Broadland District Council
Customer Services: Tel: 01603 431133
Emergency Planning Manager Tel: 01603 430434
Out of Hours: Tel: 01603 705121

South Norfolk District Council
Customer Services: Tel: 01508 533701
Out of Hours: Tel: 0800 3896109

Great Yarmouth Borough Council
Customer Services: Tel: 01493 856100
Out of Hours: Tel: 01493 330369

East Suffolk Council (was Waveney DC)
Customer Services: Tel: 0333 0162000
Out of Hours: Tel: 0800 4402516

Joint Emergency Planning Unit (JEPU)

Duty Officer 24/7 Tel: 01473 265376
emergency.planning@suffolk.gov.uk

Oil Spill Response Contractor (Tier Two)

Ambipar – **emergency response number** Tel: (24hour) 01202 653558

Oily Waste Disposal Contractors

ZZRM-Customer Service Administration, ASCO UK
Tel: +44 1493 856 722
email: Technical.Sales@ascoworld.com

Offshore Supply Base

South Denes Road, Great Yarmouth, NR30 3LX

10. Resources Directory

Tier 1 - Resources held by Broads Authority:

Vessels

8 x River Patrol launches
1 x 4m RIB, 25 hp outboard
1 x 28' twin screw steel work barge
1 x 24' steel work barge
1 x 24' weed harvester/litter collecting barge
3 x 16m Wherries with open hold
3 x 18m Wherries with open hold
Tug Aber
Tug Richard 9 metres
Tug Bantam 7.3 metres
4 cranes on pontoons (various locations on system)
1 x Land based crane at Dockyard
2 x JCB excavators
1 x JCB tractor with trailer and 2 tonne lifting arm

Vehicles

Various including Toyota Hilux, various sized vans

Oil Pollution Containment and Clean-up Equipment held by the Broads Authority

Containment boom

1 x 20m inflatable boom
2 x 5 m inflatable booms

Sorbents

6 x 3m heavy duty sorbent booms 20cm
3 x 3m Arcosorb booms 12cm
50 x sorbent pads 46 x 46cm
1 x 150' x 36" roll Matasorb sheet

Miscellaneous

Inflator for containment boom
50 x heavy duty oily waste disposal sacks
60 x light rubbish sacks
8 x oil sample bottles
Rond anchors and rope
Mudweights
Toolbox and miscellaneous hand tools
Telescopic floodlights/Floodlight stand
First Aid Kit

PPE

Hard hats
Waterproof suits
Goggles
Rubber gloves
Leather gauntlets

Held in Oil Spill Trailer

Containment Boom

3 x 20m inflatable containment boom
2 x 5m inflatable containment booms

Sorbents

8 x 3m sorbent boom 20cm 200
x sorbent sheets 46 x 46cm
Miscellaneous Inflator for containment boom plus 12-volt adaptor
Miscellaneous ropes/shackles etc.
Rhond anchors
Mudweights
14 x heavy duty oily waste disposal sacks
50 x sandbags
50 x plastic rubbish sacks
2 x 'Oil Spill No Entry' signs
1 x red/white safety tape

Miscellaneous tools

Torches / Batteries
Spot light. Flashing warning lights.
Patching/leak control equipment
2 x wreck buoys
Oil spill sample kit 2 x Buckets
First Aid Kit Mechanical hand Light on clamp Foot pump
Hand Saw Crow Bar Piston Air Pump

PPE

7 x long arm rubber gloves
2 x vapour respirators
2 x eye wash kits
16 x goggles
1 x safety glasses
1 Box face masks
3 x visors
1 x ear defenders

4 x hard hats
3 x overalls
3 x yellow waterproof suits
2 x work gloves
100 x disposable rubber gloves
2 x First Aid Kits
Handwipes
Handwash
1 x blanket
Sun Screen (Factor 30)
Sharps Container 1 x Box J Cloths
10 x Complete PPE kits

Kits held on each of 8 Broads Authority patrol launches and 3 workboats

1x 3m sorbent boom 10cm diameter
1x sorbent pillow 40 x 8cm
10 sorbent sheets 46 x 46cm
1x nylon cord
2x heavy duty oily waste disposal sacks/ties
1x goggles
1x gloves
1x Instruction Sheet

Tier 2 equipment

Resources held by Tier 2 Response Contractor Ambipar Ltd for immediate deployment on call-out basis (on site 0 - 2 hours).

Equipment commensurate with Tier 2 responder. Exact equipment list to be reviewed at time of contract placement.

Appendix 1 – Plan distribution list

Broads Authority
Chief Executive
Head of Safety Management
Head of Ranger Services (Navigation Officer)
Rivers Engineer
Head of Construction and Maintenance
Director of Operations
Head of Strategic Services

Maritime and Coastguard Agency, Humber Maritime and Coastguard Agency HQ

Marine Management Organisation

Environment Agency, Norwich

Ambipar

Great Yarmouth Port Authority

Peel Ports, Great Yarmouth

Broadland District Council

South Norfolk Council

East Suffolk Council

North Norfolk District Council

Norfolk Resilience Forum

Natural England (Norwich Office)

Royal Society for Protection of Birds

SAFETY DATA SHEET

BP DMA Marine Distillate Low Sulphur

Section 1. Identification

GHS product identifier BP DMA Marine Distillate Low Sulphur

Other means of identification Marine diesel fuel
Automotive Diesel Fuel G10

Product code 0000003682

SDS no. 0000003682

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Fuel for compression ignition diesel engines. Fuel for marine engines.
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Manufacturer

Supplier

BP Australia Pty Ltd
Level 17, 717 Bourke Street
Docklands, Victoria 3008
ABN 53 004 085 616

www.bp.com.au

Technical Helpline Number: 1300 139 700

EMERGENCY TELEPHONE NUMBER 1800 638 556

Section 2. Hazard(s) identification

Classification of the substance or mixture

FLAMMABLE LIQUIDS - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN CORROSION/IRRITATION - Category 2
CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
ASPIRATION HAZARD - Category 1

GHS labelelements

Hazard pictograms

Signal word DANGER

Hazard statements

H227 - Combustible liquid.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H332 - Harmful if inhaled.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure. (bone marrow, liver, thymus)

Precautionarystatements

General

P102 - Keep out of reach of children.
P101 - If medical advice is needed, have product container or label at hand.

Section 2. Hazard(s) identification

Prevention

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P281 - Use personal protective equipment as required.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P210 - Keep away from flames and hot surfaces. No smoking.
P271 - Use only outdoors or in a well-ventilated area.
P260 - Do not breathe vapour or spray.
P264 - Wash hands thoroughly after handling.

Response

P308 + P313 - IF exposed or concerned: Get medical attention.
P304 + P340, P312 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.
P301 + P310, P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
P362 - Take off contaminated clothing and wash before reuse.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 - If skin irritation occurs: Get medical attention.

Storage

P405 - Store locked up.
P403 + P235 - Store in a well-ventilated place. Keep cool.

Disposal

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

Not applicable.

Other hazards which do not result in classification

Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapour may cause flash fire or explosion.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 3. Composition and ingredient information

Substance/mixture

Mixture

May contain Fatty Acid Methyl Esters (FAME) and/or Bio-based diesel (BBD). Contains small quantities of polycyclic aromatic hydrocarbons (PAHs). May also contain small quantities of proprietary performance additives.

Ingredient name	% (w/w)	CAS number
Fuels, diesel	≥75	68334-30-5
Alkanes, C10-20-branched and linear	≤20	928771-01-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Inhalation

If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention.

Section 4. First aid measures

Skin contact

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Drench contaminated clothing with water before removing. This is necessary to avoid the risk of sparks from static electricity that could ignite contaminated clothing. Contaminated clothing is a fire hazard. Contaminated leather, particularly footwear, must be discarded. Clean shoes thoroughly before reuse. Get medical attention.

Ingestion

Do not induce vomiting. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Aspiration hazard if swallowed. Can enter lungs and cause damage. Get medical attention immediately.

Most important symptoms/effects,acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed,if necessary

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects. Product can be aspirated on swallowing or following regurgitation of stomach contents, and can cause severe and potentially fatal chemical pneumonitis, which will require urgent treatment. Because of the risk of aspiration, induction of vomiting and gastric lavage should be avoided. Gastric lavage should be undertaken only after endotracheal intubation. Monitor for cardiac dysrhythmias.

Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis.
Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

Specific treatments

No specific treatment.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media

Do not use water jet.

Specific hazards arising from the chemical

Combustible liquid. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. Vapours can form explosive mixtures with air. Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly-grounded containers. Static accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Liquid will float and may reignite on surface of water.

Section 5. Firefighting measures

Hazardous thermal decomposition products

Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

Special protective actions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters

Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Persona lprecautions,protective equipment and emergencyprocedures

For non-emergency personnel

Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling. Eliminate all ignition sources.

For emergency responders

Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other contaminated materials in suitable tanks or containers for recycle, recovery or safe disposal.

Methods and material for containment and cleaning up

Small spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres.

Large spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dike spill area and do not allow product to reach sewage system and surface or ground water. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilt product. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not swallow. Aspiration hazard if swallowed. Can enter lungs and cause damage. Never siphon by mouth. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container. Avoid contact of spilt material and runoff with soil and surface waterways. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Restrict flow velocity according to API 2003 (2008), NFPA 77 (2007), and Laurence Britton, “Avoiding Static Ignition Hazards in Chemical Operations”. To reduce potential for static discharge, ensure that all equipment is properly grounded and bonded and meets appropriate electrical classification requirements.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Light hydrocarbon vapours can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapour in tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks. Do not enter storage tanks. If entry to vessels is necessary, follow permit to work procedures. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. When the product is pumped (e.g. during filling, discharge or ullaging) and when sampling, there is a risk of static discharge. Ensure equipment used is properly earthed or bonded to the tank structure. Electrical equipment should not be used unless it is intrinsically safe (i.e. will not produce sparks). Explosive air/vapour mixtures may form at ambient temperature. If product comes into contact with hot surfaces, or leaks occur from pressurised fuel pipes, the vapour or mists generated will create a flammability or explosion hazard. Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposurelimits

Ingredient name	Exposure limits
Fuels, diesel	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (measured as total hydrocarbons) 8 hours. Issued/Revised: 1/2007 Form: Inhalable fraction and vapor

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Chemical splash goggles.

Skin protection

Hand protection

Wear chemical resistant gloves. Recommended: Nitrile gloves.

Do not re-use gloves. Protective gloves must give suitable protection against mechanical risks (i.e. abrasion, blade cut and puncture). Protective gloves will deteriorate over time due to physical and chemical damage. Inspect and replace gloves on a regular basis. The frequency of replacement will depend upon the circumstances of use.

Skin protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Wear suitable protective clothing.
Footwear highly resistant to chemicals.
When there is a risk of ignition wear inherently fire resistant protective clothes and gloves.
When there is a risk of ignition from static electricity, wear anti-static protective clothing. For greatest effectiveness against static electricity, overalls, boots and

Section 8. Exposure controls and personal protection

gloves should all be anti-static.
When the risk of skin exposure is high (from experience this could apply to the following tasks: cleaning work, maintenance and service, filling and transfer, taking samples and cleaning up spillages) then a chemical protective suit and boots will be required.
Work clothing / overalls should be laundered on a regular basis. Laundering of contaminated work clothing should only be done by professional cleaners who have been told about the hazards of the contamination. Always keep contaminated work clothing away from uncontaminated work clothing and uncontaminated personal clothes.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Use with adequate ventilation.
If there is a requirement for the use of a respiratory protective device, but the use of breathing apparatus (independent of ambient atmosphere) is not required, then a suitable filtering device must be worn.
The filter class must be suitable for the maximum contaminant concentration (gas/ vapour/aerosol/particulates) that may arise when handling the product.

Recommended: If ventilation is inadequate, use respirator that will protect against organic vapour and dust/mist.

Refer to standards:

Respiratory protection:AS/NZS 1715 and AS/NZS 1716
Gloves:AS/NZS 2161.1
Eye protection:AS/NZS 1336 and AS/NZS 1337

Section 9. Physical and chemical properties

Appearance

Physical state Liquid.

Colour Clear and Bright.
Colourless to light yellow. Fluorescent (Green. / Blue. / Yellow.)

Odour Mild.

Odour threshold Not available.

pH Not available.

Melting point Not available.

Boiling point 180 to 400°C (356 to 752°F)

Flash point Closed cup: >61.5°C (>142.7°F) [Pensky-Martens.]

Evaporation rate Not available.

Flammability (solid, gas) Not applicable. Based on - Physical state

Lower and upper explosive (flammable) limits Lower: 0.5%
Upper: 7.5%

Vapour pressure <0.1 kPa (<0.755 mm Hg)

Vapour density >1 [Air = 1]

Relative density 0.84

Density 810 to 850 kg/m³ (0.81 to 0.85 g/cm³) at 15°C

Solubility insoluble in water.

Partition coefficient: n-octanol/water Not available.

Auto-ignition temperature 240°C (464°F)

Decomposition temperature Not available.

Viscosity Kinematic: 2.1 to 5.5 mm^2/s (2.1 to 5.5 cSt) at 40°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Avoid excessive heat.
Incompatible materials	Reactive or incompatible with the following materials: oxidising materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Fuels, diesel	LC50 Inhalation Dusts and mists	Rat	4.1 mg/l	4 hours
	LD50 Dermal	Rabbit	>4300 mg/kg	-
	LD50 Dermal	Rabbit	>4300 mg/kg	-
	LD50 Oral	Rat	17900 mg/kg	-
	LD50 Oral	Rat	7600 mg/kg	-

Conclusion/Summary Harmful if inhaled.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Fuels, diesel	Skin - Irritation	Rabbit	-	-	-
	Skin - Irritation	Rabbit	-	-	-
	Eyes - Non-irritating to the eyes.	Rabbit	-	-	-
	Eyes - Non-irritating to the eyes.	Rabbit	-	-	-

Skin Causes skin irritation.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Fuels, diesel	OECD 471	Experiment: In vitro Subject: Non-mammalian species	Positive
	Equivalent to OECD 476	Experiment: In vitro Subject: Mammalian-Animal Cell: Germ	Negative
	not guideline	Experiment: In vivo Subject: Unspecified Cell: Somatic	Negative

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Fuels, diesel	Positive - Dermal - Unspecified	Mouse	-	2 years

Conclusion/Summary Suspected of causing cancer.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Developmental toxin	Species	Dose	Exposure

Fuels, diesel	-	-	Negative	Rat	Dermal	20 days
	-	-	Negative	Rat	Dermal	10 days
	-	-	Negative	Rat	Dermal	10 days

Specific target organ toxicity(repeated exposure)

Name	Category	Route of exposure	Target organs
Fuels, diesel	Category 2	-	bone marrow, liver, thymus

Aspirationhazard

Name	Result
Fuels, diesel	ASPIRATION HAZARD - Category 1
Alkanes, C10-20-branched and linear	ASPIRATION HAZARD - Category 1

Information on likely routes of exposure Routes of entry anticipated: Dermal, Inhalation.

Potential acute healtheffects

Eye contact No known significant effects or critical hazards.

Inhalation Harmful if inhaled.

Skin contact Causes skin irritation.

Ingestion Irritating to mouth, throat and stomach. Aspiration hazard if swallowed -- harmful or fatal if liquid is aspirated into lungs.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact Adverse symptoms may include the following:
irritation
redness

Ingestion Adverse symptoms may include the following:
nausea or vomiting

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Eye contact Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

Inhalation Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.

Skin contact Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Ingestion If swallowed, may irritate the mouth, throat and digestive system. If swallowed, may cause abdominal pain, stomach cramps, nausea, vomiting, diarrhoea, dizziness and drowsiness.

Section 11. Toxicological information

General May cause damage to organs through prolonged or repeated exposure. May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Carcinogenicity Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (dusts and mists)	4.1 mg/l

Other information Diesel exhaust particulates have been classified by the National Toxicological Program (NTP) to be a reasonably anticipated human carcinogen. Exposure should be minimized to reduce potential risk.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Fuels, diesel	EL50 >1000 mg/l Nominal Fresh water	Micro-organism	40 hours
	NOELR 3.217 mg/l Nominal Fresh water	Micro-organism	40 hours
	Acute EL50 22 mg/l Nominal Fresh water	Algae	72 hours
	Acute EL50 210 mg/l Nominal Fresh water	Daphnia	48 hours
	Acute EL50 68 mg/l Nominal Fresh water	Daphnia	48 hours
	Acute ErL50 78 mg/l Nominal Fresh water	Algae	72 hours
	Acute LL50 65 mg/l Nominal Fresh water	Fish	96 hours
	Acute LL50 21 mg/l Nominal Fresh water	Fish	96 hours
	Acute NOELR 10 mg/l Nominal Fresh water	Algae	72 hours
	Acute NOELR 1 mg/l Nominal Fresh water	Algae	72 hours
	Acute NOELR 46 mg/l Nominal Fresh water	Daphnia	48 hours
	Chronic NOEL 0.083 mg/l Nominal Fresh water	Fish	14 days
	Chronic NOELR 0.2 mg/l Nominal Fresh water	Daphnia	21 days

Persistence and degradability

This product is inherently biodegradable.

Product/ingredient name	Test	Result	Dose	Inoculum

Section 12. Ecological information

Fuels, diesel	OECD 301 F	60 % - Readily - 28 days	30 mg/l	-
	OECD 301 F	57.5 % - Not readily - 28 days	25 mg/l	-
	Equivalent to EPA OTS 796.3100	35 % - Not readily - 28 days	5 mg/l	-

Bio accumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobilityin soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination. This material may accumulate in sediments.

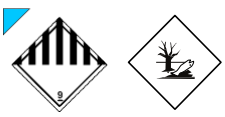
Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Special Precautions for Landfill or Incineration Empty packages may contain some remaining product. Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.

Section 14. Transport information

	ADG	IMDG	IATA
UN number	Not regulated.	UN3082	UN3082
UN proper shipping name	-	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.. Marine pollutant (Fuels, diesel)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Fuels, diesel)
Transport hazard class(es)	-	9 	9 
Packing group	-	III	III
Environmental hazards	No.	Yes.	Yes.

Section 14. Transport information

Additional information	**Remarks** Combustible liquid Class C1 (AS 1940).	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. **Emergencyschedules** F-A, S-F	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

Special precautions for user Not available.

Transport in bulk according to IMO instruments

Proper shipping name MARPOL Annex 1 rules apply for bulk shipments by sea.
Category: gas oils, including ship's bunkers

Section 15. Regulatory information

Standard for the UniformScheduling of Medicines andPoisons

Not scheduled

Consumer products - This product is exempt per Appendix A of the SUSMP.
Industrial Products - Labelling requirements for SUSMP do not apply to a poison that is packed and sold solely for industrial, laboratory or manufacturing use. However, this product is labelled in accordance with NOSHC National Code of Practice for labelling of workplace substances.

Model Work Health and Safety Regulations-ScheduledSubstances

No listed substance

MontrealProtocol

Ingredient name	List name	Status
Not listed.		

Stockholm Convention on Persistent OrganicPollutants

Ingredient name	List name	Status
Not listed.		

Rotterdam Convention on Prior Informed Consent(PIC)

Ingredient name	List name	Status
Not listed.		

Internationallists

National inventory

REACH Status For the REACH status of this product please consult your company contact, as identified in Section 1.

Australia inventory (AICS) Contact local supplier or distributor.

Canada inventory At least one component is not listed in DSL but all such components are listed in NDSL.

China inventory (IECSC) Not determined.

Japan inventory (ENCS) Not determined.

Korea inventory (KECI) Not determined.

Philippines inventory (PICCS) **(TCSI)** Not determined.

Taiwan Chemical Substances Inventory Not determined.

Section 15. Regulatory information

United States inventory (TSCA 8b) All components are active or exempted

Section 16. Any other relevant information

History

Date of printing 5/14/2021

Date of issue/Date of revision 5/14/2021

Date of previous issue 12/12/2016

Version 2

Prepared by Product Stewardship

Key to abbreviations

ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
STEL = Short term exposure limit
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations
TWA = Time weighted average
VOC = Volatile Organic Compound
SADT = Self-Accelerating Decomposition Temperature
Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 4	On basis of test data
ACUTE TOXICITY (inhalation) - Category 4	Calculation method
SKIN CORROSION/IRRITATION - Category 2	Calculation method
CARCINOGENICITY - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2	Calculation method
ASPIRATION HAZARD - Category 1	Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the

material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

Appendix 3 – Standard Pollution Report Form CG77

A. **Classification** of report

   i. Doubtful

   ii. Probable

   iii. Confirmed

B. **Date** and **time** pollution observed/reported and identify observer/reporter.

C. **Position** and **extent** of pollution. (If possible, state range and bearing from some prominent landmark or Decca position and estimate amount of pollution, e.g. size of polluted area; number of tonnes of oil spilled; or number of containers, drums etc. lost. When appropriate, give position of observer relative to pollution).

D. **Tide** and **wind** – speed and direction.

E. **Weather** conditions and SEA state.

F. **Characteristics** of pollution. (Give type of pollution, e.g. oil, crude or otherwise; packaged or bulk chemicals; or garbage. For chemicals give proper name or United Nations Number, if known. For all, give also appearance, e.g. liquid; floating solid; liquid oil; semi-liquid sludge; tarry lumps; weathered oil; discolouration of sea; visible vapour; etc.).

G. **Source** and **cause** of pollution. (e.g. from vessel or other undertaking. If from vessel, say whether as a result of apparent discharge or a casualty. If the latter, give a brief description. Where possible, give name, type, size, nationality and Port of Registry of polluting vessel. If vessel is proceeding on its way, give course, speed and destination, if known).

H. Details of **vessels in the area. (**To be given if the polluter cannot be identified and the spill is considered to be of recent origin).

I. Whether **photographs** have been taken, and /or samples for analysis.

J. **Remedial action** taken, or intended, to deal with the spillage.

K. **Forecast** of likely effect of pollution. (E.g. arrival on beach, with estimated timing).

L. **Names** of those informed other than addresses.

M. Any **other** relevant information. (E.g. names of other witnesses, references to other instances of pollution pointing to source). Part 2 : Supplementary information to be provided later. (This section may be disregarded when POLREPS are for UK internal distribution only).

N. **Results of sample** analysis.

O. **Results of photographic** analysis.

P. **Results of supplementary enquiries** (E.g. inspection by surveyors, statements from ship's personnel etc., if applicable).

Q. Results of mathematical models.

CG77 POLREG Pollution Report Form

To MCGA – Humber
Copy to Agencies as required
From Broads Authority

Part 1 : Information which should be provided in an initial pollution report

A. **Classification of report**
(i) **doubtful** (ii) **probable** (iii) **confirmed**
(Delete as necessary)

B. **Date**: _____ **Time**: _____ **pollution observed**

Identity of observer/reporter _____

C. **Position of pollution**: _____
(by latitude and longitude if possible, state range and bearing from some prominent landmark)

Extent of pollution:_____**Litres/barrels/tonnes**

Size of polluted area_____**from:** _____
(from where sighted)
(estimated amount of pollution, e.g. size of polluted area, number of tonnes of oil spilled or number of containers. When appropriate position of observer)

D. **Wind Speed**_____**knots; direction from**: _____

Tidal status at time pollution observed:_____**after/before HW/LW**

E. **Weather conditions and sea state**:

_____**sea state/ wave height**_____**metres**

F. **Characteristics of pollution:**

Type: _____
(E.g. oil, crude, diesel, packaged bulk chemicals UN number if known, garbage)

Appearance: _____
(E.g. liquids, floating solid, liquid oil etc.)

G. **Sources of pollution**: _____
(from vessel or other undertaking)

Cause of pollution: _____
_____

(Apparent deliberate or casualty. If the latter give a brief description. Where possible name, type, size and nationally and Port of Registry or polluting vessel. If vessel underway gives course speed and destination if known).

H. **Details of other vessels in the area** _____
(to be given if the polluter cannot be identified and the spill is considered to be of recent origin)

I. **Photograph taken** Yes / No
Sample taken for analysis Yes / No

J. **Remedial action taken, intended to deal with spillage**:

_____

_____

K. **Forecast of likely effect of pollution**: _____

_____

L. **Names of those informed other than addresses**:

_____

_____

M. **Any other relevant information**: _____

_____

_____
(E.g. names of other witnesses, references to other instances of pollution)

Part 2 : Supplementary Information which should be provided Later
(this may be disregarded when POLREPS are for UK internal distribution only)

N. **Results of sample analysis**: _____

_____

O. **Results of photographic analysis** _____

_____

P. **Results of supplementary enquiries** _____

_____
(E.g. inspection by surveyors, statements from ship's personnel etc.)

Q. **Results of mathematical models**: _____

_____

_____

Appendix 4 – Incident log sheet

Incident:

Date:

Name:

Location:

Time	Details

SCIENTIFIC, TECHNICAL AND OPERATIONAL ADVICE NOTE - STOp 4/2001

IMPORTANT

This STOp notice replaces STOp 2/98, please destroy your copy of STOp 2/98

ADVICE TO LOCAL AUTHORITIES ON THE COLLECTION AND HANDLING OF OIL SAMPLES

Note: This document should be read in conjunction with:

- STOp 1/2001 - The Environment Group and Maritime pollution response in the UK.
- STOp 2/2001 - The Establishment, Management Structure, Roles and Responsibilities of a Shoreline Response Centre during a Maritime Pollution Incident in the United Kingdom.
- The National Contingency Plan for Marine Pollution from Shipping and Offshore Installations (NCP).

All extant MCA STOp notices may be found on the MCA web site: www.mcga.gov.uk **and** all enquiries regarding this and other MCA STOp notices should be directed to meor_meor@mcga.gov.uk

1. BACKGROUND

Where an oil pollution incident is thought to have arisen from an illegal operational discharge an effort should be made to collect a sample of the pollutant and, if possible, matching samples from the suspect ship or other source for analysis, comparison, and possible subsequent use in legal proceedings. Samples of the pollutant may need to be taken from the sea or coastline. When beach pollution has occurred, local authorities or HM Coastguard would usually take the necessary samples. For advice on sampling at sea, contact the Counter Pollution Branch of the Maritime and Coastguard Agency (MCA) on 02380 329483. This notice sets out the procedures to be followed when collecting and handling oil samples.

The MCA's Enforcement Unit will collect evidence concerning pollution incidents from shipping at sea, upon which a decision will be made as to prosecute or not. In England, Wales and Northern Ireland the MCA will conduct prosecutions. In Scotland the case will be presented to the Procurator Fiscal for action.

If samples are likely to be used in connection with legal proceedings then the following procedures should be implemented:

In England and Wales

Although a single sealed sample of each type of pollutant is required by law, MCA would prefer three samples to be collected.

In Scotland

There is no longer a legal requirement for three sealed samples of each type of pollutant in Scotland but as in England MCA recommend three samples: one for analysis, a second to be handed to the owner or master of the suspect vessel for retention and any appropriate action, and the third for production in court, where the prosecution will be handled by the local Procurator Fiscal.

In Northern Ireland

Although the law in Northern Ireland concerning this matter is the same as that in England and Wales, the Director of Public Prosecutions, who is responsible for handling prosecutions in Northern Ireland has asked that for the sake of safety, three sealed samples of each type of pollutant should be provided on the same basis as in Scotland.

Responsibility for the collection of oil samples in Northern Ireland rests with Environment and Heritage Service, Department of the Environment (Northern Ireland).

Samples will usually be requested by a scientist/mariner in the MCA's Counter Pollution Branch or one of the Principal Counter Pollution and Salvage Officers as part of the response to a reported incident. Once a sample has been taken, agreement must be obtained from the Counter Pollution Branch before it is analysed

Please remember that analysis of samples will only be carried out and paid for by the MCA if authorised by the Counter Pollution Branch.

Please note that organisations such as Ports and Harbours or the Environmental Regulator may be taking independent samples as part of their own individual responsibilities for oil spill response and pollution regulation. The analysis of the samples and the cost of analysis of such samples will be the responsibility of the organisation taking the sample and not the MCA.

2. SAMPLING FROM THE SEA & SHORELINE

When a large oil slick exists at sea or on a coastline, the number of samples that MCA may require is:

offshore spill - minimum of 1 sample / slick / day where possible,

onshore spill - representative samples from the shoreline, following discussion with Counter Pollution Branch .

Following an incident, attempts may be made to infer that not all the oil pollution came from one vessel, and that some of it may have come from other sources. Where therefore an oiled beach is being sampled, a careful and detailed examination of the beach should be made to determine the uniformity of the oil deposit and the extent to which it is polluted by more than one type of oil. In particular, if there are any tarry, semi-solid lumps or wet tarry patches, their presence should be recorded and some idea of their quantity and extent obtained. In addition, samples of such pollution should be retained and an attempt should be made to estimate costs expended on the clean up of different oils.

In cases where samples have been taken at intervals along the beach, these should be clearly identified (see section 6 on labelling). It is desirable that samples of oil are taken in the area where the oil is first washed ashore. This is helpful since the fresher the oil the easier it is to identify by laboratory techniques.

3. SIZE OF SAMPLES

Modern analytical methods mean that very little original pollutant is required to carry out most analyses. However, a larger sample is likely to be more representative. Detailed analyses are often hampered by either contamination or the loss of the oil's lighter fractions. A larger undisturbed sample may consist of a weathered oil crust covering a less weathered (holding a greater percentage of lighter fractions) and therefore more valuable sample. The recommended minimum quantities required for a detailed programme of analyses are:

Unweathered oils that are liquid and substantially free of water	10ml
Oil exposed to seas surface and forming water-in-oil emulsion "chocolate mousse"	10ml
Overside water discharge where contravention of 100ppm or 15ppm is suspected	1 litre of the discharge
Tarry lumps as found on beaches	10 grammes

A sample should not be withheld because the recommended quantity cannot be obtained, since much smaller samples can give useful results. In cases of pollution within UK territorial waters, when it is only necessary to prove that some oil has been discharged, a relatively small sample may be acceptable. Larger samples may be useful to carry out a range of tests to determine the most appropriate response/clean-up strategy. MCA can advise when and why such an approach is desirable

4. METHODS OF COLLECTING SAMPLES

When liquid samples are skimmed off the surface of the sea, care should be taken to ensure that the sample contains sufficient oil. Various techniques may be adopted to skim thin layers of oil from the waters' surface and consolidate using a bucket with a hole.

Care should be taken to minimise contamination of liquid samples by solid matter. Oil deposited on rocks or other impervious materials should be scraped off and placed directly into the sample container. Lumps of tarry or waxy pollutant should be placed directly into sample containers; no attempt should be made to heat

or melt these samples to enable them to flow into a container. The sample container should be sealed as soon as possible to minimise evaporation of the higher fractions.

Oil adhering to seaweed, small pieces of wood, sand, plastic, material, cloth, vegetation or other debris should be dealt with by placing the complete specimen comprising oil and support material into the sample container.

5. BOTTLING, SEALING, PACKAGING AND BOXING OF SAMPLES

All samples should be securely packed and sealed, using screw-topped containers and UN approved fibre board boxes to ensure safe carriage of the sample. These have been supplied to HM Coastguard Stations and MCA Marine Offices for use by MCA Staff. In consultation with CPB, MCA sampling bottles can be made available to local authorities.

As proof against unauthorised opening, the sample container should be sealed with wire and a lead or sealing wax seal. Alternatively, adhesive labels with a signature stuck on the bottle top in such a way that they have to be broken to open the bottle are acceptable.

The bottle should then be placed inside a plastic bag, which should be sealed with a further adhesive label in the same way as for the sample bottle to ensure that it is not tampered with.

If it is necessary to take an oil sample where one of the standard containers above is not available the receptacle should be of glass with a screw-cover and a seal which would not be affected by the oil. Small (100ml) and medium (500ml) glass bottles are readily obtainable from chemists or hardware shops.

The use of closed metal receptacles or plastic jars is strongly discouraged as contact with metal or plastic can, in some cases, interfere with the analysis. Avoid the use of any metal tool made of nickel or vanadium based alloys, as these metals occur naturally in crude oils and refined products and their levels may assist in the identification of the oil source.

When boxing the sealed samples for transport, the Peters and May (Dangerous Goods) Ltd, packing instructions should be followed, to ensure the integrity of the package for transport under Dangerous Goods regulations. Vermiculite should be used to surround the sample(s) in the box for added protection and to absorb any possible seepage. Make sure that the dangerous goods documentation is completed.

Whenever possible, samples should be stored in refrigerators or cold rooms at less than 5 degrees C in the dark. These precautions are particularly important for samples containing water or sediment, but less so for bulk oil samples.

When ordering sample bottles it is important to consider the following:

- Wide necked bottles make sampling easier.
- Sample security can be achieved with locking cap seal.
- Ensure that no components of the bottle can interfere with analysis, e.g. waxed cap inserts.

6. LABELLING AND ADDRESSING OF SAMPLES

Care should be taken to ensure that every sample bottle is not only suitably sealed but also clearly labelled before being submitted to the MCA for analysis. It is important that a sample is positively identified, particularly where more than one is taken during an incident. It is of vital importance to maintain continuity in the chain of evidence. MCA recommend that each sample is labelled *and* is accompanied by more

detailed information set out on a standard proforma. The form accompanying each container should therefore provide the following details: -

a. An identifying number: year 2 digits
month 2 digits
day 2 digits
and the initials of the official in charge of taking the samples.

For example 02/04/17/JS = Sample taken on 17th April 2002 by John Smith

b. Description of samples.

c. Position from which sample was taken, grid reference if possible.

d. Date and time of sampling.

e. Purpose for which sample was taken.

f. If known, suspected source, e.g. name of tanker or ship.

g. Whether or not dispersants have been used and, if known, their type and make.

h. Method of sampling (description of sampling device and any possible contamination).

h. Name, address and contact details of person taking the samples and of anyone witnessing the taking of it.

If possible the following information would also be helpful:

j. Wind direction and velocity.

k. Air and water temperature.

l. Sample descriptions, i.e. viscosity, colour and contaminants.

m. Description of the oil spill, i.e. distribution and consistency.

An example of the recommended oil pollution sample standard label can be found in Appendix A. The recommended sample form is at Appendix B.

To assist with any subsequent investigations it is important that a letter is sent to MCA quite independently of the sample (but a copy should be sent with the samples), setting out details a. to m, where available.

7. TRANSPORTATION OF SAMPLES

If a sample needs to be analysed the Counter Pollution Branch will contact their contractor to arrange for the sample to be collected by courier and analysed.

Please ensure that samples are labelled correctly and securely packed in UN approved boxes to avoid breakage. It is important that the standard proforma described in section 6 should also be included with the sample along with all carriage documentation. To facilitate sample transportation, clear information on the number of samples to be collected, the location they need to be collected from and a contact name and phone number must be given to Counter Pollution Branch.

8. HANDLING OF SAMPLES FOR BONN AGREEMENT STATES

In cases where samples are taken at the request of a contracting member of the Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil, the BONN Agreement, the Counter Pollution Branch would be the focal point for processing the samples for either analysis or onward transmission to the requesting member state. The results of such tests would not be made public until the contracting party involved was informed.

Appendix A : Oil Pollution Sample – Standard Label

OIL POLLUTION SAMPLE – STANDARD LABEL

ID No. Date/Time Location) (Grid Ref) Name and Address of person taking sample

.....

For continuity of evidence: Please complete clearly
Sample passed to:

Date Name Address Signature

.....

.....

.....

.....

OIL POLLUTION SAMPLE - STANDARD LABEL

ID No. Date/Time Location) (Grid Ref) Name and Address of person taking sample

.....

For continuity of evidence: Please complete clearly
Sample passed to:

Date Name Address Signature

.....

.....

.....

.....

OIL POLLUTION SAMPLE – STANDARD LABEL

ID No. Date/Time Location) (Grid Ref) Name and Address of person taking sample

.....

For continuity of evidence: Please complete clearly
Sample passed to:

Date Name Address Signature

.....

.....

.....

.....

OIL POLLUTION SAMPLE - STANDARD LABEL

ID No. Date/Time Location) (Grid Ref) Name and Address of person taking sample

.....

For continuity of evidence: Please complete clearly
Sample passed to:

Date Name Address Signature

.....

.....

.....

.....

Appendix B : Oil Pollution Sample – Standard Form

Collection of oil samples - This form to be completed by person taking sample If in doubt please refer to MCA STOp Notice on sampling. Remember to complete sample jar label and sign		
A	ID Number - YY/MM/DD - with initials of person taking sample	
B	Sample description	
C	Location of sample – OS Grid Ref or Lat/Long if possible	
D	Date and time of sample collection	
E	Purpose for which sample was taken	
F	If known, suspected source	
G	Were dispersants used?	
H	Method of sampling (device?)	
I	Name, address, e-mail address & Tel No of person taking sample and any witnesses	
If possible the following information would also be helpful		
J	Wind speed and direction	
K	Air and Sea Temperature	
L	Sample description, viscosity, colour, any contaminants?	
M	Description of the oil spill, distribution and consistency	
Original form to be kept with sample - please send copy of the form to the Counter Pollution Branch of the MCA - Bay 1/11, Spring Place, 105 Commercial Road, Southampton, SO15 1EG Tel:023 8032 9485		

SCIENTIFIC, TECHNICAL AND OPERATIONAL GUIDANCE NOTE - STOp 1/98

This note is intended to provide general guidance to assist local authorities develop a framework for Health and Safety policy.

HEALTH, SAFETY & WELFARE DURING SHORELINE CLEAN-UP

1. INTRODUCTION

The Department of Environment, Transport and the Regions (DETR), through the Maritime and Coastguard Agency (MCA), exercises the responsibilities accepted by Central Government for dealing with pollution at sea from ships and for assistance to local authorities in preparing for and dealing with shoreline pollution from ships.

MCA has a key role to play in responding to shoreline pollution incidents arising from spills of oil or other hazardous substances from ships into the marine environment. Whilst the response to such incidents is time-critical, there are health and safety responsibilities for all parties which must be understood and recognised as part of the co-ordinated response.

The purpose of this STOp Note is to confirm and clarify those arrangements for major spill clean-up operations, and to provide additional guidance to local authorities on information which may be included in emergency and spill response plans. It is also hoped that the guidance contained in the STOp Note will be of assistance to local authorities and other organisations dealing with minor clean-up operations.

Experience gained from the SEA EMPRESS spill has also been reviewed and incorporated as appropriate in the STOp Note. An annex to the Note includes in summary form some of the key lessons from the SEA EMPRESS spill (see annex 1). Annexes 2-7 include further general assistance for local authority emergency planning and safety officers and advisers on hazard management and risk control.

2 LEGAL BACKGROUND

The Health and Safety at Work Act 1974 is the key legislation relating to health and safety matters in the UK. The Act establishes a number of duties and responsibilities, which can be summarised as follows:

Employers have a duty to establish and maintain a safe system of work,

Employers must take all reasonably practicable steps to protect the health safety and welfare of their employees and others including the public,

Employers must prepare and maintain written safety policies,

Employees have a duty to comply with all health and safety instructions and requirements and not to put either their own or anyone else's health, safety and welfare at risk.

The 1974 Act is supported by a great many sets of Regulations and other relevant statutory provisions. In respect of shoreline operations the most relevant (but not the only ones) are listed in annex 2.

3 ROLES

Please refer to the National Contingency Plan (NCP) for Marine Pollution from Shipping and Offshore Installations January 2000, for more detailed information.

MCA

The MCA produces, and is responsible for maintaining and updating the NCP, providing policy; operational and administrative advice to those involved with marine oil spills. The NCP also includes advice to local authorities on the content of their local emergency and spill response plans. This information is supported and augmented where necessary by STOp Notes.

Throughout an oil pollution incident, MCA will liaise with the local authority to ensure proper co-ordination of operations and health and safety. The MCA is also responsible for ensuring that any equipment or material it provides in respect of shoreline clean-up, meets current safety requirements.

Local Authorities
Local authorities are responsible for the creation of emergency response plans and for ensuring that appropriate health and safety information is included. Where local authorities undertake to prepare and apply oil spill contingency plans, the plans must address health and safety considerations. Where maritime local authorities undertake shoreline clean-up operations, they will be responsible for dealing with the clean-up and as a consequence for overall management of health and safety issues. For major incidents this is likely to be the appropriate Unitary, County or Regional authority or the Environment and Heritage Service in Northern Ireland. (In areas where District Councils still exist the District authority may deal with small-scale incidents.) Under the NCP it is the local authority that would make the request for a Shoreline Response Centre (SRC) to be established, and chairs the SRC once established.

Stockpile operators
In the event of an incident the MCA may require the stockpile operator to go to the scene with appropriate material drawn from the stockpile and specialist personnel. Where required by the MCA, usually at the request of the local authority, the stockpile operator will deploy their personnel and equipment on clean-up operations. In addition to mobilising MCA equipment to be operated by their own personnel, the stockpile operator will also provide equipment and materials for use by local authority personnel, and will ensure that appropriate operational and safety instructions and training are given.

Oil spill contractors
Oil spill contractors can provide oil clean-up equipment and personnel under commercial contracts. In addition to specialist equipment to be operated by their own personnel the contractor may provide equipment and materials for use by local authority personnel under their guidance. During shoreline operations, contractors must liaise with the local authority, via the SRC, to ensure proper co-ordination of operations and health and safety.

4 GENERAL COMMENTS ON HEALTH AND SAFETY MANAGEMENT ARRANGEMENTS

There should be clear and documented arrangements for health and safety management during shoreline incidents. During small-scale incidents, where local resources are adequate to deal with the incident, it is assumed that existing local authority management arrangements and systems will provide suitable health and safety management and control.

In operations which involve a number of organisations, and in particular where a SRC is established, each organisation involved has a statutory duty to safeguard the health, safety and welfare of its employees and others. However, the overall co-ordination of health and safety management rests with the local authority via the SRC.

Key to these arrangements will be two documents. First, the emergency spill response plan which should contain information on proposed health and safety management arrangements in the event of a spill. And second, the health and safety file, which should provide a record of actual health and safety arrangements, provisions and decisions in the event of the plan, being activated.

5 MANAGEMENT APPROACH FOR MAJOR INCIDENTS

The management approach recommended is based on that established by the Construction (Design and Management) Regulations 1994 (CDM Regs) for construction sites. These regulations implement the objectives of the EC Directive dealing with safety on temporary or mobile construction sites.

The reasons behind the adoption of the CDM Regs as a model are the many similarities between the organisational and operational issues encountered on both major shoreline clean-up and construction projects. The main similarities are:

Both involve temporary work sites,

Both involve multiple organisations on-site,

Both can involve significant numbers of personnel,

Both involve similar plant and equipment.

However it must be borne in mind that whilst the CDM Regs are considered to represent a recommended management model, the regulations may not legally apply to any or all aspects of a clean-up operation. Also there will be detailed requirements and terminology within the regulations, which may have no parallel or equivalent in general shoreline clean-up operations.

It should also be noted that under most organisations' health and safety policy statements it is incumbent on those responsible for managing the clean-up operation to inform any trade union safety representative of their health and safety arrangements and proposed operations. In protracted operations, the SRC should be aware that safety representatives have the legal right to undertake safety inspections. Consideration should be given to liaison with the Area Health Authority and the Health and Safety Executive and to the keeping of proper records.

6 SCALES AND PHASES OF OPERATIONS

Scales of operation
For the purposes of this STOp Note clean-up operations will be considered to be one of the following:

> Minimal - Can be dealt with by the shoreline authority and requires no additional assets. Operationally, unlikely to require more than a few days to complete.
>
> Minor - Does not require the mobilisation of an SRC, but may require the deployment of additional assets with the assistance of the MCA. Operations likely to extent from a few days to a few weeks could arise from a shipping casualty or an operational discharge.
> Major - Requires the mobilisation of an SRC and multi-organisation clean-up operations. The overall operation is likely to be of many weeks duration, requiring the long-term presence on-site of equipment and personnel. Usually resulting from a major loss of cargo associated with a shipping casualty.

Phases of operation
For the purposes of this STOp Note major operations will be considered to consist of 5 phases.

Phase 1: Pre-incident planning and training. This includes the preparation of the oil spill and emergency response plan; training of personnel, and exercises. (the bulk of the advice in this STOp Note relates to this phase).

Phase 2: Mobilisation. This is the first operational phase and covers the action required to mobilise the emergency response plan, including establishing the SRC and mobilising initial assets for deployment. Typically this will be of 24-48 hours duration.

Phase 3: Emergency operations. This, the second operational phase, includes all operations to collect status data, i.e. determining the extent of the incident and priorities, and to minimise further damage, or risk of damage. Typically this phase may last 5 to 7 days.

Phase 4: Clean-up and recovery phase. Once the emergency phase is over the operation will move into the final operational phase, which may last days, weeks or even months. This phase will constitute the major phase of any operation and will include the majority of clean-up and recovery activity.

Phase 5: Post incident review. - Lessons learnt from the incident must be collated and fed back to inform future planning and training.

7 Pre-incident planning and training (Phase 1)

Emergency and spill response plans

Details describing the proposed arrangements for health and safety management and co-ordination should be included in contingency and emergency response plans with particular reference to the resourcing and organisation of the SRC. The management of health and safety clean-up operations issues rests with the Technical Team of the SRC.

All emergency and spill response plans should contain relevant information on health and safety responsibilities and management arrangements in the event of the plan being activated. Information should be provided on the following key areas:

General health & safety responsibilities during incidents

The plan must contain a statement that the local authority has overall responsibility for health and safety management and co-ordination during an incident. However the plan should also make it clear that this does not affect other organisations statutory responsibilities under health and safety legislation. In any situation, which is not specifically covered by the plan, it should be assumed that the organisation or body having the overall management control for that situation also has health and safety management responsibility.

Health & safety management arrangements during incidents

The plan must show the arrangements for health and safety management during an incident. In the event of a major incident the local authority should ensure that competent personnel are present at, or accessible to, the SRC to advise on health and safety issues. In practice all local authorities have appointed safety officers. It is considered appropriate that the local authority safety officer(s) should be the competent person in respect of health and safety management during incidents.

In addition on-site supervisory staff (i.e. Beach Masters) must be competent in both the use of clean-up equipment and relevant health and safety procedures and precautions. Beach Masters will be responsible for ensuring that all personnel under their supervision have been provided with relevant safety equipment, information and guidance.

There should be a meeting of Beach Masters at the SRC at least once a week to review operational and safety management experiences over the preceding week and review plans for the forthcoming week. In a given operation the SRC will determine the actual frequency of meetings and briefings.

Where a Beach Master takes over a specific site or existing operation there should be a formal hand over process. This process should be recorded and logged.

Nature of hazards likely to be encountered

The plan should contain information on hazards likely to be encountered, relevant safety information including information for staff, and copies of any safety check lists or schedules of safety equipment. In addition details of sources of information and specialist advice should also be included. Copies of this information should be placed on the health and safety file if an operation is commenced.

The hazards can be broadly divided into four categories. Annexes 4-7 include further general assistance for local authority safety officers on hazard management and risk control for these categories.

Hazards associated with normal work practices (see annex 4)

Hazards associated with difficult access arrangements (see annex 5)

Hazards associated with clean-up equipment and materials (see annex 6)

Hazards associated with the spill material (see annex 7)

Health and safety file

The spill response plan should detail responsibilities for the maintenance of a health and safety file, and may also describe typical contents, e.g. hazard information, health and safety contacts and telephone numbers, risk assessments, etc. At the commencement of operations a health and safety file for the operation should be established and held for the duration of the operation at the SRC. The file will be the responsibility of the local authority. The maintenance of the health and safety file is the responsibility of the competent person. The competent person should ensure that copies of all health and safety relevant information is maintained on the file and that at the end of the operation the file is kept with the operation archive.

It is a duty to record all accidents and incidents. Copies of all accidents and incidents during a clean-up operation should be provided to the SRC.

In the event of an accident, dangerous occurrence, or other incident requiring notification under Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) the information should be recorded and reported by the employing organisation to the appropriate enforcing authority.

Risk assessments

Most clean-up operations use standard techniques, equipment, and material as detailed in 'Oil spill clean-up of the coastline. A technical manual' MCA 1994. Health and safety risk assessments, as required by statute, of standard clean-up operations and techniques should have been carried out by the various organisations holding or deploying equipment during an incident. These risk assessments will identify safety requirements and provisions to be adopted during operations.

Local authorities may wish to include copies of appropriate risk assessments in their contingency plan.

Health & safety policies and related documentation

Local authorities are advised to review their written safety policies and related documentation to ensure that appropriate information is included regarding health and safety issues arising from spill clean-up.

Where local authorities intend to use spill contractors they should, as part of the specification of contract, request copies of the contractors' written health and safety policy and relevant safety information including details of safety procedures and precautions, staff training, and arrangements for supervision and management. Careful consideration should be exercised with contractors using casual labour.

Training events and exercises

Training events and exercises are designed to build individual skill and competencies and to test the organisational arrangements for spill and clean-up management. In all cases the opportunity

should be taken to incorporate health and safety considerations.

Beach Masters should have attended at least one accredited training course on clean-up techniques and operations, or have gained sufficient and similar experience during the course of an oil spill incident. For protracted operations it is likely that some personnel will gain sufficient experience during the earlier stages of the operation to be considered for the Beach Master role during a later stage of the same operation.

8 THE OPERATIONAL AND POST OPERATION PHASES

Mobilisation (Phase 2)
This covers the actions required to mobilise the emergency response plan, including establishing the SRC and mobilising initial assets for deployment. The key health and safety task for this phase will be to establish the initial management arrangements at the SRC and collate safety relevant information. Annex 3 contains a suggestion for the main actions that should be considered.

Emergency operations (Phase 3)
This includes all operations to collect status data, i.e. surveys to determining the extent of the incident and priorities, and to minimise further damage, or risk of damage. Key health and safety tasks for this stage will be to carry out risk assessments for the proposed activities, or to review existing risk assessments where these were prepared for the emergency plan, and to ensure appropriate safety induction of personnel and organisations as they are introduced to the operation.

Clean-up and recovery (Phase 4)
Once the emergency phase is over the operation will move into the final operational phase, which may last days, weeks or even months. This phase will constitute the major phase of any operation and will include the majority of clean-up and recovery activity. What distinguishes this phase from the previous one is the opportunity and ability to forward plan operations.
In this phase the operation can be considered (in health and safety terms) as a conventional project. Key health and safety tasks will be to ensure that appropriate health and safety requirements are being adhered to, reviewing health and safety performance and risk assessments as appropriate, and providing specialist advice when changes to work practices are required or are proposed.

It is unlikely that additional specific risk assessment would be carried out for every beach or section of shoreline. Health and safety measures therefore rely on generic risk assessments of standard operational techniques. However, supervisory staff on operations must be competent to decide in a given situation when it is unsafe to proceed or when safety considerations dictate that specific additional safety measures are required. In such circumstances the competent person, with assistance as required, may require a particular additional assessment and monitoring of a specific hazard or situation.

Post operations review (Phase 5)
It is essential that there should be a post operation review so that the lessons learned from the operation can be incorporated in the inevitable revision of the emergency plan. It is requested that a summary of such lessons and experience be produced and provided to MCA. The MCA will then incorporate specific experience in both training events and guidance issued.

9 SOURCES OF SPECIALIST ASSISTANCE AND ADVICE

During incidents specialist advice will be available as required from the MCA and specialist stockpile operators. As well as the emergency services, the County (or Council) Waste Disposal Officer, the Environment Agency, SEPA in Scotland, EHS in Northern Ireland, the Health and Safety Executive (HSE), oil companies - via United Kingdom Petroleum Industry Association –

(UKPIA) and safety advisors from the owners of the cargo or vessel. In addition, general health and safety information on dispersants, demulsifiers, and detergents is available from the Ministry of Agriculture Fisheries and Food (MAFF) and details are included in the current review of testing, approval and use.

Names and addresses for specialist advice should be included in the emergency response plan with copies in the health and safety file during operations. Details of any specific requests for assistance or advice, and relevant responses, should be held in the health and safety file.

10 USEFUL CONTACTS

HSE - HSE Information Centre, Broad Lane, Sheffield, S3 7HQ

United Kingdom Petroleum Industry Association (UKPIA) - 9 Kingsway, London, WC2B 6XH

MAFF - Marine Environmental Protection Division, Room 629, Nobel House, 17 Smith Square, London, SW1P 3JR

SOAEFD - Scottish Office Agriculture Environment and Fisheries Department, Pentland House, 47 Robbs Loan, Edinburgh, EH14 1TY

11 SELECTED BIBLIOGRAPHY

There are many sources of further information and advice. The publications listed below should be considered as typical, and not exhaustive.

Information on specific hazards and risks associated with materials and substances, including legal requirements and exposure limits.

Croner's Substances Hazardous to Health.

Numerous papers providing general information of clean-up hazards and risks, and occupational exposures and control.

Proceedings of the Bi-annual Oil Spill Conference. American Petroleum Institute.

Guidance and advice on clean-up and disposal techniques, including related health and safety information.

Oil spill clean-up of the coastline - a technical manual MCA 1994.

Guidelines on the use of oil spill dispersants. Institute of Petroleum.

CONCAWE Report No 9/80 Disposal Techniques for Spilt Oil.

Occupational Health Implications of Crude Oil Exposure: Literature Review and Research Needs. Marine Spill Response Corporation, Washington, DC MRSC Technical Report Series 93-007.

In addition the HSE publish a wide range of documents which may be of assistance. Any HSE publication (and the HSE publication catalogue) can be obtained from:

HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 6FS, Tel 01787 881165

ANNEX 1

Selected Health, Safety & Welfare lessons arising from the SEA EMPRESS spill

Management

1 SRC

A member of the SRC should be the nominated safety officer for the incident. This role will include the responsibility to ensure that health, safety and welfare issues are considered at appropriate stages of the incident and to identify when additional advice and assistance might be required.

2 WELFARE

For protracted incidents there needs to be careful consideration of welfare provision for personnel, e.g. feeding, transport, water, sanitation, washing facilities, waste management etc. It is suggested that the voluntary sector can be rapidly mobilised to provide certain welfare services for the first week of an incident. After which alternative arrangements should come into force utilising local authority or contractors. i.e. there is a 1-week period at the beginning of the incident within which to mobilise the preferred medium to long term arrangements.

3 BEACH MASTERS

Health, safety and welfare on individual beaches should be the responsibility of the Beach Master. Beach Masters should have the authority within their area of beach or shoreline to stop any unsafe practices or activity. All Beach Masters, regardless of alternative provision, should also be able to provide first aid cover. There should be a weekly meeting of Beach Masters to review operations and health, safety and welfare issues. On sustained incidents personnel can gain Beach Master status through operational experience.

Technical Information

4 COSHH DATA FOR CRUDES, REFINED PRODUCTS, AND CLEAN-UP MATERIAL.

This information should be held, or accessible, centrally by the MCA so relevant information can be faxed to the SRC once it is known from the manifest what materials are being dealt with. It will also be necessary to obtain amended advice for weathered material where inhalation hazards are greatly reduced after 24 hours from spill release.

5 ADDITIONAL RISK ASSESSMENTS

Additional health and safety risk assessments may be required where there are particular difficulties or constraints, which necessitate unorthodox working arrangements. For instance there may be no conventional landside access to some sections of shoreline. In such situations it may be necessary to mechanically lift in and out equipment and personnel or gain access from the sea. The SRC has to come to a decision, balancing the imperative for clean-up against potential increased risk to personnel and increased costs, on when such clean-up goes ahead and what techniques will be used.

6 ADJOINING SITES

Working on beaches and shorelines adjacent to ports, harbours, docks and other industrial usage may pose additional hazards, which are not immediately apparent. Risks may arise where access to the particular beach or shoreline is via such premises. Even when the current usage presents little or no additional risk there may have been historical usage, which should be considered. In

such situations advice should be sought from the current occupier of the site as to any additional precautions that might be advisable, or in the case of vacant sites the local Environmental Health Department or local Environment Agency Office may be able to provide relevant advice.

Specific Hazards & Risks

7 TRENCHING

When trench and backfill techniques are used on sand beaches the trenched area requires time to stabilise before it can safely take traffic. Depending on the nature of the beach, and vehicle, at least 4 days is typically required for the beach to stabilise after backfilling to allow further vehicular traffic. A backfilled area may also take up to 4 days to stabilise sufficiently to allow pedestrian traffic. Caution should always be exercised on backfilled areas until it is known that there has been sufficient stabilisation, and there should be appropriate signs displayed on the main entrance points to the beach. Physical barriers may need to be considered.

8 BURIED OIL

Where oil has been intentionally buried, or otherwise covered up by beach material, it is possible for the oil to be liberated sometime after the incident. This will normally be as a result of beach stripping of dynamic beaches by energetic sea conditions. If the beach is an amenity beach there could be risk to the public or the oil could be re-mobilised by tides to contaminate other nearby beaches. Whilst this may be unavoidable, appropriate information for beach users should be displayed. Sites and approximate quantities of buried oil should be recorded.

9 HEAVY SEAS

Working on beaches in heavy seas, i.e. big rollers, requires special care. During heavy seas personnel should be deployed on tasks higher up the beach so as to maintain a safe distance from the waters' edge.

10 LARGE BOULDER FIELDS

During the SEA EMPRESS incident slips and falls on boulders were the second most frequent cause of injuries. Contaminated boulder beaches, or beaches with extensive boulder fields require additional care. Boulders, which may already be worn smooth by tidal action, become very slippery when covered in oil and can become almost impossible for pedestrian traffic. When planning an in-situ clean-up the first stages of the clean-up should concentrate on creating safe access for the personnel involved with the clean-up-operation.

11 ROCK PLATFORMS

In the event that personnel have to work from rock platforms, which may themselves be contaminated with oil material, it is essential that suitable provision must be made to reduce the likelihood of, and protect against the consequences of, falls. Additional risk assessments are necessary and consideration must be given prior to the commencement of activity to the provision and use of appropriate harnesses and other safety equipment.

12 PERSONAL PROTECTIVE EQUIPMENT (PPE)

All personnel should be issued with an agreed standard kit of PPE which will include clothing to prevent skin or soft tissue contact, safety footwear and headgear etc. and which should be worn at all times. In addition there should be additional PPE available, which would be called upon by the Beach Master and issued in accordance with any specific activities or risks that are encountered. (NB see note about PPE in hot weather -heat exhaustion).

13 HEAT EXHAUSTION AND HYPOTHERMIA

In extreme weather conditions personnel may be subject to the risk of either heat exhaustion or hypothermia. Beach Masters must be vigilant in adverse or extreme weather conditions for evidence of either effect. In the case of extreme weather conditions the SRC should ensure that routine reminders are issued to Beach Masters regarding this issue, and to consider when a suspension of certain activities might be a sensible precaution. In hot conditions Beach Masters should also be vigilant that personnel do not remove PPE, that an effective sunscreen is used where necessary and there are adequate rest breaks and availability of drink to prevent dehydration.

14 WATER QUALITY FOR BATHERS

During oil spills there will inevitable be hydrocarbons in the water column for sometime after the spill. At present whilst there are arrangements to formally prevent fish stocks from contaminated waters finding their way into the food chain, there does not appear to be similar formal arrangements to prevent the recreational use of affected waters. The local environmental health department is responsible under their statutory responsibilities to provide any clearance testing of waters for recreational use.

15 MONITORING OF AIRBORNE VOLATILE ORGANIC COMPOUNDS (VOCS)

Occupational monitoring of VOCs may be required under certain circumstances, particularly in the first hours after a spill when volatile components and particularly benzene may be released. However, given that activities take place in an open environment, it could be difficult to obtain representative exposure levels for staff without personal dose monitoring. As a consequence there may be a need to differentiate between monitoring required for occupational exposure and any general monitoring of environmental levels which may be relevant for assessing any increase in potential risk to the local population.

16 MARINE OPERATIONS

Information regarding any marine operations, which may impact on personnel on the shoreline, must be provided to the SRC. This could include, for example, a schedule of flights and locations for aerial application of dispersant.

ANNEX 2

Health and safety regulations, which are likely to apply to major, clean-up operations

First Aid at Work Regulations 1981

Noise at Work Regulations 1989

Management of Health and Safety at Work Regulations 1992

Manual Handling Operations Regulations 1992

Personal Protective Equipment at Work Regulations 1992

The Provision and Use of Work Equipment Regulations 1992

Personal Protective Equipment (Amendment) Regulations 1994

The Control of Substances Hazardous to Health Regulations 1994

Construction (Design and Management) Regulations 1994

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995

Construction (Health, Safety and Welfare) Regulations 1996

(NB each set of Regulations listed has a companion Approved Code of Practice or Guidance on Regulations.)

ANNEX 3

Initial actions in the event of mobilising the SRC for the Health and Safety Officer

1 HEALTH AND SAFETY FILE - set up the health and safety file for the operation and establish arrangements for its maintenance.

2 CARGO DETAILS - Secure information on type of material(s), total tonnage etc., estimate of tonnage spill to date. Copies of relevant hazard sheets from owner/consignee via the MCA. File in H&S file.

3 TIME OF INCIDENT - Time of first release, duration of material at sea and exposed to elements and wave action etc. Review likely impact on risk. File in H&S file.

4 WEATHER REPORTS - Weather forecast for the next 24 hours including sea conditions, obtain regular updates via the SRC. Review likely impact on risk. File in H&S file.

5 MARINE OPERATIONS - Summary of action to date, details of any material used to break up or disperse spill. Quantity used, where and when applied. Relevant hazard sheets via the MCA. Establish communications via the SRC to ensure up-dates on material usage during marine operations.

6 BEACH MASTERS - Identify Beach Masters, prepare and provide an initial safety briefing. Plan for attendance at weekly Beach Master briefings.

7 INDUCTION ARRANGEMENTS - Establish arrangements for safety induction of staff and personnel. Induction arrangements to cover the management and supervisory arrangements on-site, and principal hazards and issues.

ANNEX 4

Hazards associated with normal work practices

Local authorities should review their safety policies, related documentation, and instructions to ensure that the following hazards and issues are adequately dealt with in both their emergency plans and normal working instructions:

Lifting and manual handling,

Working with and around vehicles,

Working with and around chemicals,

Working with and around noisy equipment,

Personal Protective Equipment and clothing,

Welfare provision for site, or remote, working,

Working in extremes of temperature and weather,

Supervision for site and remote working,

First aid arrangements,

Reporting procedures.

(NB this should not be taken as an exhaustive list).

All the above are hazards or issues which may be encountered on most working days by local authority staff and should therefore already be dealt with in appropriate safety training, documentation, and instruction. In addition, local authority supervisory staff should also be familiar with these issues and their management.

ANNEX 5

Hazards associated with difficult access arrangements

In some situations it may be necessary to work on sections of the shoreline where there is no conventional vehicular or pedestrian access. In these situations it is likely that landside access may be effected by cranes and cradles, whilst marine side access may be possible using suitable shallow draft boats and other craft. In any event an operation which necessitates special access arrangements must introduce additional risks and hazards. Therefore it is appropriate that all proposed arrangements be reviewed from a safety management point of view before activities are commenced.

In some situations a review may result in an operational decision to abort any plans to clean-up an individual beach or section of shoreline where risks to staff were considered to be unacceptable. Whilst this may give rise to recurrent problems elsewhere, if oil becomes re-mobilised, it may be justified for operational and safety reasons. It is also considered essential to liaise with, and take advice from, the local Coastguard organisation in any situation where special access arrangements are proposed.

Where an operation proceeds then the SRC and Beach master should ensure **that as a minimum** the following issues and arrangements should be adequately provided for and documented in addition to the general guidance on health and safety described elsewhere in this STOp Note.

PPE: This will include items such as appropriate safety harnesses and rigs for cliff top access and personal flotation devices for marine-side access. Staff must be fully conversant with the use of such equipment.

Rescue: In the event of a safety incident it is likely that specialist assistance will be required from HM Coastguard. Experience to date indicates that it is appropriate to have the cliff rescue team in attendance for any situations where cliff top access is required. Likewise, in the event of marine side access a safety vessel should be in attendance.

Supervision: Operational supervision on difficult access sites is critical to the safe and timely completion of the work. Beach masters in such situations must be able to assess both the operational needs of the clean-up on a day to day basis and the particular safety precautions and requirements. On extended operations the SRC may decide to nominate a specific person who will act as safety advisor/officer for all difficult access sites.

Notification: The SRC must be kept informed of the commencement and progress of clean-up activities at any difficult access site.

ANNEX 6

Hazards associated with specialist clean-up equipment and materials

Dispersants: Dispersant is most likely to be applied on shoreline operations from knapsack sprayers, the beachguard super, or the WSL beach sprayer. Dispersants represent a range of hazards during use, these can be addressed by adequate training, supervision and PPE provision. The Institute of Petroleum recommends the following PPE for those involved with spraying operations:

Full cover plastic overalls,

PVC gloves,

Close fitting face visor fitted to a safety helmet,

Chemical resistant safety footwear.

If a safety helmet is not provided then protective eye-goggles should be worn along with a suitably close fitting mouth and nose mask. The PPE is designed to eliminate the contact of dispersant material with unprotected skin or eyes and to prevent inhalation of vapours or droplets. This should form the basis of standard PPE provision for all staff working on shoreline clean-up. In addition the simple precaution of ensuring that personnel always work up-wind of spraying operations should be adopted as a matter of routine.

All manufacturers and suppliers of dispersants and related material provide comprehensive hazard information with their products, and stockpile operators have carried out COSHH assessments.

Heat: A number of pieces of specialist equipment use heat, usually via steam, to raise the temperature of recovered oils in order to reduce the effective viscosity. Any equipment running at steam temperature must be adequately supervised and steps must be taken to ensure that workers are kept away from any equipment, which might represent a risk of burns or scalds.

Mechanical clean-up devices (mops): Mechanical mops present a number of hazards including machinery, oils, and heat. In addition to adequate operator training, there are two simple precautions, which will eliminate most risks. The first is to ensure that all moving parts are properly guarded or shrouded, and second ensure that all non-essential personnel are kept a safe distance from the mops. Where mechanical mops are in use then areas should be cordoned-off to prevent other personnel approaching the machinery out of curiosity or ignorance.

Argocats: these are specialist multi-wheeled vehicles for moving personnel and equipment across beaches and other similar surfaces with poor or uncertain load bearing characteristics. Particular care must be taken to ensure that all drivers of beach cats are familiar with the limitations of the vehicle, particularly in respect of suitable ground conditions and slope negotiation.

Information: All personnel on the beach should be appraised of hazards associated with clean-up equipment and materials and therefore why they should only operate with such material, or near such material, after appropriate training and with adequate supervision.

NB this is not an exhaustive list of hazards, but covers the most likely hazards to be encountered on beach clean-up from specialist equipment. Further advice and information on the equipment and techniques that may be deployed will be found in the MCA technical manual ‘Oil spill clean-up of the coastline’ MCA 1994.

ANNEX 7

Hazards associated with the spill material

General overview

Hazards for crude and refined products include both acute and chronic effects. Whilst the major concern continues to be exposure to benzene there are a number of other components such as napthas which may also be present. Principle risks exist through the inhalation of vapours or skin and soft tissue contact. Conditions, which may result, include respiratory and dermatological reactions. (See Croner's 'Substances Hazardous to Health').

Weathering effects

Existing information indicates that most volatiles are driven off from refined products within the first few hours of the spill, and from crude products within 8 hours or so. This period may be extended where there are particularly calm cool conditions and the spill is contained such that it is unable to spread to a thin film. Even so evidence is available that most if not all benzene has been volatilised and lost within a 24-hour period. As a consequence inhalation risks are usually considered to be negligible after the first 24 hours or so, leaving skin and soft tissue contact as the major hazard of concern.

NB Exposure to petroleum components such as benzene may also be as a direct result of equipment used, and it may be impracticable to isolate the cause of any exposure.

This information should be taken as a general guide because of the wide formulation of both refined products and transported crudes - useful references include papers presented at the 1989 and 1993 Oil Spill Conferences and subsequently published in the proceedings[1&2], and ASTMS Standards[3], available via MCA. Local authority safety officers wishing to understand more fully the technical arguments involved are advised to obtain copies.

PPE

When dealing with material in the early stages of a spill, e.g. the first day, it will be necessary to provide PPE as described elsewhere and appropriate respiratory protective equipment. In addition there should be effective segregation of any affected areas so that only those staff with an operational reason to do so, e.g. beach assessment, are exposed to any potential risk.

Adequate staff information and PPE will provide appropriate controls for skin and soft tissue contact route, provided Beach Masters are vigilant regarding both the behaviour of personnel on the beach and the use of PPE.

1, Eley, Morris, Hereth and Lewis 1989. Is overexposure to benzene likely during crude oil spill responses? *Proceedings of the 1989 Oil Spill Conference,* API, Washington DC, pp 127 – 129.

2, Whipple, Glenn, Ocken and Ott. 1993. A program approach for site safety at oil spills. *Proceedings of the 1993 oil spill conference, API, Washington DC, pp 99 – 104.*

3, Standard guide for health and safety training of oil responders. F 1644 – 95, November 1995, American Society for Testing and Materials (ASTMS) Sub-committee F20.21.

Monitoring issues

As discussed elsewhere in the STOp Note there may arise situations where monitoring of Benzene or VOC levels in air may be required. Where this is specifically required for occupational reasons then a personal monitoring device such as a portable photo-ionisation detector (PID) monitor should be employed to give both the Short Term Exposure Level and the Time Weighted Average Exposure. Most types will provide up to 10 hours monitoring time and the ability to record period maxima and averages, and are intrinsically safe. The more sophisticated equipment also has the ability to store information for subsequent downloading to a PC running a spreadsheet such as Excel, and both visual and audible alarms.

PIDs would be particularly applicable in the earliest stages of spill response, or where elevated levels may be suspected. The change in the nature of any risk after 24 hours elapsed time from the spill indicates that the wider routine use of PIDs in subsequent stages of a clean-up operation is not required.

If required, a more cost-effective option for routine monitoring would be to use 8-hour Draeger tubes and personal monitors. This could be backed up by spot readings taken with more sensitive and accurate equipment.

Health surveillance

Chronic exposure to many components of crude and refined products results in known or assumed carcinogenic effects. However, given the likely exposure levels during most clean-up operations, where exposure would be negligible, health surveillance is not warranted. The exception to this would be where exposures are non-negligible which may include the first 24 hours after the spill, or where the oil has been confined and volatilisation has been delayed. In these circumstances, depending on exposure levels, health surveillance of staff may be warranted. In any event it is a sensible precaution to exclude any staff with a history of skin or respiratory disorders, including asthma, from working on contaminated beaches or directly with recovered oil, oiled beach material, or other contaminated material.

SCIENTIFIC, TECHNICAL AND OPERATIONAL ADVICE NOTE STOp 4/09

GUIDELINES FOR THE PREPARATION OF COASTAL AND ESTUARINE BOOMING PLANS

The Environment Agency
Rio House
Waterside Drive
Aztec West
Bristol
BS32 4UD

The Northern Ireland Environment Agency
Klondyke Building, Cromac Avenue
Gasworks Business Park
Lower Ormeau Road,
Belfast, BT7 2JA

The Maritime and Coastguard Agency
Spring Place
105 Commercial Road
Southampton
S015 1EG

1.0 INTRODUCTION

A boom is a floating barrier designed to contain and minimise the spread of oil on water.

Booms can be used to protect environmentally and economically sensitive areas of tidal rivers, estuarine waters and harbours from contamination by floating oil. Effective and efficient deployment of booms in incidents can only be satisfactorily accomplished where there is a well-prepared and validated booming plan. Development of a booming strategy and operational plan is an integral part of preparing an overall contingency plan for an estuary or port. This is a complex task that must be carried out by personnel with appropriate experience.

The aim of this STOp notice is to give guidance and examples to those with responsibilities for preparing oil spill contingency plans on:

Content and format of a booming plan	**(What, where and how)**
Uses and limitations of booming	**(Constraints)**
Methodology of booming plan production	**(Step by step guide)**
Validation (trials) of booming plans.	**(Testing plan for real)**

This information may also be used to review critically existing plans. The development of new plans and the review of existing ones is urgent. A survey of relevant authorities in England, Wales and Northern Ireland with potential to hold booming contingency plans for the Environment Agency (EA), the Maritime and Coastguard Agency (MCA) and the Northern Ireland Environment Agency (previously Environment and Heritage Service), provided an overview of coastal contingency plans. The main conclusions were:

1. The majority of organisations in England, Wales and Northern Ireland do not have any provision for protection of coastal and estuarine areas by booming plans,
2. There was considerable regional variation with little relationship between the frequency of oil spills and the availability of booming plans,
3. Where protective booming was a significant issue many existing plans were technically inadequate and did not contain sufficient information to enable a successful boom deployment to be carried out.

These findings demonstrate that local authorities, Environment Agency regional officers and port and harbour administrations are not always adequately prepared to protect sensitive areas from contamination in the event of an oil spill.

2.0 PLANNING, FORMAT AND CONTENT OF A BOOMING PLAN

2.1 Analysis of Resources at Risk and Selection of Priority Areas

The initial stage in producing a booming plan is to identify environmental and socio-economic features at risk. A full environmental or economic resources analysis will provide this information which can then be used to determine priorities for booming site selection

2.2 Planning and Resources

Careful pre-planning is the key to the preparation of an effective booming strategy. It is a complex task that can only be carried out by people with the relevant background knowledge and operational experience of boom deployment. The development of an integrated booming strategy is described fully in section 4, but the key stages are shown in Figure 1.

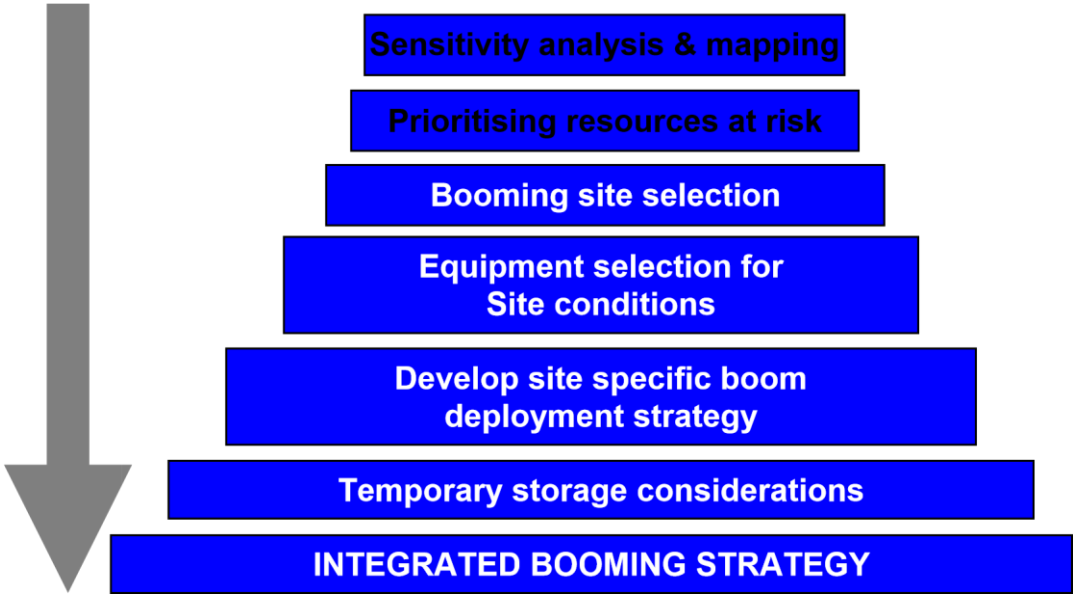


Fig 1 Key Stages in the Development of a Booming Strategy

Throughout the development process consultation with other relevant bodies such as neighbouring local authorities, fisheries departments, tourist boards and nature conservation bodies is essential to ensure their co-operation and input. Plans must be flexible and allow for seasonable variations.

When a plan has been completed it should be evaluated by a full-scale trial. This is very useful because the failure of a boom in an incident can waste valuable time and resources. In addition an unsuccessful deployment would appear incompetent to the public and media.

However, there will be some sensitive locations where the planning or validation may show that booming is not possible.

In these cases it is essential to keep detailed records to demonstrate that booming has been considered but would not work in that particular location.

2.3 Format

All plans should be clear, concise and complete. References to other documents should be limited to a brief description of how this plan fits in with other plans in a tiered contingency plan for an area or country. In general, booming plans should follow a similar format with variations to allow for local economic, environmental and geographical conditions. A useful example of a standard format is shown in Appendix 1. The advantages of adopting this recommended standard format are that plans will be:

Consistent and easily understood,
Compatible with plans from other areas,
Helpful to teams from other areas.

2.4 Contents

The contents of a booming plan should, like all good contingency plans, be divided into a strategy section and an operational plan. Full details of the contents of each section are given in section 4.

2.4 Further Information:

1. Newman, D.E. and N.I. Macbeth, October 1973.Oil Booms at A Tidal Inlet. Hydraulic Research Institute Report No INT 118.

2. ITOPF, 1981. *Use of Booms in Combating Oil Pollution*. Technical Information Paper No 2.

3. CONCAWE Report No. 9/81. *A Field Guide to Coastal Oil Spill Control and Cleanup Techniques*.

4. Environmental Consultancy Services Limited 1999. R&D Technical Report. *Coastal and Estuarine Booming Contingency Planning*. Report for the Environment Agency, Marine Pollution Control Unit, Environment and Heritage Services for Northern Ireland.

3. USES AND LIMITATIONS OF BOOMS

3.1 General

Booming is a complex activity and the successful deployment of boom to protect a sensitive area, or to collect oil for recovery depends on several factors. Key factors in the selection of a boom for a given location are: the width of the area to be boomed, current and tidal flow, wind and waves, sea or river bed composition and depth of water. Booming plans are best prepared by personnel who have significant practical experience in all aspects of booming operations. Boom deployments require trained supervisors who have considerable practical experience.

Booms are floating barriers, whose purpose is to stop the flow or spread of oil in a particular direction and to concentrate the oil into a sufficiently thick layer for recovery. To achieve this, booms can either be moored to a shoreline, riverbank, or buoy. Alternatively, to concentrate the oil for recovery they can be towed through the water by suitable boats.

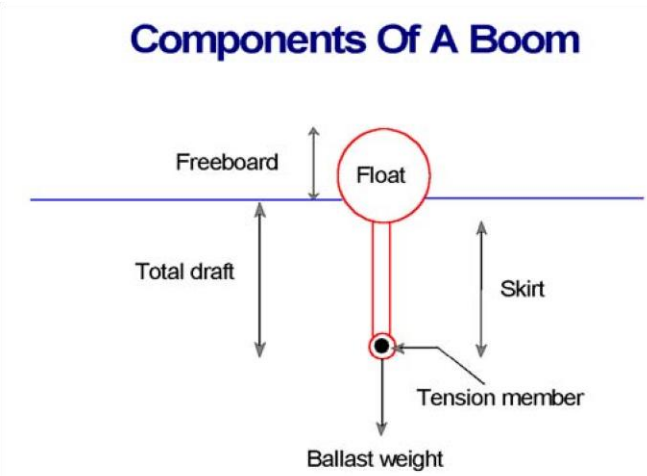


Fig 2 Components of a Skirted Boom

There are several different types of boom and although the construction varies, all types have common features. Figure 2 shows the common features of a boom. All booms must have sufficient material above the waterline (freeboard) to prevent waves from washing oil over the boom. Similarly, under the water, the skirt must have sufficient material (draught or skirt depth) to minimise the flow of trapped oil underneath the boom. To keep it afloat the boom must have buoyancy. Usually this achieved by building in permanent floats of cork or polystyrene or having an inflatable air tube. Finally, to keep the boom upright, it must have

some form of ballast weight at the bottom. This is often provided by a wire or chain, which can also give additional tensile strength to the boom.

3.2 Boom Types

There are three main types of boom:

3.2.1 Fence Booms

Fence booms generally consist of a flat piece of material, serving both as freeboard and skirt, having integral permanent buoyancy and ballast weights attached to the base of the skirt. Fence booms can be used where rapid deployment is the primary requirement. However, their fixed shape and poor wave following characteristics tend to make them less effective at containing oil.

3.2.2 Skirted Booms

Curtain booms consist of a buoyancy tube, with the skirt attached to the underside (see Fig 2). Frequently a wire or chain is attached to the base as ballast and tension member. This type is probably the most effective for containing oil, as they have a better underwater shape and wave following characteristics. However, as they have to be inflated, they are slower to deploy and require regular maintenance.

3.2.3 Shore Sealing Booms

Shore sealing booms are normally made in a cloverleaf pattern with an air tube above two tandem tubes filled with water. The purpose of the boom is to form seal at the water/shore interface thus creating a barrier in the inter-tidal area.

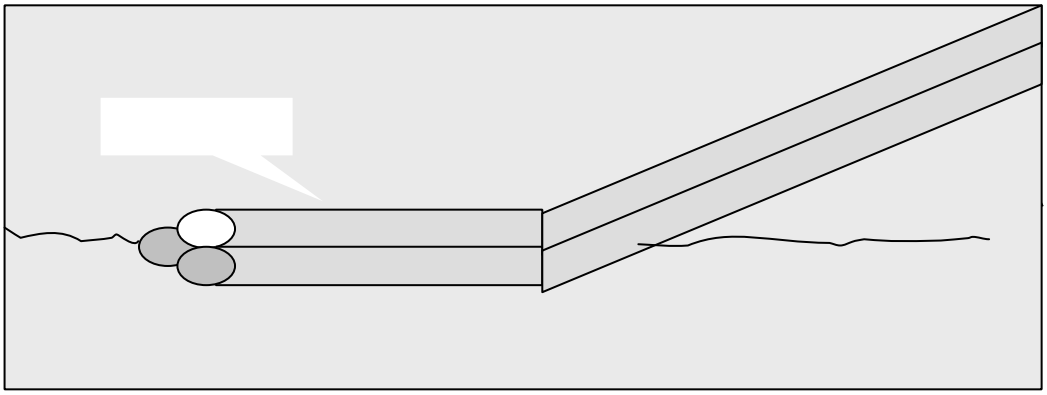


Fig 3 Diagram of the Sections of a Shore Sealing Boom

3.3 Boom Material and Sections

The material from which the boom is made also helps to determine the service for which the boom is suitable. Booms made of heavy neoprene coated fabric are generally used in open sea applications or exposed inshore waters. Booms designed for use in inshore and estuarine use are generally manufactured from polyurethane-coated fabric. This is generally lighter than neoprene and thus easier to handle.

The size of the boom required will depend on the location and weather conditions. The key dimensions are freeboard and skirt depth. In general, greater freeboard is required in open estuaries and smaller booms are more suitable for sheltered situations.

Booms, particularly skirted booms, designed for inshore use are manufactured in short sections which are portable to enable ease of handling on shorelines and by crews of small boats. These short sections are joined together by connectors and since there is no universal standard connector it is essential to check that all sections are compatible.

3.4 Use and limitations of Booms

3.4.1 Units of Measurement

In marine applications, wind and current speeds are given in knots. However, certain hydrological information may be provided in metres per second. For conversion purposes, 1 knot ≈ 0.5 metre per second.

3.4.2 Limitations

The effectiveness of booms in oil containment is constrained by a number of factors:

Winds. Strong winds generate waves, which can splash over the boom. Although oil on the surface tends to dampen waves, eventually oil may splash over the boom. Strong winds can also generate additional tensile forces on the boom.

Currents and Tides. Currents and tides will initially concentrate oil in a wedge in the boom cusp. At current speeds of less than half a knot at right angles to the boom, this wedge can be several metres wide, and will contain the majority of oil that accumulates against the boom. However, as the current speed increases, the leading edge of the wedge of oil is pushed towards the boom, and as the water dives below the boom it may take some of the oil with it. At speeds of 1.5 knots at right angles to the boom, all the oil may be lost under the boom. A similar effect occurs when a boom is towed through the water, limiting the towing speed to less than 1.5 knots.

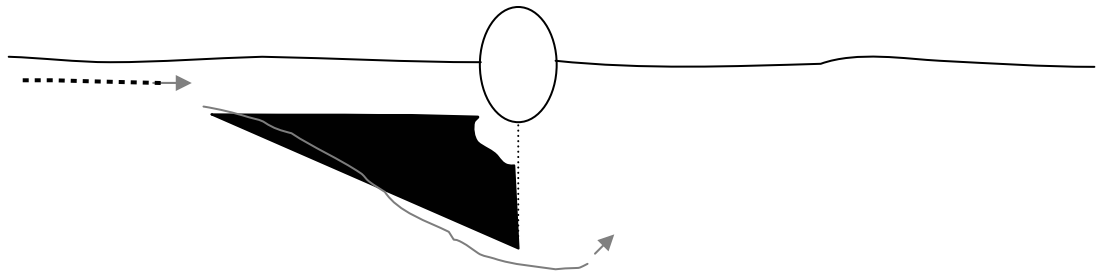


Fig 4 Oil being dragged under the Boom Skirt

Length. Long lengths of boom are difficult to deploy and control. The maximum deployable length will depend on the current speed and weather conditions.

Forces on the boom. The current speed also imposes a severe strain on the boom itself, according to the formula:

$$F=26 \times A \times V^2$$

Where: F is the force on the boom, in kg,
26 is a constant,
A is the cross sectional area in square metres exposed to the current,

V is the velocity of the current in knots.

Thus, the force acting on a 200-metre boom, with a 0.6 metre skirt depth in a 0.5-knot current will be 780 kg. Doubling of the current speed will increase the force on the boom fourfold, and the force on the same boom will be 3100 Kg. It is very important that the boom will be able to withstand these forces.

Anchors. Booms exposed to currents must be securely anchored, both on the bank or shoreline and in the water. The method of anchoring must be appropriate to the estimated tensile loading on the boom. On the shoreline temporary booms can be anchored using wooden or metal stakes driven into the ground (Holdfasts). In soft ground a number of stakes driven in line with the direction of the boom and tied together with ropes, may be required to spread the load. Alternatively, if the site sensitivity allows, anchor plates or railway sleepers can be buried to provide a sound anchorage. Permanent shore moorings may be installed once the boom configuration has been fully tested and validated. This will save valuable time when the boom has to be in place quickly.

The outboard end of the boom will sometimes need to be anchored in the water. This may present several problems. If a boom is directly connected to an anchor, increasing current speed may result the end of the boom being dragged below the surface. Therefore it is necessary to attach the anchor rope to a buoy and thence to the boom. The anchor rope or chain should be four times the depth of the water to minimise the submerging force on the boom and buoy. To enable easy recovery of the anchor, they must be fitted with a tripping buoy. This will also aid recovery if the anchor has snagged on an underwater obstruction.

Where the current speed is high, and/or the boom is long, calculation of the forces may well show the need for intermediate moorings, both to prevent excessive strain on the boom as a whole and to maintain the correct configuration. It is also likely that they may be required on both sides of the boom to maintain optimum configuration through ebb and flood stages of the tide.

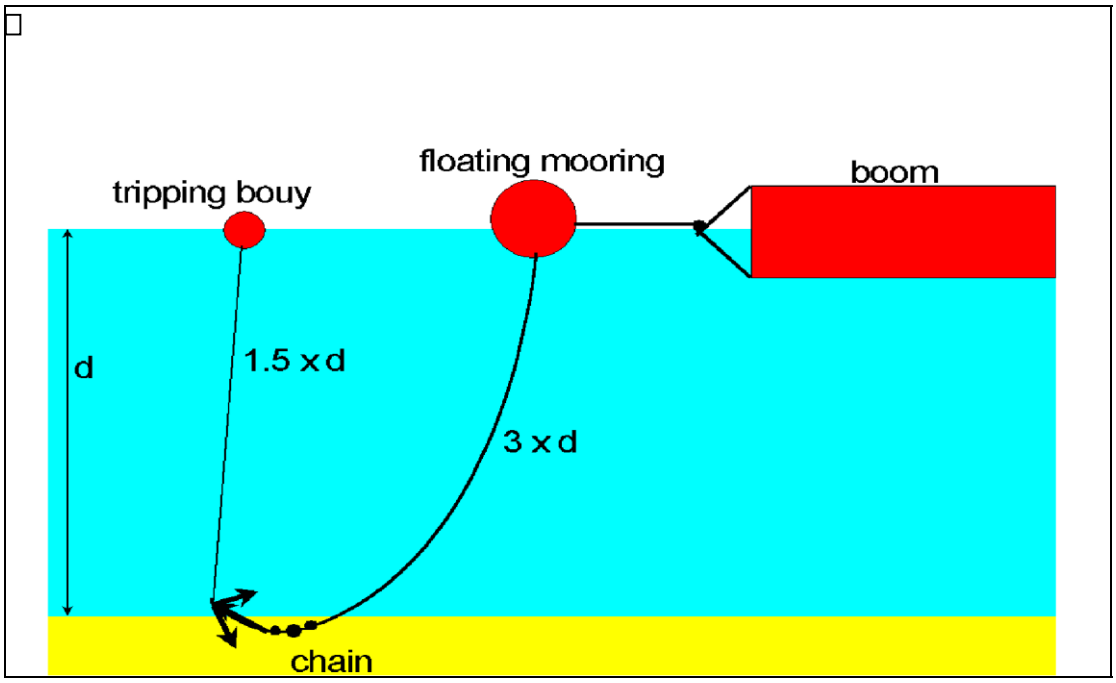


Fig 5 Diagram of Boom Anchoring

The number of anchors required and the spacing between them will be determined by several factors. These include current speed, size, length of boom, and additional factors relating to the holding power of the anchors. The holding power will vary according to the

type of anchor, its weight and the composition of the sea or riverbed. For example, anchors of the Bruce or Danforth type will be most effective on sand and mud substrates, but a fisherman's anchor (hook type) will be better on a rocky bottom.

Table 1 gives examples of the holding power of different weights of Danforth/Bruce type anchors in different substrates. (Substrate types are marked on Admiralty charts).

Anchor Weight (kg)	Holding Power (kg force)		
	Mud	Sand	Clay
15	200	250	300
25	350	400	500
35	600	700	700

Table 1 Examples of Holding Power of Different Anchor Weights

For example, a 200 metre boom, in a 1 knot current, giving a 3.1 tonne force on the boom, but now assuming a loose muddy bottom and a boom with a 3 tonne breaking strain, it is likely that one intermediate 25kg anchor would be required to prevent boom failure and maintain the boom in its correct configuration.

Shoreline Anchor sites. Some shoreline anchor sites may have sensitive vegetation and substrate that could be damaged by booming operations. When planning work at or near to environmentally sensitive sites the statutory nature conservation agencies (NE, SNH or CCW) must be consulted.

3.4.3 Methods to reduce the impact of current speed

Current force acting at right angles to the boom will have a tendency to drag oil under the boom. This can be reduced in two ways

Angling the boom to the direction of flow. By angling the boom in the direction of the flow, forces can be reduced. The effect of current velocity on boom angle is shown in Fig 6. However, angling the boom will always increase the total length of boom required. This method has been used to deploy booms in areas with current speeds up to 6 knots. At greater speeds the length of boom and the numbers of anchors required to hold it in place becomes excessive, if not impossible.

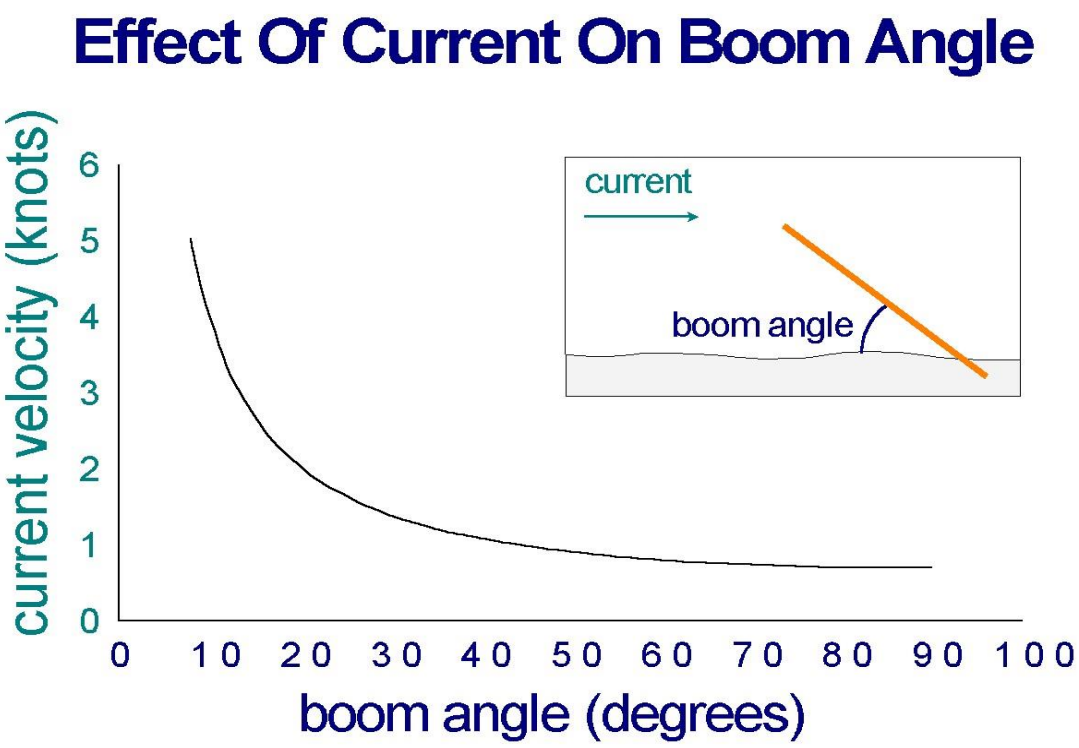


Fig 6 Effect of Current Velocity on Boom Angle

Placing the boom in areas of slowest current. By placing the boom where the current speed is relatively low the force on the boom can be reduced. In a river, this will generally be on the inside of a bend but current speeds are generally slowest in the shallower water closest to the bank. Suitable areas are shown in Figure 7. .

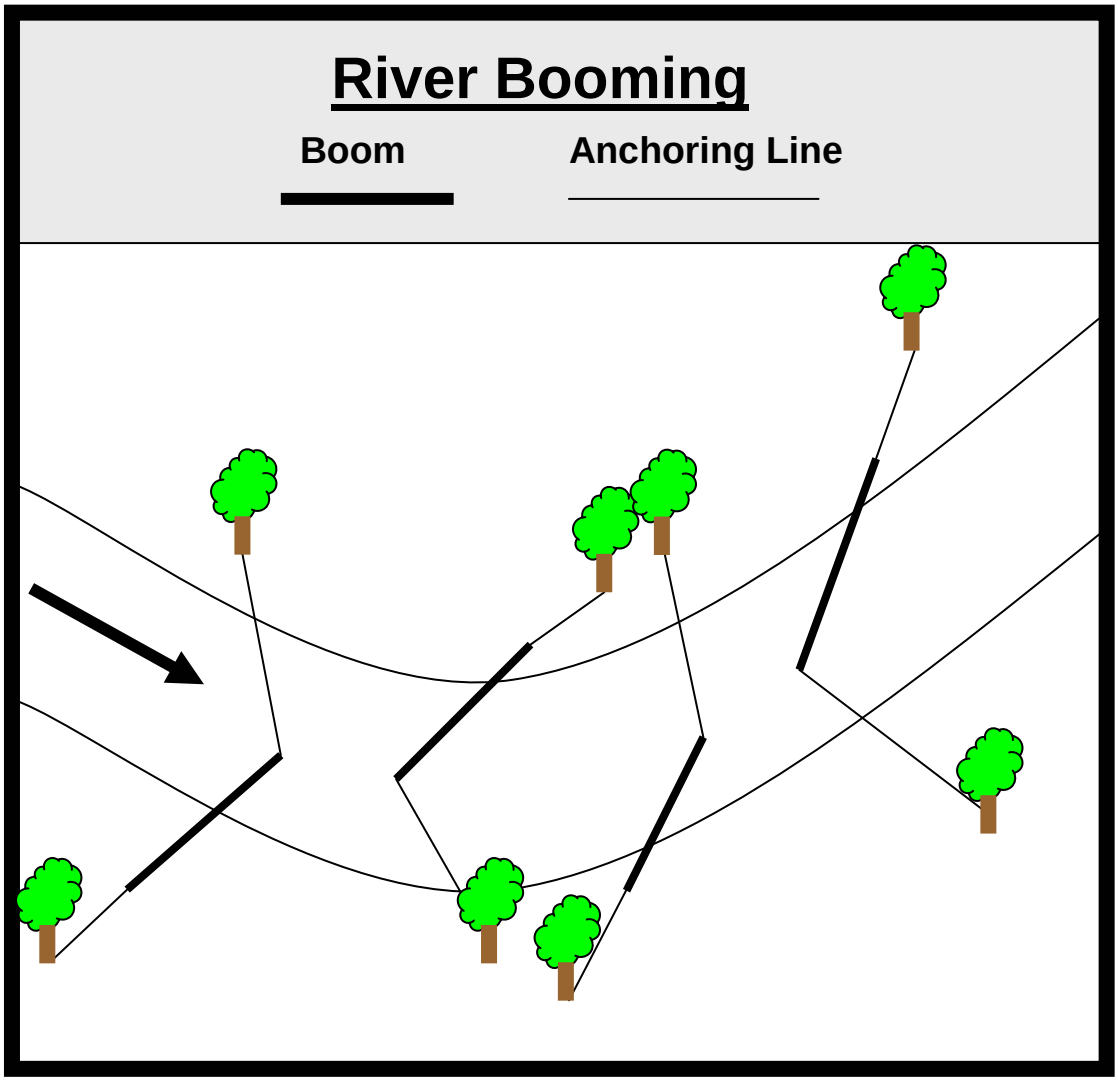


Fig 7 River Booming

3.5 Uses of Booms

General

This notice describes the use of booms in coastal and estuarine areas **and not in the open sea.** Where booms are used in areas with high current speed to collect and recover oil is important to remove the collected oil as quickly as possible to prevent it from building up and being dragged under the boom. Collection points should be sited to facilitate the easy removal of oil

Booms must not be used to collect light and volatile products such as naptha, due to the risk of fire and explosion. It is better to allow those products to evaporate naturally in the atmosphere. However, in calm and sheltered areas booms can be used to recover diesel or gas oils.

Booming Estuaries. Booms can be used to prevent oil entering a river, estuary or harbour. There are few estuaries in the UK where the peak tidal flow is less than 0.5 knot, booming directly across a river or estuary (exclusion booming) will rarely be effective. As a result, it may be necessary to deflect oil to a suitable point for collection (deflection booming). A number of deflection layouts can be used:

Single Collection Boom. Where the river is not too wide or is not used for navigation a single collection boom can be used as shown in figure 8

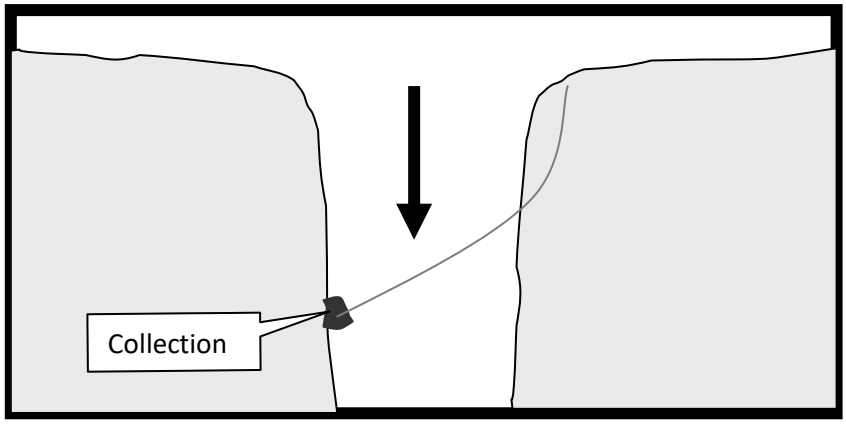


Fig 8 Collection Booming

Chevron Booming. Where a river is too wide for a single boom or it is necessary to maintain a channel for vessel navigation a staggered chevron boom can be is used. A chevron boom can be closed if required. Figure 10 shows two formations of chevron boom.

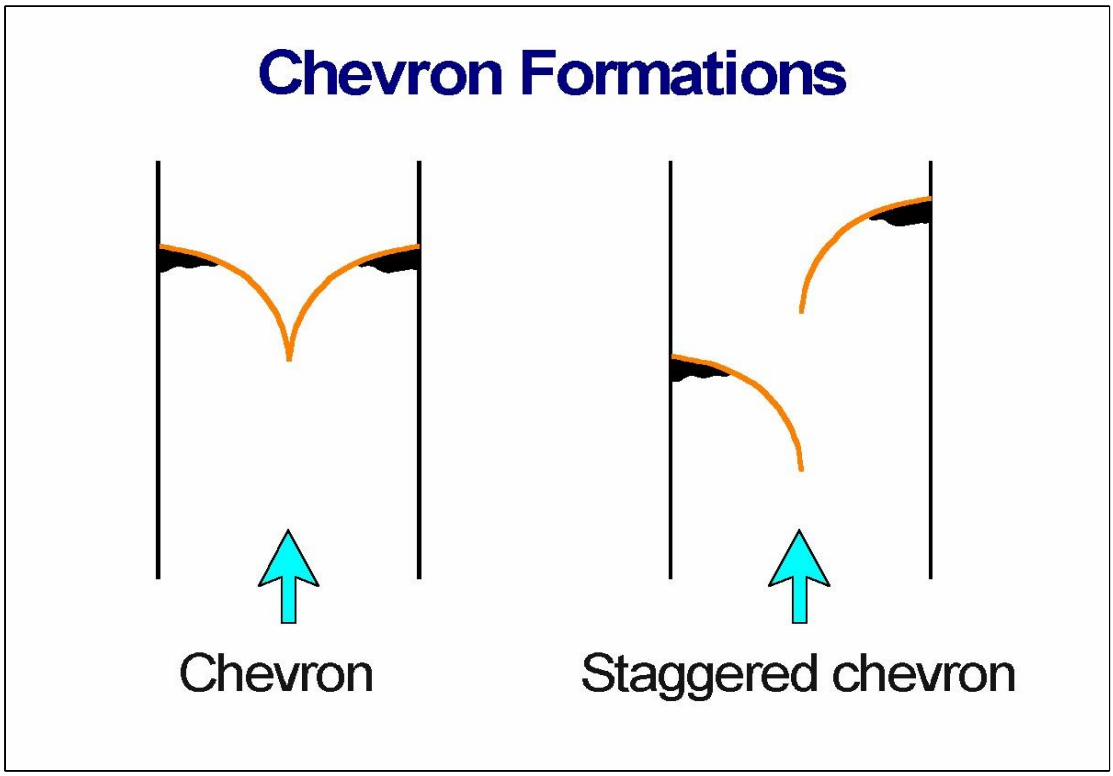


Fig 9 Chevron Booming

Deflection Booming. Deflection booming is similar to chevron booming but the oil is deflected away from a sensitive area, for collection in a less sensitive area.

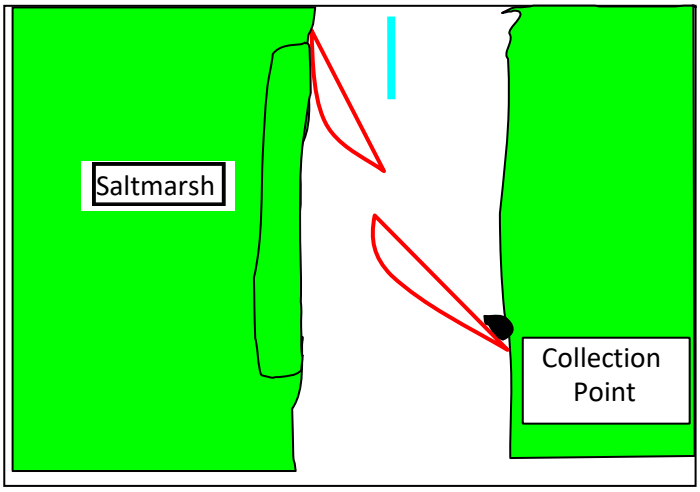


Fig 10 Protection Booming

Spur Booms. Spur booms can be used to prevent longshore spreading of oil by deflecting the oil onto a shoreline with little environmental sensitivity, or one which is relatively easy to clean.

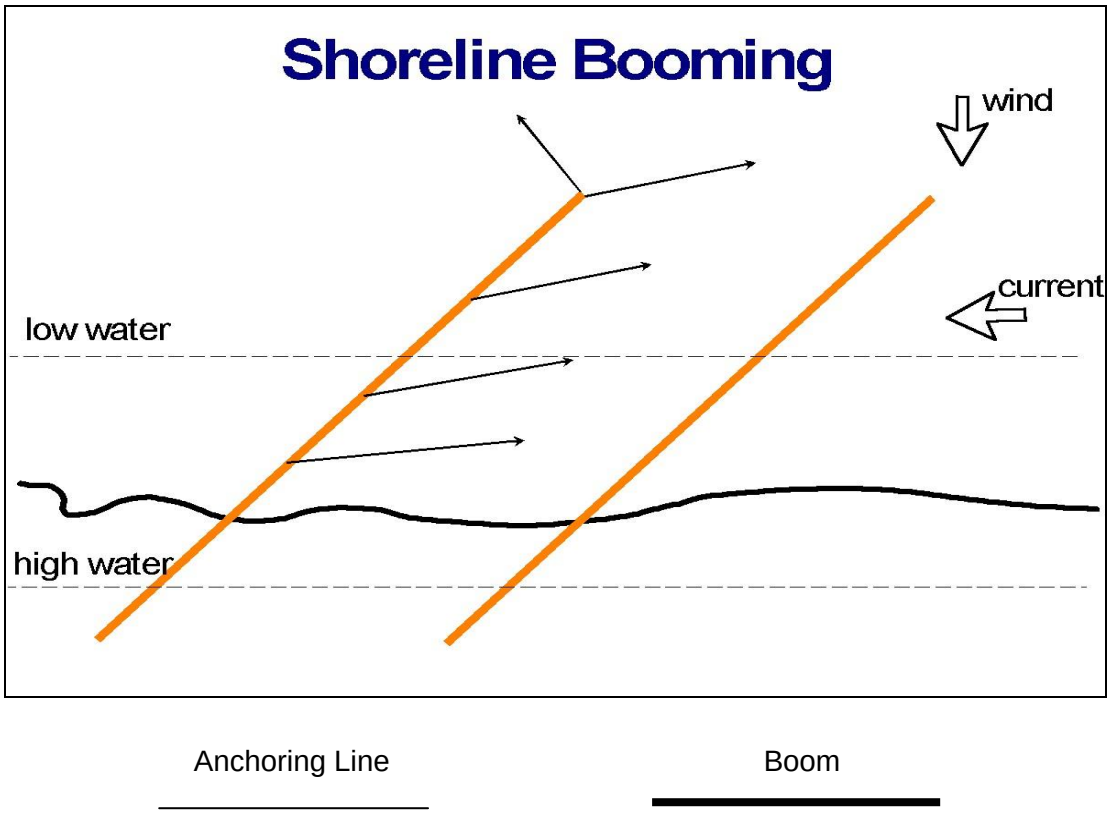


Fig 11 Spur Booming.

Jetty Booming. In port and harbour areas booms can be connected to jetties or similar structures with a hard vertical or near vertical surface. When connecting booms to fixed structures a running mooring or sliding connector should be installed to allow the boom to rise and fall with the tide. This can be a rope or wire, attached at the top of the jetty to a bollard or other secure point, with a heavy anchor at the bottom. Some harbours may already have sliding connectors in place. All types of sliding connectors must be regularly maintained because, over time, they can become jammed with marine growth. This technique will only be effective where forces on the boom are minimal. Forces exerted onto the running mooring will tend to cause the wire or rope to bow out, restraining the ability of the boom to rise or fall.

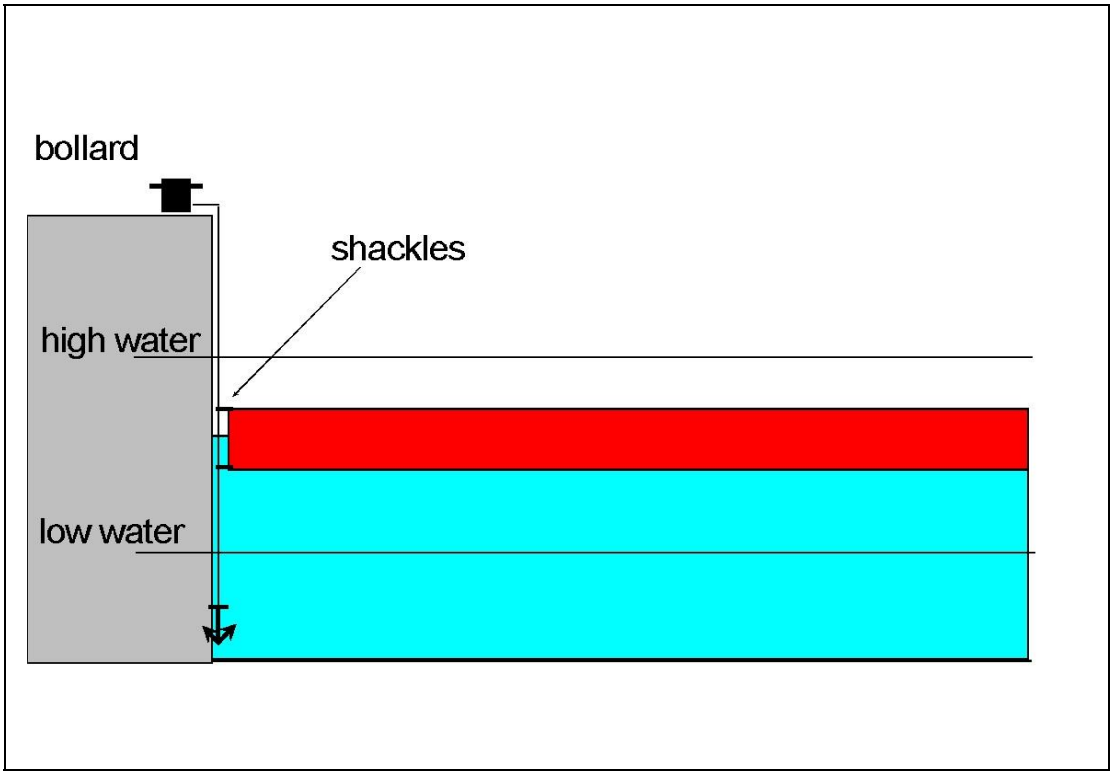


Fig 11 Jetty Booming

Sorbent Booms. Sorbent booms absorb/adsorb oil by the attraction of oil to oliophilic materials. These are made from either natural materials such as feather, hair, wool, peat and straw or synthetic materials such as polypropylene. All are effective to a limited extent but in general synthetic sorbents have been found to be more durable and effective because their hydrophobic properties prevent them from becoming waterlogged.

Sorbent booms are particularly effective in containing and collecting lighter materials such as gas oil and light crude oils. They can be used in mudflat or saltmarsh areas where conventional booms may cause damage to the sensitive environment.

3.6 Boom Maintenance

Once installed, boom systems must be regularly monitored to ensure that they are maintaining the correct configuration and that no damage or deflation of boom sections has occurred.

Collection of Oil. Effective recovery of oil trapped by a boom is essential. Plans should describe possible collection methods. The main methods of recovery are described in the MCA Manual on shoreline clean up. Selection of the best method will depend upon the type of oil, the sensitivity of the site and vehicular access. All movement and storage, especially temporary storage of the recovery material, must comply with the EA's waste movement and disposal regulations.

3.7 Health and Safety

The deployment of booms can be hazardous and all operations must comply with current Health and Safety regulations. Prior to deployment a full site and operational safety risk assessment must be carried out.

4. METHODOLOGY OF PLAN PRODUCTION

Although the detailed content of individual plans will vary, there are several features, which should be common to all plans and must be incorporated. The use of a common format will help to ensure that all issues are properly considered, that plans from one area can be understood by responders coming from another area, improve compatibility between plans and to assist in a smooth transition for inter-regional and inter-organisational response. Booming plans should be circulated within local communities and interest groups to demonstrate that sites have been identified as result of priority planning

Booming plans form part of the local authority oil spill contingency plan, though the booming plans themselves can stand alone when given to response teams. However, the plans must contain all relevant information, especially details of the sensitivity of the boom site and recovery areas.

Booming plans like all contingency plans fall readily into two parts. The first part (strategy) will delineate the area of the plan, identify and prioritise the environmental and socio-economic sensitivities in the area, show the locations of the booming sites, prioritised in accordance with the sensitivities, and further describe which sites cannot be protected and why. This section will also include other more general information on health and safety, temporary oily waste storage and disposal routes (if any) and the equipment and personnel resources available locally. This information should be included as an appendix to the local authority contingency plan. The second part is the operational plan, which would be issued to the beach supervisor. Therefore it will describe each site in detail, with the relevant environmental sensitivity and health and safety information for that site. It will describe the access to the site and contact details for landowners, the purpose and location of the boom, together with a diagram and photographs, where possible, and sufficient information to allow the response team to install the boom, set up recovery equipment and temporary storage facilities. It is important that the exact location is clearly indicated. Remember, it is likely that boom deployment teams could be from outside the locality.

Recommended contents of the plans are given in tables 2 and 3. The use of Geographical Information Systems (GIS) to give accurate site references and digital photographs can be used to illustrate boom locations making plans more easily understood.

It is clearly good practise for booming plans to be written and checked by experienced staff familiar with both the theoretical and practical aspects of protective boom deployment.

Table 2
Outline Contents of a Booming Plan

Strategic Plan	
Purpose:	**Pre spill planning for inclusion in local authority contingency plan**
Section	
1.	Scope and Geographic Coverage of the Plan.
2.	Use of the Plan
3.	Environmental Resource Analysis 3.1 Sensitivity analysis and mapping 3.2 Prioritise sensitive Areas 3.3 Will boom deployment have a negative environmental impact?

4.	Physical Site Characteristics 4.1 Map showing location of all sites for protection 4.2 Area response strategy 4.3 Booming sites in order of priority 4.4 Identification of sites which cannot be protected (with reasons) 4.5 Details of laydown areas 4.6 Area emergency contact details
5.	Health and Safety Guidelines for boom deployment 5.1 Generic risk assessment 5.2 Operational Plan risk assessment
6.	Temporary storage and disposal of oily waste guidelines

Table 3
Outline Contents of a Booming Plan

Operational Plan		
Purpose	**For Issue to Booming Supervisors**	
Section		
	Site priority	
1.	Health and safety	Generic Site specific
2.	Site information	Grid reference Access Landowners Contact details Physical description of site Bank characteristics and laydown area Shoreline load bearing characteristics Photographs
3.	River and tidal data	Tidal information Current speed Water depth Site specific information
4.	Manpower requirements	Shoreline Afloat Others
5.	Communications	VHF marine band frequency Mobile telephones (reception)
6.	Equipment requirements	Detailed list
7.	Boom deployment	Stepwise description
8.	Boom maintenance	Inspection schedule and tasks
9.	Oil recovery	Equipment and methods
10.	Temporary storage	Regulatory issues Methods and equipment
11.	Transport	Methods and equipment Waste transport regulations

12.	Boom recovery	Stepwise instructions Reinstatement

5. VALIDATION OF THE PLAN

Even the most thoroughly prepared plan cannot guarantee effective deployment of a boom in an incident. Therefore it is essential to validate the plan by deploying the boom at the actual location. Not only will this test the accuracy of the information and instructions given in the plan but also reveal any peculiar tidal and weather effects. For example the volume of water flowing in a river can increase considerably following recent heavy rainfall within a river catchment.

There is therefore a need to test the plan by a real boom deployment. This is known as validating the plan. The procedure will normally allow the deployment team sufficient time to conduct a survey prior to the validation exercise, which together with the exercise itself will give a much better idea of the range of conditions which can be experienced. The validation will also identify the detailed equipment and personnel requirement, and identify the best deployment procedure. However, the validation will only demonstrate the effectiveness of the operation under one set of weather conditions, those prevailing on the day.

The validation should where possible be carried out by an experienced team to ensure that the plan is properly evaluated. The team leader will arrange to visit the site, generally over a two-day period, to become fully familiar with the local tidal/current regime. He will make the necessary liaison with the local authority, statutory nature conservation bodies (NE, SNH, CCW), country water quality and regulatory authorities (EA, SEPA, NIEA), harbour authority if appropriate and the landowner(s).

Once deployed the boom should be left throughout a full tidal cycle to experience both the flood and the ebb tide. Teams should be prepared to modify the deployment and adjust intermediate moorings.

Boom deployment exercises may readily form part of hands-on counter pollution exercises. The MCA and EA are willing to provide help and advice on all aspects of protective booming including site selection, plan compilation, practical deployment and validation. The MCA currently provides a rolling programme of practical training for maritime local authorities. Typically each training event will be developed in partnership with the EA and other organisations with an interest in counter pollution contingency planning

The original site plan must be updated to incorporate the validation results and lessons learnt. Unvalidated plans must be treated with caution. MCA boom deployments have shown that many theoretical plans require significant amendment to allow for lessons learnt.

6. CONCLUSIONS

Booms can be used to protect environmentally sensitive or socio-economically important estuarine and coastal areas from oil pollution. Successful boom deployment depends upon the careful preparation and practical validation of a booming plan for each location. These plans should explain the reason for booming an area, prioritise the sites and give detailed and easily understood information to facilitate effective boom deployment. Preparation of booming plans is complex task that must be carried by personnel with sound practical and theoretical knowledge of the topic. Once a plan has been written it really should be tested in a real deployment (validation) and subsequently amended to allow for lessons learnt.

Sometimes during preparation and validation of a plan some areas where, after careful study, booms can not be satisfactorily deployed. When this happens it is essential to record all work and the reasons why booms cannot be deployed at this location. This will show that

booming has been considered but is not suitable for this location. Thus avoiding wasting time and resources on unsuccessful deployment in an incident. It will help explain to government, local government, interest and pressure groups, and the media why nothing appears to be happening.

Well-prepared and tested plans can save many hours of discussion in the Shoreline Response Centre, and will enable response managers to mobilise equipment and personnel promptly to the most vulnerable and highest priority sites.

Once complete, the plans should be incorporated into port, Environment Agency, and local authority oil spill contingency plans. It is essential to exercise all plans as frequently as resources allow.

APPENDIX 1

EXAMPLE OF A VALIDATED OPERATIONAL PLAN

RIVER OGMORE

NOTE. This plan is an example of well produced plan covering all the key points but it is not intended as a universal format.

Maritime and Coastguard Agency Environment Agency

OGMORE ESTUARY PROTECTION PLAN - (2 sites)

Note: This is the operational plan dealing only with physical boom deployment at the two sites referred to here. Shoreline Response Centre will determine priorities for booming as part of the overall shoreline protection strategy. Validation work carried out by MCA & EA in partnership.

SITES COVERED: Mouth of River Ogmore
50m seaward of Portabello House

HEALTH AND SAFETY: **Booming operations are potentially dangerous and before starting a full risk assessment must be carried out.**

DATE OF VALIDATION: 16 July 1998

Site 1

LOCATION: Mouth of the River Ogmore OS Sheet 170 (1:50000)
Grid ref.: SS 866760
See appendix A for site plan and Appendix B for site photograph

WEATHER (On the day) Dry, fine, wind light, West Southwest

FLOW RATES: No accurate data available for this stretch of the estuary, figures quoted are best estimates.

SPRING TIDES: Flood 3.5 knots, Ebb 4 knots

NEAP TIDES: Flood 1-2 knots, Ebb 2 knots
Rates on the ebbing tide could increase according to rainfall.

RANGE:

DEFINITIONS:

The terminology and definitions used by the Environment Agency to define riverbanks, will be used by all organisations in order to avoid any confusion, and to ensure correct deployment of manpower and resources.

The definition is as follows:

"With your back to the flow of the river all locations in front of you will be defined as "Down Stream" and all locations behind you will be defined as "Up Stream". To your right hand side will be the Right Bank and to your left will be the Left Bank "

SITE ACCESS and BOOM LOCATIONS:

Contact for access: Cardiff and Vale of Glamorgan Emergency Planning Unit.
Day: 01222 ######
Out of Hours: 01222 ######

Access can be gained via an area set aside as a car park, adjacent to the B4524 and close to the Portobello house. A locked gate, (Key Holder - Cardiff and Vale of Glamorgan EPU) then gives way to the river bank and upper shore, the boom site lies some 400m downstream from this point.

The Right Bank boom anchor point will be at a location to be determined by the Beach Master. Access to the Right Bank anchor point will be via Welsh Waters Treatment Works. (see map - Appendix A).

During winter months, due to a combination of rain and high spring tides, this area may become boggy, for this reason it is recommended that only vehicles with all-terrain capabilities are used and strict control over vehicle movements are maintained to minimise surface damage. For most of its length, the Ogmore is of high conservation value.

LOCAL LIAISON: Environment Agency:
Local Authority contacts:

MAPS DIAGRAMS:

See Appendices A & B.

EQUIPMENT LIST

Work boat, 100 HP engine (40Hp engine was used on the day.)	x1
Dinghy	x1
Marker line and Floats	x1 x
Inflation boom x 25m	2 x
Shore sealing boom x 25m	6 x
Shore sealing boom x 10m	2 x
Towing bridles	2 x
Water pump & hoses	2 x
Air blower and connector	2 x
Ground anchor plates	10 x
Danforth Anchor 15 Kg	3 x
Sea Claw Anchor 40 Kg	2

MANPOWER:

Mooring Chain x 3m	x 5
Warps 25mm x 25m	x 2
Warps 18mm x 25m	x 20
Sledge Hammer	x 20
4WD with winch or Tirfor machine	x 1
Argocat or similar	x 1
Water Bowser	x 1
Chest Waders	x 2
VHF Handheld Radios	(Channel 10)
Mobile Phones (Vodaphone & Cellnet reception is adequate over most of the site)	
Temporary Storage Tanks	x3

The response to an oil pollution incident on the river Ogmore will be co-ordinated by a Beach Master designated by the Shoreline Response Centre (SRC). The response may include the deployment of oil booms to prevent/minimise the spread of oil inshore.
The booms will be deployed by a team identified by the beach master. The team will be supervised by a supervisor with training in, and a working knowledge of boom development. This group of staff will be referred to as the Ogmore Team.

The Ogmore Team will comprise the following staff:

Beach Master	Boat Crew (1 coxswain, 1 boathandler)
Foreman	Boom Deployment Crew

The car park adjacent to Portobello House will be used as the Rendezvous Point (RvP), and the deployment of all equipment and manpower will be co-ordinated by the Beach Master at the RvP.

COMMUNICATIONS: Marine band Channel 10

PHYSICAL DESCRIPTION OF THE SITE:

The mouth of the River Ogmore, close to the proposed boom site is particularly protected from the open sea by a shingle spit, this has the effect of greatly reducing the channel width and accelerating the current in the narrow channel because of the close proximity of this potential hazard where loss of life has occurred. All personnel preparing to work at this location should be briefed of the danger.

Moving upstream to the area afforded protection by the shingle spit, the channel widens to a width of approximately 200m at mean high water and reducing to a low water channel of 50m which scour closely to the profile of the shingle spit, at this point the current speed reduces significantly and has been identified as the most suitable site for a boom to succeed. The shingle spit it self is backed to the Northwest by dune slacks and extensive salt marshes, the Southwest bank is backed by low unstable cliffs which extend upstream for approximately 400m at the boom site from the base of the cliff to the low water channel. The lower shore is firm sand shingle and small cobble.

BOOM DEPLOYMENT:

The informal car park adjacent to the Portobello house (grid ref: SS873763) would be the most suitable area to be used as a vehicle park and equipment lay down area but permission should be sought from the land owner.

Easiest deployment of the boom is at low water slack allowing sufficient time to transport all necessary equipment from the lay down area to site.

Working from the Left Bank, it is recommended that a light 6mm line marked at 25m intervals with small buoys should be drawn across the river and secured to the permanent mooring points, this will give a visual aid of final boom configuration and a clear indication of where to position intermediate anchors. Particular care should be taken on the position of the two 40Kg sea claw anchors, which will provide the main moorings on the edge of the low water channel where the greatest current speed will be exerted on the boom. All anchors should be fitted with recovery trips, when all anchors and ground anchor plates are laid; the marker line should be recovered.

The boom should be assembled on the Left Bank, ensuring the correct positioning of the section of inflation boom (i.e. 35m Shore sealing boom, 50m Inflation Boom, 125m Shore sealing boom). All air chambers to be inflated.

With a team of men positioned on the Right Bank, the work boat should tow the boom into the water channel and across to Right Bank where a heaving line should be passed ashore, the boom can now be pulled the correct distance onto the shore and secured to the permanent mooring point. With all personnel to the Left Bank, the boom can be tensioned and secured to the permanent recovery mooring point.

A Land Rover winch or Tirfor will be required for this operation. A dinghy will be required to assist the work boat securing mooring lines on the upstream side of the boom, all shore sealing water chambers should now be filled. Mooring lines secured to the ground anchor plates on the flood tide side of the boom should be secured to enable the boom to be adjusted into correct configuration as the boom is trimmed by the oncoming tide.

OIL RECOVERY AND OIL STORAGE:

Oil recovery equipment can be deployed to the area adjacent to the boom cusp where oil will collect. Choice of recovery equipment will be limited by accessibility. Small-trailerised skimmers may be towed to the site subject to the nature of the ground surface on the day. Lightweight vaculite systems can provide vacuum recovery. Rope mops and small disc or weir skimmers can access the area.

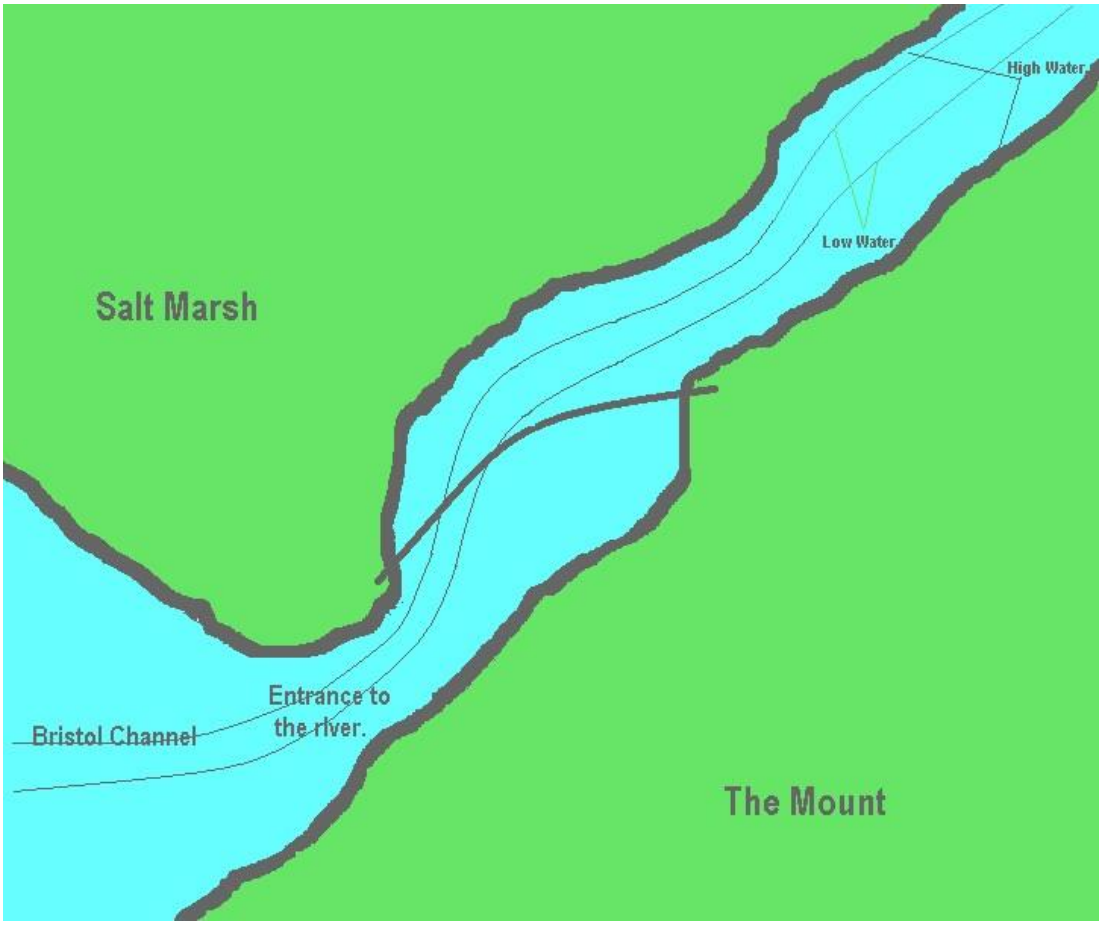
Temporary storage tanks can be utilised to provide temporary storage at this site, care must be taken during spring tides to ensure skimmers and storage tanks are not taken by the tide. Evacuation of temporary storage tanks will not be so easy. Powerful positive displacement pumps could be used to pump pollutant to a point where tractor vacs or tankers can access.

BOOM RECOVERY:

The most suitable time for recovery of the boom would be low water slack. The water chamber valves on all sections of Shore sealing boom should be opened and all intermediate-mooring lines released. The main securing line to the Right Bank should be released and the tail towed by the work boat back to the Left Bank where the boom can be recovered and returned to the lay down area section by section.

All anchor and ground anchor plates should now be recovered; the workboat may require assistance from a land rover winch for this operation. A careful visual inspection of the site should be carried out to ensure all equipment has been recovered.

Appendix A Ogmore estuary site plan



Appendix B Ogmore Estuary Boom

SITE 2

LOCATION:

50 m Seaward of Portobello House
Grid Reference SS 872763
Location Plan 1: 50000

ACCESS:

Access to site via informal car park at Portobello House, booming site is some 250m downstream of the car park. Keep to the track with vehicles to avoid damage to grassland. Track may be soft after heavy rain.

PHYSICAL DESCRIPTION OF THE SITE:

The location chosen for this contingency boom is at a point situated 50-m seaward of Portobello House where the estuary channel narrows to a more manageable contained channel. The boom location is identified as being at the head of the second salt marsh flood plain. The West boundary is contained by sand and shingle banks and the easterly boundary rising high ground protected by low limestone outcrops. The channel is tidal and at low water soft mud banks are exposed. In general the main riverbed is stony with soft mud areas and some deep pools, working in the river-wearing waders is possible. The river channel is approximately 30 m wide and the flood estuary channel is 80m wide.

EQUIPMENT:

Essentially all auxiliary equipment is as required for the main boom at the estuary mouth. Principle equipment required is as follows:

Marker line and floats	x1	Air blower and connector	x1
Danforth anchors x 15 kg (2 either side of boom)	x4	Shore sealing boom x 25 m Towing bridles	x5 x2
Warps 18 mm x 25 mm	x4	Water pump and hoses	x1

MANPOWER:

As for site one. Deployment at site one at low water, site two high water.

BOOM DEPLOYMENT:

High water slack deployment. A stout mooring point is required on the Right Bank. Permanent mooring points have been installed on the Left bank. The marker line should be drawn between these two points to allow accurate deployment of the four intermediate anchors. The marker line must be recovered once anchors are deployed.

Boom to be pre-assembled on the Left bank and all air chambers inflated. Workboat will then tow boom across to the Right Bank. Positioning of the boom on the Right Bank can be achieved by use of a heaving line. Boom to be tensioned from the Left bank using a tirfor. Once boom is tensioned intermediate anchor points may be connected and the water chambers of the shore-sealing boom filled.

OIL RECOVERY AND OIL STORAGE:

As site one, access is less difficult at site two. Ground conditions may allow direct access by vacuum tanker or tractor bowser.

BOOM RECOVERY:

Best recovery time is high water slack. Water chamber valves to be opened, and intermediate moorings to be disconnected and recovered. Main mooring line to the Right Bank can then be released and passed to work boat, which will tow boom tail to the Left bank for recovery. Don't forget to check site thoroughly for any remaining equipment.

BEACHMASTER CHECKLIST:

1) Check that the site identified by the SRC as the site requiring booming is the correct site (the check will confirm that oil has or is likely to come ashore and that a booming plan exists for this site).
2) Ensure access to site is available telephone Swansea Emergency Planning, telephone Dwr Cymru/Welsh Water
3) Establish Rendezvous Point at the car park by Portobello House.
4) Instruct Foremen and boat crew in the deployment of the boom(s).
5) Identify oil spill clean -up areas, and appoint foremen to arrange clean up.
6) Arrange for temporary beachhead storage facilities i.e. fast tanks.
7) Arrange for removal of oil from site to approved (licensed) disposal site(
8) As advised by the SRC arrange for boom(s) and associated equipment to be removed from the river and surrounding area, and instruct foremen to arrange.

9) *Advise SRC when equipment has been recovered, and seek advice as to any future requirements.*
10) *Ensure all vehicles and manpower have departed the site and the RvP, and advise Welsh Water.*

Counter Pollution Branch
Spring Place
105 Commercial Road
Southampton
SO15 1EG
Tel: 023 8032 9###
Fax: 023 8032 9###

Appendix 8 – Broads wildlife and habitat importance and designations

1. Summary

The Broads is one of Europe's finest and important wetlands for nature conservation. It includes designated sites for nature conservation, including 28 Sites of Special Scientific Interest (SSSIs), which cover 24% of the Broads executive area. One-third of SSSIs are designated National Nature Reserves (NNRs) (Map 3). Virtually all SSSIs also have international designation under European Habitats and Birds Directives and Ramsar Convention (Map 4). For more on the legislation see section 3 in this Appendix.

The Broads, apart from having many designated sites for nature conservation, is also important for wildlife throughout its area, with land and water managed for both biodiversity and landscape. Often, hydrological connections between the waterways, fens and grazing marsh dykes will result in pollution in one part of the wetland affecting a wide area.

Biodiversity Action Plans, derived from the UK's ratification of the Convention on Biological Diversity, give guidance and targets for species and habitat management and protection.

The Water Framework Directive establishes a framework for protection surface water, groundwater, and coastal and transitional waters. Targets are set to protect and improve the ecological status of the waterbodies.

2. Habitats

Maps 1 and 2 show the distribution of important habitats for nature conservation in the Broads.

2.1. Water and Reedswamp

There are 63 broads, of which 68% are directly connected to the rivers. Pollution from the river has been shown to affect these connected broads. Several of the broads and rivers are home to rare aquatic plants; some found nowhere else in the UK, such as holly-leaved naiad and intermediate stonewort.

2.2. Fens and Reedbeds

The Broads has the largest expanse of lowland species-rich fen in lowland Britain. Fens and reedbeds as part of the Broads wetland are in hydrological connection to the river water thus water quality is important for this habitat as it is for the open water itself.

2.3. Estuary

Breydon is an important salt marsh area with mud-flats which provide an internationally important staging post for migratory birds.

2.4. Grazing Marshes

These drained or grazing marshes, if managed correctly provide habitat to farmland birds, particularly waders and wildfowl. The grazing marsh dykes are important for aquatic plants and rare invertebrates such as snails. Water to supply these dykes can come from the river. This is the case for Halvergate Marshes Special Area of Conservation, (SAC) where river water is pumped into the grazing marsh dykes via the Stracey intake.

3. Legislation

3.1. International Legislation

Ramsar Convention: Or to give it its full title, the 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat'. This is a global convention, signed at Ramsar in Iran in 1971, and ratified by the UK in 1976. It has 3 main aims: designation of wetlands as Ramsar sites, 'wise use' of wetlands, and international co-operation.

3.2. EU legislation

Habitats Directive: To promote maintenance of biodiversity by requiring member states to take measures to maintain or restore habitats and species at 'favourable conservation status', with national governments reporting to the EU every 6 years. It includes designating a series of protected sites (Special Areas of Conservation SAC), which together with SPAs classified under the **Birds Directive** (see below), makes up an EU-wide network of sites (the **Natura 2000** series).

Birds Directive: Requires member states to take steps to protect listed bird species and the habitats on which they depend by classifying Special Protection Areas (SPA).

Both the Habitats and Birds Directives are enshrined in UK legislation under the Conservation (Natural Habitats &c) Regulations 1994, otherwise known as the 'Habitats Regulations'.

Water Framework Directive: To establish a framework for protection of inland surface waters (and) groundwater. It aims to ensure all aquatic ecosystems, and, with regard to their water needs, all terrestrial ecosystems and wetlands meet 'good status' by 2015. The Directive requires member states to establish river basin districts and management plans, to be reviewed every 6 years.

3.3. UK legislation

Wildlife and Countryside Act 1981 (as amended): this underpins statutory nature conservation in the UK, and most significantly, makes provision for the notification by English Nature of Sites of Special Scientific Interest (SSSI), and where appropriate, National Nature Reserves managed by 'approved bodies' other than EN.

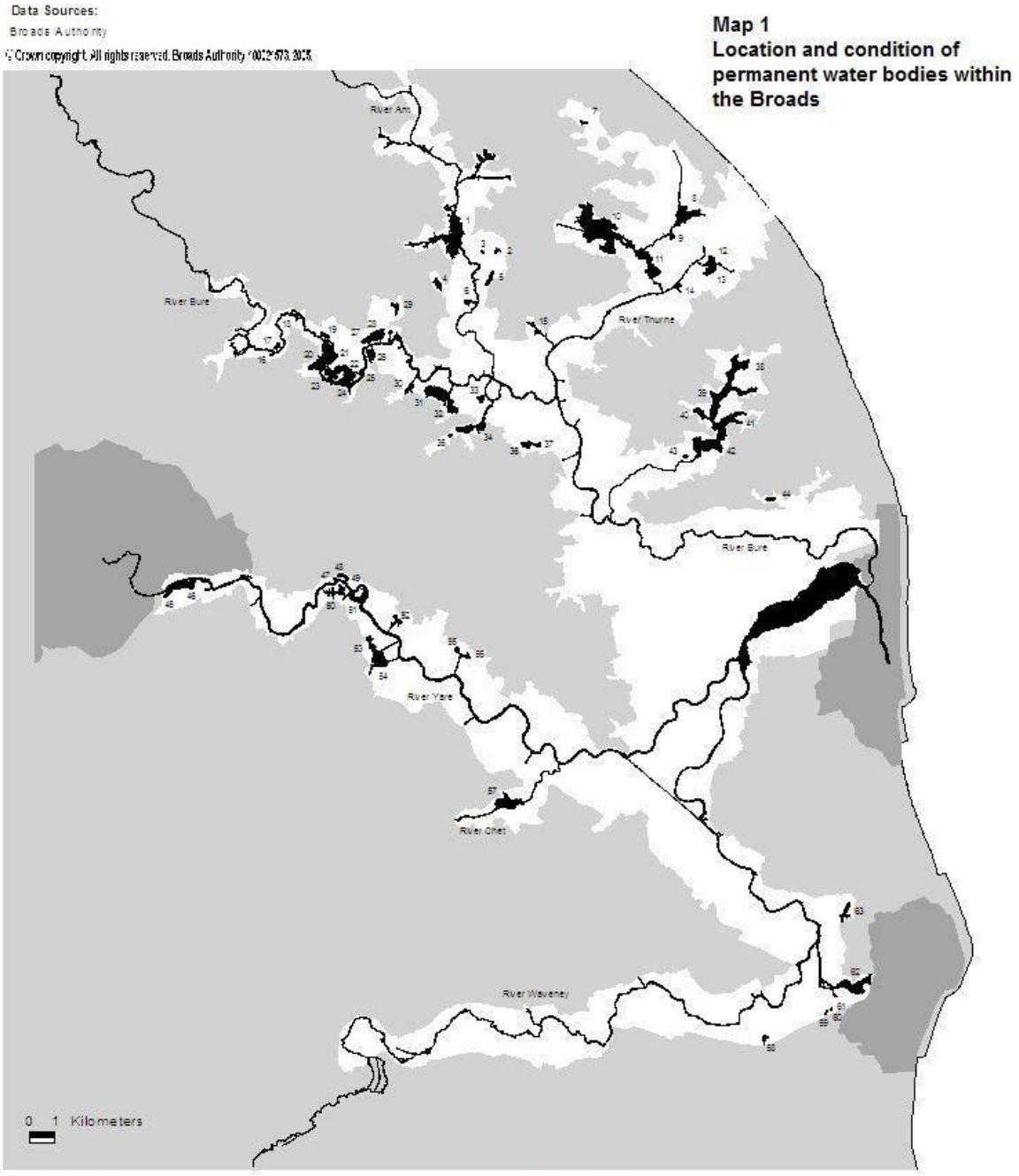
The Act is supplemented and amended by the **Countryside and Rights of Way Act 2000**, which strengthens protection of SSSIs by giving English Nature greater enforcement powers,

and makes provision for open public access to certain types of land (defined as mountain, moor, heath, and down). Section 28 places a duty on all public bodies, including the Broads Authority, to enhance the special interests of SSSIs.

The provisions of the 1995 Environment Act (Section 62) and 2000 CRoW Act (Sections 85 and 97) confer statutory duties on 'relevant authorities', which include statutory agencies and local authorities, to have regard to the purposes of national parks, Areas of Outstanding Natural Beauty and the Broads.

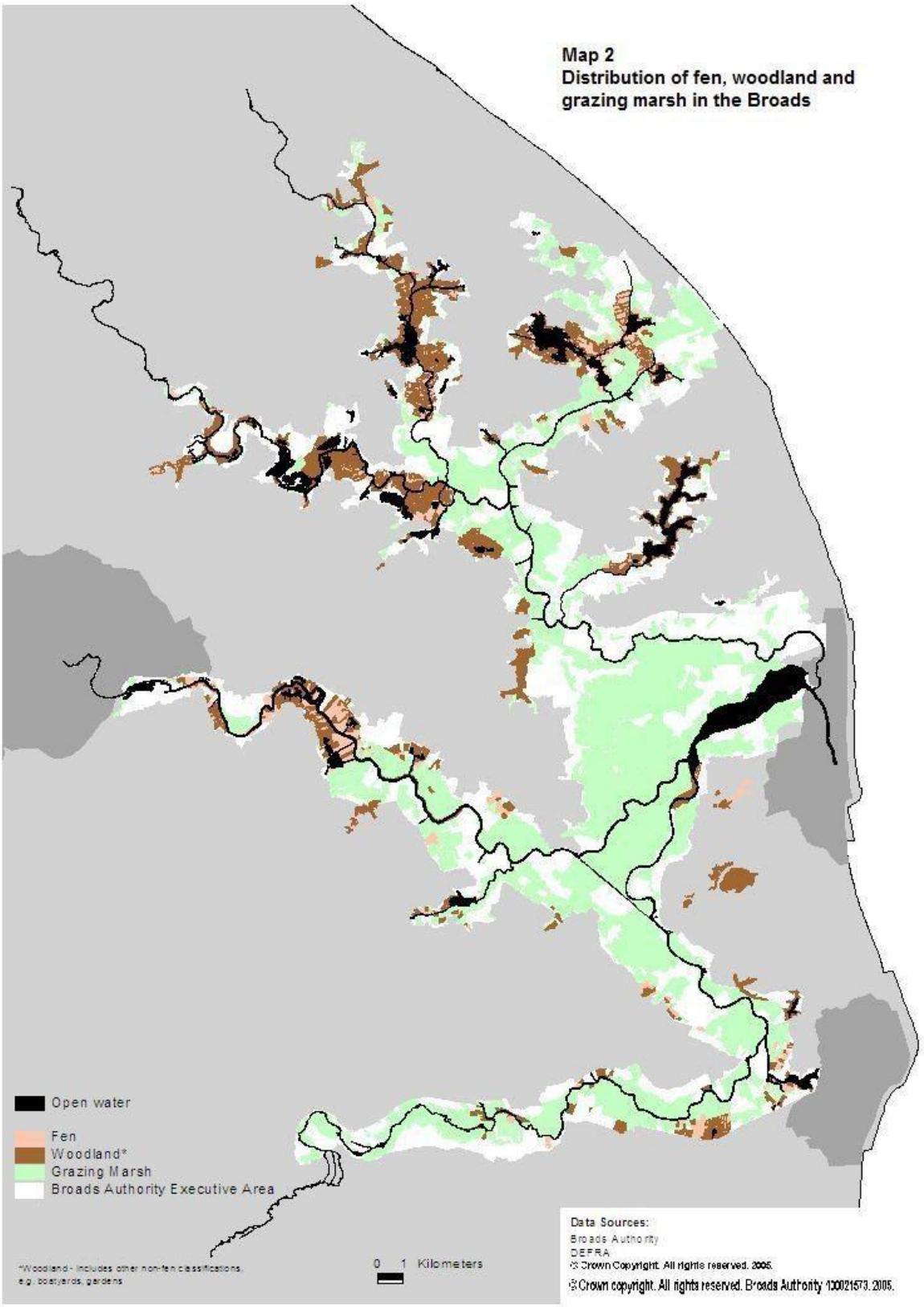
Biodiversity Action Plans: these are a framework for achieving wildlife conservation based on targets for habitats and species. These are identified and planned for at local, regional and national level, and usually implemented by local partnerships. They can embrace broad habitats (i.e. fens) or the needs of the smallest insects or plants (such as Norfolk hawker dragonfly). The production of BAPS derived from the UK's ratification of the Convention on Biological Diversity, itself one of the outcomes of the Earth Summit in Rio in 1992.

Map 1: location and condition of permanent water bodies within the Broads

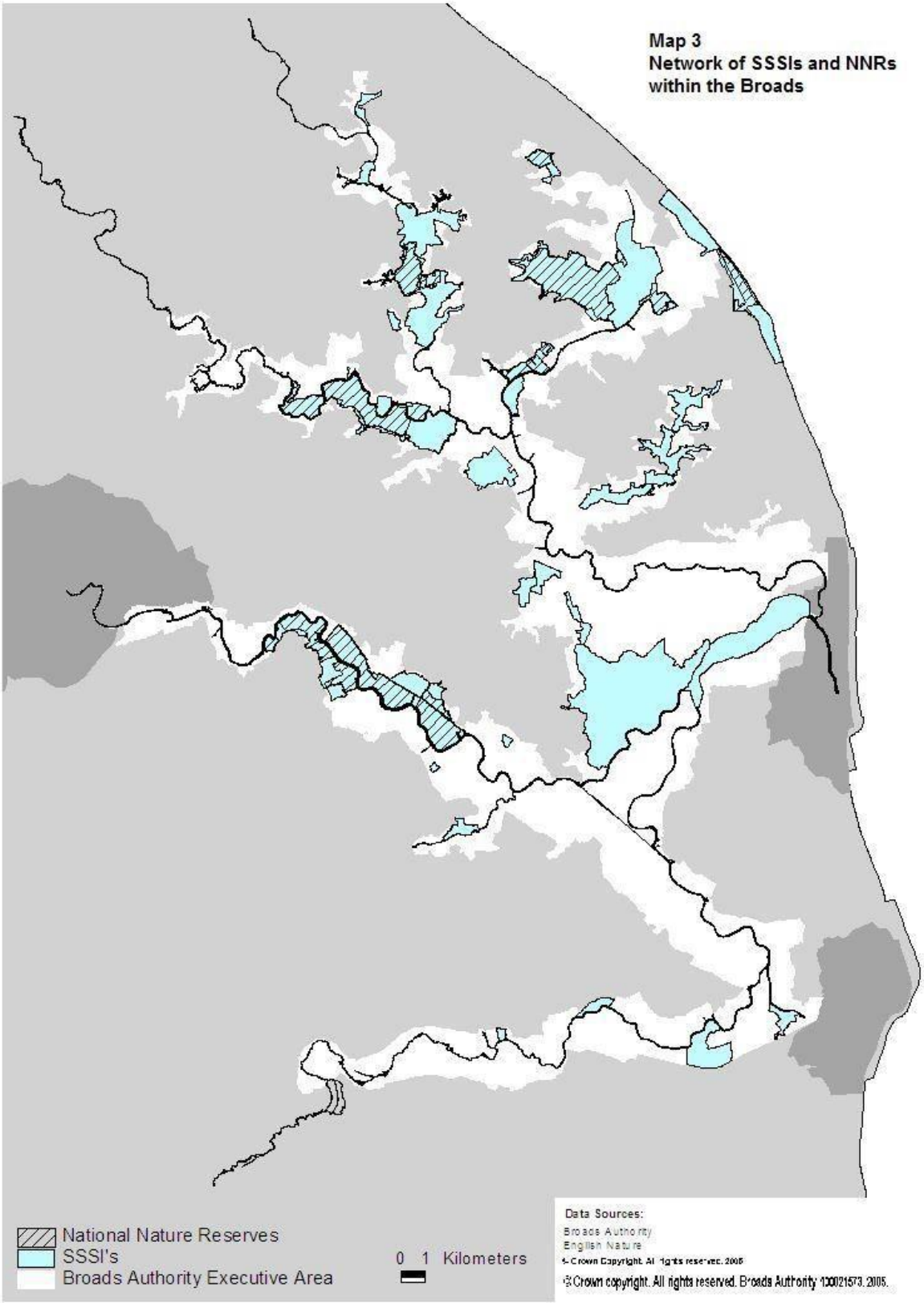


1 Barton Broad
2 Catfield Broad
3 Irstead Holmes
4 Alderfen Broad
5 Cromes Broad
6 Reedham Water
7 Calthorpe Broad
8 Horsey Mere
9 Blackfleet Broad
10 Hickling Broad
11 Heigham Sound
12 Martham North
13 Martham South
14 Martham Pits
15 Womack Water
16 Norton's Broad
17 Belaugh Broad
18 Bridge Broad
19 Snape's Water
20 Wroxham Broad
21 Hudson's Bay
22 Hoveton Great Broad
23 Salhouse Little Broad
24 Salhouse Broad
25 Devil's Hole
26 Decoy Broad
27 Pound End
28 Hoveton Little Broad
29 Burntfen Broad
30 Cockshoot Broad
31 Ranworth Broad
32 Malthouse Broad
33 Ranworth Flood
34 South Walsham Broad
35 Sotshole Broad
36 Upton Great Broad
37 Upton Little Broad
38 Ormesby Broad
39 Rollesby Broad
40 Lily Broad
41 Ormesby Little Broad
42 Filby Broad
43 Little Broad
44 Mautby Decoy
45 Whitlingham Little Broad
46 Whitlingham Great Broad
47 Brundall Outer Broad
48 Brundall Gardens Lake
49 Brundall Inner Broad
50 Surlingham Broad
51 Bargate Broad
52 Strumpshaw Broad
53 Wheatfen broad & channels
54 Rockland Broad
55 Buckenham Broad
56 Hassingham Broad
57 Hardley Flood
58 Barnby Broad
59 Woolner's Carr
60 Round Water
61 Sprat's Water
62 Oulton Broad
63 Flixton Decoy

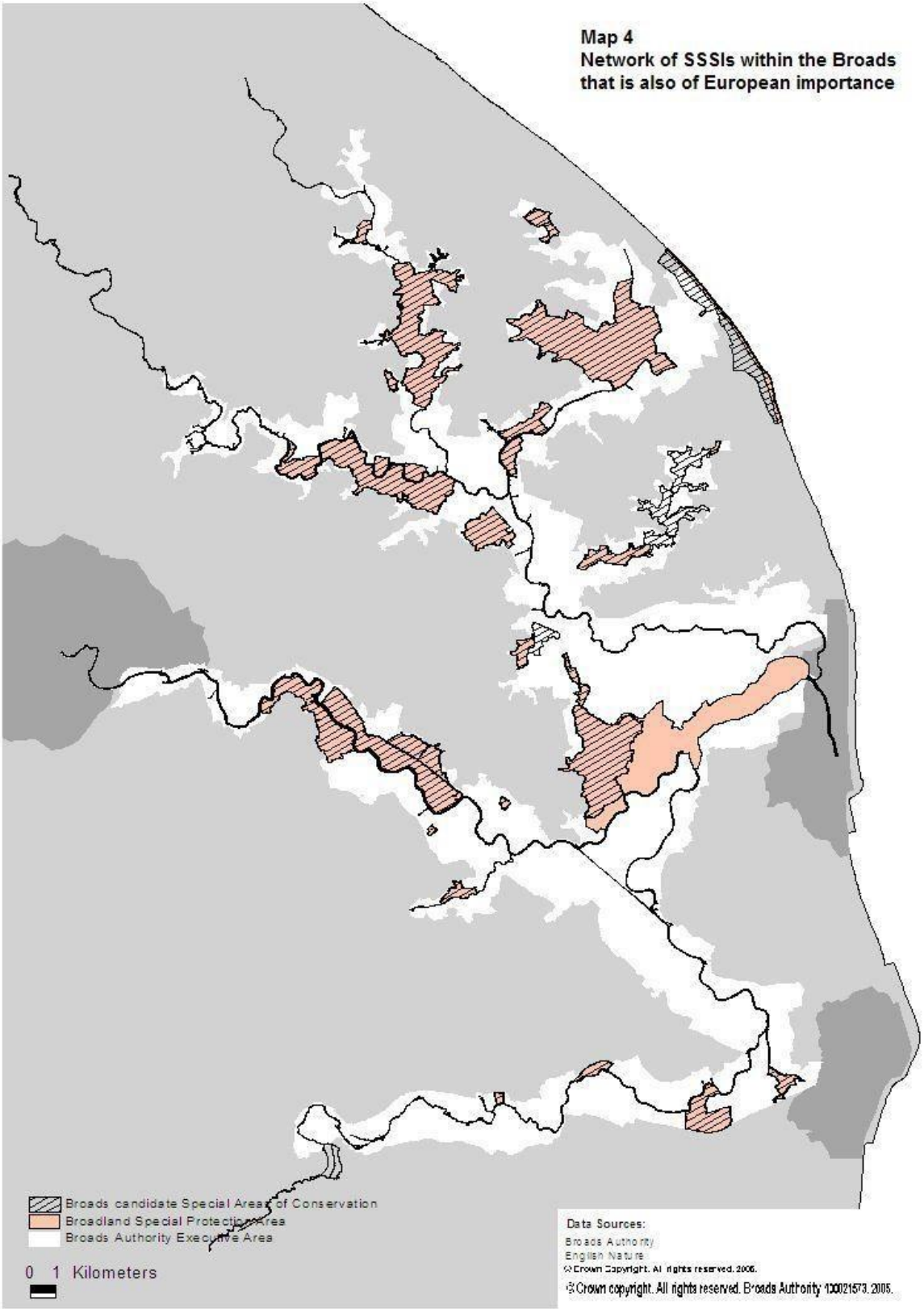
Map 2: Distribution of fen, woodland and grazing marsh in the Broads



Map 3: Network of SSSIs and NNRs within the Broads



Map 4: Network of SSSIs within the Broads that is also of European importance



Appendix 9 – Toilet disposal facilities and petrol/diesel retail outlets

December 2019

Location	Site	Telephone	Petrol Retail	Pump Out	Chemical Toilet	Diesel Retail
Acle Bridge	Bridge Craft	01493 750378	No	Yes	Yes	Yes
	Broads Boating Company	01493 750972	No	Yes	No	Yes
Beccles	Keyway Boats (Derby's Quay	07946 663053	No	Yes	No	Yes
	H E Hipperson Limited Waveney Wharf	01502 712166	No	Yes	No	Yes
Brundall	Broom Boats	01603 712334	No	Yes	No	Yes
Burgh Castle	Goodchild Marine Site Burgh Castle Yacht Station	01493 782301	No	Yes	No	Yes
Burgh St Peter	Waveney River Centre	01502 677343	No	Yes	Yes	Yes
Geldeston	Rowancraft Limited Staithe Yard Big Row	01508 518208	No	Yes	Yes	No
Hickling	Whispering Reeds	01692 598314	No	Yes	No	Yes
Horning	Ferry Boatyard	01692 630392	No	Yes	Yes	Yes
	Boulter Marine	01692 630498	No	Yes	No	Yes

Location	Site	Telephone	Petrol Retail	Pump Out	Chemical Toilet	Diesel Retail
Hoveton/ Wroxham	Brinkcraft Limited Riverside Road Hoveton	01603 782333	No	Yes	No	Yes
	Broads Tours The Bridge Wroxham	01603 782207	No	Yes	No	Yes
	Roys Petrol Station,	-	Yes	No	No	Yes
Loddon	Maffett Cruisers The Pits Chedgrave	01508 520344	No	Yes	Yes	No
	Pacific Cruisers Hardley Road Chedgrave	01508 520321	No	Yes	No	Yes
	Princess Cruisers Bridge Street Chedgrave	01508 520353	No	Yes	Yes	Yes
Ludham	Ludham Boat Services Ludham Bridge	01692 631011	No	Yes	Yes	Yes
	Ludham Garage	-	Yes	No	No	Yes
Martham	Martham Boatbuilding Co	01493 740249	No	Yes	Yes	Yes
	Martham Ferry, 31 Somerton Road	01493 740303	No	Yes	No	No
Norwich	Norwich Yacht Station (April-October)	01603 612980	No	Yes	Yes	No
Oulton Broad	Ting Dean	01502 573033	No	No	No	No
	Waveney River Tours 6 The Boulevard Yacht Station	01502 589556	No	No	No	No
Potter Heigham	Herbert Wood Limited	01692 670711	No	Yes	Yes	Yes
	Maycraft	01692 670241	No	Yes	No	No

Location	Site	Telephone	Petrol Retail	Pump Out	Chemical Toilet	Diesel Retail
Reedham	Sanderson Marine Riverside	01493 700242	No	Yes	No	Yes
Somerleyton	Somerleyton Marina	01502 730335	No	No	No	No
South Walsham	Marinetech	01603 270262	No	Yes	Yes	Yes
Stalham	Richardsons (Pleasure Craft) The Staithe Simpsons Sutton Staithe Boatyard Tesco Petrol Station	01692 581081 01692 580288 01692 581653 -	No No No Yes	Yes Yes Yes No	Yes No No No	Yes Yes Yes Yes
Thorpe	Freedom Boating Holidays Bungalow Lane	07857 245234	No	Yes	No	No
Upton	Eastwood Whelpton	01493 750430	No	No	No	No
Wayford	Wayford Bridge Petrol Station		Yes	No	No	Yes

Appendix 10 – Oil Spill Contingency Plan: Strategic Oil Booming/Container Sites

Updated November 2016

The following are sites where oil booming might be deployed to prevent oil spreading into designated conservation sites, nature reserves or important habitats, or simply to prevent oil spreading under influence of wind or tide. The significance of each booming site is recited. In many cases booming would be for deflecting oil spills rather than containment/removal, because of the remoteness and difficulty of access for oil recovery.

Some sites would be operable only at certain times, especially because of strength of tidal stream or strong fluvial currents after heavy rainfall.

This schedule of sites is complimentary to Appendix 11, which indicates appropriate to contain oil near source, including sites at high risk due to proximity of boatyard operations, fueling etc.

River Bure

Wroxham: Wroxham Viaduct to Wroxham Viaduct BA Moorings

Boom diagonally across the river from viaduct piers to mooring frontage. To contain a major spill in Wroxham from spreading upriver on flood tide into the unspoiled reaches and Bridge Broad. Would close river to navigation but effect on traffic would be limited. Access to moorings for oil recovery not good but workable. There is available space for temporary oil storage tank. Tidal streams gentle and well sheltered.

Wroxham Broad North and South Entrances

To deflect a major spill in the main river near Wroxham from entering and polluting Wroxham Broad. Both entrances are fairly narrow. Tidal streams are gentle. Access for oil recovery is poor.

Salhouse Broad East and West Entrances

To deflect a major spill in the main river from entering Salhouse Broad.

Hoveton Great Broad Entrances

Upper entrance overgrown and difficult to boom. Lower entrance (opposite Woodbastwick Hall) better defined and more easily boomed. Potential to protect very large area of high conservation importance from pollution.

Hoveton Little Broad (Black Horse Broad) Dyke

Single narrow dyke, if boomed could prevent spillage entering Hoveton Little Broad or Pound End.

Ranworth Dam
Boom across mouth of Ranworth Dam to prevent oil from entering Malthouse Broad and Ranworth Broad from a pill in Main River. Significant disruption to navigation acceptable.

Ranworth Broad
Boom across entrance to Ranworth Broad to deflect spill in Malthouse Broad from entering Ranworth Broad.

South Walsham Fleet Dyke
Boom across mouth of Fleet Dyke to deflect oil in main river from entering the dyke and broad and the high grade marshes which take water from Fleet Dyke.

Boom diagonally across Fleet Dyke near entrance of South Walsham Broad to contain oil spilled into Broad from spreading to main river and marshes. Possibility of oil recovery at Environment Agency moorings: access poor but space available for temporary containment. Tidal streams gentle.

Great Yarmouth Yacht Station
Boom diagonally across the river from yacht station to the EA piling opposite.

Oil can be recovered at site if tide is favourable. Good storage areas available but venue are open to the public and closure should be considered. Tidal flow can be in excess of 4mph.

River Ant

Wayford Bridge
Containment boom diagonally across river from Mr Cooks houseboat site immediately above the bridge to moorings opposite, to contain oil spilled downriver from entering North Walsham and Dilham Canal and Broad Fen or Dilham Arm. Gentle streams. Reasonable access to moorings for oil removal and space available for temporary oil storage tanks. Disturbance to navigation minimal.

Stalham Arm
Boom across mouth of Stalham Arm to deflect oil in Main River from entering Stalham Arm and Sutton Broad. Access for recovery very poor/impossible.

Barton Turf
Booms across main channel (south of Heater Island) and Paddy's Dyke to deflect oil spilled on Barton or in Upper Ant from entering Barton Turf.

Neatishead Arm
Boom across Gay's Staithe to north bank to prevent oil spilled in Barton Broad or main river from entering Limekiln Dyke, conversely to contain oil in Limekiln Dyke from entering Barton Broad, with good oil recovery possibilities at Gay's Staithe.

Irstead Staithe
Diagonal cross-river booming to contain oil at staithe. Possible to install boom for either flood or ebb tide use. I.e. to contain spills on Upper Ant or prevent spills in lower river spreading onto Barton Broad. Good oil recovery possibilities and access. Minimal disruption to navigation.

Ludham Bridge
Diagonal cross-river booming upriver at Ludham Bridge with fair access both sides for oil recovery on flood or ebb. Moderate tidal streams clear of bridge hole. Major disruption to navigation.

River Thurne

Waxham Cut
Boom across mouth of cut to deflect oil from entering. Very little tide. Very poor access and no possibility of oil recovery from shore. Minimal navigation disruption.

Meadow Dyke
Booming possible at either end of dyke to contain oil to area of source, but access very poor and not practicable to recover oil from shore. Very moderate streams.

Candle Dyke/Thurne Junction
Possible deflecting booming site to prevent oil coming upriver from Potter Heigham from approaching Hickling/Horsey. Possible effective especially if used in conjunction with (a) a secondary containment/collection boom diagonally across river to the Eel Set by the Holt (or Candle Dyke) and (b) deflection boom at Martham Ferry to deflect oil for collection in Martham Ferry Dyke where access for recovery is good, thus minimising spread upriver towards Martham Broad. A further secondary collection boom might be installed at Dungeon Corner. Moderate navigational disruption but extremely high conservation priority.

Such a deflection/containment system would be even more effective if a diagonal cross-river boom from Broads Authority moorings, Martham Bank, to mooring basin on Broads Authority land immediately down river of bypass road bridge.

Potter Heigham
Flood tide containment boom diagonally across river from premises of former Bridge Hotel immediately upriver of bridge to Broads Authority frontage opposite with collection and removal from mooring basin at upriver end of Broads Authority frontage. Good access and still water in mooring basin. Moderate tidal stream. Ebb tide containment by diagonal cross river boom from Broads Authority moorings, Martham Bank, to mooring basin on Broads Authority land immediately down river of bypass road bridge.

Womack Water
Deflection boom across entrance of Womack Dyke to prevent oil in main river entering dyke,

with possible secondary deflection boom across dyke, deflecting oil into Broads Authority field base mooring basin for removal.

River Yare

Trowse Eye

Diagonal booming across River Yare between premises of Carrow Yacht Club and Norwich Rowing Club. Could be installed for flood or ebb tide operation to prevent oil spilled in the main river Yare/Wensum entering the headwaters or contain spillage from entering the main river. Good access and sheltered conditions with moderate tidal streams at most times. (Increased streams at times or high rainfall)

Thorpe Rail Bridges (Upper or Lower)

Boom installed across the bridges could prevent spill emanating from Thorpe Old River entering the main River Yare or vice versa. Access for oil recovery is poor, especially at lower bridge and streams can run moderately strongly. Effectiveness probably greatest if deployed as deflection booms to prevent main river pollution from entering the Old River.

Great Yarmouth

Foreshore in front of ASDA car park to foreshore on Cobham side.

Tidal flow can be in excess of 5 mph.

Surlingham Broad Dykes

Booms could be deployed across the mouths of both Surlingham Fleet Dyke (the short dyke at the downriver side of the broad) or Surlingham Birds Dyke (the longer dyke at the upriver, west end of the broad) These would be deflection booms to prevent main river oil spills from entering the broad. Shore access to both dykes for oil removal is very poor or impossible. A spill within Surlingham Broad would be contained with booms across the dykes and in this case would be essential also to deploy a boom across the dyke at the junction of Birds Dyke and the broad, which gives access to a very large area of marsh and reed bed and the creeks up to Surlingham Staithe. Disruption to navigation by closure would be minor.

Rockland Broad Dykes

Booms would be deployed across the mouths of Rockland Fleet Dyke (the longer upriver dyke and the short, downriver dyke to deflect main river oil from entering the broad and thence the dykes and reed beds of the Ted Ellis Wheatfen Reserve. This would be a high priority in view of the undefended and highly vulnerable nature of this very important reserve and its habitats.

Haddiscoe New Cut

It should be a primary aim to prevent oil spillage in the Yare entering the Waveney system and vice versa. It is therefore important to deploy containment booming in the Haddiscoe new cut to cope with oil passing in either direction. The Reedham end of the cut is not ideal; on the ebb the flow is mainly from Haddiscoe towards Reedham, leading to turbulence and

strong streams at the Reedham junction. Access for oil removal is also extremely poor. A more appropriate place to deploy containment booming would be the vicinity of the Haddiscoe Flyover with diagonal cross river booming and oil removal from the moorings immediately west of the flyover, which has good road access and space for temporary tank storage.

River Waveney

Geldeston Locks

Possible deployment of containment boom across the main river beneath the footbridge near the Locks Inn (the head of navigation) with containment and removal from meadow opposite. Boom able to be deployed for both flood and ebb tide operation to contain oil from downstream entering the non-navigable river to Ellingham and up-river oil entering the navigable sections below Geldeston.

Geldeston Dyke

Deflection boom across mouth of Geldeston Dyke to prevent main river oil from entering the dyke and boatyard moorings.

Beccles Dam Bridge

Ebb tide containment boom using bridge fendering Gillingham side for securing, running diagonally across river to town side with deflection onto Loaves and Fishes Dyke for removal. Good access to dyke for oil removal and temporary storage. To contain oil spills emanating from Beccles and upriver. Strong stream may be experienced on spring ebbs or after rainfall. Moderate disruption to navigation.

Beccles Bypass Bridge

Diagonal cross river containment booming beneath Bypass Bridge to public bridge mooring frontages immediately downriver of bridge. Good access for oil removal but still water containment area and river subject to moderately strong streams on spring ebbs and after rainfall (2-3 knots).

Haddiscoe Environment Agency Depot

Possible deflection booming to deflect surface oil into New Cut for containment and removal adjacent to Haddiscoe Cut junction. Strong streams would require midstream anchors.

Appendix 11 – Oil Spill Contingency Plan: Emergency Oil Spill Booming – Potential Locations

Boatyards Basins/Mooring Dykes etc

The following are locations where there is an increased risk of oil spillage due to boatyard operations, refueling etc. and where containment booming could be effective to contain oil spills close to source and minimise spread of oil into the main river system.

This schedule is complimentary to Appendix 10 which indicates strategic containment or deflection booming sites where deployment might protect particular areas, including conservation designated sites, nature reserves etc.

River Bure

Wroxham

- Bridge Broad moorings/ Connoisseur Cruisers. Across entrance to broad/moorings
- Broads Tours/Faircraft Loynes mooring basin entrance
- Moores Boatyard basin entrance
- Powles Marina entrance
- Ashtons mooring basin entrance
- Barnes Brinkcraft basins upper and lower
- Daisy Broad entrance (from Beehive)
- Summercraft Boatyard/mooring dyke/Across entrance from Wildwood (Mr Royall)

Horning

- South Quays Marina
- Percivals mooring basin (opposite staithe)
- Burehaven moorings dyke
- Ferry Marina Dyke
- Woods Dyke
- Horning Pleasurecraft basin entrance

Cookshoot Dyke/South Walsham Broad/Boundary Farm Dyke/Oby Dyke/Upton Dyke

- R & J Russell boatyard basin

Acle

- Horizon Craft boatyard basin
- Anchor Craft/ Bridgecraft Dyke
- Acle Boat Dyke/Hermitage Dyke entrance

River Ant

Wayford Bridge

- Wayford Marina upper basin
- Wayford marina middle basin
- Wayford Marina downstream dyke
- Smallburgh Staithe dyke
- Peter Linfords mooring dyke

Stalham

- Keir Bedwells Chapelfield mooring basin
- Broadsedge Upper Dyke/Lower Dyke/Mooring basin
- Stalham Yacht Services basin entrance
- Richardsons boatyard main basin entrance

Sutton Staithe

- Boatyard basin/Boatyard mooring basin

Barton Turf

- Coxs Boatyard moorings entrance
- Coxs Boatyard upper dyke (adjacent to staithe)

River Thurne

Horsey Staithe Dyke

Hickling

- Pleasureboat Dyke
- Staithe Dyke
- Whispering Reeds Dyke

Martham Ferry Dyke

Martham Staithe Dyke

Potter Heigham

- Repps (upper) staithe dyke/Phoenix Fleet
- Staithe Dykes/Herbert Woods Dayboats
- Broadshaven entrance
- Repps (lower) staithe dyke

Thurne

- (west bank) EACC mooring dyke

Thurne Dyke

- Inner end/Lambs moorings
- Entrance

River Yare

Thorpe

- Reliance Boat dyke entrance

Thorpe/Whittlingham

- BA Commissioners Cut Mooring dyke

Thorpe/Griffin Lane

- Griffin Marine Dykes/Highcraft Boatyard dyke

Brundall Gardens

- J Broom boatyard dyke
- Brundall gardens marina/Linder boats basin entrance

Brundall

- Bells Marina entrance dyke
- Brooms upper (hirecraft) basin (adjacent to shop)
- Brooms middle (hirecraft) dyke
- Brooms marina entrance
- Hobro's dyke across mouth of dyke
- Brundall Bay Marina entrance

Rockland

- Boat dyke; across mouth of dyke

Langley Dyke

- Across mouth of dyke

Hardley Dyke

- Across mouth of dyke

Reedham

- Holly Farm mooring dyke/Yareside moorings

River Chet

Loddon

- Princess Cruisers (Aston Boats) boatyard basin
- Mistral Craft to upper end Pyes Mill mooring (crossover)

River Waveney

Geldeston Locks

- Downriver and Broads Authority moorings to centre island

Geldeston Dyke

- Rowan Craft; across rail bridge hole/ Rowan Craft; across bridge bypass channel
- Across mouth of dyke

Beccles

- Anglia Yacht Brokers Sales Dyke; across mouth of dyke
- Yacht Station; across Yacht Station dyke mouth
- Aston Boats; across boatyard basin entrance
- Hipperson Boatyard; across boatyard basin entrance

Burgh St Peter

- Waveney Yacht Centre, Staithe dyke, across mouth
- Waveney Yacht Centre, upper basin, across entrance
- Waveney Yacht Station, lower basin, across entrance

Oulton Broad

- Broadland Holiday village basin entrances
- Colemans Dyke entrance

Somerleyton

- Crown Cruisers basin. Across entrance

St Olaves

- St Olaves marina across entrance
- Alpha Craft boatyard across mouth of mooring dyke
- Castle Craft boatyard across mouth of mooting basin