

Zenith Energy – Bantry Bay Terminal

OPRC Oil and HNS Spill Contingency Plan



Ambipar Response

Document Management

| | | | Date |
|--------------|----------------------------------|--|------------|
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Zenith Energy – Bantry Bay Terminal: Oil and HNS Spill Contingency Plan 2023

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List of Plan Holders

| Copy | Organisation / Name | Location |
|------|-------------------------|-------------------|
| 1 | Control Room | Hard Copy and PDF |
| 2 | Marine Department | Hard Copy and PDF |
| 3 | Town Office | Hard Copy and PDF |
| 4 | Bantry Bay Port Company | PDF |
| 5 | Oil Spill Response Ltd | PDF |
| 6 | Irish Coast Guard | PDF |

Amendment Record

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| 1.0 | 27/05/2015 | Oil Spill Response Limited | OSRL |
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| O/HNSSCP | PDF | 1.0 | | Oil Spill Response Ltd |
| O/HNSSCP | PDF | 1.0 | | Irish Coast Guard |

OPERATIONS SECTION

Operations Overview

Phase 1 – Discovery and Notification, Evaluation, Identification and Activation

Phase 2 – Development of an Action Plan

Phase 3 – Action Plan Implementation

Phase 4 – Response Termination and Demobilisation

Phase 5 – Post Operations and Documentation of Costs/Litigation

Operations Overview

Introduction

This Oil and HNS Spill Contingency Plan (O/HNSSCP) has been specifically prepared by Zenith Energy (ZE) to describe the graduated and tiered response process developed to provide a robust and coordinated response to Oil Spill and HNS incidents from offshore and onshore operations at their Bantry Bay Terminal (BBT), Whiddy Island, County Cork.

The plan takes full account of requirements made within the National Contingency Plan for Oil and HNS Spills (2020), the National Framework for Emergency Management (2012), Seveso Directive and local and regional interfacing contingency plans. It has been written in accordance with international best practices and fulfils the requirements of Irish Legislation.

The requirement for all sea ports and oil handling facilities to have an O/HNSSCP is a result of the Irish Coast Guard (IRCG) ratifying, or considering ratification, of various international instruments relating to preparedness and response to marine oil or HNS pollution including the [International Convention on Oil Pollution Preparedness, Response and Co-operation \(OPRC\)](#), [Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substance, 2000 \(OPRC-HNS Protocol\)](#) amongst many others stated in the [National Maritime Oil/HNS Spill Contingency Plan 2020 \(NMO/HNSSCP\)](#). This plan satisfies the requirements of the following key national acts:

- Sea Pollution Acts 1991 to 1999;
- Pollution of the Sea (civil Liability and Compensation) Acts 1988 to 2005;
- Sea Pollution (Miscellaneous Provisions) Act 2006;
- Merchant Shipping (Salvage and Wreck) Act 1993; and
- European (Vessel Traffic Monitoring Information System) Regulations 2010.

This plan has been prepared in accordance with the IRCG [Standard Operating Procedure 05-2020 "Implementation of an oil/HNS Spill Contingency Plan"](#), [Standard Operating Procedure 04-2020 "Establishing a Shoreline Response Centre"](#), the NMO/HNSSCP, the national Framework for Emergency Management, local and regional interfacing contingency plans and international best practices.

Geographic Scope

The area covered by this plan includes the Bantry Bay Terminal (BBT), its Jetty, offshore mooring buoy and immediate waters within Bantry Bay Port Companies (BBPC) Harbour Limits.

BBT is a crude oil and product storage terminal facilitated by an offshore mooring buoy, located on Whiddy Island, Bantry Bay. There are 18 storage tanks on site, with the total storage capacity of the terminal being approximately 1,300,000m³. The terminal is currently licensed to store up to 850,000m³ of Petroleum Class 1 (crude or gasoline). The licence also covers an additional 970,000m³ of Class 2 product, (Kerosene or Jet Fuel) and 1,070,000m³ of Class 3 product.

Zenith Energy are required to respond to and mitigate against any incidents that may occur on site until a threshold has been reached which commands intervention from Bantry Bay Port Company or any higher authority. Figure 0.1 and Figure 0.2 shows the facility schematic of BBT and the relation of Whiddy Island in relation to BBPC's area of jurisdiction respectively.

This plan defines the contingency arrangements for responding to an incident from the site which poses a threat of marine pollution.

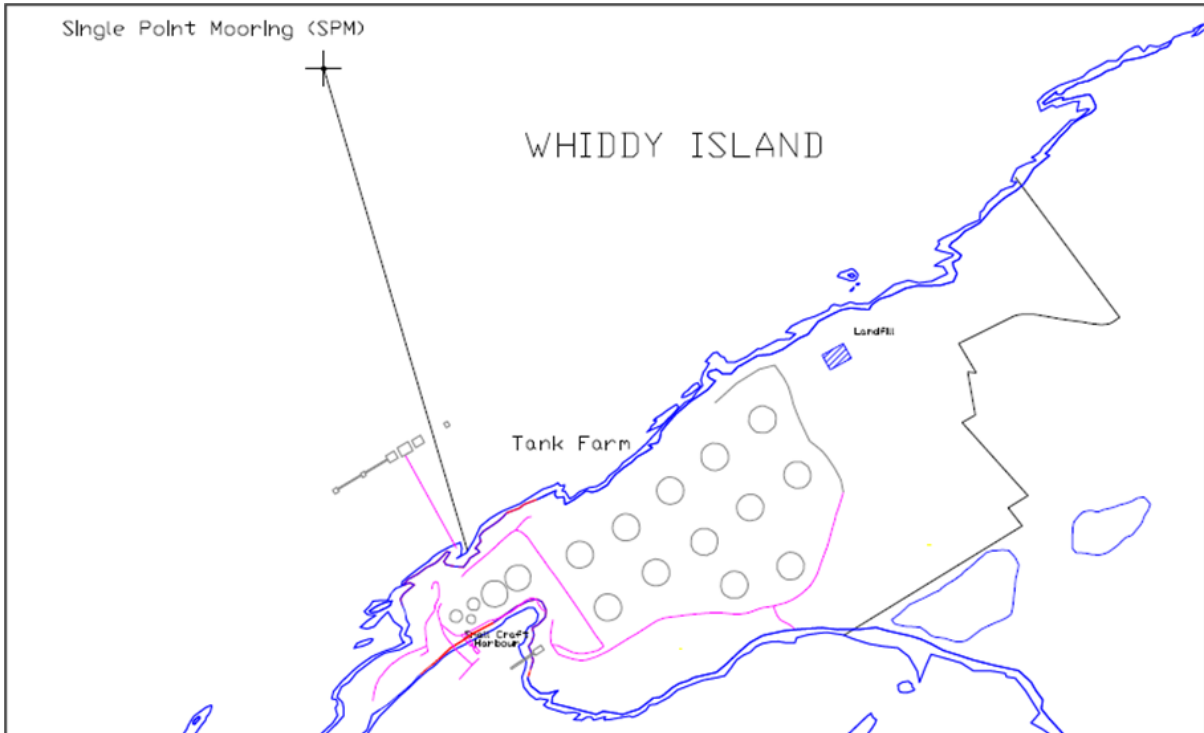


Figure 0.1 – Bantry Bay Terminal Facility Schematic

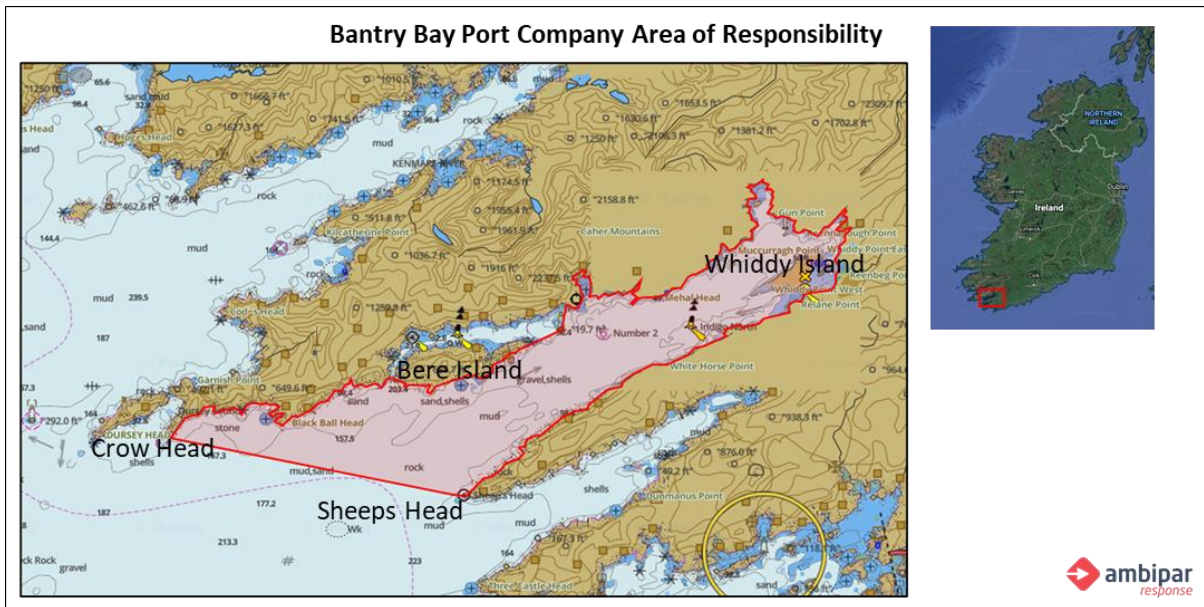


Figure 0.2 – Bantry Bay Port Company Area of Jurisdiction

Document Control Procedure

This O/HNSSCP is a controlled live document and may be amended following each response, exercise, legislative review, or change in Zenith’s oil or HNS spill risk profile. The Marine Lead is responsible for the control, review, and amendment of this document. Any amendments to this plan will be captured in the amendment record and resubmitted to all registered plan holders.

Objectives of Plan

This plan guides the Incident Management Team and other involved personnel through the decisions which will be required throughout the response to a pollution incident.

The primary objectives of this plan are:

- To prevent further pollution/damage caused by the spill;
- To contain any spill/release within the boundary of the facility;
- To contain and clean up spills migrating to inland waterways; and
- Cause no further damage to the aquatic and shoreline environment, or not to create unacceptable risk to those responding to or impacted by the incident.

Specific objectives are to:

- Mobilise appropriate personnel, equipment, and other resources;
- Make all necessary notifications to relevant agencies and organisations;
- Instigate containment, recovery, and clean-up operations to control and mitigate the effects of the spill and contribute to the restoration of the environment;
- Initiate, as appropriate, wildlife rescue and rehabilitation operations;
- Work with all other agencies to affect an appropriate response;
- Maintain accurate records so that the cost of the response operation may be accurately assessed; and
- Return to normal operations as soon as practicable.

Interfacing Plans

This O/HNSSCP interfaces with plans and documents captured in Figure 0.3.

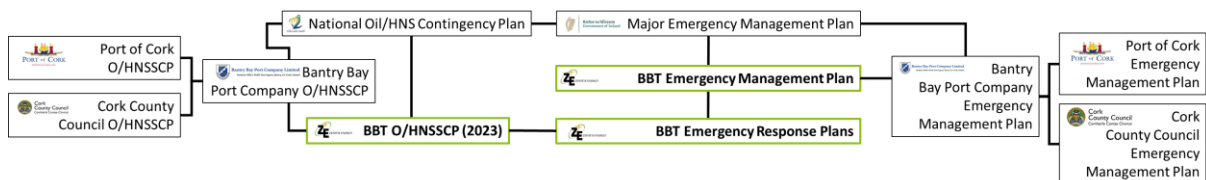


Figure 0.3 – Interfacing Plans and Documentation

Operational Phases

The following sub-sections of the Operational Section will be broken down into 5 phases in accordance with the IRCG [Standard Operating Procedure 05-2020 “Implementation of an oil/HNS Spill Contingency Plan”](#)

Phase 1 – Discovery and Notification, Evaluation, Identification and Activation (Page 5);

Phase 2 – Development of an Action Plan (Page 25);

Phase 3 – Action Plan Implementation (Page 28);

Phase 4 – Response Termination and Demobilisation (Page 32); and

Phase 5 – Post Operations and Documentation of Costs/Litigation (Page 33).

Phase 1 – Discovery and Notification, Evaluation, Identification and Activation

24/7 Spill Discovery and Notification Procedures

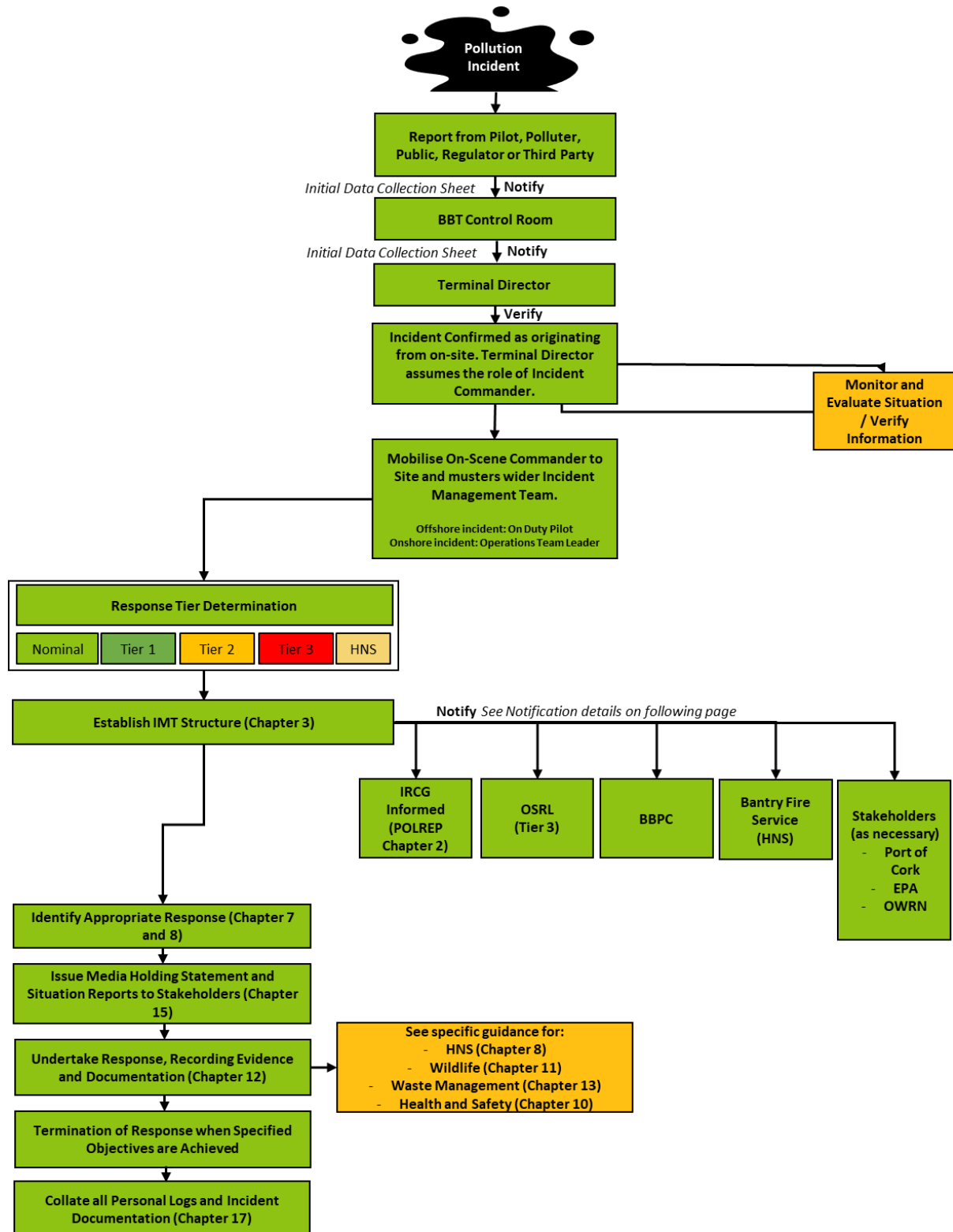


Figure 0.4 – Overarching Notification, Evaluation, Identification and Activation Flow Chart

Notification Details

| Role / Organisation | Action | Contact Details | Tier Level |
|---|---|---|---|
| Terminal Director |  | Telephone: 087 308 6988 Email: tadhg.deasy@zenithterminals.com | 1-3 |
| Irish Coast Guard |   | 999/112 (ask for Coast Guard) 016620922 (POLREP, Chapter 2) | 1-3 |
| Bantry Bay Port Company (BBPC) |  | +353(0)2753277 emergencyroom@dublinport.ie | 1-3 |
| Bantry Fire Service |  | 999/112 027 50522 | HNS |
| Port of Cork (POC) |  | Deputy Harbour Master: (Day) + 021 4273125 (Ext 18) (Out of Office) + 086 813 8748 Harbour Master: (Day) + 021 4273125 (Ext 176) | 1-3 |
| Cork County Council (Cork CoCo) |  | Pollution Officer Tel: 028 21299 Environmental Officer Tel: 021 4532700 Bantry Area Engineer Tel: 027 50058 Out of Hours Tel: 021 480 0048 | 1-3 |
| Environmental Protection Agency |  | 01890 33 55 99 | 2-3 |
| OSRL |   | +44 23 80331 551 dutymanagers@oilspillresponse.com | 3 |
| Key: | | | |
|  Call Immediately once notified of Incident |  Call as required |  Send Notification Form as soon as practicable |  Send Notification Form as required |

Tier 3 Response Provider (OSRL) Notification



OSRL Notification Form

(Initial Incident Information)

Warning! Please telephone the Duty Manager before e-mailing or faxing this form

| | | | |
|----------------------|-----------------------------------|-------------------|----------------------|
| To | Duty Manager | | |
| OSRL Base | Southampton, UK | Loyang, Singapore | Fort Lauderdale, USA |
| Telephone | +44 (0)23 8033 1551 | +65 6266 1566 | +1 954 983 9880 |
| Emergency Fax | +44 (0)23 8072 4314 | +65 6266 2312 | +1 954 987 3001 |
| Email | dutymanagers@oilspillresponse.com | | |

Guidance: This information will be used to develop and recommend the most appropriate response strategy. If new information should become available, or the situation changes, please inform the Duty Manager as soon as possible.

| Section 1 – Contact Details | | | |
|-------------------------------|---------------|--------|-----------|
| Member Company | | | |
| Name of Person Notifying OSRL | | | |
| Job Title (Designation) | | | |
| Direct Phone Number | Country code | Number | |
| Mobile Number | Country code | Number | |
| Fax Number | | | |
| Email Address | | | |
| Command Centre Address | | | |
| Date and Time of Notification | Date and Time | | Time Zone |

| Section 2 – Location | | | | |
|---------------------------------|-----------------------------------|----------------------------------|------------------------------------|----------------------------------|
| Country / Region of Spill | | | | |
| Latitude of spill (north/south) | | | | |
| Longitude of Spill (east/west) | | | | |
| Area Affected | <input type="checkbox"/> Offshore | <input type="checkbox"/> Subsea | <input type="checkbox"/> Shoreline | <input type="checkbox"/> Estuary |
| | <input type="checkbox"/> Port | <input type="checkbox"/> Harbour | <input type="checkbox"/> Inland | <input type="checkbox"/> River |
| Water Depth (if applicable) | | | | |

| Section 3 – Spill Details | | | | | |
|---------------------------|----------------------------------|---------------------------------------|----------------------------------|---|--|
| Date and Time of Spill | | Time Zone | | | |
| Source of Spill | | | | | |
| Cause of Spill | | | | | |
| Status of Spill | <input type="checkbox"/> Secured | <input type="checkbox"/> Uncontrolled | <input type="checkbox"/> Unknown | | |
| Product Properties | Product Name / Type | | | | |
| | Specific Gravity | API | | State Units Provide an assay sheet if available. <input type="checkbox"/> Assay sheet provided | |
| | Pour Point | | | | |
| | Wax Content | | | | |
| | Asphaltene | | | | |
| | Sulphur Content | | | | |
| Viscosity | Reference Temperature | | °C | | |
| Type of Release | Instantaneous Release | <input type="checkbox"/> | Volume | | |
| | OR | | | | |
| | Continuous Release | <input type="checkbox"/> | Release Rate | | |

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| Section 3 – Spill Details continued | | | | |
|--|-------------------------------------|--|---|---|
| Description of Observed Spill | Estimated Quantity | | | State Units |
| | Size | | | |
| | Appearance | | | |
| | Direction of Travel | | | |
| Section 4 – Weather and Modelling | | | | |
| Weather forecast provided? e.g., Excel/Word | <input type="checkbox"/> Yes | <input type="checkbox"/> No, OSRL to source a weather forecast | | |
| Sea Temperature | | | | State Units |
| Sea State | | | | |
| Visibility | | | | |
| Cloud Base | | | | |
| Do you require Oil Spill Trajectory Modelling? | <input type="checkbox"/> Surface 2D | <input type="checkbox"/> Sub-surface 3D Additional time and costs apply | <input type="checkbox"/> Not at this time | |
| Sub-surface 3D Modelling Information if requested | Gas to Oil Ratio | Sm ³ /m ³ | Release Hole Diameter | m |
| Section 5 – Safety and Security | | | | |
| Highlight any known safety or security risks e.g. high levels of H ₂ S, high risk country | | | | <input type="checkbox"/> Not Applicable |
| Describe security arrangements for OSRL staff | | | | <input type="checkbox"/> Not Applicable |
| Section 6 – Resources at Risk (if available) | | | | |
| Environmental or socio-economic sensitivities that may be impacted. Provide the relevant oil spill contingency plan and sensitivity maps if available. | | | | <input type="checkbox"/> Contingency plan included. <input type="checkbox"/> Sensitivity maps included |
| Section 7 – Equipment (if available) | | | | |
| Equipment already deployed or being mobilised (other than OSRL resources) | | | | |
| Section 8 – Further Information | | | | |
| | | | | |

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Tier 3 Response Provider (OSRL) Mobilisation



Mobilisation Authorisation Form

Please do not hesitate in contacting the duty manager at the earliest opportunity in the event of an incident or potential incident. Please ensure you telephone the Duty Manager before e-mailing or faxing this completed form

Safety and Security

Oil Spill Response Limited's safety policy requires us to work closely with the mobilising party to ensure all aspects of safety and security are addressed for our personnel.

| | | | |
|----------------------|-----------------------------------|-------------------|----------------------|
| To | Duty Manager | | |
| OSRL Base | Southampton, UK | Loyang, Singapore | Fort Lauderdale, USA |
| Telephone | +44 (0)23 8033 1551 | +65 6266 1566 | +1 954 983 9880 |
| Emergency Fax | +44 (0)23 8072 4314 | +65 6266 2312 | +1 954 987 3001 |
| Email | dutymanagers@oilspillresponse.com | | |

| Details of Authorised Contact | | | |
|--|--------------|--------|--|
| Incident Name | | | |
| Mobilising Company | | | |
| Name of Person Authorising OSRL | | | |
| Position of Authorising Representative | | | |
| Direct Phone Number | Country Code | Number | |
| Mobile Number | | | |
| Fax Number | | | |
| Email Address | | | |

| | |
|------------------------------|--|
| Invoice Address if available | |
| Purchase Order Number | |

I, the above named Authorising Representative for the Mobilising Company, approve activation of Oil Spill Response Limited and its resources in connection with the above incident under the terms of the Agreement in place between the above stated Company and Oil Spill Response Limited.

| | | | |
|------------|--|--------------|--|
| Signature: | | Date / Time: | |
|------------|--|--------------|--|

If Oil Spill Response Limited personnel are to work under another party's direction please complete details below:

| Directing Party's Details | |
|---------------------------|--|
| Company | |
| Contact Name | |
| Position in Incident | |
| Direct Phone Number | |
| Mobile Number | |
| Fax Number | |
| Email Address | |

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Page 1 of 1

Discovery and Notification of an oil/HNS Spill Incident

An oil/HNS spill is likely to be discovered and reported by any ZE personnel. However, a release may also be discovered and reported through a number of other sources including; BBPC, passing vessels, a member of the public, emergency services, or the Irish Coast Guard.

On receipt of initial notification, the following information should be obtained as a minimum:

- Location of the incident
- Type of oil or product (If known)
- Extent of spill – area of coverage
- Time of incident
- Potential hazardous circumstances – i.e. large release of product
- Any other relevant data

This can be guided by the Initial Data Collection Sheet overleaf.

A POLREP should also be completed on notification of the IRCG (See Chapter 2).

Upon notification of a spill incident, the Incident Commander (Terminal Director) will mobilise the On Duty Pilot for offshore incidents or the Operations Team Leader for onshore incidents to undertake the role of On-Scene Commander, who will undertake an On-Scene assessment of the incident to collect as much incident data as available. The initial data collection sheet (Page 11) is an aid memoir for the Incident Commander, On-Scene Commander and any other members of ZE BBT to collect relevant information when undertaking the initial incident evaluation.

The Incident Commander will then use the Information in this sheet concurrently with the data obtained through live weather reports, Safety Data Sheets (SDS), and information from Chapter 3.2 to determine the Tier level (Page **Error! Bookmark not defined.**), mobilise resources as required (IMT, Page 23), begin planning an effective response strategy and undertake all necessary notifications (Page 5). The Incident Commander can be assisted by mobilised members of the IMT throughout this process.

Safety of personnel should be at the forefront of all response operations from the initial incident assessment through to demobilisation. Therefore, it is fundamental the process outlined in the Safety Assessment (Figure 0.5) is followed whilst conducting the initial incident evaluation and all potential hazards are removed, or associated risk are ALARP, before conducting any response operations.

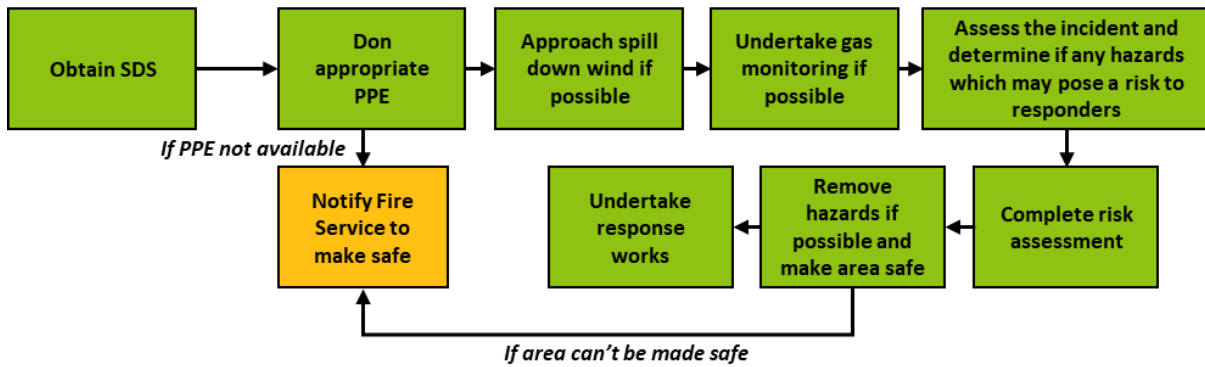


Figure 0.5 – Safety Assessment Process

Initial Data Collection Sheet

The Initial data collection sheet should be used for gathering information in anticipation of conversation with the Terminal Director, On-Scene Commander, BBPC, POC, IRCG and response contractors regarding the oil spill incident. For guidance on assessing the oil spill refer to Pages 18 – 21.

Always Retain a Copy for Potential Investigative Purpose

| Contacts Details | | | | |
|---|--|--|--|--|
| Name of Reporter | | | Company | |
| Contact Number | | | Position | |
| Alternative Contact Number | | | | |
| Time of Notification | | | Date of Notification | |
| Oil Spill Incident Details | | | | |
| Date / time | | | | |
| Vessel | Name | | | |
| | Owner/Operator | | | |
| | Response Primacy | | | |
| Hydrocarbon Released | Type | | | |
| | Name of Product | | | |
| Location of Release | Latitude | | Additional Info: | |
| | Longitude | | | |
| Any Casualties / Damage? | | | HSE been advised? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Source of Release (if known) | | | | |
| Cause of Release (if known) | | | | |
| Release quantity / Worst Case Potential (If Known) | Quantity | | On-going | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| | Potential | | | |
| Has operation been shut down and / or will incident affect operation? | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| Direction of spill trajectory | | | | |
| Is shoreline impact likely | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |
| Which other agencies have been informed? | | | | |
| Current Weather at Release Location | | | | |
| Wind direction | | | | |

| | | | |
|-----------------------------|--|-----------------------------------|-------------------------------|
| Wind Speed | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| Sea State | <input type="checkbox"/> Rough | <input type="checkbox"/> Moderate | <input type="checkbox"/> Calm |
| Wave Height | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| Visibility | <input type="checkbox"/> Low | <input type="checkbox"/> Moderate | <input type="checkbox"/> Good |
| Cloud Cover | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| Precipitation | <input type="checkbox"/> High | <input type="checkbox"/> Low | <input type="checkbox"/> Non |
| Safety of Personnel | | | |
| Is emergency evac required | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |
| List any known safety Risks | | | |
| Additional Information | | | |

Initial Action Cards

Spill Observer

| Spill Observer | | | | |
|--|--|---------|--------------------------|-----------|
| Overview of Role and Responsibilities: Person who first sees the oil/HNS spill and takes instant action. | | | | |
| Step | Action | Ref | ✓ | Time/Date |
| 1. | Make safety your first priority: <ul style="list-style-type: none"> • Inform BBT Control Room; • Stop all hot work and separate ignition sources; • If safe, take instant action to stop the spill; • ONLY approach the spill from upwind of the source; and, • If area is unsafe, leave and tell others to. | | <input type="checkbox"/> | |
| 2. | Follow up call to BBT Control Room, give information on: <ul style="list-style-type: none"> • Safety and status of personnel; • Location; • Source and cause; • Extent of spill, if its ongoing or under control; • Time and length of spill; • Hydrocarbon/HNS type; • Potential hazards; and • Other useful information. | Page 11 | | |
| 3. | Act on instructions from the Control Room / Incident Commander. Complete log of events to include <ul style="list-style-type: none"> • Time of events; • What you saw; • Any Action you undertook; • Who arrived and when; and, • What they did. | | | |
| 4. | Attend a post-incident debrief. | Page 32 | | |

Incident Commander (Terminal Director)

| Incident Commander (Terminal Director) | | | | |
|--|--|-------------------------|--------------------------|-----------|
| Overview of Role and Responsibilities: Responsible for the overall management of the oil/HNS spill incident, including mobilisation of response teams, notification to external stakeholders, and coordination of the Emergency Response Team when mobilised. | | | | |
| Step | Action | Ref | ✓ | Time/Date |
| 1 | Following notification, mobilise the On-Scene Commander to undertake an assessment of the incident and confirm information (using the Initial Data Collection Sheet). | Page 11 | <input type="checkbox"/> | |
| 2. | Support the On-Scene Commander determining the volume of oil/HNS spilt. | | <input type="checkbox"/> | |
| 3. | Determine the direction and trajectory of the spill and identify any potential Environmental or Socio-economic receptors at risk. | Page 21 Chapter 4.4 | <input type="checkbox"/> | |
| 4. | Once information has been received from the On-Scene Commander, determine the appropriate Tier level and mobilise resources accordingly (Members of the IMT, Tier 3 Contractors and Waste Management Contractors). | Page 22 | <input type="checkbox"/> | |
| 5. | If Tier ½ identify the most appropriate response strategy to mitigate the consequential impact of the incident of the incident | Chapter 7 | <input type="checkbox"/> | |
| 6. | Notify all relevant stakeholders following up with the Initial Data Collection Sheet. Submit a POLREP to the IRCG. | Chapter 15 Chapter 2 | <input type="checkbox"/> | |
| 7. | If the IMT is mobilised, prepare to brief and assign roles to incoming IMT personnel. | Chapter 3 | <input type="checkbox"/> | |
| 8. | Establish a reporting schedule and assist the On-Scene Commander in ensuring the safety of the personnel throughout any response measures taken. Assess if additional resources are required. | | <input type="checkbox"/> | |
| 9. | Request additional resources to decide upon or implement the chosen response strategy through the Tier 3 response contractors. (i.e., Modelling) | Page 7 | <input type="checkbox"/> | |

| | | | | |
|-----|--|---------|--------------------------|--|
| 10. | If Tier 3 incident prepare for the arrival of Tier 3 contractor or IRCG resources, hand over the incident to IRCG Marine Response Team (MRT) and establishing meeting agenda with IRCG MRT. | | <input type="checkbox"/> | |
| 10. | Continue to liaise with the On-Scene Commander for regular updates and further requests. Share Situational updates with all relevant stakeholders (BBPC, POC, Cork CoCo etc.). | | <input type="checkbox"/> | |
| 11. | Demobilise IMT personnel as required. | Page 32 | <input type="checkbox"/> | |
| 12. | In liaison with the On-Scene Commander, IMT, ZE Senior Management, authorities, and the vessel owners/master/insurers, establish end point criteria where response measures are no longer considered effective and the threat to the environment is considered as low as reasonably practicable, oversee the demobilisation and termination of the response ensuring the justification for terminating any response measures are recorded. | Page 32 | <input type="checkbox"/> | |
| 13. | If applicable, determine the preparation of a monitoring programme detailing: <ul style="list-style-type: none"> • Actions and measures to be taken to ensure no further hydrocarbon release; • Arrangements in place to monitor environmental impact. | | <input type="checkbox"/> | |
| 14. | Continue to update and liaise with ZE Senior Management as required. | | <input type="checkbox"/> | |
| 15. | On incident closure, collate all response paperwork, photographs and logs. | | <input type="checkbox"/> | |
| 16. | Conduct a post-incident debrief with response personnel and assign personnel to complete any after-action recommendations. | Page 32 | <input type="checkbox"/> | |

On-Scene Commander (On Duty Pilot / Operations Team Leader)

| On-Scene Commander (On Duty Pilot / Operations Team Leader) | | | | |
|---|--|------------|--------------------------|-----------|
| <p>Overview of Role and Responsibilities: Mobilise to incident scene and undertake initial incident assessment. Then take primacy in the on-scene management of the incident and coordination of the deployment of response strategies.</p> <p>For offshore incidents: On Duty Pilot For onshore incidents: Operations Team Leader</p> | | | | |
| Step | Action | Ref | ✓ | Time/Date |
| 1. | Ensure the safety and protection of personnel any assets or infrastructure within the vicinity of the spill. Follow the Safety Assessment procedure. | Chapter 10 | <input type="checkbox"/> | |
| 2. | Verify the details of the spill and gather any relevant data available at that precise moment (using the Initial Data Collection Sheet): <ul style="list-style-type: none"> • Source, location and time of release; • Spill type; • Quantity released; • Appearance of the spill; • Weather conditions and sea state; • Immediate environmental and socioeconomic sensitivities under threat; • Details of any initial response actions taken; • Potential Tier Level; and, • Escalation potential. | Page 11 | <input type="checkbox"/> | |
| 3. | Report observations to the Incident Commander and request the mobilisation of appropriate resources to mitigate the impacts of the incident. | | <input type="checkbox"/> | |
| 4. | Notify all in the vicinity of the incident to make them aware. | | <input type="checkbox"/> | |
| 5. | Update and transfer information when obtained to the Incident Commander. | | <input type="checkbox"/> | |
| 6. | Complete all necessary risk assessments. | | <input type="checkbox"/> | |
| 7. | Develop a site safety plan and deliver a safety brief to the response team. Ensure you have all | Chapter 10 | <input type="checkbox"/> | |

| | | | | |
|-----|--|--------------|--------------------------|--|
| | necessary forms (Risk Assessment, Safety Brief, Gas Detection, Site Safety Operational Survey Form). | | | |
| 8. | Take a sample of the spilt oil or assign a member of the response team to take a sample of the spilt oil. | Chapter 12.1 | | |
| 9. | If appropriate, oversee and conduct Tier ½ response measures alongside any requested additional support (Regional). | | <input type="checkbox"/> | |
| 10. | If Tier 3 incident prepare for the arrival of response contractor, or IRCG resources (Tier 3). | | | |
| 11. | Conduct regular sitrep briefings with the IMT to ensure they are up to date on the progression of the incident. Continually review the strategy being employed and advise of changes where necessary to IMT. | | <input type="checkbox"/> | |
| 12. | Continue with response until end point criteria is met or told to demobilise by the Incident Commander. | | <input type="checkbox"/> | |
| 13. | Confirm incident closure with the IMT. | | <input type="checkbox"/> | |
| 14. | Collate and populate all logs and other documents and supply copies to the IMT. Conduct a post-incident debrief with response personnel to report to the IMT. | | <input type="checkbox"/> | |

Response Team (Operations Team Members)

| Response Team (Operations Team Members) | | | | |
|---|---|--------------|--------------------------|------------------|
| Overview of Role and Responsibilities: Assist in the response to an oil/HNS spill incident, being available to be tasked by the Incident Commander, On-Scene Commander, or assisting response contractors as required. | | | | |
| Step | Action | Ref | ✓ | Time/Date |
| 1. | Following notification from the On-Scene Commander, proceed to the site of the incident and alert all of those in the vicinity of the spill of the hazard. | | <input type="checkbox"/> | |
| 2. | Attend safety brief and carry out health and safety tasks as instructed. Ensure you are wearing the correct PPE: <ul style="list-style-type: none"> • Flame Retardant Overalls; • Steel toe Cap boots; • Eye Protection; • Hard Hat; • Gloves; • Hearing protection (if required); • Life Jacket if required. | Chapter 10 | <input type="checkbox"/> | |
| 3. | As tasked, undertake monitoring and evaluation tasks (oil sampling and visual evaluation). | Chapter 12.1 | <input type="checkbox"/> | |
| 4. | As tasked, undertake or assist in response activities, supporting any mobilised resources from BBPC/Cork CoCo or response contractors. | | <input type="checkbox"/> | |
| 5. | On being informed of incident closure, provide all response paperwork, photographs, and logs to the On-Scene Commander. | | <input type="checkbox"/> | |

Spill Volume Assessment

The Incident Commander in liaison with the On-Scene Commander should oversee the process of determining the size of the spill using the following methods:

- Tank Measurement;
- Flow Rate Calculation; and,
- BONN Agreement Oil Appearance Code (BAOAC) release estimation.

Results of the calculated spill volume should be recorded in the Initial Data Collection Sheet (Page 11).

Tank Measurement

Tank measurement is suitable for assessing an accidental release of oil from a container of known volume into the sea or onto the Jetty or deck of a vessel. Use the level indicators, tank drop volume and metering to quantify the volume of oil released.

Flow Rate Calculation

Flow rate calculation is suitable for a fuel/liquid transfer operation when a flow rate of liquid into the marine environment is known. Multiply the flow rate by the time duration in which the liquid was being released into the marine environment.

- **Spilled Volume = Flow Rate * Duration of Release**

BONN Agreement Oil Appearance Code (BAOAC) Visual Estimation

Use the release size estimation guide shown in Table 0.1 (or BAOAC calculator), on the following page, in conjunction with the BAOAC assessment aide in Table 0.2 to calculate the estimated volume of released oil on the water’s surface. The visual assessment should be undertaken from a high vantage point. A conversion table is provided below to assist in this process.

Volume Conversion Table

| Conversion from | Quantity | Conversion to | Quantity |
|---|----------|--------------------------------|----------|
| Kilometres (Km) | 1 | Nautical Mile (nm) | 0.539 |
| Statute (Mi) | 1 | Nautical Mile (nm) | 0.868 |
| Barrel (US Petroleum) (bbl) | 1 | Litre (L) | 158.987 |
| Barrel (US Petroleum) (bbl) | 1 | Cubic Metre (m ³) | 0.159 |
| Cubic Metre (m ³) | 1 | Gallon (US Liquid) (gal) | 264.172 |
| Gallon (US Liquid) (gal) | 1 | Lite (L) | 3.785 |
| Gallon (UK Liquid) (gal) | 1 | Lite (L) | 4.546 |
| Cubic metre to tonnes = (m ³ x SG) | | Tonnes to cubic metre = (l/SG) | |

Table 0.1 – BONN Agreement Release Estimation Guide

| Release Size Estimation Guide | | | | | | |
|--|---|--|--|---------------------|------------------------------|-------------------|
| If the source/quantity is unknown, then a visual estimation can be attained based on the relationship between observed oil appearance colour and its thickness using the Bonn Agreement Oil Appearance Code (BAOAC). Observations should be taken from a high vantage point, onboard the bridge of a vessel, lighthouse, control tower or dedicated aerial surveillance craft. | | | | | | |
| Step 1 | Total Area: Estimate total size of the area as a square or rectangle (in Km ²) | | | | | |
| Total Area = | Average Width (km) | * | X | Average Length (km) | * | = Km ² |
| Step 2 | Hydrocarbon Release Area: Determine the degree of covering by the slick within in the total area as a %. (i.e. 60% of 10 Km ² = 6Km ²). | | | | | |
| Hydrocarbon Release Area (Estimated) = | *% | X | Total Area | Km ² | = | Km ² |
| Step 3 | Calculate Area by Colour: Estimate the area covered by each colour of hydrocarbon as % of area affected in Km ² (i.e. 60% Silvery, 40 % Metallic = 3.6Km ² & 2.4 Km ² respectively) | | | | | |
| Colour | Code | Minimum (m ³ /Km ²) | Maximum (m ³ /Km ²) | Step 3 | | |
| | | | | % of Area Affected | Area Covered Km ² | |
| Oil Sheen Silvery/Grey | 1 | 0.04 | 0.3 | * | | |
| Oil Sheen Rainbow | 2 | 0.3 | 5.0 | * | | |
| Oil Sheen Metallic | 3 | 5.0 | 50 | * | | |
| Discontinuous True Colour | 4 | 50 | 200 | * | | |
| Continuous True Colour | 5 | 200 | >200 | * | | |
| Calculation for Area Covered: This should be calculated for each code Km²= Area/100 x % of Area Covered. | | | | | | |
| Step 4 | Calculate quantity by colour: Multiply the area covered by each colour (Min and Max) by the appropriate quantity of hydrocarbon in Step 3 (i.e. 3.6 x 0.04 = Min and 3.6 x 0.3 = max) | | | | | |
| Colour | Step 3 as above | | Step 4 | | | |
| | Area Covered (Km ²) | Min Volume (m ³) | Max Volume (m ³) | | | |
| Oil Sheen Silvery/Grey | | | | | | |
| Oil Sheen Rainbow | | | | | | |
| Oil Sheen Metallic | | | | | | |
| Discontinuous True Colour | | | | | | |
| Continuous True Colour | | | | | | |
| Step 5 | Total Quantity: Add all the colour figures to get the total quantity of oil spilt | | | | | |
| Total Volume (m ³) | Min Volume (m ³) | Max Volume (m ³) | | | | |
| Step 6 | Conversion: You can convert m ³ to tonnes by multiplying total quantity in m ³ by the Specific Gravity of the released hydrocarbon. | | | | | |
| Total Quantity in tonnes (m ³ x SG) | Min Quantity (tonnes) | Max Quantity (tonnes) | | | | |

Table 0.2 – BAOAC Assessment Aide

| BAOAC Assessment Aide | | |
|--|---|--|
| | | |
| <p>Spot Spillage wind nil to very light</p> | <p>Code 1 Oil Sheen (silvery / grey) (0.04 μm – 0.3 μm)</p> | |
| <p>Spot Spillage medium wind</p> | <p>Code 2 Oil Sheen Rainbow (0.3 μm – 5.0 μm)</p> | |
| <p>Spot spillage strong wind</p> <p>thick </p> <p>medium </p> <p>thin </p> | <p>Code 3 Metallic (5.0 μm – 50 μm)</p> | |
| | <p>Code 4 <i>Discontinuous true colour</i> (50 μm – 200 μm)</p> | |
| | <p>Code 5 Continuous true colour Continuous True Colours (>200 μm)</p> | |

Oil Spill Trajectory

The Incident Commander or equally trained member of the IMT should oversee the process of predicting the oil spill trajectory by using the wind and current vector calculation guide in Table 0.3. This should be undertaken in advance of monitoring the spill and assists in determining the appropriate response option and mobilisation of resources.

Table 0.3 – Wind and Current Vector Surface Release Trajectory Calculation Guide.

| Manual Calculation of Surface Release Trajectory | | | | | |
|--|-----------------------|-----------------------------|--|----------------------|--------------------------|
| Oil spill trajectory on the sea surface is predominately influenced by 3 – 4 % the wind speed and 100% of the current. Therefore, the trajectory of an oil slick can be determined by undertaking the vector addition calculation shown below. | | | | | |
| | | | <p>Velocity of oil = surface current * 0.03 wind velocity</p> <p>Spill moves from A to B.</p> | | |
| <p>Current = 20 knots x 1 (100%) = 20 knots 20 knots = 20 miles per hour @ given bearing</p> | | | <p>Wind = 10 knots x 0.03 (3%) = 0.3 knots 0.3 knots = 0.3 miles per hour @ given bearing</p> | | |
| The following will be required to calculate the oil slicks trajectory: | | | | | |
| Nautical Chart of Area | | Known Location of The Spill | | Prevailing Wind Data | |
| Chart Stationary | | Metocean Forecast | | Tidal Data | |
| Step 1: Record Slick Position as 0 Hours | | | | | |
| Latitude | | N/S | | ' | " |
| Longitude | | E/W | | ' | " |
| Step 2: Utilise nautical chart, metocean and weather forecast data and vector addition calculation to predict oil spill trajectory for up to 8 hours. | | | | | |
| Hours Elapsed | Current Speed (knots) | Current Bearing (°) | Wind Bearing (°) | Wind Speed (knots) | 3% of Wind Speed (knots) |
| 0 | | | | | |
| 1 | | | | | |
| Calculated Position (1 hr) | | Lat: | | Long: | |
| 2 | | | | | |
| Calculated Position (2 hr) | | Lat: | | Long: | |
| 3 | | | | | |
| Calculated Position (3 hr) | | Lat: | | Long: | |
| 4 | | | | | |
| Calculated Position (4 hr) | | Lat: | | Long: | |
| 5 | | | | | |
| Calculated Position (5 hr) | | Lat: | | Long: | |
| 6 | | | | | |
| Calculated Position (6 hr) | | Lat: | | Long: | |
| 7 | | | | | |
| Calculated Position (7 hr) | | Lat: | | Long: | |
| Conversions | | | | | |
| 1 knot = 1 nautical mile per hour | | | | | |
| 1 kilometre | = | 0.539 nautical miles | 1 nautical mile | = | 1.852 kilometres |
| 1 knot | = | 1.852 kilometre per hour | 1 kilometre per hour | = | 0.54 knots |

Declaration of Tiered Response – TIER 1, TIER 2, TIER 3

The Tier level definitions below should be used concurrently with the Tier escalation matrix in Figure 0.6.

- **TIER 1** (Operational) – A Tier 1 incident is one in which a relatively small spill can be dealt with by Zenith Energy personnel and on-site equipment in the immediate vicinity, and has no external impact.
- **TIER 2** (Tactical) – A Tier 2 incident is one which will require the combined resources of Zenith Energy resources in the initial vicinity, Tier 2 stockpiles within the hose handling building (HHB), vessel personnel and potentially BBPC, Local Authorities and Emergency Services. It may also require involvement of regulatory bodies and external advisors. In general, any spill within the Zenith Energy operations area other than minor releases will require a Tier 2 response.
- **TIER 3** (Strategic) – A Tier 3 incident is a major pollution event with potential for environmental, social, and economic impacts and which is beyond the capability of local resources requiring support from BBT’s Tier 3 contactor, OSRL. It will require local, national, and probably international resources.

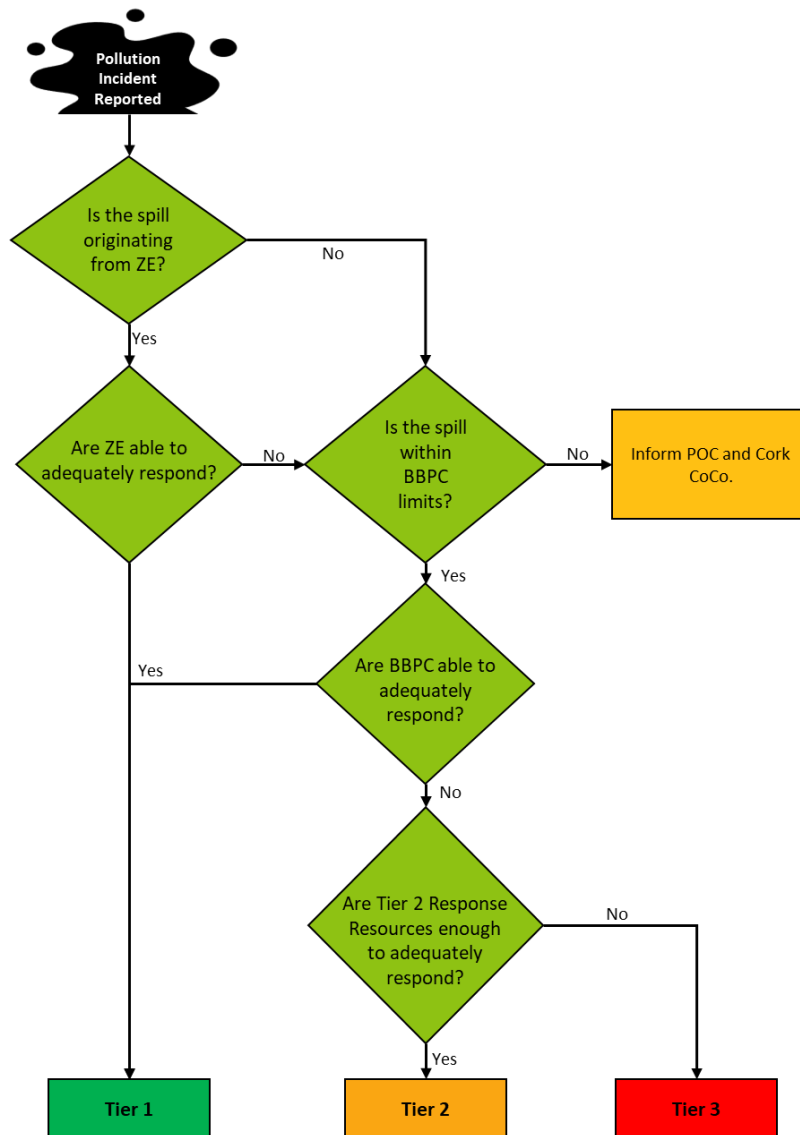


Figure 0.6 – Tier Escalation Matrix

Incident Management Structure

The general Incident Management Structure for a response by ZE’s Incident Management Team (IMT) is shown below. The incident management structure is a scalable standardised on-scene, all risk, incident management concept with the flexibility to shrink and expand to suit the requirements of an incident. Please see Figure 0.7 below for a visualisation of the incident management process.

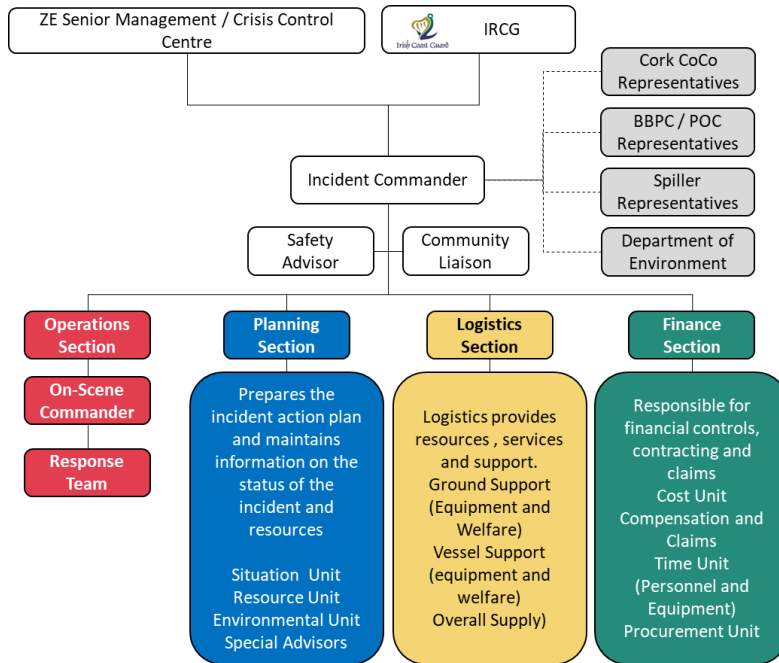


Figure 0.7 – Incident Management Structure for Zenith Energy Bantry Bay Terminal’s IMT

It is important to remember that this chart represents tasks to be undertaken and not necessarily positions to be filled. Depending on the scale and severity of the incident the Zenith Energy personnel within the Incident Management Team (IMT) may undertake a number of roles and responsibilities, or one particular role. Nonetheless, Figure 0.8 captures which organisational roles would be envisaged to fill the key functions of ZE BBT’s IMT.

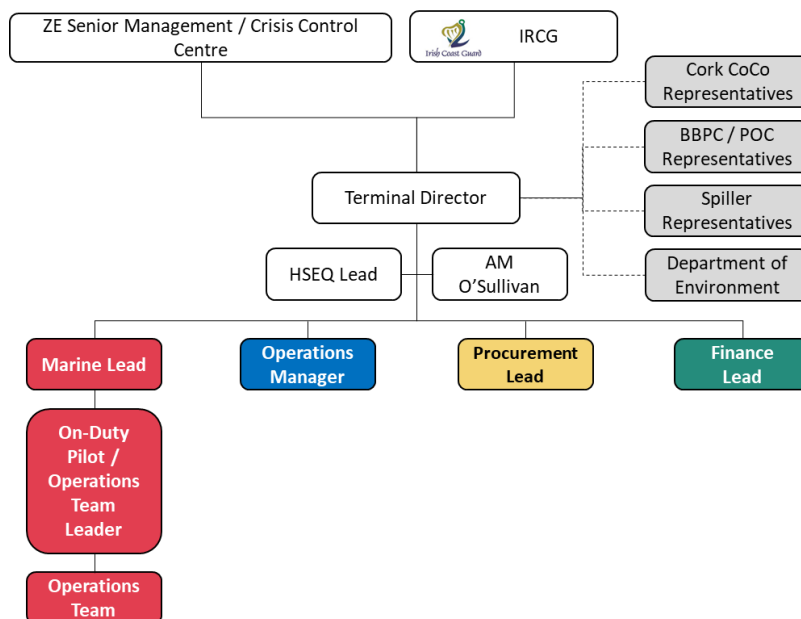


Figure 0.8 – ZE BBT Personnel/IMT Allocation

During a large Tier 2 spill, most positions in the IMT will be filled by members of ZE in order to ensure coverage over a 24-hour period and multiple days. The Incident Commander is accountable for ensuring that the response organisation is fully staffed according to the similarities in roles within ZE’s BBT Emergency Response Plan (ERP), considering health and safety of personnel, knowledge and experience and operational effectiveness. Individual section leads shall be responsible for the staffing of their sections.

During the response to a pollution incident the Terminal Director will take overall responsibility of the incident (as the Incident Commander) and assign roles to personnel accordingly.

An expanded version of the Incident Management Structure, which is utilised by the Irish Coast Guard, can be found in Chapter 3.

Terminal Control Room:

In the initial stages of an oil/HNS spill incident the response will be managed from the Terminal Control Room with the IMT assembling at this location if safe to do so.



Figure 0.9 – Location of the Terminal Control Room

Phase 2 – Development of an Action Plan

Response Objectives

Response operations will be undertaken following a hierarchy that puts a precedence on the health, safety and welfare of responders and others that may be affected by the spill or incident. The second priority is protecting the environment and implementing actions that will facilitate remediation and recovery, followed by protecting any assets involved or affected. The fourth priority is protecting the reputation of the organisations involved. The mnemonic PEAR is adopted by way of aide-memoire:

- PEOPLE
- ENVIRONMENT
- ASSETS
- REPUTATION



When setting initial Incident Objectives, the Incident Commander should take into consideration both the meaning and intent of these priorities. Response objectives will need to be agreed with other responding agencies.

At the first notification of an incident, a guiding principle of ‘prudent overreaction’ following the OARS mnemonic below should be adopted. This allows for early escalation of a response and helps to protect the IMT from being overwhelmed in the early stages of a response and as the incident progresses.



- | | |
|-------------------|---|
| Over-react | Over-reaction means we call for support earlier and ready resources quicker |
| Assess | Start the physical response with a formal assessment. In addition to confirming incident facts, it also allows is to define project needs |
| Respond | Undertake, manage and continuously review response. Maintaining our PEAR response priorities. |
| Stand Down | Stand-down when objectives set for the incident have been met or are no longer beneficial. |

Strategy and Tactics Development

Response strategies are developed based on the needs of the incident and the overarching incident objectives. Throughout the response to a pollution incident, differing strategies may be implemented concurrently with the primary strategy centred on the safety of response personnel and people within the vicinity of the incident.

Response strategies should be initially developed by the Incident Commander in consultation with the relevant On-Scene Commander following the initial assessment of the incident. The response strategies should be aimed at mitigating the deleterious impact the incident may have on environmental and socio-economic receptors through either mitigating the release, containment of the pollution as close to source as practicable, protection or recovery of sensitive receptors.

See Chapter 6 (Shoreline Clean-up Assessment Technique), Chapter 7 (Response Strategies and Guidance) and Chapter 8 (Hazardous and Noxious Substances – Response Guidance) for additional information on pollution response strategies and corresponding tactics.

Incident Action Plan Development

The Incident Action Plan (IAP) is a formal and approved document that sets out clear objectives and strategy for spill response, which is then converted into an operational, tactical, plan/response by the IMT.

Each spill event requires a specific Incident Action Plan (IAP) tailored to the incident. Zenith Energy have in place local operational plans to cover Tier 1 incidents within their ERP. In most cases these procedures will be adequate to control and mitigate anticipated response needs. For larger Tier 2 and off-site incidents a more comprehensive and integrated plan may be needed. The incident action planning process requires collaboration and participation among all IMT personnel.

Most spill incidents follow two distinct stages:

Stage 1 – Reactive: during this period events can move quickly as new information appears, incident teams are mobilised, and response efforts commence. Decisions may be taken quickly and are often verbal.

Stage 2 – Proactive: during this period, the incident has moved into ‘project’ stage. Personnel and resources are in place. The response and clean-up phase may last days, weeks or months. The incident action planning process is built on the following phases:

- i. Understand the situation
- ii. Establish incident objectives
- iii. Develop the plan based on strategies and tactics to achieve objectives
- iv. Prepare and disseminate the plan
- v. Execute, evaluate, and revise the plan

A well-conceived and complete IAP will facilitate a successful incident response operation and provides a basis for evaluating performance in achieving incident objectives. The IAP identifies incident objectives and provides essential information regarding incident organisation, resource allocation, work assignments, safety and weather.

Incident Action Plan Development and Approval

The planning team/section creates the IAP for execution by the operations and response personnel. The plan takes account of the incident aims and objectives, turning these into discrete tactics and work tasks.

The development of the IAP must include an assessment of the appropriateness of any current spill response plan implemented at the Tier 1/Tier 2 level, considering the stage of the incident.

A proforma Incident Action Plan containing the ICS forms referenced in Table 0.4 can be found in Annex 6 – Incident Command Forms.

Table 0.4 – Components of an IAP

| Common Component | Optional |
|---|---|
| Incident Objectives (ICS 202) Organisation List (ICS 203) Assignment List (ICS 204) Communication Plan (ICS 205) Medical Plans (ICS 206) Site Safety Plan (ICS 208) Incident Map/Chart Weather | Demobilisation Plan Transportation Plan Decontamination Plan Waste Management or Disposal Plan |

The completed IAP is presented to the person with overall responsibility of the response (Incident Commander) for approval. Additional approvals may be required from the Irish Coast Guard with concurrence from the EPA.

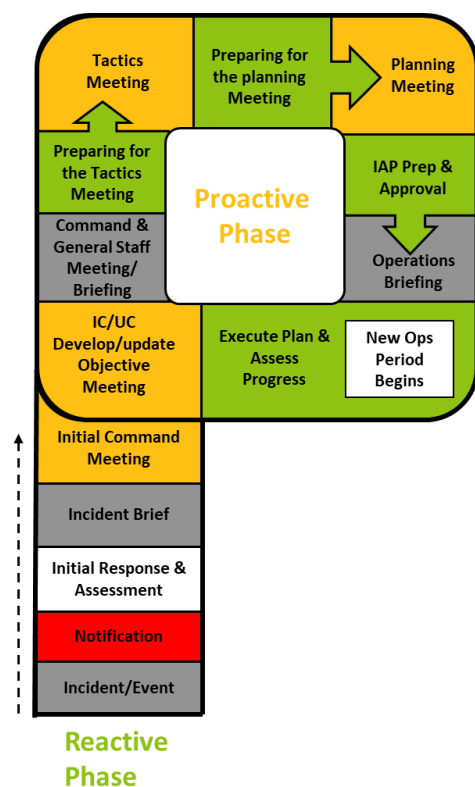
Phase 3 – Action Plan Implementation

Incident Planning Cycle

The Incident Management Team is accountable for the effective implementation of the IAP. The implementation process follows a Plan – Do – Check – Act cycle, within the incident management structure.

As discussed above, the typical response to an oil spill falls into two phases – a Reactive Phase and a Pro-Active Phase. Response during both periods is managed through the application of the ‘Planning Cycle’. The Planning Cycle is a step-by-step process through which the incident management team can develop and implement an IAP in response to and in anticipation of developing events. The Planning Cycle is shown graphically as a “P”.

The Planning “P” is a guide to the process and steps involved in planning for an incident.



The top of the “P” depicts the operational planning cycle. In this circular sequence, a series of pre-set meetings drive the response and execution of the IAP.

The leg of the “P” describes the initial response period:

Once the incident/event begins, initial steps include; IMT mobilisation, early notifications, Initial Response & Assessment, Incident Briefing

Planning begins with a thorough assessment that provides information needed to make initial management decisions – following the principle of prudent overreaction.

Incident Command Structure

Through the National Framework for Major Emergency Management and National Maritime Oil/HNS Contingency Plan, the Irish Coast Guard implements the Incident Command System (ICS) as the framework for incident management. All organisations requiring an Oil Spill/HNS plan approved by the Irish Coast guard will need to interface with the Incident Command System in the event of a major spill incident.

There are FIVE main management sections:

- Command
- Operations

- Planning
- Logistics
- Finance

Through the pro-active mobilisation and population of these sections, the response structure can be created to manage the most complex of spill events.

Zenith’s initial response organisation and IMT structure is detailed according to the Incident Command System.

Guidance on the larger response organisation, including full Roles and Responsibilities and ERT/ICS integration is found in Chapter 3.

Health and Safety

Following the Response Priorities (PEAR), the health and safety of responders and others who may be affected by the spill must take the highest priority. All health and safety requirements must be incorporated into spill response operations and actions.

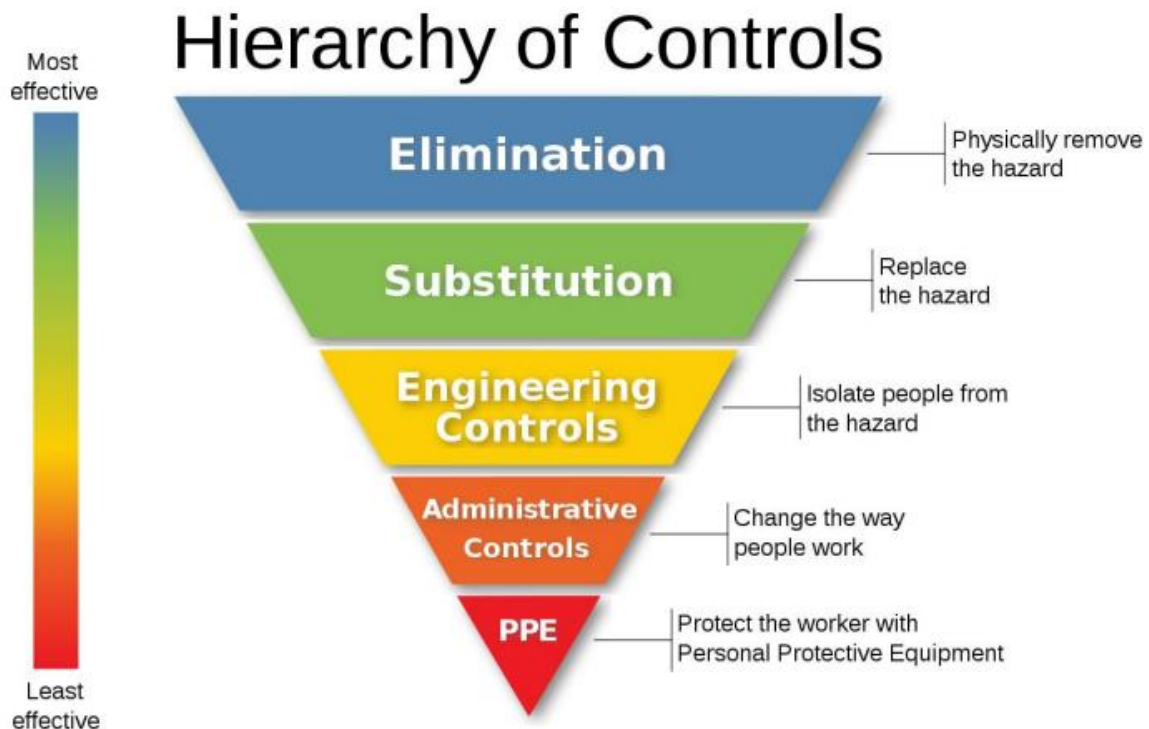


Figure 0.10 – ZE’s Hierarchy of Controls Fundamentals

All response works are to be carried out in accordance with ZE’s HSE Policy (below), Quality Policy, and in line with the fundamentals of Hierarchy of Controls (Figure 0.10).

1. Implement systems and procedures to provide a safe, secure place of work, to protect the environment, to prevent pollution and to facilitate continual improvement and enhance our performance.
2. Operate our activities with diligence and integrity and with the awareness that our goal is to manage the health, safety and wellbeing of all persons working for and on behalf of the company.

We are committed to the provision of safe and healthy working conditions to prevent work related injury and ill health

3. Identify and evaluate all health, safety, security, and environmental risks associated with works, and initiate appropriate control measures., objectives and plans
4. Eliminate hazard and reduce risk to strive for Zero Health, Safety, Security and Environmental infractions.
5. Foster openness, dialogue, communication, consultation and participation with employees (including workers representatives) and all interested parties regarding our health, safety, security and environmental performance.
6. Comply with all legal and regulatory requirements and company policies regarding health, safety, security and environment, and to provide continuous self-monitoring.
7. Ensure that our sites are managed by experienced and trained personnel, who receive support from management to fulfil their health, safety, security and environmental responsibilities.
8. Train our employees to achieve continual improvement in health, safety, security and environmental awareness. Ensure that this policy is understood, implemented and maintained by all persons working for and on behalf of Zenith Energy.
9. Measure our performance by conducting regular audits and inspections based on the Management System, relevant legal and regulatory health, safety, security and environmental requirements.
10. Publish our Health, Safety, Security and Environmental Policy internally as well as to all interested parties on request and use this policy as a framework to set HSSE objectives and plans.

Sampling and Evidential Collection

Full and accurate documentation of all response actions and associated costs is also a critical component of this process.

Chapter 12 – Evidence Collection sets out details for obtaining samples and gathering information to enable a successful prosecution and/or a civil action to be taken.

Stakeholder Engagement and Media Response

Stakeholder Engagement and Media Management are an important set of activities that can build a bridge between key stakeholders affected by a spill and the response organisation. It is a mechanism that facilitates the response organisation and stakeholders to identify, assess and respond to concerns about issues that affect both the stakeholder and the response effort.

The focus of engagement falls into three broad areas:

- 1) Helping develop the response strategy by identifying and understanding concerns before they occur;
- 2) Addressing issues identified or raised by stakeholders; and
- 3) Effective and pro-active communication.

Stakeholder Engagement and Media guidance can be found in Chapter 15.

It is Zenith's policy that only comments and information regarding an emergency incident prepared by [AM O'Sullivan PR & Strategic Communications](#) should be given to the press and media via a designated spokesperson, therefore employees, contractors & visitors who are approached following an incident by the Press and/or Media should be polite but say nothing more than:

'I am unable to comment but a prepared statement will be released'.

Documentation

Full and accurate documentation of all response actions is a critical component of the response process and may form part of future investigations and potential legal actions. Records of all communications (telephone conversations, file note), and a chronological account of the incident will be kept in accordance with ZE's Emergency Management Plan (EMP), BBT's ERP and this plan's Document Control procedures – Chapter 17.

Phase 4 – Response Termination and Demobilisation

Response Termination

The IMT Incident Commander in consultation with BBPC, the Irish Coast Guard and other appropriate Government agencies may terminate a response once incident objectives have been achieved and the incident response has been adequately completed.

It should be considered that the incident response may be terminated, notwithstanding that remediation work may be on-going. Such a decision may be contentious and therefore all responding parties should be aligned on the rationale for standing-down the response.

Response termination involves the recovery, cleaning and maintenance of all equipment used during the response as well as the demobilisation of all personnel involved in the response and replacement of all consumables. It also involves the collation and completion of all documentation associated with the spill response, including expenditure reports.

Debriefing

Zenith Energy BBT will undertake a thorough investigation into any incident resulting in a spill or release of hazardous substances. A thorough debriefing of all key personnel involved in the response will also be held. This will enable a review of the formal plans, response strategies and overall management of the response so that lessons can be learnt, and improvements made.

Phase 5 – Post Operations and Documentation of Costs/Litigation

Pollution Liability

The widely accepted policy of ‘the polluter pays’ means that any persons suffering damage or loss because of a pollution incident held to be the responsibility of Zenith Energy BBT, will likely seek compensation. This will almost certainly include clean-up and remediation costs. As such the company should ensure that a process is in place with internal administration and finance procedures to capture and record all costs associated with response and clean-up operations.

Financial system

The arrangements for the control of expenditure, cost recovery and financial authority limits are contained in Zenith Energies financial protocols.

It should be noted that costs will most likely continue to be incurred for some time after the termination of the response and clean-up phase of an incident. It will therefore be necessary to ensure a method for collating and accruing such additional costs is in place.

Legal advice and considerations

Most oil spill events culminate in actions by various parties to seek cost recovery, compensation, or other forms of legal action, both criminal and civil. The response must also be conducted within the legal framework concerning environmental protection, health and safety and waste disposal. It is therefore necessary to seek early guidance from legal counsel and be mindful of legal requirements during the development and execution of response plans and activities.

Legal advice and representation for ZE BBT should be sought from [Matheson](#)

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CHAPTERS

1. Definitions and Abbreviations
2. IRCG Notification
3. Incident Command Structure, Roles and Responsibilities
4. Risk Assessment
5. Training and Exercising Regime
6. Shoreline Clean-Up Assessment Technique (SCAT)
7. Response Strategies and Guidance
8. HNS Response Guidance
9. Dispersant Use
10. Occupational Safety and Health
11. Wildlife Rescue and Rehabilitation
12. Evidence Collection and Cost Recovery
13. Waste Management
14. Place of Refuge
15. Stakeholder Engagement and Media Protocols
16. Financial Management Protocols
17. Documentation Procedures

1 Definitions and Abbreviations

| Abbreviation | Definition |
|--------------|---|
| ADIOS | Automated Data Inquiry for Oil Spills |
| API | American Petroleum Institute |
| ASI | Area of Scientific Interest |
| BAOAC | Bonn Agreement Oil Appearance Code (BAOAC) |
| Bbls | Barrels |
| BBPC | Bantry Bay Port Company |
| BBT | Bantry Bay Terminal |
| CALM | Catenary Anchor Leg Mooring |
| CLC | Civil Liability Convention |
| CLP | Classification, Labelling and Packaging |
| Cork CoCo | Cork County Council |
| cs (cSt) | Centistokes |
| DOCL | Documentation Unit Leader |
| EEZ | Exclusive Economic Zone |
| EMP | Emergency Management Plan |
| EMSA | European Maritime Safety Agency |
| EPA | Environmental Protection Agency |
| ERP | Emergency Response Plan |
| ESI | Environmental Sensitivity Index |
| FSC | Finance Section Chief |
| FUND | International Fund for Compensation for Oil Pollution Damage |
| GESAMP | Group of Experts on Scientific Aspects of Marine Environmental Protection |
| GHS | United Nations' Globally Harmonised System |
| GIS | Geographic Information System |
| GPS | Global Positioning (Satellite) System |
| HFO | Heavy Fuel Oil |
| HHB | Hose Handling Building |
| HNS | Hazardous and Noxious Substances |
| HSEQ | Health, Safety, Environment, and Quality |
| HSSE | Health, Safety, Security and Environment |
| HWS | High Water Springs |
| IBC | Intermediate Bulk Container |
| ICS | Incident Command System |
| IMDG | International Maritime Dangerous Goods |
| IMO | International Maritime Organisation |
| IMT | Incident Management Team |
| IOPC | International Oil Pollution Compensation Fund |
| IPIECA | International Petroleum Industry Environmental Conservation Association |
| IRCG | Irish Coast Guard |
| ISGOTT | International Safety Guide for Oil Tankers and Terminals |
| ISO | International Organisation for Standardisation |
| ITOPF | International Tanker Operators Pollution Federation |
| IUCN | International Union for Conservation of Nature and Natural Resources |
| JRC | Joint Response Committee |
| Km | Kilometres |

| Abbreviation | Definition |
|--------------|---|
| LA | Local Authority |
| LR | Long Range Tanker |
| LSC | Logistics Section Chief |
| LWS | Low Water Springs |
| M | Metres |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MPA | Marine Protected Area |
| MRCC | Marine Rescue and Coordination Centre |
| MSDS | Material Safety and Data Sheet |
| NCP | National Contingency Plan |
| NEBA | Net Environmental Benefit Analysis |
| NGO | Non-Government Organisation |
| NMO/HNSCP | National Marine Oil & HNS Spill Contingency Plan |
| NNR | National Nature Reserve |
| NOAA | National Oceanographic and Atmospheric Administration |
| NPWS | National Parks and Wildlife Service |
| OEL | Occupational Exposure Limit |
| O/HNSSCP | Oil & HNS Spill Contingency Plan |
| OPRC | Oil Pollution Preparedness, Response and Co-operation Convention (1990) |
| OSC | Operations Section Chief |
| OSCAR | Oil Spill Contingency and Response |
| OSIS | Oil Spill Information System |
| OSRL | Oil Spill Response Limited |
| OSRO | Oil Spill Response Organisation |
| OWRN | Oiled Wildlife Response Network |
| P&I | Protection and Indemnity Club |
| PAH | Polyaromatic Hydrocarbons |
| PLEM | Pipeline End Manifold |
| POC | Port of Cork |
| PORDM | Place of Refuge Decision-Making |
| PSC | Planning Section Chief |
| PPE | Personal Protective Equipment |
| RAM | Risk Assessment Matrix |
| SBM | Single Buoy Mooring |
| SCAT | Shoreline Clean-up Assessment Technique |
| SDS | Safety Data Sheet |
| SG | Specific Gravity |
| SITL | Situation Unit Lead |
| SITREP | Situation Report |
| SLA | Service Level Agreement |
| SOLAS | Safety of Lives at Sea Convention |
| SOPEP | Shipboard Oil Pollution Emergency Plan |
| SPA | Special Protection Area |
| SRC | Shoreline Response Centre |
| UNCLOS | United Nations Convention on the Law of the Sea |
| VLCC | Very Large Crude Carriers |
| VOC | Volatile Organic Compounds |
| VOO | Vessel of Opportunity |

| Abbreviation | Definition |
|--------------|--|
| VTMIS | Vessel Traffic Management Information System |
| VTS | Vessel Traffic Services |
| ZE | Zenith Energy |

2 IRCG Notification

The following form has been taken from Section 2 of IRCG SOP 01-2020 and is to be used to capture the information required by the IRCG when receiving a report of marine pollution. This form will support the incident appraisal process and help determine potential response actions at the national level.

| INITIAL POLLUTION REPORT (POLREP) | | |
|-----------------------------------|---|--|
| To: | MRCC Dublin Telephone +353 (0)1 662 0795 email mrccdublin@dttas.ie | |
| From: | <i>Name of reporting entity</i> | Date and time of report: |
| 1 | DATE & TIME OF OBSERVATION | <i>Month, day and time that pollution was observed</i> |
| 2 | NAME & CONTACT OF OBSERVER | <i>Indicates who has reported the incident. If a ship, name, home port, flag and call sign must be given.</i> |
| 3 | POLLUTION POSITION AND EXTENT | <i>Indicates the main position of the pollution in latitude and longitude in degrees and minutes and may in addition give the distance and bearing of some prominent landmark known to the receiver. Estimated amount of pollution (e.g. size of polluted areas, number of tonnes of oil spilled, or number of containers, drums, etc. lost). Indicates length and width of slick given in nautical miles.</i> |
| 4 | POLLUTION CHARACTERISTICS | <i>Gives type of pollution, e.g. type of oil with viscosity and pour point, packaged or bulk chemicals. For HNS 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. Any markings on drums, containers, etc. should be given.</i> |
| 5 | POLLUTION SOURCE AND CAUSE | <i>E.g. from vessel, offshore unit or other. If from vessel, say whether as a result of a deliberate discharge or casualty. If the latter give brief description. Where possible, give name, type, size, call sign, nationality and port of registration of polluting vessel. If vessel is proceeding on its way, give course, speed and destination.</i> |
| 6 | WIND DIRECTION & SPEED | <i>Indicates wind direction and speed in degrees and m/sec or knots. The direction always indicates from where the wind is blowing.</i> |
| 7 | CURRENT OR TIDE | <i>Indicates current direction and speed in degrees and knots and tenths of knots. The direction always indicates the direction in which the current is flowing.</i> |
| 8 | SEA STATE AND VISIBILITY | <i>Sea state indicated as wave height in metres. Visibility in nautical miles.</i> |
| 9 | POLLUTION DRIFT | <i>Indicates drift course and speed of pollution in degrees and knots and tenths of knots. In case of air pollution (gas cloud) drift speed is indicated in m/s.</i> |
| 10 | FORECAST | <i>E.g. arrival on beach with estimated timing. Results of mathematical models.</i> |
| 11 | IDENTITY OR SHIPS ON SCENE | <i>Indicates who has reported the incident. If a ship, name, home port, flag and call sign must be given. Ships on scene can also be indicated under this item by name, home port, flag and call sign, especially if the polluter cannot be identified and the spill is considered to be of recent origin.</i> |
| 12 | ACTION TAKEN | <i>Any action taken to combat the pollution.</i> |
| 13 | PHOTOGRAPHS OR SAMPLES | <i>Indicates if photographs or samples from the pollution have been taken. Communication addresses of the sampling authority should be given.</i> |

3 Incident Command Structure, Roles and Responsibilities

3.1 Emergency Response Team Structure and Organisation

Effective pollution response requires the ability to implement a structured emergency response team to seamlessly transit from the initial reactive phase of a response to a proactive phase where the scope and incident needs are understood. To do this ZE BBT have adopted the guidance contained within SOP 04-2020 and the Incident Management System (IMS) which is a structured process for coordinating a variety of important activities undertaken when responding to a pollution incident.

The IMS facilitates command and control, identifies responsibilities through role pre-identification, is objective driven and is scalable allowing the structure to be fit for purpose for the needs of a given incident be it a major multi agency response or a small Tier 1 pollution incident. The IMS is based on the following management principles:

- Ensuring an objectives-driven response;
- Formulation of an Incident Action Plan;
- Use of common and consistent terminology;
- Maintaining a manageable span of control; and,
- Coordination of equipment, personnel resources and communication.

The adoption of the IMS structure ensures that common terminology and similar processes will be utilised by ZE BBT, BBPC and the IRCG throughout the response to a major incident. This will aid integration between the response organisations and ensure a well coordinate response to an incident of national significance.

Throughout the response to a small Tier 1-2 incident, ZE BBT will typically use a simplified and objective driven IMS structure which uses an iterative process to assess the incident needs, share information, assess the response progress, adapt and demobilise accordingly.

Upon notification of a major incident, ZE BBT will active the mobilisation processes and mechanisms to implement the extended command structure which will follow the robust and structured operational Planning P process in coordination with BBPC and the IRCG.

3.1.1 Organisational Structure

In cases where Oil/HNS pollution occurs, the receiver of the initial pollution report via the BBT Control Room, typically the Terminal Director, will assume the role of Incident Commander and has ultimate authority and accountability for Incident Management. The Incident Commander is specifically responsible for ensuring incident safety, providing information to internal and external stakeholders, and establishing and maintaining liaison with other agencies participating in the incident. In addition, the Incident Commander establishes incident objectives and approves all plans. It is the Incident Commanders responsibility to assemble ZE BBT's IMT and assign roles and actions relevant to the IMS and liaise with BBPC and the IRCG.

3.1.2 Functional Command Structure

As shown in Figure 3.1, the IMS organisational structure of ZE's IMT includes four main sections under a command function. A description of the responsibility of each organisational element can be found in Table 3.1.

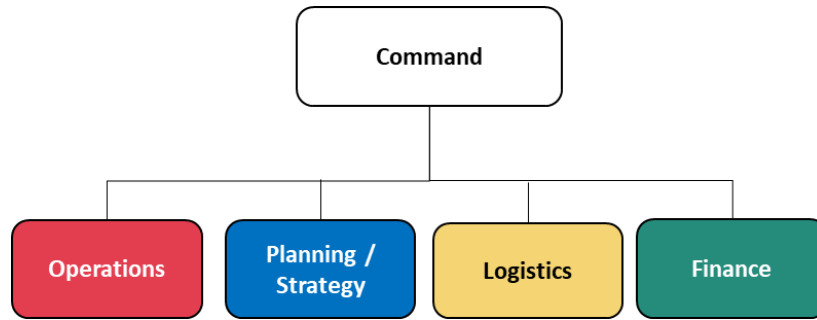


Figure 3.1 - Organisational Structure of ZE's IMT

The complexity of the incident will influence which sections are established and the personnel and resources assigned to them. The command is the first organisational element established for any incident and will be transferred to the Terminal Director (Incident Commander) once notified of the incident. The size of the organisation develops under the command function and will depend on the needs and scope of the incident based on continuous assessment and prudent overreaction.

Table 3.1 - Responsibility of IMT Organisational Elements

| Element | Description |
|---------------------------|--|
| Command | Command represents a function not a person and has the full responsibility for managing the incident, including safety of personnel, communication with stakeholders and other response agencies. They also perform duties normally carried by the other sections until they are mobilised. The command approves the incident action plan. |
| Operations Section | The role of the Operations Section is to provide specialist advice to the On-Scene Commander on how the effects of the spill should be mitigated and to control and co-ordinate and undertake the response effort. |
| Planning Section | The role of the Planning Section is to provide any assistance required by the Incident Commander, to outline resources, strategies, techniques, and information to respond to the spill. This will include disseminating any information received from operational staff and liaison with other organisations such as the IRCG. The Planning Section will also facilitate the development of the IAP and guide the IMT through the Planning Cycle. |
| Logistics Section | The Logistics Section is responsible for providing all resources, services, and support required by the incident. The section includes procurement, receiving and supply functions. In addition, communications and medical support falls within the Logistics Section. |
| Finance Section | The Finance Section is responsible for the arrangement and co-ordination of the administrative aspects of the response, including documenting all the financial activities resulting from the response and for the procurement of materials and personnel to resource the response operation. This section is also responsible for ensuring that the communications system is running smoothly. |

3.1.3 Unified Command Structure (Multi Agency Response)

Throughout the response to a major emergency or a significant incident which entails a multi-agency response. ZE BBT will appoint a Liaison Officer as necessary to form a direct communication link between the Local Co-ordination Centre and ZE BBT IMT.

As the IRCG are ensuring all local authorities, ports and harbours utilise a similar IMS structure when establishing and coordinating a response, ZE BBT will recommend establishing a unified command

(Figure 3.2) when responding to a significant pollution incident. This will promote the sharing of resources, establishing combined objectives and increase the sharing of incident information.

Upon agreeing to establish a unified command, ZE BBT’s IMT will either relocate or alternatively offer to facilitate the unified command at a ZE facility.

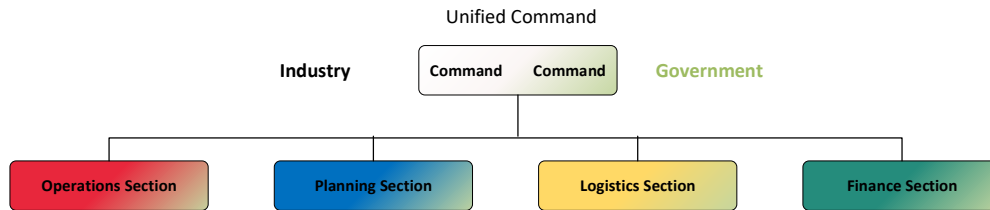


Figure 3.2 - Unified Command Structure

3.1.4 Simplified Command Structure (Tier 1/2)

In the response to a small pollution incident the activation of the IMT would be organised through the simple IMS structured shown in Figure 3.3 using the sections and positions required to combat the pollution incident effectively and efficiently.

The Terminal Director will undertake the role of the Incident Commander and perform the duties of the other sections not mobilised whilst also undertaking the role of the Incident Commander. The remaining roles will be staffed by members of ZE’s IMT according to the relevant certifications held (See Chapter 5).

If the incident scope was such that additional resources are required, the IMS structure can be populated by additional ZE personnel, The Polluter and Tier 2 contractor.

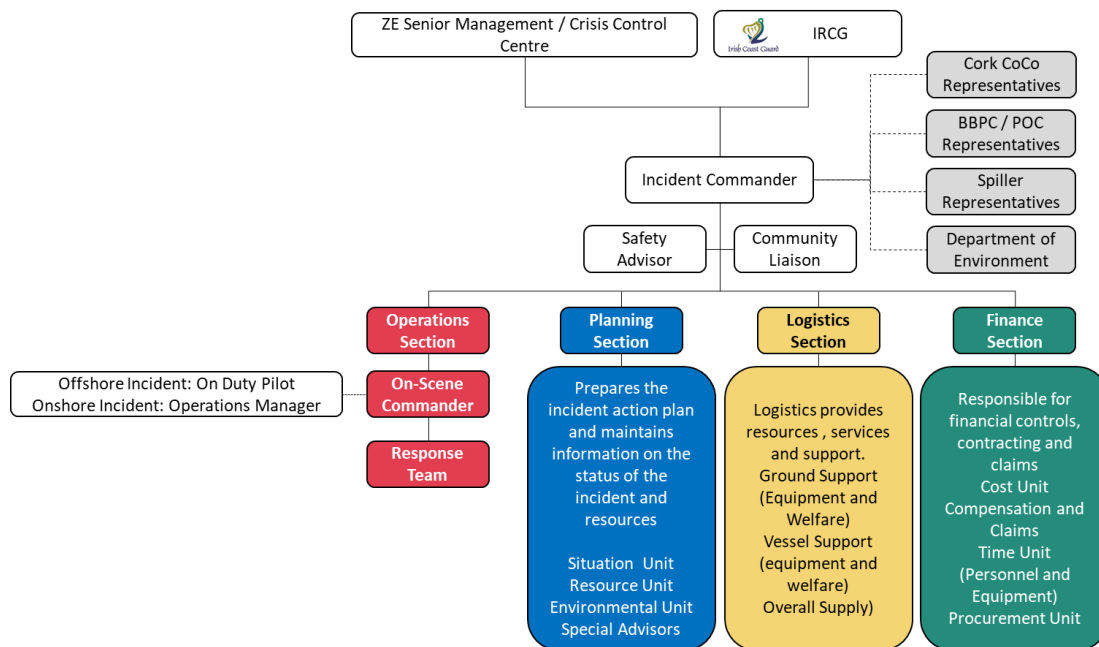


Figure 3.3 – Simplified IMT Structure

If the Fire Service have responded to the scene, the On-Scene Commander will liaise with the Fire Services Incident Commander with respect to ZE BBT’s response and resources.

The Incident Commander has the overall managerial responsibility of ZE’s response to a pollution incident with the aim of ensuring a safe, efficient, and effective response is undertaken.

See Operations Section Phase 1 – Discovery and Notification, Evaluation, Identification and Activation for Action Cards for further information on the initial phase of a response.

3.1.5 Extended Command Structure

During the response to a complex prolonged incident which involves multiple agencies, ZE may choose to mobilise personnel resources (contracted or within organisation) to establish an extended command structure to meet the needs of the incident. An example of an extended command structure for a significant Tier 2 pollution incident is shown in Figure 3.4.

The extended command structure and positions shown on the following pages and are indicative only, and the actual response structure required will be determined by the Incident Commander in consultation with IRCG, principal response agencies and other organisations during the response. Depending on the size and requirements of the spill and response, many of these positions may be filled by more than one person. Alternatively, one person may be responsible for more than one of these roles.

When responding to a prolonged complex multi-agency response ZE’s IMT will follow the organisational Planning P action planning process as detailed in the Phase 3 of the Operations Section. Which is in line with the process undertaken by the IRCG when responding to a pollution incident.

Chapter 3.2.2 contains action cards for key members of the extended IMT and meeting agendas for the organisational planning P process. Where roles personal within BBT’s organisational structure have been identified for these roles, it is indicated via in (brackets).

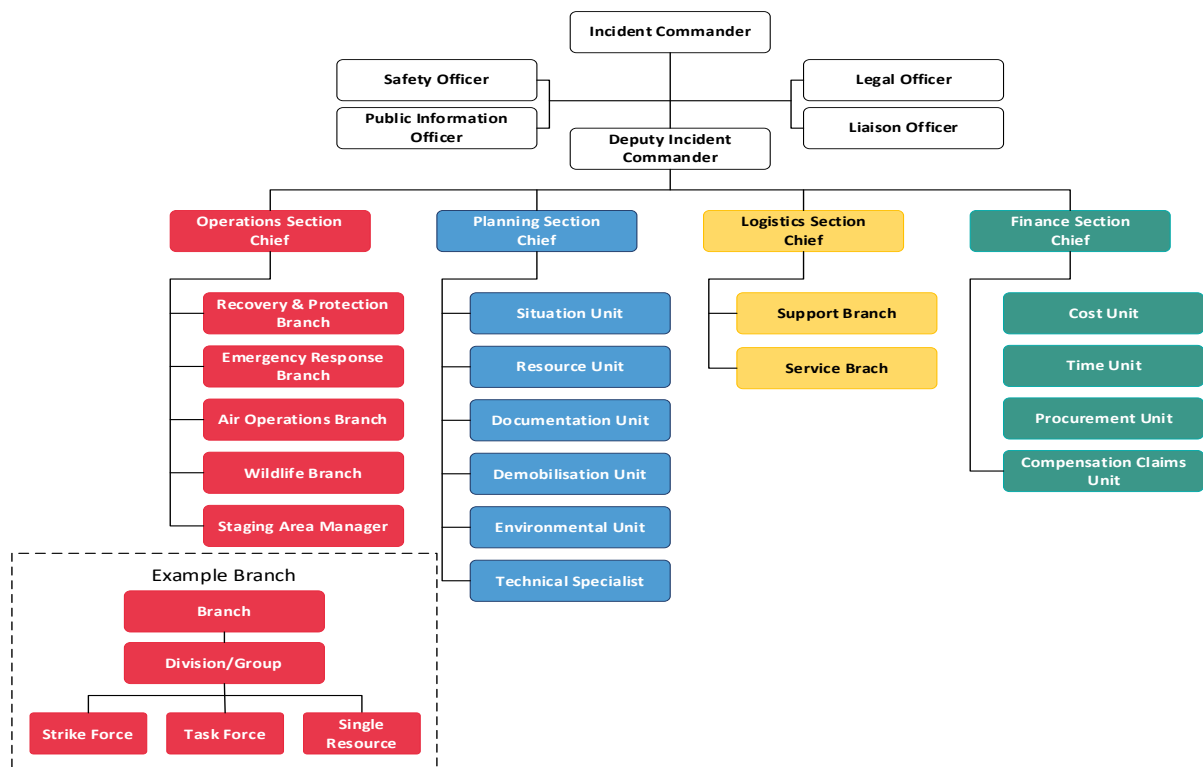
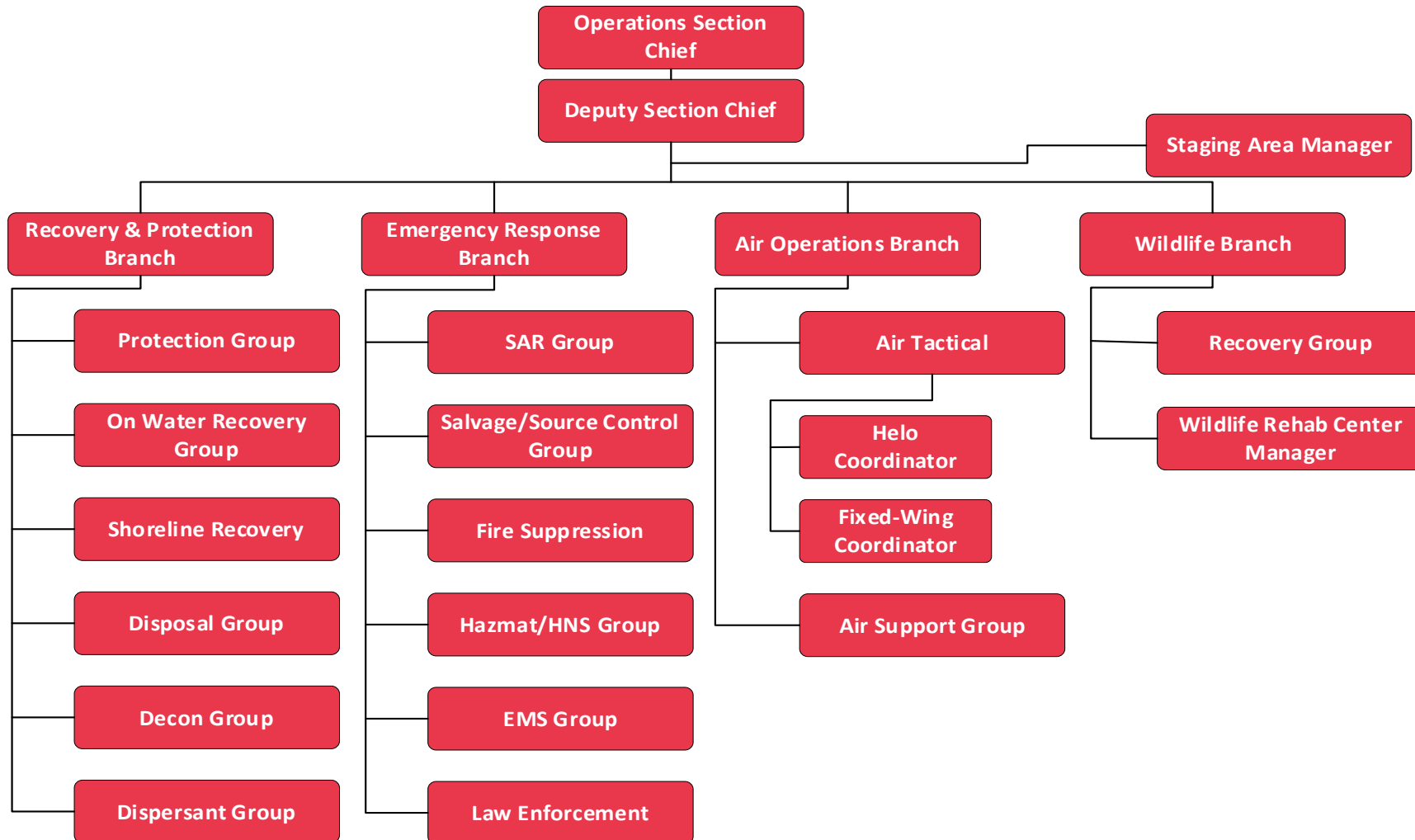
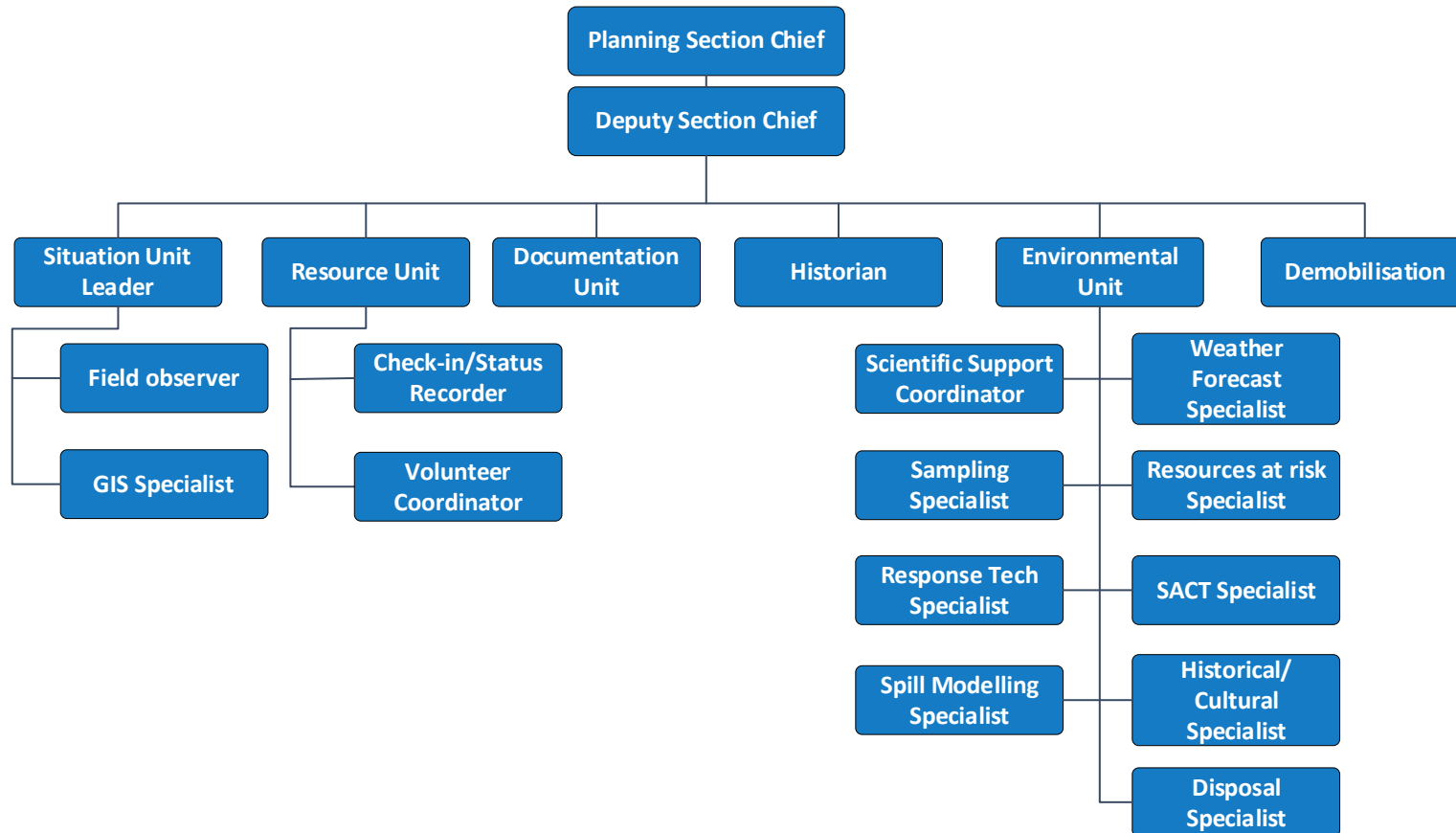


Figure 3.4 - Example of an extended IMT Structure during the response to a Tier 2/3 incident.

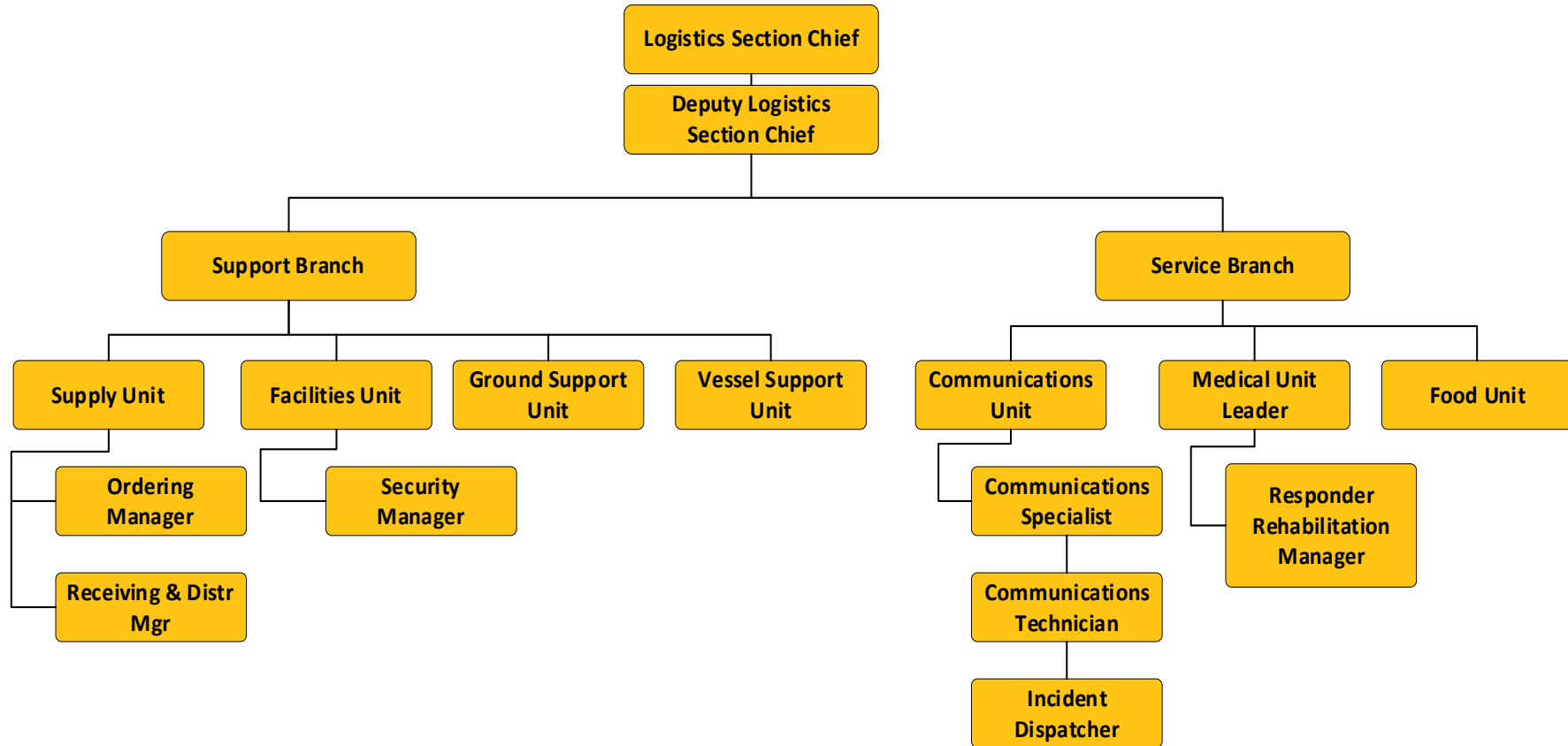
3.1.5.1 Extended Operations Section



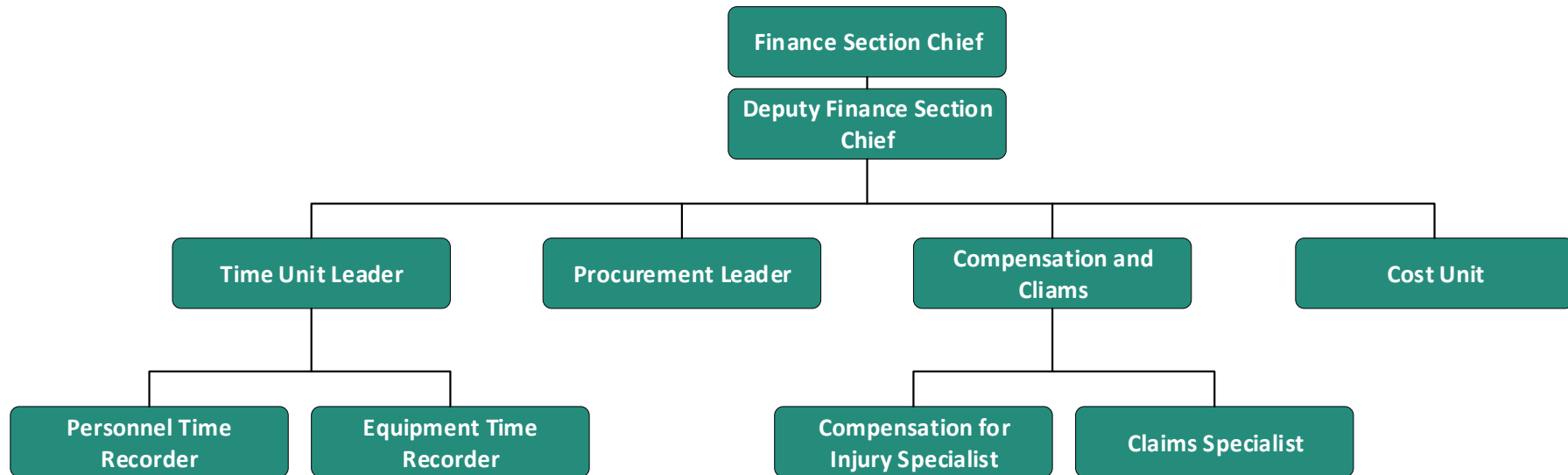
3.1.5.2 Extended Planning Section



3.1.5.3 Extended Logistics Section



3.1.5.4 Extended Finance Section



3.2 Roles, Responsibilities and Agendas

3.2.1 Common and General Responsibilities


These are the key generic actions to be undertaken by all members of the IMT when undertaking a given role within the IMS structure.

| Common Responsibilities | | |
|--|--------------------------|-----------|
| Action | ✓ | Time/Date |
| Receive assignment, notification, reporting location, reporting time, and travel instructions from the Incident Commander, or appropriate Section Chief. | <input type="checkbox"/> | |
| Upon arrival at the incident, check in at the Terminal Control Room, or with the Incident Commander if arriving to operational site. | <input type="checkbox"/> | |
| All radio communications will be addressed with the incident name | <input type="checkbox"/> | |
| Receive briefing from immediate supervisor. | <input type="checkbox"/> | |
| Acquire work materials relevant to role and assigned task. | <input type="checkbox"/> | |
| Complete forms and reports required of the assigned position and send material through to Planning/Finance section. | <input type="checkbox"/> | |
| Respond to demobilisation orders. | <input type="checkbox"/> | |
| Ensure continuity using in/out briefings. | <input type="checkbox"/> | |
| General Responsibilities | | |
| Participate in management team meetings as required. | <input type="checkbox"/> | |
| Determine status of your section's activities. | <input type="checkbox"/> | |
| Manage and motivate your team and monitor team performance | <input type="checkbox"/> | |
| Ensure the response is being carried out at a reasonable cost. | <input type="checkbox"/> | |
| Enhance the response efficiency where possible. | <input type="checkbox"/> | |
| Confirm dispatch and estimated time of arrival of staff and supplies. | <input type="checkbox"/> | |
| Assign specific duties to your staff and supervise your staff. | <input type="checkbox"/> | |
| Determine resource needs. | <input type="checkbox"/> | |
| Supervise your section demobilisation, including storage of supplies. | <input type="checkbox"/> | |
| Maintain section records, including section/activity log. | <input type="checkbox"/> | |
| Maintain register team members including names and functions. | <input type="checkbox"/> | |
| Meet with assisting and cooperating company/agency representatives, as required. | <input type="checkbox"/> | |
| Review Incident Action Plan and estimate your section needs for next operational period. | <input type="checkbox"/> | |
| Estimate future service and support requirements. | <input type="checkbox"/> | |
| Ensure that all obligation documents initiated at the incident are properly prepared and completed. | <input type="checkbox"/> | |
| Recommend release of unit resources in conformance with the Demobilisation Plan. | <input type="checkbox"/> | |


3.2.2 Action Cards for Key Functions (Tier 2/3 Incident)

The following checklists are the key role specific actions to be undertaken by the corresponding IMT member within the IMS structure.


3.2.2.1 Incident Commander (Terminal Director)

| Incident Commander (Terminal Director) | |  |
|---|--|---|
| Role: The Incident Commander has responsibility is the overall management of the incident. | | |
| Task | | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Obtain a briefing on the current situation of the incident. | <input type="checkbox"/> |
| c | Determine Incident objectives and general direction for managing the response. | <input type="checkbox"/> |
| d | Establish response priorities (PEAR). | <input type="checkbox"/> |
| e | Establish the setup of the Terminal Control Room. | <input type="checkbox"/> |
| f | Brief IMT on incident | <input type="checkbox"/> |
| g | Establish an appropriate organisation. | <input type="checkbox"/> |
| h | Ensure planning meetings are scheduled as required (following the planning P in the Operations Section of this document). | <input type="checkbox"/> |
| i | Ensure that adequate safety measures are in place. | <input type="checkbox"/> |
| j | Coordinate activity for all IMT Staff. | <input type="checkbox"/> |
| k | Coordinate with key people and officials. | <input type="checkbox"/> |
| l | Approve requests for additional resources or for the release of resources. | <input type="checkbox"/> |
| m | Approve the use of trainees, volunteers, and auxiliary personnel. | <input type="checkbox"/> |
| n | Authorise release of information to the news media. | <input type="checkbox"/> |
| o | Ensure Incident Status Summary (SITREP form, Annex 6 – Incident Command Forms) is completed and forwarded to appropriate higher authority. | <input type="checkbox"/> |
| p | Order the demobilisation of the incident when appropriate. | <input type="checkbox"/> |
| q | Maintain Unit Log. | <input type="checkbox"/> |

3.2.2.2 Safety Officer (HSEQ Lead)

| Safety Officer (HSEQ Lead) | |  |
|--|---|---|
| <p>Role: The Safety Officer has the responsibility to develop and recommend measures for assuring personnel safety and to assess and/or anticipate hazardous and unsafe situations. The Safety Officer may have assistants, as necessary, and the assistants may also represent assisting organisations. Safety assistants may have specific responsibilities, such as at sea operations, hazardous materials, etc.</p> | | |
| Task | | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Participate in tactics and planning meetings, and other meetings and briefings as required. | <input type="checkbox"/> |
| c | Review the Incident Action Plan for safety implications. | <input type="checkbox"/> |
| d | Provide safety advice in the Incident Action Plan for assigned responders. | <input type="checkbox"/> |
| e | Exercise emergency authority to stop and prevent unsafe acts. | <input type="checkbox"/> |
| f | Investigate accidents that have occurred within the incident area. | <input type="checkbox"/> |
| g | Assign assistants, as needed. | <input type="checkbox"/> |
| h | Review and approve any Medical Plans. | <input type="checkbox"/> |
| i | Ensure all risk assessments and safety documentation is complete Chapter 10 and Annex 6. | <input type="checkbox"/> |
| j | Develop the Work Safety Analysis Worksheet as required (Annex 6 – Incident Command Forms) | <input type="checkbox"/> |
| k | Ensure that all required agency forms, reports and documents are completed prior to demobilisation. | <input type="checkbox"/> |
| l | Brief IMT on safety issues and concerns. | <input type="checkbox"/> |
| m | Have debriefing session with the Incident Commander. | <input type="checkbox"/> |

3.2.2.3 Community and Other Response Agencies Liaison

| Community and Other Response Agencies Liaison | |  |
|--|---|---|
| <p>Role: Incidents that are multijurisdictional, or have several agencies involved, may require the establishment of a Community Liaison Officer and Liaison Person in the IMT.</p> | | |
| Task | | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Be a contact point for other agencies and local community representatives. Review the information in Chapter 15. | <input type="checkbox"/> |
| c | Maintain a list of assisting and cooperating agencies and agency representatives, including name and contact information. | <input type="checkbox"/> |
| d | Assist in establishing and coordinating interagency contacts. | <input type="checkbox"/> |
| e | Keep agencies supporting the incident aware of incident status. | <input type="checkbox"/> |
| f | Monitor incident operations to identify current or potential inter-organisational problems. | <input type="checkbox"/> |
| g | Participate in planning meetings, providing limitations and capability of assisting agency resources. | <input type="checkbox"/> |
| h | Provide information on community concerns. | <input type="checkbox"/> |
| i | Coordinate activities of visiting dignitaries. | <input type="checkbox"/> |
| j | Ensure that all required agency forms, reports and documents are completed prior to demobilisation. | <input type="checkbox"/> |
| k | Brief Incident Commander on agency issues and concerns. | <input type="checkbox"/> |
| l | Hold debriefing session prior to demobilisation. | <input type="checkbox"/> |
| m | Maintain Unit Log. | <input type="checkbox"/> |

3.2.2.4 Operations Section Chief (Marine Lead)

Operations Section Chief (Marine Lead)




Role: The Operations Section Chief is responsible for the management of all tactical operations directly applicable to the oil/HNS response.


They activate and supervise the tactical deployment of resources in accordance with the Incident Action Plan and directs its execution. They also direct the preparation of operational plans; requests or releases resources, monitors operational progress and makes expedient changes to the Incident Action Plan, as necessary; and reports such to the Incident Commander. In complex incidents, they may assign a Deputy to supervise On-Scene operations.

| Task | | ✓ |
|------|---|--------------------------|
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Obtain briefing from the Incident Commander. | <input type="checkbox"/> |
| c | Evaluate and request enough Section supervisory staffing for both operational and planning activities. | <input type="checkbox"/> |
| d | Supervise Operations Section tactical response (Oversee and Support the On-Scene Commander). | <input type="checkbox"/> |
| e | Implement the Incident Action Plan for the Operations Section. | <input type="checkbox"/> |
| f | Evaluate On-Scene operations and adjust organisation, strategies, tactics, and resources as necessary. | <input type="checkbox"/> |
| g | Ensure the Incident Commander is advised of changes in the status of resources assigned to the section. | <input type="checkbox"/> |
| h | Ensure that Operations Section personnel execute work assignments following approved safety practices. | <input type="checkbox"/> |
| i | Monitor need for and request additional resources to support operations as necessary. | <input type="checkbox"/> |
| j | Evaluate and monitor current situation for use in next operational period planning. | <input type="checkbox"/> |
| k | Convert operational incident objectives into strategic and tactical options. | <input type="checkbox"/> |
| l | Coordinate and consult with the Planning Section Chief and technical specialists, modelling scenarios, trajectories, etc., on selection of appropriate strategies and tactics to accomplish objectives. | <input type="checkbox"/> |
| m | Identify type and number of resources required to support selected strategies. | <input type="checkbox"/> |
| n | Subdivide work areas into manageable units. | <input type="checkbox"/> |
| o | Coordinate planned activities with the Safety Officer to ensure compliance with safety practices. | <input type="checkbox"/> |
| p | Participate in the planning process and the development of the tactical portions of the Incident Action Plan. | <input type="checkbox"/> |
| q | Assist with development of long-range strategic, contingency, and demobilisation plans. | <input type="checkbox"/> |
| r | Develop recommended list of resources to be demobilised and initiate recommendation for release when appropriate. | <input type="checkbox"/> |
| s | Receive and implement applicable portions of the incident Demobilisation Plan. | <input type="checkbox"/> |
| t | Participate in operational briefings to ERT. | <input type="checkbox"/> |
| u | Maintain Unit Log. | <input type="checkbox"/> |


3.2.2.5 Planning Section Chief (Operations Manager)

| Planning Section Chief (Operations Manager) | |  |
|---|---|---|
| <p>Role: The Planning Section Chief (PSC) is a member of the IMT, who is responsible for the collection, evaluation, dissemination and use of incident information and maintaining status of assigned resources. Information is needed to:</p> <ol style="list-style-type: none"> 1) Understand the current situation; 2) Predict the probable course of incident events; 3) Prepare strategies, plans and alternative strategies and plans for the incident; and, 4) Submit required incident status reports. | | |
| Task | | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Collect, process, and display incident information. | <input type="checkbox"/> |
| c | Assist Operations Section Chief in the development of response strategies. | <input type="checkbox"/> |
| d | Supervise preparation of the Incident Action Plan. | <input type="checkbox"/> |
| e | Facilitate planning meetings and briefings. | <input type="checkbox"/> |
| f | Supervise the tracking of incident personnel and resources through the Logistics Section. | <input type="checkbox"/> |
| g | Assign personnel already on-site to IMT organisational positions as appropriate. | <input type="checkbox"/> |
| h | Establish information requirements and reporting schedules for Planning Section Units (e.g., Resources, Situation). | <input type="checkbox"/> |
| i | Determine the need for any specialised resources in support of the incident. | <input type="checkbox"/> |
| J | Assemble information on alternative strategies. | <input type="checkbox"/> |
| k | Provide periodic predictions on incident potential. | <input type="checkbox"/> |
| l | Keep IMT apprised of any significant changes in incident status. | <input type="checkbox"/> |
| m | Compile and display incident status information. | <input type="checkbox"/> |
| n | Oversee preparation and implementation of the Incident Demobilisation Plan. | <input type="checkbox"/> |
| o | Incorporate plans (e.g., Traffic, Medical, Communications, and Site Safety) into the IAP. | <input type="checkbox"/> |
| p | Develop other incident supporting plans (e.g., salvage, transition, security). | <input type="checkbox"/> |
| q | Maintain Unit Log. | <input type="checkbox"/> |

3.2.2.6 Situation Leader

| Situation Unit Leader  | |
|---|---|
| <p>Role: The Situation Unit Leader is responsible for collecting, processing and organising incident information relating to the growth, mitigation or intelligence activities taking place on the incident. The Situation Unit Leader may prepare future projections of incident growth, maps and intelligence information.</p> | |
| Task | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. <input type="checkbox"/> |
| b | Begin collection and analysis of incident data as soon as possible. <input type="checkbox"/> |
| c | Prepare periodic predictions or as requested by the Planning Section Chief. <input type="checkbox"/> |
| d | Prepare the Incident SITREP Form (Annex 6 – Incident Command Forms) this is a collation of IMT Activities and reports from the On-Scene Commander. <input type="checkbox"/> |
| e | Provide photographic services and maps if required. <input type="checkbox"/> |
| f | Conduct situation briefings at meetings and briefings as required by the Planning Section Chief. <input type="checkbox"/> |
| g | Develop and maintain master chart(s)/map(s) of the incident. <input type="checkbox"/> |
| h | Maintain chart/map of incident in the common area of the IMT to view. (See Operations Section Introduction and Annex 6 – Incident Command Forms). <input type="checkbox"/> |
| i | Maintain Unit Log. <input type="checkbox"/> |

3.2.2.7 Resource Unit Leader

| Resource Unit Leader  | |
|---|---|
| <p>Role: The Resource Unit Leader is responsible for maintaining the status of all assigned tactical resources and personnel at an incident. This is achieved by overseeing the check-in of all tactical resources and personnel, maintaining a status-keeping system indicating current location and status of all these resources.</p> | |
| Task | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. <input type="checkbox"/> |
| b | Establish the check-in function at incident locations. <input type="checkbox"/> |
| c | Organisation Chart. <input type="checkbox"/> |
| d | Maintain and post the status and location of all tactical resources. <input type="checkbox"/> |
| e | Maintain master roster of all tactical resources checked in at the incident. <input type="checkbox"/> |
| f | Attend meetings and briefings as required by the Planning Section Chief. <input type="checkbox"/> |
| g | Maintain Unit Log. <input type="checkbox"/> |

3.2.2.8 Documentation Unit Leader


Documentation Unit Leader




Role: The Documentation Unit Leader (DOCL) is responsible for the maintenance of accurate, up-to-date incident files. Examples of incident documentation include: Incident Action Plan(s), incident reports, communication logs, injury claims, situation status reports, etc. Thorough documentation is critical to post-incident analysis. Some of the documents may originate in other sections. The Document Unit Leader shall ensure each section is maintaining and providing appropriate documents. The Document Unit Leader will provide duplication and copying services for all other sections. The Documentation Unit will store incident files for legal, analytical, and historical purposes. The DOCL may have a Deputy DOCL who must be ready to take over that position at any time.

| Task | | ✓ |
|------|--|--------------------------|
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Set up work area; begin organisation of incident files. | <input type="checkbox"/> |
| c | Establish duplication service; respond to requests. | <input type="checkbox"/> |
| d | File all official forms and reports. | <input type="checkbox"/> |
| e | Review records for accuracy and completeness; inform appropriate units of errors or omissions. | <input type="checkbox"/> |
| f | Provide incident documentation as requested. | <input type="checkbox"/> |
| g | Organise files for submitting final incident documentation package. | <input type="checkbox"/> |
| h | Maintain Unit Log. | <input type="checkbox"/> |

3.2.2.9 Logistics Section Chief (Procurement Lead)

| Logistics Section Chief (Procurement Lead) | |  |
|--|--|---|
| <p>The Logistics Section Chief (LSC), a member of the General Staff, is responsible for providing facilities, services, and material in support of the incident. The LSC participates in the development and implementation of the Incident Action Plan and activates and supervises the Branches and Units within the Logistics Section.</p> <p>The LSC may have a Deputy LSC who must be ready to take over that position at any time.</p> | | |
| Task | | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Plan the organisation of the Logistics Section. | <input type="checkbox"/> |
| c | Assign work locations and preliminary work tasks to Section personnel. | <input type="checkbox"/> |
| d | Assemble and brief Logistics Branch Directors and Unit Leaders. | <input type="checkbox"/> |
| e | Determine and supply immediate incident resource and facility needs. | <input type="checkbox"/> |
| f | In conjunction with Command, develop and advise all Sections of the IMT resource approval and requesting process. | <input type="checkbox"/> |
| g | Review proposed tactics for upcoming operational period for ability to provide resources and logistical support. | <input type="checkbox"/> |
| h | Identify long-term service and support requirements for planned and expected operations. | <input type="checkbox"/> |
| i | Advise IMT and Section Chiefs on resource availability to support incident needs. | <input type="checkbox"/> |
| j | Provide input to and review the Communications Plan, Medical Plan and Traffic Plan. | <input type="checkbox"/> |
| k | Identify resource needs for incident contingencies. | <input type="checkbox"/> |
| l | Coordinate and process requests for additional resources. | <input type="checkbox"/> |
| m | Track resource effectiveness and make necessary adjustments. | <input type="checkbox"/> |
| n | Advise on current service and support capabilities. | <input type="checkbox"/> |
| o | Request and/or set up expanded ordering processes as appropriate to support incident. | <input type="checkbox"/> |
| p | Develop recommended list of Section resources to be demobbed and initiate recommendation for release when appropriate. | <input type="checkbox"/> |
| q | Receive and implement applicable portions of the incident Demobilisation Plan. | <input type="checkbox"/> |
| r | Ensure the general welfare and safety of Logistics Section personnel. | <input type="checkbox"/> |
| s | Maintain Unit Log. | <input type="checkbox"/> |

3.2.2.10 Finance/Administration Section Chief (Finance Lead)

| Finance/Administration Section Chief (Finance Lead) | |  |
|---|--|---|
| <p>The Finance Section Chief (FSC) is responsible for all financial, administrative and cost analysis aspects of the incident and for supervising members of the Finance/Admin Section. The FSC may have a Deputy FSC who must be ready to take over that position at any time.</p> | | |
| Task | | ✓ |
| a | Review Planning Cycle and Common and General Responsibilities. | <input type="checkbox"/> |
| b | Participate in incident planning meetings and briefings as required. | <input type="checkbox"/> |
| c | Review operational plans and provide alternatives where financially appropriate. Review the information in Chapters 12, 16, and 17. | <input type="checkbox"/> |
| d | Manage all financial aspects of an incident. | <input type="checkbox"/> |
| e | Provide financial and cost analysis information as requested. | <input type="checkbox"/> |
| f | Gather pertinent information from briefings with responsible agencies. | <input type="checkbox"/> |
| g | Meet with Assisting and Cooperating Agency Representatives, as needed. | <input type="checkbox"/> |
| h | Maintain daily contact with agency(s) administrative headquarters on Finance/Admin matters. | <input type="checkbox"/> |
| i | Maintain daily contact with agency(s) administrative headquarters on Finance/Admin matters. | <input type="checkbox"/> |
| j | Ensure that all personnel time records are accurately completed according to policy. | <input type="checkbox"/> |
| k | Provide financial input to demobilisation planning. | <input type="checkbox"/> |
| l | Ensure that all obligation documents initiated at the incident are properly prepared and completed. | <input type="checkbox"/> |
| m | Brief agency administrative personnel on all incident-related financial issues needing attention or follow-up prior to leaving incident. | <input type="checkbox"/> |
| n | Develop recommended list of Section resources to be demobbed and initial recommendation for release when appropriate. | <input type="checkbox"/> |
| o | Receive and implement applicable portions of the incident Demobilisation Plan. | <input type="checkbox"/> |
| p | Maintain Unit Log. | <input type="checkbox"/> |

3.2.3 Operational Planning Cycle Meeting Agendas

| Command Objectives Meeting | |
|----------------------------|---|
| Facilitator | Planning Section Chief (PSC) |
| Attendees | Incident Commander, Section Chiefs, Situation Unit Lead (SITL) and Documentation Unit Lead (DOCL) |
| Agenda | <ol style="list-style-type: none"> 1) PSC Brings meeting to order, conducts roll call, covers ground rules and reviews agenda. 2) Review and/or update key decisions. 3) Develop or review/update response priorities, limitations and constraints. 4) Develop or review incident objectives. 5) Develop or review/update key procedures which may include: <ol style="list-style-type: none"> a) Managing sensitive information; b) Information flow; c) Resource ordering; d) Cost sharing and cost accounting; and, e) Operational security issues. 6) Develop or review/update tasks for IMT to accomplish. 7) Review, document and/or resolve status of any open actions. 8) Agree on division of IMT workload. 9) Prepare for the command and General Staff Meeting. |

| Command and General Staff Meeting | |
|-----------------------------------|--|
| Facilitator | Planning Section Chief (PSC) |
| Attendees | Incident Commander, Section Chiefs, Situation Unit Lead (SITL) and Documentation Unit Lead (DOCL) |
| Agenda | <ol style="list-style-type: none"> 1) PSC brings meeting to order, conducts roll call, covers ground rules and reviews agenda. 2) SITL conducts situation status briefing. 3) Incident Commander: <ol style="list-style-type: none"> a) Provides comments; b) Reviews key decisions, priorities, constraints and limitations (if new or changed); c) Discusses incident objectives; d) Reviews key procedures (if new or changed); and, e) Assigns or reviews functional tasks/open actions. 4) PSC facilitates open discussion to clarify priorities, objectives, assignments, issues, concerns and actions/tasks (each IMT Section Chief will be called upon for any questions, concerns or issues). 5) Incident Commander provides closing comments. |

Tactics Meeting

| | |
|--------------------|---|
| Facilitator | Planning Section Chief (PSC) |
| Attendees | Operations Section Chief (OSC), Logistics Section Chief (LSC), Resource Unit Leader (RESL), Situation Unit Lead (SITL), Safety Officer (SOF), Document Unit Lead (DOCL), Technical Specialist (THSP) (as needed), Finance Section Chief (FSC) (optional) |
| Agenda | <ol style="list-style-type: none"> 1) PSC Brings meeting to order, conducts roll call, covers ground rules and reviews agenda. 2) SITL reviews the current & projected incident situation. 3) PSC reviews incident operational objectives and ensures accountability for each. 4) OSC reviews response strategies. 5) OSC reviews and/or completes an operational planning worksheet which addresses: <ul style="list-style-type: none"> • Work assignments (who’s doing what, where); • Resource commitments; • Contingencies; and, • Needed support i.e., staging areas, fire service, Tier 2 specialist. 6) OSC reviews and/or completes Operations Section organisation chart. 7) SOF reviews and/or completes a Safety Analysis Worksheet and identifies and resolves any critical safety issues. 8) LSC discusses and resolves any logistics issues. 9) PSC validates connectivity of tactics and operational objectives. |

Planning Meeting

| | |
|--------------------|---|
| Facilitator | Planning Section Chief (PSC) |
| Attendees | Incident Commander, Section Chiefs, Situation Unit Lead (SITL), Document Unit Lead (DOCL), Safety Officer (SOF), Technical Specialist (THSP) (as needed), Community Liaison Officer, Liaison Personnel. |
| Agenda | <ol style="list-style-type: none"> 1) PSC Brings meeting to order, conducts roll call, covers ground rules and reviews agenda. 2) Incident Commander provides opening remarks. 3) SITL provides briefing on current situation re-resources at risk, weather forecast and incident projections. 4) PSC reviews Incident Commander’s priorities, decisions and objectives. 5) OSC provides briefing on current operations, an overview of the proposed plan including strategy, tactics/work assignments, resource commitments, contingencies, Operations Section organisation structure and support facilities, i.e. Staging Areas. 6) PSC reviews proposed plan to ensure IMT priorities and operation objectives are/will be met. 7) PSC reviews and validates responsibility for any open actions/tasks and management objectives. |

| | |
|--|--|
| | <p>8) PSC reviews and validates responsibility for any open action/tasks and management objectives.</p> <p>9) PSC conducts “round robin” of Section Chiefs to solicit their final input and commitment to the proposed plan:</p> <ul style="list-style-type: none"> a) Logistics Section Chief covers transport, communications and supply updates; b) Finance Section Chief covers fiscal issues; c) Safety Officer covers safety issues; d) Community Liaison Officer covers public affairs and public information issues; and, e) Liaison Personnel covers interagency issues. |
|--|--|

Operations Briefing

| | |
|--------------------|---|
| Facilitator | Planning Section Chief (PSC) |
| Attendees | Incident Commander, Section Chiefs, Situation Unit Lead (SITL), Document Unit Lead (DOCL), Safety Officer (SOF), Technical Specialist (THSP) (as needed), Community Liaison Officer, Liaison Personnel |
| Agenda | <ol style="list-style-type: none"> 1) Planning Section Chief opens briefing, covers ground rules, agenda and takes roll call of command and general staff and operations personnel required to attend. 2) Planning Section Chief goes over general contents of the plan, reviews Incident Commanders objectives and makes any required changes to the Incident Action Plan (i.e. pen and ink changes). 3) Incident Commander provides remarks. 4) Situation Unit Lead conducts situation briefing along with predictions (what is happening what might happen). 5) Operations Section Chief discusses current response actions and accomplishments. 6) Operations Section Chief Briefs Operations Section personnel. 7) Logistic Section Chief covers transportation, communications and supply updates. 8) Financial Section Chief covers fiscal issues. 9) Safety Officer covers safety issues. 10) Community Liaison Officer covers public affairs and public information issues. 11) Liaison covers interagency issues. 12) Planning Section Chief solicits final comments and adjourns briefing. |

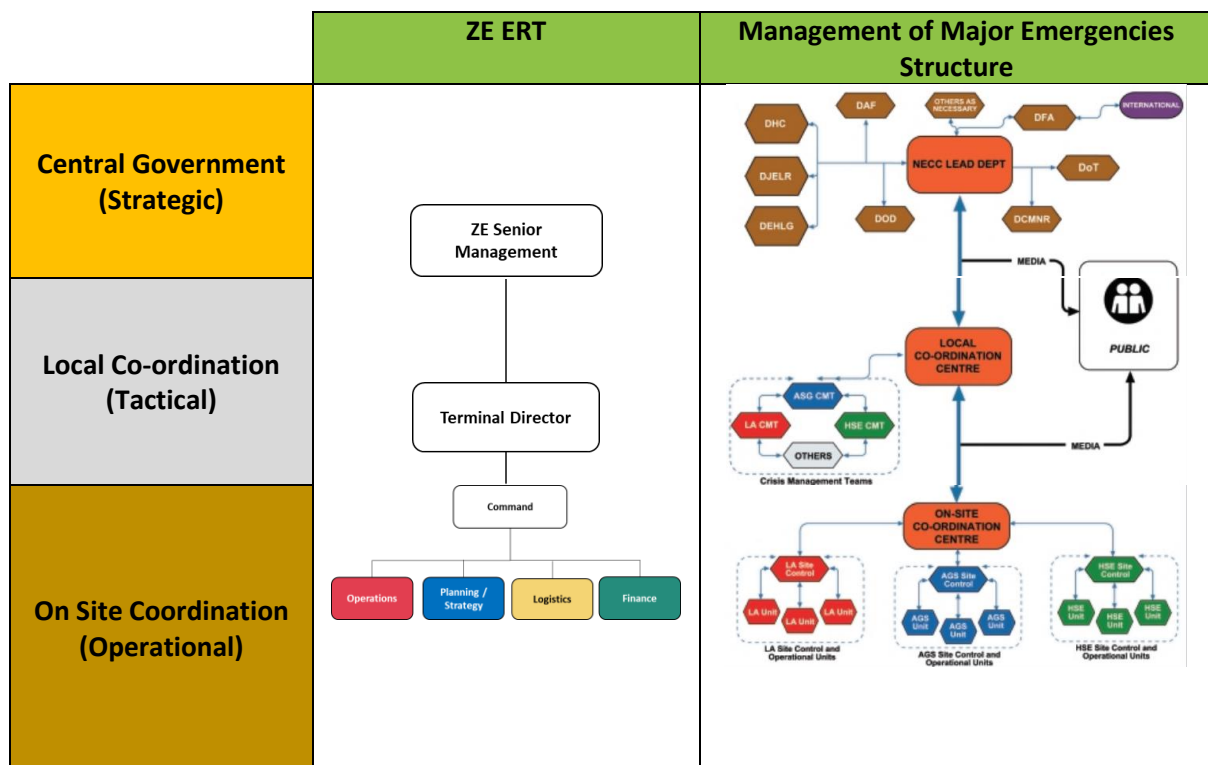
3.3 The Framework for Major Emergency Management

The Framework for Major Emergency Management sets out common arrangements and structures for front-line public-sector emergency management in Ireland. The key objective of the Framework is to set out the arrangements and facilities for effective co-ordination of the individual response efforts of the Principal Response Agencies (Garda Síochána, the Health Service Executive and Local Authorities) to major emergencies, so that the combined result is greater than the organisation.

Depending on the severity of the pollution incident faced by ZE there may be a local requirement to interface with the methodologies and command structure detailed in [The Framework for Major Emergency Management](#) through ZE’s Major Emergency Plan. Table 3.2 below shows how the IMS structure utilised by ZE’s IMT will interface with the structure implemented by principal response agencies through The Framework for Major Emergency Management.

Upon the activation of the Local Co-ordination Centre, ZE’s Terminal Director will (if required) handover the responsibilities of Incident Commander and mobilise as the representative on the Local Co-ordination Group. If the pollution incident has potential to cause severe harm to the public or national security, the Fire Service or Garda Síochána maybe appointed the lead agency of the response with support from ZE.

Table 3.2 - The Framework for Major Emergency Management structure interfacing with ZE’s ERTIMS Structure



For further information on the establishment and responsibilities of ZE within the Framework for Major Emergency Management please refer to ZE’s Major Emergency Plan.

4 Risk Assessment

This Chapter identifies the risk of oil and HNS spill events occurring from ZE’s operations at BBT. The scenarios and hazards identified throughout this risk assessment are presented in a Risk Assessment Matrix (RAM) (Chapter 4.5) based on the likelihood of occurrence and consequences on the identified environmental and socio-economic receptors.

This risk assessment was original conducted in 2015 by OSRL and has been reviewed internally annually, following exercises and training. Additionally, in 2023, the risk assessment was reviewed by Ambipar Response in line with updated best practice guidance. The risk assessment was conducted in five steps which are captured in Chapter 4.1 and meets International Maritime Organisation (IMO) guidance¹ and Joint Industry Project Risk Assessment Document².

4.1 Risk Assessment Process

Step 1

Oil Spill Scenarios

Identification of potential scenarios that may lead to an accidental release of oil. The source of the spill, event, oil type and volume are considered.

Refer to: Chapter 4.2 and Chapter 4.3

Step 2

Likelihood and Consequence

The likelihood and consequence of all oil spill scenarios identified were semi quantitatively measured using industry best practice. Only the likely consequence of the scenario on the surrounding environment is considered. The likelihood of each scenario considers oil spill mitigation measures already in place.

- The potential oil spill scenarios and assigned likelihood and consequence values are recorded in the Risk Register.

Refer to: Table 4.1 and Table 4.2

Step 3

Oil Spill Scenario Impacts

The potential impact of the scenarios outlined in the Risk Register have been assessed by reviewing the environmental and socioeconomic information to identify impacts from an oil spill.

Refer to: Chapter 4.4

Step 4

Tiered Response

The tiered response approach and response technique suitable for each scenario were determined. Influencing factors include: oil type, spill volume, climate, proximity to sensitive resources and response capability.

This information has been recorded in the Risk Register.

Refer to: Chapter 4.6

Step 5

Risk Assessment Matrix

The risk profile is completed using the RAM. The RAM highlights the scenarios which are deemed low, medium or high risk.

Refer to: Chapter 4.5

¹ as issued in the Manual on Oil Spill Risk Evaluation and Assessment of Response Preparedness (2010 Edition)

² IPIECA OGP (2013) Oil spill risk assessment and response planning for offshore installations

Table 4.1 - Definition of Likelihood Categories

| Likelihood | Description |
|------------|---|
| A | Never happened in the industry |
| B | Heard of in the industry |
| C | Has happened in the organisation or more than once per year in the industry |
| D | Has happened at the location or more than once per year in the organisation |
| E | Has happened more than once a year at the location |

Table 4.2 - Definitions of Consequence Categories

| Severity | Environmental Definition |
|----------|--------------------------------|
| 1 | Slight impact |
| 2 | Minor local impact |
| 3 | Moderate regional impact |
| 4 | Major national impact |
| 5 | Extensive international impact |

4.2 Historic Sources of Spills

4.2.1 International

ITOPF maintains a database of oil spill incidents that have occurred around the world with the most up-to-date data found on the [ITOPF website](#).

In summary, the data, which starts in 1970, shows a significant decline in the number of large (>700 tonnes) and medium sized (7 -700 tonnes) oil spill incidents, with large international oil spill events occurring on an average of 2 per year. The large oil spills account for 5% of all ITOPF recorded oil spill incidents, the cause and circumstances of the incidents being grounding, allision and collision, fire and explosion, and hull failure, with vessels grounding causing the highest percentage of recorded oil spills over 700 tonnes.

Of the large incidents that have been recorded since 1970, 50% of the incidents occurred at open sea with the other half occurring in restricted waters (Ports, Harbours, and inland waters). Allisions, collisions and groundings accounted for 99% of the incidents when a vessel was underway in restricted waters. ITOPF data shows that fire and explosions accounted for a high percentage of large oils spills that occurred during loading and discharging operations.

Small (<7 tonnes) and medium spills account for 95% of the overall ITOPF recorded incidents. The causes of small to medium spills are not reported as constitutently as larger spills; however, of the recorded incidents where the causes and circumstances are known, the most significant operation resulting in an oil spill is loading and discharging (significantly more than large spills).

4.2.2 National

The IRCG is the national competent authority for the direction of counter pollution activities and record all significant incidents within Irish waters requiring their involvement. Table 4.3 details a brief description and causation of all the incidents that have required support and assistance during their resolution.

Table 4.3 - Historic Record of Significant Oil Spills in Ireland's Exclusive Economic Zone (EEZ)

| Incident Name | Vessel Type | Cause/Operation | Outcome |
|-------------------------------------|-------------------------------|-----------------------------------|--|
| Afran Zodiac (1975) | Super Oil Tanker | Collided with tug in oil terminal | 500t |
| Betelgueuse (1979) | 121,432 DWT Oil Tanker | Explosion during cargo transfer | 40,000t |
| Salavat Yulaev (1995) | Russian Navy Vessel | Grounded during sailing | 30t |
| Irish Refining (1997) | Pipeline failure | Cargo transfer | Crude Oil Release |
| Elsinor (2001) | Stern Trawler | Grounded during sailing | Small volumes of marine gas oil < 2t |
| Celestial Dawn (2002) | Stern Trawler | Grounded during sailing | Small volumes of marine gas oil < 2t tonne |
| Dunmore East Incident (2005) | Fishing Vessel | Tank rupture/bilge release | Small volumes of marine gas oil < 2t |
| Admiral Kuznetzov (2009) | Russian Navy aircraft carrier | Unknown | 300t of HFO. |

4.2.3 Regional

The 1979 Betelgueuse incident occurred on site at Whiddy Island. The 121,432 DWT Oil Tanker exploded when unloading a cargo of Arabian heavy and light crude oil at the oil terminal. A faulty unloading operation was determined to have unbalanced the vessel, causing it to break its back and thereby rupture several empty ballast tanks.

4.2.4 HNS

There are very few accurate historic records relating to HNS spills in the marine environment, this is partially due to the relative international inaction in both response and legislation in comparison to those of oil spills³. Nonetheless, semi-comprehensive records such as the CIIMAR database are beginning to be collated and published amongst the scientific and spill response community.

The [CIIMAR](#) database has collected information on the fate and weathering of 119 global HNS spills to date. The spill incidents logged within their database occurred from 1947 to 2011 and involved 187 different spilled substances. Of the incidents reported, 96.7% occurred from 1970 onwards. 75 of the analysed incidents (63%) occurred in European waters and 45 in other regions (37%). Most occurrences involved substances transported in bulk (60%), while 40% corresponded to packaged goods. 21% of the incidents resulted in mixtures of compounds due to the spillage of more than one chemical.

Details of the incidents recorded as occurring in Irish waters can be displayed in Table 4.4.

Table 4.4 - Historic Record of HNS Spills in Ireland as Captured by CIIMAR.

| Incident | Product | HNS Type | State | Amount Spilled |
|-------------------------|----------------|----------|-------|----------------|
| BG Dublin (2010) | Sodium Bromate | Packaged | Solid | 11.5T |

³ Cunha, I., Moreira, S., & Santos, M. M. (2015). Review on hazardous and noxious substances (HNS) involved in marine spill incidents—An online database. *Journal of hazardous materials*, 285, 509-516.

| Incident | Product | HNS Type | State | Amount Spilled |
|-----------------------|----------|----------|-------|----------------|
| Kowloon Bridge (1986) | Iron Ore | Bulk | Solid | 160,000T |

4.3 Bantry Bay Terminal Operations and Storage

Bantry Bay Terminal is a crude oil and product storage terminal facilitated by an offshore mooring buoy, located on Whiddy Island, Bantry Bay. There are 18 storage tanks on site, with the total storage capacity of the terminal being approximately 1,300,000m³. The terminal is currently licensed to store up to 850,000m³ of Petroleum Class 1 (crude or gasoline). The licence also covers an additional 970,000m³ of Class 2 product, (Kerosene or Jet Fuel) and 1,070,000m³ of Class 3 product. Figure 4.1 provides an overview of the BBT site and key infrastructure.



Figure 4.1 – 3D Site Risk Map for BBT (2021)

4.3.1 Single Buoy Mooring (SBM)

Single Buoy Mooring (SBM) is located 1,600m offshore and has a license to operate vessels up to 320,000dwt. The facility is comprised of a Pipeline End Manifold (PEM) and a Catenary Anchor Leg Mooring (CALM) anchored to the seabed via six catenary chain legs.

Location of Buoy:

51°41'54"N 009°32'04"W

During a cargo transfer operation, Hydrocarbon oil products are pumped to and from the tanker through the ships manifolds via one floating hose to/from the buoy. At the SPM, the oil passes through either the crude or product sub-sea hose string. These sub-sea hoses are connected to the PEM on the seabed.

The PEM is connected to the terminal onshore via two pipelines, 30" product line and 42" crude line.

Table 4.5 - SBM Operating Capacity

| Type | Discharging | Loading | Shore Side |
|---------|-------------------------|--|---|
| Crude | 7,000m ³ /hr | 6,000m ³ /hr or ships limit | 42" sub-sea pipeline reducing to 30" onshore. 24" sub-sea hoses at the buoy, reducing to 16" at ships rail. Two dedicated crude shore pumps. |
| Product | 3,000m ³ /hr | 2,000m ³ /hr or ships limit | 30" sub-sea pipeline reducing to 24" and 18" onshore 24" sub-sea hoses at the buoy reducing to 16" at the ship rail. Two dedicated product shore pumps. |

4.3.2 Storage Tank Capacities

Table 4.6 - Storage Tank Capacities at BBT

| Tank Number | Diameter (m) | Volume (m ³) | Roof Type |
|-------------|--------------|--------------------------|-----------|
| 101 | 14 | 1180 | Fixed |
| 201 | 80 | 92,200 | Floating |
| 202 | 80 | 92,200 | Floating |
| 203 | 80 | 92,200 | Floating |
| 204 | 80 | 92,200 | Floating |
| 205 | 80 | 92,200 | Floating |
| 206 | 80 | 92,200 | Floating |
| 207 | 80 | 92,200 | Floating |
| 208 | 80 | 92,200 | Floating |
| 209 | 80 | 92,200 | Floating |
| 210 | 80 | 92,200 | Floating |
| 211 | 80 | 92,200 | Floating |
| 212 | 80 | 92,200 | Floating |
| 401 | 77 | 86,200 | Floating |
| 402 | 77 | 86,200 | Floating |
| 403 | 6.5 | 240 | Fixed |
| 405 | 37 | 15,100 | Fixed |
| 406 | 37 | 15,100 | Fixed |
| 407 | 25 | 7,630 | Fixed |

4.3.3 Pilotage

Pilotage is carried out in Bantry Bay as follows:

1. All Oil Tankers must take on a licenced pilot while calling to the SBM, these pilots operate under a licence agreement issued by the Bantry Bay Port Company; and,
2. Pilotage of any other vessels is carried out by a Bantry Bay Port Company licenced pilot.

4.3.4 Towage

Towage is currently provided by Atlantic Towage Ltd, based in Castletownbere and is available upon request, utilised during the mooring of cargo tankers at the SBM.

4.3.5 Mitigative Measures

In line with the requirements of this plan, Zenith Energy have access to extensive Tier 1,2 and 3 equipment stockpiles respectively.

Tier 1 – Onsite trailers, response equipment and ancillaries (Annex 3).

Tier 2 – Tier 2 onsite stockpile and mutual assistance from BBPC (Annex 3).

Tier 3 – OSRL and IRCG Stockpiles (Annex 3).

4.4 Environmental and Socioeconomic Sensitivities

This part of the risk assessment assesses environmental and socio-economic sensitivities likely to be adversely impacted following the release of a pollutant. Identifying the sensitive receptors is an important element in determining the consequences of a pollution event and developing response strategies to reduce the consequence and decrease the overall spill risk of the facility. This section of the plan will also assist the IMT in identifying sensitive receptors when developing an Incident Action Plan for responding to an oil spill event.

4.4.1 Environmental Sensitivities

[NPWS Designations Viewer](#) should be consulted by ZE BBT in the event of an oil/HNS incident to identify specific environmental sensitivities at risk of the spill trajectory.

The environment on Whiddy Island is mainly pastureland and is relatively low on species. The most noticeable species on the Island are mountain hares. The flora and fauna on the Island is similar to South West Ireland, with many of the species belonging to the ‘Iustanian’ group of species. This includes, but not limited to, Butterwort (*Pinguicula vulgaris*), founded in waterlogged ground; and Giant Rhubarb, found in abundance off the South Coast of Whiddy Island. Due to the clean air in Bantry Bay, there is a high abundance of lichens in the area.

Bantry Bay is home to sensitive areas including estuaries, rivers, salt marshes and mudflats. Glengarriff Harbour and Woodland, (Site Code 000090) is a Candidate Special Area of Conservation and Proposed Natural Heritage Area, Sheep’s Head (Site code 000102) is a Special Area of Conservation and both Sheelane Island (Site Code: 001977) and Cusroe, Whiddy Island (Site Code: 000110) are Proposed Natural Heritage Areas.

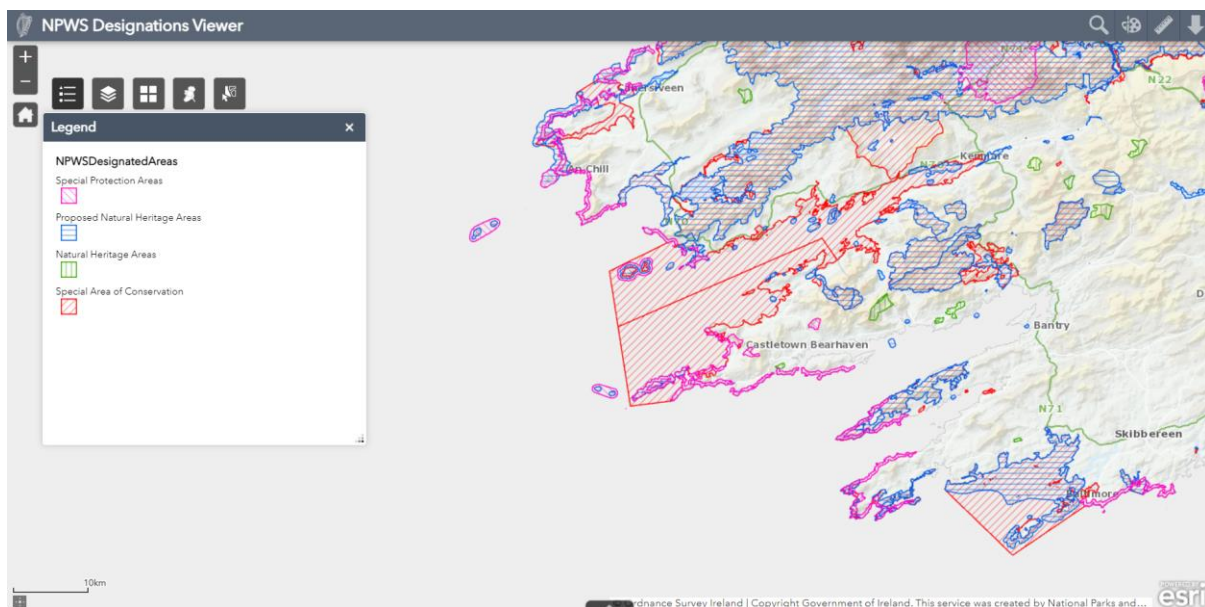


Figure 4.2 - NPWS Designations Overview of Bantry Bay Area

All are protected under the EU Habitats Directive and are home to many species, such as:

- Arctic Tern, *Sterna paradisaea*;
- Kerry Slug, *Geomalacus*;

- Eurasian Otter, Lutra Lutra;
- Common Seal, Phoca Vitulina;
- Lesser Horseshoe Bat, Rhinolophus;
- Common & Arctic Terns;
- Black Headed Gulls;
- Herring Gulls;
- Cormorants; and,
- Shag.

The largest colony of Common Seals can be found at Glengarriff Harbour. Figure 4.3 displays an overview of all key seal haul sites within Bantry Bay, response strategies should focus on minimising the impact to the locations identified especially during breeding from June to August and moulting during July to September. The haul out site at Glengarriff Harbour is used throughout the year. There is a reported increase in seal populations within Bantry Bay from June to September.

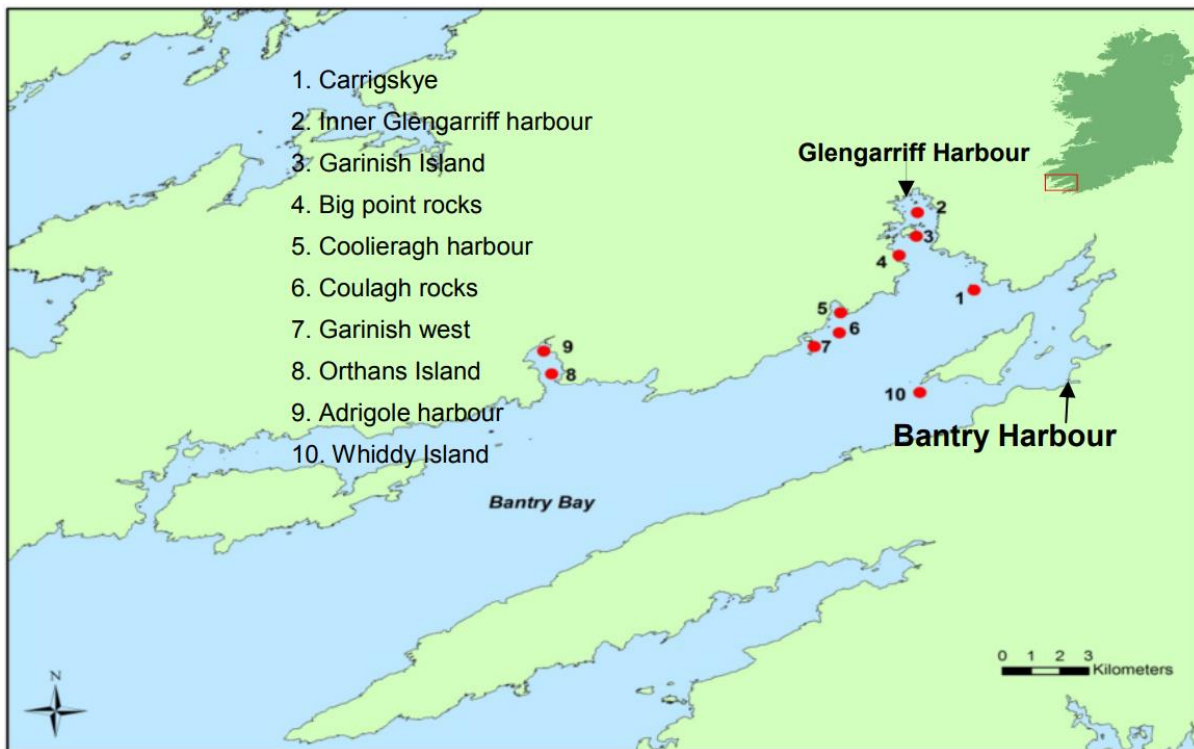


Figure 4.3 - Seal Haul Out Sites at Bantry Bay

The water in Bantry Bay is classified as ‘Conditional’. This means that shellfish taken from the bay are fit for human consumption after they have undergone a purification process. There are mussel and salmon farms in the bay that must be notified in the event of a release.

Cetacean species which have been recorded as present within the coastal waters of the Irish sea include: Fin Whale, Sei Whale, Minke Whale, Northern Bottlenose Whale, Long-Finned Pilot Whale, Killer Whale, Risso’s Dolphin, Bottlenose Dolphin, Atlantic White-Sided Dolphin, White-Beaked Dolphin, Striped Dolphin, Short-Beaked, Common Dolphin and Harbour Porpoise.

4.4.2 Socio-economic Receptors

This section will highlight the various socio-economic receptors present within the wider Bantry Bay area.

A variety of amenity and recreational activities occur within Bantry Bay and along its shoreline. Bantry Bay is very popular with tourists and the many shoreline roads and walks are very popular during peak season (May – October).

There are several beaches around the Bay which are also used, mainly by locals, for swimming and angling.

Leisure sailing is popular within Bantry Bay supported by two sailing clubs, along with other recreational marine activities such as Sea Kayaking and Paddle Boarding. A list of all water activity providers and contact details can be found on the Bantry Bay Port Company website (www.bantrybayport.com).

Resultantly, tourism is large in the area due to its striking environment and rich natural heritage. The area boasts a large number of hotels and is home to a variety of leisure activities; this includes walking, painting, golf, boating and sailing. In addition, the area is utilised for mussel and finfish farming. An agreement is in place between BBT and the Bantry Bay Users Forum, which makes allowances for loss of earnings due to an oil spill from the terminal.

4.4.3 Shorelines at Risk

Several shoreline areas within Bantry Bay have been identified as potentially at risk from a spill at BBT, utilising monthly metocean data (Table 4.7) the areas in Table 4.8 have been identified where feasible shoreline based response strategies could be employed to reduce the impact of oil upon sensitive resources.




Table 4.7 - Annual Metocean Data for Bantry Bay

| Month | Weather | Effect on Oil |
|----------|--|---|
| January | <p>Winds of up to 10 Knots can be extremely variable including peaks from NE and SE which can last up to 7hours.</p> <p>Winds of over 20 Knots are predominately south westerly to westerly and gale forces above this speed come up entirely from the South or South East. This would funnel up the bay.</p> | <p>Average effect on oil movement expected will be to move it in a north easterly direction at about 0.4-0.6 Knots.</p> <p>With easterly winds which if above 10 Knots would move the oil round to the west within 7 hours.</p> |
| February | <p>The highest percentage of winds is between east, south, and west during the passage of the warm sector of depressions over the area. The major element of wind force and direction is up to 10 Knots from an easterly to SE direction followed by a move round to south westerly and north westerly for a shorter period of time but at speeds of over 20 Knots. Gale force winds are normally from</p> | <p>Average effect on oil movement will be the spreading of oil in a northerly direction at 0.3-0.6 Knots. The movement of the wind within the passage of the depressions will tend to impact the north east and north west corners of the bay</p> |

| Month | Weather | Effect on Oil |
|----------------------------------|--|--|
| | the south or south east and are less predominant than in January. | |
| March | The predominant air flow in March is wind of over 20 Knots from a SW direction. Lighter winds of below 10 Knots are completely variable but the largest mass is again from SW. There is a greater likelihood of easterly gale force winds for short periods than in February | Average effect on oil movement will again be the spreading of oil to the north but this time more specifically to the NE. This wind regime is most likely to move oil predominately to the NE at 0.4-0.6 Knots |
| April, May, June, July, & August | <p>There is a chance of north-easterly airstreams predominately under 10knots, during these months. Winds of more than 10 Knots will again be more predominately from the SW.</p> <p>During these summer months the winds are lighter and much more variable other than from the SE. Periods of wind over 20 Knots will be shorter lived, normally about 7-9hours, followed by lighter variable winds.</p> | <p>Average effect on oil movement will be slightly different during these months. NE winds will move the oil to the SW at 0.3 Knots while SW winds will move oil to the NE at 0.6 Knots.</p> <p>It is more difficult to define an average effect during these months, but lighter winds could move oil to the SE towards Whiddy Point West where it could be influenced by tides carrying it in a NE direction.</p> <p>The wind effect may cause the oil to beach in the area of the landing strip. Tidal influence would be stronger than wind influence in this case. Average winds would move oil at 0.3-0.4 Knots.</p> |
| September | The most predominant wind of the year is from the SW for any winds of 20 Knots or over during September. There is also a greater likelihood of stronger winds than of lighter variable winds. The SW winds can last for over 12 hours compared to other directions and normally persist for 6-7 hours. | The most likely prediction for oil movement in this month is a movement to the NE corner of Bantry Bay, with the wind causing a movement on average at 0.6 Knots. |
| October | Wind is extremely variable at both 10 knots and also above 20 Knots. Average periods of wind from any one direction are fairly low at below 7 hours but short periods of gale force wind can be expected from SSW. | In lighter winds oil would be driven at about 0.4 Knots. Stronger gale force winds will drive the surface oil at 0.9 Knots in a northerly direction. |
| November | Light winds of below 10knots will be variable between the east, south and west, but not | The most likely persistent movement of oil will again be to |

| Month | Weather | Effect on Oil |
|----------|--|---|
| | from the north. The predominant wind is south-westerly at 20 Knots with a fair chance of southerly or westerly gales. | the north and north east and movement would be between 0.5-0.9 Knots. |
| December | Highest chance of strong gale force winds almost entirely from SSW. There are virtually no winds from the north during this month and the areas of impact would again be any area to the north of the SPM. | The most likely movement of oil will be to the north and northeast. It must be assumed that the movement will be at 0.6-0.95 Knots. |

Table 4.8 - Pre-identified Shorelines at Risk

| Site: | Photographs: |
|---|--|
| <p>Snave Pier: This relatively small, enclosed area has a pier and several mussel farms in the area. The shoreline type in this area is extremely rocky and responding to this site would be completed via small boats for safety reasons. The site is located directly adjacent to a main access road and there is no backshore access. This means that the site facilities would have to be set up in the lay-by which is across the road from Snave Pier. Some form of road security would be required to maintain the flow of traffic.</p> |  |
| <p>Snave Beach: The shoreline type in this area is a mix of exposed rocky shoreline, cobbles and shingles. However, there is a small area of sand at the backshore, but very little operational area to the back of the site. The main response strategy in this area would be to block off the river at the bridge and then perform high-volume, low-pressure flushing down the shoreline into the surf zone where it could be collected. Once all the mobilised oil had been collected, as with Snave Pier; high-pressure, high-volume washing could be performed to remove some of the staining in the large rocks. The mouth of the estuary would require protection to prevent oiling of the mudflats at the end of the river. This could be done by booming the entry to the bridge.</p> |  |
| <p>Glengarriff: This area is home to many seal colonies and swans. Any wildlife specialists mobilised should concentrate in this area. There are also many local fishing vessels, jetties and piers which would need to be taken account of in the event of an oil spill in this area. Again, the shoreline is rocky with no backshore to stage an operation from, therefore small boats would require to be utilised as the main access.</p> |  |

4.5 Risk Assessment Matrix (RAM)

This section of the plan provides an overview of the outcomes from the qualitative and semi-quantitative risk assessment that was undertaken.

A comprehensive HAZID Register was developed as part of the risk assessment process. This HAZID register captures the identified scenarios which could lead to a spill release. These scenarios have been identified from the assessment of the terminal’s operational activity, land and marine use within the wider Bantry Bay area, nearshore water use, historic spill data, and prevention measures in place. Further consideration was made to the prevention measures and response strategies ZE have in place to ascertain the residual risk for each scenario. The HAZID Register can be seen in its entirety in Chapter 4.6.

The scenarios in the HAZID register were given an identification number and added to a Risk Assessment Matrix (RAM) based on their residual likelihood of occurrence and potential consequences to environmental and socio-economic receptors. As can be seen in Table 4.9 , based on ZE’s risk tolerance criteria, all the identified hazards are ALARP.

Table 4.9 - Risk Assessment Matrix

| Consequence | | Likelihood | | | | |
|--|--------------------------------|--------------------------------|---|---|---|--|
| | | A | B | C | D | E |
| Severity Rating Environmental and Socioeconomic | | Never heard of in the industry | Heard of in the industry | Happened in organisation /more than once per year in industry | Happened at the location/ more than once per year in organisation | Happened more than once a year at the location |
| 1 | Slight impact | | 6 & 8 | | | |
| 2 | Minor local impact | | 4, 19 & 20 | | | |
| 3 | Moderate regional impact | 17 & 18 | 3, 5, 7, 9, 10, 11, 12, 13, 14, 15 & 16 | | | |
| 4 | Major national impact | 1 | 2 | | | |
| 5 | Extensive international impact | | | | | |

= Low

= Medium

= High

4.6 HAZID Register

| ID | Source (and location if available) | Scenario | | | | Initial | | Mitigation Measures | Residual | | |
|----|------------------------------------|---|---|---|--|---------|---|---|----------|---|------|
| | | Event | Oil/Product Type | Spill Volume | Impact | L | C | | L | C | Tier |
| 1 | Tanker | Catastrophic collision, grounding or structural failure causing full hydrocarbon release from the vessel. | Crude / Diesel / HFO / Hydraulic / Lube | Dependant on Vessel Spec (Worst case: 300,000t) | Extremely heavy coastal, sea surface and water column impact. Large area of impact. International media interest and salvage operations. | B | 5 | <ul style="list-style-type: none"> - Ship vetting procedure; SOLAS (International Convention for the Safety of Life at Sea) & CA (marine Certifying Authorities) requirements for tanker; - ISGOTT Marine ship/shore checklist & safe working practices & procedures on ship & Terminal; - BBT pilot remains on board from vessel arrival to departure, & present at tanker during all unloading & loading operations; - Highly trained and experienced personnel; - Monitoring of ship condition hourly during cargo operations; - Collision prevention radar with AIS facility located in Terminal Control Room (automated identification system); - FiFi tug in attendance during all cargo transfer operations; - Third party vetting of tankers prior to their acceptance by the Terminal; - Approach is assisted by Terminal operated Tug Ocean Challneger which is securely connected to the Stern of the approaching Tanker approximately 4 miles from the SPM, and remains connected until after the safe departure of the vessel; - Constant presence of Standby Tug Ocean Bank in close proximity of moored vessel. The crew on this vessel maintains a good navigation watch to ensure no unauthorised vessels approach the moored tanker; and - Good local knowledge by the Pilots and Mooring Masters. If the Tanker suffered mechanical breakdown there is more bollard pull available than would be required to manoeuvre the Tanker clear of any shallow depths and enable the vessel to anchor at a safe location, it is one of the most natural deep bays in the world, the only shallow areas being very close to the shore. | A | 4 | 3 |
| 2 | Tanker | Catastrophic failure during tanker offloading operation resulting in explosion and release of full hydrocarbon inventory. | Crude | Dependant on Vessel Spec (Historic: 40,000t) | Extremely heavy coastal, sea surface and water column impact. Large area of impact. International media interest and salvage operations. | C | 5 | <ul style="list-style-type: none"> - As per #1; and - Third party vetting of tankers prior to their acceptance by the Terminal. | B | 4 | 3 |

| ID | Scenario | | | | | Initial | | Mitigation Measures | Residual | | |
|----|------------------------------------|---|----------------------------|--------------------------|--|---------|---|--|----------|---|------|
| | Source (and location if available) | Event | Oil/Product Type | Spill Volume | Impact | L | C | | L | C | Tier |
| 3 | Tanker | Collision, grounding or structural failure causing full rupture of crude oil storage tank onboard the vessel. | Crude | 10,000m3, per tank | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations | B | 4 | - As per #1. | B | 3 | 2/3 |
| 4 | Tanker | Collision, grounding or structural failure causing full rupture of fuel tank | Diesel | Dependant on Vessel Spec | Diesel spill likely to naturally dissipate, but due to large volume likely to spread over a large area with heavy sea surface and coastal impact. Media interest and salvage operations. | B | 3 | - As per # 1. | B | 2 | 2 |
| 5 | Tanker | Collision, grounding or structural failure causing full rupture of fuel tank | HFO | Dependant on Vessel Spec | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations | B | 4 | - As per # 1. | B | 3 | 2/3 |
| 6 | Tanker | Minor operational or maintenance spills at sea (Lubricant Oil, Hydraulic Oil) | Lubricant / Hydraulic Oils | Dependant on Vessel Spec | Possibility for sea surface, water column and coastal impact. | C | 2 | - As per #1; and, - Fire and gas detection systems, plan maintenance system, effective training and experienced crews. | B | 1 | 1 |
| 7 | Support Vessel / Tug | Collision/grounding/structural failure, resulting in loss of fuel | Diesel | Dependant on Vessel Spec | Diesel spill likely to naturally dissipate, but due to large volume likely to spread over a large area with heavy sea surface and coastal impact. Media interest and salvage operations. | B | 4 | - Well maintained and operated vessels as they have cleared stringent third-party vetting. Cargo transfer operation closely supervised by terminal Pilot and mooring masters; - Use of Terminal and industry procedures; and - Tug Ocean Challenger is A Fire-fighting class 1 tug in the unfortunate event of a fire onboard the Tug would be able to respond immediately to the emergency. | B | 3 | 2 |
| 8 | Support Vessel / Tug | Collision/grounding/structural failure, resulting in loss of utility oils | Lubricant / Hydraulic Oils | Dependant on Vessel Spec | Possibility for sea surface, water column and coastal impact. | C | 2 | - As per #6 | B | 1 | 1 |

| ID | Scenario | | | | | Initial | | Mitigation Measures | Residual | | |
|----|------------------------------------|---|------------------|-------------------------|--|---------|---|---|----------|---|------|
| | Source (and location if available) | Event | Oil/Product Type | Spill Volume | Impact | L | C | | L | C | Tier |
| 9 | SBM | Severed or ruptured cargo hose - during discharge operations whilst tanker berthed at the SBM, the tanker makes contact with the SBM or damages are observed to the hoses/mooring ropes/chafe chains, or other ancillary equipment. | Crude | 7,000m ³ /hr | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations. | C | 4 | <ul style="list-style-type: none"> - ISGOTT Marine ship/shore checklist & safe working practices & procedures on ship & jetty; - Agreed communications procedures between ship & jetty; - Terminal mechanical integrity programme (includes testing and replacement of hoses); - Pre-berthing inspection schedule of SBM, including leak check; - BBT pilot remains on board from vessel arrival to departure, & present at tanker during all unloading & loading operations; - Double carcass cargo hose with leak detection between inner & outer hose; - Pollution patrol boat continuous checks during cargo operations; - Tug maintains constant tension to avoid the vessel coming in contact with the SBM, if the tug line was to part, the standby tug is in a position to hold the bow away from the SBM; - There is another vessel on Pollution patrols around the tanker, hoses and SBM to help with early detection of any damage or incidents; - The hoses are double carcass hoses which means if there is any rupture internally that the outer carcass will remain intact, allowing the cargo transfer to continue until completion, at that stage the affected section can be changed out; - Regular diving inspection monitors the condition, wear and other potential to all sub-sea mooring and cargo equipment. - Well-constructed and maintained oil hoses that comply with OCIMF guidelines; - Marine Breakaway coupling fitted to the hose string. This is the designed weak link in the system so should a breakout occur the hose string should fail at this location which will minimise the spill quantity considerably. Also the Mooring hawser loads are monitored by use of a Portable Tanker Unit on the bridge, this enables the mooring Masters/Pilot to react quickly should an unexpected increase of load occur at the load cell which is attached to the mooring bridle. | B | 3 | 2/3 |

| ID | Scenario | | | | | Initial | | Mitigation Measures | Residual | | |
|----|------------------------------------|---|------------------|--------------------------|--|---------|---|---|----------|---|------|
| | Source (and location if available) | Event | Oil/Product Type | Spill Volume | Impact | L | C | | L | C | Tier |
| 10 | SBM | Rupture in sub-sea hose or a seal/stem/gasket leak. | Crude | 7,000m ³ /hr | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations. | C | 4 | <ul style="list-style-type: none"> - As per #9; and - Well-constructed and maintained Sub-Sea hoses. Regular diving inspection monitors their condition, location and security. | B | 3 | 2/3 |
| 11 | SBM | Tanker overriding SBM leading to SBM damage. | Crude | Dependant on Vessel Spec | Coastal, sea surface and water column impact. Media interest and salvage operations. | B | 4 | <ul style="list-style-type: none"> - ISGOTT Marine ship/shore checklist & safe working practices & procedures on ship & jetty; - Agreed communications procedures between ship & jetty; - BBT pilot remains on board from vessel arrival to departure, & present at tanker during all unloading & loading operations; - Subsea valves are ESD valves and loss of services on SBM will cause valves to close; - Tugs present during operation; and, - Monitoring of hawser load. | B | 3 | 2/3 |
| 12 | SBM | Mechanical failure on SBM. | Crude | 7,000m ³ /hr | Coastal, sea surface and water column impact. Media interest and salvage operations. | B | 4 | <ul style="list-style-type: none"> - Marine ship/shore checklist & safe working practices & procedures on ship & jetty; - Agreed communications procedures between ship & jetty; - Terminal mechanical integrity programme; - Pre-berthing inspection schedule of SPM, including leak check; - BBT pilot remains on board from vessel arrival to departure, & present at tanker during all unloading & loading operations; - Double carcass cargo hose with leak detection between inner & outer hose; - Pollution patrol boat continuous checks during cargo operations; - Ship shore hourly checklist; and, - Leak detection system with automatic alarms on SPM; upgraded seal arrangement. | B | 3 | 2/3 |
| 13 | Pipeline | Leak at flange or valve or flexible coupling during transfer of material to/from crude/product tank farm. | Crude | 7,000m ³ /hr | Coastal, sea surface and water column impact. Media interest and salvage operations. | B | 4 | <ul style="list-style-type: none"> - Design standards to ANSI B31.3; - Terminal operating procedures; - Pressure relief linked to Control Room (monitored but not alarmed); - Operational inspections according to Year Planner; and, - Terminal maintenance procedures & programme. | B | 3 | 2/3 |

| ID | Scenario | | | | | Initial | | Mitigation Measures | Residual | | |
|----|------------------------------------|--|------------------|-------------------------|--|---------|---|--|----------|---|------|
| | Source (and location if available) | Event | Oil/Product Type | Spill Volume | Impact | L | C | | L | C | Tier |
| 14 | Pipeline | Corrosion of import / export flowline causing release. | Crude | 7,000m ³ /hr | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations. | B | 4 | <ul style="list-style-type: none"> - Design standards to ANSI B31.3; - Operational inspections according to Year Planner; - Terminal maintenance procedures & programme; - Inspection programme; vibration from pumps minimised in design phase; - Underground pipelines being moved aboveground; - Introduction of biocide dosing / treatment to combat Microbiological Induced corrosion (MIC); - Pipeline has been lined MIC resistant liner. - Each pipeline is concrete weight coated for stability, and has an anticorrosion coating of coat tar enamel; and - Terminal undertakes intelligent pigging of both sub-sea pipelines and keeps detailed reports on their condition. | B | 3 | 2/3 |
| 15 | SBM / PLEM | Burst in subsea hose between SPM & PLEM when transferring material by undersea pipeline. | Crude | 7,000m ³ /hr | Coastal, sea surface and water column impact. Media interest and salvage operations. | B | 4 | <ul style="list-style-type: none"> - Design standards; - Inspection programme; - Oil displaced as far as PLEM when loading / unloading is complete; - Double carcass hose with leak detection; and, - Subsea hoses are inspected and tested. | B | 3 | 2/3 |
| 16 | PLEM | Seal / stem / gasket leak in PLEM when transferring material by undersea pipeline. | Crude | 7,000m ³ /hr | Coastal, sea surface and water column impact. Media interest and salvage operations. | B | 4 | <ul style="list-style-type: none"> - Design standards; - Inspection programme; - Oil displaced as far as PLEM when loading / unloading is complete; - Double carcass hose with leak detection; and, - Subsea hoses are inspected and tested. | B | 3 | 2/3 |
| 17 | Onshore Pipelines | Guillotine failure of one of the petroleum pipelines based on an average pumping rate of 4,500t/hr from the SPM during unloading and a 30 minute isolation time. | Crude | 2,250t | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations | B | 3 | <ul style="list-style-type: none"> - The onshore pipeline system has been designed to ANSI B31.3, Petroleum Refinery Piping and ANSI B31.4, Liquid Petroleum Transportation Piping, with welding carried out in accordance with API Std 1104, Welding of Pipelines and Related Facilities; and - New pipelines are hydrostatically tested to 1.5 times design pressure before being put into service. The lines undergo regular NDT inspection in accordance with the requirements of API 570 Piping. | A | 3 | 2/3 |
| 18 | Onshore Storage Tank | Catastrophic release of a storage tank. | Crude | 36,049m ³ | Heavy coastal, sea surface and water column impact. Could potentially spread over a large area. Media interest and salvage operations | B | 5 | <ul style="list-style-type: none"> - Tanks designed & constructed to API 650; - Mechanical integrity programme, with tank refurbishment in accordance with API 650/653; - Full hydrostatic testing of tanks before they are brought back into service; - All tanks and pipelines were constructed in accordance with the relevant industry and international standards of the time; | A | 3 | 2 |

| ID | Scenario | | | | | Initial | | Mitigation Measures | Residual | | |
|----|------------------------------------|---|------------------|--------------------|---|---------|---|--|----------|---|------|
| | Source (and location if available) | Event | Oil/Product Type | Spill Volume | Impact | L | C | | L | C | Tier |
| | | | | | | | | <ul style="list-style-type: none"> - Tanks have bunds built around them to prevent any release into the water column or sea; and - Certain tanks have been fitted with under floor leak detection pipes. | | | |
| 19 | Onshore Storage Tank | Tank left overfilling for 5 mins and all alarms being ignored. | Crude | 167 m ³ | Coastal, sea surface and water column impact. Media interest and salvage operations | C | 2 | <ul style="list-style-type: none"> - Tanks designed & constructed to API 650; - Mechanical integrity programme, with tank refurbishment in accordance with API 650/653; - Full hydrostatic testing of tanks before they are brought back into service; - French drains installed around tanks; - Underfloor leak detection installed; - All tanks are fitted with SAAB radar level detection system installed with high and low level alarms which are linked to the Control Room; - A drain type system has been installed, designed to detect any trace of a leak from the base of a tank by monitoring the sumps for any trace of oil floating on the surface of the water; and, - Daily inspection and monitoring during topping off operations for all tanks. | B | 2 | 2 |
| 20 | Onshore Storage Tank | A chronic leak in a tank base could continue for some time before detection by stock inventory system, which are set on a volume basis. | Crude | 40 m ³ | Coastal, sea surface and water column impact. Media interest and salvage operations | C | 2 | <ul style="list-style-type: none"> - As per #18. | B | 2 | 1/2 |
| 21 | Onshore Storage Tank | Failure of the 'o' ring seal on a dresser coupling. | Crude | 350 to 1000 tonnes | Coastal, sea surface and water column impact. Media interest and salvage operations | C | 3 | <ul style="list-style-type: none"> - As per #18; and - All tanks are fitted with SAAB radar level detection system installed with high and low level alarms which are linked to the Control Room. | B | 2 | 2 |

5 Training and Exercising Regime

It is essential that all members of ZE BBT involved in the response to an oil/HNS incident as a member of the IMT, are thoroughly familiar with this plan, its associated incident management processes (Chapter 3) and the deployment of the detailed response strategies (Chapter 7).

It is vital that all members of the IMT have the necessary skills to fulfil their respective role. These skills can be developed and maintained through the implementation of a training and exercise programme, as detailed under regulation⁴. Through the establishment of a comprehensive training and exercising regime, ZE BBT are committed to fulfilling their legal and moral obligation of achieving a high level of Oil and HNS spill response preparedness.

This Chapter has been prepared in accordance with IRCG SOP 05-2020 “Content and implementation of an oil-HNS spill contingency plan” and can be further supplemented by the SOP.

5.1 Training

A pollution response training programme is fundamental in building understanding, competency and capability of personnel. As per the NMO/HNSSCP, the IRCG has adopted the International Maritime Organisation (IMO) levels of model OPRC and HNS courses; these form the basis of the national courses organised by IRCG and are at the core of ZE BBT’s maritime spill response training regime. In addition to the IMO suite of spill response training, IMS training is also undertaken to ensure personnel’s knowledge in the ICS procedures and to gain an understanding of specific roles and the corresponding responsibilities.

Under IRCG guidance, the extent of training in terms of the numbers of trained ZE BBT personnel is commensurate with the capacity to respond to the risk scenarios identified within the risk assessment (Chapter 3.2) with an 100% redundancy. Table 5.1 details the training requirements for ZE BBT personnel identified to undertake a role in responding to a pollution event. Relevant, specific employee training and certification details can be found in Annex 2 – Certifications of Employees.

Table 5.1 – ZE BBT’s Training Matrix

| Course | Trained Staff |
|---|---------------|
| OPRC OSR Operations Staff (IMO 1 Equivalent) | 10 |
| OPRC OSR Supervisors and On-Scene Commanders (IMO 2 Equivalent) | 4 |
| OPRC OSR Senior Management Personnel (IMO 3 Equivalent) | 14 |
| IMO HNS Operational Level (First Responders, Supervisor and On-Scene Commanders), | 10 |
| IMO HNS Manger Level (Administrators and Senior Managers) | 14 |
| ICS 100 - An Introduction to the Incident Command System | 10 |
| ICS 200 - Applying the Incident Command System | 10 |
| ICS 300 - Incident Command System | 14 |

5.2 Exercises

The following section provides guidance on the contents and frequency of ZE BBT’s exercising regime which has been constructed to evaluate the effectiveness of this O/HNSSCP and ensure the

⁴ See Section 8(2)(b) and (c) of the Sea Pollution (Amendment) Act 1999

development of competency and capability of personnel who will be involved in the response to a marine pollution incident. The specifications and frequency of ZE BBT's exercise programme is captured within Table 5.2.

Table 5.2 – ZE BBT's Exercise Programme

| Exercise Type | Overview | Frequency |
|------------------------------|--|----------------|
| Communication / Notification | Used to test the alert and call-out procedures for response teams, communication systems, availability of personnel, and the transmission of information. This is generally an announced exercise and will confirm the relevance and validity of contact information within the plan. | Every 6 Months |
| Mobilisation and Deployment | Used to test the actual mobilisation times of individuals and contracted resources. Ideally mobilisation should be tested without warning, although the requirement for an unannounced callout will need to be balanced against the practical difficulties of doing so. Whilst this important aspect of the response may be exercised in isolation, it may be beneficial to incorporate this within the scope of another framework exercise within the wider ZE training plan. This also provides the opportunity for the response contractor and response teams to deploy pollution response resources. | Annually |
| Table-Top | Whilst the degree of complexity can be decided upon by the Exercise Coordinator, a table-top exercise can be used to test incident management knowledge and capability. It incorporates both individual and team training, enabling familiarisation between, personnel, the various roles and responsibilities and the identification of resources. A table-top exercise can also explore the interaction between the different parties involved, particularly by testing the principles of the response strategies. | Annually |
| Live Play | These exercises provide experience for personnel responding under local conditions and spill scenarios. All participants should respond to the given scenario as though it were a real incident. This exercise, if possible, should be combined with an equipment mobilisation and deployment. The incident management structure should be incorporated within the exercise programme. | Annually |
| Multi-Agency | These exercises test the capability of multiple agencies to respond in a coordinated manner. They are usually an expansion of the live exercise. They should be used to formally assess the capability of ZE and supporting organisations interlinking throughout the response to a pollution incident. | Every 3 Years |

Additionally, all exercises within Table 5.2 should as a minimum set to establish and capture the following:

- Clear objectives;
- A record of participants and outcomes;
- Integration of plans e.g., with wider emergency planning or corporate plans;
- Interface with external organisations, where appropriate;

- An evaluation process; and
- Post-exercise actions, with responsible persons and timelines.

The IRCG maintains a National Register of Pollution Response Training and Exercises. ZE BBT are expected to report their annual training and exercise activities to the IRCG, for inclusion in the National Register.

6 Shoreline Clean-Up Assessment Technique (SCAT)

This chapter offers guidance to IMT personnel on the stepped procedure behind conducting a Shoreline Clean-up Assessment Technique (SCAT) survey and the subsequent development of a shoreline treatment strategy, as appropriate (Chapter 6.4).

6.1 SCAT Overview

The SCAT is a systematic approach to determine the degree of shoreline contamination, identify environmental and socio-economic receptors, and classify shoreline characteristics. This information can then be used in the decision-making process by the IMT to identify the most appropriate shoreline clean-up techniques. SCAT surveys can be undertaken throughout the duration of a response to highlight progress and assist in determining when to terminate a response.

6.1.1 ZE BBT's Involvement in SCAT

Due to the ZE BBT's area of responsibility, overall responsibility for Shoreline clean-up likely rests with BBPC / Cork CoCo in conjunction with ZE BBT. ZE BBT will work with external local authorities and its Tier 2 provider to ensure an effective and efficient response.

It is likely that any incident impacting Bantry Bay, the immediate waters around Whiddy Island, and adjacent shorelines (see Chapter 4.4.3) will involve the activation of the Cork CoCo Shoreline Response Centre (SRC). If this is the case, it should be clearly understood who is in overall charge of the incident and whether a Unified Command process is being activated as described in Chapter 3.1.3.

If Cork CoCo takes primacy, it would be beneficial to appoint a Liaison to communicate between the Cork CoCo SRC, BBPC IMT and ZE BBT IMT. Depending on the extent of shoreline contamination, a Shoreline Response Centre (SRC) may be established requiring ZE liaison.

6.2 Shoreline Types

When preparing to undertake a SCAT Survey to inform the selection of appropriate shoreline response techniques, it is extremely beneficial to understand the characteristics of the shoreline effected.

Key shoreline characteristics and processes such as topography, sediment size, wave energy and tidal regime not only greatly influence shoreline features, but also how those shorelines will be affected by oiling and how best they can be assisted in their recovery from an oiling event.

Characterising shorelines can be greatly assisted through utilising the NOAA Shoreline Assessment Manual⁵ which is based on the internationally renowned Environmental Sensitivity Index (ESI)⁶. This categorises shorelines into 10 main types and subsequent sub-categories based on their overall sensitivity to oiling as displayed in Table 6.1.

The sensitivity of a shoreline oiling increases from type 1 to 10.

Further information on classifying ESI types can be found in [NOAA](#)

[Shoreline Assessment Manual \(Version 4\)](#).

⁵ [Shoreline Assessment Manual, 4th edition \(noaa.gov\)](#)

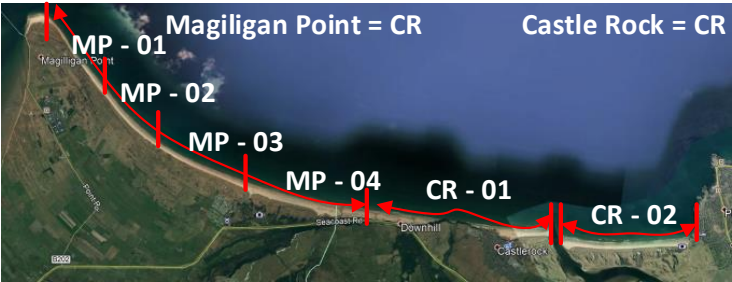
⁶ Gil-Agudelo, D. L., Nieto-Bernal, R. A., Ibarra-Mojica, D. M., Guevara-Vargas, A. M., & Gundlach, E. (2015). Environmental sensitivity index for oil spills in marine and coastal areas in Colombia. *CT&F-Ciencia, Tecnología y Futuro*, 6(1), 17-28.

Table 6.1 - Differing shoreline types as categorised by NOAA Version 4 Shoreline Assessment Manual

| Type | Description | Type | Description |
|------|---|------|--|
| 1A | Exposed rocky shore | 8A | Sheltered scarps in bedrock, mud or clay and sheltered rocky shore |
| 1B | Exposed, solid man-made structures | 8B | Sheltered, solid man-made structures |
| 1C | Exposed rocky cliffs with boulder talus base | 8C | Sheltered riprap |
| 2A | Exposed wave-cut platforms in bedrock, mud, or clay | 8D | Sheltered rocky rubble shores |
| 2B | Exposed scarps and steep in clay | 8E | Peat shorelines |
| 3A | Fine to medium-grained sand beaches | 9A | Sheltered tidal flats |
| 3B | Scarps and steep slopes in sand | 9B | Vegetated low banks |
| 4 | Coarse-grained sand beaches | 9C | Hypersaline tidal flats |
| 5 | Mixed sand and gravel beaches | 10A | Salt and brackish water marshes |
| 6A | Gravel beaches (granules and pebbles) | 10B | Freshwater marshes |
| 6B | Riprap structures and gravel beaches (cobbles and boulders) | 10C | Swamps |
| 7 | Exposed tidal flats | | |

6.3 SCAT Survey Process

Prior to undertaking a SCAT survey, SCAT Teams must be identified. These generally consist of representatives of differing stakeholders with a knowledge of coastal geomorphology, coastal ecology, shoreline clean-up techniques and those who are familiar with the SCAT process. The initial SCAT teams may consist of representatives from the Local Authority, ZE BBT, the polluter, BBPC, IRCG and an oil spill contractor to assist in recommending clean-up strategies to the SRC. The process captured in Figure 6.1 should be consulted when planning and undertaking a SCAT Survey.

| Action | Objectives | ✓ |
|-------------------------------|--|--------------------------|
| 1 Reconnaissance | <p>From overflight, ESI Map Layer, and Aerial Photographs (Google Earth):</p> <ul style="list-style-type: none"> Obtain overall perspective on shoreline types; Degree of contamination; Identify logistical constraints; and, Shoreline access for both shoreline assessment and clean-up teams. | <input type="checkbox"/> |
| 2 Segmenting the Shoreline | <p>Divide the shoreline into operational working units, called segments, for recording and tracking survey data and making recovery technique recommendations. Most segments in contaminated areas would be in the range of 0.2 – 2.0 km in length. Segments can be further broken down into sub-segments if oiling is conditions vary significantly within a segment.</p> <p>Use land marks where possible to separate the different segments.</p>  | <input type="checkbox"/> |

| | Action | Objectives | ✓ |
|----|---|--|--------------------------|
| 3 | Determine Number of SCAT Teams | Determine the number of SCAT teams required, this will be dependent on the scale of (or predicted) shoreline contamination. Ensure each team can cover the designated area in under a day and ensure adequate time remains to develop reports. | <input type="checkbox"/> |
| 4 | Determine the Members of the SCAT Teams | Practical consideration limits an assessment team to two or three, and occasionally four or five participants. The ideal composition of a team combines: <ul style="list-style-type: none"> • An individual with oil spill experience and SCAT training who can identify and document oil on the shoreline; • An individual familiar with the coastal ecology of the affected area who can document the impacts of the oil and who can recommend priorities and clean-up end-points; • In areas where archaeological or cultural resources exist, a specialist, who can advise on precautions and constraints to protect those resources; and • A representative from the SRC. | <input type="checkbox"/> |
| 5 | Data Management | SCATs can generate a large volume of data, so be sensible and practical in designing field surveys. Use existing documentation and forms that are appropriate and standardise terms, definitions, and forms at the outset (Annex 6). Ensure a procedure is in place for receiving, analysing, and storing reports, photographs and videos. A SCAT Coordinator can be assigned within the SRC to manage the input of data. | <input type="checkbox"/> |
| 6 | Brief SCAT Teams | SCAT teams should be adequately briefed before being deployed into the field. It may prove beneficial to do a shoreline walk over with all teams to ensure everyone is using the same terminology and standardisation. | <input type="checkbox"/> |
| 7 | Shoreline Surveys | The ground shoreline surveys are to collect information on shoreline types, oiling conditions, the effects on ecological and human habitation – use of resources for each segment. This is achieved by completing the SCAT Form in Annex 6. Reach agreement on treatment recommendations and priorities for specific segments. Confirm that recommendations are effective and beneficial to the environment. | <input type="checkbox"/> |
| 8 | Submitting Field Data | In almost all cases there will be need for a full time SCAT coordinator within the SRC who takes care of all data entry, manages data files (hard copy and electronic), and generates summary information for the IMT. It is the responsibility of the SCAT teams to submit complete, accurate data, to SCAT Coordinator before the end of the current operating period. | <input type="checkbox"/> |
| 9 | Developing Spill Specific Clean-up Guidelines and Endpoints | Typically, the establishment of the clean-up end points and shoreline response techniques is a joint decision by the SRC, EPA, and IRCG. The SCAT team can identify operational constraints, ecological sites, cultural resources and access considerations. | <input type="checkbox"/> |
| 10 | Clean-up evaluation/ effectiveness monitoring | Deploy SCAT teams to monitor clean-up operations routinely to evaluate the progress of clean-up activities and assess the need for modifying clean-up methods or endpoints, this will also be completed by the on-scene beach commander who will complete daily operational forms (Annex 6). Investigate reports of new oiling, changes in erosional/depositional processes that affecting oil behaviour, the response, and other issues. Conduct tests to evaluate treatment methods. | <input type="checkbox"/> |
| 11 | Post-clean-up inspections | SCAT teams comprising of land managers, local government representatives, polluter, contractors and stakeholders will inspect segments that the operations section has declared that the endpoint has been met. | <input type="checkbox"/> |
| 12 | Final sign off of clean-up activities | Approve the End Point of all clean-up activities of each segment. | <input type="checkbox"/> |

Figure 6.1 - SCAT Planning Process

6.4 Shoreline Treatment Process

During an oil spill, if oil impacts, or is expected to impact an area of shoreline, then a response can be implemented in three distinct operations⁷.

Shoreline Protection – Response options are deployed to protect the shoreline through booming to deflect oil from sensitive receptors or collect oil in a favourable location to prevent further spreading.

Shoreline Preparation – Undertaken in areas where oil is predicted to beach. Response options such as removal of uncontaminated shoreline debris, seaweed, flotsam, to above the highest stranding line and the erection of appropriate signage.

Shoreline Clean-up – Undertaken once oil is beached and entails deploying response options to remove oil from the shoreline to an agreed endpoint. The shoreline clean-up operation is generally undertaken in three stages.

Stage 1: Removal of floating oil at the water’s edge and thick concentrates on the shoreline.

Stage 2: Clean-up of moderate contamination, stranded oil and oiled beach materials.

Stage 3: Clean-up of lightly contaminated shoreline and final polishing to achieve determined endpoint.

The overall process for planning and undertaking a shoreline treatment and SCAT programme, as stated in IRCG SOP 04 “Establishing a Shoreline Response Centre” is displayed in Figure 6.2. The approach, system, terminology and standardised assessment is uniform between all stakeholders and local authorities to ensure a combined response effort.

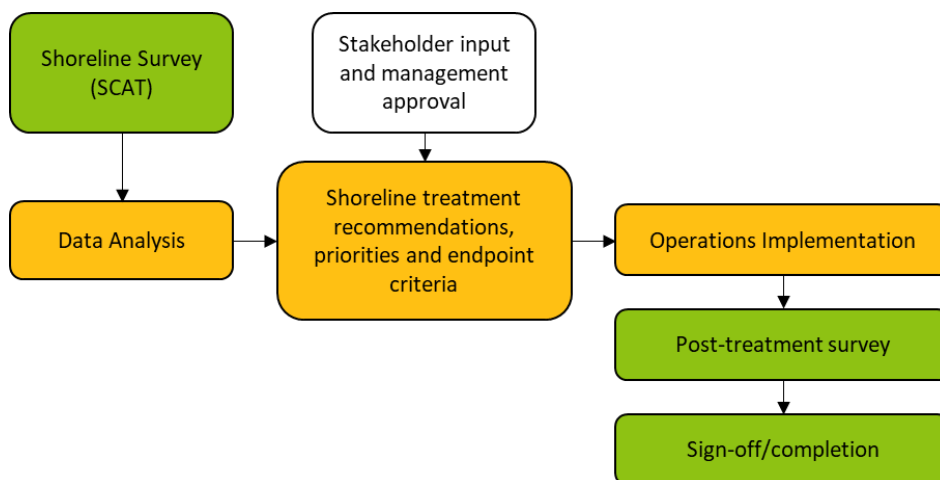


Figure 6.2 - Shoreline Treatment and SCAT Programme

Throughout the differing shoreline treatment operations and phases, various shoreline response options may be implemented. Please review Chapter 6.5 for guidance on determining the most

⁷ Shoreline Response, Oil Spill Response Tool Kit, Oil and Gas UK, 2015

appropriate response options/clean-up technique to deploy, based on the characteristics of the shoreline that has been impacted.

6.5 Summary of Shoreline Response Options

The shoreline response decision chart in Figure 6.3 should be utilised by ZE BBT personnel to determine the most appropriate response strategy for areas of oiled shoreline. Detailed descriptions of each response technique and potential end point criteria's can be found thereafter.

| Shoreline Response Technical Decision Chart | | | | | | | | | | | |
|---|--------------------|--|----------------|--|-----------------------|-----------------|--------------|----------|--|-----------------|---------------------------------|
| Types of Shoreline | Response Technique | | | | | | | | | | |
| | Natural Recovery | Mechanical recovery using pumping and vacuum equipment | Debris Removal | High Volume Low Pressure cold water flushing | High Pressure Washing | Manual Clean-up | Surf Washing | Sorbents | Protection booming and deflection / collection booming | Bio-remediation | Tilling / Harrowing / Ploughing |
| Exposed Rocky Shores | Green | Yellow | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Red |
| Exposed Solid Man-Made | Green | Green | Green | Yellow | Green | Green | Red | Yellow | Green | Red | Red |
| Exposed Rocky Cliffs | Green | Yellow | Red | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Red |
| Exposed Rocky Platforms | Green | Yellow | Red | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Red |
| Fine-Medium Sand Beaches | Yellow | Green | Green | Green | Red | Green | Yellow | Yellow | Green | Yellow | Green |
| Scarps And Steep Slopes In Sand | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Red |
| Coarse Sand Beaches | Yellow | Yellow | Green | Yellow | Red | Green | Green | Yellow | Yellow | Yellow | Yellow |
| Mixed Sand And Gravel | Yellow | Yellow | Green | Green | Red | Green | Green | Yellow | Yellow | Yellow | Yellow |
| Gravel Beaches | Yellow | Yellow | Green | Green | Red | Yellow | Green | Yellow | Yellow | Yellow | Red |
| Riprap Structures And Gravel Beaches | Green | Yellow | Yellow | Green | Yellow | Yellow | Green | Yellow | Yellow | Yellow | Red |
| Exposed Tidal Flats | Green | Red | Yellow | Yellow | Red | Yellow | Red | Yellow | Green | Yellow | Yellow |
| Sheltered Scarps And Rocky Shores | Green | Red | Yellow | Red | Yellow | Yellow | Red | Yellow | Yellow | Yellow | Red |
| Sheltered Solid Man-Made Structures | Yellow | Green | Yellow | Yellow | Green | Yellow | Red | Yellow | Yellow | Red | Red |
| Sheltered Riprap | Green | Yellow | Yellow | Yellow | Green | Yellow | Red | Yellow | Yellow | Yellow | Red |
| Sheltered Rocky Rubble Shores | Green | Yellow | Yellow | Yellow | Yellow | Yellow | Red | Yellow | Yellow | Yellow | Yellow |
| Sheltered Tidal Flats | Green | Yellow | Red | Green | Red | Yellow | Red | Yellow | Green | Yellow | Red |
| Vegetated Low Banks | Green | Red | Yellow | Yellow | Red | Yellow | Red | Yellow | Yellow | Yellow | Red |
| Salt And Brackish Water Marshes | Green | Red | Red | Green | Red | Yellow | Red | Yellow | Green | Yellow | Red |
| Freshwater Marshes | Green | Red | Red | Green | Red | Yellow | Red | Yellow | Green | Yellow | Red |
| Swamps | Green | Yellow | Red | Green | Red | Yellow | Red | Yellow | Green | Yellow | Red |



Figure 6.3 - Shoreline Response Technical Decision Chart

| Natural Recovery | |
|-----------------------------------|---|
| Overview | In time, most shorelines will clean oil naturally through interaction with the sea and microorganisms, via abrasion, flocculation, aggregation, oxidation and biodegradation. |
| Key Considerations | <ul style="list-style-type: none"> • Good for lightly oiled shores; • Most efficient and effective solution, especially during seasonal storms; • Not effective for oil trapped in anaerobic mud (ESI 8E and 9A); and, • Can be used as the final cleaning technique after other techniques have been deployed. |
| Necessary Resources | <ul style="list-style-type: none"> • None. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Reduces waste generated compared to substrate removal; ✓ High level of sediment cleanliness achieved; and, ✓ Low to no labour required (other than monitoring and sampling). <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Impact to littoral ecosystem whilst oil degrades; and, ✗ Seen to be doing nothing. |
| End-Point Criteria | <ul style="list-style-type: none"> • No visible oil, sheen, or greasy texture to sediment |

| Mechanical Recovery Using Pumping and Vacuum Equipment | |
|--|--|
| Overview | Mechanical recovery using pumping equipment can be undertaken where free floating oil has been contained. The free-floating pollutant can be pumped directly from the containment area to temporary storage tanks or into a road tanker/vacuum tanker. |
| Key Considerations | <ul style="list-style-type: none"> • The right pump is used for the pollutant; • There is adequate onsite primary waste storage for pollutant that is not directly recovered into a vacuum tanker; and, • Ensure vacuum tankers are licensed to transport hazardous waste. |
| Necessary Resources | <ul style="list-style-type: none"> • Certified vacuum tankers; • Skimmer attachments; and, • Primary waste storage equipment for liquid. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Removal of bulk pollutant; ✓ Low biological impact; ✓ If using vacuum truck can be non-labour intensive; and, ✓ Can efficiently and effectively treat cobbles and pebbles. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ If not correctly undertaken a lot of water can be recovered therefore increasing the overall waste generated. |
| End-Point Criteria | <ul style="list-style-type: none"> • When no more pollutant can be recovered. |

| Debris Removal | |
|----------------------------------|--|
| Overview | Utilises manual and mechanical recovery techniques to remove debris from the shoreline, or to above the highest stranding line before an oil spill impacts the shoreline. |
| Key Considerations | <ul style="list-style-type: none"> Identify the current position and trend of the tidal cycle at each location and constantly review weather reports for the region, considering tidal variations, storm events, flood events, which may affect how high to displace debris above the current stranding line; and, Consider tidal times to ensure the safety of responders and ensure access to shorelines. At high tides, response teams may become cut off from the access and egress points or have an insufficient area to operate within. |
| Necessary Resources | <ul style="list-style-type: none"> Beach Master/Supervisor; Labour; Hand tools (rakes, pitch forks, shovels); and, Mechanical Machinery (front loaders, backhoe excavators etc.). |
| Advantages /Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Reduces the waste generated and a result of the oil spill incident; and, ✓ Makes for an easier clean-up operation. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Can remove organic matter from the littoral ecosystem. Organic matter can be a crucial source of nutrients to littoral ecosystems. Once shoreline operations have ceased it is advised to segregate flotsam and jetsam from the recovered organic matter and then redistribute the organic matter on the shoreline. |
| End-Point Criteria | <ul style="list-style-type: none"> When debris is removed from the shoreline or above highest stranding line. |

| High Volume, Low-Pressure Cold-Water Flushing | |
|---|--|
| Overview | High volumes of water at low pressure is used to wash stranded, or buried, oil from sensitive shorelines. |
| Key Considerations | <ul style="list-style-type: none"> Identify the tide times, as this technique is more successful on the ebb tide; Salt water can damage equipment, so ensure regular maintenance of equipment For flushing above the waterline, the released oil can be channelled into natural collection areas, or excavated pits for skimmer recovery; Locating oil spill containment boom down gradient of the flushing in a U formation will form a catchment area and prevent the migration of oil; and, Complete a NEBA before deploying this technique on sensitive shorelines. |
| Necessary Resources | <ul style="list-style-type: none"> Beachmaster / supervisor; Labour; Hand tools (rakes, pitch forks, shovels) to assist agitation; Oil Spill containment booms (Shore sealing and tube and skirt); Waste bags for contaminated consumables; and Pumping system and perforated hoses and lances. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Reduces waste generated compared to substrate removal; ✓ Removes oil from sensitive areas, such as salt marshes; and ✓ Minimal disruption to beach profile and ecosystem, due to natural attenuation. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Moderate to high labour intensity; ✗ Operation is limited to the ebb tide; and, ✗ Coating of oil may remain on substrate |
| End-Point Criteria | <ul style="list-style-type: none"> When no more oil can be released from flushing. Additional clean-up techniques such as tilling, natural weathering, or surf washing maybe required to achieve desired end point. |

| High Pressure Washing | |
|-----------------------------------|---|
| Overview | Utilised on hard substrates and manmade surfaces and deployed when the natural cleaning rate is insufficient to satisfy end point objectives. |
| Key Considerations | <ul style="list-style-type: none"> • Recommended pressure is 50 -150 bars with flow rates of 10-20 litres/minute; • Hot water high pressure washing operating temperatures are generally between 70-95 °C, response personnel should wear appropriate PPE, for example oil skin coveralls and face masks; • If salt water is used, regular maintenance of the equipment will be required; • It can be beneficial to pump water into a temporary storage tank then into the compressor to ensure a continuous supply of water; • The jetting process can be slow and cause damage to surfaces and kill biota (to be taken into consideration when conducting a NEBA); • Tidal times required (often more successful on the ebb tide); • The jetting is a slow process (average rate of 1-3 m²/hr); and, • Safe working platforms e.g. floating pontoons/cherry pickers may be required to access oil staining with lance. |
| Necessary Resources | <ul style="list-style-type: none"> • Beachmaster; • Labour; • Compressor; • Lances; • Safe working platforms (if necessary); • Temporary storage tanks (if used); • Transfer pump system (water source to temporary storage tank); • Sorbent material (preferably sorbent booms); and, • Waste bags for spent sorbent. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Removes oil staining and achieves aesthetically based objectives and end points. <p>Disadvantages</p> <ul style="list-style-type: none"> x Very aggressive clean-up technique; x Safety of response personnel; and, x Can have large impact on coastal ecosystem. |
| End-Point Criteria | <ul style="list-style-type: none"> • None to faint oil staining on surface. |

| Manual Clean-up | |
|-----------------------------------|---|
| Overview | Utilised on non-fluid stranded oil and oiled beach materials (sand and shingle) on shorelines accessible on foot. |
| Key Considerations | <ul style="list-style-type: none"> • Tide times, access points and operational hours; • When planning the response, the transportation of waste on the shoreline, especially in areas where vehicle access isn't supported, should be considered; • Ensure there is adequate personnel to undertake the manual recovery response and regular rest breaks are undertaken; and, • An effective span of control should be implemented (7 – 10 labours to one Beachmaster or Supervisor). |
| Necessary Resources | <ul style="list-style-type: none"> • Beachmaster; • Labour; • Implements trowels, scrapers, rakes and shovels; • Heavy plant (loaders, dump trucks, backhoe tractors, tractor trailer, all-terrain vehicle with trailer); • Sorbent material (preferably absorbent booms); and, • Waste bags. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Removal of stranded oil from all types of shoreline as well as contaminated sediments from sand and shingle shorelines; ✓ Highly selective, leading to a high oil content in oily waste with relatively small amounts of clean substrate, thereby minimising the amount of waste for transport and disposal; and, ✓ Low biological impact. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Requires a large workforce which needs to be well organised with a high level of supervision to maintain focus of work force; ✗ Restricted by tides and beach access points; ✗ Temporary disruption to beach use; and, ✗ The coordination of large numbers of volunteers in this role calls for significant management effort. |
| End-Point Criteria | <ul style="list-style-type: none"> • When no more product can be manually recovered. |

| Surf Washing | |
|-----------------------------------|---|
| Overview | Surf washing is a natural process, which can be enhanced by using heavy plant to relocate contaminated substrate into the surf zone. |
| Key Considerations | <ul style="list-style-type: none"> • Tide times will affect access points and operational hours; • Salt water can be damaging to heavy plant, freshwater wash down required; • Undertake a NEBA to assess the risk of surrounding shorelines of remobilised oil; • Silver and iridescent sheen maybe visible on the surface of the water because of this technique which will dissipate naturally into the marine environment; and • The end point for amenity beaches will be different to non-amenity beaches. |
| Necessary Resources | <ul style="list-style-type: none"> • Beachmaster; • Labour; • Heavy plant (loaders, dump trucks, 360 excavators, backhoe tractors); • Sorbent material (preferably absorbent booms); and, • Waste bags for spent absorbents. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Reduces waste generated throughout a response; ✓ Relies on natural clean-up processes and cleans a high volume in a small time; ✓ Low Labour. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Restricted by tides and beach access points; ✗ Temporary disruption to beach use and alteration of profile; ✗ Potential to disrupt beach ecosystem especially in fauna; and, ✗ Vehicle access and exposure to breaking waves is required. |
| End-Point Criteria | <ul style="list-style-type: none"> • When no more oil can be released from sand sediment. |

| Sorbent Use | |
|-----------------------------------|--|
| Overview | Sorbents can be used to collect oil from the shore, manmade structures or floating on the marine environment. |
| Key Considerations | <ul style="list-style-type: none"> • Correct use of sorbents; and, • Waste management of saturated absorbents. |
| Necessary Resources | <ul style="list-style-type: none"> • Spill Response Technician; • Temporary waste storage; and, • Absorbents. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Low labour requirement – sorbent materials need to be changed when saturated; ✓ Low biological impact; and, ✓ Can be used in conjunction with other clean up strategies (pumping, surf washing, flushing, protective booming). <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Can leave an oil residue depending on location further treatment may be required; and, ✗ Generates waste (spent/saturated absorbents) |
| End-Point Criteria | <ul style="list-style-type: none"> • No visible oil, sheen, is released. |

| Protection Booming and Deflection/Collection Booming | |
|--|---|
| Overview | To protect environmental and socio-economic sensitive receptors from the detrimental effects of an oil spill incident. Protection booming can be the last line of defence in preventing contamination of sensitive receptors. |
| Key Considerations | <ul style="list-style-type: none"> • When deploying the boom consideration should be taken regarding effect of current on the angle at which the boom should be deployed; • The technique is restricted to conditions of light breezes and slight seas (i.e wave heights between 0.5 and 1.25 metres high); • Calculations regarding the force of the water on the boom will have to be made to ensure enough anchors are deployed to hold the boom in place; • Response teams will require a suitable staging area at the deployment site to deliver equipment and safely deploy the boom; and, • A boat and a trained response team will be required to deploy boom; |
| Necessary Resources | <ul style="list-style-type: none"> • Beachmaster/Supervisor; • Response Technicians; • Containment boom and ancillaries (anchors, rope, buoys); and, • Boat to deploy boom. |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Protects sensitive receptors; ✓ Contains floating oil in one location for recovery; ✓ Minimises the contamination of sediment and therefore reduces waste generated; and, ✓ Low biological impact <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ End point leaves surface residues on any contaminated sediment. Contaminated sediment will require further treatment; and, ✗ Initially labour intensive. |
| End-Point Criteria | <ul style="list-style-type: none"> • No visible oil in containment area. |

| Bioremediation | |
|-----------------------------------|---|
| Overview | Microorganisms degrade oil by using it as food source and converting it into carbon dioxide and water. This process can be enhanced through biostimulation. |
| Key Considerations | <ul style="list-style-type: none"> • Best suited to lightly oiled shores; • Bioremediation may accelerate the process, but likely to have the same effects as active clean-up techniques; • Can be used as the final cleaning technique after other, more active techniques; and, • Bioremediation can be enhanced at offsite locations where the environment is controlled, and then the sediment can be replaced back to the shoreline. |
| Necessary Resources | <ul style="list-style-type: none"> • Nutrients; and, • Selected microorganisms (bioaugmentation). |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Low environmental impact; and, ✓ Can enhance the natural process of biodegradation. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Slow removal process; and, ✗ Not effective on heavily oiled shorelines |
| End-Point Criteria | <ul style="list-style-type: none"> • No visible oil, sheen, or greasy texture to sediment. |

| Tilling/Ploughing/Harrowing | |
|-----------------------------------|---|
| Overview | Tilling of sediment is to use agricultural equipment to plough, or harrow, lightly contaminated sediment. |
| Key Considerations | <ul style="list-style-type: none"> • Identify the tide times, as it may be impractical to undertake tilling on a high tide; • Can only be utilised on tidal shorelines; • Reworking the beach can have an acute impact on the littoral ecosystem; and, • Natural attenuation through wave action should return the beach to its natural beach profile. |
| Necessary Resources | <ul style="list-style-type: none"> • Beachmaster/Supervisor; and, • Tractor; and Agricultural equipment (plough). |
| Advantages / Disadvantages | <p>Advantages</p> <ul style="list-style-type: none"> ✓ Reduces the volume of waste generated compared to substrate removal; ✓ Low labour and Agriculture equipment required is readily accessible; and, ✓ High level of sediment cleanliness achieved. <p>Disadvantages</p> <ul style="list-style-type: none"> ✗ Acute effects on littoral ecosystem. |
| End-Point Criteria | <ul style="list-style-type: none"> • No visible oil, sheen, or greasy texture to sediment. |

7 Response Strategies and Guidance

Response objectives and specific priorities, including the development of an Incident Action Plan are detailed and described in the Operations Section.

This section of the plan should be used to develop response Strategies and Tactics using the available Assessment Aides and Oil Spill Response Resources to ZE BBT.

7.1 How Response Options are Considered and Prioritised

Following the event of an oil spill, different response options need to be weighed up against minimising environmental and socio-economic impacts (as identified in Chapter 4.4). Advantages and disadvantages of viable response options will be considered and compared against environmental and socio-economic impacts of leaving a spill in-situ to undergo natural weathering processes with the implementation of a monitoring and evaluation response.

Net Environmental Benefit Analysis (NEBA) can be used to compare different response options, prioritise sensitivities and identify the response strategy to be used following a spill. The NEBA process considers the variables of each spill, specifically considering the characteristics of the spill, feasibility of different response options whilst also considering the impacts of oil and clean-up options on environmental and socio-economic sensitivities. The NEBA process is streamlined if accompanied with a contingency plan and comprehensive risk assessment.

An overview of the NEBA process can be found in Chapter 7.5.

Formulation of a response strategy should be articulated using the following guidelines:

- **Assessment** – Gaining situational awareness of the spill scenario and its characteristics (Phase 1 and Chapter 7.4)
- **Goals** – Setting the overall end goals of the response (Phase 2 – Development of an Action Plan)
- **Objectives** – Smaller sub goals which are tailored to be incident specific (Phase 2 – Development of an Action Plan)
- **Strategies** – The viable response strategies for the incident. (Chapter 7.3)
- **Tactics** – Means in which the strategies are achieved/undertaken. (Chapter 7.3); and,
- **Windows of Opportunity** – Duration for which response options are feasible i.e., tidal movements and oil characteristics, prevailing metocean conditions, and the weathering of oi (Chapter 7.4).

To formulate the incident goals and objectives which will ultimately pave the way for a decision on response strategies, the PEAR principles should be at the forefront of the decision-making processes. Prioritising the principles as they appear i.e., people first, environment second, assets third and reputation last. Therefore, ensuring a safe response (Chapter 10) should always be of the highest priority.

7.2 Overarching Response Strategy Selection

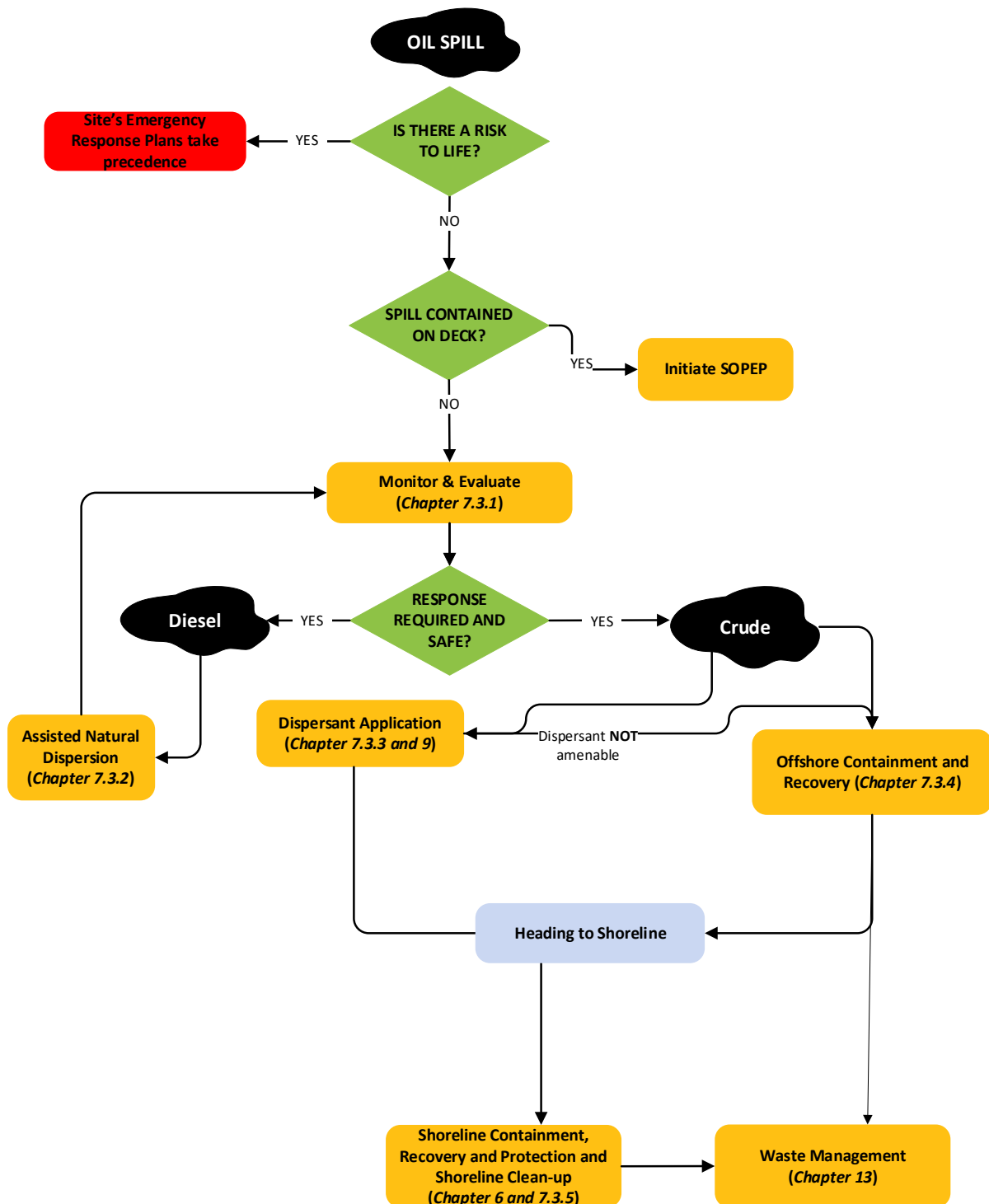


Figure 7.1 - Offshore Response Strategy Selection

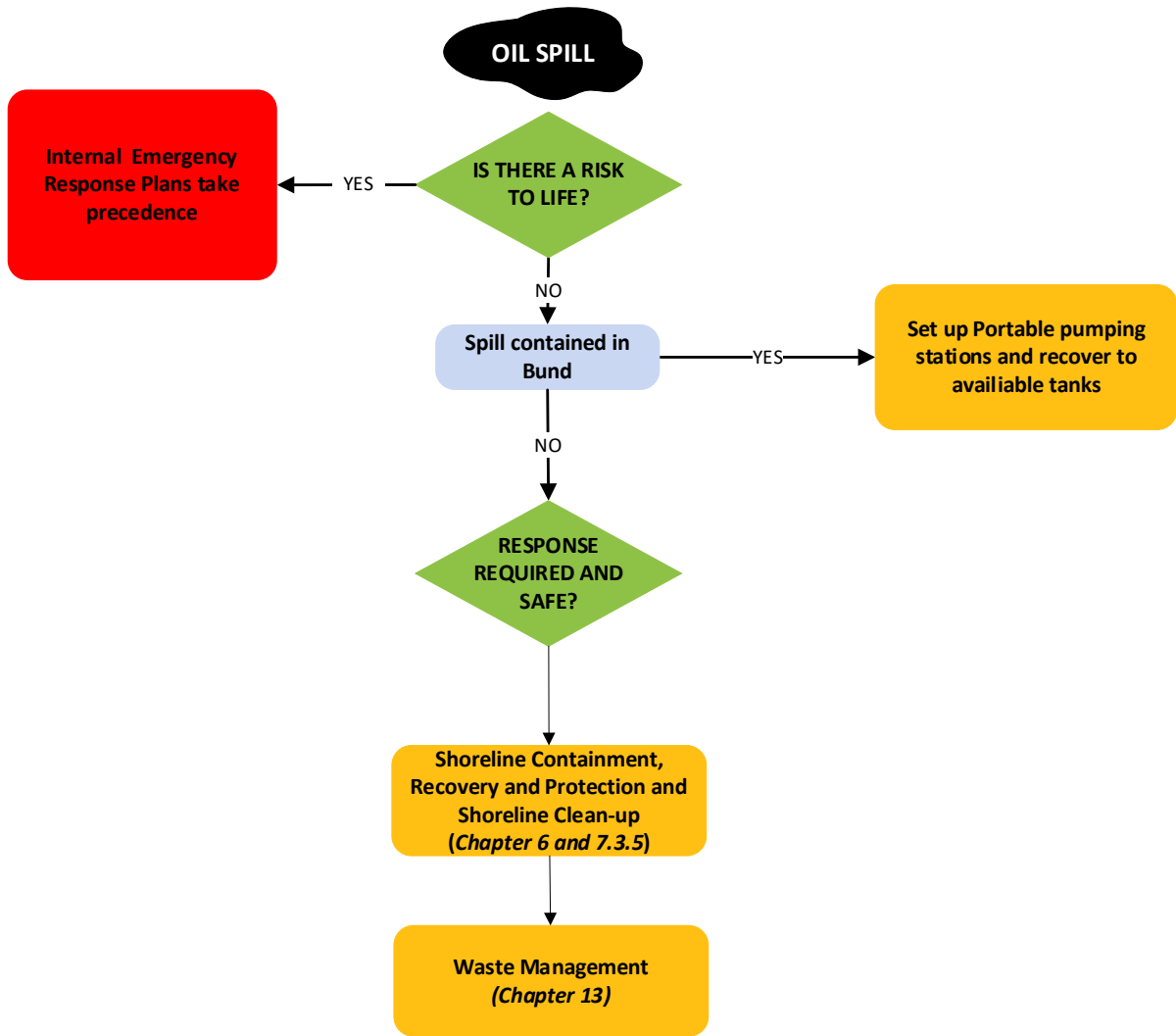


Figure 7.2 - Onshore Response Strategy Selection

7.3 Response Strategies

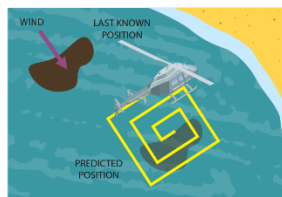
7.3.1 Monitor and Evaluate

| Monitor and Evaluate | Operational Information for Bantry Bay Terminal | | |
|---|---|--|--|
| Response Objective | Minimum of two assessments (depending on size of spill) carried out early morning and late afternoon to locate, monitor and inform an effective oil spill response. | | |
| Response Considerations | Flying authorisation, air clearances, government support and aerial infrastructure / logistics. | | |
| Safety Awareness | Emergency ditching of aircraft | Exposure to Volatile Organic Compounds (VOCs) and potentially also Hydrogen Sulphide (H ₂ S) from the oil being recovered | Rotating machinery (propellers/ helicopter blades) |
| | Slips, trips and falls | Acute airsickness | Noise (85-90dBA) |
| Response Efficiency | Aerial surveillance results dependent on flying conditions and visibility. | | |
| Resources | Trained observers are available through OSRL, aircraft to be sourced in country | | |
| Logistics | Specific support | Response implementation | |
| | Trained observers | Suitable aircraft, refuelling | |
| Supporting Information and Tools | Spill Trajectory Aide (Page 21) BAOAC Aide (Page 18) | | |

There are four key missions that aerial support can be tasked with, these are listed below:

1. Verification of Oil Spill

Using predicted locations estimated from manual or computer calculated trajectories, aerial support can follow simple search paths (such as expanding square or ladder patterns) to ensure all oil is encountered and accounted for.



3. Monitor and Evaluate

Aircraft can be used as a surveillance tool to monitor the location of the spill and current condition, then evaluate whether the spill appears to be naturally dispersing, or if further response is necessary.



2. Quantification of Amount of Oil Spilled

To calculate the amount of oil spilled, the aircraft will need to fly both the width and length of the slick.

1. Calculate the length and width (m):

$$\frac{\text{TIME TAKEN TO FLY (seconds)} \times \text{SPEED (knots)}}{3600 \text{ (seconds) OR } 60 \text{ (minutes)}}$$

$$\text{Divide answer by 1.85 to convert to kilometres.}$$

2. Calculate the area (km²):

$$\text{AREA (km}^2\text{)} = \text{LENGTH (km)} \times \text{WIDTH (km)}$$

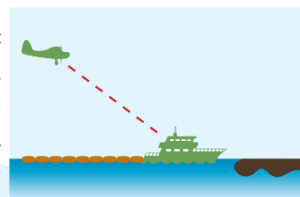
3. Calculate the volume (m³):

$$\text{OVERALL AREA (km}^2\text{)} \times \text{MINIMUM THICKNESS (microns)}$$

NOTE: If using the Bonn Agreement Colour Code then two values will be calculated to get a maximum and minimum value.

4. Supporting Operations

Aircraft may be tasked with surveillance of other aircraft and vessels conducting dispersant or recovery missions. The aircraft acts as a 'spotter' plane, identifying and directing other operational assets to the leading edge of the slick.



More information regarding aerial surveillance for oil spill operations can be found in the Aerial Surveillance Field Guide.

7.3.2 Assisted Natural Dispersion

| Assisted Natural Dispersion | Operational Information for Bantry Bay Terminal | | |
|---|---|--|--|
| Response Objective | Enhance the natural dispersion of non-persistent hydrocarbon within the marine environment. | | |
| Response Considerations | Vessel availability and secondary contamination. | | |
| Safety Awareness | Vessel operations | Exposure to Volatile Organic Compounds (VOCs) and potentially also Hydrogen Sulphide (H ₂ S) from the oil being recovered | Rotating and moving machinery (propellers/ Fifi systems) |
| Response Efficiency | Dependent on product type, sea state and weather conditions. | | |
| Resources | Vessels of opportunity, FiFi systems and external support. | | |
| Logistics | Specific support Trained vessel crews | Response implementation Suitable vessels | |
| Supporting Information and Tools | Spill Trajectory Aide (Page 21) Weathering processes (Chapter 7.4) Mass balance modelling (Annex 7 – Modelling Tools) | | |

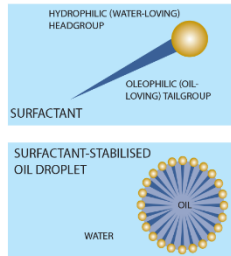
7.3.3 Dispersant Application

| Dispersant Application | Operational Information for Bantry Bay Terminal | | | | |
|--------------------------------|---|--|---------------------------------------|--|------------------|
| Response Objective | Reduce the amount of oil on the water surface and therefore reduce the amount of generated waste. Ensure effectiveness of dispersant is monitored and adjusted. | | | | |
| Response Considerations | Window of opportunity, application method (aerial/vessel), oil type and operating conditions, approval for operations, monitoring (visual and water sampling). | | | | |
| Safety Awareness | Manual handling | Man overboard / emergency crash landing | Unsecured load | Exposure to dispersant | Noise (85-90dBA) |
| | Slips, trips and falls | Exposure to Volatile Organic Compounds (VOCs) and potentially also Hydrogen Sulphide (H ₂ S) from the oil being recovered | | | |
| PPE requirements | Personal Floatation Devices (PFD) or lifejackets (dependent on proximity to water's edge) | Ear defenders (whilst machinery is running) | Oil resistant suit (Tyvex) and gloves | Sturdy footwear, hardhat, safety goggles, breathing apparatus. | |
| Resources | Annex 3 – Equipment and Resources for a full list of Tiered Equipment. | | | | |
| Range of use | Oil types <i>Most effective on Type 2/3 crudes.</i> | Metocean conditions | | Ireland Requires approval from the Regulators. | |
| | | Wind | 0-10kts (0-20km/hr) | | |
| | | Current | 0-0.5kts (0.25m/s) | | |

| | | | |
|------------------|--|---|------------------|
| | Weather | <i>Calm</i> | (See Chapter 9). |
| | Waves | <i>Calm, swells</i> | |
| Logistics | Specific support Fluorometry Dispersant testing | Response implementation • Suitable vessels/aircraft for dispersant spraying | |

1. Dispersants

Dispersants are substances that can be applied to a spill at sea in order to break the surface tension and allow the formation of microscopic oil droplets that are then 'dispersed' in the water column. By dispersing the oil, it becomes much easier for the natural process of biodegradation to take place by greatly increasing the surface area of the oil. The dispersant is a blend of two principal components; a surfactant and a solvent. The surfactant is the active ingredient comprising a hydrophilic head and hydrophobic tail; the solvent acts as the transport medium.



3. Applying Dispersants

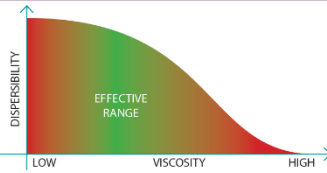
Dispersants can be applied in a number of ways depending on the operating conditions, availability of resources and size of the spill.

- ✓ A vessel or helicopter can target an oil spill with dispersant with more precision, however, a large aircraft can cover a greater area in a shorter period of time.
- ✓ Any dispersant operation must be directed at the thickest part (the leading edge) of the slick.
- ✓ When the spill has been located, a ladder or zigzag approach should be adopted dependent on the distribution of the oil on the surface of the sea.

! To confirm or support visual observations, fluorometry can be used to provide near real-time qualitative measurements, if the equipment and trained responders are available.

2. Dispersant Operations

To ensure dispersant is an effective response option, the oil, operating conditions and the logistics of the operation must be considered. Approval may need to be sought from the appropriate authorities. The viscosity of the oil often determines dispersant effectiveness (see graph) and there will be a window of opportunity where dispersant will be effective. The duration of this window will also vary according to ambient sea and air temperatures as well as weather conditions.



4. Dispersant Monitoring

To ensure that the dispersant application is effective, the slick should be monitored with visual observations as a minimum.

- ✓ If the application rate is effective, a grey or coffee coloured plume will be visible in the water.
- ✗ If the oil slick is underdosed with dispersant, no change will be obvious.
- ✗ If the oil slick is overdosed, or the dispersant is ineffective, cloudy white plumes will appear in the water.

A basic field test can also be used to confirm dispersant effectiveness. Using a two glass jar test, in the first jar, a sample of oil and sea water should be mixed with a sample of dispersant. The second jar should contain oil and sea water only, for comparison. Both jars should then be shaken, the oil, water and dispersant sample should form a cloudy mixture; if the water retains the cloudiness (> 1 hr) and there is less visible surface oiling, it is likely that the dispersant will be effective.

7.3.4 Offshore Containment and Recovery

| Offshore Containment And Recovery | | Operational Information for Bantry Bay Terminal | | | | |
|-----------------------------------|---|--|------------------|---------------|--------------------------|------------------|
| Response Objective | Contain oil in a boom configuration and recover oil with skimmers or pumps. | | | | | |
| Response Considerations | Suitable selection of equipment for the oil type and weather conditions. Well-maintained boom. Deployed by trained operators. Suitable deployment/tow vessels. Effective communications. Available storage for recovered waste. | | | | | |
| Safety Awareness | Manual handling / oil contact | Exposure to Volatile Organic Compounds (VOCs) and potentially also Hydrogen Sulphide (H ₂ S) from the oil being recovered | | | Man overboard | |
| | Slips, trips and falls | Unsecured loads / cranes | Fire / collision | Tides / water | Hypothermia / heatstroke | Noise (85-90dBa) |
| Resources | Annex 3 – Equipment and Resources for a full list of Tiered Equipment. | | | | | |
| Supplementary Resources | The IRCG maintains oil spill equipment based in Castletownbere and Dublin. | | | | | |
| Logistics | Specific support | Response implementation • Suitable vessels for deployment operations | | | | |

| | | |
|---|---|------------------------------|
| | Aerial Surveillance support | • Suitable oil waste storage |
| Supporting Information and Tools | Communications Plan Vessel Tracking Automatic Identification System (AIS) on all vessels | |

The containment and recovery of an oil spill uses floating barriers (booms) to contain the oil in sufficiently concentrated quantities to enable recovery devices (skimmers) to remove the oil from the surface.

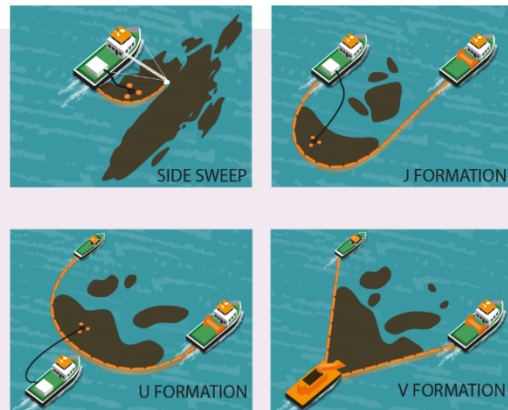
1. Identify Response Resources

Before deploying boom, the priorities of the response operation must be established such as choosing the correct boom type. Operating conditions must also be taken into account as wave height, swells and currents can cause the boom to fail. To deploy boom correctly, the following will be required:

| | |
|----------------------------|--|
| Deployment Vessel | Vessel will need adequate deck space and an open stern to load, secure and deploy the containment and recovery equipment. |
| Tow Vessel | Vessel will need a suitable means of securing the tow line in a safe manner. |
| Suitable Storage | Recovered oil will need to be stored in containers; there will need to be adequate space on board to store these containers. |
| Correct Boom Type | Certain booms are suitable in different environments. Booms may be joined together to increase length as necessary. |
| Recovery Device | The device deployed will be dependent on oil type and operating conditions. |
| Deployment Strategy | To ensure deployment is successful, a strategy must be agreed and communicated to all parties involved effectiveness |
| Spotter Aircraft | To improve operational effectiveness and ensure the system is in the thickest part of the oil. |

2. Choose An Appropriate Boom Configuration

Different boom configurations can be utilised dependent upon the resources that are available for the containment and recovery operations. Whilst more vessels will allow for a wider encounter rate, operations will be harder to coordinate and a wide boom encounter will make it difficult to position the recovery device for optimum oil and minimum water recovery.



7.3.5 Shoreline Protection and Response

| Shoreline Protection and Response | Operational Information for Bantry Bay Terminal, Ireland | | | |
|-----------------------------------|--|--|---|------------------|
| Response Objective | Protect sensitive areas from oiling, contain and recover oil on the water surface and shoreline | | | |
| Response Considerations | Selection of suitable recovery devices for oil type and weather conditions. Well-maintained boom deployed by trained operators. Effective communications. Pre cleaning sites and suitable storage available. Net Environmental Benefit Analysis (NEBA). Shoreline Clean-up Assessment Technique (SCAT). Identifying and prioritising sensitive shorelines. | | | |
| Safety Awareness | Manual handling | Exposure to Volatile Organic Compounds (VOCs) and potentially also Hydrogen Sulphide (H ₂ S) from the oil being recovered | Rotating machinery and hydraulic hose failure | |
| Safety Awareness | Slips, trips and falls | Tides | Hypothermia / heatstroke | Noise (85-90dBA) |
| Response Efficiency | Results are dependent upon prioritising resources and selecting the most appropriate booming strategy and recovery device for the environment. | | | |

| | | |
|---|---|--|
| Resources | Annex 3 – Equipment and Resources for a full list of Tiered Equipment. | |
| Supplementary Resources | The Irish Coastguard maintains oil spill equipment based in Castletownbere and Dublin. Cork CoCo Tier 1 and 2 response resources. | |
| Logistics | Specific support Volunteers Post spill monitoring | Response implementation <ul style="list-style-type: none"> • Suitable vessels for deployment of boom • Site set up of shoreline clean-up area; zones for oil clean-up operations, decontamination and rest/food areas • Suitable oil waste storage |
| Supporting Information and Tools | Chapter 6 Chapter 13 Annex 6 – Incident Command Forms | |

If oil is expected to impact sensitive areas, booms may be used as a barrier to protect the shoreline.

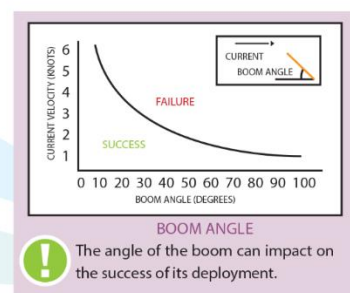
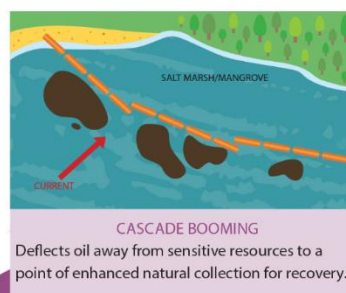
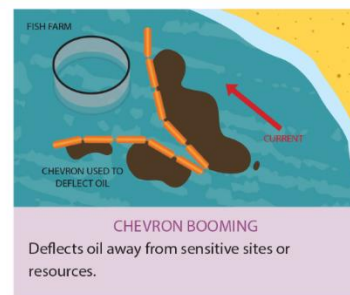
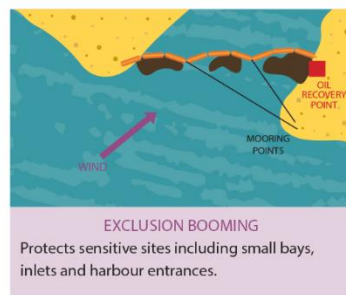
1. Prioritise Resources

Some shorelines can be considered more sensitive to oil than others due to their ecological, economic or cultural importance. These shorelines may be prioritised for protection. It is important to involve local stakeholders to prioritise sensitive areas for protection resources.

Identify the type of shoreline from the Environmental Sensitivity Index (ESI) / Source: NOAA

| ESI Values | Shoreline Type |
|------------|-------------------------------|
| 1 | Exposed Rocky Shore |
| 2 | Exposed Rocky Platform |
| 3 | Fine-grained Sand Beaches |
| 4 | Coarse-grained Sand Beaches |
| 5 | Mixed Sand and Gravel Beaches |
| 6a | Gravel Beaches |
| 6b | Riprap Structures |
| 7 | Exposed Tidal Flats |
| 8a | Sheltered Rocky Shores |
| 8b | Sheltered Man-made Structures |
| 9 | Sheltered Tidal Flats |
| 10a | Salt to Brackish Marshes |
| 10b | Freshwater Marshes |
| 10c | Swamps |
| 10d | Mangroves |

2. Deploy Appropriate Booming Strategy



7.4 Weathering Processes

When identifying a suitable response strategy and undertaking a Net Environmental Benefit Analysis it is important to understand the products fate and how they are likely to react in the environment over a period of time, Figure 7.3 and Table 7.1 provide a general insight to weathering processes of oil in the environment. These processes should be considered to anticipate the chemical and physical changes the oil will undergo in the marine environment.

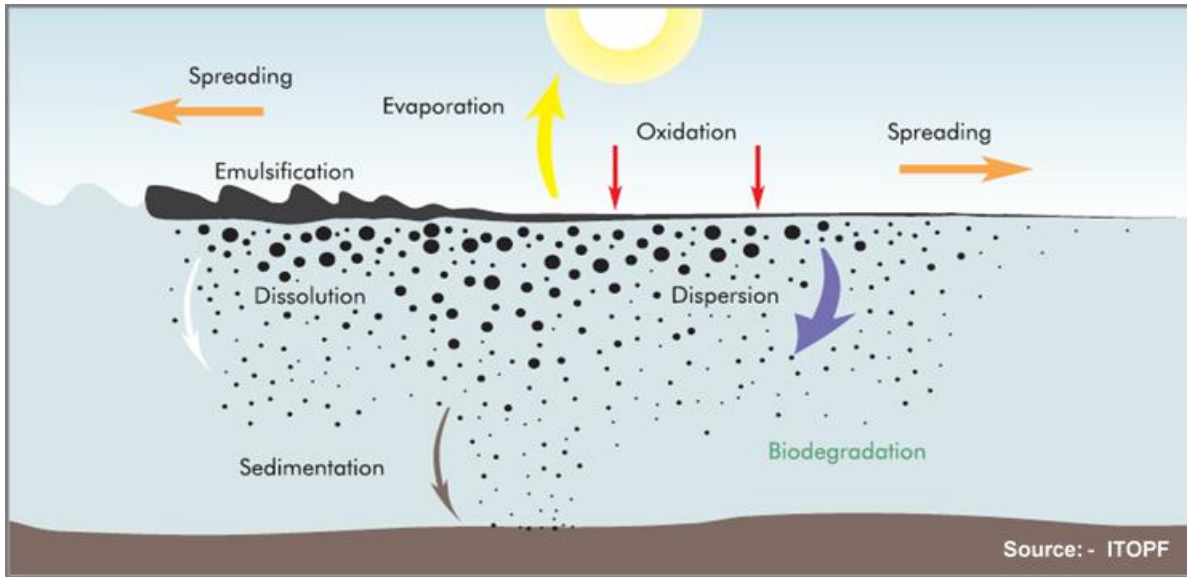


Figure 7.3 - Diagram displaying the different weathering processes oil may undergo in the marine environment.

Table 7.1 - High level description of key weathering processes oil undergoes in the marine environment.

| Process | Explanation |
|-----------------------|--|
| Spreading | As soon as oil is spilled, it immediately starts to spread over the sea surface. |
| Oxidation | Hydrocarbons react with oxygen which may either lead to the formation of soluble products or persistent tars. |
| Evaporation | The more volatile components (lighter ends) of a hydrocarbon are more susceptible to evaporate. |
| Emulsification | Many oils absorb water and form oil emulsions, increasing the volume of pollutant factor by up to five times. |
| Dissolution | The rate and extent to which oil dissolves depends upon its composition, spreading, the water temperature, turbulence and degree of dispersion. The lighter ends of the oil are more susceptible to dissolution. |
| Dispersion | The rate of dispersion is largely dependent upon the nature of the oil and the sea state, proceeding most rapidly with low viscosity oils in the presence of breaking waves. |
| Sedimentation | Dispersed oil droplets can interact with sediment particles and organic matter suspended in the water column so that the droplets become dense enough to sink slowly to the seabed. |
| Biodegradation | Sea water contains a range of marine micro-organisms capable of metabolising oil compounds. |

7.5 Net Environmental Benefit Analysis

Net Environmental Benefit Analysis (NEBA) can be used when formulating the choice of response strategies. NEBA is the processes of weighing the advantages and disadvantages of taking a response action, including recognising the likely outcomes if the action is not taken. The result will determine

whether the proposed response action(s) will have a likely net beneficial or detrimental outcome. Table 7.2 and

Table 7.3 below show the different factors and variables that can be considered when using the NEBA approach to a spill.

Table 7.2 - Net Environmental Benefit Analysis Factors

| Net Environmental Benefit Analysis Factors | | |
|--|---|---|
| Stage | Activity | Data |
| 1) Compile and Evaluate Data | Time should be taken to acquire high quality data from the potential collection points as it reduces speculation and assumption providing greater confidence in the NEBA selection process. Using all available data assess the current and potential impacts the oil spill may have on sensitive environmental and community receptors based upon environmental sensitivities and social values (Chapter 4.4) | <ol style="list-style-type: none"> 1) Property and volume of spilled product 2) Fate and Trajectory of spilt product 3) Environmental and Socioeconomic sensitivity 4) Response Options |
| 2) Predict Outcomes | Using the data obtained in stage 1 determine the potential outcomes and impacts of the incident if no response were to be undertaken by comparing previous spill cases, academic studies, including restoration considerations, and use subject matter expertise. Consider how different response options may change the overall impact of the spill to allow for the Stage 3 of the NEBA process to be undertaken. | <ul style="list-style-type: none"> - SDS Sheet - Environmental and Socioeconomic Sensitivities - Environmental Subject Matter Expert - Oil Spill Response Specialist |
| 3) Balance Trade offs | Weigh environmental and social impacts to determine most effective oil spill response tools and balance trade-off. | <ul style="list-style-type: none"> - Short term vs long term actions - Ease of clean-up - Waste generation - Environmental and Socio-economic sensitivities - Availability of resources and operational limitations and constraints. |
| 4) Select options | Using the data gained in Stage 3 select the optimum response strategy(s) which will provide net environmental benefit for the given incident and prevailing environmental conditions. Establish plans and put pre-approvals in place for the deployment of strategy. | <ul style="list-style-type: none"> - Response Options (Section 7.2) - Resources (- - - - - Annex 3 – Equipment and Resources) |

| Net Environmental Benefit Analysis Factors | | |
|--|----------|--|
| Stage | Activity | Data |
| | | <ul style="list-style-type: none"> - Mobilisation Procedures (Ops Section) - Incident Action Plan (Annex 6 – Incident Command Forms) |

Table 7.3 - Net Environmental Benefit Analysis Variables

| Net Environmental Benefit Analysis Variables | |
|--|-----------------------------------|
| Variable | Description |
| 1 | Proximity to Local Population |
| 2 | Presence of Sensitive Species |
| 3 | Presence of Sensitive Species |
| 4 | Impact on Regional Industries |
| 5 | Impact in Regional Infrastructure |
| 6 | Geographical Considerations |
| 7 | Seasonable Variables |
| 8 | Weather (Wind, Temperatures etc) |
| 9 | Wave Conditions |
| 10 | Oil Type, Viscosity and Thickness |
| 11 | Oil Depth, Movement and Volume |

7.6 Developing Endpoints

Ideally, clean-up efforts will return the marine environment to its baseline condition without suffering further impact or affecting other resources. However, this is not always the case and it is important to agree Clean-up Techniques and Endpoints early in the spill response process.

Endpoints are selected based on general clean-up objectives, which are to:

1. Minimise exposure hazards for human health;
2. Speed recovery of impacted areas if possible;
3. Reduce the threat of additional or prolonged natural resource impacts;
4. Return the shoreline to its original state; and,
5. Eliminate the threat to environmental and socio-economic receptors (Chapter 4.4).

8 HNS Response Guidance

The major difference between the response to Hazardous and Noxious Substances (HNS) as opposed to an oil spill is the difference in the specialism of personnel and resources required from the onset. The responsibility will initially reside with ZE, likely supported by Bantry Fire and Rescue Service until the scene is made safe and then handed over to a specialist contractor under ZE’s instruction. Throughout the response, the Incident Commander will continue to oversee the response, so it is vital they have a grounded understanding of the response process and steps to be taken during a HNS spill, as displayed in Figure 8.1.

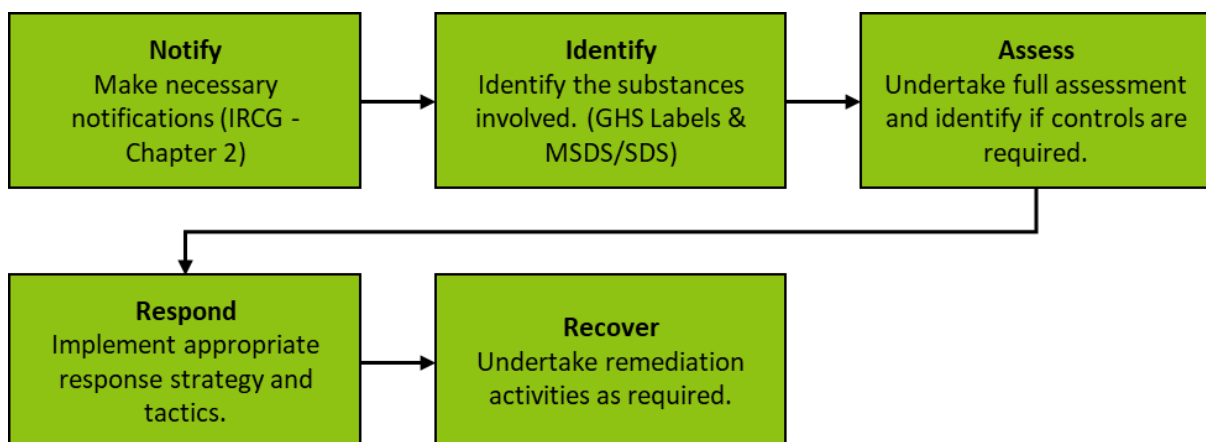


Figure 8.1 - Summary of the HNS response process.

Notify – Notifications should be made as per Phase 1 of the Operations Section.

Identify – It is critical to the management of the incident that the type of substance(s) is identified. The sections within this chapter provide detailed information on product identification and labelling. Full use should be made of any available data (MSDS/SDS) and manufactures guidance.

Assess – A full Health and Safety and Environmental Risk Assessment should be undertaken prior to commencing a response.

Respond – An appropriate response strategy should be implemented in line with the PEAR principles. Summary guidance on specific response strategies is given within this Chapter.

Recover – Once the initial response phase has ended, it will be necessary to assess the need for decontamination and remediation of any contaminated land and material.

8.1 HNS Identification

A HNS is classified by its ability to cause harm to human health and the environment. The classification process involves the identification and evaluation of hazard information (physical properties, human health and environmental effects), and communication of those hazards via a label and within a safety data sheet.

8.1.1 Safety Data Sheets

In accordance with the REACH (Regulation (EC) No. 1907/2006), a safety data sheet (SDS) should be supplied with any hazardous chemical. Safety data sheets (SDSs) provide useful information on chemicals, describing the hazards the chemical presents and provides information on handling, storage and emergency measures in case of an accident. A SDS ensures that information on physical hazards and toxicity from chemicals is available to enhance the protection of human health and the environment during the handling, transport and use of these chemicals.

A SDS contains the following 16 headings:

- **Section 1** contains contact details of the person/company responsible for supplying the chemical, the uses of the chemical, as well as the telephone number to contact in case of an emergency.
- **Section 2** gives details on the hazards of the chemical and the potential effects and symptoms resulting from use. This will help in the assessment of the risks to health, the health of workers and the environment. All hazardous substances and mixtures must be classified and labelled according to the CLP Regulation. Therefore, pictograms, the signal word, hazard and precautionary statements must appear in this section. The information in this section must be consistent with the information on the label.

- **Section 3** provides information on the identity, hazards and concentration of individual substances in a mixture. In the case of an SDS for a substance, this section provides the identity of the substance.
- **Section 4** describes the necessary first aid measures to be taken in case of an accident.
- **Section 5** gives specific information on fighting a fire caused by the chemical, including the most suitable extinguishing media and protective equipment.
- **Section 6** describes what actions need to be taken if there is an accidental release of the chemical.
- **Section 7** contains details on how to handle and store the chemical safely.
- **Section 8** gives details of the steps needed to reduce exposure, for example ventilation and personal protective equipment (PPE) necessary to protect health, as well as Occupational Exposure Limit (OEL) values where required.
- **Sections 9, 11 and 12** provide detailed information on the physical/chemical, toxicological and ecological properties of the chemical.
- **Section 10** contains details of any hazardous reactions that may occur if the chemical is used under certain conditions.
- **Section 13** explains how the chemical should be disposed of correctly.
- **Section 14** contains information relating to the transportation of the chemical.
- **Section 15** contains details on relevant EU/national legislation.
- **Section 16** gives any other information relevant to the chemical for example training advice or full text of hazard statements.

In addition, SDSs for substances or for mixtures containing substances that have been registered under REACH are required to include:

- Registration numbers where appropriate; and,
- Exposure Scenarios including any risk management measures required, in an Annex to the SDS for hazardous substances registered at >10 tonnes/year.

8.1.2 Classification and Labelling

8.1.2.1 United Nations' Globally Harmonised System (GHS)

The European Union's Classification, Labelling and Packaging Regulations adopt the United Nations' Globally Harmonised System (GHS) on the classification and labelling of chemicals. GHS provides a basis for communicating information on hazards in a uniform way, overcoming differing labelling information requirements for the same chemicals around the world.

When responding to a HNS incident, ZE personnel should follow the initial incident evaluation and assessment procedures in Phase 1 of the Operations Section to assist in the identification of the HNS and its associated hazards in accordance with the GHS in Table 8.1.

8.1.2.2 International Maritime Dangerous Goods Code (IMDG Code)






Additional labelling may be present on products transported by vessel under the IMDG Code (International Maritime Dangerous Goods Code). The IMDG code contains regulations for transporting dangerous goods and marine pollutants by sea which applies to all ships, including ships of less than 500 gross tons, carrying goods in packaged form. IMDG Code provides a set of rules covering consignment and transport issues such as classification, identification, packing, marking and

labelling, documentation, security and training. Dangerous goods are allocated to one of nine hazard ‘classes’ according to the main danger they present in the IMDG Code, as outline in Table 8.2.

Each of these classes has a distinctive label and other information referring to individual substances and the hazards that they may present.

All substances, materials and articles which appear in the Dangerous Goods List of the IMDG Code are also listed, in alphabetical order, in the index of the Code, which gives the product’s hazard class and UN number. Substances identified as marine pollutants are indicated as such in the index.

Table 8.1 - GHS Hazards and Associated Labels

| Hazard | Process/Description | Labelling |
|-----------------------|---|---|
| Flammability | Flammability is the ease with which a material ignites either naturally or through the presence of an ignition source. The flammability of a liquid is governed by its vapour pressure or flash point. Flammable liquids are characterised by low boiling point and low flash points. |  |
| Explosive | An explosive substance is a chemical or mixture of chemicals that becomes unstable under certain environmental conditions for example by heat, friction, impact or static electricity, and releases its stored energy. |  |
| Oxidising | An oxidising hazard may be presented by substances that in themselves are not combustible, however providing oxygen may cause or contribute to the combustion of other material. Nitric acid can react violently with organic material. |  |
| Acute Toxicity | Toxic chemicals include those that cause death or injury to live organisms if inhaled, ingested or absorbed through the skin at low levels. Toxicity is often expressed as acute and chronic exposure limits. Which are available in Safety Data Sheets. |  |
| Corrosive | A corrosive chemical can destroy or irreversibly damage another surface or substance that it comes into contact with including living tissues and response equipment. |  |

| Hazard | Process/Description | Labelling |
|----------------------------------|--|-----------|
| Gases Under Pressure | Several different hazards are associated with the “Gases Under Pressure” classification, with the common primary hazard being high pressure contained in the cylinder. Gases in high-pressure cylinders contain an extraordinary amount of stored energy. If a cylinder valve is breached, the stored energy in the cylinder is released as thrust. | |
| Systematic Health Hazards | May cause serious and prolonged health effects on short or long-term exposure. Do not swallow the material, allow it to come into contact with skin or breathe it in. | |
| General Warning Hazard / | The exclamation mark is used to denote a range of hazards such as: <ul style="list-style-type: none"> • Irritant of the skin or eyes; • Skin sensitizer, which is an allergic response following skin contact; • Acute toxicity—which may be fatal or cause organ damage from a single short-term exposure; • Narcotic effects like drowsiness, lack of coordination, and dizziness; and, • Respiratory tract irritation. | |
| Environmental Hazard | Chemicals that may present an immediate or delayed danger to one or more components of the environment and care should be exercised over their disposal. | |

More information on IMDG Code can be found through the relevant [IMO Publications](#)

Table 8.2 - Packaged Goods Classification (IMDG Code)

| Group | Description |
|----------------|--|
| Group 1 | Explosives |
| Class 1.1 | Substances and articles which have a mass explosion hazard |
| Class 1.2 | Substances and articles which have a projection hazard but not a mass explosion hazard |
| Class 1.3 | Substances and articles which have a fire hazard and either a minor blast hazard or both but not a mass explosion hazard |
| Class 1.4 | Substances and articles which present no significant hazard |
| Class 1.5 | Very insensitive substances which have a mass explosion hazard |
| Class 1.6 | Extremely insensitive articles which do not have a mass explosion hazard |
| Group 2 | Gases |
| Class 2.1 | Flammable gases |
| Class 2.2 | Non-flammable, non-toxic gases |

| Group | Description |
|----------------|---|
| Class 2.3 | Toxic gases |
| Group 3 | Flammable liquids |
| Group 4 | Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases |
| Class 4.1 | Flammable solids, self-reactive substances and desensitized explosives |
| Class 4.2 | Substances liable to spontaneous combustion |
| Class 4.3 | Substances which, in contact with water, emit flammable gases |
| Group 5 | Oxidising substances and organic peroxides |
| Class 5.1 | Oxidizing substances |
| Class 5.2 | Organic peroxides |
| Group 6 | Toxic and infectious substances |
| Class 6.1 | Toxic substances |
| Class 6.2 | Infectious substances |
| Group 7 | Radioactive material |
| Group 8 | Corrosive substances |
| Group 9 | Miscellaneous dangerous substances and articles |

8.2 HNS Assessment (Fate and Effects)

Similar to hydrocarbons, it is important to understand how chemicals react in the marine environment to ensure the best response strategies are selected. The fate of a chemical in the marine environment is determined by the key properties of volatility, solubility and density which in turn determine the hazard(s) presented by the chemical (toxicity, flammability, reactivity, explosivity, corrosivity etc.).

The Standard European Behaviour Classification System categorises chemicals into 12 groups based on their dominant behaviour in water, as shown in Table 8.3 and Figure 8.2 respectively. These behaviours will ultimately inform the overarching strategy and level of response required to mitigate against the spill the products associated hazards.

Table 8.3 - Standard European Behaviour Classifications for Chemicals

| Property Group | | Properties |
|----------------|------------------------------|-----------------------------|
| G | gas | evaporate immediately |
| GD | gas/dissolver | evaporate immediately |
| E | evaporator | float, evaporate rapidly |
| ED | evaporator/dissolver | evaporate rapidly, dissolve |
| FE | floater/evaporator | float, evaporate |
| FED | floater/evaporator/dissolver | float, evaporate, dissolve |
| F | floater | float |
| FD | floater/dissolver | float, dissolve |

| | | |
|----|----------------------|-----------------------------|
| DE | dissolver/evaporator | dissolve rapidly, evaporate |
| D | dissolver | dissolve rapidly |
| SD | sinker/dissolver | sink, dissolve |
| S | sinker | sink |

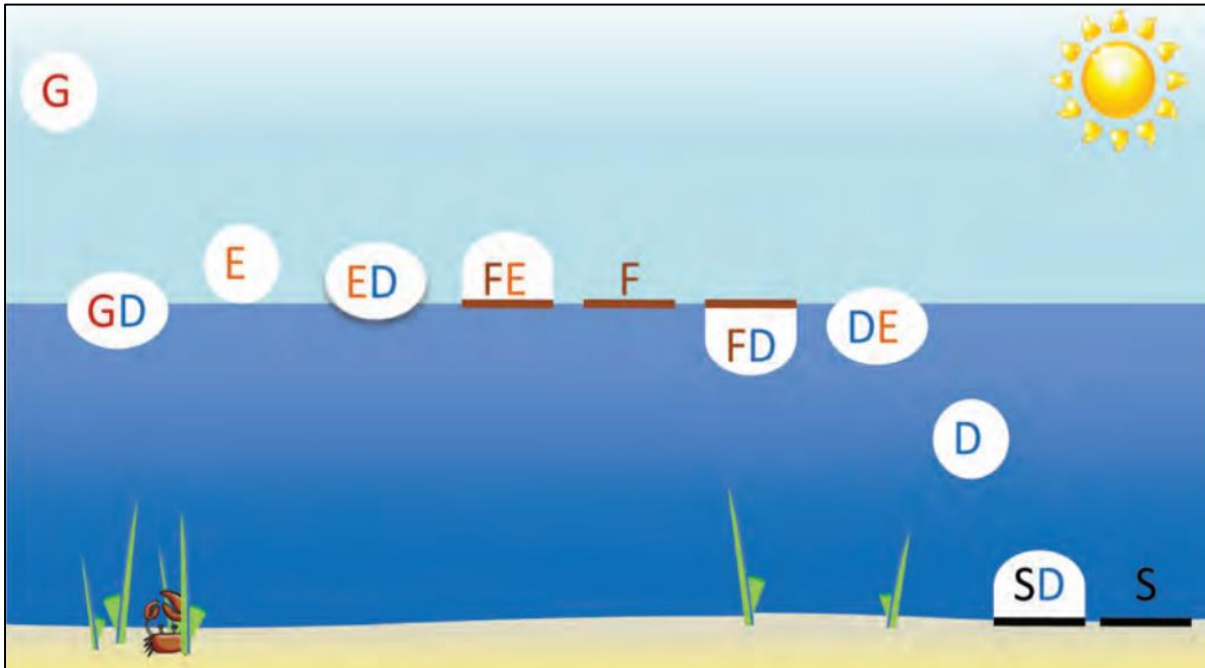


Figure 8.2 - Visual Representation of The Standard European Behaviour Classification for Chemicals

The assessment and trajectory calculations of certain HNS can be assisted by the information contained within the Operations Section and specialist modelling may be requested through a contractor.

8.3 HNS Response Options

ZE will enact an overarching safety response strategy to any HNS incident, as captured in Figure 8.3.

Once safe, any loose HNS material or leaking drums/containers will be dealt with by the contracted HNS Tier 2 Contractor to ZE. Prior to attempting containing, recovering, diluting or dispersing any HNS material, the Contractor’s trained personnel will conduct appropriate risk assessments.

Undamaged (non-leaking) drums/containers will be dealt with by HNS-trained Dublin Fire Brigade personnel. The drum/container will be made safe as regards it being a risk to the public.

ZE are responsible for establishing an acceptable waste disposal route for the material. Secure temporary storage of the HNS material in a compound may be required whilst sampling and analysis of the material is conducted. The waste disposal plan and temporary storage arrangements will require EPA approval and close liaison between the Environmental Team and the EPA.

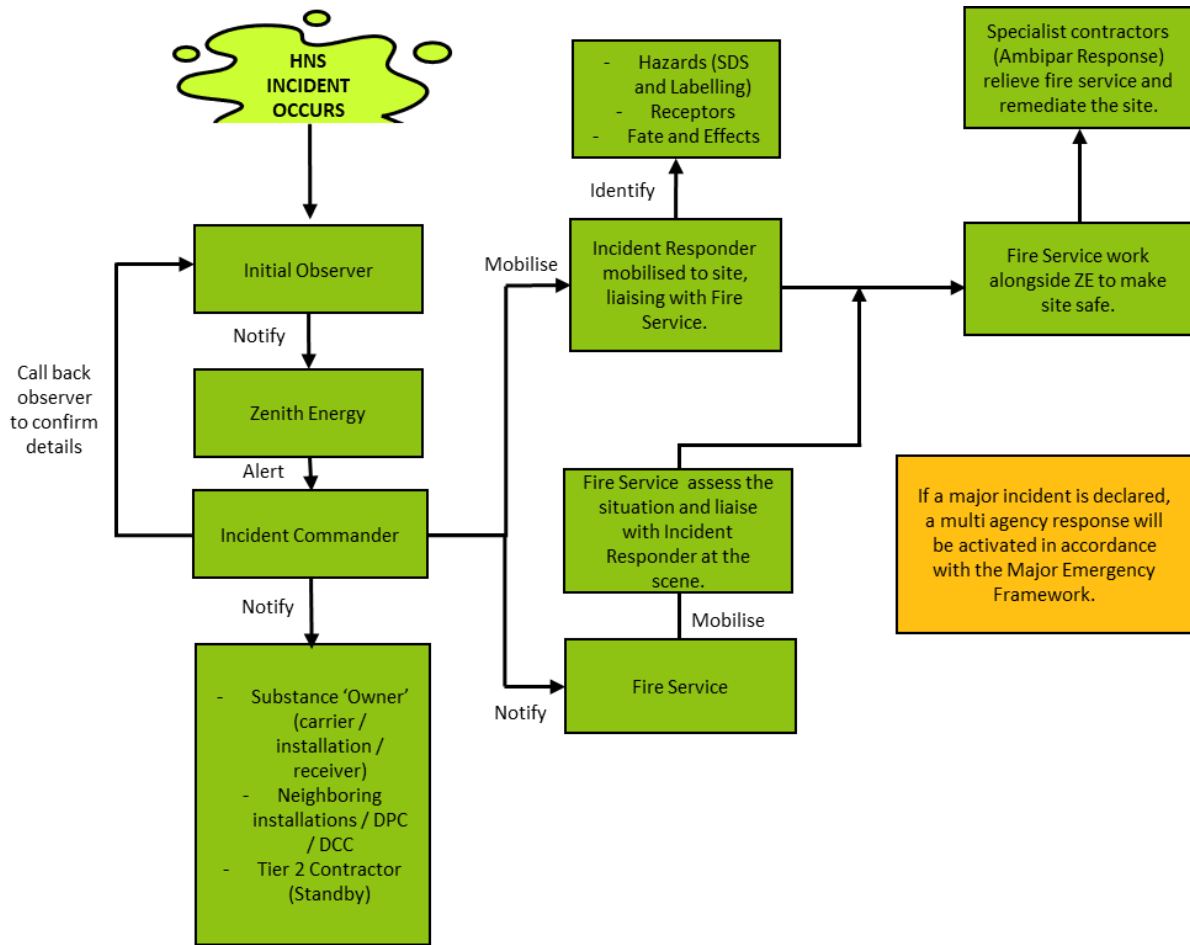


Figure 8.3 - ZE HNS Safety Response Actions

ZE will continue to oversee the response, irrespective of Tier 2 contractor or Fire Brigade involvement, as such, specific guidance on response options for various HNS is subsequently detailed within Chapters 8.3.1 to 8.3.4 to assist ZE personnel.

8.3.1 Gas & Evaporators

The release of a gas or chemical substance evaporating under the weather conditions prevailing at the time have the potential to generate large vapour clouds that might be toxic or form an explosive mixture with air. As a result, there may be potential health and safety implications for the vessel crew, responders, and population nearby.

When planning a response, it is important to ascertain how the gas or vapour might behave and the likely trajectory of any hazardous cloud. Relevant computer modelling of the spreading of airborne contaminants is likely to help to forecast the movement and fate of the plume as it disperses. Appropriate safety zones can then be put into place as necessary and the public advised as appropriate.

Issuing advice to the public to remain indoors for a short period should be considered by ZE. If the chemical is of a flammable nature, then all ignition sources must be eliminated. Techniques such as trying to “knock down” a water-soluble vapour cloud or trying to stop or deflect it using water sprays are other measures that may be available to responders. In such incidents occurring near populations, the emergency services are likely to have the commanding role in the response.

Responders must wear the appropriate Personal Protective Equipment (PPE) and response crafts must be adequately designed should they need to enter a hazardous atmosphere.

8.3.2 Chemicals that Dissolve

A dissolving chemical will form a growing 'plume' of decreasing concentration in the water as it dilutes. It is important to monitor the concentrations in the water to track the movement of the chemical and therefore to predict any hazard that may arise to the environment, fisheries, freshwater intakes or recreational areas. Relevant computer models can give useful indications on the likely fate of the substance.

The ability to contain and recover dissolved chemicals is extremely limited. Providing means to accelerate the natural processes of dispersion and dilution may be the only way to respond to such chemicals. Some dissolved chemical plumes may, in theory, be neutralised, oxidised, flocculated or reduced by the application of other chemicals. However, careful assessment of feasibility and expected efficiency in an open environment as well as approval of the relevant authorities is usually required before this response method is employed.

8.3.3 Chemicals that Float

Chemicals that float may spread under the effect of gravity to form a slick in a similar way to oil (depending on ambient temperatures, wind, and viscosity of the chemical). However, unlike oil they may not be visible on the water. Nevertheless, in some cases remote sensing techniques may be employed to detect and monitor floating materials.

Floating chemicals can be low or high viscosity liquids or may even be solid. If the spilt chemical has a high vapour pressure it may evaporate quickly and form a gas cloud above the slick. In such cases air quality monitoring is usually undertaken to assess fire, explosion and toxicity risks.

It may (subject to Risk Assessment) be possible to consider deploying booms to contain and control the movement of substances over the water surface. Skimmers and other oil spill response equipment may also be used to recover the material from the surface of the water. However, it is important to make sure, prior to use, that the spilt chemical will not react with the equipment. Responders may have firefighting or suppressant foams that can be applied to reduce the evaporation and the risk of fire/explosions.

8.3.4 Chemicals that Sink

Chemicals that sink have the potential to contaminate the seabed, and sometimes to persist in the sediment. The response to sunken chemicals may, therefore, need to consider the recovery of the chemical and any heavily contaminated sediment. Careful attention will also need to be paid to the removal and disposal of these contaminated sediments.

In shallow waters, mechanical dredgers and pump/vacuum devices may be used to recover sunken substances. The use of submersibles and remotely controlled underwater cameras may identify and recover chemicals on the seabed.

9 Dispersant Use

This Chapter has been prepared in accordance with IRCG SOP 03-2020 “Oil Spill Control Agents” and can be further supplemented by the SOP.

In the event of a spill, it is highly unlikely that chemical dispersants/spill control agents will be indicated as a response strategy by ZE due to the proximity of their operations to shorelines at Whiddy Island and the wider Bantry Bay. A NEBA has shown there is minimal environmental benefit gained by the application of dispersant within their operational area under a very limited window of opportunity.

However, the following information is supplied as a contingency in case of a multi-agency response and involvement of ZE in any strategic decision-making process.

Dispersants/spill control agents are chemical agents that help break up an oil slick into very small droplets, which dilute throughout the water column. While this does not remove the spilled material, smaller oil particles are more susceptible to weathering and biodegradation, thus accelerating their removal from the marine environment. They are applied through specialist sprayers, equipped to either marine vessels or aircraft.

The application of dispersants/spill control agents can therefore be an effective response strategy to large volume offshore spills when used appropriately. Their application can form a critical element in preventing significant oiling of sensitive shoreline habitats during an oil spill response and their availability provides an extra measure of protection for sensitive habitats threatened by a slick.

Chemical dispersant may not be used without the authorisation of the Irish Coast Guard unless there is potential to protect human life, for example by reducing risk of fire at or near on stricken vessel or offshore unit.

9.1 Authorisation

The decision to use approved oil spill control agents will be made on a case-by-case basis, authorised by the IRCG only. The use of dispersants in shallow waters, bays, harbours, and inlets is unlikely to be authorised except in exceptional circumstances. In deeper offshore waters away from the coastal zone, there are limited or no concerns about the dilution potential for dispersed oil and IRCG will make decisions on whether dispersant use may be authorised.

The oil must be of suitable viscosity for the dispersants to be effective. Dispersants may work on certain crude oils and some medium or heavier fuel oil. Those oils amenable to dispersion may become less so as their properties change due to the weathering process. Therefore, if there is an opportunity to apply dispersant successfully, the window may be limited from hours to a few days depending on the oil and prevailing environmental conditions.

However, when dispersant is:

- In shallow waters (depth <30m);
- Within one mile from or inside the base lines; or
- Within one nautical mile of charted banks.

The following bodies will be consulted by the IRCG to assist with decision-making and the consideration of net environmental benefit concerning the dispersed oils impact:

- Department of Agriculture, Fisheries and the Marine;
- Department of Communications, Climate Action and Environment;
- Sea Fisheries Protection Authority;
- Department of Housing, Planning and Local Government;
- National Parks and Wildlife Service;
- Relevant local authorities; and,
- Relevant harbour authorities.

9.2 Application

Dispersant can be sprayed onto oil from; vessels, helicopters and fixed-wing aircraft of various sizes. The aim is to accurately deposit the dispersant on the spilled oil as evenly as possible and achieve the recommended dispersant dosage rate. Albeit sea state and prevailing weather conditions can severely alter the accuracy of a spraying system. Additionally, dispersant injection can also be used to control sub-sea releases allowing for controlled rates of application, with an efficient encounter rate, compared to surface application. Sub-surface application also has a wider window of operability in relation to sea state and can operate in poor visibility⁸.

9.3 Monitoring Effectiveness

Visual observation of dispersant effectiveness is relatively simple to conduct but requires good viewing conditions. Successful use of dispersant will cause the spilled oil to be transferred into the water column as a light brown (café au lait) coloured cloud, or plume. Whereas a milky white plume

will be present if the dispersant has missed the oil or has run off very viscous or highly emulsified oil⁸ field sampling and test kits as captured in Chapter 12.1 can also be used prior to commencement of full application.

10 Occupational Safety and Health

Protecting human life and ensuring the safety of responders are the fundamental objectives in any pollution response operation and are at the forefront of ZE's response principles and BBT HSSE Policy. The safety of all responders should be at the forefront of all other considerations during an oil or HNS spill. This is administered through the adherence to safe working procedures and practices, designed to reduce health and safety risks to the personnel, response workers, the surrounding community and the environment.

The fundamental health and safety procedures outlined in this Chapter are designed to reinforce training and procedures common to a range of spill response operations. All national Occupational Health and Safety regulations continue to apply to any pollution response events and these regulations are in no way superseded by the information within this Chapter. It should be noted that all personnel involved in pollution response activities under the direction of ZE BBT's Incident Commander and their team, will be deemed as 'employees' and therefore are within the remit of all such regulations.

All response works are to be carried out in accordance with ZE's HSSE Policy.

⁸ IRCG SOP 03-2020 "Oil Spill Control Agents"

10.1 Overarching Health and Safety Strategy

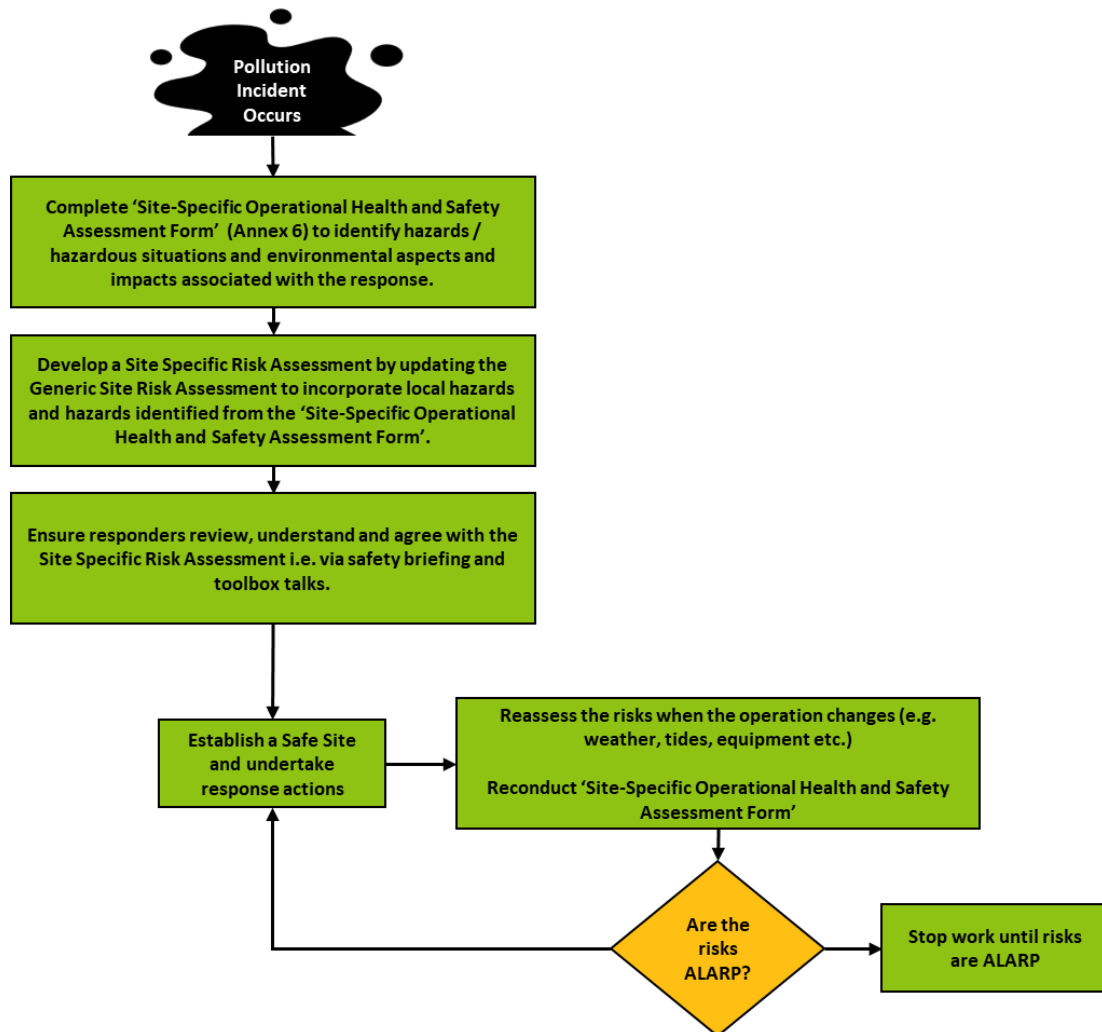


Figure 10.1 - ZEBBT Strategy for Developing Risk Assessments During a Response

10.2 Hazard Identification and Mitigation

Systematic and dynamic hazard identification and risk assessment will be carried out by members of ZE BBT’s IMT, evaluating the workplace by establishing a site-specific risk assessment and safety plan for each response operation. The development of these plans can be assisted through a ‘Site-Specific Operational Health and Safety Assessment Form’ (Annex 6 – Incident Command Forms).

The Site-Specific Operational Health and Safety Assessment Form facilitates a thorough survey of the on-site conditions, operations, equipment, facilities, access, and egress routes, allowing for the identification of any associated hazards. From here, further mitigation measures can be implemented and communicated via a Safety Brief (Annex 6 – Incident Command Forms) from the On-Scene Commander.

Table 10.1 provides an overview of some of the common hazards presented throughout a spill response and the mitigation measures to reduce the risk. These are likely to be identified and captured within the relevant risk assessments and safety plans throughout the duration of a response.

Table 10.1 - Common Spill Response Hazard Descriptors and Mitigation Measures

| Hazard | Description | Mitigation Measures |
|-------------------------------|--|---|
| Weather | In the case of heat, work performance declines especially where the task requires coordination, alertness or vigilance. In cold wet conditions reduces comfort and increases distractions. | Correct clothing for the weather conditions, and supply appropriate welfare, warm drinks in wet cold conditions, and cold drinks in warmer humid conditions. |
| Toxicity | Hazardous Substances will often contain potentially harmful components. Toxic components can enter the body through inhalation, absorption and ingestion. | Ample supply of coveralls, gloves, boots and respirators. Brief responders on health and Safety measures and decontamination procedures. SDS should also be checked before carrying out response. |
| Flammability / Fumes | Whilst a spill is fresh, care must be taken to exclude any potential sources of ignition as the volatile compounds evaporate. Volatile compounds may also be inhaled with potential to have detrimental effect on responder. Fumes of spilled hazardous materials can contain harmful compounds. The Fumes can also displace oxygen especially in confined spaces which can cause asphyxiation, the gas may not be sensed by any responders. | Gas detection monitors, gas monitoring schedule and log undertaken by trained personnel. Respirators given to responders until gas detection levels are deemed safe. Care must be taken to monitor harmful gas concentrations in the air. |
| Slips, Trips and Falls | Spilt chemicals, along with firewater can be slippery. Shoreline areas and vessels where responses are carried out can also be very slippery areas. | A hazard identification and site safety briefing should be undertaken before an oil spill response commences. Which potential hazards fenced off and appropriate PPE supplied, life jackets, boots, climbing harnesses if required. |
| Manual Handling | Responding to a spill incident can be manually intensive requiring responders to lift waste and response equipment. Continuous and improper lifting of overweight items can lead to exhaust and injury. | Gloves should be worn during lifting; loads should be assessed depending on weight, number of lifts posture, distance to be lifted and features of the load. |
| Open Water | Offshore and shoreline response operations will have open water concerns. Not preparing responders can result in loss of life in extreme cases. | For offshore response, personal lifejackets should be worn at all times, for shoreline they should be worn within 10m of the water, tide times should be noted. |

ZE adopt the ‘Hierarchy of Controls’ throughout their operations and look to eliminate hazards and reduce risk to strive for Zero Health, Safety, Security and Environmental infractions, as stated within their BBT HSE Policy.

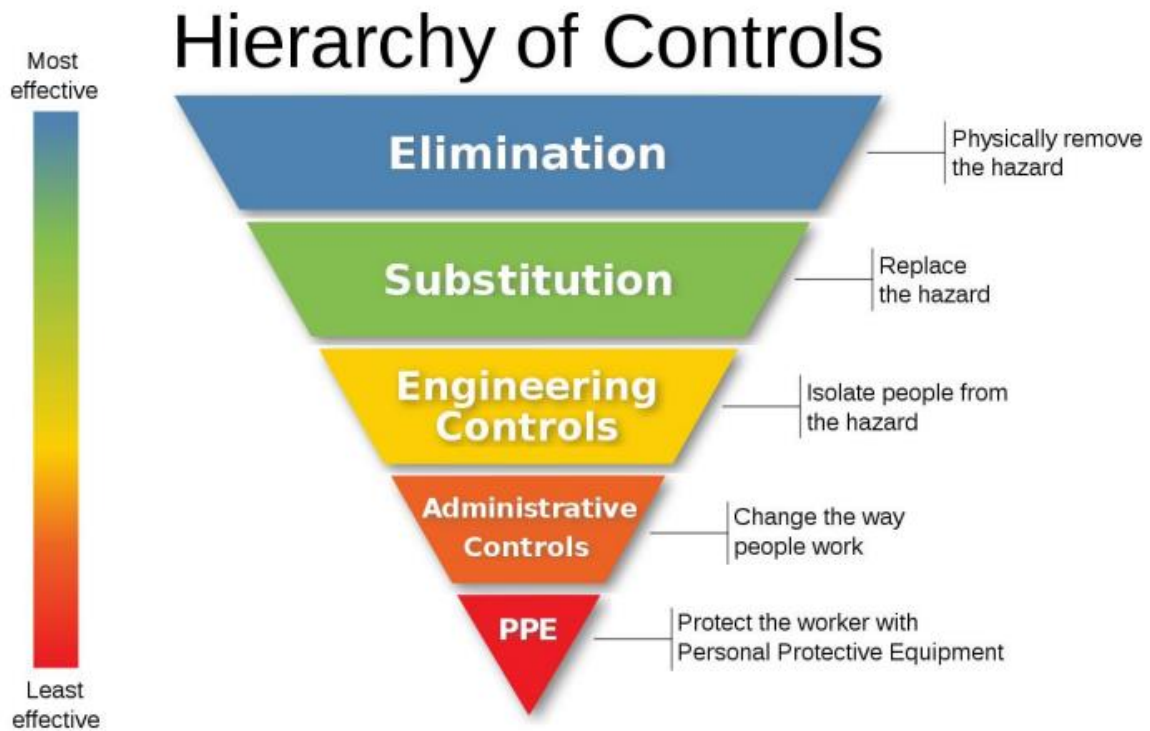


Figure 10.2 – ZE BBT's Hierarchy of Controls

10.3 Safe-Site Setup and Facilities

When undertaking a response, operational sites should be set up in a safe manner where hot (red) zones and cold (green) zones are clearly identified and joined by a decontamination (orange) zone to reduce levels of contamination on personnel, PPE, equipment and transport.

Figure 10.3 provides an example of how a 'safe site' should be laid out and the order of tasks (T1 -T7) that should be carried out to ensure it is set up safely at all sites (on a quay wall, shoreline or the deck of a vessel). Decontamination zones should take personnel and equipment from the 'hot' contaminated zone through a 'warm' cleaning/decontamination zone to the 'cold' exit point from the operations area. Movement through these zones should be coordinated to reduce cross contamination.

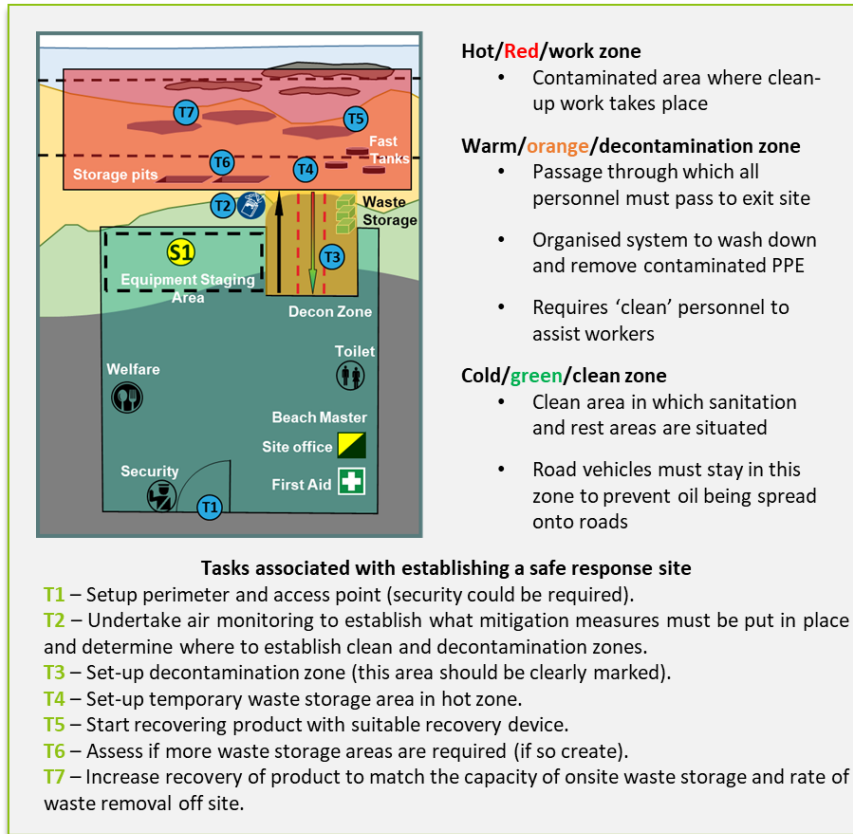


Figure 10.3 - Safe Site Set-up

11 Wildlife Rescue and Rehabilitation

This Chapter provides a brief overview of wildlife response considerations and actions, ensuring ZE BBT's IMT and response personnel are familiar with wildlife response procedures.

When planning a response, consideration should be made towards wildlife response activities and the wildlife response team should be liaised with throughout. Responders should be provided a dedicated number to notify the wildlife response team of any observed wildlife and the recovery of wildlife should be undertaken by trained personnel only.

Wildlife response activities should only be undertaken under the guidance and instruction of trained professionals.

There are a variety of wildlife species present which would be placed at risk and made vulnerable if a spill incident were to occur as a result of ZE BBT's operations. Notably, birds would be extremely susceptible due to the risks presented to their plumage and potential ingestion. Some birds would be less vulnerable on land, but more vulnerable at sea/water when rafting. Please see Chapter 4.4 for specific environmental sensitivities.

ZE BBT do not have any trained oiled wildlife response personnel and thus require additional support and resources via OSRL.

Through OSRL, BBT has access to an external international wildlife response capability. Sea Alarm has extensive experience in dealing with oiled wildlife emergencies. Specialised wildlife response equipment is pre-packaged, custom approved and stockpiled at OSRL. This equipment can be mobilised by the OSRL Duty Manager on request by BBT. The mobilisation of Tier 3 wildlife emergency teams is not guaranteed and will depend on availability and voluntary commitment. This equipment is available 365 days a year on a 24-hour basis, as part of the SLA.

Experts from outside of OSRL and Sea Alarm are required to operate the equipment.

11.1 Wildlife Response Options

The primary response objective of any incident is to contain the spill at the source(s), thus preventing the spread of contaminants in the environment and reducing the risk of impacting socio-economic and environmental receptors, wildlife included.

However, for instances when this is not achievable, potentially due to the scale or complicating factors of the incident, further secondary and tertiary wildlife response options may be required, as detailed below:

- **Wildlife Reconnaissance** - evaluating the wildlife that has become involved in the incident or is at risk of becoming involved (Chapter 4.4), this should be undertaken throughout the response and undertaken by wildlife specialists in conjunction with the contents of this O/HNSSCP;
- **Primary Response** - maintaining the spill away from the wildlife. This can be achieved through utilising the response strategies detailed within Chapter 7. Additional resources may be required from ZE's Tier 2 response contractor or the IRCG to control or deflect the spill away from wildlife habitats and populations;
- **Secondary Response** - maintaining the wildlife away from the spill. This includes hazing and deterrence methods (scaring animals away from oil) and the pre-emptive capture and collection of un-oiled animals and their offspring or eggs;

- **Tertiary response** - rescuing, and rehabilitating wildlife exposed to the spill. A summary of this process is captured in Figure 11.1; and,
- **Documentation** - maintaining detailed records and transparency in all information, decisions and activities involved in the wildlife response.

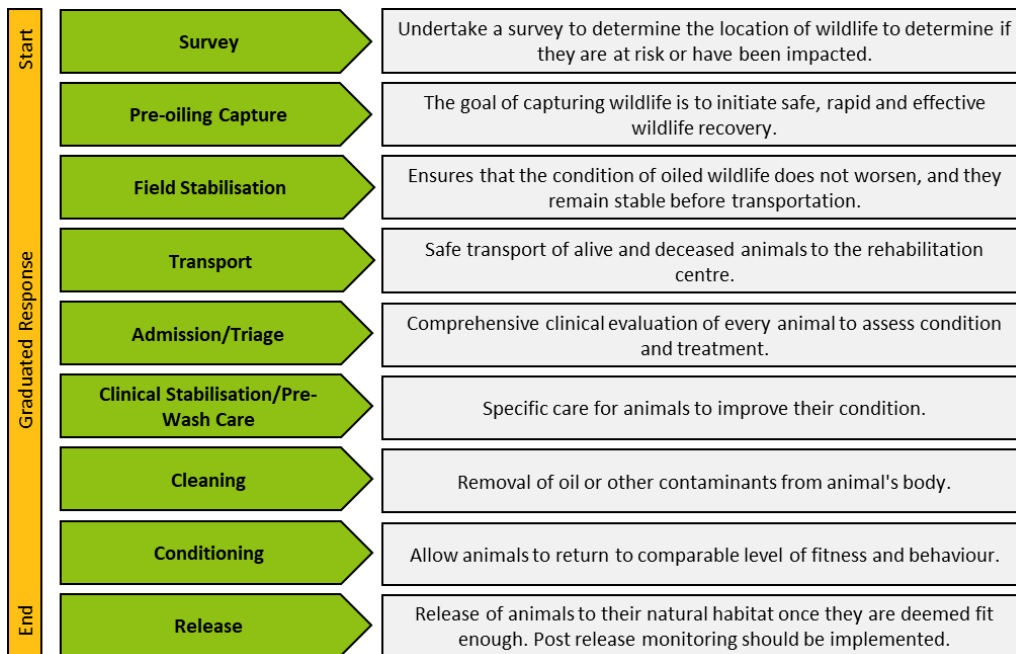


Figure 11.1 – Summary of the Tertiary/Contaminated Wildlife Response Process

11.2 Wildlife Response Strategy

An overview of ZE’s wildlife response strategy and key considerations during the rescue and rehabilitation of oiled wildlife is captured within Figure 11.2.

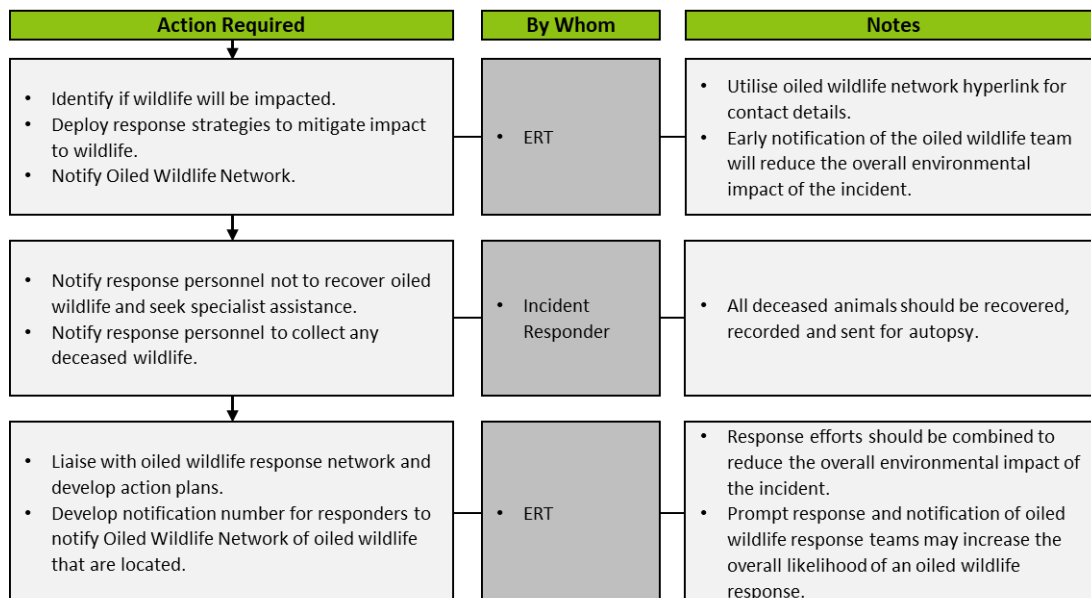


Figure 11.2 – ZE’s Overall Wildlife Response Strategy

12 Evidence Collection and Cost Recovery

This chapter details guidance on evidence collection, spill sampling requirements and procedures in relation to benefiting incident investigation and cost recovery.

Information collected and data generated during a spill response is integral to adequately evidencing any potential cost recovery or litigation processes.

Throughout a response ZE BBT personnel should capture all relevant information within the various incident management forms and response tools supplied within this O/HNSSCP. These should be stored for evidential purposes in accordance with the processes detailed within Chapter 17.

12.1 Spill Sampling Guidance

It is important to take samples from a spill to determine whether a relationship exists between the product and suspected source samples. Where there is no initially confirmed source, independent chemical laboratory investigations can be of great help in identifying possible sources, and with whom the liability of the release resides. Nonetheless, even when it is clear where the spill originates from, these samples help act as a reference and can be used for further tests to determine the properties and weathering capabilities of the pollutant or the effectiveness of dispersant for example (See Chapter 9.3).

Sampling in relation to liability investigations must be performed with great care and under a strict chain of custody control until identification and possible legal procedures have been completed. They must be handled and stored so that the samples cannot be manipulated or contaminated by other substances. Detailed guidance on this process is captured within Table 12.1.

Table 12.1 - Spill Sampling Guidance

| Oil Spill Sampling | |
|---|---|
| Oil sampling is a fundamental step in spill assessment and will influence the response strategy selection. Sampling of oil can be carried out by personnel on board the standby vessel. Samples of floating or stranded oil are taken for qualitative purposes to confirm the source of the oil. If the oil type is unknown, the oil must be tested and verified to help determine specific response details. Small quantities of oil (10 - 20 grams) are required for analysis and can be collected directly through sampling jars or sorbent pads. Samples should be taken from the bow of the vessel, avoiding sheen from the vessel hull and engine exhaust or cooling water systems. | |
| Description | Indication of Minimum Required Quantity (per sample) |
| Pure oil source sample | 30 - 50 millilitres |
| Contaminated oil (e.g. emulsified oil, oil from the sea or shore, sandy tar ball) | 10 - 20 grams |
| Debris with oil, stained sand | 10 milligrams |
| Oiled feather | 5 - 10 feathers depending on quantity of oil |
| Fish, shellfish (flesh and organs) | Multiple individuals of some species totalling 30 grams |
| Water sample with visible oil | 1 litres |
| Water sample with no visible oil | 3 - 5 litres |

| | | | | |
|---|--|------------|-----------|--------------------|
| Dispersant Effectiveness | The effectiveness of dispersant application can be sampled on-site using a simple 'jam jar' test. This is a basic dispersant effectiveness test. This can be carried out by personnel onboard the standby vessel, and all information reported to the pilot. | | | |
| | | | | |
| Tools Required | Water | Dispersant | Spilt oil | Pipette (optional) |
| 2 x clear glass containers with lids (plastic bottles not suitable) | | | | |
| Sample Handling, Storage and Labelling | <p>Maintain integrity of samples with proper handling, storage and labelling.</p> <p>Avoid contaminating samples when collecting oil in the field. Use appropriate containers to store the sample (Glass jars or bottles).</p> <p>Use clear labelling system for quick identification of the sample. Include detailed information of the location of the sample, how collected and by who should be recorded</p> | | | |
| Sample Analysis | <p>Samples should be transported using padded boxes or similar to avoid breakage, loss or degradation of samples.</p> <p>Laboratory testing can be used to identify the specific oil properties and test for dispersant effectiveness.</p> <p>The nearest laboratory to ZE BBT is Chemtest Ireland: Tel: 028 9061 2244</p> | | | |

12.2 Cost Recovery

Cost recovery aligns with both financial management protocols (Chapter 16) and documentation procedures (Chapter 17), these processes should be followed to ensure that ZE have documentation in place to support cost recovery claims. The 'polluter pays' principle means that ZE are likely to seek cost recovery for remediation from any incident affecting their site by a vessel owner and/or their insurer.

However, it is important to highlight that if a spill is the result of ZE's activities, it is likely that they will be the subject of cost recovery from stakeholders who have encountered adverse effects because of the spill; in this event ZE will have to claim associated remediation costs from their insurer and may potentially be required to supply their own evidence to defend their case.

Typical costs that may be incurred following a pollution could be related to:

- Cost of clean-up operations and preventative measures;
- Property damage;
- Economic losses from business; and,

- Cost to reinstate the environment.

The Finance Section of the IMT should document the costs incurred relating to the above. It is paramount that all response actions are proved to be technically justifiable to ensure costs for response actions undertaken are recovered.

Information pertaining to the claims and liability regime can be found in Chapter 16.3.

13 Waste Management

If waste material is produced as a result of a pollution incident, then ZE BBT has a duty of care to ensure the waste is handled, transported, managed (treatment/disposal) in an appropriate manner.

Oil and HNS spills have the potential to generate a substantial amount of waste. This includes not just the product, but polluted debris, shoreline sediment, fauna and flora, equipment and protective clothing (PPE). Should shoreline impact occur, waste can sometimes amount to as much as ten times the volume of product originally spilled.

Any hazardous waste storage and disposal routes must be agreed with the EPA.

Consequently, waste storage and disposal can cause major logistical problems and delays for the clean-up operation and even bring the response to a standstill unless adequate arrangements are in place. Crucially, disposal sites for hazardous waste are very limited in the Republic of Ireland and if a disposal route is not immediately available and approved, temporary storage will be required.

This Chapter should be used to assist ZE BBT in their responsibilities for determining appropriate waste treatment, storage and disposal routes during a spill response.

13.1 Waste Hierarchy

The overall approach when dealing with waste from a pollution incident is to follow the waste hierarchy as outlined in Figure 13.1. This should be referred to at all stages of a response.



Figure 13.1 - Waste Hierarchy

Wherever possible, spilled substances should be recovered for re-use and recycling. However, if this is not possible as any shoreline clean-up operation is likely to result in amounts of contaminated

waste far in excess of the original volume beached on the shoreline, sustainable methods for treatment/disposal should be applied.

13.2 Types of Waste

At the start of an incident, it helps to have a realistic estimate of how much waste there is likely to be and what it is likely to comprise of.




Typically, an HNS spill will generate less waste than an oil spill, however this is relative to the type of substance spilt, the quantity and concentration. Instinctively some products are subject to ‘quick clean ups’, which usually coincides with how hazardous the product is, the approach to be taken and how much product is spilt. It is also important to note that a gas spill from a chemical tank will create much less waste than a liquid oil spill for instance.

The clean-up process itself also generates waste, with used response materials, such as sorbents, PPE, waste bags and other material considerations, adding to the volume to be removed (Table 13.1). In the result of a large-scale spill, sediment samples may have to be taken, and remedial activities may have to be undertaken, these processes will in turn also heavily increase the waste generation.

The severity of contaminated soils in relation to hazardous waste storage and transportation is detailed within the [EPA’S National Hazardous Waste Management Plan \(2014 – 2020\)](#).

Different types of waste are often disposed of differently, so it helps to separate out the waste and keep it segregated from the outset. This is not always easy, but it saves time in the long run and makes it much easier to direct the waste towards the appropriate treatment or disposal method.

Table 13.1 - Types of Hazardous Waste Generated During a Spill

| Types of Hazardous Waste | | | |
|-------------------------------|---|---------------------------------|---|
| Liquid Pollutant |  | Contaminated Seaweed |  |
| Contaminated Sand |  | Contaminated Solid Waste |  |
| Contaminated Substrate |  | Container Debris |  |
| Spent Sorbent |  | Contaminated Fauna |  |

13.3 Waste Storage

The waste collected during clean-up operations often needs to be stored, initially close to site in temporary storage to allow time for the logistics to be put in place to transport and dispose of it. The general process for recovering and storing shoreline waste is shown in Figure 13.2.

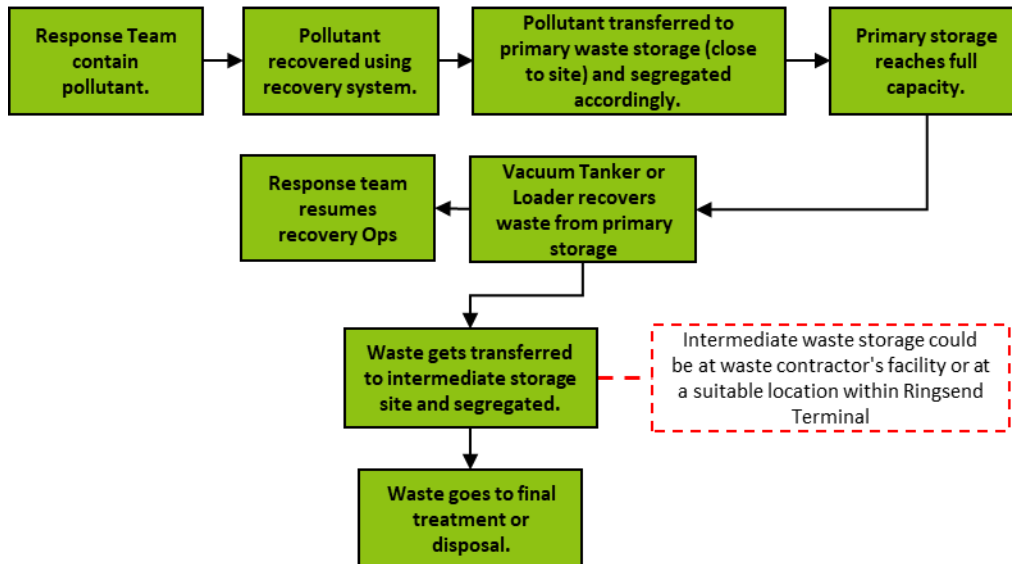


Figure 13.2 - Waste Management Strategy.

13.3.1 Primary Storage

If possible, the primary storage area needs to be lined with impermeable membrane to make sure there is no secondary contamination. It should also be separated from public access areas where possible. Typical types of primary waste storage are detailed in Table 13.2.

Table 13.2 - Types of Primary Waste Storage Utilised During a Spill Response

| Primary Waste Storage | |
|--------------------------------------|---|
| Storage Facility | Comments |
| Vacuum Tankers | Ideal for routing to final disposal site and well suited for operations close to shore especially when quays are available. Are used to recover oil from primary storage vessels, dracones, barges, pillow tanks, direct from skimmer etc. |
| Intermediate Bulk Storage Containers | Suitable for the storage of liquid waste. Require a forklift to relocate when full. |
| Bunds / Large Waste Storage Areas | Can be created from scaffold, and impermeable membrane. Good as intermediate storage area. Due to the large surface area can collect a lot of rainwater. |
| Specialist Response Equipment | Purpose built, specialist storage units such as fastanks can be quickly erected and are designed to hold oiled products. They can utilise purpose-built covers and attachments to prevent rainwater and secondary contamination during filling. |

| Primary Waste Storage | |
|-------------------------|--|
| Storage Facility | Comments |
| Skips | Versatile, robust and cheap. Can be transported on supply boats/landing craft to remote sites. If possible, line with plastic. Good for solid waste and highly viscosity products. |
| Open Top Oil Drums | Difficult to handle when full. |
| Heavy Duty Plastic Bags | Ideally suited when clearing beaches by hand. Can be moved above the high-water line. Lead to problems at the disposal site. Can store high volumes of oiled PPE and other contaminated solid waste. |

13.3.2 Waste Segregation

Asides from lining any storage facilities, where possible, waste should be segregated based on its type and characteristics. This ensures that any opportunities within the waste hierarchy to reuse, recycle or recover the waste remain viable (Chapter 13.4). An example storage site setup can be seen in Figure 13.3.

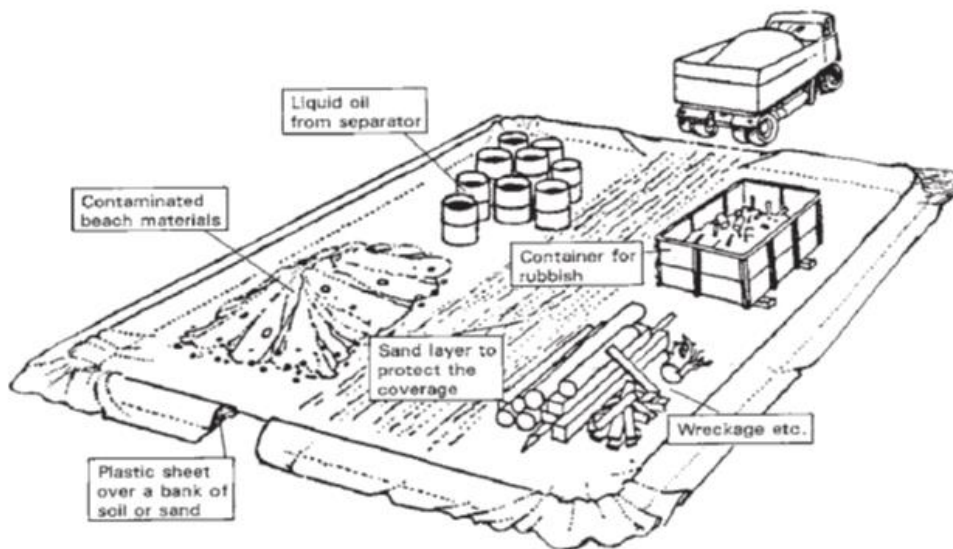


Figure 13.3 - Example Waste Segregation Layout (IMO, Manual on Oil Pollution, Section IV: Combating Oil Spills)

13.3.3 Intermediate Storage

During a large spill response, the amount of material collected may be greater than the local treatment, storage or disposal sites processing capacity. In these cases, larger temporary storage facilities need to be identified, or erected. Figure 13.4 shows the logistics for planning an intermediate storage system for a significant spill event.

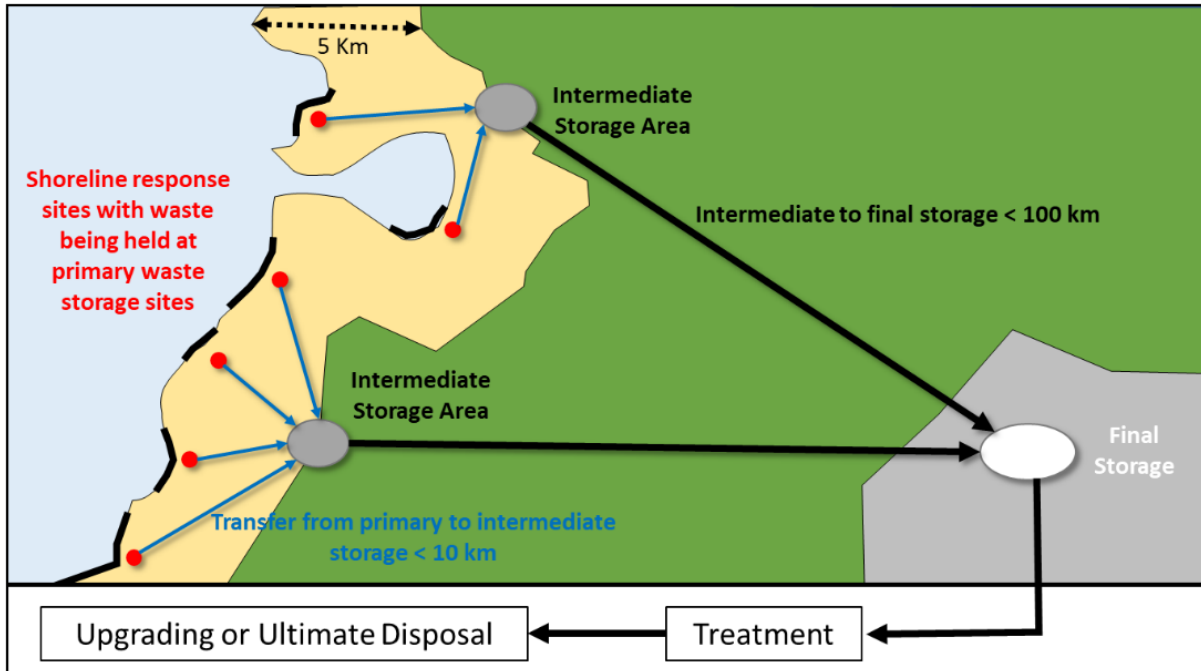


Figure 13.4 - Waste Management System Incorporating Intermediate Storage Sites.

At the immediate storage areas large liquid storage areas can be created from impermeable membrane and metal scaffolding frames, or alternatively be designated areas containing a vast number of temporary waste holding options such as, fastanks, Intermediate Bulk Containers (IBC's), skips, 205l drums etc. could be stored there until removed to the final destination.

13.3.4 Preidentified Immediate Waste Holding Areas

Liquid waste may be recovered using Tank 101 and the API separator on site.

All temporary waste storage sites must be developed in close liaison with the Local Authority and the Environmental Protection Agency. Temporary waste storage sites can be established in the tank banded areas, where there is both space and access. Further, there are two small concrete bunds that can be utilised at Tank 101, Tank 403 and also the Barrel Bay. Liner will be available in stores for all temporary bunding arrangements. The terminal also has access to large drip trays which should be utilised to prevent secondary contamination from the oil. Ensure all waste storage is covered to prevent rainfall adding water to the stored waste.

The Hose Handling Building has been identified as a suitable area for both equipment and vessel decontamination. This has been proposed due to the slip way, covered area, and proximity to Tank 101. All oiled water runoff in the decontamination process must be collected and disposed of in line with hazardous waste. Therefore, bunds must be set up within this area. Furthermore, this area is close to the support facilities that will be required.

13.4 Waste Processing and Disposal

The final method chosen for the processing or disposal of hazardous waste generated during a spill event and response depends on several factors:

- The nature and consistency of the waste;
- The volume of waste collected;
- The availability of suitable sites and facilities; and,
- Any cost or regulatory restrictions.

Dependent on the above, the department of environment may offer approval on the following final destinations:

Recovery to Oil Processing Installations - reprocessing is the preferred option. Generally, only pure oil and oil/water mixtures will be accepted.

Landfill - this is the primary disposal method but can only be used where there is little or no ground water abstraction. Future regulations are likely to be more restrictive.

Stabilisation - this is an expensive method but is likely to be used increasingly as landfill becomes further restricted. Development work is in progress using silage mounds.

Land Farming - this can only make a limited contribution to oil spill disposal and is becoming less acceptable. However, it may be suitable for small quantities of oily waste such as contaminated seaweed.

Combustion - uncontrolled combustion is unsatisfactory because of air pollution. Commercial waste incinerators can dispose of limited quantities of oily waste.

13.5 European Waste Codes

Waste needs to be handled in accordance with local regulations. ‘Waste Transfer Notices’ are required with all waste materials for disposal. In preparation for the transport and disposal of hazardous waste, the categories of wastes generated will need to be cross referenced to the guidance issued by the [EPA on the European Waste Catalogue \(EWC\)](#). Table 13.3 summarises the categories of waste which may be produced during a spill response, together with the relevant EWC Codes. Those that have been highlighted, have been so to reflect the most likely waste identified by ZE’s Risk Assessment (Chapter 4).

Table 13.3 - Potential EWC Codes for Waste Transport and Disposal.

| EWC Code | Description |
|-----------|--|
| 05 01 | Wastes from petroleum refining |
| 05 01 05* | Oil Spills |
| 13 | Oil wastes and wastes of liquid fuels |
| 13 05 01* | Solids from grit chambers and oil/water separators |
| 13 05 06* | Oil from oil/water separators |
| 13 05 07* | Oily water from oil/water separators |
| 13 05 08* | Mixtures of wastes from grit chambers and oil/water separators |

| EWC Code | Description |
|------------------|---|
| 15 02 02* | Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances |
| 17 | Construction and demolition wastes (including excavated soil from contaminated sites) |
| 17 05 03* | Soil and stone containing hazardous substances |
| 19 | Wastes from waste management facilities, off-site wastewater treatment plants and the preparation of water intended for human consumption and water for industrial use. |
| 19 02 04* | Pre-mixed wastes composed of at least one hazardous waste |
| 19 02 07* | Oil and concentrates from separation |
| 19 02 08* | Liquid combustible wastes containing dangerous substances |
| 19 02 09* | Solid combustible wastes containing dangerous substances |

14 Place of Refuge

A place of refuge is ‘a place where a ship in need of assistance can take action to enable it to stabilise its condition and reduce the hazards to navigation, and to protect human life and the environment’⁹.

This Chapter is to assist ZE should BBT or the wider Bantry Bay be identified as suitable Place of Refuge for a distressed vessel.

The IRCG is the lead agency for decisions relating to a ship in need of assistance and thus requesting a place of refuge. As such, the IRCG is responsible for ensuring the IMO guidelines are considered and implemented to the extent possible. In accordance with the IMO guidelines, and Vessel Traffic Management Information System (VTMIS) EU Operational Guidelines¹⁰ the IRCG has developed a comprehensive Place of Refuge Decision-Making (PORDM) process, detailed in SOP 06-2020.

SOP 06-2020 should be consulted by ZE’s Incident Commander (or any other personnel), who could be identified as a potential ‘Ship Casualty Assessment Team Member’ under the guidance of ANNEX 2 within SOP 06-2020.

14.1 Place of Refuge Decision-Making Process

The PORDM applies to all situations where a ship is in need of assistance and requests a place of refuge within Irish waters. This includes Ireland’s internal waters, territorial sea and the Exclusive Economic Zone (EEZ). The PORDM also applies in the case where a ship is destined for Ireland and has reported a problem (a defect, deficiency, or a casualty). The PORDM does not apply to distress situations where the safety of life is involved. In such cases, established search and rescue procedures by the IRCG shall be followed.

⁹ IMO Res. A.949(23), Section 1.19.

¹⁰ [Vessel Traffic Management Information System \(VTMIS\) EU Operational Guidelines](#)

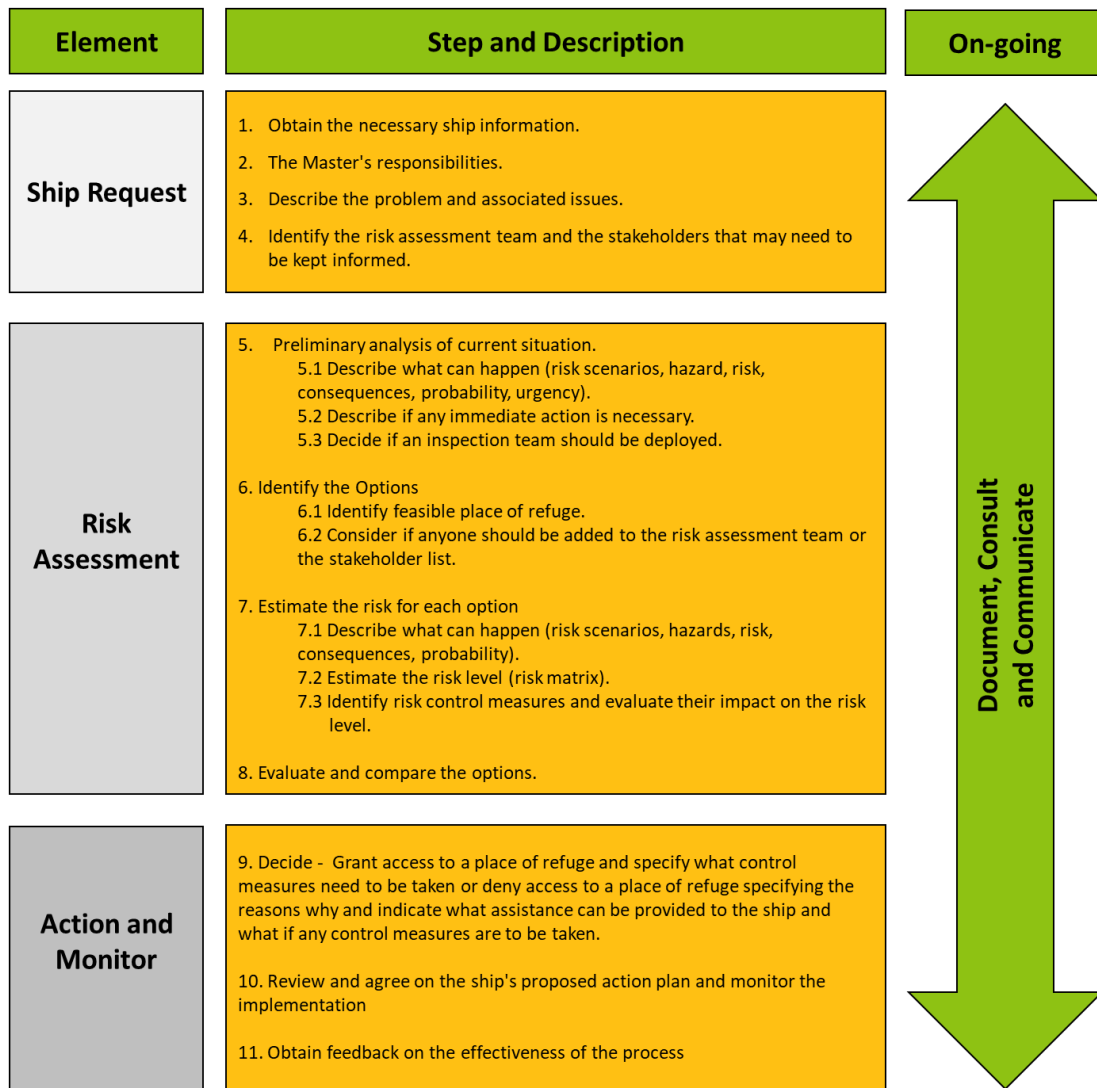


Figure 14.1 - Places of Refuge decision-making process (SOP 06-2020)

An overview of the PORDM process is displayed in Figure 14.1. This process will assist the IRCG and ship casualty assessment team in determining if access is to be allowed or not, facilitating effective and objective decision-making.

Each step of the PORDM process is captured in detail within Section 3 of SOP 06-2020.

Where access is granted, the most suitable place will be identified, and appropriate risk control measures implemented. Where the risk is considered too great and access to a place of refuge cannot be granted, then the nature and degree of assistance to the ship offshore will be decided upon, along with any operational recommendations¹¹

¹¹ IRCG SOP 06-2020

14.2 ZE Assistance

Where required, ZE will do their utmost to assist the IRCG throughout the PORDM process, facilitating multi-agency cooperation and decision making.

Notably, following consultation of SOP 06-2020, ZE will look to supply the following to assist:

- 1) **A copy of this Contingency Plan** – this plan details foreseeable accidental scenarios that might result from the granting of a place of refuge and details what measures might be taken to reduce the consequences. ZE will have this plan readily available to the ship casualty assessment team for consultation in an incident;
- 2) **Access to personnel and relevant contracted specialists** – certain members of ZE may be acquired as part of the ship casualty assessment team; and,
- 3) **Relevant jurisdictional information** - nautical charts and publications, environmental and sensitivity data (captured within this plan).

15 Stakeholder Engagement and Media Protocols

In the event of a significant oil or HNS spill, it will be inevitable that members of the press and media will attempt to gather details from witnesses, persons involved, Zenith BBT employees, persons acting on behalf of Zenith and members of the emergency services on the basis that they will probably have at least some knowledge of the incident.

It is important that the media do not interpret information incorrectly, so personnel must not make any other comment other than to refer these persons to the Terminal Director or External PR Team, [AM O'Sullivan](#). Personnel must report any conduct or conversations with the media to the Terminal Director as soon as possible after the event.

Under normal circumstances personnel from AM O'Sullivan will deal with enquiries from the Press, Television and Radio. This will leave the Incident Commander to manage the incident itself.

The supplementary guidance in Chapters 15.1 and Error! Reference source not found. can be provided to the designated AM O'Sullivan representative to assist in engaging with

The person dealing with the Press and Media must maintain a separate Incident Log.

No member of staff or any contractor my discuss incidents with anyone other than their own management team.

It is Zenith's policy that only comments and information regarding an emergency incident prepared by AM O'Sullivan should be given to the Press and Media via a designated spokesperson, therefore employees, contractors & visitors who are approached following an incident by the Press and/or Media should be polite but say nothing more than:

'I am unable to comment but a prepared statement will be released'.

Restrict access of Press or Media to the incident scene where possible and ensure that they do not interfere with the emergency services emergency arrangements

Members of the public, Press or Media must be escorted to AM O'Sullivan's appointed spokesperson, or shown to a pre-designated room to await further information.

It is important that the Media do not interpret information incorrectly, so personnel must not make any other comment other than to refer these persons to AM O'Sullivan's media representative.

Personnel must report any conduct or conversations with the Media to the Terminal Director or AM O'Sullivan representative as soon as possible after the event.

Telephone calls to the Press and Media will only be made by AM O'Sullivan's appointed spokesperson.

[AM O'Sullivan \(PR and Strategic Communications\)](#)

T: +353 (0)21 466 3076

E: info@amosullivanpr.ie

15.1 Template Stakeholder Engagement Process

Effective stakeholder engagement is accomplished through the planning and implementation of a program that leverages local knowledge, relationships and networks. The 5-step stakeholder engagement model in Figure 15.1, subsequent sub-chapters and worksheet (Chapter 15.1.6) can be used to implement such a programme.

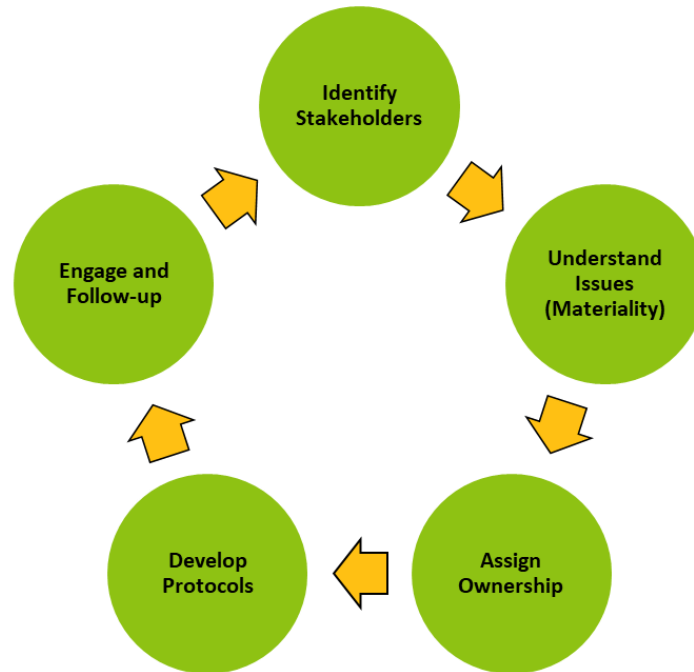


Figure 15.1 - Stakeholder Engagement Model

The stakeholder engagement guidance and processes within this Chapter have been adapted from [ARCOPOL – Community Engagement Guidance for Oil and HNS Incidents \(2013\)](#)

15.1.1 Identify Stakeholders

The foundation of the stakeholder engagement model is the early identification of stakeholders. Whilst some stakeholders will be easily identified and already known, others will not. Relevant stakeholders are those groups and individuals, or organisations that could be affected by the response.

It is important to recognise that proximity (to an event) is not sound basis for stakeholder identification. Some organisations that will become interested in a spill event may be based nationally, or even internationally, but will mobilise personnel in order to gain representation. Additionally, where possible a group or association representing stakeholders should be identified rather than dealing with multiple individual stakeholders with similar needs and or agendas.

The five following attributes can be used as a line of questioning when trying to identify potential stakeholders during a specific oil or HNS spill event:

- **Dependency** – those who are directly or indirectly dependent on ZE BBT or those whom ZE BBT is dependent upon for operation;
- **Responsibility** – those to whom ZE BBT has, or in the future may have, legal operational, commercial, or moral/ethical responsibilities;

- **Tension** – group or individuals who need immediate attention about financial, wider economic, social or environmental issues;
- **Influence** – those who can have an impact on strategic or operational decision making; and,
- **Diverse Perspectives** – those whose different views can lead to a new understanding of the situation and identification of unforeseen opportunities.

The allocation of these attributes forms step 1 of the stakeholder engagement model and worksheet in Figure 15.1 and Chapter 15.1.6 respectively.

15.1.2 Understand Issues (Materiality)

The next stage is to identify potential issues or concerns regarding the spill incident for each respective stakeholder. This can be done in isolation, but best-practice is to work collaboratively and in consultation with the identified stakeholders to identify and rank their concerns.

Stakeholders' concerns can be categorised into 12 main areas:

- **Health** – concerns for critical human wellbeing and condition;
- **Safety** – concerns for the safety of individuals or groups;
- **Environment** – concerns for environmental receptors;
- **Trust** – concerns regarding their trust in the organisation or response;
- **Information** – concerns regarding a lack of supply of clear information and data;
- **Economics** – concerns for the financial implications of the spill;
- **Legal** – concerns for the legal or litigious implications of the spill;
- **Process** - concerns regarding the handling or procedural pathway of the spill response;
- **Livestock / Pets** – concerns for their animals;
- **Compensation** – concerns for the supply of adequate compensation;
- **Land Access** – concerns over the use of their land or facilities for access; and
- **Other** – concerns other than those previously covered.

The identification and recording of these concerns form Step 2 of the stakeholder engagement model and worksheet in Figure 15.1 and Chapter 15.1.6 respectively.

15.1.3 Assign Ownership

Various members of ZE's IMT, Senior Management or AM O'Sullivan may have particular knowledge, skills, authority, resources and pre-existing relationships with the identified stakeholders that will make engagement more affective. These individuals should be clearly identified and assigned to each party respectively.

The identification and signalling of these individuals form Step 3 of the stakeholder engagement model and worksheet in Figure 15.1 and Chapter 15.1.6 respectively.

Whilst during a significant Tier 3 spill the IRCG will maintain overall ownership of the response process and subsequent stakeholder engagement, the identified individuals may make themselves known to assist as Liaison's in this process.

15.1.4 Develop Engagement Protocols

Following the early identification of stakeholders, potential issues and suitable liaison individuals, the next step is to define engagement protocols and the level of engagement for each relevant stakeholder. This can range from a passive (no engagement), to empowered (delegated decision-making). Table 15.1 details the various levels of stakeholder engagement and should be consulted when capturing the stakeholder engagement process during step 4 of the stakeholder engagement model and worksheet in Figure 15.1 and Chapter 15.1.6 respectively.

Table 15.1 - Levels of Stakeholder Engagement

| Level | Goal | Communication | Nature of Relationship | Engagement Approaches |
|--------------------|---|--|--|---|
| Passive | No goal. No engagement. | No active communication. | No relationship. | Stakeholder concern expressed via protest, letters, media etc. |
| Monitor | Monitor Stakeholder views. | One-way: stakeholder to company. | No relationship. | Media and internet tracking or second hand reports. |
| Inform | Inform or educate stakeholders. | One-way: company to stakeholder. | Short- or long-term relationship – “we will keep you informed”. | Bulletins, letters, reports and presentations. |
| Transact | Work together in a contractual relationship. | Limited two-way. Setting and monitoring performance according to terms of contract. | Relationship terms set by contractual agreement. | Public or Private partnerships' and Private Finance Initiatives. |
| Consult | Gain information and feedback from stakeholders to inform decisions made internally. | Limited two-way. Company asks questions and the stakeholders answer. | Short- or long-term involvement "We will keep you informed, listen to your concerns, consider your insights, and provide feedback on our decision." | Surveys, focus groups, assessments, meetings and workshops. |
| Involve | Work directly with stakeholders to ensure that their concerns are fully understood and considered in decision making. | Two-way. or multi-way between company and stakeholders. Learning takes place on both sides. Stakeholders and company act individually. | May be one-off or longer-term engagement. "We will work with you to ensure that your concerns are understood, to develop alternative proposals and to provide feedback about how stakeholders views influenced the decision making process". | Multi-stakeholder forums. Advisory panels. Consensus building processes. Participatory decision making processes. |
| Collaborate | Partner with or convene a network of stakeholders to develop mutually agreed solutions and joint plan of action. | Two-way, or multi-way between company/ies and stakeholders. Learning, negotiation, and decision making on both sides. Stakeholders work together to take action. | Long-term. "We will look to you for direct advice and participation in finding and implementing solutions to shared challenges." | Joint projects, voluntary two-party or multi-stakeholder Initiatives, Partnerships. |

| Level | Goal | Communication | Nature of Relationship | Engagement Approaches |
|----------------|--|--|---|--|
| Empower | Delegate decision- making on a particular issue to stakeholders. | New organisational forms of accountability: stakeholders have formal role in governance of an organisation or decisions are delegated out to stakeholders. | Long-term. "We will implement what you decide." | Integration of Stakeholders into Governance Structure. (e.g., as members, shareholders or on particular committees etc.) |

15.1.5 Engage and Follow-Up

As indicated in Figure 15.1, the engagement process with some if not all stakeholders, should be a continuous process that begins pre-incident and continues, in the event of a spill, after the response operations have been completed.

The level of engagement should be constantly reviewed to ensure it is appropriate in terms of content, level of authority and the representative agency/group. Noting a suitable point for follow-up forms step 5 of the stakeholder engagement worksheet in Chapter 15.1.6.

15.1.6 Stakeholder Engagement Worksheet

The following worksheet could be used to establish a stakeholder engagement process following the occurrence of an oil or HNS spill. The worksheet should be populated in consultation with Figure 15.1 and subsequent step specific information within Chapters 15.1.1 - 15.1.5.

| Stakeholder | 1. Identification Attributes | | | | 2. Concerns | | | | | | | | | | | 3. Ownership | 4. Engagement Protocols | | | | | | | 5. Engage and Follow-up | | | |
|--|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|------------|
| | Dependency | Responsibility | Tension | Influence | Diverse Perspectives | Health | Safety | Environment | Trust | Information | Economics | Legal | Process | Livestock / Pets | Compensation | Land Access | Other | Liaison (Initials) | Remain Passive | Monitor | Inform | Transact | Consult | Involve | Collaborate | Empower | Engagement |
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16 Financial Management Protocols

The Terminal Director has the financial authority for expenditure relating to routine operational and maintenance requirements during a response. Irrespective of the size of the incident and corresponding management structure, the IMT are to exercise strategic management of financial expenditure and ensure all units and personnel mobilised keep records of policy and financial decisions.

Under the IMT's full IMS structure, Financial Authority shall be sought from the Finance/Administration Unit within the IMT under the approval of the Terminal Director.

This Chapter should be read in conjunction with Chapter 12 and Chapter 17 due to the interconnectivity between their contents.

16.1 Procurement of Services & Payment of Contractors

The procurement of services during an incident will adhere to the standard ZE procurement protocols. Albeit, the Terminal Director has the authority to suspend the standard protocols to expedite services, equipment and supplies to mitigate against the consequences of an incident.

Should additional services be required which fall outside the financial authority or budget of the Terminal Director, emergency financial authority should be sought through the Crisis Management Team.

16.2 Financial Authorities & The Compilation of Claims

As stipulated above, the internal financial authority for ZE resides with the Terminal Director. Ultimately, any spill within ZE BBT's area of functional remit will fall upon their internal financial authority initially to release funds following any pollution incident.

Notably, if a spill occurs as a result of an external party and costs are incurred to ZE, funds will be recuperated as per the 'Polluter Pays' principle which defines the financial responsibility of an incident as the polluter (likely a vessel owner or operator), they will therefore assume financial control of the incident through their own internal financial management protocols and/or insurance.

Production of evidence through sampling (Chapter 12), and efficient documentation procedures (Chapter 17) ensure that any cost incurred by ZE can ultimately be recuperated through either mutual agreement with the polluter, or through legal action between the two parties.

16.3 Cost Recovery

Cost recovery will be of fundamental importance to any organisation affected by spill events. Initially, the cost of any clean-up operation will fall upon the bodies undertaking them.

Cost recovery can be considered at three levels:

- Larger spill events where owners have cover provided by P&I or IOPC claims,
- Small vessels/facilities with their own insurance, and,
- Vessels/facilities with no insurance.

It is likely in the case of larger spill events that there will be one of two insurers in attendance at the scene, representing the insurers of the parties thought likely of being responsible for the spill event. If they aren't the P&I Club the claim will be lodged against the IOPC Fund.

In general, the IOPC is for the large tier 3 tanker centred events and P&I represent the smaller vessels.

In dealing with any pollution incident, it is recommended that a review of the legislative basis to pursue incurred costs is undertaken, in order to identify the correct procedures that should be followed.

Legal advice and representation for ZE BBT should be sought from [Matheson](#)

+353 1 232 2000

dublin@matheson.com

16.3.1 1992 Civil Liability Convention – Claiming from Ship Owners

Ship owners are obligated to maintain insurance to cover their liability. Claims for compensation for oil pollution damage may be brought against the owner of the ship which caused the damage (or his insurer) under the 1992 Civil Liability Convention. Normally the insurer will be one of the Protection and Indemnity Associations (P&I Clubs) which insure the third- party liabilities of ship owners. The convention sets out liability limits based on ship sizes.

Those suffering oil pollution damage not fully compensated under the 1992 Civil Liability Convention may be compensated by the 1992 Fund described below.

16.3.2 IOPC Fund/1992 Fund

The 1992 Fund provides compensation for damage from oil pollution which occurs as a result of spills of persistent oil from tankers in States which are Members of the Organisation. It is a worldwide intergovernmental organisation.

Persistent oil includes crude oil, fuel oil, heavy diesel oil and lubricating oil. Spill damage caused by non-persistent oil (such as gasoline, light diesel oil and kerosene), is not compensated under the Convention. The Convention covers incidents in which persistent oil has been discharged or escaped from a sea-going vessel which was constructed or adapted to carry oil in bulk as cargo (normally a tanker).

A claimant can be anyone who has suffered pollution damage in a Member State of the 1992 Fund. They may be private individuals, partnerships, companies, private organisations or public bodies, as well as States or local authorities.

Claims should be submitted to the following address:

**International Oil Pollution Compensation Fund 1992 (1992 Fund),
Portland House, Bressenden Place, London, SW1E 5PN, United Kingdom.**

Telephone: +44 (0)2075927100

Fax: +44 (0)20 7592 7111

Claims should be made in writing (including fax/electronic mail). They should be presented clearly. The facts and the supporting documentation presented with the claim should be sufficiently detailed to allow assessing the amount of the damage. All items of a claim must have associated evidence by

way of an invoice or other supporting documentation, such as work sheets, explanatory notes, accounts and photographs. The claimants are responsible for the submission of evidence to support their claims.

Detailed guidance on the compensation and liability regime, explicitly the claims procedure can be found in the [IOPC Funds' Claims Manual](#).

16.3.3 Bunker Spills Convention

The Bunker Spills Convention seeks to ensure that adequate compensation is promptly available to persons, not otherwise compensated under the 1992 CLC, who suffer damage or are required to clean-up as a result of spills of ships' bunker oil. The IMO Convention entered into force on 21 November 2008.

16.3.4 HNS by Sea Convention

In 1996 the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention) was adopted, but it has yet to enter into force.

The HNS Convention is based on the CLC and Fund Convention. Thus, the ship-owner (and their P&I insurer) will be strictly liable to pay the first tier of compensation, whereas the second tier will come from a fund that is levied on cargo receivers in all Contracting States on a post-event basis.

16.3.5 Other Vessels / Craft

Contact should be made with the Ships Agent or Registered Owner in the instance of smaller vessels, craft and inland facilities that are not within the P&I and IOPC schemes.

They should be notified of the incident and advised of the details and of the intention to recover costs. It should be advised that their insurers should be notified by them.

17 Documentation Procedures

This chapter details how incident information and data will be captured, consolidated, displayed and archived by ZE during the event of an oil or HNS spill in keeping with the principles of IMS.

The documentation, forms and display boards referenced throughout this Chapter can be found in Annex 6 – Incident Command Forms.

17.1 Document Production and Supply

Figure 17.1 provides an account of how the different IMT functional areas will compile and retain documentation for further action and review.

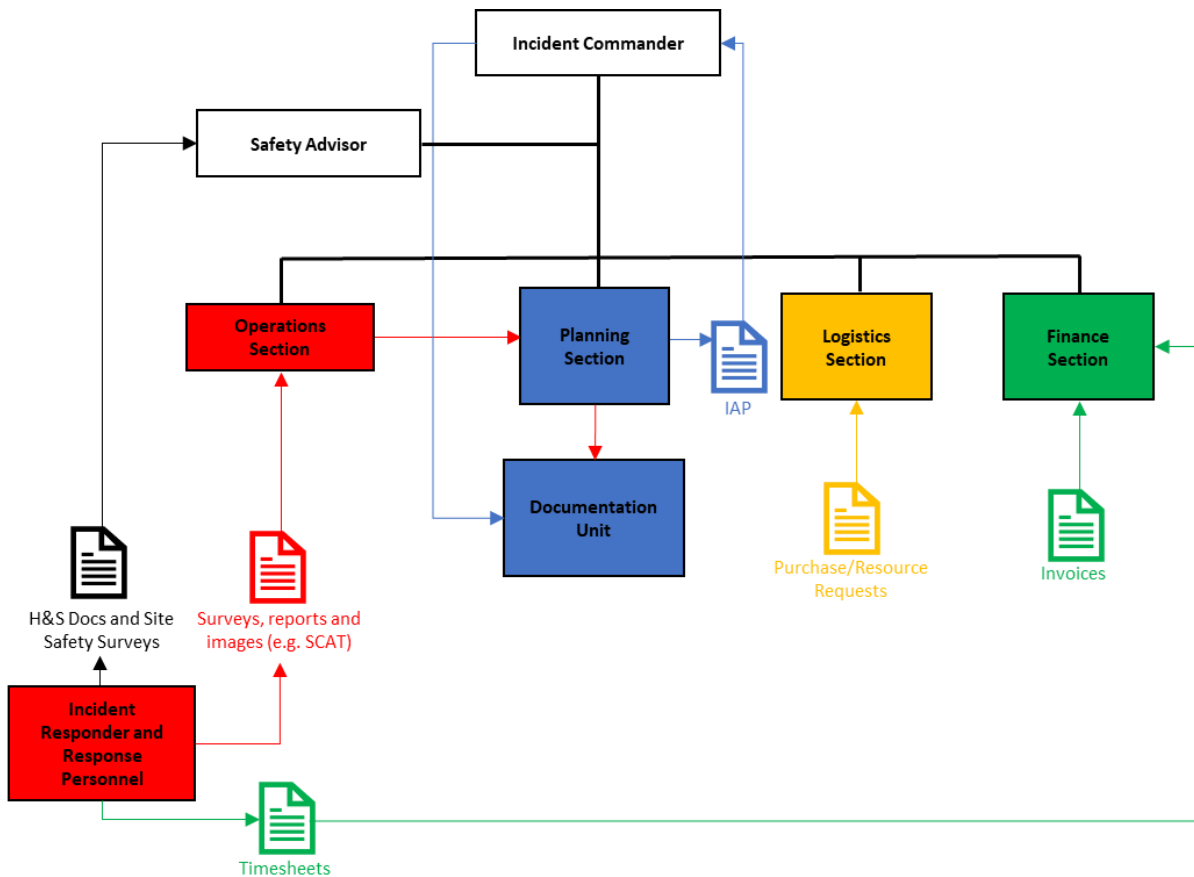


Figure 17.1- IMS Document Control Procedures Throughout a Pollution Response

The documentation should go through ZE BBT’s Quality Management System and be stored within SharePoint for retention and future referral. Documentation will be kept for claims purposes and incident response debriefs and assessments.

Through ZE’s SharePoint document control system, documents are given a unique document ID, title and name. The section responsible for production can also be logged alongside the owner of the document and whether it is an active or archived document.

17.2 Information and Data Display

The situational display boards shown in Figure 17.2 should be placed on available wall space within the Terminal Control Room upon activation of the IMT. The situational display boards are critical in sharing incident information and ensuring situational awareness.

It is the responsibility of the Situation Unit Lead to ensure that the situation boards display accurate up to date information on the incident.

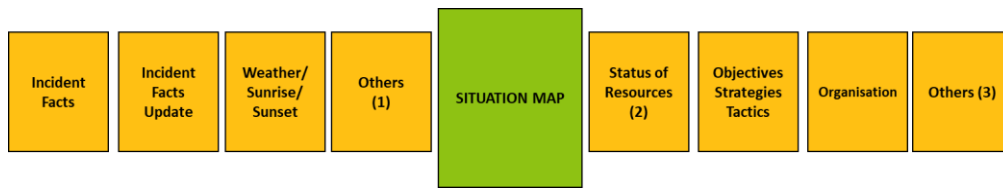


Figure 17.2 - Example Situational Display Board Layout

The situation displays on the left of the situation map present information on the incident. The situation displays on the right of the situation map present information on the status of spill response operations.

ANNEXES

Annex 1 – Contact List

Annex 2 – Certifications of Employees

Annex 3 – Equipment and Resources

Annex 4 – Communication Equipment and Protocols

Annex 5 – Service Contracts and MOUs

Annex 6 – Incident Command Forms

Annex 1 – Contact Lists

Primary External Contact Directory

| Contact Name | Contact Details | Notes |
|---|---|-------|
| Irish Coast Guard | 999/112 (ask for Coast Guard) 016620922 mrccdublin@irishcoastguard.ie admin@irishcoastguard.ie | |
| Bantry Bay Port Company | +353(0)2753277 emergencyroom@dublinport.ie | |
| Port of Cork | Deputy Harbour Master: (Day) + 021 4273125 (Ext 18) (Out of Office) + 086 813 8748 Harbour Master: (Day) + 021 4273125 (Ext 176) | |
| Oil Spill Response Ltd. Duty Manager | Tel 24hrs: 00 44 23 80331 551 | |
| Bantry Bay Fire Service | 999/112 027 50522 | |
| Environmental Protection Agency (EPA) | 24 Hr: 01890 33 55 99 Tel: 021 4875540 | |
| Cork County Council | Pollution Officer Tel: 028 21299 Environmental Officer Tel: 021 4532700 Bantry Area Engineer Tel: 027 50058 Out of Hours Tel: 021 480 0048 | |
| Corporate Reports | See Zenith Energy Crisis Management Plan | |
| Bantry Garda Station | 999/112 027 207867 | |
| Bantry Hospital (Ambulance) | 999/112 027 50133 | |
| Coast and Cliff rescue | Mobilised By Calling Coast Guard on 999/112 | |
| Bantry Inshore Rescue (BISRA) | Mobilised By Calling Coast Guard on 999/112 | |
| South Doc | 1850 335999 | |

| | | |
|-------------------------|---|--|
| Castletownbere Lifeboat | Mobilised By Calling Coast Guard on 999/112 | |
| HSA | 24 Hr: 1850 289 389 | |

Primary Internal Contact Directory

| Contact Name | Contact Details | Notes |
|---|----------------------|---|
| Terminal Director (Incident Commander) – Tadgh Deasy | +353 (0) 87 308 6988 | |
| HSEQ Lead (Safety Advisor) – David Lee | +353 (0) 87 236 3402 | |
| Marine Superintendent (Operations Section Chief) – Fintan Gilsean | +353 (0) 86 824 0966 | |
| On-Duty Pilot (On-Scene Commander Offshore) | | Contact Marine Superintendent for details |
| Operations Team Leader (On-Scene Commander Onshore) Oisin Kemp | +353 (0) 83 459 8022 | Contact Operations Lead or deputy for details (Colin Foley) (Oisin Kemp) |
| Operations Manager (Planning Section Chief) – Colin Foley | +353 (0) 87 694 9108 | |
| Procurement Lead (Logistics Section Chief) – Adrian Buckley | +353 (0) 86 817 7736 | |
| Finance Lead (Finance Section Chief) – Tomas O’Cellaigh | +353 (0) 86 377 6848 | |

Secondary External Contact Directory

| Contact Name | Contact Details | Notes |
|--------------|-----------------|-------|
|--------------|-----------------|-------|

| | | |
|-------------------------------|---------------------------------|--|
| Ships Agent | | Appointed by charterer, contact details available from Operations or Marine Lead |
| Enva Ireland Waste management | 021 4387200 | |
| Irish Helicopters | 353 1890 2895 | |
| Irish Arc Waste Management | 086 8248505 (JJ O Donovan) | |
| Bantry Hire | 027 50001 | |
| Bantry Skip Hire | 027 50068 | |
| Whitegate Refinery | 021 462 2200 (Main Switchboard) | |
| Nunan Cleaning services | 0872655835 (Harry Nunan) | |
| Manning Cleaning services | 086 2541481 (Val Manning) | |
| Dickson Bearings | 353 1 8443000 | |
| Ocean Challenger | 087 914 6299 (Bridge 24 hr) | |
| Maid of the Isles | 087 927 3180 (24 hr) | |
| Atlantic Towage and Marine | 086 859 5701 (Sean Harrington) | |
| Blue Ocean Marine | 086 242 3140 (Colm Harrington) | |
| LCF Marine | 087 233 9822 (Mike O Sullivan) | |

Annex 2 – Certifications of Employees

ZE BBT are in the process of assembling a list of personnel to be put forward for further training in conjunction with the IRCG.

| Employee | Certification Title |
|----------------|---------------------|
| Fintan Gilsean | OPRC OSR Level 2 |
| Steve Malone | OPRC OSR Level 2 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Annex 3 – Equipment and Resources

On-Site Tier 1

| Resources | |
|-----------|--|
| Quantity | Resource |
| 3 | Komara 20 Skimmer |
| 200m | Ro-Boom (Containerised) |
| 200m | Troil Boom |
| 300m | Nofi Boom (Tug Based) |
| 1 | Absorbent Stockpile (Marine Booms, Socks and Pads) |
| 1 | Temporary Storage Stockpile (Fastanks and Ancillaries) |

On-Site Tier 2 (On-Hire)

| Resources | |
|-------------------|--------------------------------------|
| Quantity | Resource |
| Container* | |
| 1 | Desmi DBD 16 Disc/Brush/Drum Skimmer |
| 1 | Storage Barge 5T Storage Box |
| 1 | Power Pack - Desmi 7.5Kw |
| 1 | PPE Box |
| 3 | Spares Box |
| 1 | Storage Barge Electric Blower |
| 1 | Storage Barge 5T Lancer Barge |
| Trailer 1* | |
| 1 | Fastank Bund |
| 1 | Stihl Air Blower |
| 1 | Lamor Power Pack and Spate Pump |
| 1 | Minimax 12 Skimmer |
| 40m | Shoreguardian Boom |
| 160m | Sea Sentinel Boom |
| 2 | Honda Water Pump |
| 1 | Fastank 5 |
| 3 | Spares Box |
| 2 | PPE Box |
| 2 | Shoreline Ancillaries Box |
| 1 | Shoreline Toolbox |
| Trailer 2* | |
| 1 | Fastank Bund |
| 2 | Stihl Air Blower |

| Resources | |
|------------|---------------------------------|
| Quantity | Resource |
| 1 | Lamor Power Pack and Spate Pump |
| 1 | Minimax 12 Skimmer |
| 40m | Shoreguardian Boom |
| 160m | Sea Sentinel Boom |
| 2 | Honda Water Pump |
| 1 | Fastank 2000 |
| 3 | Spares Box |
| 2 | PPE Box |
| 1 | Shoreline Ancillaries Box |
| 1 | Shoreline Toolbox |
| Trailer 3* | |
| 1 | Fastank Bund |
| 2 | Stihl Air Blower |
| 1 | Lamor Power Pack and Spate Pump |
| 1 | Minimax 12 Skimmer |
| 40m | Shoreguardian Boom |
| 160m | Sea Sentinel Boom |
| 2 | Honda Water Pump |
| 1 | Fastank 5 |
| 3 | Spares Box |
| 3 | PPE Box |
| 2 | Shoreline Ancillaries Box |
| 2 | Shoreline Toolbox |

*OSRL undertake routine maintenance visits and issue updated equipment packing lists.

Tier 3 (OSRL SLA)

Full details on the equipment available to ZE BBT under their SLA is published on OSRL's website: [sla-equipment-report-2022-12-06.pdf \(oilspillresponse.com\)](https://oilspillresponse.com/equipment-report-2022-12-06.pdf)

Tier 3 (IRCG OSR National Stockpile Equipment Hire)

IRCG SOP 01-2020 Section 6 states that items from the IRCG national Oil Spill Response Equipment Stockpile can be hired upon request to support any response operations.

The procedure for hiring equipment is shown within this Section.

Equipment Borrowed

Equipment to be borrowed or requested should be listed.

Conditions

- 1) The equipment remains the property of the Irish Coast Guard (IRCG), a division of the DTTAS and may be recalled at any time for use elsewhere if the Department considers this necessary.
- 2) The borrower will provide details of the delivery point and recipient and give reasonable notice of return to the stockpile depot.
- 3) The borrower will agree to pay transportation costs to and from the stockpile depot unless using their own transport.
- 4) The borrower will ensure that the equipment is loaded, unloaded, stored and operated by competent staff in accordance with the safety instruction set out in the technical literature supplied with the equipment or otherwise notified by the IRCG or its agents.
- 5) The borrower will provide secure protection for the equipment during the loan period and will not loan the equipment to another party without consent of the IRCG.
- 6) The borrower will return the equipment to the stockpile depot in a condition similar to that in which it was received, or pay for cleaning, repairing or replacement.
- 7) The borrower will insure the equipment for the IRCG against loss or damage during the loan period.
- 8) The Department will accept any liability for compensation for injuries or damage, which may occur as a result of the loan when the equipment is outside the control of the IRCG or its agents.
- 9) Equipment dispatched from stores will be subject to standby or in use hire rates, as detailed on the Department website, and the borrower shall be liable to pay the IRCG;
 - a. Such fee as may have been agreed in writing between the borrower and the IRCG or its agents prior to such use; or,
 - b. If (a) above does not apply, such fee as may be notified in writing to the borrower by the IRCG or its agents at any time prior to, during or after such use.

Borrower's Details

The borrower's name, designation, organisation, and contact details should be provided. The above terms and conditions must be accepted, documentation signed, dated and sent to the IRCG.

Annex 4 – Communication Equipment and Protocols

Basic Communications

This Annex contains details relating to the means of communications that will be utilised during an incident originating from ZE BBT.

There are two basic types of communications with respect to this plan:

- Communications in relation to the execution of the plan (See Operations Section, Phase 1); and
- External communications in relation to stakeholders and the media (See Chapter 15).

Overarching Types of Communications Anticipated for Incident Management

Effective and timely communication throughout a response can be fundamental in the overall success of the response and critical for sharing situational awareness to all response personnel and response agencies. Figure A shows a preidentified communications plan to be adapted to suit the scope of the response. In addition to the communications plan regular team meetings and briefings will be held to support the dissemination of incident information and prompt a timely transition from the reactive phase to the proactive phase.

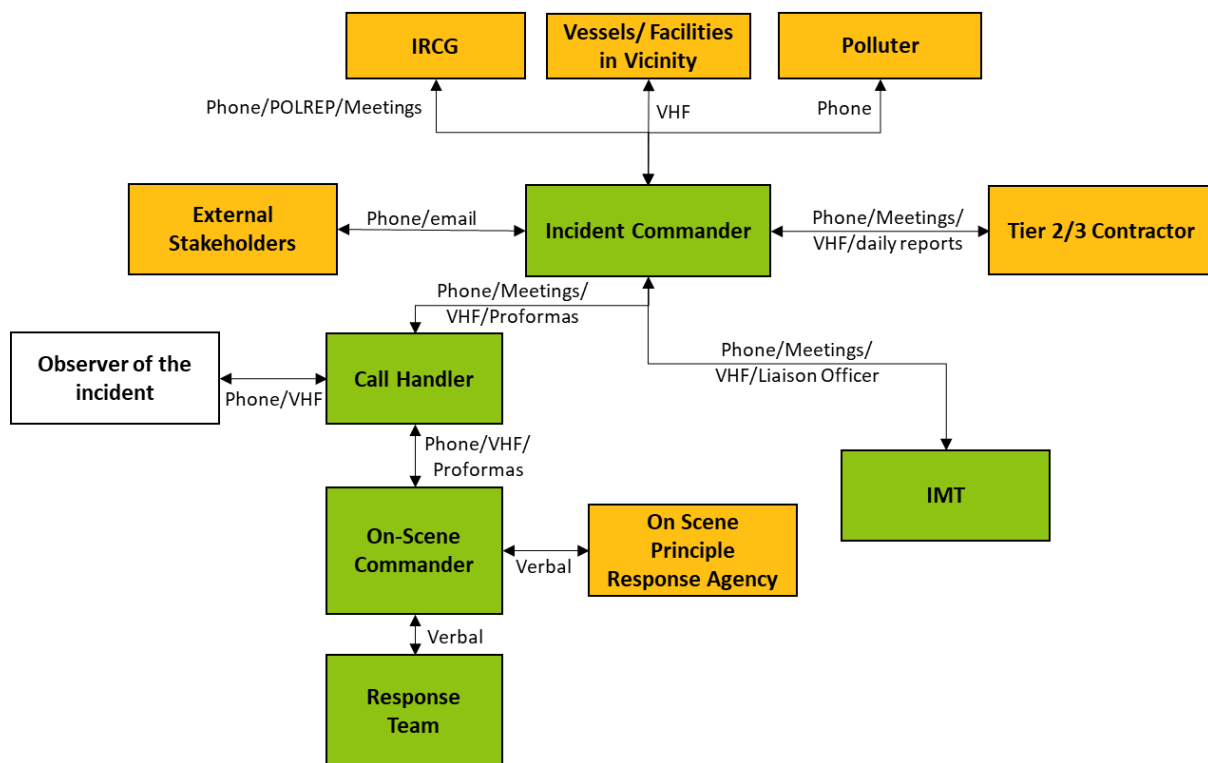


Figure A - Communications Plan

Depending on the scope of the response, it may be appropriate to acquire mobile phones and VHF radios to implement efficient communications from the site(s) to the IMT. The IMT should keep a record of the contact telephone numbers of additional personnel mobilised to site.

Communication with the Broader Emergency Planning Framework

Throughout the response to a major emergency or a significant incident which entails a multi-agency response. ZE will appoint a Liaison Officer as necessary to form a direct communication link between the Local Co-ordination Centre and ZE's IMT.

As the IRCG are ensuring all local authorities, ports and harbours utilise a similar IMS structure when establishing and coordinating a response, ZE will recommend establishing a unified command (Figure B) when responding to a significant pollution incident. This will promote the sharing of resources, establishing combined objectives and increase the sharing of incident information.

Upon agreeing to establish a unified command, ZE IMT will either relocate or alternatively offer to facilitate the unified command at BBT.

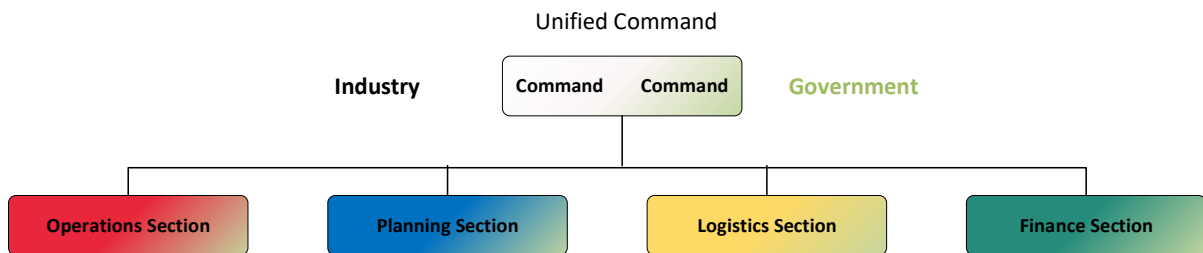


Figure B - Unified Command Structure

For incidents that are declared under the MEM Framework, ZE personnel should refer to their MEP.

Annex 5 – Service Contracts and MOUs

BBT has an agreement with OSRL to provide Tier 3 technical advice, resources and expertise 365 days a year on a 24-hour basis. **Error! Reference source not found.**, summarises the OSRL membership and service level agreement (SLA) available to the Terminal in the event of a spill.

THIS RENEWAL AGREEMENT is made the day of January 2023

B E T W E E N:

- (1) **OIL SPILL RESPONSE LIMITED** a company incorporated under the laws of England and Wales and whose registered office is at Lower William Street, Southampton SO14 5QE, United Kingdom, registered number 1808594 (hereinafter referred to as "the Company") and
- (2) **ZENITH ENERGY BANTRY BAY TERMINAL LIMITED** a corporation organised and existing under the laws of Ireland Registered number 545527, and whose registered office is at Reenrour, Bantry, Co Cork, Ireland, P75 FF80, (hereinafter referred to as "the Associate")

WHEREBY IT IS AGREED as follows: -

- (a) A contract for membership between the Associate and the Company was entered into on 5th February 2015 ("the Associate Agreement") for a period of twelve months and renewed from time to time.
- (b) In accordance with Clause 2 of the Associate Agreement, a written request has been received from the Associate to extend the Agreement for a further period on the terms set out below ("Renewal Agreement").
- (c) An Associate who have entered into supplementary agreements for additional services as further specified in the table set out in Clause 4 hereof and the Associate has produced to the Company a written request to extend each agreement for a further period on the terms set out below.
- (d) This Renewal Agreement shall act as a formal renewal of each agreement specified in the table set out in Clause 4.

NOW THEREFORE ASSOCIATE AND THE COMPANY HAVE AGREED as follows:

1. That the Associate Agreement set out in the table in Clause 4 below shall be extended for a further period with effect from 5th February 2023 ("Renewal Date") such that each extended contract will automatically terminate on 4th February 2023 unless otherwise agreed in writing by both Parties.
2. That all the provisions of each individual applicable Agreement shall apply to this Renewal Agreement.
3. Prior to the Renewal Date and in consideration of the rights granted to the Associate hereunder, the Associate shall pay the total amount shown set out in the table in Clause 4, excluding taxes by electronic bank transfer to the Company's account No 72296853, Sort Code 40-01-06 at HSBC Bank plc, 90 Baker St, London W1U 6AX, UK.
4. The Associate warrants that the signatory to this Renewal Agreement is the duly authorised signatory for every agreement specified and it is intended the execution of this Renewal Agreement shall act as a formal renewal of each agreement specified in the table set out hereafter:

| Agreement Type | Contracting Entity | Assets covered | Renewal Fee |
|----------------|---|---------------------|---|
| Associate | Zenith Energy Bantry Bay Terminal Limited | Bantry Bay Terminal | GB£38,867 (thirty eight thousand, eight hundred and sixty seven) pounds sterling. This represents the entire Annual Fee |

5. Call out fees as per the attached schedule, reviewed and implemented under Clause 5 of the Associate Agreement.
6. Annual Certificate of Compliance as per the attached schedule, reviewed and implemented under Clause 14 of the Associate Agreement
7. Notices by either party to the other shall be adhered to under Clause 18 of the Associate Agreement and sent to:-

| To the Company | By Mail | By facsimile |
|------------------|---|---------------------|
| | Oil Spill Response Limited Lower William Street Southampton SO14 5QE United Kingdom | +44 (0)2380 331 972 |
| To the Associate | By Mail: | By facsimile: |
| | Reenrour, Bantry, County Cork, Ireland | |

AS WITNESS the hands of the duly authorised representatives of the parties hereto the day and year first above written

SIGNED for and on behalf of

OIL SPILL RESPONSE LIMITED

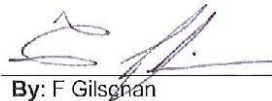


By: R Bayliss

Membership Manager

SIGNED for and on behalf of

ZENITH ENERGY BANTRY BAY TERMINAL LIMITED



By: F Gilsghán

Marine Superintendent

| Agreement Type | Contracting Entity | Assets covered | Renewal Fee |
|----------------|---|---------------------|---|
| Associate | Zenith Energy Bantry Bay Terminal Limited | Bantry Bay Terminal | GB£38,867 (thirty eight thousand, eight hundred and sixty seven) pounds sterling. This represents the entire Annual Fee |

5. Call out fees as per the attached schedule, reviewed and implemented under Clause 5 of the Associate Agreement.
6. Annual Certificate of Compliance as per the attached schedule, reviewed and implemented under Clause 14 of the Associate Agreement
7. Notices by either party to the other shall be adhered to under Clause 18 of the Associate Agreement and sent to:-

| To the Company | By Mail | By facsimile |
|------------------|---|---------------------|
| | Oil Spill Response Limited Lower William Street Southampton SO14 5QE United Kingdom | +44 (0)2380 331 972 |
| To the Associate | By Mail: | By facsimile: |
| | Reenrour, Bantry, County Cork, Ireland | |

AS WITNESS the hands of the duly authorised representatives of the parties hereto the day and year first above written

SIGNED for and on behalf of

OIL SPILL RESPONSE LIMITED

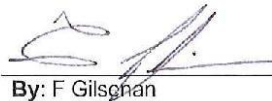


By: R Bayliss

Membership Manager

SIGNED for and on behalf of

ZENITH ENERGY BANTRY BAY TERMINAL LIMITED



By: F Gilsghán

Marine Superintendent

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OIL SPILL RESPONSE LIMITED SERVICE LEVEL AGREEMENT

Purpose of document

This document outlines the scope of response services provided by Oil Spill Response Limited (the Company) to its Participant and Associate members (herein collectively referred to as Members) and acts as a schedule to the Participant and Associate Agreements, subject always to the provisions of Clause 5 of the Participant Agreement and/or Clauses 3.4 and 3.5 of the Associate Agreement and/or Clauses 3.3 and 3.4 of the Associate Agreement Shipping. The Service Level Agreement (SLA) provides guidance on the level and performance of the response services, sets out the procedures for Members to utilise the services. The SLA is defined and approved by the shareholders of the Company.

Index

| Section | Description |
|---------|--------------------------------|
| 1.0 | Mobilisation Procedures |
| 2.0 | Mobilisation Considerations |
| 3.0 | Response Deliverables |
| 4.0 | Response Integration Programme |
| 5.0 | Industry Outreach |

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1.0 Mobilisation Procedures

In the event of an oil spill incident a call should be placed to any one of the following numbers:

| | Telephone Number |
|----------------------------------|------------------|
| EMEA (Europe Africa Middle East) | +44-2380-331551 |
| APAC (Asia Pacific) | +65-6266-1566 |
| AMER (Americas) | +1-954-983-9880 |

These numbers are staffed on a 24-hour basis. On placing a call, the caller should make it clear that they are reporting a spill incident (or potential incident) and wish to make contact with the **Duty Manager**. They will be asked to provide the following information:

- 1) Name of caller
- 2) Name of mobilising Member company
- 3) Location of incident
- 4) Telephone number (both mobile and landline if appropriate) including country prefix

If not immediately available, the Duty Manager will establish contact with the caller within 10 minutes. Once contact has been made, further details will be collected to develop and agree a response strategy in line with industry Good Practice Guidance. Full details of the mobilisation procedure can be found at www.oilspillresponse.com.

2.0 Mobilisation Considerations

a) Staff Security and Safety

The safety and security of Company personnel (responders) is of paramount importance and must be assured prior to departure. The Company will enlist the assistance of the mobilising Member to verify the security situation and responders must be placed under the health, welfare and security protection of the Member whilst deployed. The Company personnel operate under industry aligned safety processes and procedures for the protection of their health and wellbeing and those they are working with; this includes the IOGP Life Saving Rules (<https://www.iogp.org/life-savingrules>) which form the baseline minimum standard for safety.

b) Costs

Weekly cost sheets will be provided to the mobilising Member to monitor the costs of ongoing operations. The Member is responsible for identifying and bringing any errors or omissions in the cost sheets to the attention of the Company on a timely basis.

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Details on invoicing and payment terms along with equipment and personnel rates for response activities and the associated terms and conditions are published in Schedule 1 (“Charge Out Rates and List of Equipment” or “the Scale of Fees”). Rates are reviewed on an annual basis. Supplementary Services such as a range of Subsea Well Intervention Services (SWIS), additional dispersant supplies over those contained within the Service Level Agreement held in the Global Dispersant Service (GDS) and UK Dispersant Stockpiles and access to regional surveillance aircraft for West Africa and the UKCS areas are subject to separate agreements and charges.

c) Equipment Logistics

The Company provides logistics support to Members but responsibility for the transportation of equipment from:

i in the case of a Participant Member, the port/airport reasonably nominated by the Company at which the equipment is delivered to the Participant Member; or

ii in the case of an Associate Member the port named in the applicable Associate Agreement

lies with the mobilising Member. A safe and secure storage area for equipment must be identified. Any equipment supplied to a Member to respond to an oil spill, the threat of an oil spill, or other incident will be accompanied by Company provisioned response personnel. All associated costs of a mobilisation lies with the mobilising member.

d) Customs Clearance

The mobilising Member is responsible for ensuring the clearance of equipment into the country and the payment of all associated duties, importation costs etc. The Company will provide full documentation for the equipment and will give all possible assistance in the process.

e) Flight Clearances

The Company will arrange for flight / landing clearances for Company-operated wide area aerial dispersant application aircraft, and Company-operated surveillance aircraft, where those Supplementary Services are activated, through the Company contracted aircraft service provider in each case, but may request support from the Member to expedite the process where necessary. Costs will be the responsibility of the mobilising Member.

f) Immigration

Immigration arrangements for the entry of Company personnel into a country are the responsibility of the mobilising Member. In practice the Company will apply for the travel documents where possible but in some circumstances may require assistance from the Member to facilitate access for response staff into country. All costs will be for the account of the mobilising Member.

g) Continuity of Response Staff

The Company will apply reasonable endeavours to maximise the continuity of response staff for any incident, but reserves the right to select the most appropriate personnel based on a number of factors including availability, competence level, other work commitments and fatigue management. In order to manage fatigue and

| | | | |
|---------------------|-------------|---------------------|--------------|
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preserve personnel wellbeing in-field, teams will be replaced every two to three weeks with fresh personnel to allow for sufficient in-field handover at the cost of the mobilising Member.

| | | | |
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| | | | |
|---|---------------------|---|---|
| | | <ul style="list-style-type: none"> • Dispersant advocacy • Community liaison <p>The Company maintains a minimum pool of 80 dedicated response staff but can also draw from suitably experienced and qualified personnel in other roles throughout the business. Members are entitled to the number of response staff stated above (18), however, in the event that more are required, this may be approved on a case by case basis. If additional staff are provided, it is on the condition that they may be recalled by the Company in the event of a further incident response.</p> <p>All Company response personnel maintain a suite of relevant vaccinations for travel, BOSET/HUET and MIST certification.</p> | <ul style="list-style-type: none"> • Dispersants permissions support |
| D | Equipment Resources | <p>The Company retains sufficient types and quantities of response equipment to meet a wide range of oil spill scenarios. Access to this equipment is on a "first come first served" basis regardless of membership band/category. A Member is entitled to mobilise up to 50% of the available equipment by generic type as per Schedule 1 ("Charge Out Rates and List of Equipment" or "the Scale of Fees") for any incident.</p> <p>Equipment is distributed across the Company's bases, which are strategically located around the world. Equipment for any one incident may be provided from a number of different bases.</p> <p>Regardless of the resources already deployed, the Company will always endeavour to provide some level of response to all Members within the constraints of the available resources</p> | |
| E | Dispersant Usage | <p>The Company hold sufficient dispersant (circa 750 m³) within the SLA stockpile to support most surface response scenarios. Additional stocks are available for sustained subsea injection / ongoing release scenarios via separate Supplementary Agreements. Subject to re-supply considerations, a Member may access up to 100% of the global SLA dispersant stockpile if required. The Company's stocks include mainly dispersants from three manufacturers complying to UK, US and French standards; at least one of which are approved in most jurisdictions around the world. The company also maintain a database of global industry and government stocks which may be accessed if required and subject to agreement with the relevant stockholder.</p> <p>The Company can supply wide area dispersant application aviation platforms equipped with dedicated dispersant application systems with pilots/crew trained and experienced in low-level spray mission flying as follows:</p> <ul style="list-style-type: none"> • Hercules C-130A equipped with 12te payload RIDSS dispersant application system, based Malaysia • Boeing 727-2S2F (RE) equipped with 15te payload TERSUS dispersant application system, based UK <p>The Company hold a variety of vessel-mounted and helicopter-mounted dispersant application systems, for the latter appropriately equipped and licenced helicopters / pilots will need to be sourced by the Member.</p> | |

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| | | | |
|---|---------------------------|---|--|
| | | <p>Where the use of dispersants are technically justified, the Company will support the Member in obtaining permissions for dispersant use with the relevant authorities through NEBA/SIMA justification supported by test spray or other in-field assessment as appropriate.</p> <p>The Company will monitor and report on dispersant effectiveness utilising industry-standard SMART protocols in line with Good Practice Guidance.</p> | |
| F | Oiled Wildlife Management | <p>The Company's stockpile includes first strike oiled wildlife capture and treatment equipment. This equipment is standardised across the Company's base locations and is designed to provide equipment critical to the initial phase of a response, although other locally sourced supplies and equipment will also be required in a wildlife response.</p> <p>Via the Company's contract with the Sea Alarm Foundation, two oiled wildlife response technical advisors are on call to support Members with one person in-field or at the Command Post and the second supporting remotely. The oiled wildlife response technical advisor would typically support the Wildlife Branch Director or the Planning and Operations Section as appropriate.</p> <p>Furthermore, through the Company's ongoing funding of the Global Oiled Wildlife Response System (GOWRS) Project, a wildlife assessment team of four wildlife experts can be mobilised in-field in addition to the Sea Alarm resources noted above. There is also access to additional oiled wildlife resources on a 'reasonable endeavours' only basis through the GOWRS partners. The GOWRS project comprises ten well-respected international wildlife rescue and rehabilitation organisations working to common Good Practice standards.</p> | |
| G | Logistics Support | <p>Although the mobilising Member holds responsibility for the movement of equipment and personnel from the point of delivery of equipment specified in 2.c) to the incident location, the Company has a dedicated in-house logistics team to support the deployment of personnel and equipment. Through the Company's support contracts with travel agencies, logistics providers and aviation cargo brokers, a range of deployment options can be explored with Members.</p> <p>The Company will work with the mobilising Member's logistics and government affairs teams to provide support in obtaining visas, customs clearances and other logistics requirements in-country.</p> <p>Where the Company's contracted wide area dispersant aircraft, or where applicable surveillance aircraft under Supplementary Agreements are mobilised, the Company will arrange for flight / landing clearances and permissions for flying related to the aircrafts' missions in field through the Company contracted aircraft service provider. Support to obtain these clearances and permission shall be provided by the Member where required.</p> | |
| H | Surveillance Services | <p>All the Company's response personnel are trained and experienced in aerial observation and quantification of oil spills and are supported with in-house software in surveillance tasks. The Company will work with the Member to identify</p> | |

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| | | |
|---|-----------|--|
| | | <p>suitable aircraft of opportunity for aerial surveillance missions which offer crucial situational awareness for strategic planning and operational tasking.</p> <p>Dedicated fixed-wing aerial surveillance platforms are available via separate Supplementary Agreements in UKCS waters and West & Central Africa.</p> <p>The Company holds a contract with a Satellite provider for Synthetic Aperture Radar (SAR) imagery on demand, 24/7. Speed of provision of imagery will depend on location, satellite coverage and timing of next pass to task the satellite accordingly. This is typically 6 to 24 hrs, with enhanced near-real time processing delivery of an emergency oil tracker report.</p> <p>The Company have call-off contracts with a global network of Unmanned Aerial Vehicles/Systems (UAV/S) with trained operators who are familiar with local flying regulations. The UAV/S network includes Line of Sight and Beyond Visual Line of Sight operators. These can offer further situational awareness, especially at a tactical level. The Company can also offer aerostat and kite-mounted surveillance platforms which have particular merit in enhancing encounter rates in offshore containment and recovery operations.</p> <p>The Company can supply tracking buoys to follow and report on oil slick drift and have access to prototype Autonomous Underwater Vehicles to provide further information from the field.</p> |
| 1 | Modelling | <p>The Company's geomatics specialists can provide 2D and 3D spill modelling.</p> <p>2D modelling is typically used to create an oil spill forecast, predicting oil spill movement over a 3 to 5-day horizon. These forecasts support a variety of planning requirements including directing aerial surveillance assets or predicting shoreline impact or transboundary scenarios.</p> <p>Back track modelling is also available, forecasting backwards in time allowing potential sources of spills of unknown origin to be shortlisted.</p> <p>More advanced 3D modelling is used for sub-sea releases or where the behaviour of the oil subsurface is of particular interest. They are commonly tailored to a specific challenge faced in the response rather than as a standard output in the very early stages of a spill.</p> <p>2D models are typically produced in 2 to 3hrs whereas 3D models take commensurately longer to run; typically 24-48hrs.</p> <p>Models rely on good input data in order to offer meaningful outputs. This includes not only access to extensive databases of oil, weather and ocean data but also ensuring that live spill observations or surveillance data is fed to the modelling team.</p> |

| | | |
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| | | |
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| | | <p>The Company have access to global databases of oil properties, wind forecasts, ocean forecasts and historic datasets. However up-to-date information and/or authoritative versions on all of these is needed where possible from the mobilising member.</p> <p>In areas of complex current patterns such as near-shore and near major river outflows, more granular metocean data may be required at an extra cost which the Company can assist in sourcing.</p> |
|--|--|---|

4.0 Response Integration Programme

New Members are entitled to a free of charge integration workshop. Held at a location of their choosing, the purpose of the meeting is to incorporate OSRL into Members' existing emergency plans and in-turn promote efficient, effective response. Organised by the Company, the workshop explains service entitlements, response activation processes and the respective roles and responsibilities of each party. We endeavour to deliver Integration workshops within 30 days of New Members joining.

Each subsequent year of renewed membership, Members are entitled to a review meeting, performed by OSRL free of charge, at a time and location of the Member's choosing. Aimed at adding value to Member's preparedness levels, the meeting format is flexible with content being agreed in advance by both parties. Typical subjects covered by the review should include but are not limited to callout authority verification, service updates, new / future operations and changing spill risk. This can be achieved through discussion, presentation or location-specific table-top exercise with a verbal report on Member readiness as an output.

Up to 10 working days per Member per year are available free-of-charge to Members for these integration activities.

Members can at any time and free-of-charge utilise a simple web-based "Ready Check" to self-assess their preparedness levels. This tool can be accessed here: <https://www.oilspillresponse.com/tools/ready-check/>

The outputs of the integration programme are:

- Clarity of roles and responsibilities in the event of an incident to facilitate seamless integration of resources
- Insight into the range of services available to Members as part of their Membership, including any subscribed Supplementary Services
- Clear understanding of how and when to contact the Company in the event of an incident or potential incident
- Identification of areas for development and improvement for the Member / Affiliate to improve readiness
- Appreciation for OSRL of the Member / Affiliate's risks and environmental & socio-economic sensitivities

5.0 Industry Outreach

The Company has an agreed role in supporting its Members' in dialogue with governments, regulators, the scientific community and other stakeholders, especially in the promotion of Good Practice as defined in the IOGP/PIECA report series: <https://www.iogp.org/bookstore/product-category/environment/oil-spills/>. In particular, the Company focusses on the themes of Tiered Preparedness & Response, use of Net Environmental Benefit Analysis and Spill Impact Mitigation

| | | |
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Assessment (NEBA/SIMA) and Overcoming Barriers; especially in relation to dispersant approvals. These activities are required to encourage efficient and effective science-based preparedness and response decision-making.

The outputs from the Industry Outreach programme are:

- Participation in relevant conferences, seminars and other forums to promote key industry messages as described; taking a lead role in the organisation and delivery of the Triennial Conference Series of the International Oil Spill Conference, Interspill and SpillCon.
- Support to Members engaging directly with governments, regulators and other stakeholders in the promotion of the key messages, overcoming barriers in gaining permission to use a full set of tools from the response toolbox and in the maintenance of licence to operate
- Collaboration with key international organisations, industry associations and other stakeholder groups such as the global oil and gas industry association for environmental and social issues (IPIECA), the International Maritime Organization (IMO), the International Association of Oil and Gas Producers (IOGP) and the American Petroleum Institute (API).
- Support to the IPIECA/IMO Global Initiative (GI) programmes to enhance oil spill preparedness and response capacity for marine spills at priority locations around the world
- Management of the Industry Technical Advisory Committee (ITAC) to provide a forum for industry to engage with the scientific community, bridging research to response. Using this and other forums to share Good Practice with the scientific / academic community.

Annex 6 – Incident Command Forms

Incident Action Plan Components

| INCIDENT OBJECTIVES (202) | |
|--|--|
| 1. Incident Name | 2. Operational Period (Date/Time) From: To: |
| 3. Objective(s) | |
| 4. Operational Period Command Emphasis (Safety Message) | |
| Approved Site Safety Plan Located at: | |
| 5. Prepared by: (Planning Section Chief) | Date/Time |

| ORGANISATION ASSIGNMENT LIST (ICS 203) | | | |
|---|-------|---|----------------------|
| 1.Incident Name | | 2.Operational Period: | |
| 3.Incident Commander(s) and Command Staff: | | Date From: Time From | Date To: Time To: |
| IC/UCs | | 7.Operations Section: | |
| | | Chief | |
| | | Deputy | |
| Deputy | | | |
| Safety Officer | | Staging Area | |
| Public Info Officer | | Branch | |
| Liaison Officer | | Branch Director | |
| 4.Agency/Organisation Representatives: | | Deputy | |
| Agency/Organisation | Name | Division/Group | |
| | | Division/Group | |
| | | Division/Group | |
| | | Division/Group | |
| | | Division/Group | |
| | | Branch | |
| | | Branch Director | |
| 5.Planning Section: | | Deputy | |
| Chief | | Division/Group | |
| Deputy | | Division/Group | |
| Resource Unit | | Division/Group | |
| Situation Unit | | Division/Group | |
| Documentation Unit | | Division/Group | |
| Demobilisation Unit | | Branch | |
| Technical Specialist | | Branch Director | |
| | | Deputy | |
| | | Division/Group | |
| | | Division/Group | |
| 6. logistics Section: | | Division/Group | |
| Chief | | Division/Group | |
| Deputy | | Division/Group | |
| Support Branch | | Air Operations Branch | |
| Director | | Air Ops Branch Dir | |
| Supply Unit | | | |
| Facilities Unit | | | |
| Ground Support Unit | | 8.Finacnce/Administration Section: | |
| Service Branch | | Chief | |
| Director | | Deputy Time Unit | |
| Communication Unit | | Procurement Unit | |
| Medical Unit | | Comp/Claims Unit | |
| Food Unit | | Cost Unit | |
| 9.Prepared by: | Name: | Position/Title: | |
| Date/Time: | | Signature: | |

FIELD ASSIGNMENT (204)

| | | |
|----------------|---|---|
| 1.Event | 2.Operational Period (Date/Time) From: To: | 3. Branch: Division: Group: Staging Area: |
|----------------|---|---|

| 5.Resource Assigned: | | # of Persons | Contact (e.g., phone, pager, radio frequency etc. | Reporting Location, Social Equipment and Supplies, Remarks, Notes, Information |
|----------------------|--------|-----------------|---|---|
| Resource Identifier | Leader | | | |
| | | | | |
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6. Work Assignments:

7. Special Instructions:

8.Communications (radio and/or phone contact numbers needed for this assignment):

| Name/Function | Primary Contact: Indicate Cell, pager, or radio (frequency/system/channel) |
|---------------|---|
| | |
| | |
| | |
| | |
| | |

| | | |
|---------------------|-----------------|------------|
| 9.Prepared by: Name | Position/Title: | Signature: |
| | Date/time: | |

MEDICAL PLAN (206)

| | | |
|-------------------------|---------------------------|--|
| 1. Incident Name | 2. Incident Number | 3. Operational Period (Date/Time) From: To: |
|-------------------------|---------------------------|--|

4. Medical Aid Stations:

| Name | Location | Contact Details | Paramedics on Site? |
|------|----------|-----------------|---------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

5. Transportation (indicate air or ground):

| Ambulance Service | Location | Contact Details |
|-------------------|----------|-----------------|
| | | |
| | | |
| | | |
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| | | |

6. Hospitals:

| Name | Address | Contact Details | Travel Time (Air) | Travel Time (Ground) | Trauma Centre? | Helipad? |
|------|---------|-----------------|-------------------|----------------------|----------------|----------|
| | | | | | | |
| | | | | | | |
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7. Special Medical Emergency Procedures:

| |
|--|
| |
|--|

6. Prepared by: (Medical Unit Leader)

Date/Time

Site Safety Plan (ICS 208)

Incident Name:

Operational Period:

Date From:

Date To:

Time From:

Time To:

Safety Message/Safety Plan:

Site Safety Plan Required?

Yes

No

Prepared By:

Name:

Position/Title:

Signature:

ICS 208

Date/Time:

SITREP Template

| SITREP | | | |
|--|------------------------------|---------------------|------------------------|
| 1. Incident Name: | | 2. Incident Number: | 3. Date/Time Prepared: |
| 4. Location of Incident: | | 5. Organisation: | |
| 6. Prepared By: | | 7. SITREP No: | |
| 8. Health and Safety Concerns | | | |
| | | | |
| 9. Personnel | | | |
| Name | Role with Response Structure | Organisation | Location |
| | | | |
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| 10. Current and Planned Objectives: | | | |
| | | | |
| 11. Summary of Events Since Last SITREP: | | | |
| | | | |
| 12. Additional Resource Requirements: | | | |
| | | | |

SITREP

13. Waste Recovered

Blank area for reporting waste recovered.

14. Response overview Chart/Map

Blank area for response overview chart or map.

15. Resource (Equipment) Summary

| Qty | Resource | Resource Location | Date/Time Ordered | In use | Standby | Notes |
|-----|----------|-------------------|-------------------|--------------------------|--------------------------|-------|
| | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
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| | | | | <input type="checkbox"/> | <input type="checkbox"/> | |
| | | | | <input type="checkbox"/> | <input type="checkbox"/> | |

16. Photographs

Blank area for photographs.

SCAT Survey Form

| SCAT Form | | | |
|-----------------------------|--|---|---|
| Incident: | | | |
| Site Name: | | | |
| Location: | | | |
| Surveyor Name: | | | |
| Surveyed By: | <input type="checkbox"/> Foot | <input type="checkbox"/> Boat | <input type="checkbox"/> Air |
| Date: | | Time: | |
| A. Weather Conditions | | | |
| A1. Temperature | <input type="checkbox"/> Hot | <input type="checkbox"/> Warm | <input type="checkbox"/> Cold |
| A2. Wind Speed | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| A3. Wind Direction | | | |
| A4. Cloud Cover | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| A5. Precipitation | <input type="checkbox"/> High | <input type="checkbox"/> Low | <input type="checkbox"/> Non |
| A6. Humidity | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Cold |
| B. Sea Conditions | | | |
| B1. Wave Height | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| B2. Sea Dynamics | <input type="checkbox"/> Calm | <input type="checkbox"/> Moderate | <input type="checkbox"/> Rough |
| B3. Tide Times | Low Water Time | | High Water Time |
| C. Shoreline Features | | | |
| C1. Shoreline Type | <input type="checkbox"/> Cliffs | <input type="checkbox"/> Bedrock | <input type="checkbox"/> Boulders (> 10 cm) |
| | <input type="checkbox"/> Pebbles (1 - 10cm) | <input type="checkbox"/> Gravel (2mm - 1cm) | <input type="checkbox"/> Sand |
| | <input type="checkbox"/> Mud | <input type="checkbox"/> Sea Defence | <input type="checkbox"/> Marsh/Mangrove |
| | <input type="checkbox"/> Docks | <input type="checkbox"/> Other: | |
| C2. Shoreline Use | <input type="checkbox"/> Commercial | <input type="checkbox"/> Industrial | <input type="checkbox"/> Farming |
| | <input type="checkbox"/> Public | <input type="checkbox"/> Recreational | <input type="checkbox"/> Residential |
| | <input type="checkbox"/> Other: | | |
| C3. Load Bearing | <input type="checkbox"/> Firm | <input type="checkbox"/> Soft | <input type="checkbox"/> Very Soft |
| C4. Shoreline Access | <input type="checkbox"/> Metalled Road | <input type="checkbox"/> Track | <input type="checkbox"/> Pathway |
| | <input type="checkbox"/> Steps | <input type="checkbox"/> Slipway | <input type="checkbox"/> Car Park |
| | <input type="checkbox"/> Boat | <input type="checkbox"/> Other: | |
| D. Ecological | | | |
| D1. Considerations | <input type="checkbox"/> Important Habitat | <input type="checkbox"/> Rare Species | <input type="checkbox"/> Birds |
| | <input type="checkbox"/> Marine Life | <input type="checkbox"/> Dunes | <input type="checkbox"/> Breeding Area |
| | <input type="checkbox"/> Statutory Designation | | |
| | Description: | | |

| SCAT Form | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|--|---|---|---|---|---|------------------|-------------------|------------------|----|-----------|----------------------------|----|--------|-----------------|-------|----------------------|---|----|----------|--|----|-----------------|---|----|------------------|---------------------------------|----|-----------------|------------------|
| G. Surface Oiling Record | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G1. Band | A | B | C | D | E | F | | | | | | | | | | | | | | | | | | | | | | | | |
| G2. Area Length | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G3. Area Width | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G4. Distribution | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G5. Thickness | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G6. Character | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G7. Tidal Zone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Surface Oiling Key | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G1. Band | As depicted on the sketch map with alphabetic identifiers (A,B,C..) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G2. Area Length | Length of the oiled area at each zone (m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G3. Area Width | Width of the oiled area at each zone. If there are multiple bands of oil across the shore, the width represents the sum of them (m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G4. Distribution | <p>The percentage of the surface within a band covered by oil, visual estimation below:</p> <p>The key shows three rows of patterns representing different oil types: TO (Thick Oil), CV (Cover), and CT (Coat). Each row has eight boxes corresponding to the percentage ranges: <10%, 20%, 30%, 40%, 50%, 60%, 70%, and >80%. The patterns become increasingly dense and dark as the percentage increases.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G5. Thickness | <p>Average or dominant thickness of the oil within an area:</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Category</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>TO</td> <td>Thick Oil</td> <td>> 1cm thick</td> </tr> <tr> <td>CV</td> <td>Cover</td> <td>1mm - 1cm thick</td> </tr> <tr> <td>CT</td> <td>Coat</td> <td>0.1mm - 1mm thick (can be scratched off rock with fingernail)</td> </tr> <tr> <td>ST</td> <td>Stain</td> <td>< 0.1mm thick (cannot be scratched off easily)</td> </tr> <tr> <td>FL</td> <td>Film</td> <td>Transparent / translucent film or sheen</td> </tr> </tbody> </table> | | | | | | Value | Category | Definition | TO | Thick Oil | > 1cm thick | CV | Cover | 1mm - 1cm thick | CT | Coat | 0.1mm - 1mm thick (can be scratched off rock with fingernail) | ST | Stain | < 0.1mm thick (cannot be scratched off easily) | FL | Film | Transparent / translucent film or sheen | | | | | | |
| Value | Category | Definition | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TO | Thick Oil | > 1cm thick | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CV | Cover | 1mm - 1cm thick | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CT | Coat | 0.1mm - 1mm thick (can be scratched off rock with fingernail) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ST | Stain | < 0.1mm thick (cannot be scratched off easily) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FL | Film | Transparent / translucent film or sheen | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G6. Character | <p>Average or dominant characteristics of the oil within an area:</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Category</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>FR</td> <td>Fresh</td> <td>Unweathered, low viscosity</td> </tr> <tr> <td>MS</td> <td>Mousse</td> <td>Emulsified</td> </tr> <tr> <td>TB/PT</td> <td>Tar Balls or Patties</td> <td>Balls <10cm; Patties >10cm</td> </tr> <tr> <td>TC</td> <td>Tar Coat</td> <td>Weathered coat or cover</td> </tr> <tr> <td>SR</td> <td>Surface Residue</td> <td>Non-cohesive, oiled surface sediments.</td> </tr> <tr> <td>AP</td> <td>Asphalt Pavement</td> <td>Cohesive mix of oil & sediment.</td> </tr> <tr> <td>NO</td> <td>No Oil Observed</td> <td>No oil observed.</td> </tr> </tbody> </table> | | | | | | Value | Category | Definition | FR | Fresh | Unweathered, low viscosity | MS | Mousse | Emulsified | TB/PT | Tar Balls or Patties | Balls <10cm; Patties >10cm | TC | Tar Coat | Weathered coat or cover | SR | Surface Residue | Non-cohesive, oiled surface sediments. | AP | Asphalt Pavement | Cohesive mix of oil & sediment. | NO | No Oil Observed | No oil observed. |
| Value | Category | Definition | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FR | Fresh | Unweathered, low viscosity | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MS | Mousse | Emulsified | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TB/PT | Tar Balls or Patties | Balls <10cm; Patties >10cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TC | Tar Coat | Weathered coat or cover | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SR | Surface Residue | Non-cohesive, oiled surface sediments. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AP | Asphalt Pavement | Cohesive mix of oil & sediment. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NO | No Oil Observed | No oil observed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G7. Zone | <p>Refers to the height of the oil on the shoreline:</p> <table border="1"> <tr> <td>US = Upper Shore</td> <td>MS = Middle Shore</td> <td>LS = Lower Shore</td> </tr> </table> | | | | | | US = Upper Shore | MS = Middle Shore | LS = Lower Shore | | | | | | | | | | | | | | | | | | | | | |
| US = Upper Shore | MS = Middle Shore | LS = Lower Shore | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SCAT Form

H. Subsurface Oiling Record

| H1. Pit | #1 | | #2 | | #3 | | #4 | | #5 | | #6 | |
|----------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|
| H2. Penetration Depth (cm) | | | | | | | | | | | | |
| H3. Penetration Range (cm) | | | | | | | | | | | | |
| H4. Concentration | | | | | | | | | | | | |
| H5. Samples | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| H6. Sample Label | | | | | | | | | | | | |

Subsurface Oiling Key

| H1. Pit | As depicted on the sketch map with numeric identifiers (1,2,3..) | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|--|--|----------|------------|-----|-----------------------------|--|----|------------------|---|----|------------------------|---|----|-------------|---|----|----------------|---|----|-------|--|----|--------|--------------------------------------|
| H2. Penetration Depth (cm) | Depth of the pit used to sample the oil. | | | | | | | | | | | | | | | | | | | | | | | | |
| H3. Penetration Range (cm) | Depth range within the pit used to sample the oil. | | | | | | | | | | | | | | | | | | | | | | | | |
| H4. Concentration | <p>Average or dominant characteristics of the oil within the sample:</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Category</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>SAP</td> <td>Subsurface Asphalt Pavement</td> <td>Cohesive sediment/weathered oil mixture.</td> </tr> <tr> <td>OP</td> <td>Oil-filled Pores</td> <td>Pore spaces in the sediment matrix filled with oil.</td> </tr> <tr> <td>PP</td> <td>Partially Filled Pores</td> <td>Pore spaces filled with oil (oil flows out of sediment when disturbed).</td> </tr> <tr> <td>OR</td> <td>Oil Residue</td> <td>Cover (>0.1 - 1 cm) or Coat (0.01 - <0.1cm) of oil residue on sediments.</td> </tr> <tr> <td>OF</td> <td>Oil Film/Stain</td> <td>Stain (<0.01 cm) or film oil residue on the sediment surfaces. Non cohesive.</td> </tr> <tr> <td>TR</td> <td>Trace</td> <td>Discontinuous film or spots of oil on sediments or tackiness with no visible evidence of oil</td> </tr> <tr> <td>NO</td> <td>No Oil</td> <td>No visible or apparent trace of oil.</td> </tr> </tbody> </table> | Value | Category | Definition | SAP | Subsurface Asphalt Pavement | Cohesive sediment/weathered oil mixture. | OP | Oil-filled Pores | Pore spaces in the sediment matrix filled with oil. | PP | Partially Filled Pores | Pore spaces filled with oil (oil flows out of sediment when disturbed). | OR | Oil Residue | Cover (>0.1 - 1 cm) or Coat (0.01 - <0.1cm) of oil residue on sediments. | OF | Oil Film/Stain | Stain (<0.01 cm) or film oil residue on the sediment surfaces. Non cohesive. | TR | Trace | Discontinuous film or spots of oil on sediments or tackiness with no visible evidence of oil | NO | No Oil | No visible or apparent trace of oil. |
| Value | Category | Definition | | | | | | | | | | | | | | | | | | | | | | | |
| SAP | Subsurface Asphalt Pavement | Cohesive sediment/weathered oil mixture. | | | | | | | | | | | | | | | | | | | | | | | |
| OP | Oil-filled Pores | Pore spaces in the sediment matrix filled with oil. | | | | | | | | | | | | | | | | | | | | | | | |
| PP | Partially Filled Pores | Pore spaces filled with oil (oil flows out of sediment when disturbed). | | | | | | | | | | | | | | | | | | | | | | | |
| OR | Oil Residue | Cover (>0.1 - 1 cm) or Coat (0.01 - <0.1cm) of oil residue on sediments. | | | | | | | | | | | | | | | | | | | | | | | |
| OF | Oil Film/Stain | Stain (<0.01 cm) or film oil residue on the sediment surfaces. Non cohesive. | | | | | | | | | | | | | | | | | | | | | | | |
| TR | Trace | Discontinuous film or spots of oil on sediments or tackiness with no visible evidence of oil | | | | | | | | | | | | | | | | | | | | | | | |
| NO | No Oil | No visible or apparent trace of oil. | | | | | | | | | | | | | | | | | | | | | | | |
| H5. Samples | Were samples of the sediment taken for further analysis? | | | | | | | | | | | | | | | | | | | | | | | | |
| H6. Sample Label | What was the label code? | | | | | | | | | | | | | | | | | | | | | | | | |

I. Summary of Proposed Action

Following the site evaluation what clean up strategy is proposed:

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Site Safety Operational Form

| Site Safety Operational Form | | | |
|------------------------------|--|---|---|
| Incident: | | | |
| Site Name: | | | |
| Location: | | | |
| Surveyor Name: | | | |
| Surveyed By: | <input type="checkbox"/> Foot | <input type="checkbox"/> Boat | <input type="checkbox"/> Air |
| Date: | | Time: | |
| A. Weather Conditions | | | |
| A1. Temperature | <input type="checkbox"/> Hot | <input type="checkbox"/> Warm | <input type="checkbox"/> Cold |
| A2. Wind Speed | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| A3. Wind Direction | | | |
| A4. Cloud Cover | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| A5. Precipitation | <input type="checkbox"/> High | <input type="checkbox"/> Low | <input type="checkbox"/> Non |
| A6. Humidity | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Cold |
| B. Sea Conditions | | | |
| B1. Wave Height | <input type="checkbox"/> High | <input type="checkbox"/> Moderate | <input type="checkbox"/> Low |
| B2. Sea Dynamics | <input type="checkbox"/> Calm | <input type="checkbox"/> Moderate | <input type="checkbox"/> Rough |
| B3. Tide Times | Low Water Time | | High Water Time |
| C. Shoreline Features | | | |
| C1. Shoreline Type | <input type="checkbox"/> Cliffs | <input type="checkbox"/> Bedrock | <input type="checkbox"/> Boulders (> 10 cm) |
| | <input type="checkbox"/> Pebbles (1 - 10cm) | <input type="checkbox"/> Gravel (2mm - 1cm) | <input type="checkbox"/> Sand |
| | <input type="checkbox"/> Mud | <input type="checkbox"/> Sea Defence | <input type="checkbox"/> Marsh/Mangrove |
| | <input type="checkbox"/> Docks | <input type="checkbox"/> Other: | |
| C2. Shoreline Use | <input type="checkbox"/> Commercial | <input type="checkbox"/> Industrial | <input type="checkbox"/> Farming |
| | <input type="checkbox"/> Public | <input type="checkbox"/> Recreational | <input type="checkbox"/> Residential |
| | <input type="checkbox"/> Other: | | |
| C3. Load Bearing | <input type="checkbox"/> Firm | <input type="checkbox"/> Soft | <input type="checkbox"/> Very Soft |
| C4. Shoreline Access | <input type="checkbox"/> Metalled Road | <input type="checkbox"/> Track | <input type="checkbox"/> Pathway |
| | <input type="checkbox"/> Steps | <input type="checkbox"/> Slipway | <input type="checkbox"/> Car Park |
| | <input type="checkbox"/> Boat | <input type="checkbox"/> Other: | |
| D. Ecological | | | |
| D1. Considerations | <input type="checkbox"/> Important Habitat | <input type="checkbox"/> Rare Species | <input type="checkbox"/> Birds |
| | <input type="checkbox"/> Marine Life | <input type="checkbox"/> Dunes | <input type="checkbox"/> Breeding Area |
| | <input type="checkbox"/> Statutory Designation | | |
| | Description: | | |

| Site Safety Operational Form | | | |
|----------------------------------|---|---|---|
| E. Storage/Parking | | | |
| E1. Parking Areas | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |
| E2. Equipment/Waste | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |
| E3. Security | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Required |
| | Description: | | |
| F. Planned Operation(s) | | | |
| F1. Operation(s) | <input type="checkbox"/> Containment | <input type="checkbox"/> Protection Booming | <input type="checkbox"/> Equipment Recovery |
| | <input type="checkbox"/> Manual Recovery | <input type="checkbox"/> Heavy Plant | <input type="checkbox"/> Vacuum Recovery |
| | <input type="checkbox"/> Shoreline Survey | <input type="checkbox"/> Open Water Survey | <input type="checkbox"/> Waste Extraction |
| | <input type="checkbox"/> Trenching | <input type="checkbox"/> Other: | |
| G. Hazards | | | |
| G1. Identified Hazards | <input type="checkbox"/> Boot Safety | <input type="checkbox"/> Chemical Hazard | <input type="checkbox"/> Cold |
| | <input type="checkbox"/> Heat | <input type="checkbox"/> Electrical Hazard | <input type="checkbox"/> Endemic Diseases |
| | <input type="checkbox"/> Equipment Ops | <input type="checkbox"/> Fatigue | <input type="checkbox"/> Fire, Explosion |
| | <input type="checkbox"/> Fumes | <input type="checkbox"/> Drum Handling | <input type="checkbox"/> Helicopter |
| | <input type="checkbox"/> Humidity | <input type="checkbox"/> Insects/animals | <input type="checkbox"/> Lifting |
| | <input type="checkbox"/> Manual Handling | <input type="checkbox"/> Motor Vehicles | <input type="checkbox"/> Noise |
| | <input type="checkbox"/> Overhead Utilities | <input type="checkbox"/> Open Water | <input type="checkbox"/> Pumps and Hoses |
| | <input type="checkbox"/> Slips, trips and falls | <input type="checkbox"/> Steam & hot water | <input type="checkbox"/> Tides |
| | <input type="checkbox"/> Trenches | <input type="checkbox"/> UV Radiation | <input type="checkbox"/> Heavy Plant |
| | <input type="checkbox"/> Weather | <input type="checkbox"/> Visibility | <input type="checkbox"/> Other: |
| H. Safety | | | |
| H1. Air Monitoring | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |
| H2. PPE | <input type="checkbox"/> Foot Protection | <input type="checkbox"/> Impervious Suits | <input type="checkbox"/> Eye Protection |
| | <input type="checkbox"/> Coveralls | <input type="checkbox"/> Ear Protection | <input type="checkbox"/> Head Protection |
| | <input type="checkbox"/> Life Jacket | <input type="checkbox"/> High Visibility | <input type="checkbox"/> Hand Protection |
| | <input type="checkbox"/> Respirator | <input type="checkbox"/> Other: | |
| H3. Site Facilities Required | <input type="checkbox"/> Sanitation | <input type="checkbox"/> First Aid | <input type="checkbox"/> Decontamination |
| H4. Emergency Plan Requirements | <input type="checkbox"/> Alarm System | | <input type="checkbox"/> Evacuation Plan |
| I. Additional Notes/Requirements | | | |
| | | | |

Site Safety Briefing Sheet

| Site Safety Briefing Sheet | |
|--------------------------------|--------------------------|
| Incident: | Project Code: |
| Site Name: | Location: |
| Date: | Time: |
| Briefing Conducted By: | |
| Topics Covered: | |
| Weather | <input type="checkbox"/> |
| Injuries and illness | <input type="checkbox"/> |
| Corrective actions/precautions | <input type="checkbox"/> |
| First Aid | <input type="checkbox"/> |
| Site emergency plan | <input type="checkbox"/> |
| Site hazards | <input type="checkbox"/> |
| Oil/chemical hazards | <input type="checkbox"/> |
| PPE to be worn | <input type="checkbox"/> |
| Decontamination procedures | <input type="checkbox"/> |
| Other Topics (listed below) | <input type="checkbox"/> |
| Comments: | |

Situational Display Boards

| Incident Information | | | | | | | |
|---|---------------------|--|-----------------|-----------------------|--------------|--|--|
| Date: | | | | | | | |
| Incident Name: | | | | | | | |
| Date and Time Incident Occurred: | | | | | | | |
| Incident Location: | | | | | | | |
| Affected Asset/facility/vessel: | | | | | | | |
| Nature of Incident: | | | | | | | |
| Description of Incident: | | | | | | | |
| Status of Personnel: | POB: | | | Accounted for: | | | |
| | Unaccounted: | | Injured: | | Dead: | | |
| Facility Evacuation: | | | | | | | |
| Status of Source: | | | | | | | |
| Pollution Product: | | | | | | | |
| Volume/Quantity Spilt: | | | | | | | |
| Quantity Still at Risk: | | | | | | | |
| Location/Weather Information | | | | | | | |
| Time: | | | | | | | |
| Weather: | | | | | | | |
| Sunrise: | | | | Sunset: | | | |
| Low Tide: | | | | High Tide: | | | |

| Incident Status Update | | |
|---|----------------------------|------------|
| Incident Name: | | |
| Time of Last Update: | | |
| Status of Source: | | |
| Volume/Quantity of Pollutant Recovered: | | |
| At Sea: | | |
| Shoreline: | | |
| Other: | | |
| Impact to Shoreline: | | |
| Location/s: | Estimated Volume/Quantity: | |
| | | |
| Impact to Wildlife: | | |
| Species: | Location: | Recovered: |
| | | |

| Health and Safety | | |
|--------------------|---------------|-------------|
| Incident Area/Task | Hazards/Risks | Mitigations |
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| Objectives | | |
|------------------------|----------|--------|
| People | | |
| Environment | | |
| Assets | | |
| Reputation | | |
| Strategies and Tactics | | |
| Location | Strategy | Tactic |
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| Environmental and Socio-economic Considerations | | |
|---|----------|----------------|
| Name | Location | Considerations |
| | | |

Annex 7 – Modelling Tools

ZE BBT have access to the National Oceanic and Atmospheric Administration (NOAA) ADIOS¹² (Automated Data Inquiry for Oil Spills) software. ADIOS is an oil weathering model that assesses how different types of oil weather in the marine environment. Working from a database of more than a thousand different crude oils and refined products, ADIOS is able to estimate the expected characteristics and behaviours of spilled products using basic geo-physical data such as; wind speed(s), wave heights, water temperature, water salinity; the type and amount of oil or product spilled; and the rate and duration of the release.

Through their SLA with OSRL, ZE BBT also have access to trajectory and stochastic services for surface or subsurface oil spills on request, and backtrack services for surface oil spills using commercial modelling software:

- Oil Spill Information System (OSIS)
- OILMAP
- Oil Spill Contingency and Response Model (OSCAR)

Additionally, ZE have access to the IRCG modelling capacity within MRCC as a redundancy measure should it be required.

¹² [ADIOS | response.restoration.noaa.gov](https://response.restoration.noaa.gov)