SOHAR PORT / FREEZONE

OIL POLLUTION EMERGENCY PLAN

TENANTS, PORT USERS & STAKEHOLDERS EDITION

Version 3
December 2020

OIL POLLUTION EMERGENCY PLAN

TENANTS, PORT USERS & STAKEHOLDERS EDITION

PORT COMMON AREAS
SOHAR INDUSTRIAL PORT

Prepared By:
OMAN PESCO L.L.C.

December 2020

Contents

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Prepared by	OMAN PESCO L.L.C. for Sohar Industrial Port Company S.A.O.C.
Reviewed by	HSE Manager
Reviewed by	Harbour Master
Management Approval	Executive Manager Corporate Affairs

Revision Control

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D1	**20.02.2013**	E.D	J.I	A.N	Internal Review
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STRATEGY

Contents

1. Strategy

1.1 Introduction

1.1.1 Statement of Policy

In the event of a spill within the common areas in the area of jurisdiction of the Sohar Industrial Port, Sohar Industrial Port Company (SIPC) will be responsible for the overall coordination of the spill response in compliance with the SIPC Health, Safety and Environmental Policy (See Figures 1.a and 1.b) and to the satisfaction of concerned authorities and statutory bodies.

1.1.2 Scope of the Plan

This Oil Spill Contingency Plan is designed to guide the Sohar Industrial Port Company (SIPC) and Sohar Industrial Port (SIP) Tenants' response personnel through the processes required to manage an oil spill originating from operations within -or- approaching the Port's area of jurisdiction.

In order to ensure best industry practices are upheld, this plan has been written in the format stipulated by the Oil Pollution Preparedness, Response and Co-operation Convention (OPRC 90) legislation. The convention, adopted by the International Maritime Organisation (IMO) is aimed to "mitigate the consequences of major oil pollution incidents involving, in particular, ships, offshore units, seaports and oil handling facilities.

The requirement to have an Oil Spill Contingency Plan for Ports and Oil Handling Terminals within Omani territorial waters has been formalised by Article 10 - Chapter 2 of the Royal Decree issuing the Law on Conservation of Environment and Prevention of Pollution, Royal Decree 114 of 2001 (RD 114/2001).

The Environment Authority (EA) is responsible for applying the regulations to Ports, Harbours and Offshore Oil and Gas operations within the Omani Territorial Waters and Exclusive Economic Zone (see Figure 2) in addition to the approval of Oil Spill Contingency Plans.

This plan is designed to initiate an appropriate oil spill response in the event of an incident within its area of coverage. It details a tiered response strategy that takes into account the spill risk associated with the operation; the nature of the hydrocarbons that could be spilled; the prevailing meteorological and hydrographic conditions and the environmental sensitivity of the surrounding areas.

This plan is specifically designed to cover general port operations, either maritime or onshore, within the port basin and the common-use zones within the area of jurisdiction of SIPC. Activities within Tenants' facilities are excluded from this plan. Such activities shall be covered under the individual Oil Spill Contingency Plans of the respective tenants.

Figure 1(a): SIPC Health, Safety and Environmental Policy

SOHAR PORT / FREEZONE

HSE Policy

Environmental Vision

It is the vision to create, and maintain, a Sohar Industrial Port Complex that is healthy, safe, secure and environmentally friendly for the industries, its employees, visitors and the surrounding population and nature. The hazards that will possibly occur will be identified. The impacts of its activities on the health, safety and the social and natural environment will be minimalized according to the Oman law or good international practice. Good operational practices of the activities within the SIP-Area will ensure the protection of human life and health, the natural environment and the property in and around the SIP-area.

Safety is the condition of being protected against failure, damage, error, accidents, or harm. Protection involves here both causing and exposure.
The principle standards for regulation of safety in the SIP-Area are:

Royal Oman Policy Directive of Civil Defence rules and regulations

Principles of Seveso II and UK COMAH, describing procedure for Quantitative Risk Assessment and design of a Contingency Plan

Road Safety

SIP road safety standard is that all drivers, vehicles and equipment shall comply with the road traffic laws of Oman and ROP traffic rules and regulations. For the Common Areas, and the roads therein, traffic rules is in force to ensure safe traffic and Trespassers will have to be prosecuted. Royal Oman Police started patrolling in SIP-Area from 2009.

Labor Camps

Policy is that as from first January 2007 when industrial operational activities in the SIP-Area are well underway no labor camps for construction activities are permitted in SIP-Area.

Dangerous Goods

Dangerous goods are substances which pose risk to health, safety, property or the environment during operation and/or transportation. All of these substances are divided in classes in accordance to the specific chemical characteristics resulting in a degree of danger.

Related law and rules which are regulating the use and handle dangerous goods in the SIP-Area are:

IMO- IMDG-Code Royal Decree nr 46/1995, Handling and use of chemicals

Ministerial Decision 248/97, Registration of Hazardous Chemical Substances and the relevant permits

Ministerial Decisions 249/97, Control and management of Radioactive Materials

Ministerial Decision 317/2001, Packing and labeling of hazardous chemicals

All Vessels have the obligation to report Dangerous Goods to Harbour Master Office SIPC by Vessel Notification System. In the Contingency Plans of the tenants are listed the dangerous installations/substances.

Figure 1(b): SIPC Health, Safety and Environmental Policy (Continued)

Radioactive Activity

Standard for use of radio-active materials in the SIP-Area is identical with the standard in Oman. Controls for protecting persons against exposure to ionizing radiation shall be aimed at minimizing the time of exposure, maximizing the distance from the radiation source and ensuring maximum shielding. Legal requirements for the import, transport, storage or use of radioactive materials in the Sultanate of Oman are established by:

Ministerial Decision 249/97 "Regulations for the Control and Management of Radioactive Materials".

In the SIP-Area import of scrap can be hazardous as to possible presence of radio-active materials. For the importing and handling of scrap is valid:

Procedure Scrap and Radio-activity MRMEWR 1-1-2005

Above this procedure SIPC requires from the scrap importing party a Contingency Plan, as well as a guarantee sum, for the solving of problems should they occur.

Construction Activities

Constructions in the SIP-Area should adhere to the applicable Oman laws and regulations. For the construction activities on a Plot in the framework of a Work Permit a HSE-Plan should be handed over to SIPC. SIPC expects these HSE-Plans for Constructions to implement good international practices as to identification of hazards, containment measures and monitoring systems. Occupational Health and Safety as per Oman law should be adhered too. Adequate measures as to working hours, de-hydratation and other health related issues should be in place, as well as sufficient and adequate personal protection equipments for employees exposed to hazards involved with the Work. All construction activities should be executed only after a SIPC permit has been issued for the construction activity. This permit system is part of SIP R&R Industrial Area.

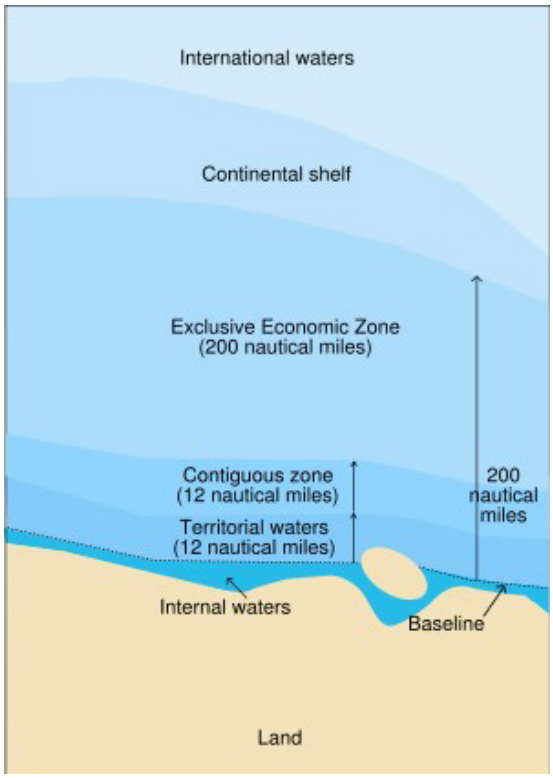
SIPC and Health

According to the Concession Agreement, SIPC evaluated the usefulness of Common Facilities as a Health Center and a Hospital. This is done in co-operation with the tenants and the Ministries of Health and Manpower in the Task Force Health. In co-operation between tenants and the Ministry of Health a request for proposal has been given to three pre-selected companies on May 31, 2006 and based the taskforce evaluation Badr Al-Samaa was selected to be the provider of a health services clinic in the SIP Area. The polyclinic started operation on 11th June 2008; it is located in plot 33. The polyclinic has a pharmacy and there is always a doctor and two nurses present at clinic. The clinic will be open for 24 hours every day of the week with ambulances.

For all enquiries to Sohar Environmental Unit, please email HSSEnquiries@portofsohar.com

Source: http://www.portofsohar.com/hse-policy

Figure 2: Map illustrating the terrestrial Water and Exclusive Economic Zone



Consultation Process

This document has been compiled in consultation with the Environment Authority (EA), who under RD 114/2001 complemented by RD 90/2007, is responsible for establishing a national system for responding promptly and effectively to oil pollution incidents; in particular:

- EA is the competent national authority with responsibility for oil pollution preparedness and response;
- EA is the contact point for the ultimate receipt of oil pollution report(s);
- EA is the authority, which is entitled to act on behalf of the Government of the Sultanate of Oman to request assistance from external sources or decide whether to render assistance when requested by a neighbouring state.
- EA is responsible for preparing the National Oil Spill Contingency Plan and keeping it up-to-date;
- EA is the government agency responsible for the co-ordination of Oman's policy on oil spill preparedness and response;
- EA is responsible for administrating the Environment Protection Fund; and
- EA can call on government and foreign funds, such as GEF (Global Environment Fund) to support environmentalprojects.

1.1.3 Plan Format

This plan is written in three distinct sections:

Section 1: Strategy

This section illustrates to consultees the purpose and scope of the plan, concentrating on the Port's geographical location and area of jurisdiction. It clearly defines the roles and responsibilities of individuals, statutory and non-statutory organizations in the event of an incident.

Section 2: Actions and Operations

The actions and operations section contains all emergency procedures and information required to activate a rapid and organised response that is proportional to the size of a spill. Data includes report forms, notification procedures and communication networks prompted by action sheets designated to key individuals assigned specific roles.

Section 3: Data Directory

The data directory contains additional supplementary information, cross-referenced with Section 2, required to assist response operations. Specifically, the section includes a contact directory, oil spill response resources list, surveillance and quantification techniques, use of the dispersant, containment and recovery operations and considerations, health and safety issues and waste disposal issues.

1.1.4 SOHAR Port General Information

SOHAR Port is a deep seaport in the Middle East situated in the Sultanate of Oman, 220 KM northwest of its capital Muscat. The management of this industrial port lies with Sohar Industrial Port Company SAOC (SIPC), a 50/50 joint venture between the Government of Oman and the Port of Rotterdam.

The original agreement between the two parties was signed in 2002 and the first industrial developments started in 2004. Today, the port is fully operational with state-of-the-art facilities and terminals. With current investments exceeding $27billion, it is one of the world's largest port development projects.

SOHAR Port houses three clusters: logistics, petrochemicals, metals and utilities. World-leading companies are established in SOHAR Port. The independent terminals are operated by a multitude of world-class leading companies.

Figure 3: SOHAR Port General View

Figure 4: SOHAR Port – General Layout

1.1.5 Area of Operations

SOHAR Port is located in the northern part of Oman, 220 KM to the Northeast of the capital Muscat. This deep-sea port is sited on the Gulf of Oman, Latitude 24° 30' 15" N, 56° 36' 37" E.

SOHAR Port Anchorage positions are located at the following coordinates:

- 24˚ 36, 0 N 56˚ 38, 5 E
- 24˚ 35, 6 N 56˚ 39, 0 E
- 24˚ 35, 3 N 56˚ 38, 5 E
- 24˚ 35, 0 N 56˚ 39, 0 E
- 24˚ 34, 4 N 56˚ 38, 5 E
- 24˚ 36, 0 N 56˚ 40, 0 E
- 24˚ 35, 0 N 56˚ 40, 0 E
- 24˚ 34, 4 N 56˚ 40, 0 E
- 24˚ 35, 5 N 56˚ 41, 0 E
- 24˚ 36, 0 N 56˚ 42, 0 E

The Pilot Station is located at: 24˚ 33, 3 N , 56˚ 37, 7 E

1.1.6 Tiered Response Structure

For the purposes of this plan, the tiered response structure depicted in the Emergency Response Plan of SIPC has been adopted. The structure adopted is in line with the globally accepted tier definition that takes into consideration the extent and sensitivity of the area affected as well as the potential consequences of the incident.

In order to warrant efficient crisis management three tiers of response are prepared. An important feature of this system is that an incident can be elevated swiftly and efficiently from one tier to another should the severity of the crisis escalate.

Procedures are designed to provide the immediate prepared response at any of these three tiers:

i **Tier 1:** Incidents in this category are likely to have minor local consequences. They can be contained entirely within a tenant facility with tenant resources and may require assistance from local emergency services. These are local problems posing minimal threat to safety and the environment and have remote potential for escalation.

No action is required by SIPC beyond routine coordination related to matters such as site access. The incident is to be reported to SIPC immediately so that they have first hand reliable knowledge of the situation and will not be misled by rumour. There is no impact or effect outside the tenant facility other than issues such as ambulance access. No action is required by parties at SIP other than the tenant involved. Systems can be made ready in anticipation of a possible escalation to Tier 2at the discretion of SIPC if that seems a possibility. SIPC in coordination with the ROP will monitor the incident to its conclusion.

ii **Tier 2:** An incident in this category has the potential for moderate to significant damage to the facility; it will have caused or threatens to cause significant casualties and has the potential to escalate if not handled properly. The incident is likely to impact on operations, may pose a significant threat to safety and the environment and affects or is likely to affect neighbouring tenants. It cannot be concluded by the tenant without additional resources and coordination.

The initial alert of the emergency services is a tenant responsibility and the highest priority. The incident is to be reported to ROP/SIPC by the SIP 24 hour emergency number immediately. The SIPC Duty Manager is also to be informed as soon as possible. The emergency management organization will be mobilised.

iii **Tier 3:** A major incident that has catastrophic potential and has caused or threatens to cause major casualties and damage. Consequences might include multiple casualties/major fires/ explosions/toxic release/environmental damage/ significant business interruption. The incident will require response from agencies beyond the resources available within SIP, and will have an affect or potentially have an affect beyond the SIP area.

Such an incident will require an immediate alert to local authorities and to the higher authority to which SIPC is responsible. Centralised control of the passage of information and management at the appropriate level are essential when responding to this level of incident. Operations rooms need to switch to Crisis Management configuration, lines of communication established and telephones manned. The emergency services and other agencies outside SIP will become involved. Good, prompt and effective liaison, coordination and leadership are required.

IMPORTANT REMARK (1)

In the first instance it is a Tenant responsibility to designate an incident as a Tier 1, or Tier 2.

SIPC or ROP-CG may re-designate a Tier 1 as Tier 2 should commanders consider that is required in order to guarantee the appropriate response.

SIPC and ROP-CG both have the authority escalate an incident further to Tier 3.

This is an important decision. Inappropriate designation can be costly, risk negative publicity and cause unnecessary alarm, but delays may generate the risk of the incident running out of control.

1.1.7 Roles and Responsibilities

Within the Sultanate of Oman there is an adopted structure and procedure for response to marine oil spills, which clearly defines the roles and responsibilities of the Industry and the Government of the Sultanate of Oman.

- **Statutory Bodies**

  The passing of information between SIPC and SEU/EA enables an assessment of the situation to be made, allowing the extent of the pollution to be determined and the possible environmental implications to be established, before a strategy plan is formalised and clean up operations commence.

  In addition to that, and as per the SIPC Emergency Response Plan (ERP), the Royal Oman Police (ROP) has overall responsibility for control of Tier 2 and 3 Emergencies. ROP-CG (ROP – Coast Guard) has officers permanently on duty at Sohar to provide a first line emergency response coordination function.

  ROP-CG has primary command authority of incidents and emergencies within the SIP area. In this function ROP-CG has command responsibility to their National Authorities.

IMPORTANT REMARK (2)

Royal Decree 3/2013 establishes the Public Authority for Civil Defence and Ambulance services as a separate entity from the ROP. As of the date of the issue of this OPEP, the transition from the old framework to the new one established by RD 3/2013 has not been completed. There is currently no information as to the expected data of completion of the transition. As such, this plan has been designed according to the existing framework. As soon as the transition is completed, this OPEP shall be revised to reflect the statutory changes.

- **Sohar Industrial Port Company (SIPC)**

  SIPC has a responsibility to ensure the provision of a prepared response to an emergency situation within the SIP. This will include measures for the initial report of the onset of the crisis, ensuring first responders have been alerted, and coordinating and providing support that may be required appropriate to SIPC's response role.

  SIPC has responsibility for common areas and unoccupied plots within SIP. Tenants have responsibility for their own sites.

  SIPC is committed to respond effectively and promptly to emergency situations with the cooperation of all those concerned.

  Specialist resources for handling emergency situations are owned and controlled by an assortment of entities. These include the tenants, local emergency services, the ROP, armed forces and by a number of other agencies and private companies in the region.

  Working under the operational command umbrella of ROP-CG, SIPC has responsibility for operational control and coordination of activity within the SIP site. This includes marine and landward activities. This function is conducted through the SIPC Crisis Management Team (CMT)

  The Harbour Master has the overall responsibility on all aspects pertaining to marine safety.

- **SIPC Tenants**

  It is the responsibility of the respective Tenants to ensure that, as far as reasonably practicable, safe operations and prudent industry practices are adhered in all activities and operations that take place in Tenant plots. Moreover, and in line with statutory requirements, Tenants shall ensure that necessary counter spill measures are in place to mount initial response to oil spill incidents until such time that specialist response resources are on-site. Such measures should be risk-based and commensurate with the anticipated, most credible spill scenarios.

- **Port Control Officers (PCO)**

  Port Control Officers man the Port Coordination Centre (PCC) accommodates SIPC's main 24 hour control room. The PCC's prime function is the coordination of port operations. A secondary but critical function is its status as the first reporting point to SIPC for an incident or emergency in SIP.

  The key role of the PCO is to take the first call from the 24 hour emergency line (9991), take essential first response actions and to monitor, report and inform on the incident until the appropriate managers arrive on site. Throughout the course of responding to the incident, the PCO is tasked with maintaining a log of events and relaying communications between field personnel and other stakeholders until the termination of response operations and demobilization of response resources.

- **On Scene Commander (OSC)**

  In case of an incident within the area of jurisdiction of SIPC, the responsibility for On- Scene command and hand-over of such command from one level of response to the other shall be as detailed in Table 1.

  In all cases, the OSC is in charge of overall management of the Spill and his/her responsibilities include but are not limited to the following:

  - Setting-up Incident Control Team and Site Control Room (if applicable);
  - Assuming command and establishing control of situation;
  - Notifying stakeholders and concerned parties;
  - Assessing the situation and/or obtaining a briefing from on-site personnel; and
  - Advising the Duty Manager (DM) on elevating or downgrading the level of the emergency based on the demand of the incident.

Table 1. Oil Spill Incident Command Matrix

SIPC Tier	Common Areas				Tenants' Facilities			
	On-Shore		Near/Off-Shore		On-Shore		Near Shore	
	OSC	IC`	OSC	IC	OSC	IC	OSC	IC
1*	DC Hands over to: OP	DM	DC in coordination with MSO Hands over to: OP	DM in coordination with Harbour Master	Tenant Hands over to: OP**	Tenant	Tenant Hands over to: OP	Tenant
2	ROP-CG Hands over to: OP	ROP-CG	ROP-CG Hands over to: OP	ROP-CG	ROP-CG Hands over to: OP**	ROP-CG	ROP-CG Hands over to: OP	ROP -CG
3	EA POC	NCCD / NEC	EA POC	NCCD / NEC	EA POC	NCCD / NEC	EA POC	NCCD / NEC

*This applies when the response to the incident is just by SIPC resources, OMAN PESCO and/or tenant resources. In case ROP resources respond to a tier 1 OSC and IC will be with ROP-CG .

**Unless tenant has its own contract for oil spill response.

DC : SIPC Duty Coordinator
DM : SIPC Duty Manager
OP : Oman PESCO
EA POC : Environment Authority Pollution Operation Centre
NCCD : National Committee for Civil Defence (as per National OSCP)
NEC : National Emergency Committee (as per SIPC ERP)

- **Duty Manager (DM)**

  The Duty Shift Manager will acts as the operations Coordinator. He will be responsible for coordinating the response as required by the On Scene Commander, passing information between the actual scene and the Incident Control Team to ensure a safe environment and access for the responders.

- **Duty Coordinator (DC)**

  It is the Role of the Duty Coordinator to visit the site of any incident, emergency or unforeseen event that needs to be monitored and to:

  - Immediately appraise the situation and inform the Port Coordination Centre (PCC).
  - Contact those with responsibility for the immediate situation.
  - Decide if DM needs to be informed and liaise with the PCC as necessary.

  For any incident that is categorised as an emergency of Tier 1 or above the Duty Coordinator is to remain on site maintaining a monitoring and reporting function until further instructions are received from the Duty Manager.

  As per SIPC regulations, Duty coordinators shall at all times be within 45 minutes of the SIPC Administration Building on a 24/7 basis throughout the period of their duty.

- **Crisis Management Team (CMT)**

  This team has the necessary authority and access to the command chain to make and execute major decisions. The CMT's members are:

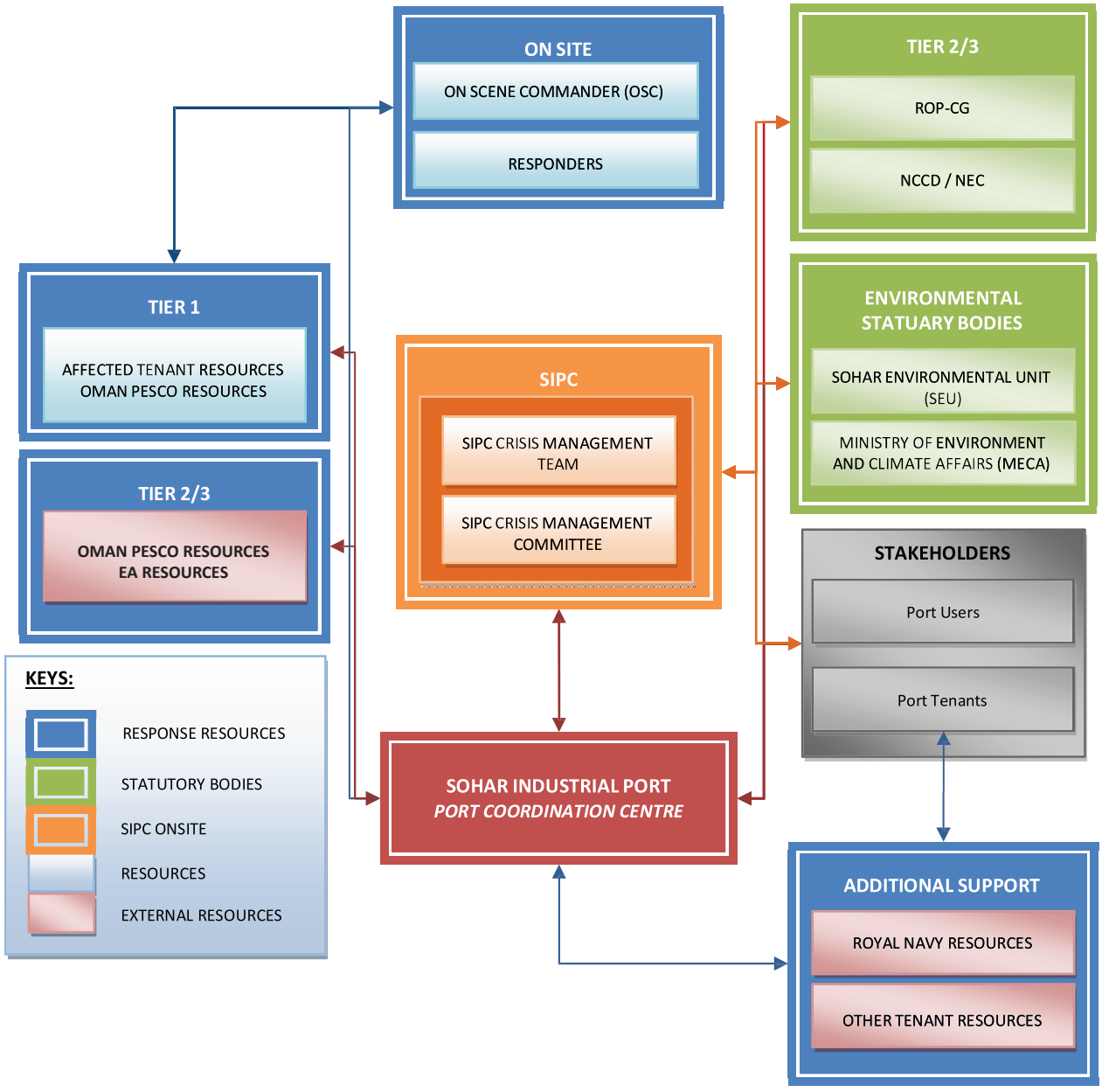
  - Chairman: CEO/DCEO SIPC.
  - Executive Manager Corporate Affairs.
  - COO SOHAR Freezone
  - Marine: HM
  - Technical: Infrastructure; routes. Exec Manager Technical Group.
  - Communication Representative: PR; Tenant communications; Info Cell.
  - Secretary.
  - DM; DC; Admin, drivers etc.
  - Co-opted members as required

- **Crisis Management Committee (CMC)**

  The function of the CMC is to draw up policies, carry out strategic coordination and communication. All those at the Sohar Industrial Port that are directly affected by the incident are represented in the Committee. The CMC's members are as follows:

  - Chair: CEO/DCEO SIPC.
  - Coordinator: Communication Representative
  - Executive Manager Corporate Affairs.
  - ROP-CG.
  - Civil Defence; Ambulance; Health (Co-opted as required.)
  - Tenant representatives (As required).
  - Co-opted members might include:
    - ROP-OGIS
    - ROP Customs
    - Tenant Representatives

Figure 5: Routes of Communication between SIPC, Stakeholders, Statutory Bodies and Response Contractor.



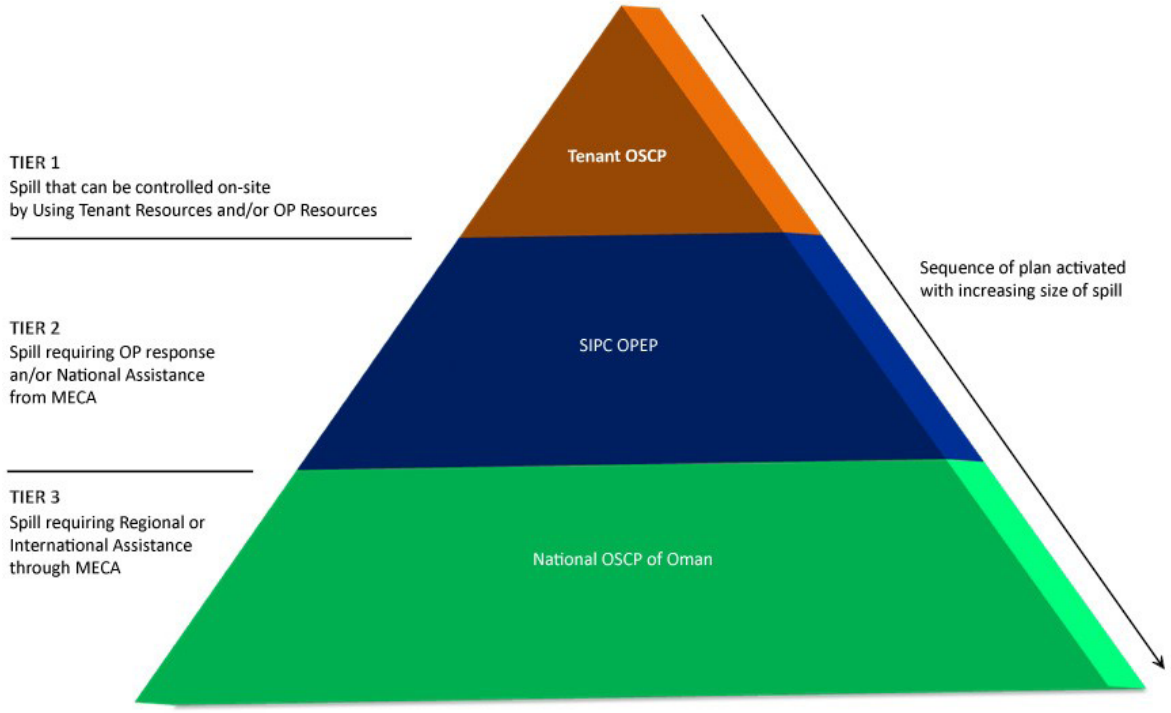
1.1.8 Interfaces with Other Emergency Plans

The procedures detailed in this plan provide guidance for dealing with the hydrocarbon pollution aspect of an emergency and assume that it is safe to undertake the spill response operation. Where a spillage is part of a wider emergency; such as fire or explosion, reference should also be made to the relevant Emergency Management Plans and Procedures.

National Oil Spill Contingency Plan (NOSCP)

Major spills that have the potential to threaten the shoreline of Oman may require the activation of the National Oil Spill Contingency Plan (NOSCP) of Oman. The governing body for the NOSCP is the Environment Authority (EA). SIPC Crisis Management Team (CMT) has the responsibility to advice EA accordingly.

Figure 6: Oil Spill Contingency Plans and Sequence of Activation.



1.2 Training

Training and exercise will be prepared to ensure that the effectiveness of response activity and implementation of SIPC Oil Spill Emergency Plan; training must be conducted regularly for On Scene Commander and the Incident Response Team in order that they may mount a credible response in the event of an oil spill.

This can be done either as a desktop exercise to verify communication procedures or by operational exercises involving deployment of personnel, equipment and materials. On completion of each exercise, an evaluation should be conducted to examine any deficiencies, which are identified and make any necessary revisions and amendments to improve the effectiveness of the plan.

Oil spill response training of key personnel will be undertaken by a presentation as detailed below. See Table 2 below:

TABLE 13 : TRAINING ON THE SPECIFIC USE OF THIS PLAN AND OIL SPILL RESPONSE

Name	Type of Training	Date Trained	Recertification Date
Anurag Tripathi	» IMO Level-1	» February, 2012	» February, 2014
Jamal Al Mamari	» IMO Level-1	» January, 2013	» January, 2015
Khalid Al Alawi	» IMO Level-1 Command and Control	» January, 2013 June, 2013	» January, 2015 » June, 2015
Khalid Al Shamsi	» IMO Level-1	» February, 2012	» February, 2014
Mohsin Al Jabri	» IMO Level-1 Command and Control	» January, 2012 June, 2013	» January, 2014 » June, 2015
Nasser Al Mawali	» IMO Level-1 Command and Control	» February, 2012 June, 2013	» February, 2014 » June, 2015
Sufian Al Mamari	» IMO Level-1	» January, 2013	» January, 2015
Tabe De Jager	» IMO Level-1 Command and Control	» February, 2012 June, 2013	» February, 2014 » June, 2015
Waleed Al Siyabi	» IMO Level-1 Command and Control	» January, 2012 June, 2013	» January, 2014 » June, 2015

It is the responsibility of SIPC to ensure all persons identified for the management of oil spill response have suitable training and are fully aware of their responsibilities under this plan.

This plan shall require periodic testing to ensure it remains effective and viable to cover the ongoing operations as detailed throughout the plan.

In addition to the list of SIPC trained staff above, a list of trained Tenant personnel is provided in the appendices section of this plan.

Vessel crews shall be trained in accordance with MARPOL 73/78 and all relevant training details retained in the Shipboard Oil Pollution Emergency Plan (SOPEP).

ACTIONS & OPERATIONS

Contents

2. Sohar Industrial Port – Oil Spill Checklist

Summary of Actions and Operations

2.0 Sohar Industrial Port – Oil Spill Checklist

2.1 Assess Situation & Initiate Initial Response

- SIPC Port Coordination Officer (PCO)
- Vessel's Master
- Tenant

↓

2.2 Decide Upon Course of Action

- SIPC-Duty Manager (DM)
- SIPC Marine Safety Officer (MSO)
- SIPC Duty Coordinator (DC)
- OMAN PESCO

↓

2.3 Notify Concerned Bodies

- SIPC-Duty Manager (DM)
- SIPC Port Coordination Officer (PCO)

↓

2.4 Request Additional Response Resources

- SIPC-Duty Manager (DM)
- SIPC Port Coordination Officer (PCO)

↓

2.5 Confirm Quantity of Spill

- On-Scene Commander
- OMAN PESCO

↓

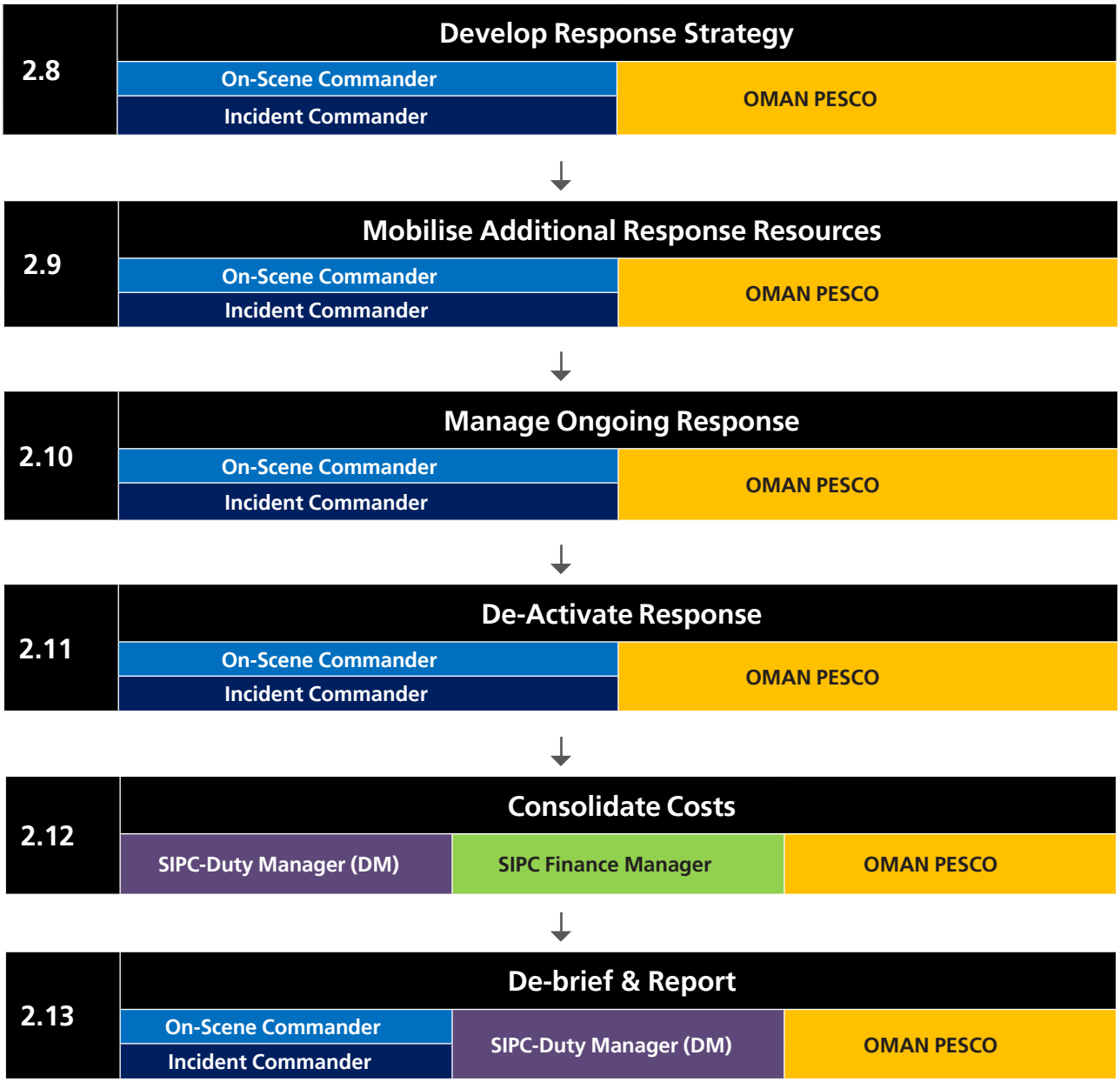
2.6 Track Spill and Forecast Fate

- On-Scene Commander
- OMAN PESCO

↓

2.7 Continue Spill Reporting

- On-Scene Commander
- OMAN PESCO


2.8
Develop Response Strategy
On-Scene Commander
Incident Commander
OMAN PESCO
2.9
Mobilise Additional Response Resources
On-Scene Commander
Incident Commander
OMAN PESCO
2.10
Manage Ongoing Response
On-Scene Commander
Incident Commander
OMAN PESCO
2.11
De-Activate Response
On-Scene Commander
Incident Commander
OMAN PESCO
2.12
Consolidate Costs
SIPC-Duty Manager (DM)
SIPC Finance Manager
OMAN PESCO
2.13
De-brief & Report
On-Scene Commander
Incident Commander
SIPC-Duty Manager (DM)
OMAN PESCO

2.1	Assess Situation & Commence Response	SIPC - (PCO)	Vessel's Master Tenant

SIPC - (PCO)	
Task No.	**Action**
1	Obtain all available information regarding the spillage from the Vessel's Master and/or Tenant.
2	Communicate with the Vessel's Master and/or Tenant in order to identify the source of the spill and confirm that the source has been isolated and secured.
3	Commence a chronological log of events. The form provided in the Appendices Section of this plan can be used.
4	Communicate with the Tenant and/or Vessel's Master to ensure that the Tenant's OPEP and/or vessel's Shipboard Oil Pollution Emergency Plan (SOPEP) have been activated.
5	Dispatch the Duty Coordinator and OMAN PESCO Representative to scene of incident as soon as possible.
6	In collaboration with the Duty Coordinator/MSO (in case of a marine spill) and OMAN PESCO, establish information regarding the incident in terms of people, environment, damage to facilities and disruption of business in order to determine the most appropriate course of action.
7	If the source has been confirmed and found to be a vessel, and after obtaining the approval of the Harbour Master, place the vessel on hold until all claims are settled or a Letter of Undertaking has been received. Please refer to Appendices for suggested Letter of Undertaking format.
8	If responsible party is known, liaise with the Harbor Master and OMAN PESCO to issue a Pollution Liability Notification. See Note 1.
Note 1	Pollution Liability Notification

Fax message

To

For the attention of

Fax

From J. Hollander

Copy to

Subject

Date
Our reference
Telephone +968 26852777
Fax +968 26852701
E-mail sps@portofsohar.com
Number of pages 1 (incl. annexes)

Herewith I inform you that a spill has occurred which polluted water and possibly infrastructure in the area of the Port of Sohar, Sultanate of Oman.

The spill was caused by a vessel of which you are the agent.

I request you to notify the master of the vessel concerned.

This message serves the purpose to establish liability. We will revert to this matter later.

For surveying purposes and cleaning you may contact the Harbourmaster mr J. Hollander, tel. 00968 26852777 (office hours). After office hours you can contact the Port Control Centre, tel. 00968 99342899

Date :
Name ship :
Also involved :
Location of the spill :
Description of the spill :

Yours sincerely,
Sohar Industrial Port Company SAOC

Mr John Hollander
Harbour Master

UNCONTROLLED COPY IF NOT SIGNED

DOCUMENT NO.	REVISION	PRINT DATE	PAGE
SIPC-MD-FM-0006	0	21/01/2009	Page 1 of 1

Vessel's Master	Tenant
Task No.	**Action**
1	In light of the spill event, make sure that all safety precautions are in place in order to ensure the safety of the facility and/or crew and vessel.
2	Activate the facility's OPEP and/or vessel's SOPEP.
3	Identify, isolate and secure the source of spill as soon as possible.
4	Deploy first response resources available to minimize damages.
5	Maintain constant communication with SIPC Port Coordination Officer.

2.2 Decide Upon Course of Action

SIPC -DM | SIPC -MSO | SIPC -DC | OMAN PESCO

SIPC-DM	SIPC-MSO	SIPC-DC	OMAN PESCO

Task No.	Action
1	In discussion with the SIPC-MSO (in case of a marine spill) and SIPC-DC in case of onshore spills, and in collaboration with OMAN PESCO, assess the resources required to provide a response proportional to the size of the spill. **See Note 2.**

Note 2

Tier 1: Response that requires monitoring or use of sorbent packs onboard the supply vessels.

Tier	Resource	Locat ion	Capability	Response Time
1	Pilot Boat / Tug Boat	Infield	Monitoring	Within 30 min.
1	OPA/IMO Absorbent Packs	Infield	Up to 10 Tonnes of Amenable Hydrocarbons	Within 30 min.
1	First Response Containment Booms	Infield	Initial Containment of oil slick	Within 30 min.

No further onshore action is required unless situation offshore deteriorates.

If the spill cannot be adequately handled utilising the Tier 1 resources of the affected Tenant and/or OMAN PESCO, a Tier 2/3 Response should be adopted. **Tier 2/3:** Response that requires the mobilisation of the oil spill response contractors, OMAN PESCO, (Tier 2/3) should be activated to provide equipment and personnel proportional to the size of the spill.

Tier	Resource	Location	Capability	Response Time
2	OMAN PESCO Response Equipment & Personnel	Sohar	Containment, Recovery and Shoreline Protection	Exe 1 hours
2/3 Support	OMAN PESCO Response Equipment & Personnel	Muscat	Containment, Recovery and Shoreline Protection	Exe 6 hours
3	EA Tier 3 Support	TBC	Tier 3 Containment, Recovery and Shoreline Protection	TBA

2.3	Notify Concerned Bodies	SIPC-DM	SIPC-PCO

SIPC-DM	SIPC-PCO
Task No.	**Action**
1	Upon instructions from the SIPC-DM, the SIPC-PCO shall EA informing them of the situation and action taken to date. Use the standard Oil Spill Incident Report form. See Note 3
2	Act as a liaison between EA, ROP-CG and SIPC throughout the course of the incident.
3	Route all communications with internal parties within SIPC and Tenants through the Port Coordination Centre.
Note 3	**Oil Spill Incident Report Form**
	

2.4	Request Additional Response Resources	SIPC-DM	SIPC-PCO

IPC-DM	SIPC-P O

Task No.	Action
1	Through the SIPC-Port Coordination Officer, contact OMAN PESCO to request additional response resources as appropriate.
2	For a Tier 2/3 spill and in agreement with ROP-CG and OMAN PESCO, request additional response support from EA.
3	Provide all available information regarding the spillage to the support provider (OMAN PESCO and/or EA)
4	Hand Over Incident Command as per the Command Matrix adopted by SIPC. ***See Note 4.***
Note 4	**SIPC OIL SPILL COMMAND MATRIX**

SIPC Tier	Common Areas				Tenants' Facilities			
	On-Shore		Near/Off-Shore		On-Shore		Near Shore	
	OSC	*IC`*	*OSC*	*IC*	*OSC*	*IC*	*OSC*	*IC*
1*	DC Hands over to: OP	DM	DC in coordination with MSO Hands over to: OP	DM in coordination with Harbour Master	Tenant Hands over to: OP**	Tenant	Tenant Hands over to: OP	Tenant
2	ROP-CG Hands over to: OP	ROP-CG	ROP-CG Hands over to: OP	ROP-CG	ROP-CG Hands over to: OP**	ROP-CG	ROP-CG Hands over to: OP	ROP -CG
3	MECA POC	NCCD / NEC	MECA POC	NCCD / NEC	MECA POC	NCCD / NEC	MECA POC	NCCD / NEC

*This applies when the response to the incident is just by SIPC resources, OMAN PESCO and/or tenant resources. In case ROP resources respond to a tier 1 OSC and IC will be with ROP-CG .

**Unless tenant has its own contract for oil spill response.

DC : SIPC Duty Coordinator
DM : SIPC Duty Manager
OP : Oman PESCO
MECA POC : Ministry of Environment and Climate Affairs Pollution Operation Centre
NCCD : National Committee for Civil Defence (as per National OSCP)
NEC : National Emergency Committee (as per SIPC ERP)

2.5	Confirm Quantity of Spill	On-Scene Commander	OMAN PESCO

On-Scene Commander	OMAN PESCO
Task No.	**Action**
1	In discussion with OMAN PESCO determine whether quantification of the spill utilising Techniques 1 & 2 observations from vessels detailed are accurate (for marine spills). If inconclusive, determine the likely extent of the spill by mobilising an aerial surveillance aircraft if possible **See Note 5** It is vitally important to assess the type, volume and overall size of the spill as this will determine the level of response required. ▪ Camera video / stills; ▪ Trained personnel to estimate spill size; and ▪ Constantly monitor the situation to verify the volume of oil spilt. In case of a land-based spill, confirm quantity using flow rate over time calculations, or other calculations as appropriate to the technical particulars of the source.

Note 5

Technique 1: Initially investigate the volume of oil lost from the relevant containment system, considering the following where appropriate:

- Volume of oil lost from pipeline
- Volume of oil lost from storage tank
- Rate of spill
- Duration of spill
- Oil in hose/pipeline
- Pumping rate
- Loss or unaccounted volume of oil

Technique 2: Estimation of Quantity From Appearance Of Oil At Sea (Taken from the Bonn Agreement Pollution Observation Log)

1. Measure the parameter of the area affected, by flying / steaming along the length and breadth to calculate the area of coverage in km^2.
2. Determine the appearance of the oil (i.e. Silvery, Blue, Rainbow, etc) as described below.
3. Calculate the % coverage of oil appearance and multiply this by the total area affected.
4. Multiply the total area affected by its colour code quantity to determine the total tonnes spilt. See examplebelow.

Code	Oil Appearance / Colour	Quantity (tonnes / km^2)
1	Silvery	0.02
2	Grey	0.10
3	Rainbow	0.30
4	Blue	1.00
5	Blue / Brown	5.00
6	Brown / Black	15.00
7	Dark Brown / Black	> 25

Example:

If the total area of coverage is 5km x 5km (Total = $25km^2$) and the area within that covered by oil is estimated to be about 80%, then the total area affected will be $20km^2$. If the area covered by blue oil is 30%, then take the total area affected figure ($20km^2$) x 30% = 6km2 of the total area affected covered by blue oil. Then take 6 km2 and multiply by Colour Code Quantity in this case Blue = 1 tonne/km^2 giving a total of 6 tonnes spilt. If the area covered by rainbow oil is 70%, then take the total area affected figure ($20km^2$) x 70% = 14 km2 of the total area affected covered by rainbow oil. Then take 14 km2 and multiply by Colour Code Quantity in this case Rainbow = 0.3 tonne/km^2 giving a total of 4.2 tonnes spilt.

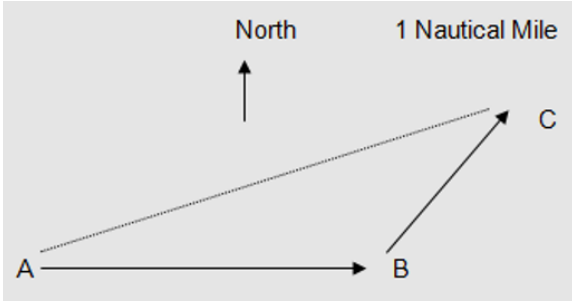
Sum =

Blue : 20 km^2 x 30% = 6 km^2 x 1 tonne/km^2 = 6 Tonnes Spilt

Rainbow : 20 km^2 x 70% = 14 km^2 x 0.3 tonne/km^2 = 4.2 Tonnes Spilt

Therefore, total amount of oil spilt = 10.2 Tonnes

2.6	Track Spill and Forecast Fate	On-Scene Commander	OMAN PESCO

On-Scene Commander	OMAN PESCO
Task No.	**Action**
1	Obtain spill data from Oil Spill Report Form and a future weather forecast, plot spill on chart to forecast trajectory. Consider weather conditions and hydrocarbon type when predicting fate. **See Notes 6 and 7**
2	Utilise oil spill computer model if available.
3	Inform Incident Commander of findings.
4	If there are any changes in slick volume or weather conditions re-plot trajectory.
Note 6	The natural fate of spilt oil must be considered when determining an appropriate response. This will depend upon the meteorological and oceanographic conditions and the individual characteristics of the hydrocarbon, which may enhance or inhibit weathering processes. The most critical process is that of emulsification where wind and water movement creates the formation of oil in water mixture known as chocolate mousse. This is of vital importance as it increases the volume of the oil and persistence whilst inhibiting clean-up method
Note 7	Given the direction and speed of both water currents and the wind, it is possible to determine, by manual plotting, the movement of the oil. This can be calculated by following the method for oil spill tracking detailed below. ▪ Mark the most accurate central position of the slick **A**. ▪ Plot the current vector at 100% of the flow and the direction of flow from **A**. • Note: current flows to a given direction. 1 nautical mile = 1 minute of latitude. Example : If setting 090° at a force of 2 knots (2 nautical miles per hour) draw a line equivalent to 2 nautical miles in the direction of 090° **B**. ▪ Plot the wind vector at 3% of the force from the end of the current vector at **B** in the direction the wind is blowing. Note: wind blows from the given direction. Example: if the wind direction is 225° at 10 knots draw a line of 0.3 nautical miles (3% of 10 knots) in the direction of 045° (225° reversed) **C**. ▪ Complete the vector diagram to arrive at **C**, which is the centre of the slick an hour from **A**. **Example:** 

2.7 Continue Spill Reporting

On-Scene Commander | **OMAN PESCO**

On-Scene Commander	OMAN PESCO			
Task No.	**Action**			
1	Agree a time frame for situation reports from the On-Scene Commander / OMAN PESCO to the Incident Commander and the relevant authorities (depending on spill tier). The situation reports should clearly state all actions taken, effectiveness and outline expected events until next report. The following situation reports are recommended:			
	Source	**Destination**	**Type of Report**	**Frequency**
	On-Scene Commander (and/or) OMAN PESCO	Incident Commander	Progress Report	30 mins
	On-Scene Commander (and/or) OMAN PESCO	SIPC-PCO	Progress Report	1 hour
	Incident Commander	EA / SEU	Situation Report	2 hours

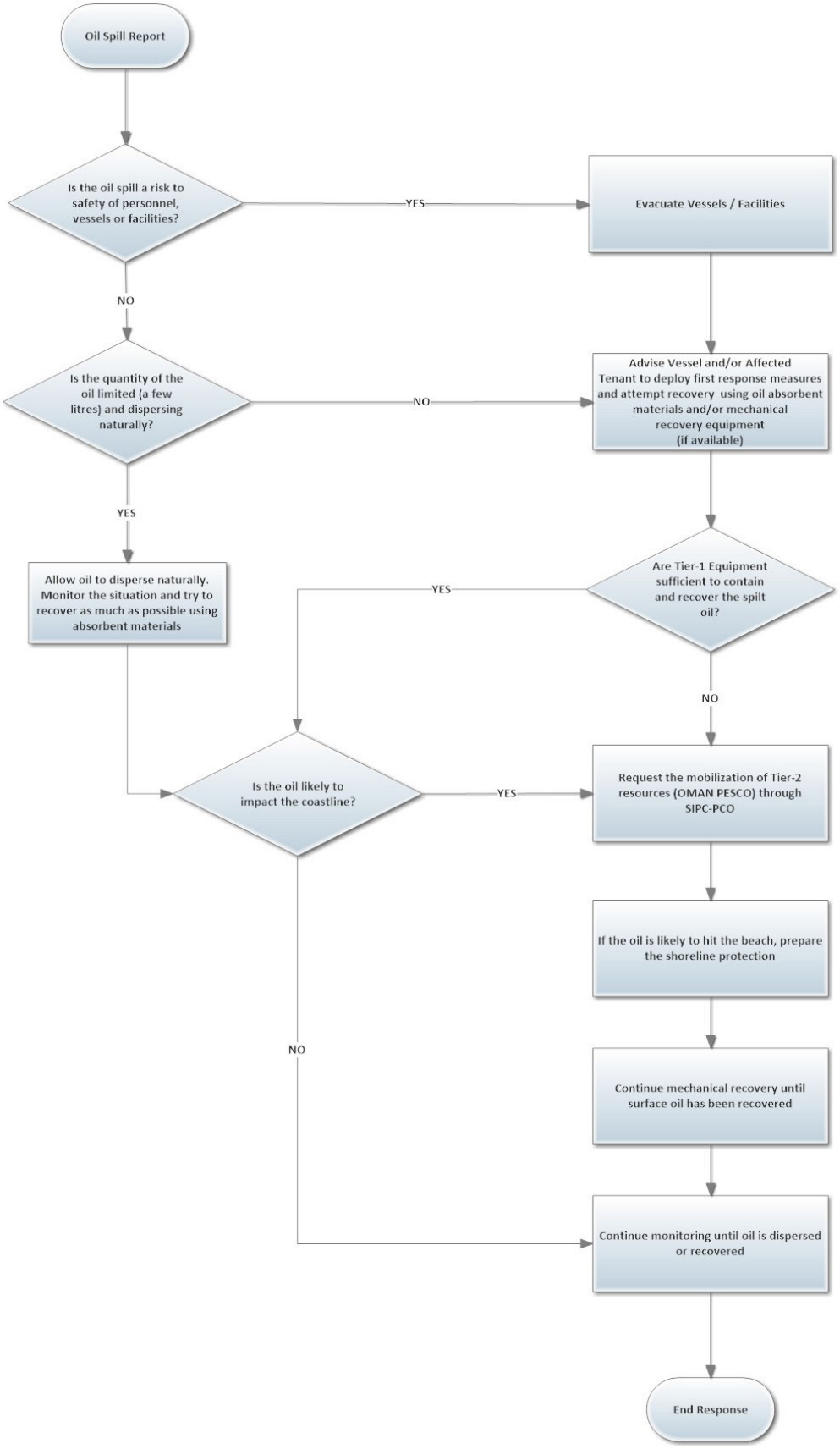
2.8 Develop Response Strategy

On-Scene Commander / **Incident Commander** | **OMAN PESCO**

OSC	IC	OMAN PESCO
Task No.	**Action**	
1	In discussion with OMAN PESCO and the Incident Commander; decide upon the most effective response strategy accounting for equipment available, oil type, environmental sensitivities, tracking, fate forecasting and corporate issues. **See Note 8** and **Figure 8** for guidance.	
Note 8	Options for response include: ▪ Natural Dispersion, Monitoring and Reporting ▪ Mechanical Containment and Recovery and Shoreline Protection. Controlling factors to be considered when determining which response to adopt: ▪ Oil Type and Amount Spilt the Behaviour and Fate of Spilt Oil. ▪ Sea State, Wind Speed & Direction, Environmental Sensitivities. Due to the constant variance in the above controlling factors a precise response which may require one or more strategies can only be established at the time of the spill. Response Personnel must be prepared to alter plans as the situation develops and changes.	

OMAN PESCO	
Task No.	**Action**
1	Through the On-Scene Commander; Assist the Incident Commander in developing the most appropriate response strategy taking into account the factors contained in Notes 6 and 7.

Figure 8: Response Strategy Decision Tree



2.9	Mobilize Additional Response Resources	On-Scene Commander / Incident Commander	OMAN PESCO

OSC	IC	OMAN PESCO
Task No.	**Action**	
1	Based on the response strategy developed in 2.8, the OSC, IC and OMAN PESCO shall communicate in order to determine any requirements for additional response resources, establish and confirm the availability and location of the required resources.	
2	Upon confirmation of a Tier 2 spill and after obtaining the authorization of the Incident Commander; request mobilisation of specialist equipment necessary for implementation of response from OMAN PESCO.	
3	Monitor levels of equipment and manpower, logging time activated and type.	
4	Should the spill prove to be out of the capability of Tier 2 resources, and after obtaining the approval of the Incident Commander, the OSC shall request the mobilisation of EA's national response resources.	

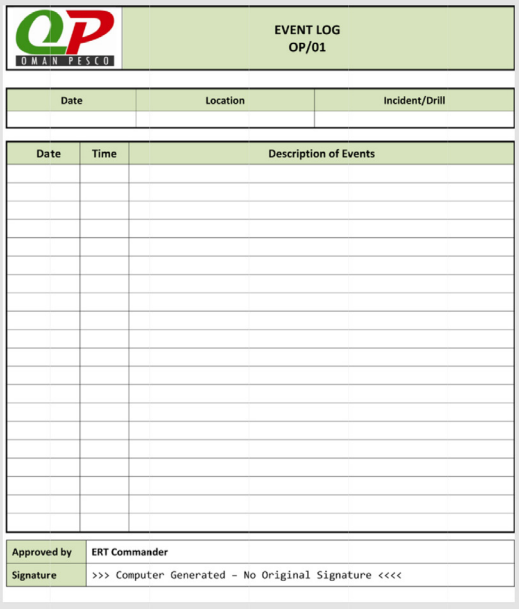
2.10	Manage Ongoing Response	On-Scene Commander / Incident Commander	OMAN PESCO

OSC	IC	OMAN PESCO
Task No.	**Action**	
1	In discussion with OMAN PESCO through the On-Scene Commander; monitor the progress of the response strategy and alter as conditions dictate.	
2	Ensure response strategies meet with SEU and EA Environmental Policies.	
3	If any liquid oil has been recovered from clean-up operations, inform SEU/EA through the SIPC-PCO / SIPC Environmental Dept.; and discuss waste disposal options. **See Note 9**	
Note 9	Some options for waste disposal or treatment of material, be it oily liquids or oiled solids, are: **1. Bioremediation – the breakdown of oil using biological processes.** **2. Direct to Appropriate Disposal Site for Burial.** **3. Temporary Storage and Appropriate Disposal Site for Burial.** **4. Temporary Storage / Clean, Treat, Stabilise, Recover, Reuse.** This option aims to store temporarily the material and then, slowly over the ensuing period, to clean it or stabilise it and then to recover or reuse it. In most cases this is the best environmental option. It avoids the risk of changing what was a marine oil pollution problem into an inland surface pollution problem or groundwater pollution problem. **5. Take to a Refinery / Incinerator (mainly for oily liquids only).** If the oily liquids are onboard a dedicated recovery vessel following an at sea containment and recovery operation, then it can be transferred across the quay, at a suitable berth, to a road tanker or other suitable waste reception facility. Alternatively, this waste can be fed directly into the reception facility at a marine terminal of an oil refinery.	

OMAN PESCO	
Task No.	**Action**
1	Obtain data on likely quantities of liquid oily wastes, which are being collected by any recovery operations and inform the Incident Commander.
2	If shoreline has been contaminated, estimate quantities of non-liquid oily wastes created primarily on shorelines (i.e. soiled absorbents, etc.) and ensure that transport of oily wastes from the shoreline temporary storage sites is sufficiently frequent to prevent the temporary storage being overwhelmed.
3	Log any damaged or lost equipment.
4	Maintain regular situation reports to the Incident Commander.

2.11	Deactivate Response	On-Scene Commander Incident Commander	OMAN PESCO

CMT	IC	OMAN P SCO
Task No.	**Action**	
1	Determine from on-site personnel through the On-Scene Commander and OMAN PESCO when response operations are no longer necessary.	
2	In discussion and agreement with OMAN PESCO through the On-Scene Commander, stand down resources and cease clean up operations.	
3	Obtain the final Event Log from OMAN PESCO. **See Note 10**	
4	Contact SEU and EA through the SIPC-PCO and inform of incident closure and sub-mit a copy of the OMAN PESCO Event Log.	

OMAN PESCO	
Task No.	**Action**
1	On instruction from the Incident Commander, stand down personnel and equipment and organise return. (Log all times until equipm nt and personnel returned to point of origin.) (Equipment requiring maintenance, cleaning, etc to be logged with times until returned to original state.)
Note 10	OMAN PESCO Event Log 

EVENT LOG
OP/01

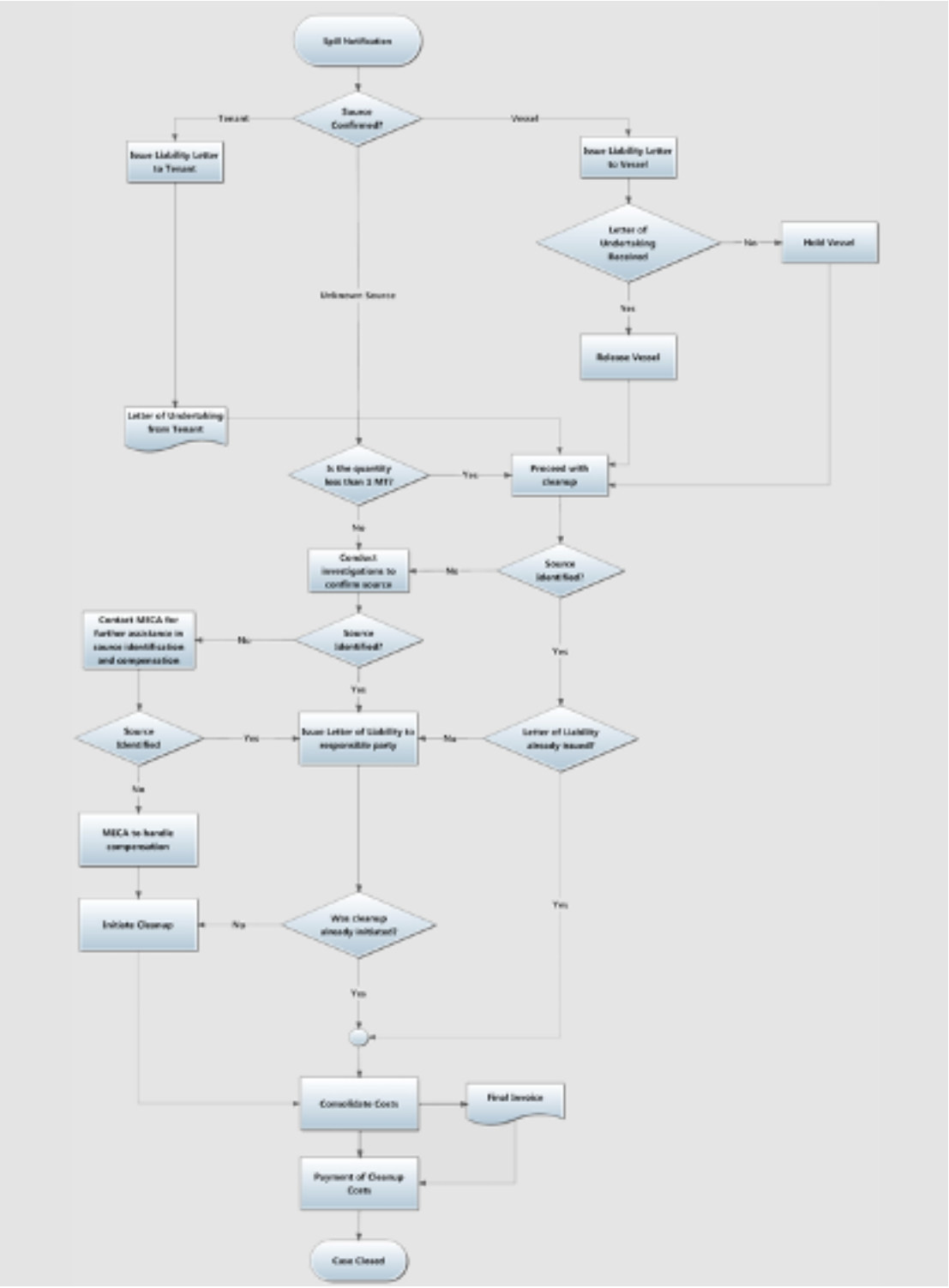
Date	Location	Incident/Drill

Date	Time	Description of Events

Approved by	ERT Commander
Signature	>>> Computer Generated - No Original Signature <<<<

2.12	Consolidate Costs	SIPC-DM	SIPC Finance Manager	OMAN PESCO

SIPC-DM	SIPC Finance Manager	OMAN PESCO
Task No.	**Action**	
1	The SIPC-DM in collaboration with the SIPC Finance Manage shall collate costs arising from damage to SIPC assets and loss of business.	
2	OMAN PESCO to collate equipment, personnel and consumable costs incurred during the response to the incident.	
3	Handle oil spill response claims as per the approved procedure. **See Note 10**	

Note 10	**Approved Claims Handling Procedure** 

2.13	Debrief and Report	On-Scene Commander Incident Commander	SIPC-DM	OMAN PESCO

CMT	IC	SIPC-DM	OMAN PESCO
Task No.	**Action**		
1	At close of incident, print a copy of the Oil Spill Log and ensure it is maintained for future reference.		
2	Through the On-Scene Commander and OMAN PESCO, obtain Event Logs maintained by all response units.		
3	Notify appropriate organisations of de-brief meeting time and location.		

DATA DIRECTORY

Contents

3. Data Directory

3.1 Contact Database

3.1.1 Contacts Directory Index

A. Authorities and Response Organization		
All contact details within this section are placed in alphabetical order according to company/ bodname and are as follows:		
M	ENVIRONMENT AUTHORITY MINISTRY OF DEFENCE MINISTRY OF OIL AND GAS MINISTRY OF TRANSPORT AND COMMUNICATIONS	EA MOD MOG MOTC
N	NATIONAL COMMITTEE FOR CIVIL DEFENCE	NCCD
O	OMAN PESCO	OP
R	ROYAL OMAN POLICE	ROP
S	SOHAR ENVIRONMENTAL UNIT (SEU) SOHAR INDUSTRIAL PORT COMPANY (SIPC)	SEU SIPC

B. Tenants		
All contact details within this section are placed in alphabetical order according to company/body name and are as follows:		
A	AIRLIQUIDE SOHAR INDUSTRIAL (ALSIG) AROMATICS OMAN L.L.C.	ALSIG AROM
C	C.STEINWEG OMAN	CSO
L	LARSEN & TOURBRO HEAVY ENGINEERING LLC	LTHE
M	MAJAN ELECTRICITY COMPANY MAJIS INDUSTRIAL SERVICES	MJEC MISC
O	OILTANKING ODFJELL TERMINALS	OOTO
	OMAN ELECTRICITY TRANSMISSION COMPANY	OETC
	OMAN FORMALDEHYDE CHEMICAL CO. LLC	OFCC
	OMAN GAS COMPANY	OGC
	OMAN INTERNATIONAL CONTAINER TERMINAL	OICT
	OMAN METHANOL COMPANY	OMC
	OMAN POLYPROPYLENE	OPP
	OMAN REFINERIES AND PETROCHEMICALS CO.	ORPC
	OMANOIL MATRIX MARINE SERVICES	OMXO
S	SHADEED IRON & STEEL SHARQ SOHAR STEEL SOHAR ALUMINUM (SA) SOHAR ALUMINUM POWER PLANT SOHAR INT'L UREA & CHEMICALS INDUSTRY SOHAR POWER COMPANY	SIS SSSRM SA SAP SIUCI SPC
V	VALE OMAN DISTRIBUTION CENTRE	VODC

A. Authorities and Response Organization

	Organization/Title	Office	Mobile	Fax
M	**Ministry of Environment and Climate Affairs**			
	Pollution Hotline	24693666	99632164 99219429 96009009	24691082
	Superintendent General Pollution Operations	24692310	99336443	24693946
	Director General of Environment Affairs	24404814	99357935	24692462
	Ministry of Defence			
	Royal Airforce of Oman (RAFO) 24 Hours Duty Officer	24334211	N/A	N/A
	Operations Centre (RAFO)	24334212 24334244	N/A	24334743
	Royal Navy of Oman Operations Centre	24338805 24338806	N/A	24334776
	Ministry of Oil and Gas			
	Director of Ministry Security Office	24699470	N/A	24696972
	Oil Companies Security Contact	24560021 24562030 24563237	99034444	24568675
	Ministry of Transport and Communications			
	H.E The Undersecretary for Ports & Maritime Affairs	24685994	N/A	2468599
	D.G. of Ports	24685995	99257777	24685992
	D.G. of Maritime Affairs	24685982	N/A	24685984
	Director of Navigation and Maritime Safety Department	24685950	N/A	24685984
	Director of Forecasting and Meteorology Department	24519610	N/A	N/A
	Air and Navy Meteorology Navigation Section	24519363	N/A	N/A
N	**National Committee for Civil Defence (NCCD)**			
	Central Command	24560202	N/A	24567161
	Search & Rescue Coordination Team (SRCT)	24511136 24511138	N/A	N/A
O	**OMAN PESCO**			
	OMAN PESCO L.L.C.	24497774	96622214 97770005	24499123

	Organization/Title	Office	Mobile	Fax
R	**Royal Oman Police (ROP)**			
	ROP CG – SOHAR Port Emergency Hotline	9991	N/A	N/A
	Directorate General of Operations	24560099	N/A	24563352
	Directorate General of Civil Defence	24702170 24706408	N/A	24709610
	Directorate General of Police Aviation	24510559 24510370	N/A	24510463
	Oil & Gas Installation Security Police HQ	24560021 24562030	N/A	N/A
	Director of Coast Guard Operations	24714661 24714888	N/A	24714937
	Coast Guard Operations- Musandam	26730799	N/A	26730799
S	**Sohar Environmental Unit (SEU)**			
	Sohar Environmental Unit	26850285	97770772	N/A
	Sohar Industrial Port Company (SIPC)			
	Port Coordination Centre (VHF 71)	26852777	99342699	26850272
	Harbour Master	26852700	99512337	26850272
	Environmental Project Manager	26852719	98083459	26850272
	Environmental Assistant Manager	26852735	99434644	26850272

B. Tenants

	Organization/Title	Office	Mobile	Fax
A	**Airliquide Sohar Industrial**			
	Control Room	95474697	95120360 95474697	26850203
	Aromatics Oman L.L.C.			
	Control Room	26853999 26851555	97777873	26865771
C	**C.Steinweg Oman**			
	Control Room	94104771 26850420	99419687 99335994	26850426
L	**Larsen & Tourbro Heavy Engineering LLC**			
	Control Room	26762390 26762395	96603868 97080867 96725406	26762193
M	**Majan Electricity Company**			
	Control Room	26846980	99856385	26841438
	Majis Industrial Services Senior Project (MISC)			
	Control Room	26850545 92854090 97676281	96600034	26852444

O	**Oiltanking Odfjell Terminals**			
	Control Room	26700310 26700311	92295225 99310076	26700306
	Oman Electricity Transmission Company			
	Control Room	24540968 24540967	92836400	24540952
	Oman Formaldehyde Chemical Co. LLC			
	Control Room	92881210 26850260 26850270	92827040 99332017	26850271
	Oman Gas Company			
	Control Room	24681616	99447212 99211675	24681668
	Oman International Container Terminal			
	Control Room	26865616 99866942	99866942 98058658 95634842	26865606
	Oman Methanol Company			
	Control Room	95757491 95757492 26865842	92899035 92899026 96093728	26850541 26850540 99221691
	Oman Polypropylene			
	Control Room	26865151 26851555	92910846 99329860	26365129
	Oman Refineries and Petrochemicals Co.			
	Control Room	26851555 26851309 24570842	95079772 99899293 99444853	26851436 24570863
	Omanoil Matrix Marine Services			
	Head Office	24574100	95232211	24574101

	Organization/Title	Office	Mobile	Fax
S	**Shadeed Iron & Steel**			
	Control Room	26846649	95426043	93306144
	Sharq Sohar Steel			
	Control Room	26850204	92880563 99324304	N/A
	Sohar Aluminum			
	Control Room	26863333	99211280 99256687 92851346	26863001
	Sohar Aluminum Power Plant			
	Control Room	26863939	99314769	26863946
	Sohar Int'l Urea & Chemicals Industry			
	Control Room	26704021 26704024	99449890 99445872	26704110
	Sohar Power Company			
	Control Room	26850502	92884779 99231224 99231460	26850501
V	**Vale Oman Distribution Centre**			
	Control Room	26759521	93291367 98292213	26859799
	Terminal	93221021	99106687	26859799

3.2 Tiered Response Resources

TIER	RESOURCES AVAILABLE	CAPABILITY	MOBILISATION AUTHORITY & RESPONSE TIME
1	INFIELD RESOURCES	Vessel / Tenant Initial Response Team Personnel	Activated By: Vessel/Tenants Resp. 🕒: SIP Immediate
		Containment & Recovery Equipment (EA SIP Equipment Package)	Activated By: SIPC Resp. 🕒: SIP Within 1 hour
		OMAN PESCO Tier 1Support Containment& Recovery Equipment	Activated By: SIPC Duty Manager Resp. 🕒: SIP Within 1 hour
2/3	OMAN PESCO RESOURCES Sohar Response Base	Response Team Personnel	Activated By: SIPC Duty Manager
		Containment & Recovery Equipment.	Resp. 🕒: Sohar Personnel & Equipment within 1 Hour Resp. 🕒: Muscat Personnel & Equipment within 6 Hours
ADDITIONAL RESOURCES	Ministry of Environment and Climate Affairs Resources	AT THE DISCRETION OF EA	

TIER 1

The following resources are available to SIPC and positioned at the SOHAR Port for immediate deployment

EA PROVIDED OIL SPILL RESPONSE EQUIPMENT	
Quantity	**Resources**
	TO BE CONFIRMED WITH EA

Mobilisation / Call Out Procedure
Tier One Resources can be mobilised by SIPC Duty Manager.

TIER 2/3

OMAN PETRO ENVIRONMENTAL SERVICES COMPANY (OMAN PESCO)

OMAN PESCO have been contracted by the Sohar Industrial Port Company (SIPC) to provide professional response resources consisting of trained consultants, equipment and operators in the event of an oil spill. Contracted SIPC Tenants can mobilize OMAN PESCO resources at any time through the SIPC Response Coverage mechanism. Under this agreement, when notified OMAN PESCO shall mobilize resources within 1 hour.

Resources

Clean up equipment, owned and operated by OMAN, is stockpiled at a number of locations both within Oman and the UAE. The most effective response equipment will be mobilised based on the selected response strategy.

No.	Description	Qty
1.	Ro-Clean Desmi boom reel	1
2.	Vikoma 100 hydraulic boom reel no. 01	1
3.	Vikoma 100 hydraulic boom reel no. 02	1
4.	Abasco Hydraulic Driven Boom Reel	1
5.	Abasco Hydraulic Driven Boom Reel	1
6.	ABASCO Neo 9 Oil Containment Boom with 30oz PVC Fabric (Self Inflated Boom), 42" overall height; 14" freeboard x 28" draft, 3/8" top tension cable and 1/2" ballast chain, 30M section lengths Sections from 01 to 07	7 sections = 210 meters
7.	ABASCO Neo 9 Oil Containment Boom with 30oz PVC Fabric (Self Inflated Boom), 42" overall height; 14" freeboard x 28" draft, 3/8" top tension cable and 1/2" ballast chain, 30M section lengths Sections from 08 to 10	3 sections = 90 meters
8.	Ro-Clean Desmi boom 1300 Sections 01, 02 (50 Mts each)	2
9.	Ro-Clean Desmi boom 1300 Section 03 (100 Mts)	1
10.	Vikoma Sea Sentinel boom 1000 mm, Sections 01 to 04 (50 Mts each)	4
11.	Vikoma Sea Sentinel boom 1000 mm, Sections 05 to 09 (50 Mts each)	5
12.	Vikoma Sea Sentinel boom 1100 mm, Sections 01 to 20 (25 Mts each)	20
13.	Sentinel 400 boom, Sections 01 to 04 (20 Mts each)	4
14.	Shore Guardian 550 boom, Sections 01 to 02 (20 Mts each)	2
15.	Lamor Premator rigid fence boom, 900 mm, rack no. 01, section 1 to 10 (15 Mts each)	10
16.	Lamor Premator rigid fence boom, 900 mm, rack no. 02, section 11 to 20 (15 Mts each)	10
17.	Vikoma Komara 20k skimmer	1
18.	Vikoma Komara 12k skimmer	2
19.	RO-Clean Termite Skimmer	1
20.	Foilex Mini Skimmer	1
21.	Delta Head c/w pipe & floats (Vacuum System)	1
22.	ABASCO ATS 40 SP Offshore Skimmer (Dual brush banks and dual metal disc banks)	1
23.	ABASCO Series 100 DHY Diesel Hydraulic Power Pack complete with Yanmar diesel, controls, gauge and pump mounted on a aluminium two wheeled cart, ESD included and Spark Arrestor	1
24.	RO-Clean Desmi 35 kW Powerpack	1
25.	Vikoma GP10 7.4 kW Powerpack	1

No.	Description	Qty
26.	Vikoma Yanmar 2.8 kW Powerpack	1
27.	3" Spate Pump 75c	2
28.	ABASCO Spate PD 75, Diesel driven	1
29.	Diesel Driven MWM Diter Pump	1
30.	3" Honda WB30XT	1
31.	3" Honda WB30XT	1
32.	2" Honda WB20XT	1
33.	2" Honda WB20XT	1
34.	3" Spate Pump 75c C/W powerpack (built in)	1
35.	4" Koshin Trash KTR-100XD	1
36.	4" Koshin Trash KTR-100XD	1
37.	4" Kipor KDP40	1
38.	PB 4800 Blower	1
39.	PB 4800 Blower	1
40.	Echo 1B400 Blower	1
41.	STIHL Air Blower C/W Hoses	1
42.	Tug Mounted Dispersant Spray Arms (2 arms/set)	2 sets
43.	Air compressor Atlas Copco 50L	1
44.	Fastank 1500 gallon	1
45.	Fastank 2000 gallon	1
46.	Fastank 2000 gallon Firefighter	1
47.	Vikoma Octitank 9000 liters	1
48.	Amiantit PVC tank 2000 Gallon	1
49.	Amiantit PVC tank 2000 Gallon	1
50.	Amiantit PVC tank 2000 Gallon	1
51.	Amiantit PVC tank 2000 Gallon	1
52.	Amiantit PVC tank 400 Gallon	1
53.	Amiantit PVC tank 400 Gallon	1
54.	Amiantit PVC tank 400 Gallon	1
55.	Amiantit PVC tank 400 Gallon	1
56.	Dispersant Boat Spray System (Power Pack, hoses and Accessories) and 4 sets Boat Spray Guns	1
57.	Karcher electrical high pressure washer	1
58.	Karcher high pressure steam washer	1
59.	Karcher high pressure steam washer	1
60.	Karcher high pressure steam washer	1
61.	Karcher high pressure steam washer	1
62.	Karcher high pressure steam washer	1
63.	Honda EB2200 1.7 kVA Generator	1
64.	Kipor KGE12E 9 kVA Generator	1

No.	Description	Qty
65.	Air/sand blasting machine c/w: - Spraying nozzles - 10m 32mm diameter air hose - Remote control handle with hoses Air cylinder - Musk, Coverall, Gloves	1 set
66.	20 ft shipping container	1
67.	20 ft shipping container	1
68.	20 ft shipping container	1
69.	20 ft open top shipping container	1
70.	Seaboard Fluke Anchors 30 kg C/W Tripping Buoys and 5 Mts Chain	10
71.	Tent 4x8 meters	1
72.	Tent 4x8 meters	1
73.	¾" Tricoflex yellow hose for Karcher	10
74.	2" suction (foot valve/male camlock)	2
75.	2" delivery (male/female camlocks)	5
76.	2" Tricoflex delivery (male/female camlocks)	1
77.	3" suction (foot valve/male camlock)	4
78.	3" delivery (male/female camlocks)	3
79.	3" blue delivery (male/female camlocks)	2
80.	3" blue delivery flat lay (male/female camlocks)	2
81.	3" blue delivery flat lay (male/female camlocks)	1
82.	3" black delivery flat lay (male/female camlocks)	1
83.	4" suction (foot valve/male camlock)	3
84.	4" delivery (male/female camlocks)	5
85.	1.6m, 2" hose connected to two hoses each 5m, 1 ½"	1
86.	6m, 2" hose	1
87.	5m, 2" hose	1
88.	5m, 2" hose connected to one hoses 3.25m, 1"	1
89.	Compressor pipe (helix)	1
90.	10m, ½" hose, pressure	1
91.	10m, ½" hose, return	1
92.	10m, ½" hose, pressure	1
93.	10m, ½" hose, return	1
94.	5m, ½" hose, pressure	1
95.	5m, ½" hose, return	1
96.	15m, 3/8" hose, pressure	1
97.	15m, 3/8" hose, return	1
98.	10m, 3/8" hose, pressure	1
99.	10m, 3/8" hose, return	1
100.	10m, 3/4" hose, pressure	1
101.	10m, 3/4" hose, return	1
102.	00m, ½" hose, pressure	0
103.	00m, ½" hose, return	0

No.	Description	Qty
104.	5 kg Co_2 fire extinguisher	1
105.	6 kg Powder fire extinguisher	1
106.	6 kg Powder fire extinguisher	1
107.	2 kg Powder fire extinguisher	1
108.	2 kg Powder fire extinguisher	1
109.	2 kg Powder fire extinguisher	1
110.	2 kg Powder fire extinguisher	1
111.	Fire blanket	1
112.	6 kg Powder fire extinguisher	1
113.	6 kg Powder fire extinguisher	1
114.	2 kg Powder fire extinguisher	1
115.	2 kg Powder fire extinguisher	1
116.	2 kg Powder fire extinguisher	1
117.	2 kg Powder fire extinguisher	1
118.	2 kg Powder fire extinguisher	1
119.	1 kg Powder fire extinguisher	1
120.	1 kg Powder fire extinguisher	1
121.	1 kg Powder fire extinguisher	1
122.	1 kg Powder fire extinguisher	1
123.	Gas Detector RAE	1
124.	Gas Detector Micro Clip	1
125.	Intrinsically Safe Torch	1
126.	Intrinsically Safe Torch	1
127.	GPS, Garmin	1
128.	Emergency Mobile phone	1
129.	Digital Camera, Canon	1
130.	UHF Motorola set 25 Miles (2 Pcs)	1 set (2 Pcs)
131.	UHF Motorola set 25 Miles (2 Pcs)	1 set (2 Pcs)
132.	UHF Motorola set 16 Miles (2 Pcs)	1 set (2 Pcs)
133.	UHF Motorola set 5 Miles (2 Pcs)	1 set (2 Pcs)
134.	Spilfighter, M50 boom units , 4 pcs/bale (Diameter 13 cm x 3 Mts length)	2 bales (5 booms)
135.	Abasco boom units ,4 pcs/bale (5" x 10')	20 bales
136.	Spilfighter, M75 pads units of 100 pads (16" x 18")	2 boxes
137.	Abasco pads units of 100 pads (15" x 19")	6 boxes
138.	Spilfighter, M90 rolls (96 cm x 44 Mts)	2 rolls
139.	Abasco medium weight rolls (30" x 150')	3 rolls
140.	Pallet truck 2.5 ton	1
141.	Pallet truck 2 ton	1
142.	Platform trolley 916x616mm 300 kgs	1
143.	10m webbing rope sling 2"	2
144.	10m webbing rope sling 3"	2
145.	10m webbing rope sling 4"	2

No.	Description	Qty
146.	10m ratchet lashing sling 2"	2
147.	10m ratchet lashing sling 3"	2
148.	bow shackles 3/8", 10 mm	8
149.	D shackles ½", 12 mm	8
150.	bow shackles ½", 12 mm	7
151.	D shackles 3/4", 18 mm	10
152.	bow shackles 3/4", 18 mm	10
153.	D shackles 1", 25 mm	10
154.	bow shackles 1", 25 mm	10
155.	D S. Steel Shackles, 10 mm	3
156.	Bow S. Steel Shackles, 10mm	12
157.	Snap Hock Shackles, 10 mm	2
158.	P.P. Rope 5 mm, in meters	220
159.	PVC Rope 12 mm, in feet	200
160.	P.P. Rope 12 mm, in meters	220
161.	PVC Rope 18 mm, in feet	200
162.	P.P. Rope 24 mm, in meters	220
163.	Store cabinets (2 doors)	2
164.	Ladder 8 ft	1
165.	Ladder 6 ft	1
166.	Operation tent tables (large)	2
167.	Operation tent tables (small)	2
168.	Operation tent chairs	4
169.	Tables of UHF (office)	2
170.	Electrical powered ice box	1
171.	Ice boxes c/w 2 extra small boxes for each large box	4
172.	25m, electrical cable, (Genset plug/heavy outlet plug)	2
173.	Delivery socket set	2
174.	(25-30) m electrical cable	3
175.	Electrical distributer for small genset	1
176.	Electrical extension cord 10m (coil)	1
177.	Electrical extension cord 50m (coil)	2
178.	Electrical fan 16"	2 nos
179.	Light towers	2 sets
180.	Liner sheet rolls 4mx25m	3 nos
181.	Plastic sheets, tanks foundation	6 nos
182.	Fuel tanks, 20 litres each	8 nos
183.	HILTI DD120 Core sampler 1600 W C/W water pump	1
184.	Black & Decker drill machine 570 Watts, KR 572	1
185.	Black & Decker variable speed hummer drill machine 550 Watts, KR55CRE	1
186.	Makita angle grinder 180 mm 2200 Watts, GA7020	1
187.	Bench grinder Creuser DS8150T, 350 W	1

No.	Description	Qty
188.	Black & Decker air blower 600 Watts, KX 4010	1
189.	Battery charger	1
190.	Electrical Saw (Bosch GST 65 BE)	1
191.	Electrical Core-Pit / bore and cutting tool	2
192.	Drill pit set 1-13 x 0.50mm 25 pcs (For metals)	1 set (25 Pcs)
193.	Drill pit set 4-12mm 7 pcs (For concrete)	1 set (7 Pcs)
194.	Steel grinding disc 180 x 3 x 22 mm, 7"	2
195.	Steel grinding disc 180 x 6 x 22 mm, 7"	6
196.	Steel cup brush	4
197.	Crocodile battery charging cables	2
198.	Record Vice 5"	1
199.	Levers	2
200.	Oil cane ¼ pint	1
201.	Oil cane 3 litres	1
202.	Oil/fuel plastic funnels	2
203.	Cutter knife C/W extra knives	1
204.	Mundial socket set 59 PCS	1 set
205.	19mm Long ratchet socket	1
206.	Combined spanners set 6-32 mm 21 pcs	1 set
207.	Hand wire brush	30
208.	Adjustable wrench 300 mm	1
209.	Adjustable wrench 250 mm	1
210.	Pipe wrench 10"	1
211.	Pipe wrench 14"	1
212.	Pipe wrench 24"	1
213.	Pipe wrench 36"	1
214.	Silicon gun	1
215.	Hammer 1000 grams	1
216.	Hammer 500 grams	1
217.	Hammer nylon 42 mm	1
218.	Hammer 16 oz fibre	1
219.	Screw driver	4
220.	Screw driver (cross)	3
221.	Screw driver 6 pcs (black)	1 set
222.	Star screw driver for blowers	1 set (7 pcs)
223.	Side cutting plier 8"	1
224.	Combination plier 7"	1
225.	Long nose plier 7"	1
226.	Mundial nose plier bend 200 mm	1
227.	Vice grip plier 250 mm	1
228.	Verner	1
229.	Verner (Goring Germany)	1

No.	Description	Qty
230.	Measuring tape 30 meters	1
231.	Measuring tape 10 meters	1
232.	Measuring wheel 10 km	1
233.	Spark plug spanners c/w handles for Honda equipment	4 sets
234.	Allen Key 12 mm	1
235.	Allen Key 14 mm	1
236.	Allen Key 17 mm	1
237.	Hacksaw frame c/w blades	1
238.	Hand saw (for wood), 500 mm	1
239.	Spirt level 12"	1
240.	Oil pump (manual) 1"	1
241.	IRWIN tool box 26"	1
242.	Rivet gun Stanly	1
243.	Spray gun (for the compressor)	1
244.	Tool box (Briggs)	1
245.	Plastic oiler (Briggs)	1
246.	Socket wrench handle (Briggs)	1
247.	Socket 46 mm (Briggs)	1
248.	Adjustable wrench 10" (Briggs)	1
249.	Adjustable wrench 12" (Briggs)	1
250.	Allen key 6 mm (Briggs)	2
251.	Grease gun (Briggs)	1
252.	Allen key set 9 pcs (Briggs)	1
253.	Spanner (Sizes: 8/10, 10/12, 13/14, 17/19, 22) (Briggs)	5
254.	Network RJ plier	1
255.	File set (5 Pcs)	1 set
256.	Wood chisel 18 mm	1
257.	Wood flat chisel	1
258.	Wood measuring 90° angle	1
259.	Long Socket 19 mm for spark plugs	1
260.	Socket set (Namsom 52 pcs)	2
261.	Shovels	10
262.	Forks	10
263.	Pawed	5
264.	Pickaxe	5
265.	Offshore Dispersant Drums (Polychem Dispersit SPC 1000) (55 Gallon/ Drum) c/w MSDS and EPA Clearance Certificate	2 drums
266.	ABASCO Modified 20" ISO Container for Oil Spill Response Package painted International Safety Yellow, 1ea standard front entry doors, 4ea side entry doors for full face opening on one side for deployment	1

No.	Description	Qty
267.	ABASCO Modified 20" ISO Container for Oil Spill Response Package painted International Safety Yellow 1ea standard front entry doors 4ea side entry doors for full face opening on one side for deployment	1
268.	TB 30 Tow Bridles	3
269.	TB 30 Tow Bridles	3
270.	3" suction (foot valve/male camlock)	2
271.	3" delivery (male/female camlocks)	1
272.	3" black delivery flat lay (male/female camlocks)	1
273.	5m, ½" hose, pressure	1
274.	5m, ½" hose, return	1
275.	5m, ½" hose, pressure	1
276.	5m, ½" hose, return	1
277.	Abasco Sorbent Boom bags A-8-10 (8 in x 10 ft) - (4 booms / bag)	20 bales
278.	Abasco Sorbent Pad bags A-100 (17 x 19 x 3/8 in) - (100 pads / bag)	20 boxes
279.	Abasco Sorbent Roll bags WR150M (3/8 in x 30 in x 150 ft) - (1 roll / bag)	20 rolls
280.	2m webbing rope sling 2"	2
281.	3m webbing rope sling 2"	2
282.	Bow shackles ½", 12 mm	12
283.	P.P. Rope 24 mm, in yards	200
284.	2 boxes have repair kits for the boom (1 for each winder)	2
285.	1 box has spare parts kit for the power pack	1
286.	1 box has spare parts kit for the spate pump	1
287.	Spare parts for the ATS 40 skimmer	1 kit

Mobilisation / Call Out Procedure

The format for mobilising OMAN PESCO is by a single telephone call to 96622214 (or) 97770005. The caller should request the duty manager and detail the nature of the incident.

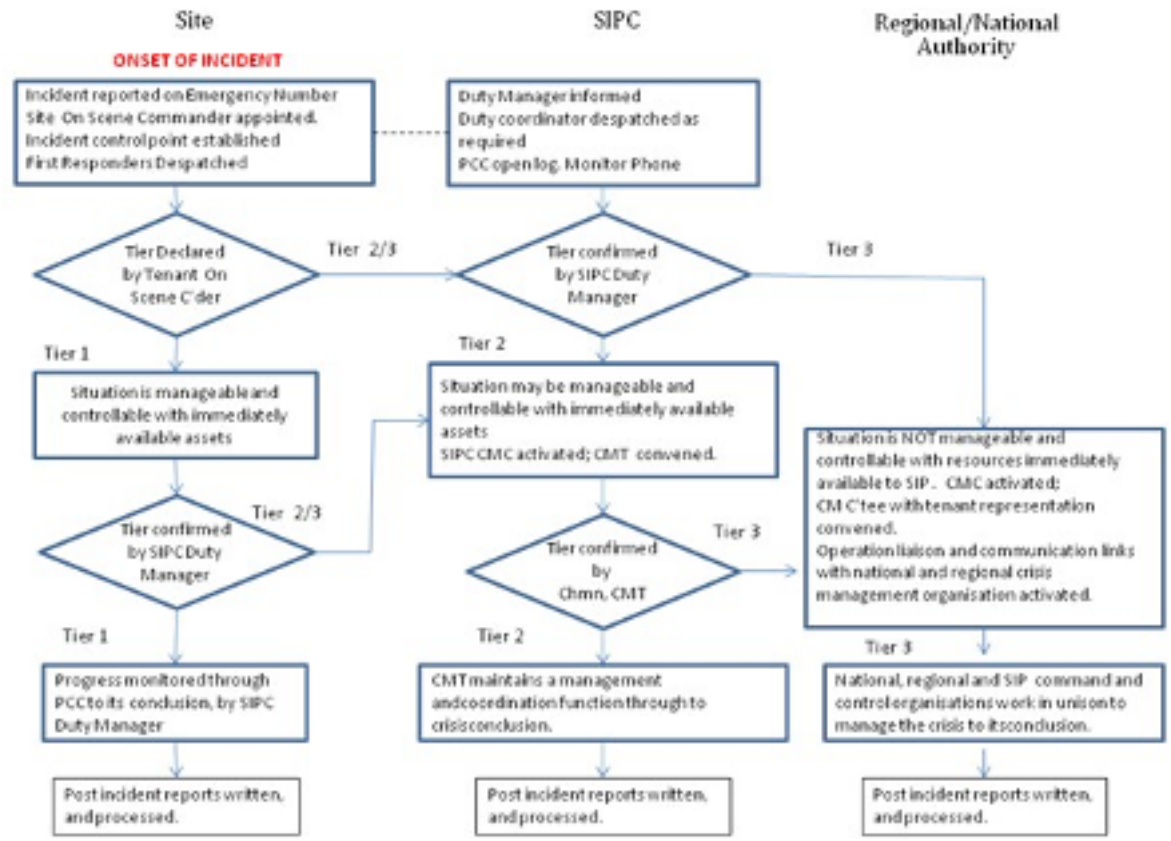
Contractual Agreement

SIPC currently has a contract with OMAN PESCO through the National Pollution Response Club to provide equipment and personnel in the event of an oil spill emergency.

ENVIRONMENT AUTHORITY (EA)

Mobilised at the discretion of EA.

3.3 SIPC ERP Command & Control Structure



Notes:

1. This diagram illustrates the command and control structure as it is required at different Tiers of emergency. It does not try to prescribe a sequence of events. Its purpose is to provide the necessary organization to mobilize, apply, control and coordinate the assets required appropriate to the severity of the emergency in the most efficient and effective manner.

2. The diagram illustrates the authority vested in the SIPC Duty Manager to elevate the emergency from Tier 1 categorised by the On Scene Commander to a Tier 2.

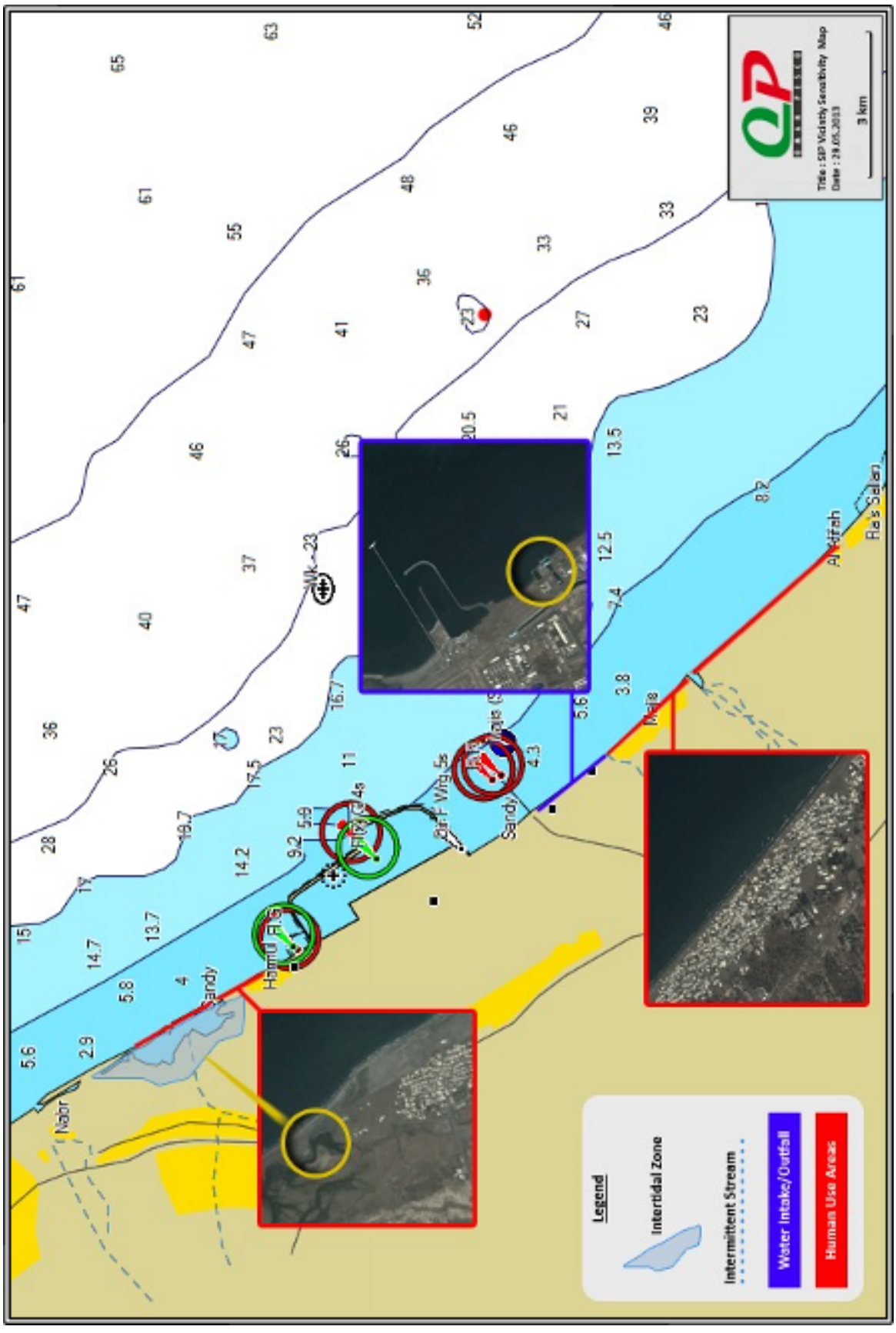
3. At the onset of the incident the SIPC Duty Manager has the authority to declare the emergency a Tier 3.

4. The Chairman CMT confirms the category once he has assumed control of a Tier 2/3 incident.

5. The diagram illustrates the option to review the Tier category as required, should the emergency escalate.

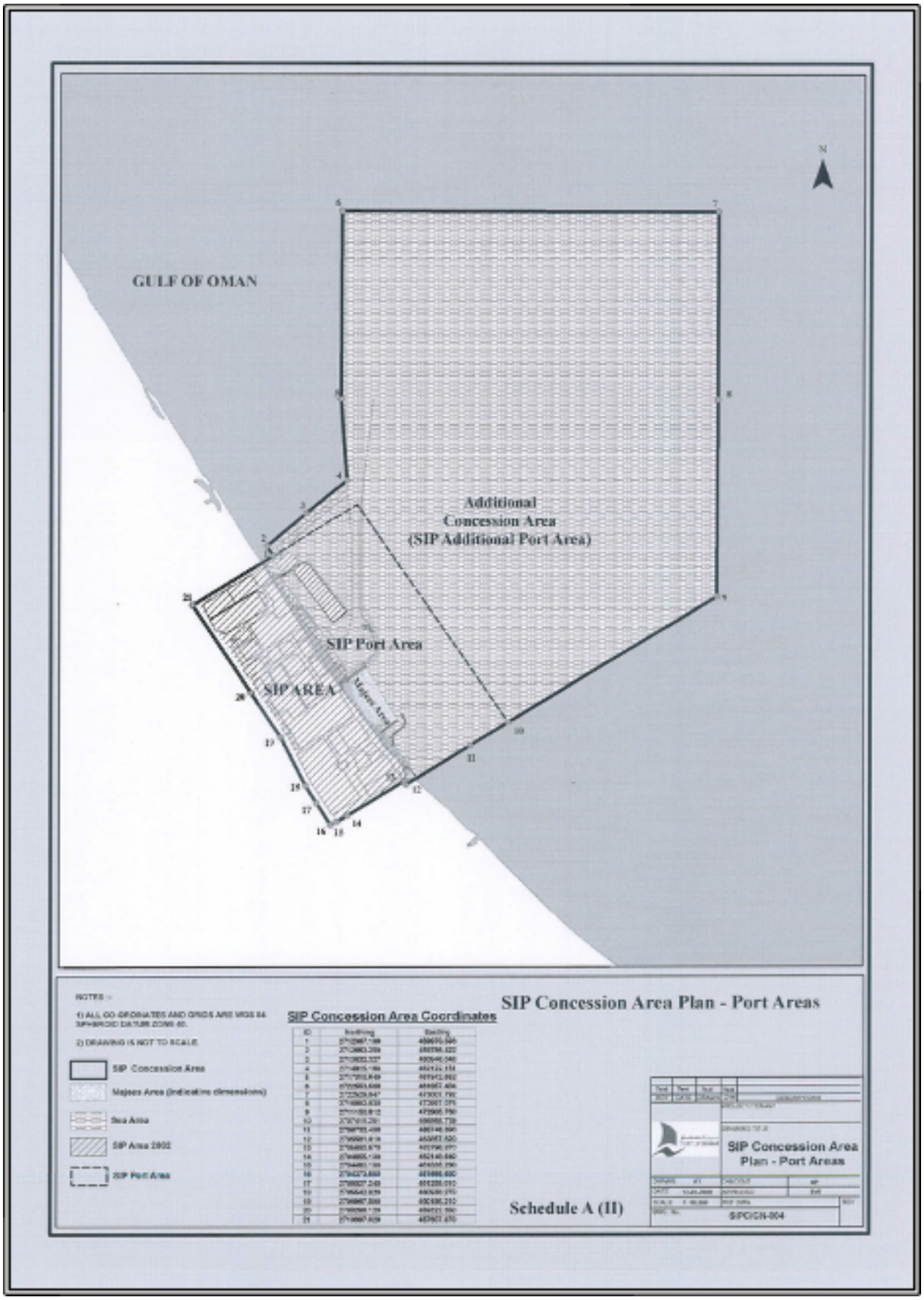
3.4 Area Maps

3.4.1 SIP Vicinity Sensitivity Map

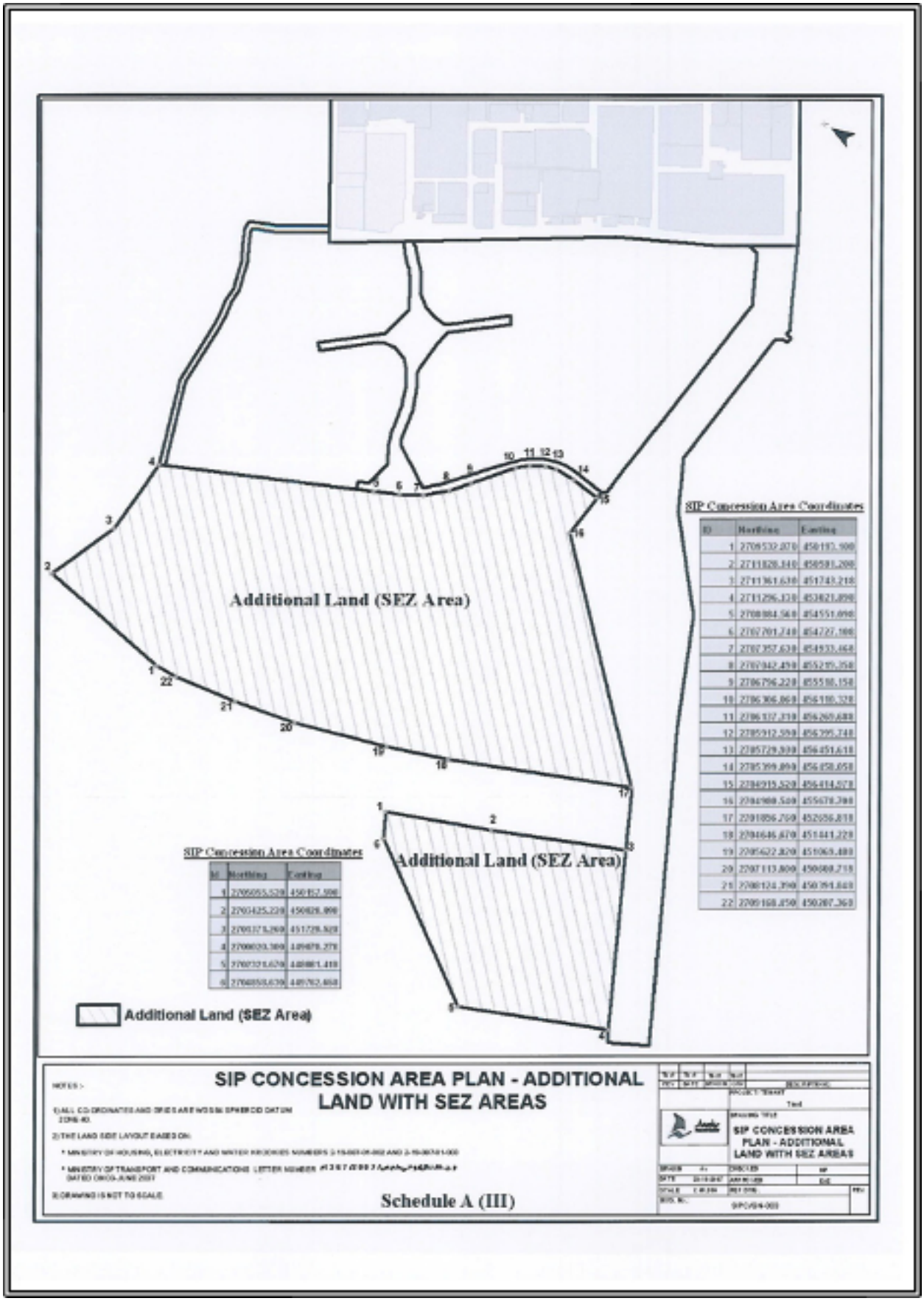


3.4.2 SIP General Layout

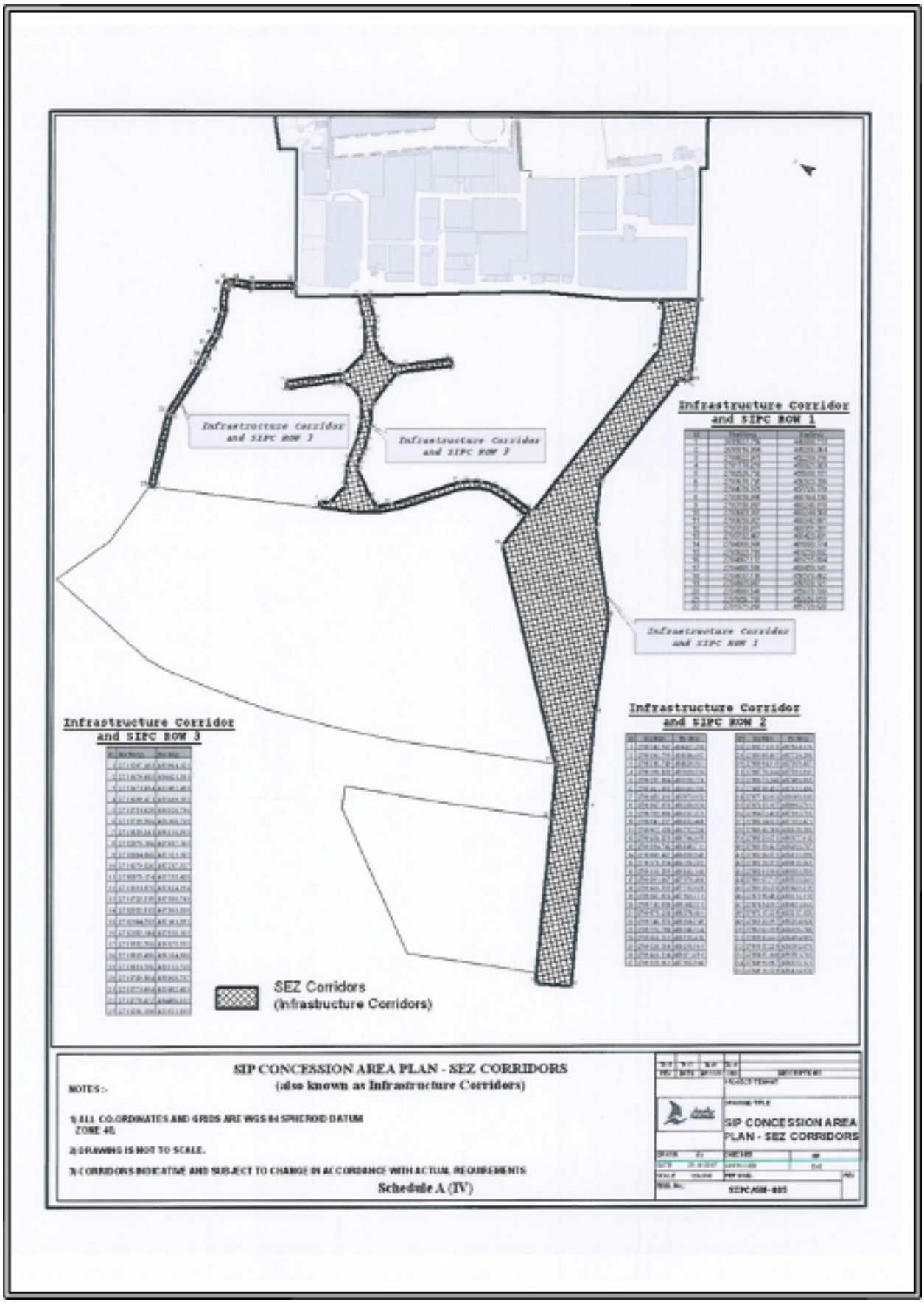
3.4.3 SIP Concession Area Plan – Port Areas



3.4.4 SIP Concession Area Plan – Additional Land with SEZ Areas



3.4.5 SIP Concession Area Plan –SEZ Corridors



3.5 List of Trained Tenant Personnel

S.N	Name	Company	Training Type	Date Trained	Re-Certification Date
1	Abdul Kareem Al-Balushi	SAC (terminal)	OPRC IMO Level-1	February, 2012	February, 2014
2	Abdul Rahman Al Mamari	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
3	Abdulaziz Al-Mamari	SAC (terminal)	OPRC IMO Level-1	January, 2012	January, 2014
4	Abdulbasit Al-Shizawi	OMC	OPRC IMO Level-1	January, 2012	January, 2014
5	Aftab Hafiz	OOTO	OPRC IMO Level-1	January, 2013	January, 2015
6	Ahmed Al Alwi	SIUCI	OPRC IMO Level-1	January, 2012	January, 2014
7	Ahmed Al-Barkaty	C.Steinweg	OPRC IMO Level-1	February, 2012	February, 2014
8	Ali Khalifa Humaid Al Abdul Salaam	SIUCI	OPRC IMO Level-1	January, 2013	January, 2015
9	Amin Kindi	Vale	OPRC IMO Level-1	January, 2013	January, 2015
10	Anil Raheja	OOTO	OPRC IMO Level-1	January, 2012	January, 2014
11	Anoop Kumar	SIUCI	OPRC IMO Level-1	February, 2012	February, 2014
12	Dipak Dhole	OOTO	OPRC IMO Level-1	January, 2012	January, 2014
13	Farid Hassan Mohammed Al-Balushi	OICT	OPRC IMO Level-1	February, 2012	February, 2014
14	Hamdan Almamari	Shadeed	OPRC IMO Level-1	January, 2013	January, 2015
15	Hamed Hamdan Al Badi	OICT	OPRC IMO Level-1	January, 2013	January, 2015
16	Haroon AL SHAQSI	SAC (smelter)	OPRC IMO Level-1	January, 2012	January, 2014
17	Hassan Jamman	C.Steinweg	OPRC IMO Level-1	February, 2012	February, 2014
18	Issa Al Mayasi	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
19	Javed Iqbal	SPC	OPRC IMO Level-1	February, 2012	February, 2014
20	Khadeem AL KAHALI	SAC (terminal)	OPRC IMO Level-1	February, 2012	February, 2014
21	Khalid Al Shaqsi	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
22	Khalifa Al Kindi	OMC	OPRC IMO Level-1	February, 2012	February, 2014
23	Khamis Mohammed Al-Balushi	OICT	OPRC IMO Level-1	January, 2012	January, 2014
24	M. Suraj	L&T MFY	OPRC IMO Level-1	January, 2013	January, 2015
25	Maha Al-Jabri	SEU	OPRC IMO Level-1	January, 2012	January, 2014
26	Majid Al Saidi	SEU	OPRC IMO Level-1	February, 2012	February, 2014
27	Mohammed Al Habsi	OICT	OPRC IMO Level-1	February, 2012	February, 2014
28	Mohammed Al Maqbali	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
29	Mohammed Al-Balushi	OFFC	OPRC IMO Level-1	January, 2013	January, 2015
30	Mohammed M Hasan	OICT	OPRC IMO Level-1	February, 2012	February, 2014
31	Mohammed Najeed Ahmed	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
32	Mustafa Al Balushi	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
33	O.G.C. Muralidharan	SIUCI	OPRC IMO Level-1	February, 2012	February, 2014
34	Qais Al Barhi	SEU	OPRC IMO Level-1	January, 2013	January, 2015
35	Rajesh Dalvi	OMC	OPRC IMO Level-1	February, 2012	February, 2014
36	Ramadhan Said Ramadhan Al-Zadjali	OICT	OPRC IMO Level-1	February, 2012	February, 2014
37	Ramaiah Karuppaiah	MISC	OPRC IMO Level-1	February, 2012	February, 2014
38	Saeed Al-Farsi	SAC (smelter)	OPRC IMO Level-1	February, 2012	February, 2014
39	Said Abdullah Said Al Harthy	ORPIC	OPRC IMO Level-1	January, 2012	January, 2014
40	Said Al Marmari	SAC	OPRC IMO Level-1	January, 2013	January, 2015
41	Said Al Sheedi	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
42	Saleh Al-Jadidi	SAC (smelter)	OPRC IMO Level-1	February, 2012	February, 2014
43	Samer Hussein	Vale	OPRC IMO Level-1	February, 2012	February, 2014
44	Saud Al Balushi	Shadeed	OPRC IMO Level-1	January, 2012	January, 2014
45	Sivadas Thangappan	MISC	OPRC IMO Level-1	February, 2012	February, 2014
46	Soji Philip	L&T Feb.	OPRC IMO Level-1	January, 2012	January, 2014
47	Sugumar	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
48	Suliman Al-Hinai	Vale	OPRC IMO Level-1	January, 2012	January, 2014
49	Sultan Ahmed	Shadeed	OPRC IMO Level-1	January, 2013	January, 2015
50	Sultan Al-Mazrouai	Vale	OPRC IMO Level-1	February, 2012	February, 2014
51	Umush Pujouy	OFCC	OPRC IMO Level-1	January, 2012	January, 2014
52	Venkatesan	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
53	Waleed Al Amri	OOTO	OPRC IMO Level-1	February, 2012	February, 2014
54	Waleed Al Siyabi	SIPC	OPRC IMO Level-1	January, 2012	January, 2014
55	Yasir Al Shamsi	OFCC	OPRC IMO Level-1	February, 2012	February, 2014
56	Yeshwant Gawali	SPC	OPRC IMO Level-1	February, 2012	February, 2014
57	Yousuf Khamis Al-Hasani	OICT	OPRC IMO Level-1	January, 2012	January, 2014

APPENDICES

Contents

Appendices

I. Abbreviations

ALARP : As Low as Reasonably Practicable

CMT : Crisis Management Team

CMC : Crisis Management Committee

DC : Duty Coordinator (SIPC)

DM : Duty Manager (SIPC)

IMO : International Maritime Organization

MARPOL : International Convention for the Prevention of Pollution from Ships (73/78)

EA : Ministry of Environment and Climate Affairs - Oman

MSO : Marine Safety Officer (SIPC)

NCCD : National Committee for Civil Defence

NEC : National Emergency Committee

NOSCP : National Oil Spill Contingency Plan

OP : OMAN PESCO

OPEP : Oil Pollution Emergency Plan

OPRC : International Convention on Oil Pollution Preparedness, Response & Cooperation

OSC : On-Scene Commander

OSR : Oil Spill Response

PCO : Port Control Officers (SIPC)

ROP : Royal Oman Police

ROP-CG : Royal Oman Police – Coast Guard

ROP-OGIS : Royal Oman Police – Oil & Gas Installations Security

SEU : Sohar Environmental Unit

SIP : Sohar Industrial Port

SIPC : Sohar Industrial Port Company

SOPEP : Shipboard Oil Pollution Emergency Plan

STS : Ship-to-Ship

II. Oil Spill Report Format

This format is to be used to inform the relevant authorities about a oil pollution incident, or the threat of an oil pollution incident. Every effort should be made to provide all information requested.

However, the notification of an incident to the relevant authorities should not be delayed simply because not all information is immediately available.

CONTACTING THE AUTHORITIES

1. In the event of an oil spill, SIPC, SEU and EA should be contacted immediately by telephone.

Emergency Contacts

Authority	Emergency Hotline
EA	99336443 24692310
SEU	26850285 97770772
SIPC	26852777

Written confirmation, using the OILPOL format, should be faxed as soon as possible to:

Authority	Emergency Fax
EA	24693946 24692462
SEU	26840681
SIPC	26850272

OIL SPILL INCIDENT REPORT

From		**To**	
Date		**Time**	
Reported By		**Job Function**	

Notification Classification	☐ Doubtful	☐ Probable	☐ Confirmed	
Oil Spill Location	Lat.		Long.	
Geographical Position (if known)				

Spill Data				
Characteristics of Pollution	Color		Size	
Oil Type				
Estimated Quantity		MT	M^3	bbl
Source and Cause of Pollution				
Responsible Party(If Known)				
Pollution Forecast				
Photographs and Samples (if applicable)				

Environmental Conditions						
Environmental Data		Tide		Wind		
Wind	Direction					
	Speed					
Sea	Beaufort		**Tidal Information**	HT		LW
	Current Direction			1		1
	Current Speed			2		2

Actions and Notifications				
Notifications	☐ EA	☐ SEU	☐ ROP	☐ Others (Specify – Use Space provided bellow)
Initial Actions				
Support Required	☐ YES	☐ NO		

Any other relevant Information	
Vessels in the Area	
Helicopter to over flight	

III. Aerial Surveillance Form

This format is to be used by the assessor dispatched to conduct an aerial surveillance operation. The completed report should be sent to the Emergency Response Team Controller as soon as possible.

Aerial Surveillance Observer Log

Incident:		**Date:**		**Observers:**	
Aircraft Type:		**Call Sign:**		**Area of Survey:**	
Survey Start Time:		**Survey End Time:**		**Average Altitude:**	
Wind Speed (Knots)		**Wind Direction**			
Cloud Base (Feet)		**Visibility (NM)**			
Time High Water		**Time Low Water**			
Current Speed (NM)		**Current Direction**			

Slick Details

Slick Grid Parameters by Lat/Long				**Slick Grid Parameters by air speed**				**Slick Grid Dimensions**	
Length Axis		**Width Axis**		**Length Axis**		**Width Axis**		**Length**	**NM**
Start Lat.		**Start Lat.**		**Time (Sec)**		**Time (Sec)**		**Width**	**NM**
Start Long		**Start Long**						**Length**	**Km**
End Lat.		**End Lat.**		**Air Speed (Kt)**		**Air Speed (Kt)**		**Width**	**Km**
End Long		**End Long**						**Total Grid Area**	**Km^2**

Oil Code	Colour	% Cover Seen	Total Grid Area	Area Per Oil Code	Factor	Oil Volume
0	Clean	%	Km^2	Km^2	0 m^3 / Km^2	m^3
1	Silver	%	Km^2	Km^2	0.1 m^3 / Km^2	m^3
2	Rainbow	%	Km^2	Km^2	0.3 m^3 / Km^2	m^3
3	Black/Dark brown	%	Km^2	Km^2	100 m^3 / Km^2	m^3
4	Brown/Orange	%	Km^2	Km^2	1000 m^3 / Km^2	m^3

Note:

None shaded areas to be completed on flight, Shaded areas completed on return.

IV. Site Specific Health and Safety Assessment Form

To achieve a safe operation, those in charge of the response must assess all potential hazards that may cause an uncontrolled incident and further damage to the environment or injury to personnel working within the designated area. The Site Assessment Form overleaf provides the surveyor with a comprehensive guide to risks that may be encountered whilst indicating the PPE associated with each. The assessment form should be completed before spill response operations commence and must be site specific.

Site Specific Health and Safety Assessment Form

1. Applies To Site					
2. Date		**3.Time**		**4.Incident**	
5.Products					(Attach MSDS)
6. Site Characterization	Tick all relevant boxes				
6a. Area	☐ Ocean	☐ Bay	☐ River	☐ Saltmarsh	☐ Mudflats
	☐ Shoreline	☐ Sandy	☐ Rocky	☐ Cliffs	☐ Docks
6b. Use	☐ Commercial	☐ Industrial	☐ Farming	☐ Public	☐ Government
	☐ Recreational	☐ Residential	☐ Other		
7. Weather	☐ Ice/frost	☐ Snow	☐ Rain	☐ Wind	☐ Sun

8. Site Hazards		
☐ Bird Handling	☐ Fire, Explosion, in-situ burn	☐ Slip, trips and Falls
☐ Boat Safety	☐ Heat Stress	☐ Steam and hot water
☐ Chemical Hazards	☐ Helicopter Operations	☐ Tides
☐ Snakes/Scorpions	☐ Lifting	☐ Trenches, Excavations
☐ Drum Handling	☐ Motor Vehicles	☐ UV Radiation
☐ Equipment Operations	☐ Noise	☐ Visibility
☐ Electrical Hazards	☐ Overhead/Buried Utilities	☐ Weather
☐ Fatigue	☐ Pumps and Hoses	☐ Work near Water
☐ Other	☐ Other	☐ Other

9. Air Monitoring		
☐ O2	☐ LEL	☐ Benzene
☐ H2S	☐ Other (Specify)	

10. Personal Protective Equipment			
☐ Foot Protection.....	(Qty)	☐ Coveralls.....	(Qty)
☐ Head Protection.....	(Qty)	☐ Impervious Suits.....	(Qty)
☐ Eye Protection.....	(Qty)	☐ Personal Floatation.....	(Qty)
☐ Ear Protection.....	(Qty)	☐ Respirators.....	(Qty)
☐ Hand Protection.....	(Qty)	☐ Other.....	(Qty)

11. Site Facility Required		
☐ Sanitation	☐ First Aid	☐ Decontamination

12. Emergency Plan Required	
Alarm System	Evacuation Plan

13. Contact Details Required		
☐ Fire	☐ Doctor	☐ Ambulance
☐ Police	☐ Hospital	☐ Other. .....

14. Date Plan Completed	
15. Plan Completed By	

Site Name	
Location / Map Reference	

Include Work Zones, First Aid Locations, Primary and Secondary Escape Routes, Assembly Points, Staging Area and Command Post Locations

V. Pollution Liability Notification

SOHAR INDUSTRIAL PORT COMPANY Pollution Liability Notification

Fax message

To

For the attention of

Fax

From J. Hollander

Copy to

Subject

Date
Our reference
Telephone +968 26852777
Fax +968 26852701
E-mail ops@portofsohar.com
Number of pages 1 (incl. annexes)

Herewith I inform you that a spill has occurred which polluted water and possibly infrastructure in the area of the SOHAR Port, Sultanate of Oman.

The spill was caused by a vessel of which you are the agent.

I request you to notify the master of the vessel concerned.

This message serves the purpose to establish liability. We will revert to this matter later.

For surveying purposes and cleaning you may contact the Harbourmaster mr J. Hollander, tel. 00968 26852777 (office hours). After office hours you can contact the Port Control Centre, tel. 00968 99342699

Date
Name ship
Also involved
Location of the spill
Description of the spill

Yours sincerely,
Sohar Industrial Port Company SAOC

Mr John Hollander
Harbour Master

UNCONTROLLED COPY IF NOT SIGNED			
DOCUMENT NO.	REVISION	PRINT DATE	PAGE
SIPC-MD-FM-0006	0	21/05/2009	Page 1 of 1

VI. Letter of Undertaking Format

LETTER OF UNDERTAKING

To: XXXXXXXXXX
P.O.Box XXXX
Postal Code: XXXX XXXX,
Sultanate of Oman

Claims: All claims arising from or related to the MT "XXXX" having involved in xxxx hydrocarbon spill due to xxxx on DD/MM/YYYY.

Place: SOHAR Port,

Dear Sirs,

In consideration of your refraining from arresting or otherwise detaining the: **M.T XXXXX**

Or any other vessel or property in the same or associated ownership, management, possession or control for the purpose of obtaining security in respect of your Claim arising from the above allision we hereby undertake to pay you within seven (7) days from receipt of your written demand RO**xxxx**,. **xxx** (**xxxxxxxxxxxxxx** Omani Rials) as may be due to you from the **M/T XXXX – IMO Number: XXXXXX** and/or its owners ([name of ship owners and address] "the Shipowner") and/or operator in respect of your said Claims as may be found either by agreement between the parties or by final and non-appealable judgment of a competent Court, inclusive of interest and costs.

We shall, upon demand, cause to be filed a bond in a form and sufficiency of surety satisfactory to you in any such amount as you may seek to arise from your Claims in a proceeding brought in a Court of competent jurisdiction.

And for the consideration aforesaid:-

1. We hereby warrant that **XXXXX**" was not demise chartered at any material time;

2. We further undertake within 14 days of a request from you to do so, to instruct and authorise lawyers forthwith to accept on behalf of the MT " XXXXXX" and/or the Shipowner and/or Operator, service of court process issued in a court of competent jurisdiction in respect of the claims.

3. We hereby warrant that we have received irrevocable authority from the shipowner/operator to provide this letter of undertaking in these terms.

This undertaking shall be governed by English law [] and any dispute arising hereunder shall be submitted to the exclusive jurisdiction of the Courts of [] [England].

Date of signature
Signature of Guarantor

VII. Event Log Format

SOHAR PORT / FREEZONE	Event Log

Date	Location	Incident	Parties Involed

Date	Time	Description of Event

Approved by	
Signatuer	

VIII. Technical Resources and References

Fate of Oil

1. Fate of Spilled Oil

Hydrocarbon products are mixtures of a large number of components, each with their own chemical and physical properties. Once oil is spilled, it immediately begins to undergo many natural, physical, chemical and biological changes. This process, known as weathering, is assisted by spreading and movement created by waves, winds and currents.

Weathering processes involved are evaporation, solution/dilution, sedimentation, dispersion into droplets and particles, emulsification, chemical photo-oxidation, biodegradation by micro-organisms, uptake by marine organisms and formation of tarry lumps and particles.

The effect of all these processes dictates the persistence of the oil within the environment and therefore its effects upon vulnerable marine resources. In addition, the oil's behaviour influences the response strategy that may be employed which may require a number of different options to be considered. Therefore knowledge of how oil is going to behave will ensure the correct equipment is mobilised to effectively reduce the potential impact of the spill.

2. Fate Processes of Oil

The following summarises the more important processes:-

A) Spreading and Movement

Oil, being lighter than water, forms slicks which spread over the surface of the ocean at rates which are influenced by gravity, surface tension, viscosity, pour point (i.e. temperature of solidification), wind, waves and currents. Temperature is another important variable that controls spreading because viscosity is temperature- dependent. It should be noted that crude oils vary widely in composition and their behaviour in the ocean varies accordingly. Even viscous crude oils may spread rapidly into thin layers. The action of the sea and wind elongates, distorts and breaks the slicks into moving patches of oil which will contain the largest (thickest) amount near the leading edges. The oilpatch movement on the water is effected by both wind and current. The effect of wind is to move the oil at 2.5 to 3.5 % of wind velocity.

B) Evaporation

Due to the high percentage of volatile components in most crude oils, the rate of loss of these volatiles from oil in the sea is quite important. Such evaporation occurs quite rapidly, is physically related to the process of dissolution and is promoted by spreading, high water temperature and rough seas, (which generate sea sprays and bursting bubbles that eject the oil into the atmosphere). Studies have shown that up to 50 percent of crude oil can be lost by evaporation, usually within 24 to 48 hours. This compares with only 10 percent from a heavy or residual fuel oil, 75 percent from a diesel or home-heating fuel oil and virtually all from kerosene or gasoline.

C) Emulsification

The formulation of emulsions of water-in-oil (as contrasted with dispersions of oil-in-water, which are discussed below) leads to many difficulties. The tendency to form emulsions - which are persistent, thick, grease-like masses often called "Chocolate mousses" - depends upon the type of oil involved, but is promoted by rough sea conditions. Under suitable conditions, emulsions

containing up to about 80 percent water can be formed rapidly. Their formation adds to the difficulty of clean-up, onshore and offshore, it increases the volume and viscosity of material to be removed and, therefore, the difficulty in handling and disposing of the oil.

It has been postulated by some that weathering processes can convert emulsions into tarry lumps and particles which can persist in the sea for a year or more and travel long distances, to be washed ashore as familiar "tar balls". Many such lumps found in the sea or washed ashore are not derived from crude oil spills, but rather from discharges from tanks, engines or bilges.

Most tar balls break up and weather at sea, but those, which reach beaches and shorelines, may degrade more slowly, depending upon the type of shoreline involved. Studies on the biological effects of stranded tars on marine life in temperate shoreline areas have shown that such effects probably do not pose a serious ecological threat, but the aesthetic and economic consequences of tars stranded on amenity beaches can be serious.

D) Dispersion

Depending upon the type of crude oil involved, spontaneous formation of small droplets of oil-in-water can occur rapidly due to wave and wind action. The temperature of the sea and other factors contribute to this process. Natural dispersion can be helpful in mitigating the effects of spilled oil by dissipating the oil and thereby reducing its toxicity towards marine life. This process can be markedly hastened by the use of special dispersants. However, dispersant application in shallow or enclosed bodies of water should only be undertaken with the careful guidance of experts, including ecologists.

The gradual spontaneous disappearance of spilled crude oil from the surface of the sea is assisted by the dispersion processes. Because of the greatly enhanced oil/water interface, the small particles (globules) of oil created are more easily biodegraded by micro-organisms. They lose their more toxic soluble volatile components more readily than large continuous patches of oil, and are rapidly dissipated by the diluting action of the sea.

The rapid dilution of dispersed oil often prevents the oil from travelling as far as surface slicks and thereby reduces the likelihood of its reaching coastal areas and washing ashore. Dispersion also reduces the hazard to marine birds.

E) Dissolution

Although the solubility of most hydrocarbons in water is quite low, some components of crude oil - notably the lighter, low boiling aromatic hydrocarbons - are soluble enough to enter the sea quite rapidly after an oil spill. The rate of dissolution depends upon such factors as water turbulence and temperature.

These more soluble fractions are also the most volatile components of oil and therefore preferentially evaporate rather than transfer to the water phase. This has been confirmed by analytical measurements of the concentrations of dissolved hydrocarbons, which may remain below or near the spill site. Dissolution is therefore not as important as other processes, such as evaporation, in determining the fate of spilled oil.

F) Sedimentation

Sedimentation is the process whereby particles of floating oil sink to the bottom of the sea. In order for this to occur, it is necessary for the oil particles, which are less dense than seawater, to be modified by evaporation of lighter components and, more important, by incorporation of particulate matter present in the water column, which then renders them denser than water.

Because of the low levels of particulate matter present in the open sea, sedimentation is not likely to occur. This process becomes more important in near-shore areas where the suspended sediments loads may be encountered near shores by tidal or estuarine 4flows, land run off and storm conditions.

G) Photochemical Oxidation

Oil subjected to the rays of the sun on the surface of the sea undergoes chemical changes, generally termed photochemical oxidation. These changes degrade certain components of the oil and render them more water-soluble and subject to dissipation by dissolution and dilution. The rates of photochemical oxidation of oil are greatest at the sea surface, or on physically-stranded exposed oil.

H) Biodegradation

Water and sediments throughout the world contain micro-organisms (bacteria, yeasts and fungi) which utilise and degrade petroleum components. A very large number of species of micro-organisms, which can degrade petroleum, have been identified in open sea and coastal areas.

Biodegradation is the most important of the processes in determining the ultimate fate of oil in the marine environment, although it does not immediately decrease the volume of oil or its impact on the environment after it is spilled.

Biodegradation is promoted by dispersion of oil slicks into small particles over a large surface area. This applies whether dispersion occurs naturally or is induced by application of dispersants. It is interesting to note that biodegradation enhances the rate of natural dispersion of oil.

For biodegradation to proceed at reasonable rates, nutrients such as nitrogen and phosphorus must be present. Thus, biodegradation proceeds more rapidly in coastal waters (which contain many more of these nutrients) than the open sea. Most components of crude oil can be degraded by micro-organisms, but the lighter, lower molecular weight components are degraded faster than the heavier ones.

Higher temperatures accelerate biodegradation, but this process still proceeds at significant rates even in Arctic regions. Unlike emulsions, the viscosity of the oil-in-water dispersions are similar to that of the water phase and once formed, such dispersants tend to disappear from the surface, but remain in near-surface waters, where further dilution occurs.

Surveillance and Tracking

1. Introduction

A monitoring, surveillance and tracking response is only appropriate for small, non- persistent spills. The following table details the surveillance, monitoring and trajectory predictions that should be carried out throughout the course of the incident to identify any resources at risk and confirm when the slick has dispersed.

SURVEILLANCE MONITORING AND TRAJECTORY PREDICTION CHECKLIST	
Checklist	**Notes**
Determine extent and coordinates of slick.	
Chart slick size, growth patterns and affected area(s); estimate quantities if possible.	
Carry out slick trajectory predictions.	
Follow direction of movement of slick.	
Identify heaviest concentrations of oil.	Likely to be at downwind leading edge of spill.
Identify onset and progress of water in oil emulsion formation.	Heavy oil (e.g. intermediate fuel oil) will change in appearance soon after spill; in initial stages, the thicker parts will appear as dense, black areas, but as emulsification takes place, the colour will change to brown, orange or yellow.
Watch for any flocks of birds.	Refer to Section 1.2 / Sensitivity maps in Section 3.3 for further information.
Watch for any oil floating subsurface.	
Watch for breakup of slick and determine direction of movement of any oil patches.	
Report on progress of natural dispersion.	This is likely to be good for MGO spills.
Report on effectiveness of response.	If dispersants are employed watch particularly for signs of dispersant not working.

A monitoring and surveillance response is undertaken by observing the slick on the sea surface. Although this can be undertaken from a pier or vessel, surveillance from boats and ships can be difficult for large spills due to the vessel's limited visibility, speed and range. Best estimates are made from aerial surveillance flights.

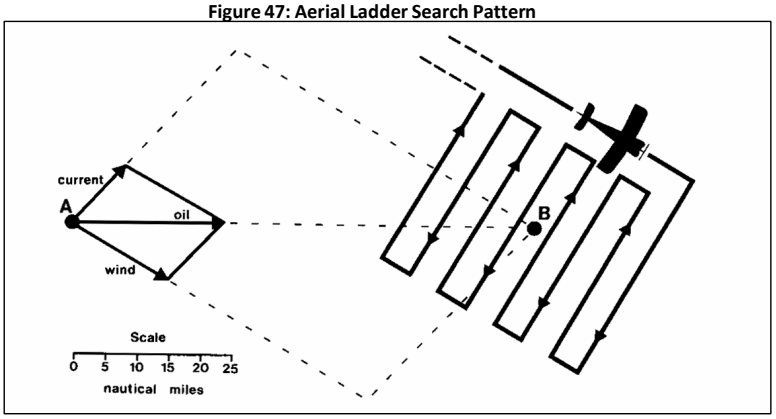
Surveillance of the spill by sea and / or air should be attempted as soon as possible (In good conditions) in order to gain a clear picture of the overall situation. Surveillance flights should be repeated as often as necessary, particularly if the conditions of the source of the spill and the weather change. A final surveillance flight should be made shortly before dusk. Information gained should be brought to the attention of the onsite team and their deployment reconsidered in light of any changes to circumstances. Use of video or still photography is highly recommended.

2. Recommended Over Flight Patterns

The "Ladder Search" (See Figure 47) is frequently the most economical method of surveying a large sea area to locate a spill. Since floating oil has a tendency to become aligned in long narrow

windrows parallel to the direction of the wind, a ladder search across the wind will increase the chances of oil detection.

Figure 47: Aerial Ladder Search Pattern



from A to B three days later, predicted by combining 100% of the current speed and 3% of the wind speed. The arrows from A represent current, wind and oil movement for one day. A cross wind ladder search pattern is shown over position B.

An Aerial Surveillance Observer Log form can be found in Annex III.

3. Legal Constraints

It is important for the aircraft operator to check their flight path prior to take off. If it is necessary to fly through no fly zones or airports they need to apply for permission to enter the area.

4. Limitations

The limitations of aerial surveillance include altitude, weather and light restrictions.

Altitude

The pilot of the aircraft will constantly assess the situation and consider the safety of personnel when altering altitude. It is important to note there is a minimum 500ft limitation over structures and vessels.

Weather

Weather conditions may dictate when it is safe to fly and will be considered prior to take off.

Visibility

Surveillance from vessels may be restricted to small spills as the entire slick may not be visible fromthe deck. For both at sea and aerial surveillance the most effective time of day to survey oil is during daylight hours.

5. Logistical Constraints

Logistical constraints for aerial surveillance include requirements to refuel. At sea surveillance will either be undertaken by a vessel from the nearest large port or a vessel of convenience. Steaming time to the incident location may be considered a logistical constraint.

Use of Dispersants

1. Introduction

Before oil reaches the coastline the use of dispersants may substantially reduce the potential environmental damage by treating the spill at an early stage before the oil has weathered.

Dispersants reduce the tension of the oil therefore increasing the rate of droplet formation and enhancing the natural break-up of the oil thereby removing it from the water surface and redistributing it through the water column.

2. Legal Constraints

Oman has a cautious approach to dispersant use, and prefers to use containment and recovery to deal with oil at sea.. Dispersants would probably not be used in water depths of less than 25m. The ROPME approved list of dispersants is generally adhered to.

As per the National Oil Spill Contingency Plan of Oman, the use of dispersants is only allowed after obtaining an approval from the Environment Authority (EA).

The list of dispersants approved by ROPME is as follows:

- DASIC SLICKGONE NS
- FINASOL OSR-52
- GAMLEN OD 4000 (PE 998)
- NU CRU
- RADIAGREEN OSD

3. Limitations

Dispersants will not work effectively in all circumstances, therefore it is important to understand the limitations of the chemical prior to application and the following points should be considered:

- If the oil is too viscous the dispersant solvents will not be able to penetrate and the energy input from breaker boards or natural turbulence will be insufficient to distort and break up the oil into droplets.
- Heavy fuel oil will be impossible to disperse but light fuel oil may be amenable under favourable conditions.
- Dispersants work more effectively applied on fresh oils since weathering of oil can increase viscosity. It is very important that dispersant is used as soon as possible, ideally within 24 hours.
- The use of dispersant is not appropriate within waters forming part of an SSSI or shell-fishery, or when a flood tide will take dispersed oils into such sensitive areas.

4. Logistical Constraints

Prior to considering dispersant application it is important to take into account the mechanical containment and recovery methods that may need be employed as a secondary measure. Certain types of recovery equipment i.e. oleophilic skimmers will impair, reduce or prevent the recovery of oil which has been treated with dispersant. Unfortunately recovery devices that are not affected by dispersant in this way usually recover a large proportion of water.

Mechanical Containment & Recovery

1. At Sea Containment and Recovery

Every effort should be made to contain and recover spilled oil close to the source before spreading and thinning has taken place. Even if the weather conditions at the beginning of the spill are unfavourable for undertaking an at sea containment and recovery response, this solution may become feasible as the incident progresses.

2. Shoreline Containment & Recovery

In the event that oil reaches the shoreline, despite attempts to contain the oil at source, cleanup operations may be necessary to allow the coast to recover to its natural state and socio-economic value. At this time salvage and coastal spill control operations may still be in progress and in some areas it may be possible to undertake intensive protective measures. It is essential that the overall strategy be reconsidered at this time.

Main Factors influencing the Overall Strategy

- Equipment and expert manpower may need to be re-deployed. Normally there is little conflict in continuing with spill control operations and organizing the cleanup of beaches. However, if containment booms are used in coastal waters it may now be prudent to use at least some of them for protecting sensitive sites along the spill threatened coast. There will be a natural inclination to over-stretch resources and attempt protective booming in too many locations. However experience shows that successful booming has been achieved when resources are concentrated on protecting a limited number of sites.

- In order to predict the behaviour and subsequent movement of an oil spill sufficient data on tides, coastal currents and weather has been detailed in this plan. Valuable preparation time can be gained by alerting people in threatened areas. Preparatory actions include the removal of debris from the shoreline prior to impact in order to reduce the volume of oily waste, making equipment ready for use etc.

- The extent of the cleanup work in various coastal areas should be carefully balanced with the possible ecological damage, which may result from extensive cleanup activities. In some areas, especially where amenity use of the coast is of minor significance, the ecologically most desirable course of action may be to allow the beached oil to degrade naturally.

- The decision whether or not to clean the affected shoreline will depend on a number of factors including: the impact of stranded oil on the environment and commercial activities, the possibility that stranded oil may re-contaminate another part of the shoreline and the feasibility of cleanup operations (i.e. extent of pollution, shoreline access, shoreline type, equipment & manpower available, prevailing weather and sea state conditions).

- Expert advice should be sought prior to selecting cleanup techniques and determining the extent of the cleanup operation. It is important to verify, during the early stages of the cleanup activity, that the on-site teams fully understand and agree with these objectives.

- Particular attention should pay to rescuing and, if necessary, rehabilitating wildlife both in spills affected and spill threatened areas. Especially at risk are seabirds, young sea mammals (e.g. seals) and salt marsh fauna. Wherever possible, local experts should be consulted when developing a cleanup strategy.

- Beach cleanup operations will generate substantial quantities of oily debris, and temporary storage, transportation and disposal methods have to be arranged to avoid interruption of the beach cleanup operations.

- If no other possibility exists, oily debris may have to be stored in plastic bags or in open, lined pits excavated in suitable locations.

- Manpower requirements may vary considerably due to factors such as availability of mechanical equipment, weather, temperature, available shelter etc.

- One of the primary tasks of the Incident Manager is to organize the manpower required for the cleanup operations and to direct deployment and specific objectives as the overall situation requires. Experience has shown that small groups reporting to a supervisor form the most effective working unit.

Vulnerability Index of Shores

The impact oil has on a shoreline can vary dramatically depending on the shoreline type. In order to priorities which shorelines require protection it is useful to classify their vulnerability. This is best achieved by using a sensitivity index. Following the basic principles that sensitivity to oil increases with increasing shelter to the shore from wave action, penetration of oil into the substratum, natural oil retention and biological activity, it is possible to create an index, as detailed in the table presented herein under:

- Rocky shores encompass a variety of intertidal habitats and consequently have a range of vulnerabilities to oil pollution. In wave exposed areas, a rocky shore is relatively quick to recover. Conversely, rocky shores in wave sheltered areas are more sensitive to oil spills, as oil can be trapped in sensitive sub-habitats, and such habitats have greater recovery times.

- Sensitivity to oil pollution of sand, mud and shingle shores is dependent upon the ease with which the oil can penetrate the sediment. In fine grained, gently sloping beaches oil will not readily penetrate the beach; whereas in steeply sloping, shingle beaches oil penetration may be deeper, with subsequent cleanup made more difficult.

- Salt marshes develop where tides and wave action are not sufficiently strong to prevent deposition of fine sediments, which most commonly occurs in sheltered inlets and bays. Salt marsh areas are priority areas for protection following oil spills, because they can trap and retain large quantities of oil and are difficult to clean.

VULNERABILITY INDEX OF SHORES		
Vulnerability Index	**Shoreline Type**	**Comments**
1 **Least Vulnerable**	Exposed rocky headlands	Wave reflection keeps most of the oil offshore No cleanup necessary.
2	Eroding wave-cut platforms	Wave-swept. Most oil removed by natural processes within weeks.
3	Fine-grained sand beaches	Oil does not penetrate into the sediment, facilitating mechanical removal if necessary. Otherwise, oil may persist several months. (Recent evidence suggests that penetration can occur, depending on water table movements in sediments).
4	Coarse- grained beaches	Oil may sink and/or be buried rapidly making cleanup difficult. Under moderate to high- energy conditions, oil will be removed naturally from most of the beaches.
5	Exposed, compacted tidal flats	Most oil will not adhere to, nor penetrate into, the compacted tidal flat. Cleanup is usually unnecessary.
6	Mixed sand and gravel beaches	Oil may undergo rapid penetration and burial. Under moderate to low energy conditions, oil may persist for years.
7	Gravel beaches	Same as above. Cleanup should concentrate on high- tide/ swash area. A solid asphalt pavement may form under heavy oil accumulations.
8	Sheltered rocky coasts	Areas of reduced wave action. Oil may persist for many years. Cleanup is not recommended unless oil concentration is very heavy.
9	Sheltered tidal flats	Areas of great biological activity and low wave energy. A number of interpretations of the "Biological activity" are possible. In this case, it is taken to mean a combination of high productivity, biomass and possibly bioturbation (Interaction at the interface between the seabed and water column). Oil may persist for years. Cleanup is not recommended unless oil accumulation is very heavy. These areas should receive priority protection by using booms or oil sorbent materials.
10 **Most Vulnerable**	Salt march	Most productive of aquatic environments. Oil may persist for years. Cleaning of salt marshes by burning or cutting should be undertaken only if heavily oiled. Protection of these environments by booms or sorbent materials should receive first priority, where practicable, although damage caused by access may outweigh the benefits.

Three Stages for Shoreline Cleanup

There are three recognised stages to shoreline cleanup that are considered relevant for all oil types. These are detailed herein under:

CLEANUP STAGES FOR SHORELINE CLEANUP OPERATIONS	
Stage	**Notes**
1	**Removal of gross contamination.** Floating and stranded oil should be contained and collected as quickly as possible to prevent its migration and contamination of clean areas. For beaches, booms can be used to hold oil against the shoreline for recovery, whilst for rocky areas booms can be used to prevent oil stranding allowing it to migrate to a more appropriate collection point.
2	**Cleanup of moderate contamination, stranded oil and beach material.** The longest stage is removing stranded oil to prevent it from becoming mixed into the substrata or even buried. Great care is needed to limit the quantities of beach material removed so that the risk of erosion and the quantity of material for disposal are minimised.
3	**Final cosmetic – cleanup of lightly contaminated shorelines and oil stains.** The importance of the area, time of year and rate at which natural cleansing is expected will determine the final level of cleanup. Generally required for high amenity beaches.

In many situations it will not be necessary to progress through all these stages and on occasions oil on shorelines will be best left to weather and degrade naturally.

Cleanup Techniques for Various Shoreline and Oil Types

The following tables provide a summary of the varying coastlines within the area and identify the most appropriate options available for shoreline response.

CLEANUP TECHNIQUES FOR ROCK, BOULDERS AND MAN MADE STRUCTURES	
Stage	**Description**
Stage 1	Where there is vehicular access to the water's edge the oil can be collected using skimmers, pumps, vacuum trucks or vacuum tank trailers. Many skimmers do not function well in shallow water or in the presence of waves and therefore would only be used if they led to enhanced oil recovery rates. A typical vacuum truck or tank trailer can collect up to 20m3/day. As far as possible free water collected with the oil should be allowed to settle and then drained off before the oil is taken away for disposal. On tidal shorelines the oil can sometimes be concentrated at the water's edge by flushing it off the rocks or stones. Depending on the sea conditions it may be possible to use booms or even floating ropes to hold oil onto the shoreline during collection. In situations where vehicles are unable to get sufficiently close to the water's edge, the oil has to be picked up manually using buckets, scoops or dustbins. In such cases open topped 200 liter drums are unsuitable because of the difficulty of manhandling them over rocky terrain. However, drums can be carried in small boats where these can approach oil trapped amongst rocks. If the oil is particularly fluid it may be easier to handle if sorbents are first mixed into it. The most effective are synthetic materials such as expanded polyurethane foam and polypropylene fibers. These tend to be expensive although some can be used repeatedly. In the absence of synthetic products, natural local materials such as straw, peat or chicken feathers can be used. The oil/sorbent mixture can then be collected with forks and rakes and carried from the collection point in plastic bags or small containers.

CLEANUP TECHNIQUES FOR ROCK, BOULDERS AND MAN MADE STRUCTURES	
Stage	**Description**
Stage 2	In many cases, once the mobile oil has been removed, the remaining oil can be left to weather since a hard surface film readily forms, minimizing the spread of pollution. However, where rocky shores are part of the coastal amenities, further cleaning can be achieved by washing with water under pressure. Both hot and cold water can be used depending upon equipment availability and oil type: higher temperatures and, on occasions, even steam is required to dislodge viscous oils. Typically water is heated to about 600c and sprayed at 10-20 liters / minute from a hand lance operating at between 80 and 140 bar. It is essential that oil released in this way is collected; otherwise it may pollute previously cleaned or uncontaminated surfaces. The oil may be flushed down into a boom at the waters edge and collected with skimmers or vacuum trucks or it may be collected by arranging sorbents at the base of the rocks being cleaned. It should be appreciated that whereas many marine plants and animals will survive a single oiling, any of the methods described above will lead to the destruction of most of the marine biota living on the rocks. Some damage to rock surfaces themselves may also occur. These methods should therefore be reserved for areas where there is easy access and where members of the public clambering over the rocks are likely to come into contact with oil if no action is taken.
Stage 3	As a last resort and only after exhausting all other possibilities stains left after high- pressure washing can sometimes be removed by brushing dispersant into the oil and then hosing off the oil/dispersant mixture. By this stage of the cleanup the oil will be in the form of extremely thin films therefore only a very light application will be necessary.

CLEANUP TECHNIQUES FOR COBBLES & PEBBLES AND SHINGLE	
Stage	**Description**
Stage 1	This type of shoreline is probably the most difficult to clean satisfactorily because much of the oil will have penetrated into the spaces between the stones, deep into the beach. The first stage of cleanup for this type of shoreline follows similar lines to that of rocks, boulders and man-made structures: pumping fluid oil where possible or removing it by hand. The poor load bearing characteristics of such beaches can inhibit the movement of both vehicles and personnel.
Stage 2	Water at high pressure can be used to flush surface oil to the water's edge but some of the oil will also be driven into the beach. Low viscosity oils may be washed out from between the stones and the use of dispersants can sometimes enhance this. Inevitably some oil will remain in the body of the beach after the stones at the surface have been cleaned. This oil will slowly leach out as sheen over a period of weeks. Removal of all oily stones will rarely be a practical option and will usually only be possible if tracked front- end loaders can be used. Such actions will only be contemplated if the removal of stones will not cause serious erosion and disposal is possible. Another approach which might be used in locations, subject to vigorous winter storms, is to mask the oiled area with stones from higher up the beach thereby providing a clean surface over the summer for those using the beach for recreational purposes. Some weathering will occur due to the elevated temperatures and then, during the natural rearrangement of the beach that takes place in the winter, the oil will be broken up and dispersed. This method can only be used where the beach is moderately oiled and is not suitable for finer beach materials because the oil tends to migrate back to the surface. A further consideration is that the beach profile may be permanently altered and the natural sea defences weakened.

CLEANUP TECHNIQUES FOR COBBLES & PEBBLES AND SHINGLE	
Stage	**Description**
Stage 3	Except in the case of low viscosity oils, the use of dispersants is not advisable on cobble and pebble beaches because it tends to carry the oil further into the substrate. One way to remove the greasy film remaining after the stones have been cleaned with high pressure water is to push the top layer of the stones into the sea where the abrasive action caused by the sea rapidly cleans them. However, this is obviously inappropriate if oily stones underneath are then exposed. It should also be appreciated that it may be several years before the beach profile is restored since vigorous wave action is necessary to lift stones of this size back up the beach.

CLEANUP TECHNIQUES FOR SAND BEACHES	
Stage	**Description**
Stage 1	Very often sand beaches are regarded as a valuable amenity resource and priority is given to cleaning them. Intertidal sand flats, on the other hand, are often biologically productive and important for commercial fisheries. Environmental considerations may therefore dictate the selection of methods likely to cause the least additional damage, as are described later for muddy shores. Recreational beaches often have good access although on some shorelines temporary roadways may have to be constructed to allow heavy equipment onto the beach. In a major spill a balance has to be struck between the speed with which large quantities of oil can be collected using heavy machinery and the associated increased removal of beach substrate. To a large extent this is determined by beach type. Coarse sand beaches are frequently unable to support any vehicle without its wheels or tracks sinking into the sand and causing the oil to be mixed further into the beach. Furthermore, vehicles driven onto the beach may become immobilised once loaded. In all cases, care must be exercised to ensure that excessive removal of sand does not result in beach erosion. Manual methods must be used if there is no hard standing at the top of the beach or if it is too far for pump or suction hoses to reach the water's edge. Oil, as well as oiled sorbents and debris, can be collected in plastic bags or dustbins and carried up the beach, above the high water mark. Flat hard packed beaches may support heavy vehicles such as graders and front-end loaders. The grader's blade is set to skim just below the beach surface and the oil and sand drawn into lines parallel to the shoreline. The grader works down from the top of the beach and the collected oil is picked up by the front-end loaders. The work can be done using front-end loaders alone although the amount of sand then picked up will inevitably be greater. An alternative method for tidal beaches is to flush the oil into trenches dug parallel to the water's edge. In a similar way a sump may be dug, the oil flushed down the beach and deflected into the hole by suitably positioned boards or bunds built of sand. Oil collecting in the trench or sump can be removed using pumps, vacuum trucks or tank trailers. This method results in some oil becoming mixed into the sand where the trenches are dug. Trenches dug in clean sand just above the high water mark can be used to collect floating oil that has concentrated at the water's edge at high tide. These trenches should be lined with plastic sheeting to minimize contamination of the sand.

CLEANUP TECHNIQUES FOR SAND BEACHES	
Stage	**Description**
Stage 2	Oily sand is best removed by teams of men working in conjunction with front- end loaders, the latter being used solely to transport the collected material to temporary storage sites at the top of the beach. Typically each man collects between 1 and 2 m3 per day by this method. Front-end loaders and other heavy machinery used to pick up the oily sand directly can remove as much as 100-200 m3/day machine, but at the expense of at least three times as much clean substrate. As a rule the oil content of sand collected by machines is between 1 and 2% whereas that collected manually contains 5-10% oil. This is because heavy equipment tend to mix the oil into the sand and is less selective in what it picks up. To prevent oil being spread up the beach the front- end loader should work from the clean side as far as possible. Vehicles equipped with low-pressure tyres are generally more suitable than tracked vehicles. Where there is no possibility of getting vehicles onto the beach the collected oily sand has to be carried off the beach in heavy duty plastic bags. They should not be filled completely because of the difficulty in carrying them full over soft sand.
Stage 3	After the majority of the contaminated beach material has been removed, the remaining substrate is likely to have a greasy texture and may be discoloured. This will not usually be acceptable for recreational beaches and a final cleanup will be necessary to restore the beach to its original use. Another method particularly appropriate for tidal beaches is repeatedly to plough or harrow the affected beach at low water. The oil is then mixed with a greater volume of sand and more frequently exposed to weathering processes. Oil can be released from coarse-grained sand by passing high volumes of water through sections of the beach. Seawater is drawn through a high capacity pump and distributed through a number of hoses. By directing these water jets into a small area of beach the oil is floated out and flushed to the water's edge for collection. The method is slow and limited to the treatment of small areas at a time. The material remaining after the cleanup of dry sand beaches is usually in the form of small nodules of oily sand up to approx. 50mm in diameter. These, and tar balls washed up along the high water mark, can be collected using beach cleaning machines. In principle, these machines remove the top surface of the beach to a pre-set depth and pass the sand through a series of vibrating or rotating screens. The oily lumps are retained within the vehicle while the clean sand is allowed to drop back onto the beach. Such machines are usually purpose-built for general beach litter collection. In order to return the beach to its original use in the shortest possible time, clean sand can be brought from elsewhere and spread over any remaining lightly oiled sand. As far as possible, this clean sand should have the same grain size as the natural material so that it behaves in a similar way. If finer grained sand were to be used as replacement there is a risk that it might be washed away too quickly. When sufficient notice is available before the spill reaches the beach it may be possible to move some of the sand above the high water mark. This material can then be replaced after the beach has been cleaned.

CLEANUP TECHNIQUES FOR MUDDY SHORES	
Stage	**Description**
Stages 1,2 and 3	Whenever possible it is preferable to allow oil that arrives on this type of shoreline to weather naturally, particularly where it has been washed up onto vegetation. It has been found that on many occasions activities intended to clear pollution have resulted in more damage than the oil itself due to trampling and substrate erosion. Marsh vegetation often survives a single oil smothering and in several instances new plants have grown through a covering of oil. Where removal of the oil is essential to prevent its transfer elsewhere, low-pressure water hoses can be used to flush the oil into open water where it may be possible to contain it within a boom for subsequent collection. Compressed air from SCUBA diving equipment might also be used to direct floating oil away from the vegetation. These techniques are best applied by approaching the shoreline from the water in shallow draught boats. If birds are threatened, cutting and removal of oiled vegetation might be considered but must be balanced against the longer-term damage likely to be caused by trampling.

Having identified the cleanup techniques for various shoreline types it is important to provide a summary of the varying in order to identify the most appropriate options available for shoreline response. These are detailed in the following table:

CLEANUP OPTIONS MATRIX

Cleanup Options		Salt Marches	Sheltered Tidal Flats	Sheltered Rocky Coast	Gravel Beach	Mixed Sand& Gravel Beach	Exposed Compact Tidal Flats	Coarse/ Fine Sand Beach	Eroding Wave – Cut Platform	Exposed Rocky Headland	Concrete Walls & Slipway	Marina	Boats
Natural cleanup	Leave alone	P	P	P	A	A	P	A	P	P	T	D	D
Manual Methods	Collection of oiled debris	T	T	A	P	P	A	P	A	N/A	A	A	N/A
	High water mark debris collection	A	A	A	P	P	A	A	A	A	A	A	N/A
	Use of sorbent material	A	A	A	A	A	A	A	A	N/A	A	A	A
	Cutting & removal of oiled vegetation	T	N/A	N/A	A (back–	A (back – shore)	N/A	A (back – shore)	N/A	N/A	N/A	N/A	N/A
Mechanical Methods	Removal of oiled surface sediments using earth moving equipment	D	D	T	T	A	T	A	T	N/A	N/A	N/A	N/A
	Hosing/ flushing	T	T	A	A	A	T	A	A	A	P	A	A
	Hot water / steam treatment	D	D	T	T	T	D	D	T	T	A	A	P
	Recovery of oil by skimming and pumping to temporary storage	A	A	A	A	A	A	A	A	N/A	P	P	P
Bioremediation	Oil biodegradation enhancement	P	P	P	A	A	P	A	N/A	A	N/A	N/A	N/A
Chemical Methods	Approved dispersant	D	D	D	D	D	D	D	D	T	T	D	T
	Other approved oil treatment products	D	D	D	D	D	D	D	D	T	T	D	T

LEGEND

P	Preferred options/ method. Where more than one preferred option is given, conduct both activates simultaneous	T	To be avoid	N/A	Not applicable
A	Alternative options / method. One or more of the alternative options may be used	D	Don't be used		

Notes:

1. The leave alone option may be influenced by amenity value and a mechanical removal of oiled surface sediments may be the preferred option from May to the end of September.
2. The leave alone option may be influenced by seasonal bird numbers. Depending on access during the months of October to March, free oil should be removed wherever reasonably possible.

The cleanup options detailed in the previous table may vary depending on the type of oil spilled therefore this section provides a description of cleanup techniques for the pre-identified oil types that may be encountered within the area, a definition of which is detailed below.

White Oil and Black Oil Description:-

White oils are usually considered as refined oils colourless or pale in colour. Examples of white oils are gasoline, kerosene and gas oil, which includes MGO. White oils are considered light in structure with evaporation accounting for a large percentage of the oil's fate, reducing its persistence within the environment and the response resources and effort required when undertaking a cleanup.

Black oils are considered to be dark coloured petroleum liquids that are viscous in nature and persistent once released into the marine environment. Black oil products include heavy and medium fuel oils, crude oils and some MGO oils. Spills involving these products requiring a more involved and concerted response effort increasing the time required to complete each cleanup stage.

The following table details the cleanup techniques and their suitability to substrata and oil type:

VARYING CLEANUP OPTIONS DEPENDING ON OIL TYPES	
Salt marsh / Sheltered Tidal Flats	For white oil spills on salt marsh and sheltered tidal flats the preferred option would be to leave the oil to degrade naturally and monitor the recovery of the area. Black oil spills affecting extensive areas may require removal of oil by skimmers however care should be taken to ensure that cleanup activities do not cause more damage than the oil itself.
Sheltered Rocky Coasts	For both white and black oil spills in sheltered rocky coasts high & low pressure washing and sorbent use can be undertaken. Low pressure washing should be attempted initially and in the event that this is not successful medium pressure washing should be applied. Only in the event of extremely persistent oils should high pressure washing be used as the higher the pressure the greater the damage. Black oils are more viscous and therefore may require the use of oil releasing agents or vigorous cleaning e.g. brushing, & scrubbing to remove oil from the surface. White oils may also be left to degrade naturally if it is thought that they will not contaminate other areas. Constant monitoring of this area should be undertaken until complete recovery.
Gravel Beaches	For both black and white oil spills on gravel beaches low pressure washing and flushing can be undertaken. Black oils are more viscous and therefore may require the use of in situ pit washing. Lightly oiled materials may be moved into the tidal zone where wave action will accelerate tidal degradation.
Sandy Beaches	Prior to oil beaching it is recommended that where possible any debris is removed from the beach before impact to reduce the quantity of oily waste to be disposed of later. For both black and white oil spills on sandy beaches low pressure washing can be undertaken.
Rocks, Boulders and Man made Structures	For both black and white oil spills on rocks, boulders and manmade structures e.g. port walls, pressure washing and the use of sorbents can be undertaken. White oils may be left to degrade naturally if it is though they will not contaminate other areas. Constant monitoring of this area should be undertaken until complete recovery.

Manpower Organizational Requirements for Shoreline Cleanup Operations

Proper organization of the work force engaged in shoreline cleanup is vital to success of the operation. This can be achieved by division of the affected coastline into smaller areas and it may be appropriate to relate these divisions to shoreline type. An On Scene Commander should be assigned to an area with a group of men divided into teams. Each team should then be allocated a section of the beach to clean base on the amount of material that each man can be expected to collect in a day; for example, on a sandy beach 1-2 m3/day. The size of the section is set so that it can be cleaned within a given time period, perhaps half a day. The men then have the satisfaction of completing a task each day and seeing the progress they have made, while the beach is cleaned methodically section by section. A team should contain no more than ten men whilst five is the optimum number (According to Span-of-Control Recommendations of the Incident Command System - USA).

Equipment should be organised in parallel to the workforce. Vehicles working on the beach should be confined to the work area, while larger capacity lorries transporting the collected material to storage or disposal sites should be kept off the beach so that contaminated and uncontaminated areas remain segregated. This not only limits the number of vehicles involved but also helps reduce the amount of oil spilling onto the roads, a point that should be considered when selecting vehicles for the transport of oily material. Access to some work sites will need to be restricted to minimize damage to sand dunes and other natural sea defenses. Traffic around the work site should be controlled to enable Lorries to move without hindrance. Police may also be required to close the beach in the interests of public safety, particularly where heavy vehicles are being used.

On tidal shores the work has to be arranged around the tides with rest periods and meal breaks being taken at high water. Night time working is usually found to be inefficient, even when adequate lighting is provided.

Daily records of the men and equipment working in each area should be kept and are essential for the formulation of a subsequent claim for compensation. A record maintained at the same time of the quantities of oil and oily debris removed enables progress to be easily monitored. In addition to written reports, the status of each work site and the location of men and equipment can be conveniently monitored on large scale maps.

3. Sorbents

Sorbents are used to recover spilled oil by absorption or adsorption and must satisfy the following requirements:

- High absorption / adsorption efficiency;
- Easy recovery after absorption / adsorption; and
- Easy processing after recovery.

Furthermore sorbents can be classified into three main types according to material:

- Inorganic materials e.g. vermiculite;
- Synthetic organic materials e.g. polypropylene fiber;
- Natural organic materials e.g. peat, cotton, rice straw and coconut fibre.

The majorities of synthetic sorbents on the market are made of polypropylene fibre and are most conveniently used as pads, rolls or booms.

Oil Spill Response Safety Procedures

1. Site Safety Notes

The site safety Assessment is intended to. The Site Safety Assessment should comprise the following Sections:

A. Site Survey

B. Operations Analysis

C. Site Control

D. Logistics and Supplies

E. Personnel

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

A) Site Survey

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

The site survey should address the safety of those personnel taking part in the cleanup as well as those members of the public who may also be involved.

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

- Communications Requirements
- Exposure to Temperature
- Feasibility of Handrails or Ropes
- Hazards to the Eyes
- Lack of or Shelter from Weather
- Lighting Conditions
- Machinery Usage
- Manoeuvrability
- Manual Handling
- Pedestrian Traffic
- Requirement to access Confined Spaces
- Sample collection
- Terrain Surface and Incline
- Vehicle Traffic
- Visibility
- Water Hazards

B) Operations Analysis

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

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

- Cranes
- Boats
- Breathing Apparatus
- Fork Lifts
- Hoses and Pumps
- Low Loaders
- Motor Vehicles
- Raking and Sweeping Gear
- Winches

C) Site Control

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

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

D) Logistics and Supplies

Specifically with respect to Safety, it should be ensured that the appropriate equipment, materials and substances are available at the required times. Particular attention should be paid to the availability of the various sizes of protective clothing required. This sometimes cannot be established until the members of the workforce have been detailed and their individual roles and tasks decided.

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

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

Protective Clothing:

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

Personal Protective Equipment (PPE):

PPE shall include, but not be limited to:

- Breathing Apparatus including Respirators
- Flotation Suits and Vests
- Life Jackets
- Gloves / Gauntlets
- Protective Clothing
- Goggles, Visors and Safety Glasses
- Hard Hats
- Insulated Clothing
- Reinforced Boots, Shoes and Gloves

First Aid:

Trained first aiders and equipment should be on site to attend to any accidents.

E) Personnel

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

2. Safety on the Foreshore

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

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

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

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

3. Safety on the Water

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

The use of boats fitted with outboard engines can be highly risky in explosive environments. It is advisable that boats do not venture into areas with spills of highly explosive or flammable products, especially during night time when visibility is low due to darkness, until the risk of explosion has subsided, after sufficient evaporation of volatile material, and after a gas test has been conducted.

Protective Clothing

Workers operating from sea-going vessels should be suitably equipped with harnesses. They should, at all times, wear a self or automatic inflating lifejacket and should be protected by appropriate protective clothing.

4. Risk Assessment

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

5. Safe Operations

Decontamination

Conditions Requiring Decontamination

Where workers have been wearing waterproof and protective clothing, it is likely that the clothing will become contaminated by crude oil or chemicals that might have been used during the cleanup operation. The clothing needs to be cleaned to prevent further contamination. Facilities for such cleaning should be made available either near to rest or feeding areas or close by, but clear of the work site.

Personal Hygiene Practices on the Job

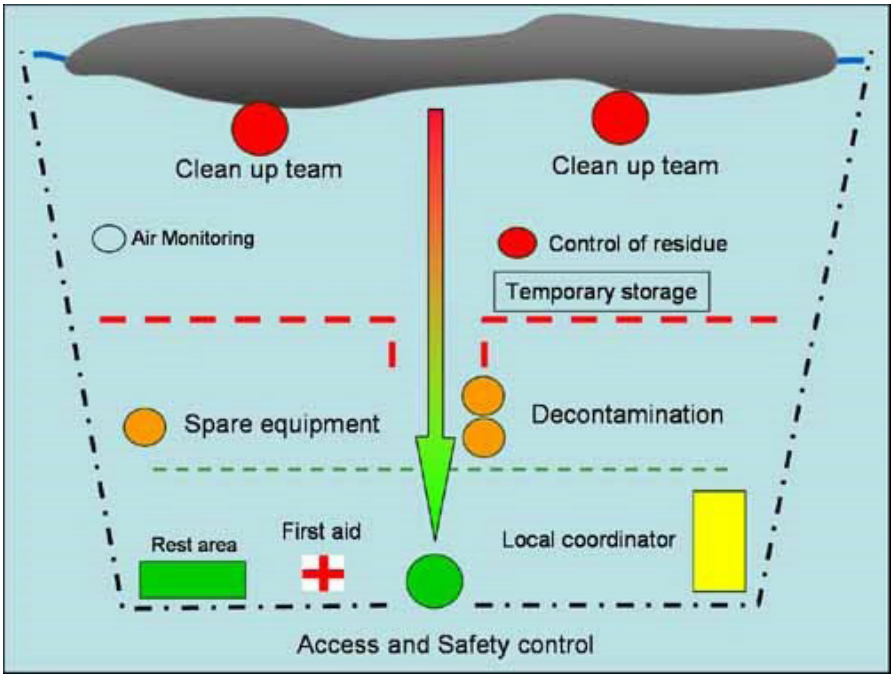
Workers should be instructed on the dangers of ingesting hydrocarbons and chemicals through contact of contaminated equipment or clothing, such as gloves via the mouth and nose. Facilities for removing protective clothing and washing before consuming food or smoking should be made available.

Decontamination Area Drainage

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

The decontamination zones on an onshore work-site can be established as shown in the following figure:

Figure 47: Site Decontamination Zones



Health and Safety Assessment

1. Statutory Duties

It is the duty of all employers and persons responsible for premises to ensure that the workplace is safe and in the case of the employer, to have a safe system of work. This duty is placed regardless of whether the workers are employees, sub- contract workers, temporary workers or self employed persons.

It is considered good practice that all employers carry out suitable and sufficient Risk Assessments of all tasks to be undertaken in the workplace. Where a group of personnel are employed then an assessment is to be carried out and recorded with those at particular risk informed accordingly.

The employer should execute a Safety Management System and ensure that measurement of performance against standards is made. All employees must receive adequate training, information and supervision. Additionally, there is a requirement for all employees to receive suitable and sufficient health surveillance to ensure that they are fit to carry out the work and that the work and conditions do not cause them adverse effect.

Equipment provided for use at work is safe and fit for purpose. The persons using the equipment must be adequately trained in its use and the operation must be properly supervised.

All personnel should be trained in the proper use of Personal Protective Equipment and are familiar with associated risks they may impose. Lifting, pulling and pushing should be reduced to as low as reasonably practicable.

All substances to which a worker may be exposed, including dusts and gases are properly assessed and the risks to health reduced to a safe and acceptable level.

2. Site Specific Health and Safety Assessment Form

To achieve a safe operation, those in charge of the response must assess all potential hazards that may cause an uncontrolled incident and further damage to the environment or injury to personnel working within the designated area. The Site Assessment Form overleaf provides the surveyor with a comprehensive guide to risks that may be encountered whilst indicating the PPE associated with each. The assessment form should be completed before spill response operations commence and must be site specific.

A Site Specific Health and safety Assessment form can be found in Appendix IV.

Media Management

1. Media Coverage

During an oil spill, it is expected that the media coverage will be on the site seeking detailed information on the incident. It is important that the media is provided with the correct information as soon as possible and updated at appropriate intervals.

2. Information

Any requirement for a media response will be channelled through Executive Manager of Corporate Affairs. Under no circumstances should any other personnel make statements to the media unless instructed in writing by the Executive Manger Corporate Affairs to do so.

3. Immediate Information to Media

All information given to the media must be reviewed for correctness by the Crisis Management Team and approved by the CEO. The On Scene Commander is permitted to update the Press only after he/she has been authorised in writing by the Executive Manager Corporate Affairs.

4. Suggested Initial Press Statement

The following initial press statement is suggested. However, under no circumstances shall this statement be issued without prior approval of the Incident Commander:

"The Sohar Industrial Port Company confirms that an incident has occurred (state where and give brief description) at approximately (give time) hours today. Emergency response procedures have been initiated and relevant authorities have been/are being advised. All support services are being co-ordinated through the authorities' incident response team and every possible effort is being made both to minimise risk to personnel at the scene and to contain and mitigate any effects. Further information will be released as it becomes available at a Press conference scheduled for (give time) hours today."

Waste Disposal Operations

1. General

If oily waste material is produced as a result of a pollution incident then the response contractor under the supervision of SIPC has a duty of care to ensure that the waste is handled, transported and ultimately disposed of in an appropriate manner. Any waste contractors used should have the relevant waste transportation and disposal licenses.

2. Temporary Storage

Each temporary storage site will have to be constructed in a specific manner. It is therefore essential that the construction of temporary storage sites be done through close liaison with the Local Authority or appropriate body. Temporary storage will be necessary in those cases when the location of the clean-up operations or the quantity of oil or oily debris makes it impractical to transport the waste directly to the final disposal site or when the final disposal methods have not yet been selected.

Temporary on-site storage during clean-up operations should be established at an early stage. Storage facilities can be situated either at sea in barges, to vessel tanks or on the shore in dedicated spill containers, oil drums or even lined pits, if constructed correctly. The size, numbers and type of facility required depends upon the amount and nature of the material to be recovered. As a general rule it is necessary to establish separate storage for liquid oil and mousse, and oiled debris, etc.

The storage facilities should be established close to the centre of clean-up operations in a place with easy access to public roads. Storage facilities for waste created from personnel, equipment and vehicle cleaning should be established in order to ensure that the pollution is not spread from the site to public roads and personnel accommodation facilities.

A large quantity of water will normally be collected together with the oil and should be accounted for when calculating storage space. Separating the oily water mixture whilst in a temporary storage facility can then be carried out.

3. Disposal Methods

The final disposal of oily waste should, to the greatest extent possible, ensure that damage to the environment is minimised and pollution is not transferred from one place to another. Furthermore, the chosen treatment or the final disposal method must ensure that any subsequent threat to the environment is eliminated, permanently.

Recovery by Oil Processing

Reclaiming the oil is where liquid oil is recovered for further use. This involves transporting the oil to a refinery where the oil can be reprocessed and usable elements withdrawn. Waste oil contaminated with debris cannot be treated in this manner.

Landfill

Direct disposal sites must always be agreed with the authorities. When land filling or burying oil or oily debris, extreme care must be exercised so that in due course the oil will not leach into aquifers or surface water. There may be municipal regulations or legal restrictions on the selection of sites for this purpose.

If a suitable landfill site has not been designated, disused quarries often make satisfactory disposal sites. However, they are often impermeable to water and it is important to ensure that the quarry is deep enough to prevent the overflow of any accumulated rainwater, which could transfer oil outside the site.

The co-disposal of oil and domestic waste is often an acceptable method even though degradation of the oil is likely to be relatively slow due to the lack of oxygen. Oil appears to remain firmly absorbed by all types of domestic waste with little tendency to leach out.

Stabilization

An approach which is sometimes applicable to oily sand, provided it does not contain large amounts of debris, is to bind the material with inorganic substances such as quicklime, cement, pulverised fuel ash waste, etc. This forms an inert product, which does not allow the oil to leach out. The stabilised material can be disposed of under less stringent conditions than unstabilised oil and can also be used for land reclamation and road construction. The optimal amount of binding agent required is primarily dependent on the water content of the waste rather than the amount of oil and is best determined experimentally on site. However, for quicklime the amount required is between 5% and 20% weight of the bulk material to be treated.

In spill situations where sandy areas have been polluted by oil the binding agents can be mixed with the oily sand in conjunction with or immediately after the collection of the oily sand. Such mixtures can be used directly for road beds, parking lots, etc. or can be stored for subsequent use in civil engineering works. The mixture of binding agents and oily sand is a clean, easily handled material, which can be readily transported and stored.

Land Farming

It is well established that microbial populations increase rapidly in the soil around an oil spill. Aerobic decomposition of oily debris can be completed in one to three years. Although low temperatures slow down the rate of oxidation, land farming has been successfully applied in cold climatic conditions.

Land farming requires adequate land within reasonable distance of the spill site. Land farming sites should not be located where underground and other water supplies would be affected by the possible release of contaminants. In addition the soil permeability should be low to avoid percolation of leachates into the groundwater. The maximum quantity of oil spread on the soil should be about 10 kg/m^2 (100 Tonnes/Hectare).

Once most of the oil has degraded, the soil should be capable of supporting a wide variety of plants, including trees and grasses.

Combustion

The open burning of oily debris is not recommended except in very remote locations since it usually causes much atmospheric pollution. When oil is burnt in the open it tends to spread and be absorbed into the ground. In addition, a tarry residue may remain since it is rarely possible to achieve complete combustion.

These problems can be overcome by using an incinerator. A number of portable incinerators have been developed which contain the oily waste and facilitate the high temperatures required for total combustion. The rotary kiln and open hearth types are most appropriate for oils with a high solid content. As a general rule, incinerators used for domestic waste are not suitable since chlorides from seawater may give rise to corrosion. High temperature industrial incinerators, whilst likely to tolerate salts may not have sufficient capacity to deal with the additional burden created by a large quantity of oily waste. However, if long term storage of waste is possible this may be an acceptable route.

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