

## **UKOPA Guidance for Managing Product Release Emergencies and Damaged Pipelines**

### **1.0 Introduction**

This document outlines UKOPA recommendations for how pipeline product release or damage incidents should be managed. Installations that have their own on-site plan should be managed in line with that plan and are not within the scope of this document.

### **2.0 Managing Incidents**

The flowchart in Section 2.2 identifies the main steps in dealing with a product release or pipeline damage incident. More detailed information for each of the steps can be found in the following sections. Further guidance is given in Appendix 2, and a Checklist is given in Appendix 3.

#### **2.1 Key Roles and Responsibilities**

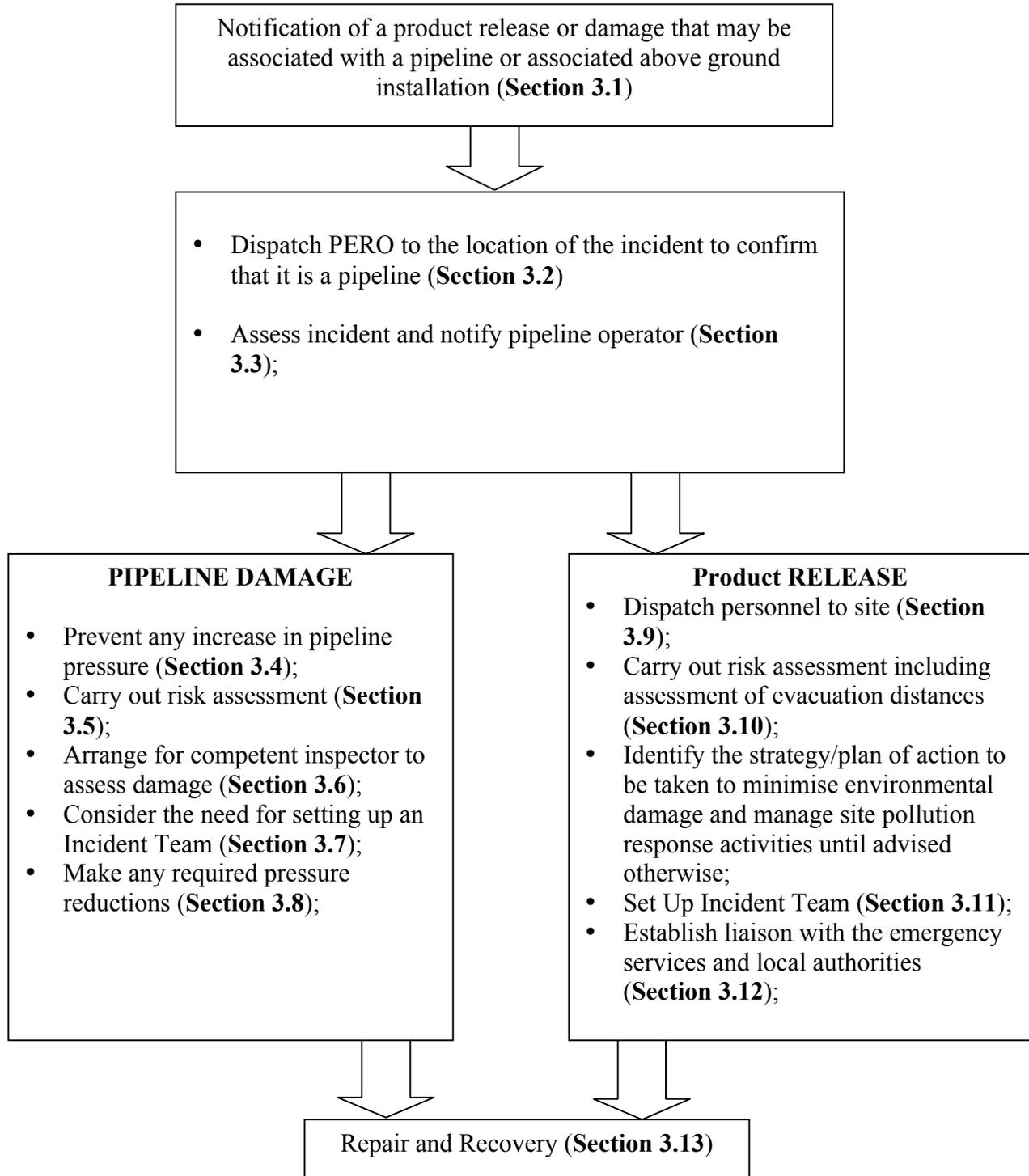
##### **Pipeline Emergency Response Officer**

Personnel dispatched by the pipeline operator as their first line response to the incident, may be responsible for:

- Categorising the nature and scale of the incident on behalf of the operator and for taking steps at the location of the incident to safeguard life, the environment and property.
- Responsible for co-ordinating activities at the location of the incident.
- Co-ordinates the mobilisation to site of the oil spill response standby equipment and personnel.
- Liaison with operator emergency response contractors.

An overview of PERO responsibilities is given in Appendix 1.

## 2.2 Summary Incident Management Flowchart



## 2.3 Requirements for Safe Management of a Damaged Pipeline

- a) On receipt of damage report, prevent pressure from exceeding the level at the time of damage.
- b) Establish the safe limit at a distance from the damage site<sup>1</sup>.
- c) Restrict access within safe limit to essential personnel only.
- d) Carry out leak checks on exclusion zone boundary and within exclusion zone<sup>2</sup>.
- e) Excavate damage location in accordance with relevant operator safe working procedure.
- f) Monitor for leakage and reassess safety requirements as appropriate.
- g) Assess trench stability and egress throughout work.
- h) Restrict access to trench to appropriate personnel only.
- i) Ensure appropriate pressure restrictions are in place throughout work.
- j) Assess need for permanent support of the pipeline on completion of work.

## 3.0 Detailed Requirements

### 3.1 Notification of Incident

The initial notification may come from one of a number of sources including:

- A member of the public.
- The emergency services.
- The pipeline operator.
- A field operative.

A product release from a high pressure pipeline can be recognised from one or more of the following characteristics:

Gas:-

- Noise;
- Debris throw;
- Gas or liquid jetting;
- Freezing of the ground around the failure point;
- The formation of a crater;
- The product odour.

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<sup>1</sup> The safe distance should be specified by the PERO.

<sup>2</sup> The safe limit may be revised by the PERO based on the monitoring of leak dispersion/direction.

Liquid:-

- Liquid jetting;
- Pool formation - impermeable surface;
- Ground soaking – permeable surface;
- River / stream pollution;
- Vaporisation;
- Product odour.

### 3.2 Responsibilities of PERO at the Location of the Incident

The PERO should take immediate steps to safeguard life, the environment and property.

### 3.3 PERO Assessment of Incident

The PERO should confirm, using the relevant pipeline plans or other available relevant data, that the incident relates to the specific pipeline, and should advise the pipeline operator on whether:

- Pipeline damage has occurred;
- The pipeline has failed and is leaking;
- If possible the estimated size of the failure, i.e. whether it can be determined if the failure is a puncture (hole) or full bore pipeline rupture (**the PERO must not place himself at risk in making this assessment**);
- If possible, the estimated scale of product loss.
- Whether the product has ignited.

SECTIONS 3.4 TO 3.8 BELOW COVER THE REQUIRMENTS FOR MANAGING INCIDENTS ASSOCIATED WITH PIPELINE DAMAGE

### 3.4 Prevent any increase in pipeline pressure

In the event of pipeline damage without loss of product, the relevant Pipeline Operator Control Centre should be instructed not to increase the pressure within the pipeline until they have been notified that the pipeline has been made safe. Prior to pipeline inspection by a competent inspector (see section 3.7 below), the pipeline pressure must be reduced in accordance with pipeline operator procedures.

### 3.5 Carry out risk assessment

Even though the pipeline has not failed there is always the potential that pipeline failure could subsequently occur. A risk assessment should therefore be carried out and a safe distance determined at which individuals not involved in the assessment of the pipeline

damage should be kept. **If practical, individuals should be kept a minimum of 100m away** from the location of the pipeline damage. If the damage has occurred in a built up area where a 100m zone would cause considerable disruption, then **this 100m can be reduced to 50m if it can be confirmed that the relevant Pipeline Operator Control Centre has been informed** of the damage.

### 3.6 Arrange for a competent inspector to assess damage

The inspection of the pipeline should be carried out by a competent inspector and the subsequent assessment of the damage should be carried out by a competent assessor.

**NB: Prior to pipeline inspection by the competent inspector, the pipeline pressure must be reduced in accordance with operator procedures.**

### 3.7 Consider the need for setting up an incident team

It may be appropriate to set up an incident team to manage the incident.

### 3.8 Make any pressure reductions

Following assessment of the damage by the competent inspector and assessment by the competent assessor, consideration should be given as to whether there is a requirement for further pressure reductions. **Under no circumstances must the pressure be increased until the damage has been assessed and any required repair work has been carried out.**

## SECTION 3.9 BELOW COVERS THE REQUIREMENTS FOR MANAGING INCIDENTS ASSOCIATED WITH PRODUCT RELEASE

### 3.9 Carry out risk Assessment

Based on the information available, a risk assessment should be carried out. The immediate concern should be the safeguarding of life, the environment and property. **Pipeline Operator personnel must not put themselves at undue risk when dealing with the incident including the evacuation of members of the public. Key actions must be supported by risk assessment.**

#### **If the release has not ignited:**

Safe distances for evacuation of individuals in the vicinity of a gas release should be based on the maximum thermal hazard ranges provided by the Pipeline Operator. It is recommended that the control point is established at a distance twice the maximum thermal hazard range away from the incident. If in doubt err on the side of caution, safe distances can always be reduced once more information is known about failure.

**NB: For a high pressure gas pipeline failure, flammable gas concentration readings are not a reliable indication of a safe evacuation distance,** if the leaking gas subsequently ignites then the resulting thermal hazard range would be well beyond the distance that gas would be present in flammable concentrations at ground level.

Liquid releases will flow away from the failure location according to the topography of the terrain. Safe distances for evacuation of individuals in the vicinity of a liquid release should be based on maximum thermal ranges provided by the Pipeline Operator, and on the direction of flow (including into rivers) and locations of pooling.

**If the release has ignited:**

Gas:-

Pressure in the pipeline will reduce as the product leaks, so the worst case consequences will occur at the beginning of the incident. The PERO will, under these circumstances, be able to identify an evacuation distance and a location for a control point based on a distance away from the fire where it is comfortable to stand without being affected by the heat from the burning gas. This safe distance should make allowance for any potential variation in the wind direction.

Liquid:-

Pressure in the pipeline will reduce immediately when pumps are shut down, but product will continue to drain according to the profile of the pipeline, and will follow the terrain topography to the lowest point. The source of ignition may be remote from the pipeline failure, and in such cases ignition of the released product is likely to trace back to the source of the leak, so worst case consequences for liquid releases are difficult to predict. The PERO will need to identify the evaluation distance and control point location based on distance and topography.

### **3.10 Set up an incident team**

It would normally be appropriate to set up an Incident Management Team to manage the incident for any significant gas or liquid release from a high pressure pipeline.

### **3.11 Managing the incident**

The incident should be managed in accordance with pipeline operator procedures. This should include any issues related to management of product transmission downstream of the incident.

### 3.12 Liaison with Emergency Services

Immediate liaison should be established with the emergency services to ensure clear lines of authority on site are understood and managed, and relevant information relating to the product and release hazards is available.

### 3.13 Repair and Recovery

In the event of a pipeline failure or significant damage to a pipeline, a suitable repair must be undertaken. The repair should be undertaken in accordance with pipeline operator arrangements for emergency repair and associated procedures. The responsible engineer should seek specialist design advice for the repair, taking into account the operating conditions and pipeline design criteria to ensure that declared Safe Operating Limits of the pipeline are not compromised. This should include the provision of technical advice to develop a program of rectification.

## APPENDIX 1 – PERO RESPONSIBILITIES

The PERO must liaise with on-site Emergency Services. This may involve evacuation from property and road or rail closures.

The PERO must establish an Incident Control Point outside the Exclusion Zone.

Safe distances for evacuation of individuals in the vicinity of the incident should be based on the maximum thermal hazard ranges provided by the pipeline operator. It is recommended that the control point is established at a distance twice the maximum thermal hazard range away from the incident. If in doubt err on the side of caution, safe distances can always be reduced once more information is known about failure

If the MAHP is to be shut down immediately, the PERO must undertake actions, in conjunction with the Emergency Services, to manage the MAHP emergency while the pipeline unpacks.

The PERO, in conjunction with the Operator Control Centre, must agree the most effective method and locations for isolation.

Actions must be undertaken in accordance with the Operator's procedures for Safe Control of Operations or Permit to Work.

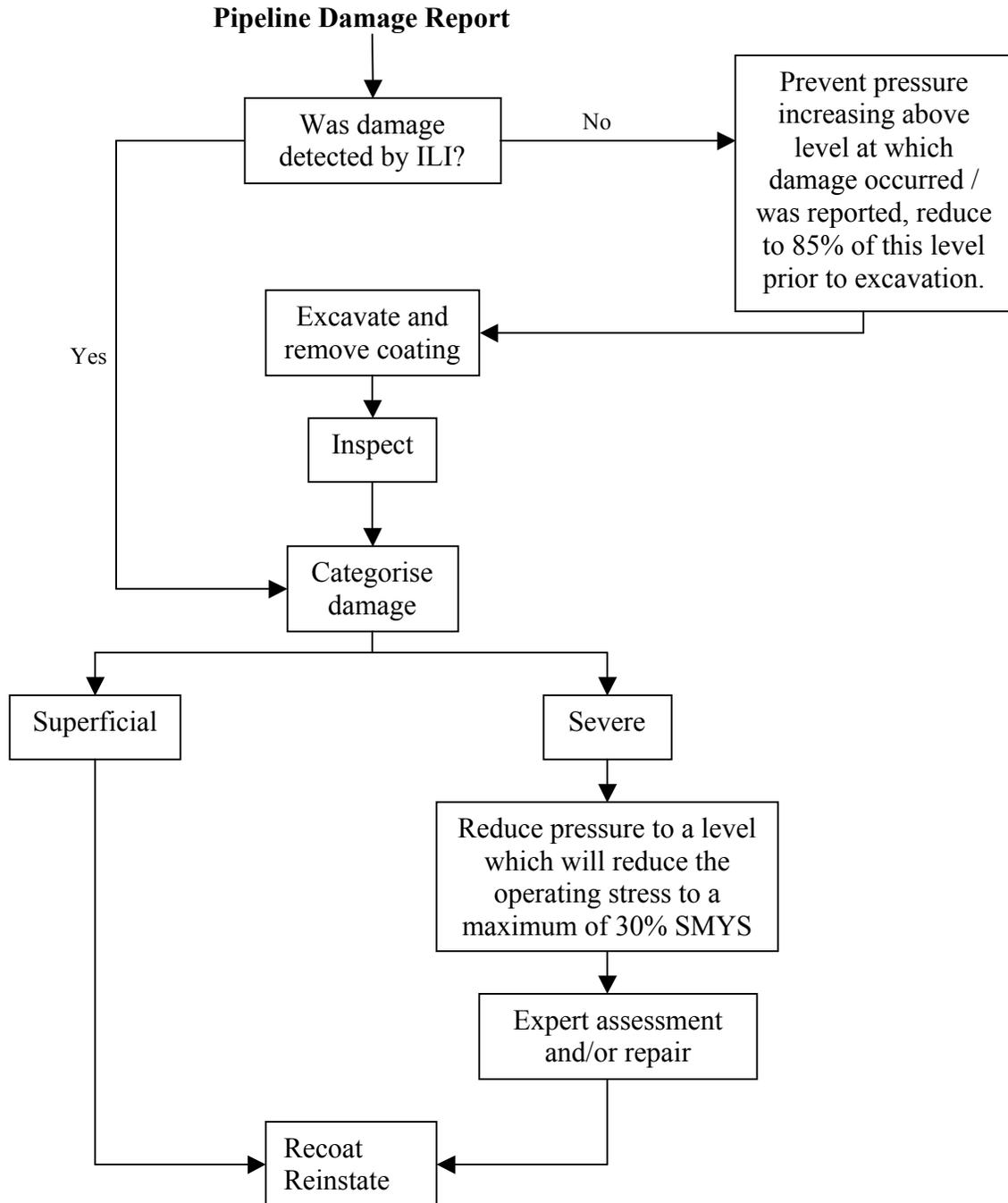
If the MAHP is not to be shut down immediately, the PERO must undertake actions in conjunction with the Emergency Services to manage the MAHP emergency.

The PERO must undertake agreed actions to make safe.

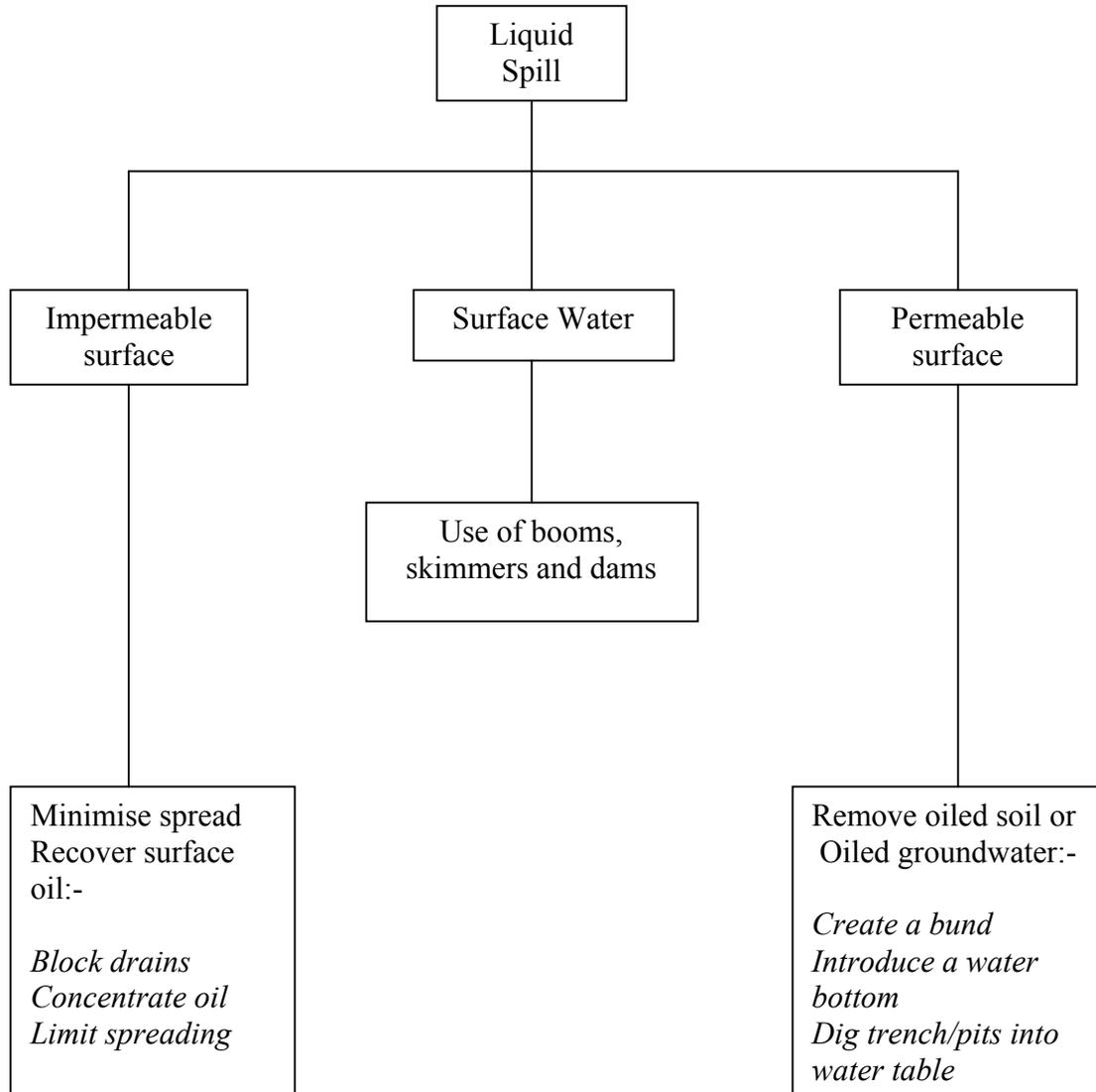
Permanent remedial actions must be agreed by the Pipeline Operator, and managed in accordance with approved procedures.

## APPENDIX 2 – FURTHER GUIDANCE

### A2.1 Flowchart for Assessment of Pipeline Damage

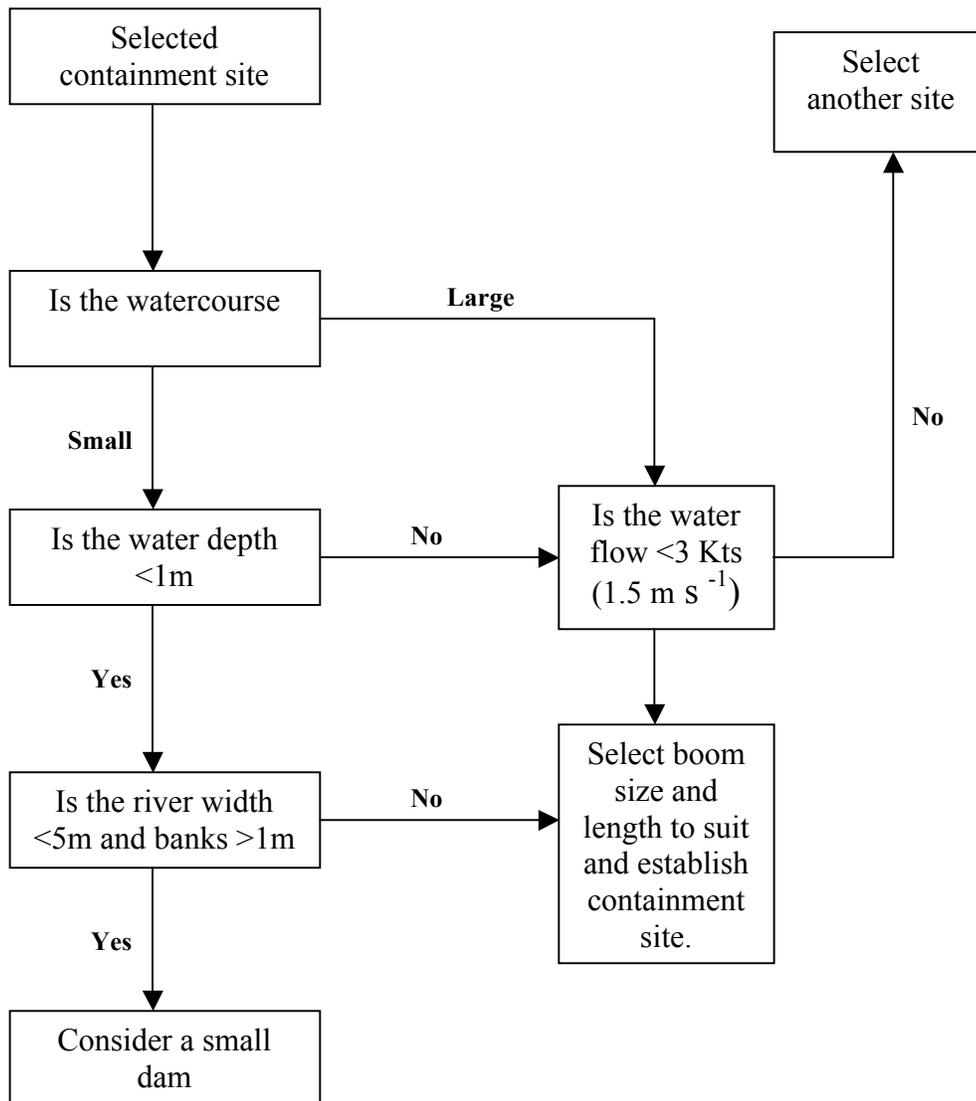


## A2.2 Flowchart for Assessment of Requirements for liquid spill response



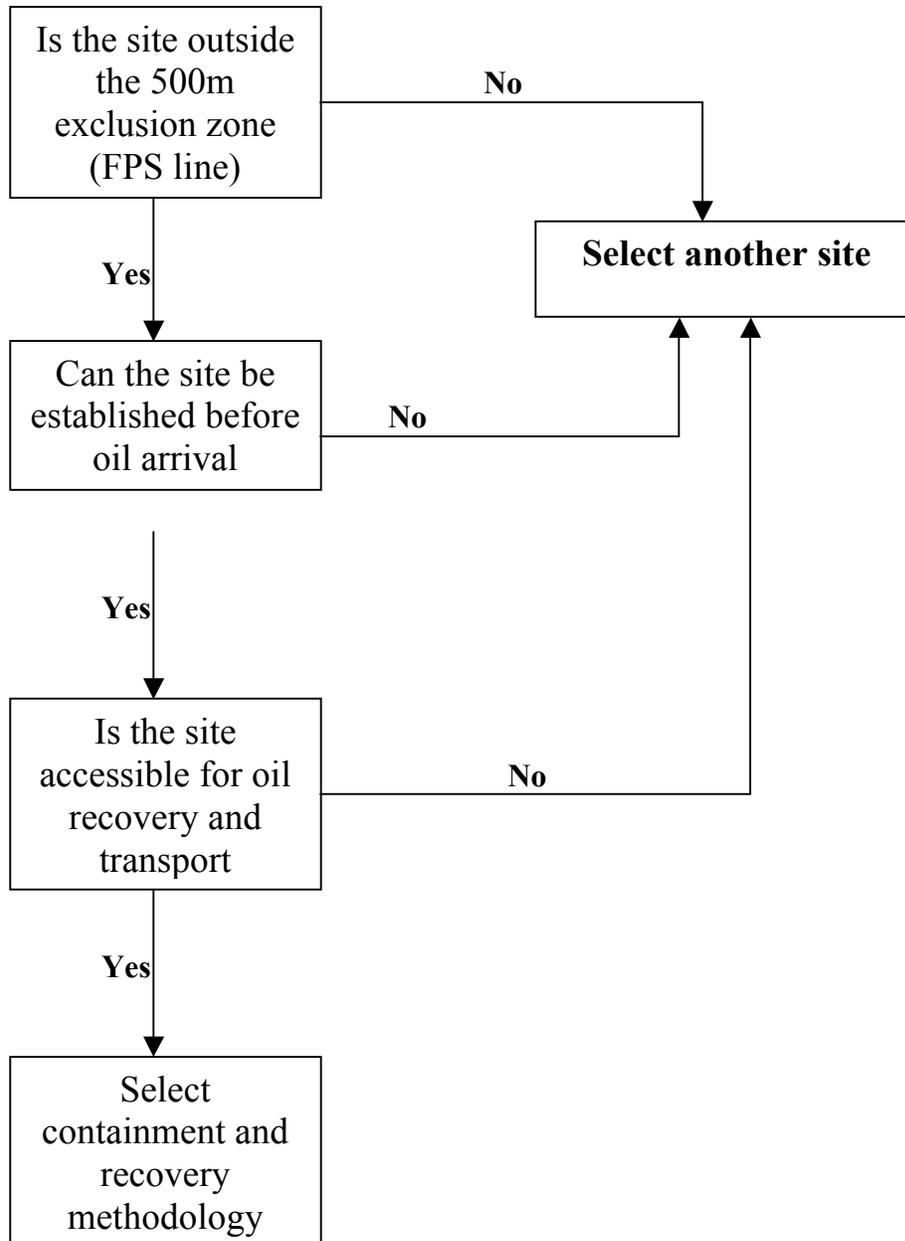
## A2.3 Flowchart for selecting liquid spill containment and recovery site

### a) Selection of Containment and Recovery Site



## A2.3 Flowchart for selecting liquid spill containment and recovery site

### b) Selection of Alternative Site



## APPENDIX 3 – CHECKLIST

### Management of Damaged Pipelines Checklist

- Obtain incident initial information:
  - Call-back details
    - Call-back names and numbers
    - Call-back Operator Control Centre
    - Call-back PERO details
  - Incident location
  - Anticipated gas escape / liquid spill size
  - Weather conditions
  - PERO rendezvous pipeline pressure location
  - Have contractors been mobilized
- Start personal logs (operator control centre and PERO)
- Establish contact with PERO
  - Confirm location for control point
  - Request update
- Operator Control Centre to access standard operator release / containment information
- PERO should provide EXCLUSION zone information and safety related information.
- Brief contractor supervisor on known facts.
- Select appropriate strategy/containment site(s).
- Operator Control Centre to brief PERO on planned actions, and keep PERO informed of actions/progress.
- Prepare summary of actions / progress for Incident Management Team.