

# Sampling of road tankers, UN portable tanks and containers



VERSION 6  
PUBLISHED May 2019

The Hierarchy of Control has been designed as guidance on a specific Health and Safety issue and should not be used in pure isolation.

The aim of the hierarchy is to reduce the need to access the top of tankers for the purpose of sampling but where it is necessary ensure the highest degree of safety for all involved in the operation. This guidance note is not mandatory, it is designed to provide a number of indicative headings which may be of use to organisations writing or reviewing handbooks for drivers.

#### Acknowledgement

The text in this document is based on the work of the joint CBA/CIA Working Group on sampling at height. CBA and CIA thank the members of the group who put together the guidance and their companies who generously allowed them time to carry out the work.

© 2019 Chemical Business Association

© 2019 Chemical Industries Association

All rights reserved. Except for normal review purposes or use with participants in a CBA or CIA sponsored training course, no part of this publication may be reproduced, utilised, stored in a retrieval system or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information, storage, or retrieval system without the written permission of the publisher.



Working for chemical and  
pharmaceutical businesses

Group House  
Southmere Court  
Electra Way  
Crewe, Cheshire  
CW1 6GU

Tel: +44 (0) 1270 258200  
Fax: +44 (0) 1270 258444

Website: [www.chemical.org.uk](http://www.chemical.org.uk)  
Email: [cba@chemical.org.uk](mailto:cba@chemical.org.uk)

Kings Buildings,  
Smith Square,  
London  
SW1P 3JJ

Tel: +44 (0) 207 834 3399  
Fax: +44 (0) 207 834 4469

Website: [www.cia.org.uk](http://www.cia.org.uk)  
Email: [enquiries@cia.org.uk](mailto:enquiries@cia.org.uk)

## Contents

Chapter		Page(s)
1	Responsible Care	4
2	Introduction	5
3	Hierarchy	6
3.1	Quality assurance procedures	6
3.2	Certificate of analysis or conformity	6
3.3	Travelling sample	7
3.4	Barrel sampling	7
3.5	Bottom valve sampling	8
3.6	Top sample with fixed gantry	10
3.7	Top sample with mobile gantry	11
3.8	Top sample without gantry	12
4	Asset Management	15
5	Suspension Trauma	16
6	Additional Information	17
7	References	18
	<u>Appendices</u>	
	Appendix 1	19
	Appendix 2	20
	Appendix 3	21

## 1. Responsible Care

Responsible Care is a global chemical industry voluntary initiative designed to improve continuous performance in health, safety, environments as well as demonstrate activities and achievements of the industry in an open and transparent manner.

A set of global Responsible Care principles commits companies and national associations to work together as a means to improve the industry's performance.

Further information on the initiative can be found on the following websites:

Global Responsible Care website: <https://www.icca-chem.org/responsible-care/>

Cefic website: <http://www.cefic.org/Responsible-Care/>

CIA website: <https://www.cia.org.uk/Sustainability-Our-contribution-vision/Responsible-Care>

CBA website: <https://www.chemical.org.uk/membership/responsible-care/>



## 2. Introduction

Statistics produced by the Health and Safety Executive (HSE) based on the data collated under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013<sup>1</sup>, indicate that 'Falls from Height' is the biggest killer in the workplace.

In 2017/2018, 35 people died and some 5,000 suffered an injury as a result of a fall from height in the workplace.

Falls from height are the most common cause of fatal injury and the second most common cause of major injury to employees<sup>2</sup>. All industry sectors are exposed to the risks presented by this hazard although the number of incidences varies considerably. Experience in such cases highlights that these events usually arise due to poor management control rather than because of equipment failure and that the common factors include:

- ❑ Failure to recognise a problem.
- ❑ Failure to ensure that safe systems of work are followed.
- ❑ Failure to provide safe systems of work.
- ❑ Inadequate information, instruction, training or supervision provided.
- ❑ Failure to use appropriate equipment.
- ❑ Failure to provide safe plant/equipment.

The Health & Safety Commission's strategy for workplace health and safety in Great Britain – 2010 and beyond<sup>3</sup> continues to promote a key programme to reduce injuries and ill health caused by falls from heights as well as slips and trips.

This guidance document aims to provide a recommended hierarchy of control for the purpose of product sampling and access to tankers. The aim of the hierarchy is to reduce the need to access the top of tankers for the purpose of sampling. Where access to the top of tankers cannot be avoided it is necessary to ensure the highest degree of safety for those involved in the operation is maintained. This Hierarchy of Control has been designed as guidance on a specific health and safety issue and should not be used in isolation.

---

<sup>1</sup> <http://www.hse.gov.uk/riddor/index.htm>

<sup>2</sup> <http://www.hse.gov.uk/statistics/causinj/kinds-of-accident.pdf>

<sup>3</sup> <http://www.hse.gov.uk/aboutus/strategiesandplans/strategy.htm>



### 3.3. Travelling sample

A representative sample is taken at point of loading under strict agreed control mechanisms. The sample then either precedes or accompanies the driver to the point of discharge depending on the agreed terms and conditions of sale.

The sample must be labelled in accordance with Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) and suitably packaged for transport. The degree of packaging is dependent on the mode of travel employed for the sample.

If the sample is travelling with the consignment, it must be suitably packed in a lockable, secure external container. The sample must never travel in the cab of the vehicle, as the risk of chemical contact for the driver is unacceptable.

If the sample is to precede the delivery, the company in charge of its carriage must be aware of the hazards and risks of the product, if any exist, and be provided with all appropriate paperwork to carry the sample safely.

In addition, the size of the sample must be agreed with the consignee/customer prior to delivery and preferably during contract negotiations. It is the responsibility of the customer to retain the entire sample. Under no circumstances should a driver accept a sample back from a customer. Products travelling in ISO containers/tanks should not be accompanied with a "travelling sample". If a sample is required, with apportionment of any costs incurred an agreement should be reached for the pre-delivery of the sample.

### 3.4. Barrel sampling

ADR Road tankers are of a construction to allow the affixing of a suitable sampling device onto the barrel of a tanker. However, the sampling device must be:

- ❑ Designed to maintain the requirement in ADR (Chapter 6.8.2.2.2) for three (3) levels of containment, arranged in such a manner as to be protected against the risk of being wrenched off or damaged during carriage or handling operation. (ADR 6.8.2.2.1),
- ❑ Should be regularly maintained to retain integrity and reduce the risk of failure.

The location of the sampling device should allow a representative sample, from inside the tanker, to be taken in a safe and controlled manner under the supervision of the customer.

### 3.5. 'Bottom Valve' sample

Where it is absolutely necessary to sample 'on-site' prior to discharge and a barrel sample is not available or suitable for the material in question, the first option to consider should be to sample from the bottom outlet valve.

However, this results in the rise of other difficulties such as:

- ❑ The capacity of the sampling container;
- ❑ The force/pressure behind the product as the valve is opened;
- ❑ The quantity of product obtained during the operation;
- ❑ The disposal of unwanted product;
- ❑ Selection of suitable materials of construction for sampling devices;
- ❑ Provision of suitable bonding and earthing when sampling flammable liquids;
- ❑ Exposure of sampling personnel to the chemical being sampled.

Any customer and/or supplier who wishes to utilise a bottom sampling method must first perform a suitable and sufficient risk assessment of the operation. All staff that perform the operation must be in receipt of documented information, instruction and training, as identified in the risk assessment process, prior to commencement of the operation.

The use of 'screw or bolt on sampling devices' should be encouraged for frequently performed operations. The cost of such devices should be discussed and agreed prior to commencement of the contract with further instruction and training provided to all staff involved in their operation.



*Sampling Device for connection to road tanker outlet*

The ownership, maintenance and cleanliness of the device should be negotiated as part of the supply agreement.



Alternatively, a sample point may be provided on a discharge or unloading line, prior to the first isolation valve. Sampling by this means will require the tanker delivery hose to be connected to the intake point and the hose / discharge pipework filled under gravity to the sample point.



*Discharge line sampling Device*

### 3.6. Top sample with fixed gantry



Tanker top access with a fixed gantry system is essential for frequent operations. There is no 'definitive' interpretation of the term 'frequent' but previous HSE guidance, now discontinued, identified 'frequent' as "several times a week".

The gantry design must assess the safe access, egress and worker protection whilst performing the sampling operations.

As these gantries will be located in external conditions, they must be designed to take into consideration the prevailing weather conditions.

- ❑ Stairs should be manufactured to reduce the risk of slipping and the angle of ascent should be no more than 45°.
- ❑ Handrails, intermediate rails and kickboards must be fitted in accordance with Health and Safety guidance <sup>5</sup>.
- ❑ The gantry must be well drained and easily cleanable.
- ❑ During the design the products to be loaded/off-loaded must be considered to ensure that static electric build-up is reduced. This is essential for flammable materials such as solvents.

<sup>5</sup> [http://www.hse.gov.uk/foi/internalops/ocs/200-299/200\\_31/#requirementsreg8](http://www.hse.gov.uk/foi/internalops/ocs/200-299/200_31/#requirementsreg8)

### 3.7. Top sample with mobile gantry

Where the frequency of delivery is such that a fixed gantry system is 'cost prohibitive', an alternative option may be the use of mobile systems.

However, the careful consideration and choice of any mobile system is essential as the wrong choice can introduce a different set of hazards than those faced when using a fixed gantry.

Two styles of system are available:

#### 1. Fully portable



These gantries are the most predominant type of system available and have wheels attached (see example). These styles of gantry are placed by the side of the tanker, manually, to allow access.

These gantries must be adjustable to provide protection for all dimensions of tankers available. They must be assessed for manual handling<sup>4</sup> implications and static electricity / spark generation if used with flammable materials.

#### 2. Mechanically handled



These gantries are generally designed for only portable / ISO tanks and are lifted by forklift truck onto the tank frame.

Once in position they allow unrestricted access to the top of the tanker, but the method of access and egress must be assessed to ensure that a safe system is available. This could be achieved by a separate ladder system.

Gantries, fixed or mobile used for sampling must be located such that they are away from and protected from other vehicular traffic with suitable containment measures, in the event of an uncontrolled release. In addition, mobile gantries should only be used on stable, firm and level ground. Gantry structures and platforms will be subject to periodic examination by a suitably qualified and competent person to ensure continued fitness for service.

### 3.8. Top sample without gantry

Top sample without gantry systems, as detailed in the previous two sections, may still be necessary so has not been excluded from this guidance. For companies where the delivery frequency cannot support the installation of fixed or even mobile gantry systems, the hierarchy must be expanded to incorporate their requirements.

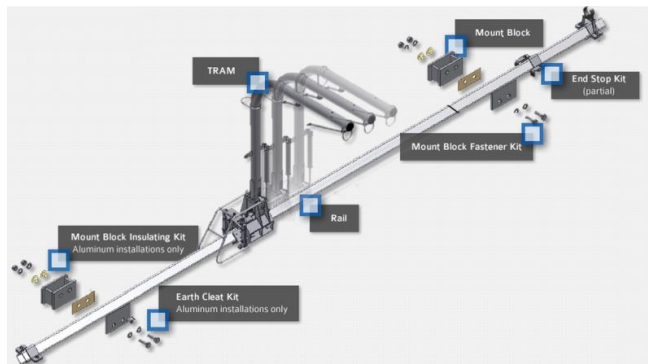
Most operational road tankers (ADR or otherwise) are fitted with 'fold down' or fixed access ladders and handrails to aide access to the top of the tanker, but alone these may not be adequate to provide the degree of operator safety required. The design of these handrails and ladders will vary dramatically and must be considered as part of the overall 'risk assessment' of the operation.

Operator safety can be increased by the use of extra equipment such as:

- ❑ Harnesses attached to a fixed, secure anchor point separate from the vehicle.  
The system has various formats but in essence is an external framework installed at a site. Attached to the framework is a runner with a "descender" device attached. The operator attaches their harness to the descender cable and then accesses the top of the tanker. The descender device will 'halt their fall' and either suspend them in place or lower them to the ground.



- ❑ Harnesses attached to a fixed, secure anchor point on the vehicle.  
One system is a “running pole” and is attached to the top of a tanker with a “moveable arm” device attached that slides along the running pole. The moveable arm hangs over the tanker ladders, the person accessing the top of the tanker attaches their harness lanyard to the arm and then accesses the top of the tanker. They hold onto the bar and walk along the tanker.



- ❑ Other systems are a cable secured to the top of a tanker that the accessing person attaches their harness lanyard and then walk along the tanker platform.

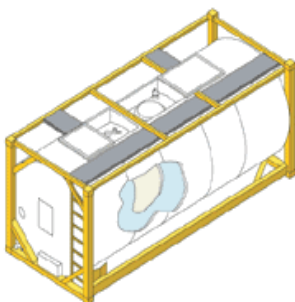


- ❑ Capture nets or Air bags – positioned around the tanker barrel. These systems are usually utilized in long-term installations such as those found in construction sites as they are slow to install and uninstall so delay tanker offloading during deployment. However, they are still a viable option to be investigated.



However, these systems ***must not*** be allowed to become an easy/cheap option around the whole situation. The adoption of these methods must be rigorously controlled via:

- ❑ Comprehensive risk assessments
- ❑ Comprehensive and Audited procedures or method statements
- ❑ Instruction, information and training
- ❑ Certified and tested equipment
- ❑ Adequate liability insurance



Whilst handrails may be fitted to road tankers, they are not fitted to UN portable tanks (so called ISO tanks). These tanks are designed for carriage by differing modes of transport (road, rail and sea) and they have specific dimensions and build criteria.

These 'portable' tanks are loaded and unloaded numerous times onto the different modes during their journey and hence any 'fold down' or fixed handrail system would be prone to damage so they are not fitted.

Importers often offer the facility to affix a handrail, when the tank arrives at the port terminal, to one side of a portable tank beside the walkway.

However, the access ladders on portable tanks vary dramatically in design and are often very difficult to use safely. The clearance between the tank and the ladder rungs is dependent on the size of the barrel and can sometimes be as low as 5 to 10 millimetres.

## 4. Asset Management

Consideration must be given to the inspection and maintenance requirements of any equipment such as gantries and fall arrest equipment which will be subject to additional requirements.

The Provision and Use of Work Equipment Regulations, often abbreviated to PUWER, places duties on people and companies who own, operate or have control over work equipment. PUWER also places responsibilities on businesses and organisations whose employees use work equipment, whether owned by them or not. PUWER requires that equipment provided for use at work is:

- ❑ Suitable for the intended use;
- ❑ Safe for use, maintained in a safe condition and inspected to ensure it is correctly installed and does not subsequently deteriorate;
- ❑ Used only by people who have received adequate information, instruction and training;
- ❑ Accompanied by suitable health and safety measures, such as protective devices and controls. These will normally include emergency stop devices, adequate means of isolation from sources of energy, clearly visible markings and warning devices;
- ❑ Used in accordance with specific requirements, for mobile work equipment and power presses.

Some work equipment may also be subject to other health and safety legislation in addition to [PUWER](#). For example, lifting equipment must also meet the requirements of Lifting Operations and Lifting Equipment regulations or [LOLER](#) which would include mobile gantries.

HSE have written a number of guidance documents in relation to working at heights, PUWER and LOLER and these should be consulted as part of the evaluation process of which system to use. For example INDG367 - Inspecting fall arrest equipment made from webbing or rope would cover harnesses (<http://www.hse.gov.uk/pubns/indg367.pdf>)

## 5. Suspension Trauma (Syncope)

"The term "suspension trauma" is one that has developed as a parlance amongst many who work in the fall protection industry and training sector. It is used to describe the situation of a person falling into suspension in a harness and then becoming unconscious. In this scenario the loss of consciousness is not due to any physical injury, but rather, it is thought that orthostasis, motionless vertical suspension, is responsible. "Trauma" is therefore an inappropriate term which may be better replaced by the descriptive term "syncope" which is the sudden transient loss of consciousness with spontaneous recovery, as may occur with a simple faint. **See HSE RR708 2009**<sup>6</sup>

Due to the fact that gravity is strong and blood is viscous, veins in the legs need to be squeezed from outside by muscle contractions to pump blood up out of the legs and return it to the rest of the body. Evolution has moved veins in legs between muscles, so they can be squashed and released over and over whilst walking.

However, if a casualty cannot use their legs or move them sufficiently, they will eventually faint as blood collects/pools in their legs and is not returned to the rest of the body and the brain. In normal situations when a casualty faints, they fall over and blood can rush back to the brain and they recover. However, if a casualty is 'suspended' in a harness, they are prevented from falling and blood continues to pool in the legs. Motionless head up suspension can lead to pre-syncope, light headedness; nausea; sensations of flushing; tingling or numbness of the arms or legs; anxiety; visual disturbance; or a feeling they are about to faint in most normal subjects within 1 hour and in a fifth within 10 minutes.

When contemplating working at height, and in particular when considering the use of a fall arrest system, employers need to consider any emergency or rescue procedures that may be required and the drawing up of an emergency and rescue plan. It is not feasible to rely on the emergency services.

Emergency procedures need to be considered for reasonably foreseeable circumstances. The measures need to be covered in the risk assessment and planned prior to the work activity being carried out. The primary aim is to get the person down safely in the shortest possible time and before emergency service response.

**If employers cannot do this, then harness work is not the correct system of work.**



## 6. Additional Information

Accessing the top of tankers must be avoided wherever possible. Should deliveries still demand for the on-site sampling of products, companies should take into account the recommendations of HSE in terms of sharing responsibilities for the safety of delivery staff.

HSE has dedicated a section of their website on the safety of delivery staff. Further information can be found at:

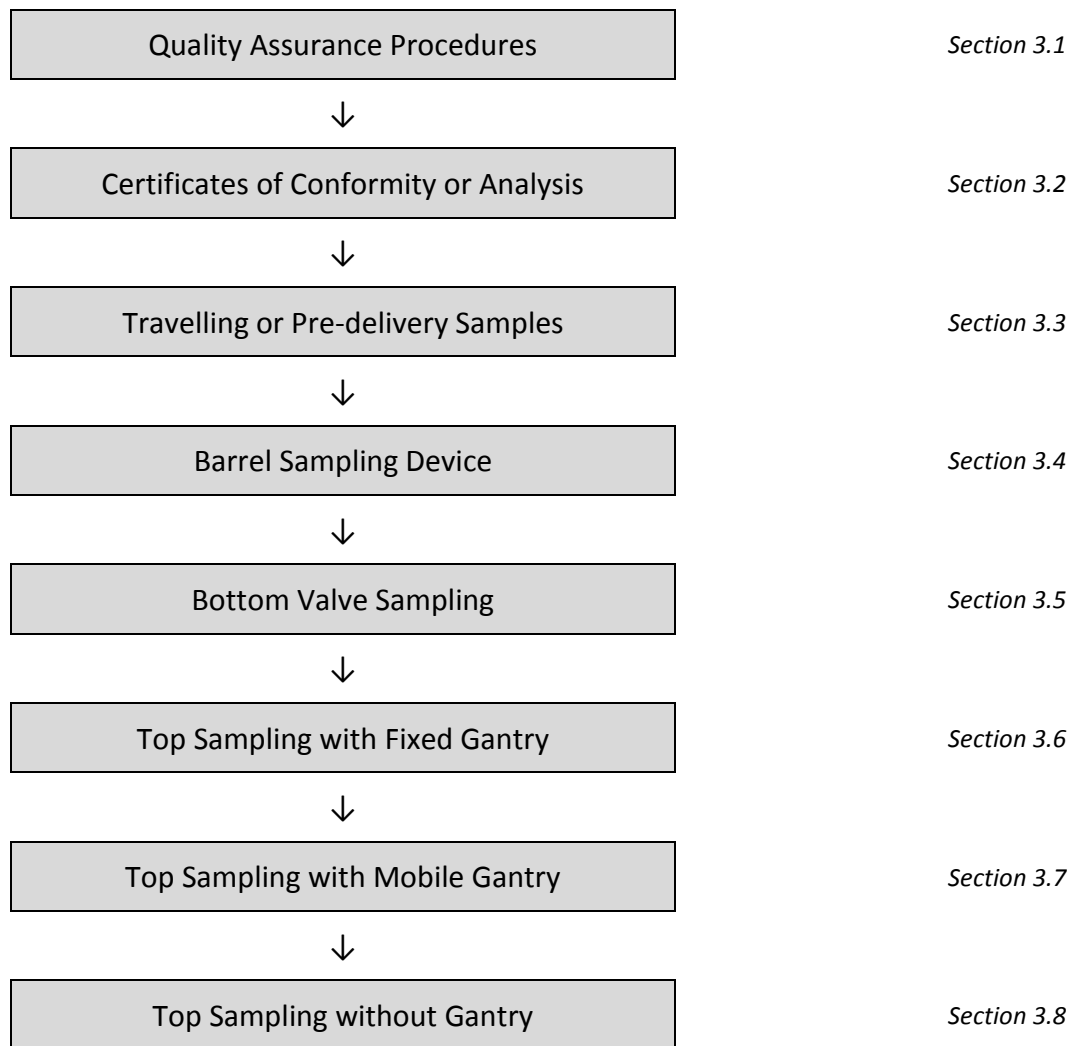
- ❑ **Delivering safely: co-operating to prevent workplace vehicle accidents:**  
<http://www.hse.gov.uk/workplacetransport/information/cooperation.htm>
- ❑ **Safety of workers when accessing the top of tank containers Research report HSL/2005/04**  
[http://www.hse.gov.uk/research/hsl\\_pdf/2005/hsl0504.pdf](http://www.hse.gov.uk/research/hsl_pdf/2005/hsl0504.pdf)
- ❑ **Cefic/ECTA/FECC best practice guidelines for the safe working at height in the chemical's logistics supply chain**  
<https://cefic.org/app/uploads/2018/12/BestPracticeGuidelines-for-safe-working-at-height-in-the-logistics-supply-chain-2012-GUIDELINES-R-R-S-B-A.pdf>
- ❑ **CIA Publication “Working On Top Of Chemical Tankers 2012”**  
<https://www.cia.org.uk/Portals/0/Documents/Publications/Working%20on%20top%20of%20chemical%20tankersFINAL2012.pdf?ver=2017-01-09-143809-970>

## 7. References

1. Reporting of Diseases and Dangerous Occurrence Regulations (RIDDOR) 2013.
2. HSE HID Semi Permanent circular SPC/TECH/GENERAL/04. Version 3 May 2004.
3. Health and Safety at Work Regulations (HASWA) 1974
4. Manual Handling Regulations 1992  
SI 1999 No 2793 (as amended by SI 2002 No 2174)
5. Provision and Use of Work Equipment Regulations (PUWER) 1998  
SI 1998 No 2306 (as amended by SI 1999 No 2001 & SI 2002 No 2174)
6. Working at Heights Regulations 2005  
SI 2005 No 735

## Appendix 1

### ADR Road Tankers



*“The aim of the hierarchy is to reduce the need to access the top of tankers for the purpose of sampling. Where access to top of tankers cannot be avoided it is necessary to ensure the highest degree of safety for those involved in the operation is maintained. This Hierarchy of Control has been designed as guidance on a specific health and safety issue and should not be used in isolation.*”

## Appendix 2

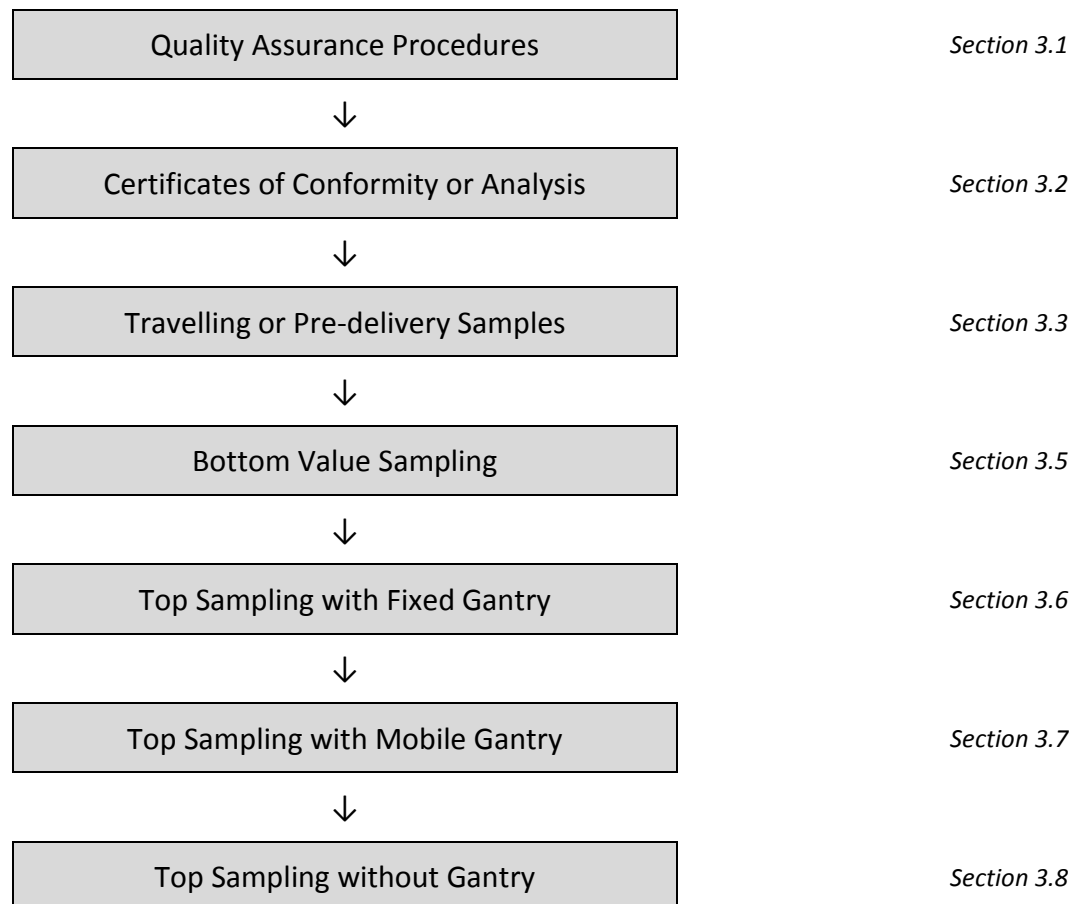
### ISO Tankers



*“The aim of the hierarchy is to reduce the need to access the top of tankers for the purpose of sampling. Where access to top of tankers cannot be avoided it is necessary to ensure the highest degree of safety for those involved in the operation is maintained. This Hierarchy of Control has been designed as guidance on a specific health and safety issue and should not be used in isolation.*”

## Appendix 3

### ISO Containers & Bulk Powders



*“The aim of the hierarchy is to reduce the need to access the top of tankers for the purpose of sampling. Where access to top of tankers cannot be avoided it is necessary to ensure the highest degree of safety for those involved in the operation is maintained. This Hierarchy of Control has been designed as guidance on a specific health and safety issue and should not be used in isolation.*”