

# **Appendix E.**

## **Chemical and Hydrocarbon Management Plan**



**PILBARA IRON ORE AND INFRASTRUCTURE PROJECT**

# **Chemical and Hydrocarbon Management Plan**

**August 2010**

**45-PL-EN-0011**



<b>Document Title:</b>	<b>Chemical and Hydrocarbon Management Plan</b>
<b>Document No:</b>	<b>45-PL-EN-0011</b>
<b>Document Type:</b>	<b>Management Plan</b>
<b>First Issue Date:</b>	<b>30 August 2006</b>

Rev	Issue Date	Description of Revisions Made	Signatures		
			Originator	Checked	Approved
a		Plan developed	Dan Rowe		
b		Changed to revised EMP format	Dan Rowe		
0		Update to include risk assessment and other requirements of Ministerial Statement 690, and safety current procedures	Dan Rowe	Greg Barrett	
d	25/01/06	Amendment following comment from PHPA	Greg Barrett		
1	30/08/06	Issued for Use			D.E.C
2	15/03/07	Minor revisions to change responsibilities, update cross references and change report number.	Greg Barrett		
2a	27/07/09	Major revisions to appropriately deal with bulk storages and rail transport of hydrocarbons	GHD		
2b	18/08/10	Update to include infrastructure and capacity of the expansion of the Herb Elliott Port Facility to 120 Mtpa.	SKM	Sean McGunnigle	Brett McGuire



## TABLE OF CONTENTS

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>4</b>
1.1	BACKGROUND .....	4
1.2	SCOPE OF DOCUMENT .....	5
1.2.1	Purpose.....	5
1.2.2	Facilities Included .....	6
1.3	RELEVANT LEGISLATION, DOCUMENTS AND GUIDELINES.....	7
1.4	RELATED DOCUMENTS AND SYSTEMS .....	9
<b>2.</b>	<b>ABBREVIATIONS AND DEFINITIONS.....</b>	<b>10</b>
2.1	ABBREVIATIONS .....	10
2.2	DEFINITIONS .....	11
<b>3.</b>	<b>CHEMICAL AND HYDROCARBON FACILITIES .....</b>	<b>15</b>
3.1	CHEMICAL AND HYDROCARBON STORAGE.....	15
3.2	TRANSPORT .....	18
3.2.1	Risk Assessment .....	18
<b>4.</b>	<b>MANAGEMENT STRATEGIES .....</b>	<b>19</b>
4.1	REPORTING .....	20
4.1.1	Incident Reporting.....	20
4.1.2	Chemical and Hydrocarbon Tracking .....	21
4.2	SPILL RESPONSE.....	22
4.2.1	Chemical and Hydrocarbon Spill Response .....	22
4.3	CHEMICAL AND HYDROCARBON PROCUREMENT .....	24
4.3.1	Chemical and Hydrocarbon Procurement .....	24
4.4	CHEMICAL AND HYDROCARBON STORAGE.....	26
4.4.1	Significant Permanent and Temporary Storage .....	26
4.4.2	Minor Permanent and Temporary Storage .....	28
4.5	CHEMICAL AND HYDROCARBON TRANSPORT AND HANDLING .....	30
4.5.1	Bulk Road Transport.....	30
4.5.2	Packaged Transport .....	32
4.5.3	Rail Transport .....	34
4.5.4	Bulk Handling.....	35
4.5.5	Minor Quantities Handling .....	37
4.6	USE AND DISPOSAL .....	39
4.6.1	Chemical and Hydrocarbon Use and Disposal.....	39
4.7	OILY WATER .....	41
4.7.1	Oily Water Management.....	41
4.8	GREENHOUSE GAS .....	43
4.8.1	Greenhouse Gas Emissions Management.....	43



4.9 TRAINING .....45  
    4.9.1 Incident Response Training .....45

5. INCIDENT DECLARATION AND RESPONSE TEAM ACTIVATION ..... 47

6. ENVIRONMENTALLY SENSITIVE AREAS ..... 48

7. AUDITS ..... 49

8. REVIEW..... 50

9. REFERENCES ..... 51

**LIST OF TABLES**

Table 1: Relevant Legislation and Standards ..... 7

Table 2: Summary of Ministerial Commitments..... 8

Table 3: Summary of Significant Permanent Chemical and Hydrocarbon Storage Facilities by Project Area (>10kL) ..... 16

Table 4: Environmentally Sensitive Areas..... 48

**LIST OF APPENDICES**

<b>Appendix A</b>	<b>Spill Response</b>
<b>Appendix B</b>	<b>Chemical and Hydrocarbon Storage Standards</b>
<b>Appendix C</b>	<b>Greenhouse Gas Emissions</b>



## **1. INTRODUCTION**

### **1.1 BACKGROUND**

Fortescue Metals Group Limited (Fortescue) has commenced operation of the Pilbara Iron Ore and Infrastructure Project (the Project), which consists of several iron ore mines and associated rail and port infrastructure in the Pilbara region of Western Australia. The primary environmental approvals for the project have been obtained in four stages:

- Stage A consisting of an iron ore export facility at Port Hedland and a north-south railway from the central Pilbara to Port Hedland (approved under Ministerial Statement 690);
- Stage B consisting of two iron ore mines in the Eastern Pilbara (Christmas Creek and Mindy Mindy) and an east-west spur rail line connecting to the Stage A railway (approved under Ministerial Statement 707);
- Cloudbreak iron ore mine west of the Christmas Creek area (approved under Ministerial Statement 721 and Commonwealth Assessment EPBC 2005/2205); and
- Port facility upgrade of the third berth at Anderson Point, Port Hedland: Dredging and wharf construction (approved under Ministerial Statement 771).

The Cloudbreak and Christmas Creek mine sites are located on the southern slopes of the Chichester Ranges; collectively the two mine sites are referred to as the Chichester Operations.

During the initial stages of operation, mining will occur in the Cloudbreak and Christmas Creek areas, with ore hauled by truck from Christmas Creek to the ore processing facility at Cloudbreak. Ore from Cloudbreak and Christmas Creek is then transported by train along the approved north-south (Stage A) and east-west (Stage B) railways to Port Hedland.

Proposed extensions of the rail line to the south and to the east will be considered in future expansions.

The existing infrastructure at Fortescue's Herb Elliott Port provides for train unloading, stacking and reclaiming and ship loading of iron ore via a conveyor system. Expansion of the port facility to include an additional



fourth berth and increased reclaiming capacity is proposed to handle increased ore production from the Chichester Operations. This expansion will allow for the storage of up to 57 ML of diesel fuel.

Fortescue uses a variety of chemicals and hydrocarbons across the various sites. Ministerial Statements 690 and 707 contain proponent's commitments to produce a Chemical and Hydrocarbon Management Plan (CHMP). This document has been developed to address this requirement and is applicable to all sites, not just those covered by Ministerial Statements 690 and 707.

## **1.2 SCOPE OF DOCUMENT**

### **1.2.1 Purpose**

The purpose of the CHMP is to provide a mechanism for the management of chemicals and hydrocarbons such that the risk of impact upon the surrounding environment is minimised.

The CHMP is a risk-based management plan, and aims to provide a control mechanism to reduce the risk posed to the environment by chemical and hydrocarbon hazards identified within the Project. It refers to site specific Emergency Response Procedures (ERPs) developed in association with the CHMP.

The CHMP will provide a framework to assist Fortescue in:

- Achieving compliance with relevant legislation and standards for chemical and hydrocarbon storage, transport and use;
- Developing a current register of all significant stores of chemicals and hydrocarbons;
- Developing criteria to be assessed during site audits of facilities incorporating chemical and hydrocarbon storage, handling and/or use;
- Tracking chemical and hydrocarbon use across the Project;
- Reporting and tracking chemical and hydrocarbon spills across the Project;
- Respond to chemical and hydrocarbon spills related to the Project;
- Demonstrating compliance with Ministerial Statements 690 and 707; and
- Managing contaminated soils and materials generated from the Project.



The CHMP considers chemicals that are considered to be hazardous materials. These are chemicals that can be defined as Dangerous Goods and/or Hazardous Substances.

Dangerous Goods are defined as substances presented within the *Australian Dangerous Goods Code* (NTC, 2007), and are classified on the basis of their physical hazards.

Hazardous Substances are assessed on the basis of their physiochemical, toxicological and exotoxicological properties and their impact upon health. A consolidated list of hazardous substances is maintained by the Office of the Australian Safety and Compensation Council at the following website: <http://hsis.ascc.gov.au/TheList.aspx>.

Waste oil is not listed as a Dangerous Good or Hazardous Substance. For the purposes of this management plan, waste oil will be managed according to the same requirements described in this management plan.

### **1.2.2 Facilities Included**

Facilities considered during the development of this management plan include:

- Cloudbreak Mine Site (including mining, accommodation, the airport and support facilities);
- Christmas Creek Mine Site (including mining, accommodation and support facilities);
- Rail facilities (including workshops, track, locomotives, rolling stock, camps and bores);
- Herb Elliott Port facilities (including train unloading, transfer stations and the wharf);
- Exploration; and
- Welshpool Freight Depot.





## 1.3 RELEVANT LEGISLATION, DOCUMENTS AND GUIDELINES

Relevant legislation, codes of practice and standards to this document include:

**Table 1: Relevant Legislation and Standards**

Document	Description
<i>Dangerous Goods Safety Act 2004</i>	Outlines requirements for safe storage, handling and transport of dangerous goods.
<i>Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007</i>	Outlines the procedures for transporting dangerous goods by road or rail. Supports the legislation.
<i>Road Traffic Act 1974</i>	Covers licensing requirements for transport vehicles.
<i>Australian Dangerous Goods Code</i>	Covers procedures and vehicle requirements for carrying Dangerous Goods.
<i>Pollution of Waters by Oil and Noxious Substances Act 1987</i>	Empowers the Port Hedland Port Authority to manage oil pollution within its area of responsibility.
<i>Contaminated Sites Act 2003</i>	Outlines requirements for the management of contaminated sites.
<i>Contaminated Sites Regulations 2006</i>	Outlines the procedure for assessing potentially contaminated sites.
<i>Australian Standard 1940 – 2004</i>	Provides requirements and recommendations for the design, construction and operations of installation where flammable or combustible liquids are stored and handled.
<i>Australian Standard 3780 – 2008</i>	Provides requirements and recommendations for the safe storage and handling of corrosive substances.
<i>Australian Standard 3833 - 2007</i>	Provides requirements and recommendations for the safe storage and handling of dangerous goods, in packages and intermediate bulk containers of up to 1.6 m <sup>3</sup> .
<i>Environmental Protection (Controlled Waste) Regulations 2004</i>	Regulates transport for disposal of controlled wastes.
<i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>	Schedule 1 – Materials that must not be discharged into the environment



The CHMP has been developed to address the requirements of Ministerial Statement 690 (Proponent Commitment 6) and Ministerial Statement 707 (Proponent Commitment 8) in respect of the provision of a “Hydrocarbon Management Plan / Oil & Chemical Spill Contingency Plan”. The details of the specific requirements of these commitments, and their location within the CHMP, are detailed in Table 2.

**Table 2: Summary of Ministerial Commitments**

<b>Elements of Proponent Commitment</b>	<b>Location in Plan</b>
Spill prevention	4.5, 4.6, 4.7
Identification of the level of risk posed from contamination by chemical and hydrocarbons in the area of operation which includes: <ul style="list-style-type: none"><li>• identification of sensitive areas and measures to protect them; and</li><li>• likely types and volumes of hydrocarbons / chemicals.</li></ul>	3.1, 4.3, 6
Appropriate procedures to allow rapid assessment of a spill and the mobilisation of response.	4.1, 4.2, 4.3
Appropriate procedures to control fuel and chemicals handling and berthing contamination.	4.3, 4.6
Appropriate clean up procedures on site according to the level of risk posed.	4.3
A first strike response capability is maintained in the event of a spill, which includes the following: <ul style="list-style-type: none"><li>• equipment appropriate to the level of risk; and</li><li>• on site personnel trained in spill response and management.</li></ul>	4.3
Appropriate on site arrangements for the disposal of oily and chemical wastes.	4.7
Systems in place to monitor and report spills.	4.1, 4.8
Systems to continually monitor and reduce contamination.	4.1, 4.8



## 1.4 RELATED DOCUMENTS AND SYSTEMS

This document should be developed in conjunction with the following documents and/or systems:

- Port Hedland Port Authority – *2009/2010 Environmental Management Plan* (December 2008);
- Port Hedland Port Authority (2008), *Marine Oil Pollution Management Plan*.
- *Greenhouse Gas Management Plan* (45-PL-EN-0016);
- *Cloudbreak Operations Environmental Management Plan* (CB-PL-EN-0001);
- *Rail Route (Stage B) Environmental Management Plan* (R-PL-EN-0011);
- *Port Facility Construction Environmental Management Plan* (P-PL-EN- 007);
- *Exploration Environmental Management Plan* (E-PL-EN-0002)
- *Environmental Compliance Audits Procedure* (100-PR-EN-1003);
- *Chemical and Hydrocarbon Spills Procedure* (PR-EN-0014);
- *Chemical and Hydrocarbon Storage Procedure* (PR-EN-0015);
- *Incident Management System Plan* (100-PL-SA-0002);
- *Incident Event Reporting Procedure* (100-SA-PR-0011);
- *Waste Management Procedure / Plan* (45-PL-EN-0014)
- *Emergency Response Procedure* ( 100-PR-SA-0046)
- Banlaw (Fuel Management System);
- ChemAlert; and
- Fortescue Business Management System (BMS) for HSES incident reporting, investigation and management.



## 2. ABBREVIATIONS AND DEFINITIONS

### 2.1 ABBREVIATIONS

<b>ADGC</b>	<i>Australian Dangerous Goods Code (7<sup>th</sup> Edition)</i>
<b>AS/NZS</b>	Australian Standard / New Zealand Standard
<b>BMS</b>	Business Management System
<b>CHMP</b>	Chemical and Hydrocarbon Management Plan
<b>DEC</b>	Department of Environment and Conservation
<b>DMP</b>	Department of Mines and Petroleum
<b>EPBC</b>	<i>Environmental Protection and Biodiversity Conservation Act (1999) (Commonwealth)</i>
<b>ERP</b>	Emergency Response Procedure
<b>Fortescue</b>	Fortescue Metals Group Limited
<b>GHG</b>	Greenhouse Gas
<b>HAZID</b>	Hazard Identification
<b>HESE</b>	Health, Safety, Environment & Security
<b>IBC</b>	Intermediate Bulk Container
<b>IMT</b>	Incident Management Team
<b>kg</b>	kilogram
<b>L</b>	Litre
<b>mg</b>	milligram
<b>ML</b>	Megalitre (1,000,000 litres)
<b>Mtpa</b>	Million tonnes per annum
<b>NOHSC</b>	National Occupational Health and Safety Commission
<b>NPI</b>	National Pollutant Inventory
<b>NTC</b>	National Transport Commission
<b>PG</b>	Packing Group
<b>PHPA</b>	Port Hedland Port Authority



PPE	Personal Protective Equipment
UN	United Nations

## 2.2 DEFINITIONS

As per AS 1940-2004: The Storage and Handling of Flammable and Combustible Liquids.

<b>Boundary</b>	The perimeter of the whole of the site under the same occupancy as the storage area.
<b>Bulk</b>	Dangerous goods that are not in packages.
<b>Bund</b>	An embankment or wall which may form part or all of the perimeter of a compound.
<b>Class (of Dangerous Goods)</b>	The number assigned to dangerous goods which exhibit a common single or most significant risk, determined from the criteria given in the UN <i>Manual of Tests and Criteria</i> and listed in the ADGC.
<b>Combustible Liquids</b>	Any liquid, other than a flammable liquid, that has a flash point, and has a fire point that is less than its boiling point. AS 1940-2004 divides combustible liquids into two classes: <ul style="list-style-type: none"><li>• Class C1: A combustible liquid that has a flash point of 150°C or less.</li><li>• Class C2: A combustible liquid that has a flash point greater than 150°C.</li></ul>
<b>Controlled Waste</b>	As defined by the <i>Environmental Protection (Controlled Waste) Regulations 2004</i>
<b>Dangerous Goods</b>	Substances and articles that: <ol style="list-style-type: none"><li>1. Satisfy the UN tests and criteria for determining whether they are dangerous goods;</li><li>2. Are listed in the ADGC.</li></ol>
<b>Decant</b>	To pour from one container to another.
<b>Environmentally Sensitive Area</b>	The term includes, but is not limited to: <ul style="list-style-type: none"><li>• A water catchment area;</li><li>• A reservoir for drinking water;</li><li>• A freshwater or marine environment; or</li><li>• A national park or equivalent.</li></ul>
<b>Flammable Liquid</b>	Liquids, or mixtures of liquids, or liquids containing solids in solution or suspension which give off a flammable vapour at temperatures of not more than 60.5°C, closed cup test, or



	<p>not more than 65.6°C, open cup test, normally referred to as the flash point.</p> <p>This class also includes:</p> <ul style="list-style-type: none"><li>• Liquids offered for transport at temperatures at or above their flash point; and</li><li>• Substances that are transported or offered for transport at elevated temperatures in a liquid state and which give off a flammable vapour.</li></ul> <p>Class 3 flammable liquids are divided into 3 Packing Groups (PG), as follows:</p> <ul style="list-style-type: none"><li>• PG1: High danger; initial boiling point <math>\leq 35^{\circ}\text{C}</math>;</li><li>• PG2: Medium danger; flash point (closed cup) <math>&lt; 23^{\circ}\text{C}</math>; initial boiling point <math>&gt; 35^{\circ}\text{C}</math>; and</li><li>• PG3: Low danger; flash point (closed cup) <math>\geq 23^{\circ}\text{C}</math>, <math>\leq 60.5^{\circ}\text{C}</math>; initial boiling point <math>&gt; 35^{\circ}\text{C}</math>.</li></ul>
<b>Flash Point</b>	<p>The lowest temperature, corrected to a barometric pressure of 101.3 kPa, at which application of a test flame causes vapour of the test portion to ignite under the specified conditions of test.</p>
<b>Ignition Source</b>	<p>A source of energy sufficient to ignite a flammable atmosphere.</p>
<b>Incompatible</b>	<ol style="list-style-type: none"><li>1. In relation to dangerous goods or other goods, goods that are:<ul style="list-style-type: none"><li>• Likely to interact with the dangerous goods so as to increase the hazard when mixed or otherwise brought into contact with the liquids;</li><li>• Listed in the ADGC as being incompatible; or</li><li>• Declared by the regulatory authority to be incompatible.</li></ul></li><li>2. In relation to packaging or transfer equipment, a container or item of equipment that is constructed of a material likely to interact with the liquids such that is weakened or damaged to the extent that risk increases.</li></ol>
<b>Intermediate Bulk Container (IBC)</b>	<p>Rigid or flexible portable packagings for the transport of dangerous goods that:</p> <ol style="list-style-type: none"><li>1. Have a capacity of:<ul style="list-style-type: none"><li>• Not more than 3 m<sup>3</sup> for solids and liquids of Packaging Groups II and III;</li><li>• Not more than 1.5 m<sup>3</sup> for solids of Packing Group I when packed in flexible or rigid plastics, composite, fibreboard and wooden IBCs;</li><li>• Not more than 3 m<sup>3</sup> for solids of Packing Group I when packed in metal IBCs; and</li><li>• Not more than 3 m<sup>3</sup> for radioactive material of Class 7;</li></ul></li><li>2. Are designed for mechanical handling;</li><li>3. Are resistant to the stresses produced in usual handling and transport; and</li></ol>



	4. Comply with UN <i>Recommendations on the Transport of Dangerous Goods – Model Regulations</i> .
<b>Material Safety Data Sheet</b>	A document which provides information on the identification, health hazards, precautions for use and safe handling of a specific chemical product, and which complies with NOHSC:2011 (2003).
<b>Minor Storage</b>	The storage of flammable and combustible liquids, in various locations, in quantities conforming to the criteria specified in Section 2 of AS 1940-2004.
<b>Packaging</b>	A receptacle and any other components or materials necessary for the receptacle to perform its containment function, and: <ul style="list-style-type: none"><li>• In relation to dangerous goods of Class 2, a container having a capacity not exceeding 500 L; and</li><li>• In relation to dangerous goods of any other class, a container having a capacity not exceeding 450 L and having a net mass of not more than 400 kg.</li></ul>
<b>Protected Place</b>	Any of the following: <ul style="list-style-type: none"><li>• A dwelling, residential building, place of worship, public building, school or college, hospital, theatre, and any building or open area in which persons are accustomed to assemble whether it is within or outside the property boundary of the installation;</li><li>• A factory, workshop, office, store, warehouse, shop or building where persons are employed, that is outside the property boundary of the installation;</li><li>• A ship lying at permanent berthing facilities; and</li><li>• Any storage facility for dangerous goods outside the property boundary of the installation, except for those defined as minor storage.</li></ul>
<b>Rail Tank Vehicle (Rail Tanker)</b>	A rail wagon, of which a tank forms an integral part.
<b>Regulatory Authority</b>	The authority responsible for the administration of control of the storage, transport and use of dangerous goods.
<b>Road Tank Vehicle (Road Tanker)</b>	A road vehicle, of which a tank forms part, or to which a tank (other than a portable tank) is attached.
<b>Significant Storage</b>	Storage of dangerous goods exceeding minor quantities as defined within Australian Standards. For diesel, this is greater than 5 kL for storage around buildings that is separated from any buildings by at least 1 m and greater than 10 kL for storage in open land
<b>Tank</b>	A container other than a package or IBC, intended for the storage or transport of a liquid and having a capacity greater than 450 L. Where a tank category is mentioned, it means the category specified in AS 1692 and defined in Clause 1.4.7 of AS 1940-2004.



	<p>A tank may be one of the following types:</p> <ol style="list-style-type: none"><li>1. Static storage tank: A tank of the types as described in AS 1692, intended to remain permanently in place once installed;</li><li>2. Demountable delivery tank: A tank intended to be placed on a vehicle from time to time to enable use as a temporary delivery tanker;</li><li>3. Tank container: A tank fitted with frames to international freight container dimensions in accordance with AS 3711.6;</li><li>4. Underground tank: A static storage tank wholly or partially buried below the surrounding ground gradient;</li><li>5. Above-ground tank: A static storage tank which is not an underground tank;</li><li>6. Portable tank: A multimodal portable tank, including a shell fitted with service equipment and structural equipment necessary for the transport of dangerous substances.</li></ol>
<b>Tank Vehicle</b>	A road tank vehicle or rail tank vehicle.





### **3. CHEMICAL AND HYDROCARBON FACILITIES**

#### **3.1 CHEMICAL AND HYDROCARBON STORAGE**

Fortescue has a number of permanent chemical and hydrocarbon storage facilities with significant additional hydrocarbon facilities proposed as part of the port expansion plans. Both existing and proposed facilities are included in Table 2.

Fortescue also has a number of temporary chemical and hydrocarbon storage facilities across its sites. The majority of these are self-bunded diesel storage tanks with capacities up to approximately 100 kL. These storage facilities are located where construction and operational activities are taking place away from permanent storage facilities.



**Table 3: Summary of Significant Permanent Chemical and Hydrocarbon Storage Facilities by Project Area (>10kL)**

Project Area	Storage facility	Substance stored	Volume stored (kL)
Port	Point Anderson fuel farm	Diesel	55
	Proposed Anderson Point main tank farm	Diesel	55 000
	Proposed Truck loading facility	Diesel	2 000
Rail	Locomotive refuelling facility	Diesel	750
	Bulk fuel storage for rail tankers	Diesel	1 500
	Mine Fuel Supply	Diesel	
Cloudbreak	Cloudbreak fuel farm	Diesel	3,490
	Powerstation	Engine oil	10
		Waste oil	15
	Fortescue workshop	Engine oil	55



Project Area	Storage facility	Substance stored	Volume stored (kL)
		Hydraulic oil	15
		Transmission oil	15
		Gear oil	15
		Waste oil	85
		Engine coolant	10
	Dave Forrest Airfield aircraft refuelling facility	A-1 jet fuel	100



## 3.2 TRANSPORT

Fortescue operates a diesel storage facility at Rowley Marshalling Yard, Port Hedland. This system consists of two 750 kL diesel storage tanks (total storage 1,500 kL). The diesel storage tanks are filled by triple road trains. The storage tanks are then used to fill rail tankers and then transported to Cloudbreak mine site.

Rail tankers with a capacity of 95 kL each are used to transport diesel to Cloudbreak.

At Cloudbreak, diesel is received from the rail tankers and stored in two 1,745 kL storage tanks (total storage 3,490 kL), before being decanted for distribution for local services.

With the exception of diesel, all dangerous goods are brought to site packaged.

### 3.2.1 Risk Assessment

A hazard identification (HAZID) was undertaken by Fortescue to identify the key environmental hazards posed by chemicals and hydrocarbons.

Key aspects identified include:

- Loss of containment of storage;
- Spillage during transport or handling; and
- Environmental impact through inappropriate or incorrect usage or disposal.

Two hazards not covered within the risk workshop in any detail, but identified as significant enough to warrant management are:

- The procurement of chemicals and hydrocarbons; and
- Greenhouse gas emissions from the Project.



## 4. MANAGEMENT STRATEGIES

Management strategies address the risks posed by chemicals and hydrocarbons. This represents the minimum level of management to be applied at all Fortescue owned and operated facilities. These strategies will be adopted (and where necessary adapted) as part of the environmental management of every facility.

Management strategies included in this section are:

- Reporting;
- Spill Response;
- Chemical and Hydrocarbon Procurement;
- Chemical and Hydrocarbon Storage;
- Chemical and Hydrocarbon Transport and Handling;
- Chemical and Hydrocarbon Use and Disposal;
- Oily Water Management;
- Greenhouse Gas Emission Management; and
- Training.

Fire protection and emergency response is not included in this management plan. It is documented in the Emergency Response Plans relevant to each of the Port, Rail and Mine sites.

Each strategy addresses the following areas:

- Purpose and key objectives;
- Hazards managed;
- Procedure actions;
- Performance indicators;
- Monitoring;
- Reporting;
- Corrective and preventative actions;
- Term; and
- Responsibility.



## 4.1 REPORTING

### 4.1.1 Incident Reporting

<b>Purpose/Objective</b>	Ensure incidents are reported and investigated in a timely manner. Enable the assessment of spills associated with the Project, to identify issues with chemical and hydrocarbon management at the Project.
<b>Hazards Managed</b>	Chemical and hydrocarbon spills.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Train key personnel incident reporting.</li><li>• Investigate and respond to reported spills as per the Spill Response Decision Tree (see Appendix A).</li><li>• Log all reported incidents into BMS, including all available information.</li></ul>
<b>Performance Indicators</b>	All incidents are reported. All incidents are investigated and appropriate action taken in a timely manner.
<b>Monitoring</b>	'Close out' rate of incident reports generated in BMS. HSES audits.
<b>Reporting</b>	Internal HSES reports. Reporting to government agencies as required (spills in excess of 500 L or those causing significant environmental impact).
<b>Corrective and Preventative Actions</b>	Retraining of personnel if incident reporting is found to be unsatisfactory.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	All personnel to report incidents using BMS. Manager Governance and Sustainability to report spills over 500 L to the DEC and DMP.
<b>Key Documents</b>	<i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i>



#### 4.1.2 Chemical and Hydrocarbon Tracking

<b>Purpose/Objective</b>	Track the volume and distribution of chemicals and hydrocarbons from delivery to site to ultimate use/disposal, thus allowing improvements in efficiency throughout the Project, identifying potential leaks or theft and assisting in greenhouse gas reporting requirements.
<b>Hazards Managed</b>	Undetected leaks.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Monitor and record the storage and transfer volumes of hydrocarbons from fuel delivery points at all stages to ultimate use or disposal, through the use of temperature adjusted flow metering and tank gauging feeding to a Project wide Fuel Management System;</li><li>• Assess the reconciliation between the volume of material delivered to site and the consumption or disposal of the material as part of an annual audit;</li><li>• Ensure flow meters and gauges are serviced in line with the manufacturer's recommendations;</li><li>• Monitor the fuel usage of each vehicle via fuel logs or a Fuel Management System; and</li><li>• Reconcile copies of Controlled Waste Tracking Forms with volumes and characteristics of waste removed from site.</li></ul>
<b>Performance Indicators</b>	Reconciliation percentage between the volume of fuel delivered to site and ultimate disposal (target >95%).
<b>Monitoring</b>	Annual chemical and hydrocarbon audit.
<b>Reporting</b>	As part of GHG, NPI and NGER reporting requirements. Fuel Management System Reporting.
<b>Corrective and Preventative Actions</b>	Ensure that all fuel flow meters installed are temperature corrected. Assess monitoring procedures for the facility.
<b>Term</b>	Life of Project.
<b>Responsibility</b>	Senior Environmental Advisor (Strategic Projects) to compile data for GHG reporting. Group Tax Manager to oversee implementation and operation of Fuel Management System.
<b>Key Documents</b>	ChemAlert Banlaw



## 4.2 SPILL RESPONSE

### 4.2.1 Chemical and Hydrocarbon Spill Response

<b>Purpose/Objective</b>	Ensure that any hydrocarbon or chemical spills are managed such that there is the minimum impact on the environment.
<b>Hazards Managed</b>	Chemical and hydrocarbon spills.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• In the event of a spill, utilise the spill response decision tree to determine the appropriate response;</li><li>• Train personnel in the requirements for spill response within the terrestrial environment (including the usage of spill kits) and in spill prevention;</li><li>• Train port personnel in the PHPA requirements for spill response in the marine environment;</li><li>• Conduct training and participate in exercises in spill prevention and control;</li><li>• Ensure that appropriately sized spill response equipment is maintained at each facility storing chemicals and hydrocarbons. Facilities that store corrosive liquids (Class 8 substances) should include a separate spill kit with sodium hydrogen carbonate in place of vermiculite;</li><li>• Maintain spill trailers for spills during transport;</li><li>• Spill clean up within bunded areas shall only use materials compatible with the relevant oily water separator;</li><li>• Prevent significant spills from reaching surface or ground water systems and the drainage network;</li><li>• For spills that cannot be managed with the use of spill kits, ensure that the spill response checklist is completed to ensure that the spill has been effectively managed or that the Emergency Response Procedure is implemented as required.</li><li>• Bulk spills of hydrocarbons and chemicals shall be managed according to the site Emergency Response Procedure.</li><li>• Appropriate spill equipment shall be located in close proximity to where chemicals and hydrocarbons are being used;</li><li>• Ensure that spill kits and trailers are regularly audited and following use, and are replenished as necessary; and</li><li>• Any contaminated soils or sediments should be removed for treatment within an approved hydrocarbon bioremediation facility.</li></ul>
<b>Performance Indicators</b>	All spills are managed in accordance with established procedures. Spills do not generate a contaminated site.





	Spills do not impact upon the surrounding ecology.
<b>Monitoring</b>	Review of accident and incident reports and through outcomes of training exercises.
<b>Reporting</b>	Internal reporting on effectiveness of spill response.
<b>Corrective and Preventative Actions</b>	Retraining of personnel. Revision of spill response procedures. Introduction of additional engineering controls. Site remediation and/or rehabilitation.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	Site Environmental Superintendent and Incident Management Team Leader to coordinate response to spills. HSE Manager to ensure that sufficient emergency response equipment is available at the facility, and restocked as necessary. HSE Manager to ensure that there are sufficient personnel trained in emergency response to respond to spills.
<b>Key Documents</b>	See Appendix A Spill Response Decision Tree Spill Response Checklist Spill Kit Requirements Spill Kit Training Presentation <i>Chemical and Hydrocarbon Spills Procedure (45-PR-EN-0010)</i> <i>Incident Management System Plan (100-PL-SA-0002)</i>



## 4.3 CHEMICAL AND HYDROCARBON PROCUREMENT

### 4.3.1 Chemical and Hydrocarbon Procurement

<b>Purpose/Objective</b>	<p>Ensure that due consideration is given to the environmental concerns of chemicals and hydrocarbons before they are brought to the project area.</p> <p>Ensure that control and remediation measures are in place prior to chemicals being approved for site use.</p>
<b>Hazards Managed</b>	<p>Incorrect usage or disposal of chemicals and hydrocarbons.</p>
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Prior to bringing chemicals on site, all contractors and Fortescue personnel shall provide a list of chemicals and hydrocarbons, along with the associated MSDSs, that they wish to use at the Project site, and the maximum storage volumes required;</li><li>• Any new chemicals on the request list and MSDs shall be accompanied by a New Chemical Product Form ( 100-FR-SA-0050 ) for each new chemical.</li><li>• No new chemical product shall be brought to any site without an approved New Chemical Product Form completed and signed by all relevant parties.</li><li>• Chemalert shall maintain a register of approved chemicals and hydrocarbons for the Project, and shall include information such as volume purchased, the classification of the chemical (if any), the location stored, and reference to the location of the MSDS for the chemical;</li><li>• An annual audit shall be undertaken for the chemicals stored at the site, identifying the volume of each chemical, the storage location, segregation, and identifying any necessary improvements in the storage of chemicals and reconciling the actual storage against indicated storage of chemicals in Chemalert.</li><li>• When procuring hydrocarbons for the site, the volume of hydrocarbon should be recorded within Fortescue's Accounting System;</li><li>• All chemicals intended to be applied direct to land shall be approved by the Environment Superintendent as part of the New Chemical Product Request and Job Hazard Analysis processes.</li><li>• A copy of the MSDS shall be located with or near each stored chemical.</li></ul>
<b>Performance Indicators</b>	<p>Only approved chemicals and hydrocarbons located on the Project site.</p>



<b>Monitoring</b>	<p>The chemicals and hydrocarbons stored onsite shall be compared to an approved list during site audits.</p> <p>The audit shall confirm that there is an appropriate MSDS readily available for each chemical.</p>
<b>Reporting</b>	<p>Internal reporting.</p>
<b>Corrective and Preventative Actions</b>	<p>Corrective action should be undertaken to meet the above requirements, and could include removal of unapproved chemicals or hydrocarbons from site, and education regarding procurement processes.</p>
<b>Term</b>	<p>Life of the project.</p>
<b>Responsibility</b>	<p>Personnel to bring chemicals on site to provide suitable documentation (list and request forms) as outlined above.</p> <p>HSE Manager to assess chemicals, define storage requirements and provide MSDS's to relevant Facility Managers.</p> <p>HSE Manager to ensure that all chemicals stored at the respective facility are accompanied by an MSDS, and are stored as required.</p> <p>The Environment Superintendent shall approve chemicals procured for the purpose of direct application to land.</p>
<b>Key Documents</b>	<p>MSDS</p> <p>Accounting System</p> <p>Banlaw System</p> <p>ChemAlert System</p>



## 4.4 CHEMICAL AND HYDROCARBON STORAGE

### 4.4.1 Significant Permanent and Temporary Storage

<b>Purpose/Objective</b>	Ensure that all chemicals and hydrocarbons are stored in a manner that meets legislative requirements and Australian Standards, reflects industry best practice and minimises the risk to the environment.
<b>Facilities Managed</b>	Facilities with dangerous goods storage exceeding minor quantities as defined within Australian Standards. For diesel, this is greater than 5 kL for storage around buildings that is separated from any buildings by at least 1 m and greater than 10 kL for storage in open land.
<b>Hazards Managed</b>	Chemical and hydrocarbon spills.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Chemicals and hydrocarbons will be stored in a manner consistent with AS 1940-2004, utilising specially designed facilities, including any necessary bunding. Hydrocarbons and chemicals are to be stored only at designated areas;</li><li>• Ensure a current MSDS for chemicals stored is maintained near all storage areas, in a clearly identified file;</li><li>• Class 3 chemicals and hydrocarbons shall be separated from boundaries, ignition sources, (including cigarettes) protected places and accumulations of combustible materials by the distances indicated in AS 1940-2004;</li><li>• Ensure that safe access to and egress from the storage vessels is maintained at all times;</li><li>• Storage facilities containing greater than 10 kL of chemicals or hydrocarbons shall be located on open land;</li><li>• Storage facilities should be secured from public access;</li><li>• Bunding at the Main Tank Farm at Anderson Point will have a capacity of 22 ML;</li><li>• Bunding at the Truck Loading Facility will have a capacity of 1 ML;</li><li>• In other instances, storage shall utilise bunding capable of storing 110% of the volume of the largest vessel, or 10% of the total volume;</li><li>• Any drainage valves within storage bunds should be kept closed at all times, unless being used to drain the bund into an appropriate vessel for treatment or disposal;</li><li>• Bunding shall be inspected following all rainfall events and if necessary during major rainfall events where safety permits;</li><li>• Spill cleanup within bunded areas shall utilise only materials that are compatible with the oil/water</li></ul>



	<p>separators;</p> <ul style="list-style-type: none"> <li>Any potential flow of a spill shall be prevented from draining to a protected place or watercourse via drainage management;</li> <li>Water collected at the facility shall be managed according to the relevant section in this management plan. For other chemicals, or where there is the potential for contamination of water, liaise with the Environment Superintendent to determine an appropriate testing and disposal approach;</li> <li>Storage tanks shall not be overfilled;</li> <li>Tank vents and fittings shall be inspected at least annually, or on arrival on site for temporary storage vessels;</li> <li>Tanks shall only be used to store the chemicals for which they are labelled.</li> </ul>
<b>Performance Indicators</b>	All Class 3 chemicals (including hydrocarbons) are stored in accordance with the established requirements.
<b>Monitoring</b>	<p>Auditing.</p> <p>Quarterly inspections.</p> <p>Internal and external tank inspections</p>
<b>Reporting</b>	Audit and inspection reports.
<b>Corrective and Preventative Actions</b>	Take any action required to meet the objective outlined above.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	<p>HSE Manager to ensure that all Dangerous Goods are stored appropriately, licensed as required, and audits are taken out as required. If necessary Dangerous Goods Manager shall liaise with local FESA to ensure appropriate emergency management systems, including site and storage area access are in place.</p> <p>Maintenance Superintendent to manage the appropriate collection and treatment of contaminated water and waste.</p> <p>HSE Team to ensure that facilities and infrastructure are operated in accordance with the listed management actions and safety equipment is available at the facility.</p> <p>Environmental Superintendent to manage the appropriate collection and treatment of contaminated water and waste.</p>
<b>Key Documents</b>	<p><i>Chemical and Hydrocarbon Storage Procedure</i> (PR-EN-0015)</p> <p><i>Chemical and Hydrocarbon Spills Procedure</i> (PR-EN-0014)</p> <p>Storage Standards by Chemical Type (see Appendix B).</p>



#### 4.4.2 Minor Permanent and Temporary Storage

<b>Purpose/Objective</b>	Ensure that all chemicals and hydrocarbons are stored in a manner that meets legislative requirements and Australian Standards, reflects industry best practice and minimises the risk to the environment and health.
<b>Facilities Managed</b>	Permanent and temporary facilities with dangerous goods storage not exceeding minor quantities as defined within Australian Standards. For diesel, this is less than 5 kL for storage around buildings that is separated from any buildings by at least 1 m.
<b>Hazards Managed</b>	Chemical and hydrocarbon spills.
<b>Management Actions</b>	<ul style="list-style-type: none"> <li>• Chemicals and hydrocarbons will be stored in a manner consistent with the minor storage requirements of AS 1940-2004, and only in designated areas;</li> <li>• Ensure a current MSDS for chemicals stored is maintained near all storage areas, in a clearly identified file;</li> <li>• Class 3 chemicals and hydrocarbons shall be separated from boundaries, ignition sources, (including cigarettes), hot surfaces (including engines), protected places and accumulations of combustible materials by at least 5 m (required by AS 1940-2004);</li> <li>• Storage areas should be secured from public access and access by unauthorised persons;</li> <li>• Packages shall be kept closed when not in use, drum venting shall be managed as required;</li> <li>• All leaks and spills shall be managed as required by the <i>Chemical and Hydrocarbon Spills Procedure</i>;</li> <li>• In locations where more than 1000 L of combustible liquids (such as diesel) or 100 L of flammable liquids are stored, at least one portable fire extinguisher (suitable for the materials stored at the facility) shall be maintained;</li> <li>• Field storage should utilise bunding capable of storing the greater of 110% of the volume of the largest vessel, or 10% of the total volume;</li> <li>• Bunding shall be inspected following all rainfall events and if necessary during major rainfall events where safety permits;</li> <li>• Water collected at the facility shall be managed according to the relevant section in this management plan. For other chemicals, or where there is the potential for contamination of water, liaise with the Environment Superintendent to determine an appropriate testing and disposal approach;</li> <li>• Liquids shall be kept at least 1 m from any boundary, workshop, dwelling or protected place, body of water, watercourse or environmentally sensitive area;</li> <li>• The ground around the store shall be kept clear of combustible vegetation or refuse for a distance of at</li> </ul>



	<p>least 3 m;</p> <ul style="list-style-type: none"> <li>• All chemicals and hydrocarbons to be stored away from drains and water courses;</li> <li>• The location of packages shall not prevent access by emergency response teams; and</li> <li>• Minor storage tanks shall be inspected on a regular basis to identify any leaks or maintenance requirements;</li> <li>• Storage within dangerous goods storage cabinets shall not exceed the loading capacity of the storage cabinet;</li> <li>• Appropriate segregation shall occur within and between dangerous goods storage cabinets;</li> <li>• Unless decontaminated, empty chemical and hydrocarbons containers shall be treated as full, and stored in an appropriate facility, with appropriate containment;</li> <li>• Category 1 storage tanks shall not be used to store Class 3 goods, including diesel; and</li> <li>• Containers, drums and tanks shall only be used to store the chemicals for which they are labelled.</li> </ul>
<b>Performance Indicators</b>	All Class 3 chemicals (including hydrocarbons) are stored in accordance with the established requirements.
<b>Monitoring</b>	Auditing. Quarterly inspections.
<b>Reporting</b>	Audit and inspection reports.
<b>Corrective and Preventative Actions</b>	Take any action required to meet the objective outlined above.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	<p>HSE Manager to ensure that all Dangerous Goods are stored appropriately, licensed as required, and audits are taken out as required.</p> <p>Maintenance Superintendent to manage the appropriate collection and treatment of contaminated water and waste.</p> <p>HSE Manager to ensure that facilities are operated in accordance with the listed management actions and safety equipment is available at the facility.</p>
<b>Key Documents</b>	<p><i>Chemical and Hydrocarbon Storage Procedure</i> (PR-EN-0015)</p> <p>Storage Standards by Chemical Type (see Appendix B)</p> <p><i>Chemical and Hydrocarbon Spills Procedure</i> (PR-EN-0014)</p>



## 4.5 CHEMICAL AND HYDROCARBON TRANSPORT AND HANDLING

### 4.5.1 Bulk Road Transport

<b>Purpose/Objective</b>	Ensure that bulk hydrocarbons (and chemicals) are transported on site in a manner that reduces the risk of pollution arising from an accident or incident and in accordance with <i>Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007</i> .
<b>Facilities Managed</b>	Tanker trucks
<b>Hazards Managed</b>	Hydrocarbon or chemical spill. Light Vehicle interaction
<b>Management Actions</b>	<ul style="list-style-type: none"> <li>• Bulk transportation of dangerous goods is to comply with the ADGC;</li> <li>• Check that all Transport Contractors are appropriately licensed. Transport Contractors are ultimately responsible for managing requirements under the ADGC; however relevant Facility Managers or designated site personnel shall ensure that contractors accessing site comply with the ADGC and the requirements described in this section;</li> <li>• All Transport Contractors transporting dangerous goods, hazardous materials and waste liquids are to have appropriate spill response and management equipment on board, including appropriate fire extinguishers, three double sided reflector signals that comply with AS 3790 and PPE and safety equipment (where required by the ADGC); During transport, every valve cap, manhole cover or other closure on the tank vehicle must be kept closed and secured;</li> <li>• All vehicle speed limits on and off site are to be obeyed;</li> <li>• Any spills should be managed as per the <i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i> and the <i>Chemical and Hydrocarbon Spills Procedure (PR-EN-0015)</i></li> <li>• Empty portable tanks that are not cleaned and/or gas-free must comply with the same requirements as portable tanks filled with the previous substance;</li> <li>• Loading and unloading of bulk containers shall occur on suitably contained areas, with contained catchment systems draining to an appropriate collection and treatment facility;</li> <li>• The total mass of hydrocarbon or chemical transported should not exceed the maximum allowable axle loading of the tanker;</li> <li>• Prior to loading, the transport unit should be inspected to ensure that there is no damage that could affect its integrity;</li> <li>• Portable tanks must be securely fastened in accordance with the Load Restraint Guide; In the event</li> </ul>





	<p>of vehicle breakdown on site, contact shall be made with the site security and emergency response team as appropriate;</p> <ul style="list-style-type: none"> <li>• Only authorised personnel are to ride in the cabin of a vehicle transporting dangerous goods as prescribed in the ADGC;</li> <li>• A trailer containing dangerous goods must not be detached from a prime mover or combination road vehicle other than at a designated vehicle marshalling area, a transport depot, for the purpose of immediate exchange of trailers between towing vehicles, in an emergency requiring the trailer to be detached for the purposes of safety or in the event of the vehicle becoming disabled on a road or street;</li> <li>• Routes should be pre-planned and selected to minimise the risk of personal injury or harm to the environment or property during the journey, including heavily populated areas, environmentally sensitive areas, congested crossings and river crossings; and</li> <li>• Ensure there is appropriate documentation for the dangerous goods, hazardous materials and waste liquids transported and that documentation is retained for appropriate periods.</li> </ul>
<b>Performance Indicators</b>	Chemicals and hydrocarbons are transported in accordance with all requirements.
<b>Monitoring</b>	<p>Inspection of bulk transport vehicles entering site.</p> <p>Site speed checks.</p> <p>Inspection of loading and unloading areas for evidence of spills</p>
<b>Reporting</b>	NA.
<b>Corrective and Preventative Actions</b>	Request corrective action and re-audit Transport Contractors in the event that the above requirements are not met.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	<p>Supply Manager is to ensure that all Transport Contractors are familiar with the requirements for chemical and hydrocarbon transport.</p> <p>Transport Contractor is to ensure that they comply with FMG's requirements, and provide evidence of licence documentation to the FMG Supply Manager.</p> <p>Facility Manager to ensure that loading and unloading occurs at appropriate areas.</p> <p>Site Manager to ensure that traffic management at the site is appropriate to enable safe movement of trucks.</p> <p>Site Security or Stores Personnel shall obtain copies of documentation when loads enter or leave site.</p>
<b>Key Documents</b>	Site specific traffic management plans



	<p><i>Australian Dangerous Goods Code (7<sup>th</sup> Edition)</i> <i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i> <i>Chemical and Hydrocarbon Spills Procedure (PR-EN-0014)</i></p>
--	---

#### 4.5.2 Packaged Transport

<b>Purpose/Objective</b>	Ensure that packaged chemicals and hydrocarbons are transported on site in a manner that reduces the risk of pollution arising from an accident or incident and in accordance with Dangerous Goods Safety (Road and Rail Transport of Non-explosive) Regulations 2007.
<b>Facilities Managed</b>	Packaged chemical and hydrocarbon transport vehicles.
<b>Hazards Managed</b>	Hydrocarbon or chemical spill.
<b>Management Actions</b>	<ul style="list-style-type: none"> <li>• Bulk transportation of dangerous goods is to comply with the ADGC;</li> <li>• Check that all Transport Contractors are appropriately licensed. Transport Contractors are ultimately responsible for managing requirements under the ADGC; however relevant Facility Managers or designated sit45-e personnel shall ensure that contractors accessing site comply with the ADGC and the requirements described in this section;</li> <li>• All Transport Contractors transporting dangerous goods, hazardous materials and waste liquids are to have appropriate spill response and management equipment on board, including appropriate fire extinguishers, three double sided reflector signals that comply with AS 3790 and PPE and safety equipment (where required by the ADGC), and be trained in its use;</li> <li>• All vehicle speed limits on and off site are to be obeyed;</li> <li>• Any spills should be managed as per the <i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i> and the <i>Chemical and Hydrocarbon Spills Procedure (45-PR-EN-0014)</i>;</li> <li>• Empty portable containers that are not cleaned and/or gas-free must comply with the same requirements as portable containers filled with the previous substance;</li> <li>• Prior to loading, the transport unit should be inspected to ensure that there is no damage that could affect its integrity or that of the packages to be loaded in it;</li> <li>• Packages must be stowed and restrained in the transport unit in accordance with the Load Restraint Guide;</li> <li>• Transport units must be loaded so that incompatible dangerous or other goods are segregated in accordance with the ADGC;</li> <li>• Packages must be restrained by suitable means in the transport unit in a manner that will prevent any</li> </ul>



	<p>movement during transport. Restraints should not be over-tightened to avoid damaging or deforming the packages;</p> <ul style="list-style-type: none"> <li>• Packages and IBCs that are fitted with a vented closure should be stowed and restrained with the closure uppermost;</li> <li>• Dangerous goods and hazardous materials which release flammable, toxic or otherwise hazardous gases shall not be stowed such that no harmful gases released can enter the vehicle cabin in the event of leakage;</li> <li>• Where packages are stowed on a pallet, the pallet must be of sound construction and free of projections;</li> <li>• In the event of vehicle breakdown on site, contact shall be made with the site security and emergency response team as appropriate;</li> <li>• Only authorised personnel are to ride in the cabin of a vehicle transporting dangerous goods, as prescribed in the ADGC;</li> <li>• Routes should be pre-planned and selected to minimise the risk of personal injury or harm to the environment or property during the journey, including heavily populated areas, environmentally sensitive areas, congested crossings and river crossings; and</li> <li>• Ensure there is appropriate documentation for the dangerous goods, hazardous materials and waste liquids transported and that documentation is retained for appropriate periods.</li> </ul>
<b>Performance Indicators</b>	Hydrocarbons and chemicals are transported in accordance with all requirements.
<b>Monitoring</b>	<p>Inspection of packaged hydrocarbons or chemicals prior to transport when leaving site, or on arrival at site.</p> <p>Site speed checks.</p>
<b>Reporting</b>	NA.
<b>Corrective and Preventative Actions</b>	Request corrective action and re-audit Transport Contractors in the event that the above requirements are not met.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	<p>Supply Manager is to ensure that all Transport Contractors are familiar with the requirements for chemical and hydrocarbon transport.</p> <p>Transport Contractor is to ensure that they comply with FMG's requirements, and provide evidence of licence documentation to the FMG Supply Manager.</p> <p>Facility Manager to ensure that loading and unloading occurs at appropriate areas.</p> <p>Site Manager to ensure that traffic management at the site is appropriate to enable safe movement of trucks.</p>



	Site Security or Stores Personnel shall obtain copies of documentation when loads enter or leave site.
<b>Key Documents</b>	<i>Australian Dangerous Goods Code (7<sup>th</sup> Edition)</i> <i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i> <i>Chemical and Hydrocarbon Spills Procedure (PR-EN-0014)</i>

#### 4.5.3 Rail Transport

<b>Purpose/Objective</b>	Ensure that bulk hydrocarbons (and chemicals) are transported on site in a manner that reduces the risk of pollution arising from an accident or incident and in accordance with Dangerous Goods Safety (Road and Rail Transport of Non-explosive) Regulations 2007.
<b>Facilities Managed</b>	Rail.
<b>Hazards Managed</b>	Hydrocarbon or chemical spill.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Bulk transportation of dangerous goods is to comply with the ADGC;</li><li>• All Transport Contractors are to be appropriately licensed;</li><li>• All Transport Contractors are to have appropriate spill response and management equipment, including appropriate fire extinguishers, three double sided reflector signals that comply with AS 3790 and PPE and safety equipment (as required in the ADGC);</li><li>• Dangerous goods must not be transported in a tank unless the compliance plate fitted to the indicates that the tank is suitable for the properties of the substance to be transported and has been appropriately maintained and tested;</li><li>• During transport, every valve, cap manhole cover or other closure on the tank vehicle must be kept closed and secured;</li><li>• All rail speed limits are to be obeyed;</li><li>• Any spills should be managed as per the <i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i> and the <i>Chemical and Hydrocarbon Spills Procedure (D-SA-PP-1205-1132)</i>;</li><li>• Empty portable tanks that are not cleaned and/or gas-free must comply with the same requirements as portable tanks filled with the previous substance;</li><li>• The total mass of hydrocarbon or chemical transported should not exceed the maximum allowable loading of the rail tanker;</li><li>• Prior to loading, the transport unit should be inspected to ensure that there is no damage that could affect its integrity;</li><li>• Portable tanks must be securely fastened using twistlocks or other equipment for securing a container</li></ul>



	<p>on a vehicle set out in AS/NZS 3711.10; and</p> <ul style="list-style-type: none"> <li>• Loading and unloading of rail tankers shall occur on suitably contained areas, with contained catchment systems draining to an appropriate collection and treatment facility.</li> </ul>
<b>Performance Indicators</b>	Hydrocarbons and chemicals are transported in accordance with all requirements.
<b>Monitoring</b>	<p>Inspection prior to transporting of bulk hydrocarbons or chemicals.</p> <p>Accident and Incident reports relevant to rail spills</p>
<b>Reporting</b>	NA.
<b>Corrective and Preventative Actions</b>	Update protocol as required.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	Rail Manager to ensure that all locomotive drivers transporting bulk chemicals or hydrocarbons are appropriately trained in management of Dangerous Goods.
<b>Key Documents</b>	<p><i>Australian Dangerous Goods Code (7<sup>th</sup> Edition).</i></p> <p><i>Incident-Event Reporting Procedure (100-SA-PR-0011)</i></p> <p><i>Chemical and Hydrocarbon Spills Procedure (45-PR-EN-0014)</i></p>

#### 4.5.4 Bulk Handling

<b>Purpose/Objective</b>	Ensure that bulk chemicals and hydrocarbons are handled on site in a manner that reduces the risk of pollution arising from an accident or incident and in accordance with Dangerous Goods Safety (Road and Rail Transport of Non-explosive) Regulations 2007.
<b>Facilities Managed</b>	<p>Tank fuelling facilities.</p> <p>Tank unloading facilities.</p> <p>Waste oil storage tanks</p>
<b>Hazards Managed</b>	Hydrocarbon or chemical spill.
<b>Management Actions</b>	<ul style="list-style-type: none"> <li>• Handling operations shall be undertaken in accordance with the facility's developed handling procedures;</li> <li>• Loading and unloading of bulk containers shall occur on suitably contained areas, with contained catchment systems draining to an appropriate collection and treatment facility.</li> <li>• Facility bund drainage valves shall be kept closed except when supervised drainage operations are occurring;</li> <li>• Floors should be cleaned using non-flammable liquids, and using only quick-break detergents compatible with</li> </ul>



	<p>oily water separators;</p> <ul style="list-style-type: none"> <li>• Tank vehicles should be driven forward when entering and exiting the filling/unloading area;</li> <li>• A tanker shall not stand or park in or under a filling facility other than when filling or draining;</li> <li>• When a flammable liquid spill occurs at a bulk transfer facility, no vehicle engines shall be started until the spill has been cleaned up to the satisfaction of the emergency response team leader, except in the event of an emergency;</li> <li>• During transfer operations: <ul style="list-style-type: none"> <li>– Vehicles shall be prevented from driving over the hose assembly or striking its connections;</li> <li>– Filling and emptying flow-rates for which the tank vents were designed shall not be exceeded;</li> <li>– The engine of the vehicle should not be run, unless it is necessary for the operation of a pump or compressor driven by the vehicle's engine;</li> <li>– The safe filling level for tanks and tankers (including allowance for thermal expansion) shall not be exceeded;</li> <li>– A person must remain in proximity of the vehicle during the transfer process, and oversee the transfer process;</li> <li>– The cabin of the vehicle shall not be occupied; and</li> <li>– There should be sufficient light to read valves, fitting, gauges and hose connections to undertake the transfer operation safely; and</li> </ul> </li> <li>• Transfer of Class 3 goods must not be directly from a vehicle into drums or smaller packaging, except at facilities designated for the purpose.</li> </ul>
<b>Performance Indicators</b>	Hydrocarbons and chemicals are handled in accordance with all requirements.
<b>Monitoring</b>	Annual Internal auditing.
<b>Reporting</b>	Internal reporting.
<b>Corrective and Preventative Actions</b>	Update procedures to ensure compliance.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	<p>Facility Manager to ensure appropriate supervision during bulk handling operations.</p> <p>Emergency Response Team Leader shall inspect areas affected by a spill, following clean up, to approve normal use of the area.</p>
<b>Key Documents</b>	<p><i>Chemical and Hydrocarbon Spills Procedure (PR-EN-0015)</i></p> <p><i>Australian Dangerous Goods Code (7<sup>th</sup> Edition)</i></p>



	AS 1940-2004
--	--------------

#### 4.5.5 Minor Quantities Handling

<b>Purpose/Objective</b>	Ensure that minor quantities chemicals and hydrocarbons are handled on site in a manner that reduces the risk of pollution arising from an accident or incident and in accordance with Dangerous Goods Safety (Road and Rail Transport of Non-explosive) Regulations 2007 and AS 1940-2004.
<b>Facilities Managed</b>	Fuelling facilities. Package storage handling facilities. Waste oil storage tanks.
<b>Hazards Managed</b>	Spillage during transport or handling.
<b>Actions</b>	<ul style="list-style-type: none"><li>• Packages should only be opened, filled or decanted where there is sufficient ventilation to ensure a safe working environment;</li><li>• No smoking within 3 m of any point within 3 m of any point where flammable liquid might be exposed;</li><li>• Vehicles shall be turned off prior to fuelling;</li><li>• Floors should be cleaned using non-flammable liquids, and using only quick-break detergents;</li><li>• Handling of minor quantities of hydrocarbons or chemicals should take place at a bunded, impermeable area or within spill trays;</li><li>• Transfer of Class 3 goods must not be directly from a vehicle into drums or smaller packaging, except at facilities designated for the purpose; and</li><li>• All minor quantities of dangerous goods, hazardous materials or waste liquids shall be stored on appropriately contained areas, including during temporary storage while loading.</li></ul>
<b>Performance Indicators</b>	Hydrocarbons and chemicals are handled in accordance with all requirements.
<b>Monitoring</b>	Annual internal auditing.
<b>Reporting</b>	Internal reporting.
<b>Corrective and Preventative Actions</b>	Update procedures to ensure compliance.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	Personnel to handle materials in accordance with the management plan and the MSDS. Facility Managers to ensure that chemical handling practices within each facility is appropriate.
<b>Key Documents</b>	Specific Handling Procedures



	<p><i>Australian Dangerous Goods Code (7<sup>th</sup> Edition)</i> AS 1940-2004 <i>Chemical and Hydrocarbon Spills Procedure (45-PR-EN-0014)</i></p>
--	--





## 4.6 USE AND DISPOSAL

### 4.6.1 Chemical and Hydrocarbon Use and Disposal

<b>Purpose/Objective</b>	Ensure that chemicals and hydrocarbons are used and/or disposed of in a manner that does not cause environmental impact.
<b>Facilities Managed</b>	All facilities
<b>Hazards Managed</b>	Environmental impact from incorrect usage or disposal.
<b>Management Actions</b>	<ul style="list-style-type: none"> <li>• All chemicals and hydrocarbons shall be used only for their intended purpose, with the correct application rate as indicated on the package and correct application equipment and PPE. They shall never be mixed without confirming compatibility within the ADGC;</li> <li>• All specific environmental controls and disposal conditions identified within the MSDS shall be complied with;</li> <li>• Hydrocarbons, chemicals and liquid wastes shall never be poured into a stormwater drain or enter waterways;</li> <li>• Water containing hydrocarbons from hardstands shall be treated to a concentration of &lt;5 mg/L prior to discharge to the environment;</li> <li>• All chemicals applied direct to land shall be approved by the Environment Superintendent as part of the procurement process, and shall not generate a contaminated site when applied as approved;</li> <li>• Appropriate spill equipment shall be located in close proximity to where chemicals and hydrocarbons are being used;</li> <li>• Hazardous wastes shall be segregated from the general waste stream, with wastes (including empty packages, rags, etc) stored in a manner fit for storing full packages. Hazardous wastes shall be managed according to the following:             <ul style="list-style-type: none"> <li>– Solid, combustible wastes (e.g. rags soaked with flammable liquid) shall be disposed of into an oily rag or hydrocarbon filter bin.</li> <li>– Waste flammable liquids (e.g. used solvents) may be collected in a clean metal drum for a short time, with the screw cap kept tightly closed at all times, in a ventilated undercover area and managed for venting as required.</li> <li>– Hazardous and non-hazardous wastes shall be appropriately segregated. Incompatible wastes shall never be mixed.</li> <li>– Waste drum storage areas shall be contained and routinely inspected. Empty drums shall be treated as a hazardous waste and transported off site in accordance with Controlled Waste requirements;</li> <li>– Hazardous wastes shall not be allowed to accumulate</li> </ul> </li> </ul>



	<p>and should be removed offsite by an appropriately licensed controlled waste transporter; and</p> <ul style="list-style-type: none"> <li>– Waste hydrocarbons (including oily water) may be stored within an appropriate storage facility (tank, drum or IBC) that meets AS 1940-2004 requirements, including bunding;</li> <li>• Hydrocarbons and chemicals which pose a hazard to personal health, safety or the environment shall only be used by staff trained in their correct use, handling and disposal;</li> <li>• Appropriate documentation recording waste volumes leaving site and intended destinations, treatment or disposal points shall be maintained; and</li> <li>• Liquid waste volumes shall be inspected as part of the site auditing procedure.</li> </ul>
<b>Performance Indicators</b>	<p>Compliance with the requirements of environmental protection regulation discharge requirements, procedures and MSDS.</p> <p>No pollution to the environment from the use and disposal of chemicals and hydrocarbons.</p>
<b>Monitoring</b>	<p>Incident reporting.</p> <p>Site audits and inspections</p>
<b>Reporting</b>	<p>Incident investigations.</p> <p>Reporting to government agencies as required.</p>
<b>Corrective and Preventative Actions</b>	<p>Implementation of corrective and preventative actions identified as necessary through accident and incident investigations.</p> <p>Additional training in the use, handling and disposal of chemicals and hydrocarbons.</p>
<b>Term</b>	<p>Life of the Project.</p>
<b>Responsibility</b>	<p>Environmental Superintendent to manage compliance with the management actions.</p> <p>Facility Managers to maintain spill response equipment.</p>
<b>Key Documents</b>	<p>Product MSDS</p> <p>Packaging</p> <p>AS 1940-2004</p>



## 4.7 OILY WATER

### 4.7.1 Oily Water Management

<b>Purpose/Objective</b>	To ensure that water generated from hardstand areas likely to contain fugitive oily waste does not impact upon the environment.
<b>Facilities Managed</b>	Facilities that may potentially contain significant quantities of hydrocarbons on the floor or in generated runoff, including: <ul style="list-style-type: none"><li>• Workshops</li><li>• Hydrocarbon storage facilities</li><li>• Loading and unloading areas</li><li>• Fuel facilities</li><li>• Lube facilities</li><li>• Hydrocarbon handling facilities</li><li>• Washbays</li></ul>
<b>Hazards Managed</b>	Impacts arising from inappropriate or incorrect usage, disposal or spills.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Water generated from facilities potentially containing significant concentrations of hydrocarbons shall be treated using an appropriate oily water separator to remove the hydrocarbon concentration to &lt;5 mg/L prior to reuse or disposal, unless contaminated with materials incompatible with separation;</li><li>• Waste oil should be stored appropriately before removal offsite for recycling, and sediments allowed to dry and removed to an approved bioremediation facility for treatment. Alternatively, the water can be collected in a vacuum tanker and taken offsite for treatment;</li><li>• Reuse of oily water shall be in accordance with conditions of the site environmental licence. Periodic testing of treated oily water shall occur to confirm &lt; 5 mg/l oil and absence of potentially hazardous chemicals;</li><li>• Prior to treatment by an oily water separator, the bulk of suspended solids shall be removed from the water via a sediment trap or sedimentation basin;</li><li>• Oily water separators and sediment separation devices should be operated, cleaned and maintained as recommended in the Operations and Maintenance Manual for the equipment, copies of these manuals shall be retained in appropriate workshops adjacent to the device;</li><li>• Separated waste oil and waste oily water (where unsuitable for reuse or discharge) should be removed offsite by an appropriately licensed controlled waste contractor for disposal; and</li><li>• Sediment separation systems should be emptied when sediment accumulates to the design level. Sediment should be treated at a managed hydrocarbon bioremediation facility .</li></ul>



<b>Performance Indicators</b>	<p>Conformance with the discharge requirements for the site.</p> <p>No impacts on the ecology, soil, surface water or groundwater as a result of hydrocarbon content of the discharge water.</p> <p>Compliance with the Environmental Protection (Controlled Waste) Regulations and tracking system.</p>
<b>Monitoring</b>	<p>Discharge water quality monitoring.</p> <p>Quarterly inspection of oily water separators</p>
<b>Reporting</b>	<p>Internal reporting.</p>
<b>Corrective and Preventative Actions</b>	<p>Upgrade treatment equipment as required.</p> <p>Update procedures to reduce the hydrocarbon loading on the hardstand areas.</p> <p>.</p>
<b>Term</b>	<p>Life of the Project.</p>
<b>Responsibility</b>	<p>Environmental Superintendent to advise staff of oily water generated at the site, including maintenance of sediment traps, removal of collected oil waste, remediation facility operation and quarterly inspection of oily water separators.</p> <p>Maintenance Department shall ensure oily water separators are appropriately maintained</p>
<b>Key Documents</b>	<p>Facility Specific Operation and Maintenance Manuals</p> <p>Oily water separator maintenance requirements</p>



## 4.8 GREENHOUSE GAS

### 4.8.1 Greenhouse Gas Emissions Management

<b>Purpose/Objective</b>	To manage the emission of greenhouse gases generated by the Project and generate information to support compliance with the Energy Efficiency Opportunities Act 2006 and the National Greenhouse and Energy Reporting System.
<b>Facilities Managed</b>	Fuel storage, handling and transfer facilities.
<b>Hazards Managed</b>	Greenhouse gas emissions.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Undertake monitoring sufficient to support the required greenhouse reporting (see Appendix C), including the use of a Fuel Management System;</li><li>• Undertake emissions reporting as required by the appropriate regulations (see Appendix C);</li><li>• Undertake improvements to process and energy usage as part of Energy Efficiency Opportunity reporting;</li><li>• Implement the Greenhouse Gas Management Plan for the Project; and</li><li>• Remove or reduce direct emissions or energy consumption resulting in greenhouse gas emissions where possible.</li></ul>
<b>Performance Indicators</b>	Greenhouse Gas Management Plan developed and implemented. All required greenhouse gas reporting is undertaken and completed.
<b>Monitoring</b>	Greenhouse Gas Emissions relative to productivity over time. Ensure that all necessary greenhouse reporting is completed on time.
<b>Reporting</b>	Greenhouse Gas Emission reporting. Internal reports.
<b>Corrective and Preventative Actions</b>	Provide additional monitoring equipment and update monitoring and reporting procedures to ensure that all necessary information is recorded.
<b>Term</b>	Life of the Project.
<b>Responsibility</b>	Manager Governance and Sustainability to oversee greenhouse gas management and reporting. HSE Manager to manage the Fuel Management System and monitor hydrocarbon use.



<b>Key Documents</b>	<i>Greenhouse Gas Management Plan (204-00-EN-RP-0002)</i> ChemAlert Banlaw <i>Energy Efficiency Opportunities Assessment Handbook</i> <i>National Greenhouse and Energy Reporting Guidelines</i>
----------------------	--



## 4.9 TRAINING

### 4.9.1 Incident Response Training

<b>Purpose/Objective</b>	Ensure all relevant personnel have the necessary training to respond to chemical and hydrocarbon incidents, including spill response and reporting, and to prevent such incidents occurring.
<b>Hazards Managed</b>	Hydrocarbon and chemical spills.
<b>Management Actions</b>	<ul style="list-style-type: none"><li>• Include an environmental component in site induction (all site-based personnel), including chemical and hydrocarbon management and incident prevention;</li><li>• Provide specialist training to those likely to be involved in spill management. This training should include detailed spill response procedures, and should be administered to the following staff as a minimum:<ul style="list-style-type: none"><li>– Relevant Environmental staff;</li><li>– Relevant Emergency Response Team members;</li><li>– Rail Operators involved in transport of diesel</li><li>– Relevant Camp operators;</li><li>– Relevant Incident Management Team members;</li><li>and</li><li>– .</li></ul></li><li>• Conduct training exercises in spill prevention and control.</li></ul>
<b>Performance Indicators</b>	100% Percent of personnel who have received environmental induction Number of personnel who have received specialist training in spill management in each work area (target number of people trained will vary by site).
<b>Monitoring</b>	Training records on site.
<b>Reporting</b>	Training matrix and VoC.
<b>Corrective and Preventative Actions</b>	Ensure that all personnel are inducted. Retrain depending upon outcomes of training exercises, changes in procedures or based upon recommendations from incident reports. Maintain and regularly update training materials.



<b>Term</b>	Life of the project.
<b>Responsibility</b>	HSE Manager to update the site inductions to incorporate chemical and hydrocarbon management. Emergency Response Superintendent to ensure that there are sufficient staff with spill response training at site to enable effective response to spills, and coordinate training exercises.
<b>Key Documents</b>	Spill Kit Training Presentation <i>Chemical and Hydrocarbon Spills Procedure (45-PR-EN-0014)</i>





## **5. INCIDENT DECLARATION AND RESPONSE TEAM ACTIVATION**

Chemical or hydrocarbon related incidents will typically be reported by Fortescue personnel or contactors using BMS. Any significant incidents should be reported to the Facility Supervisor, Emergency Response Superintendent and the Environment Superintendent as soon as reasonably practicable.

Many of the events that result in a spill of chemicals or hydrocarbons will coincide with an emergency or crisis. In these events, managing the emergency or crisis takes precedent over the environmental response. Once approval is provided by the Incident Management Team Leader, response to the environmental impact may commence.

Incident response should be undertaken with reference to the Spill Response Decision Tree (Appendix A).



## 6. ENVIRONMENTALLY SENSITIVE AREAS

A number of Environmentally Sensitive Areas have been identified in the area of Fortescue's operations. These areas require special protection from chemicals and hydrocarbons. A breakdown of the specific controls protecting these areas is presented in Table 3.

**Table 4: Environmentally Sensitive Areas**

Site	ESA	Controls
Port	Port Hedland harbour and surrounds	Trained personnel Emergency Response Team Spill kits and trailers Adherence to this plan PHPA Emergency Plan
Chichester Operations	Fortescue Marshes	Operations are sufficiently distant from the Marshes Adherence to this plan
Solomon Exploration	Millstream Water Reserve	Adherence to this plan



## 7. AUDITS

Auditing of Fortescue's performance against its environmental compliance obligations is achieved through the conduct of regular internal audits.

Fortescue will conduct compliance audits at least annually. Audit reports will describe the status of compliance with environmental obligations at the time of the audit and identify areas of non-conformance and non-compliance and assign corrective actions to remedy any non-conformance and non-compliance issues.



## **8. REVIEW**

It is important that plans and procedures are frequently reviewed and revised as Fortescue's operations change and opportunities for improved management practices are identified.

This Management Plan will be reviewed at least every five years, or when significant additional information comes to hand. The review will be based on achieving approval requirements, Fortescue commitments, and progress in implementing the management plan and will incorporate any new investigations, information, techniques and advice from experts and regulatory authorities.

Upon review, the document revision status will be updated in accordance with Fortescue's document control procedures.



## 9. REFERENCES

- National Occupational Health and Safety Commission (April 2003) *Code of Practice for the Preparation of Material Safety Data Sheets, 2<sup>nd</sup> Edition. NOHSC:2011 (2003)*
- National Transport Commission (NTC) (2007). Australian Dangerous Goods Code. 7<sup>th</sup> Edition.
- Standards Australia (1997) *AS 4452-1997: The storage and handling of toxic substances.*
- Standards Australia (1998) *AS 2057-1998. The storage and handling of agricultural and veterinary chemicals.*
- Standards Australia (2000) *AS 4681-2000: The storage and handling of Class 9 (miscellaneous) dangerous goods and articles.*
- Standards Australia (2001) *AS 2927-2001: The storage and handling of liquefied chlorine gas.*
- Standards Australia (2004) *AS 1940-2004: The storage and handling of flammable and combustible liquids.*
- Standards Australia (2004) *AS 4332-2004: The storage and handling of gases in cylinders.*
- Standards Australia (2007) *AS 3833-2007: The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers*
- Standards Australia (2008) *AS 3780-2008: The storage and handling of corrosive substances.*

# **Appendix A**

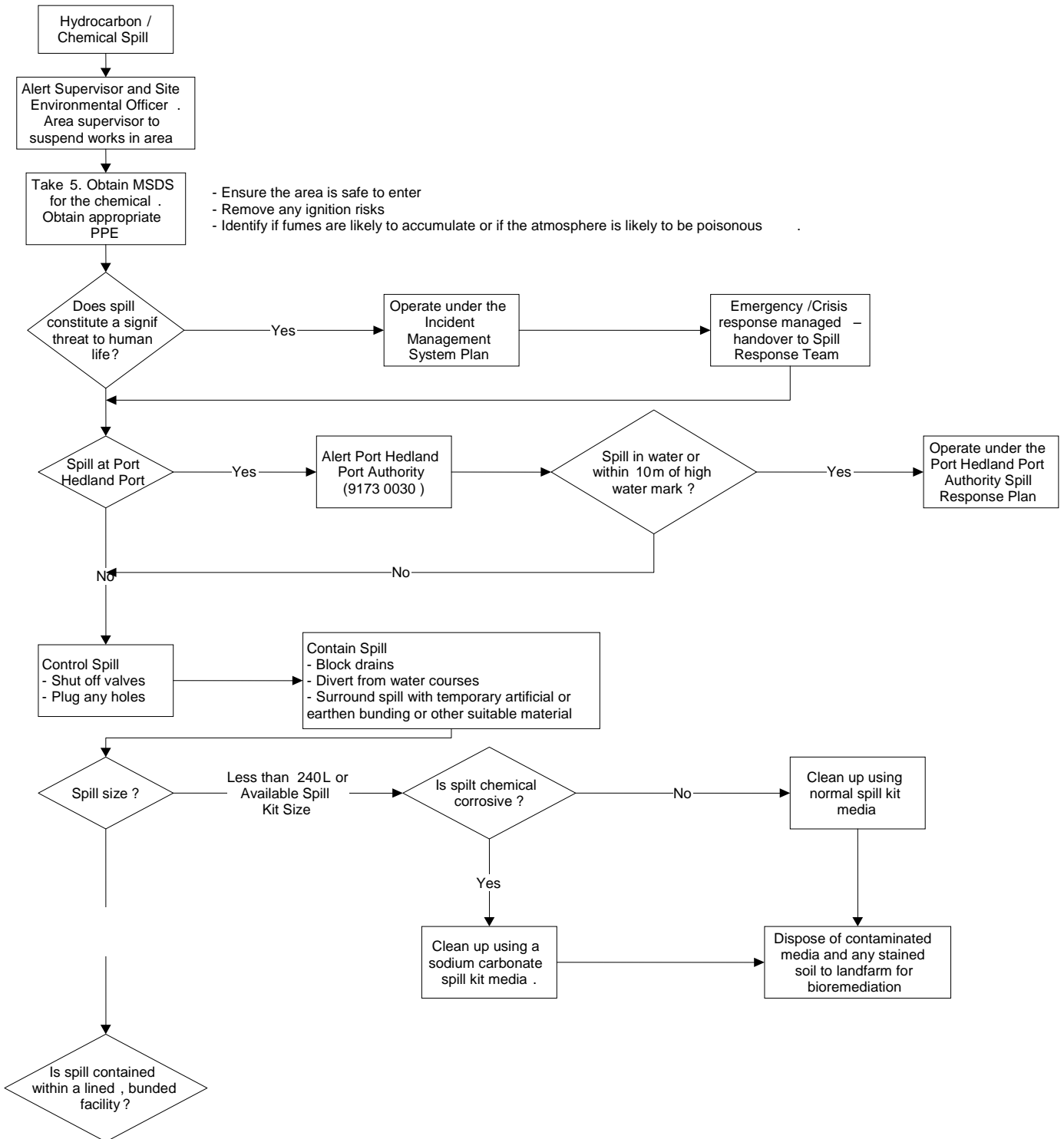
**Spill Response**

**Spill Response Decision Tree**

**Spill Response Checklist**

**Spill Kits Requirements**

## Spill Response Decision Tree







# Spill Response Checklist

<b>1</b>	Supervisor, Emergency Response Superintendent and Environment Superintendent alerted.	
<b>2</b>	Spill material identified MSDS obtained and reviewed Appropriate PPE obtained.	
<b>3</b>	Hazard of spill assessed Incident Response commenced if required	
<b>4</b>	Spill contained from further spreading	
<b>5</b>	Spill absorbed or recovered	
<b>6</b>	Site cleaned up to remove any remaining material	
<b>7</b>	Site investigation and sampling undertaken (if spill occurs outside of sealed bund facility)	
<b>8</b>	Remediation works undertaken and completed	
<b>9</b>	Spill recorded in Spill Register	
<b>10</b>	Spill register is updated	

# Spill Kit Requirements

## HYDROCARBON AND OIL / NON-CORROSIVE SPILL KIT

Each oil and hydrocarbon/non-corrosive chemical spill kit should contain the following materials as a minimum:

- Instructions on use;
- Sufficient booms to prevent runoff entering drains or discharging to creeks;
- PPE including PVC gloves and safety goggles;
- Absorbent media (appropriate type for likely spills);
- Absorbent pillows (for drains, sumps, etc.);
- Pads;
- Broom;
- Square-headed shovel; and
- Disposal bags.

## CORROSIVE MATERIAL SPILL KIT

Each oil and hydrocarbon spill kit should contain the following materials as a minimum:

- Instructions on use;
- Sufficient booms to prevent runoff entering drains or discharging to creeks;
- PPE including PVC gloves and safety goggles;
- Sodium hydrogen carbonate;
- Absorbent media;
- Absorbent pillows (for drains, sumps, etc.);
- Pads;
- Broom;
- Square-headed shovel; and
- Disposal bags.

## **SPILL TRAILERS**

Each spill trailer should contain the following materials as a minimum:

- Instructions on use;
- Witches hats/warning signage;
- Bunding material;
- Skimmers;
- PPE, including PVC gloves, safety goggles, PVC waders, coveralls and safety showers;
- First aid kit;
- Basic tool kit;
- Broom;
- Square-headed shovel;
- Absorbent material;
- Absorbent pillows; and
- Absorbent pads.