2.3.1 - CARDIFF SAFETY PROCEDURES

2.3.1.10 - ACCIDENT PREVENTION PLAN (APP)

Version 2.0

Contents

1.0 Introduction

Castle Waste Services Ltd operate a Waste Treatment and Transfer Facility under Environmental Permit number LP3439HM.

The site accepts a range of wastes including waste acids, waste alkalis, wastes with oxidising properties, and non-hazardous materials.

The wastes are either processed at the site through physico-chemical processes, or they are transferred to third party waste treatment facilities.

This document serves to provide an overview of the hazards that the site presents, the pathways, and receptors that could be harmed by the hazards and the controls that are in place the prevent harm

2.0 Scope

This document applies to the acceptance, storage, treatment, and transfer of wastes at the Castle Waste Services Ltd Cardiff site. Emergency Management Arrangements are not within the scope of this document, they are specified within document *2.3.1.1 - On Site Emergency Plan.*

3.0 References

1.1.6 ISO 45001 Health and Safety Manual
2.3.1.1 - On Site Emergency Plan.
FMEA0017 – Major Accident Development Resulting from Fire
FMEA0018 – Major Accident Development Resulting from Leaks and Spills
FMEA0019 – Major Accident Development Resulting from Unplanned/Runaway Reaction
FMEA0027 – Major Accident Development Resulting from Extreme Weather
M3617-06-006 - Pressure relief calculations

4.0 Site overview and location

4.1 Site location

Castle Waste Services Ltd operate a waste treatment and transfer facility under the terms of Environmental Permit LP3439HM. The site is located within the Cardiff dock

complex and located adjacent to Roath dock. The Cardiff docks complex is occupied by a wide selection of commercial and industrial businesses including other waste management operations such as scrap metal processors, and an energy from waste incinerator and construction and demolition contractors. Adjacent land is also used to store wastes prior to export. There is a large storage terminal operated by Valero which is approximately 125m from the boundary of the permitted site.

The Table 1.1 below shows the receptors considered to be sensitive to dust located within an approximate 1km radius of the site. Figure 1.1 provides a map showing the location of the receptors.

The prevailing wind direction in Cardiff is from the west (WSW). Figure 1.2 is a wind rose for the Cardiff area

Table 1: Sensitive receptors within the vicinity of the site

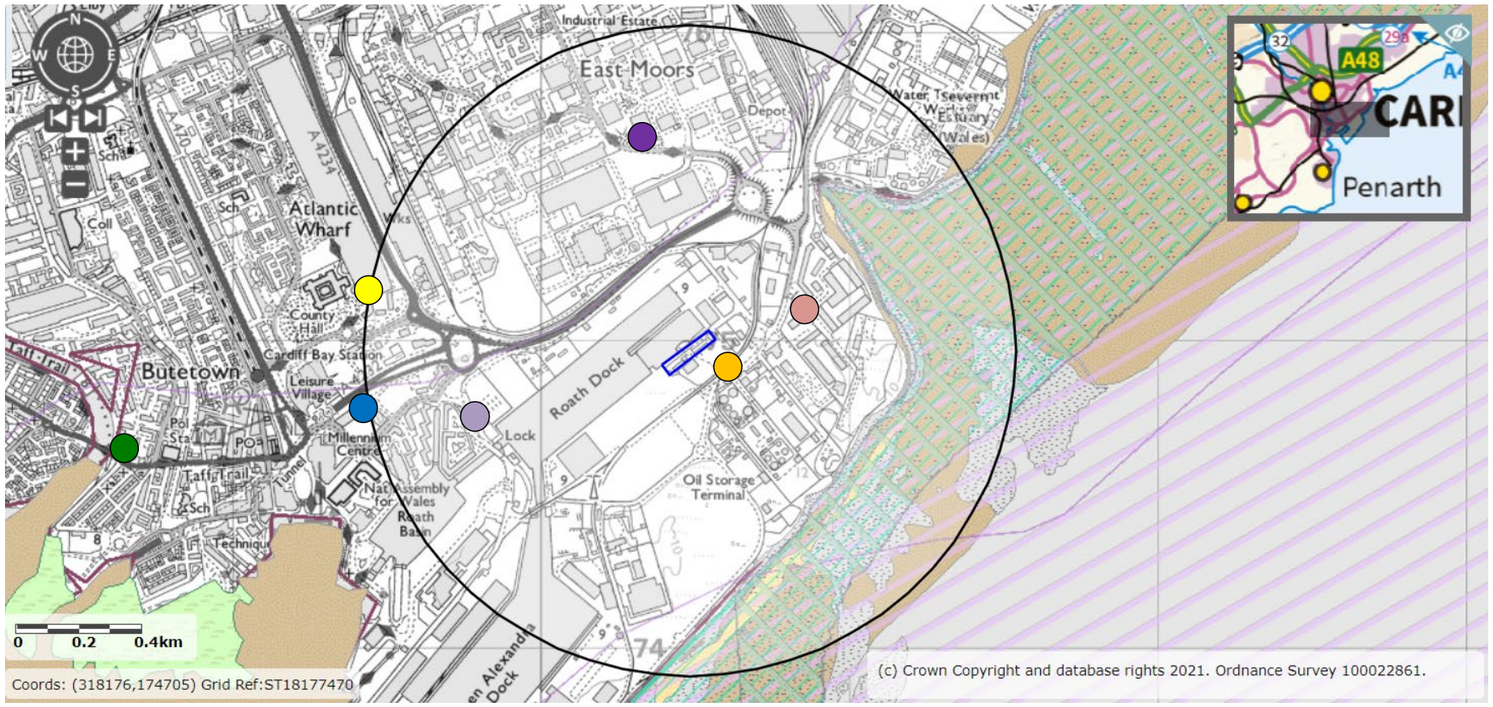
Description	Direction	Approximate distance
Environmental Receptors		
Roath Dock	N	10m
Severn Estuary (RAMSAR)	E and S	550m
Severn Estuary SSSI	E and S	550m
Residential, commercial and recreational receptors		
Cardiff bay area (recreation)	WSW	1000m
Valero oil storage terminal	SSE	125m
Residential care home	W	>1000m
Atlantic wharf (residential and recreation)	W	1000m
Various commercial and industrial units	N	500m
Various commercial and industrial units	E	150m

Environmental receptors have been selected either due to their proximity to the site or their designation. The Defra Magic Map service has been utilised to determine designations and to generate the base map shown in Figure 1.1.

Roath dock is adjacent to the site whilst the Sever Estuary is a designated RAMSAR and Site of Special Scientific Interest, it is also designated an important bird area and a habitat for White Beaked Dolphins.

Other receptors identified are considered to be sensitive as they may be recreational areas such as the Cardiff Bay and Atlantic Wharf areas, may be residential areas, or may be commercial properties that could be sensitive to dust. A residential care home has been identified which is located beyond the 1km radius.

Figure 1.1 – Location of sensitive receptors



Legend

Ramsar Sites (Wales)
Ramsar Sites (Wales)

SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)

Sites of Special Scientific Interest (Wales)
Sites of Special Scientific Interest (Wales)

Special Areas of Conservation (Wales)
Special Areas of Conservation (Wales)

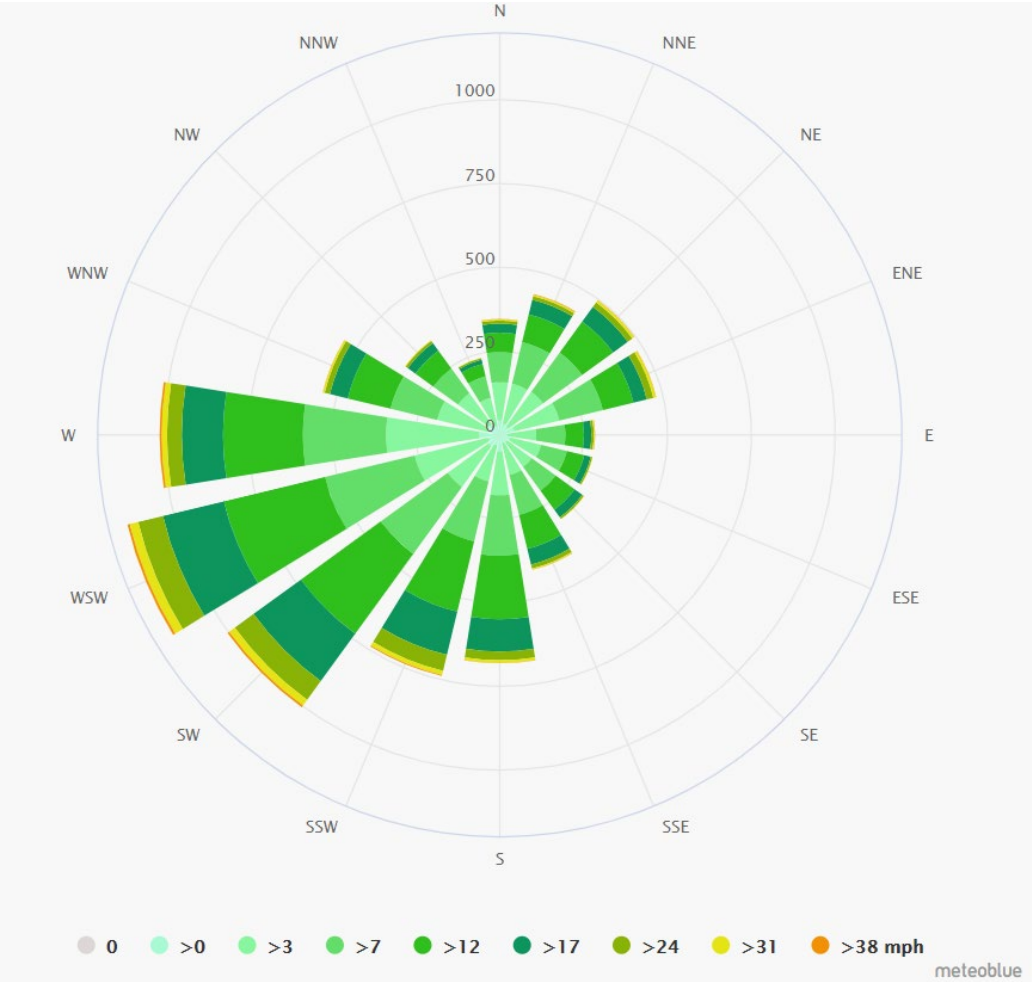
Special Protection Areas (Wales)
Special Protection Areas (Wales)

Marine Designations
Statutory
Marine Nature Reserves (Wales)

Habitats and Species
Habitats
Coastal
Saltmarsh (Wales)
Marine
Intertidal Substrate (Wales)
Mud
Mud/Shingle
Rock
Rock/Shingle
Sand
Sand/Shingle
Shingle

Cardiff Bay Area
Valero Terminal
Residential care home
Atlantic wharf
Various small retail and industrial units
Various small retail and industrial units
Closest residential receptor

Figure 1.2 – Windrose for Cardiff



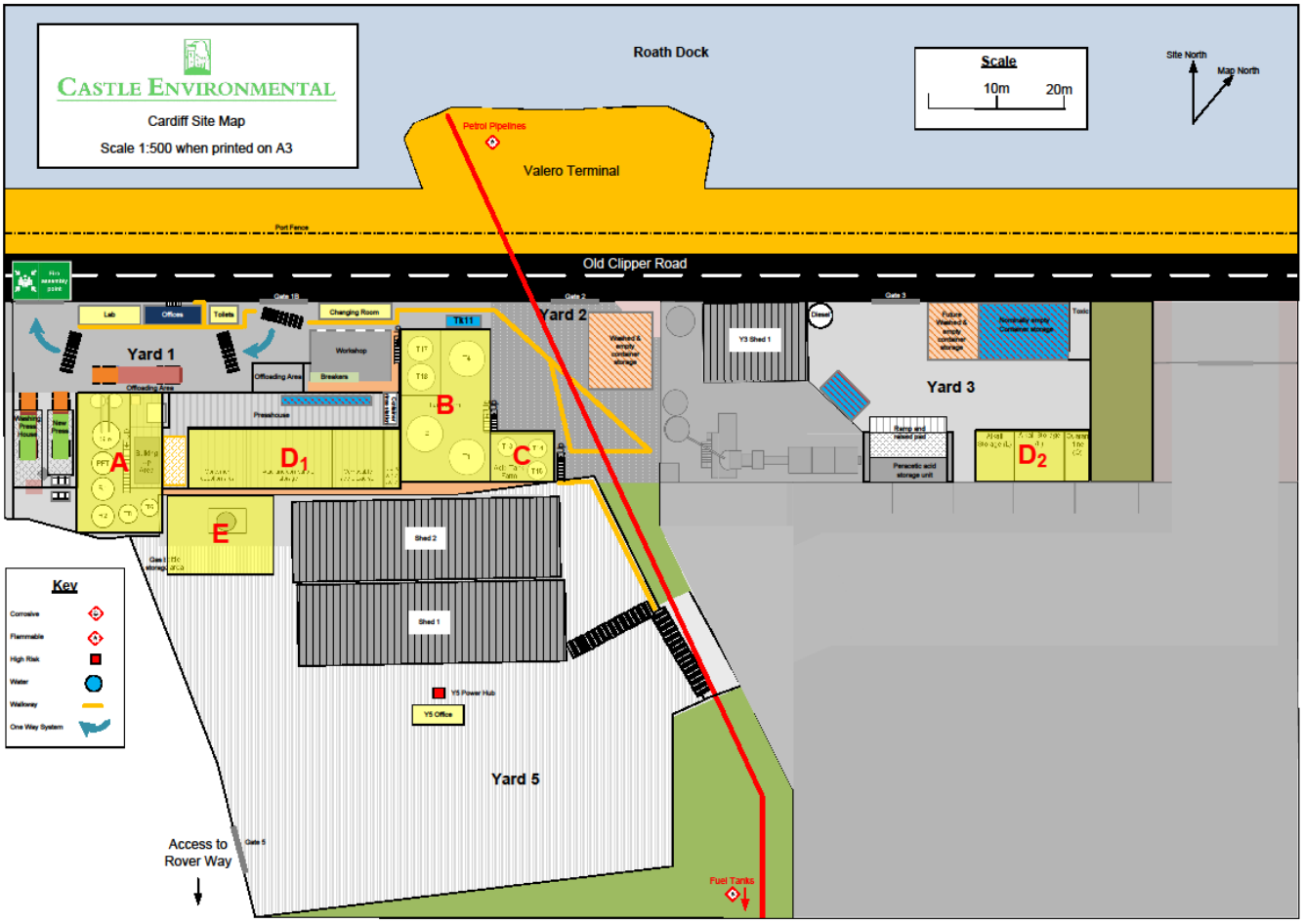
4.2 Site Layout

It is considered that waste treatment activities, bulk storage of waste and handling of containerised waste present the greatest degree of risk. The hazards associated with the construction business are considered to be less significant when considering incidents that could cause significant environmental harm. Figure 2 below identifies main processing areas and flammable and combustible material locations. As per the below Table.

Table 2: Overview of processes and main hazards.

Figure 1 reference	Process / Activity	Type of activity	Main hazardous consequence
A	Hazardous and Non-Hazardous Waste Treatment Process	In-vessel Physico-chemical treatment of inorganic, non-flammable wastes present as aqueous liquids, sludges, solids, and powders. Treatment methodology is acid / alkali neutralisation, precipitation, and pH adjustment. Containerised wastes can be added directly to the process via bulking from press house	Adverse chemical reaction Loss of containment
B	Storage of Bulk Acids	Storage of aqueous waste acids in 3 x HDPE storage vessels. Filling from bulk liquid tankers only. Acids pumped from storage tanks to reactors in Area A	Adverse chemical reaction Loss of containment
C	Storage of treated effluent and weak alkali liquids	Storage of treated effluent prior to discharge to sewer. Storage of weak alkali prior to treatment in Area A	Loss of containment
D	Containerised waste storage area	Storage of wastes in IBCs, drums or similar. Stored in accordance with S/S procedures. Wastes include; corrosives, toxics, oxidisers and non-hazardous.	Loss of containment Adverse chemical reaction
E	Storage of liquified carbon dioxide	Delivery and storage of bulk liquified carbon dioxide	Loss of containment due to tank failure

Figure 2: Annotated site plan – Processing locations and other



It is clear from Table 2 that the main hazards at the site can be considered to fall into the following categories:

- Adverse Chemical Reaction,
- Loss of containment,

The evaluation of these hazards and identification of the relevant risk factors for each of those hazards are discussed in section 5.0 below. The necessary controls are then detailed in section 6.0

5.0 Hazard evaluation and risk factors

The hazards presented by a process or operation are assessed throughout its lifespan. The degree of sophistication adopted during the risk assessment is dependent upon the nature of the risk and the complexity of the operation. Types of assessment may include:

HAZOP studies,

Failure Mode Effect Analysis

Qualitative Environmental Risk Assessments

Task Based Risk Assessments.

When considering the hazards with the highest consequence, as detailed above, risk assessments are used to assess those failures that could give rise to the realisation of those high consequence hazards. Assessment references are detailed below in Table 3.

Table 3: Index of Assessments for high consequence hazards

Hazard	Risk Assessment
Development of significant incident due to fire	EFMEA0017
Development of significant incident due to spillage or leak	EFMEA0018
Development of significant incident due to adverse reaction	EFMEA0019
Development of significant incident due extreme weather	EFMEA0027
Pressure relief calculations	M3617-06-006

Through assessment the below risk factors are considered most relevant and require control when considering the high consequence hazards.

5.1 Fire/Explosion

5.1.1 Fire Risk Factors

There are a wide range of factors that can contribute to the risk of a fire developing. The next section highlights those factors. A fire requires a source of fuel, an ignition source and oxygen in order to propagate. Therefore, it is the case that management of these three elements provides to focus of fire prevention activities.

5.1.2 Arson

Arson is a common cause of fire within the waste industry. It is essential that unauthorised access to waste treatment sites is prevented.

5.1.3 Plant and Equipment

Plant and equipment that is poorly installed, maintained or operated can increase the risk of a fire developing by introducing ignition sources. Poorly controlled maintenance and modification procedures and inadequate communication between shifts can lead to unsafe operating conditions. Low standards of cleanliness within process equipment can introduce a source of fuel.

5.1.4 Ignition sources

The control of ignition sources is a key measure in controlling fire risk. There are numerous potential ignition sources which must be considered. A non-exhaustive list is presented below:

Use of cigarettes/matches

Cutting and welding flames

Hot surfaces

Hot process vessels

Space heating equipment

Mechanical machinery

Spontaneous heating

Friction heating or sparks

Impact sparks

Sparks from electrical equipment

Stray currents from electrical equipment

Vehicles, unless specially designed or modified to contain a range of potential ignition sources.

5.1.5 Fuel sources

The Cardiff site and office accommodation presents potential sources of combustible materials such as general office equipment, gas cylinders, maintenance supplies. The location of fuel sources is marked on site plan within Appendix 1. It is noted that the site is traversed by a fuel line linked to the close by Valero terminal

5.1.6 Fire spreading

Left unchecked fire could spread between different areas of the site, however, as the site does not manage combustible or flammable wastes, it is considered that a fire could only be located within a few limited areas.

5.1.7 Hazardous Areas

Hazardous Areas are defined by the Dangerous Substances and Explosive Atmosphere regulations (DSEAR) as "any place in which an explosive atmosphere may occur in quantities such as to require special precautions to protect the safety of workers". Ordinarily these areas will be identified by undertaking a hazardous area classification or DSEAR assessment.

There are no Hazardous Areas in place at the Cardiff site. The only flammable material would be those used for maintenance purposes.

5.2 Adverse Reaction

5.2.1 Adverse Reaction Risk Factors

Adverse or unplanned reactions presents a significant risk to the Cardiff site. Processes are designed in order to undertake defined chemical reactions, where reactions outside of this design criteria occur it can result in damage to processing equipment, pressurisation of tanks, losses of containment, fugitive emissions, failure of abatement systems and risk of fire or explosion. The types of adverse reactions that can occur include those that generate toxic / noxious vapours, thermal runaway reactions, hazardous decomposition reactions, generation of flammable atmosphere, oxidation / reduction.

5.2.2 Incompatible Materials coming into contact

The mixing of incompatible materials will result in a chemical reaction. This may be a desired chemical reaction intended as part of a treatment operation, or it could be an adverse or unexpected reaction with hazardous consequences. Due to the nature of the processes operated at the Cardiff site incompatible materials are stored, although they are stored segregated from each other.

Incompatible materials could come into contact during reception of bulk loads. In addition, they could come into contact during treatment processes including during bulking operations.

5.2.3 Unsuitable waste

The authorisation of a waste that is not suitable for the intended process presents a risk of adverse reaction. This situation could arise due to a lack of knowledge from the member of staff undertaking the initial assessment. The lack of knowledge could be in relation to the waste, the process, or the safe operating conditions.

5.2.4 Misdescribed waste

A waste that has been misdescribed by the producer presents a significant risk to the site. It is a criminal offence to misdescribe waste. In this event the waste could have satisfied Pre-Acceptance procedures and be delivered to the site. Not only does the waste present a processing risk but it is also a risk during sampling as selection of PPE could be incorrect depending upon the true nature of the waste.

5.2.5 Failure of processing equipment

Failure of items such as mixers and stirrers increase the risk of adverse reactions occurring. Mixers and Stirrers are fitted to all reaction vessels at the Cardiff site, they ensure reactions occur as per their intended pathway. A loss of agitation can result in concentrated reactions taking place within a larger mass of liquid, these “hotspots” can result in adverse reactions. In addition, the sudden and complete agitation of a vessel where reactants have been without mixing can cause the release of a lot of energy with large volumes of reactants interacting at the same time.

Failure of process instrumentation prevents the detection of adverse reactions or failure of primary control systems and may result in the addition of excess reactants. Types of critical instruments include flow, level and mass addition rates.

5.2.6 Operator error

There are many occasions where operator error can give rise to adverse reactions, these include:

Error made in waste acceptance procedure

Error made in process modelling procedure

Offloading bulk tanker to wrong location

Incorrect valve configuration during transfer

Bulking of incorrect waste

Failure to monitor process correctly

There are many reasons why errors such as these occur, risk factors include, poor instruction, training and supervision which result in knowledge gaps. Other risk factors

such as poorly designed plant, processes and procedures can make lead to confusion and increase the risk of errors being made. Factors affecting the mental capacity of workers including, high workload, stress and fatigue can also lead to errors being made due to slips or lapses in memory.

5.3 Loss of containment

5.3.1 Loss of containment risk factors

Loss of containment events present a significant risk to the Cardiff site. Loss of containment events vary in the degree of severity which is impacted by the volume of waste lost and the nature of the waste. Loss of containment can result from leaks and spillages of containerised wastes, leaks and spills from process pipework and associated items, overfilling events, or catastrophic failure events.

Loss of containment of hazardous materials presents a more significant with potential for release of toxic or noxious vapours, in addition secondary hazards could be realised such as adverse reactions.

Loss of containment events present a risk to ground and groundwater by migration of pollution

5.3.2 Leaks and spills from containerised wastes

Reception, storage, and transfer of containerised wastes presents various opportunities of leaks and spillages to occur, these could range from relatively minor spillages during sampling to damage to a container resulting in loss of the entire contents (up to 1000 litres). Spillages present an exposure hazard to site personnel via skin, inhalation, and ingestion. In addition, there are the associated risks discussed above.

5.3.3 Leaks and spills from pipework

Storage and transfer of materials via pipework, pumps and valves presents the risk of spillages, either from union points within the various components, due to damage from impact or collision, or poor specification, maintenance, and inspection. Ordinarily

leaks of this nature would be relatively minor provided they are detected early, and remedial actions are completed. However, where leaks involve corrosive or toxic, materials a small volume can cause secondary impacts such as exposure risks and damage to other process equipment.

Poorly controlled maintenance and modification procedures and inadequate communication between shifts can lead to unsafe operating conditions.

5.3.4 Overfilling events

Where a storage or treatment tank, road tanker, or container is filled beyond its capacity an overfill event occurs. This can result in an uncontrolled loss of the tank contents via the most accessible pathway from the primary containment. This will often be out of any available openings on the tank including vent lines, breather valves, relief vents or overflows. Large volumes of material can be involved, and an event will carry various risks depending upon the nature of the waste involved. It will most likely present an exposure risk to staff along with the risk of damage to equipment, potential adverse reactions with other materials. Overfilling events also present environmental risks from the transfer of pollutants to ground and/or groundwater along with potential release of toxic / noxious vapours to atmosphere.

5.3.5 Catastrophic failures

A catastrophic failure relates to the complete failure of primary containment, it is usually only used to refer to bulk storage or handling of materials. A catastrophic failure could result in the entire contents of a tank being lost and hence it presents the highest potential consequence with regard to spillage and leak hazards. It will certainly present an exposure risk to staff along with the risk of damage to equipment and potential adverse reactions with other materials. Catastrophic failures present environmental risks from the transfer of pollutants to ground and/or groundwater along with potential release of toxic / noxious vapours to atmosphere and potential impacts on the local human population. Catastrophic failures are usually a secondary hazard of an initial failure, for example, a catastrophic failure could arise due to an adverse reaction causing the pressurisation of the vessel which causes it to fail, or it could be caused due to a fire occurring elsewhere at the site which goes on to affect the tank. Failures can occur for other reasons, such as impact damage or poor selection,

maintenance and inspection of vessels which result in poor materials of construction and unsuitable inspection arrangements.

5.4 Combined Hazards

It should be acknowledged that the hazards identified above do not exist in isolation, often with the realisation of one hazard becoming a trigger for other failures to occur. These can be considered multiple cause hazard realisations. For example:

- An adverse reaction within a storage vessel can cause pressurisation of the tank which could ultimately lead to catastrophic failure of the tank.
- A fire elsewhere at the site could spread to bulk storage areas and cause damage to tanks
- Leaks in pipework allowing incompatible liquids to meet

Secondary impacts of potential failures are investigated through the risk assessment process and impact on the severity assessment which in turn affect the choice of control measures implemented to prevent a particular failure.

6.0 General Control measures

6.1 Site security

The site is fully secured by a combination of palisade fencing and large concrete walls around the perimeter. It is also located within the Cardiff docks industrial complex which is private property and not open to public access. All deliveries to, and collections from the site are by pre-arranged bookings. The site has a CCTV system which records to a local HDD. Outside of operational hours the site access points are locked. Port security undertake randomised security checks outside of core hours.

6.2 Maintenance operations and Plant Modification

Proposed changes to plant and equipment must be documented and communicated to interested parties. The impact of changes must be assessed by competent persons.

Any updates to site plans, P&ID's, operational procedures, or risk assessments must be made in a timely manner and in accordance the company document management procedures. These steps are achieved by following procedure *1.8.8 Management of Change Procedure for Plant Modifications*.

Permit to Work controls are required for hot works, or other significant maintenance works that involve opening of normally closed systems, major mechanical works, works on fixed installations, works that involve the disabling of any safety devices, or any other works that require physical or mechanical isolations to be implemented. Regular desludging of bulk inventory is undertaken in order to reduce potential for odours or adverse reactions. Ordinarily this would be undertaken as part of normal site operations. In any occasion where confined space entry is required, this is performed under a permit to work and by specialist third party contractors using specialist equipment.

Procedure *1.8.6 Permit to Work System* details the process for issue, acceptance, communication and close out of permit to work documents. Processes are in place to communicate active permits and lockouts which are in place across multiple shifts.

6.3 Plant and equipment

Processes are designed and installed in order to remove hazards as far as is reasonably practicable. An assessment of proposed new equipment and control philosophy is undertaken as part of the design process with key failure modes addressed and contingency measures implemented. This systematic approach also serves to identify critical items of infrastructure and define safety critical steps within operational procedures.

All plant and equipment is installed by competent persons and is included within the site Planned Preventative Maintenance (PPM) system. Maintenance, service, and calibrations are conducted in accordance with schedules defined by manufacturers requirements. Works are completed either by internal maintenance staff or third-party specialists dependent upon the qualifications and competencies required.

Electrical installation is undertaken by qualified electricians. Inspection of all fixed electrical installations is undertaken on a triennial basis or more regularly as defined by the competent person. In addition, all installations are subject to annual thermographic surveys.

All Forklift Trucks used at the site are provided on a long-term hire and subject to maintenance contracts provided by third party engineers. Other items of plant are

included within the site PPM system and services accordingly. All mobile plant is subject to pre-shift inspections and checks.

Processes are operated in accordance with documented procedures and operational risk assessments. Suitable PPM schedules and pre-shift inspections are in place.

6.4 Further ignition sources

Smoking is not permitted within the boundary of the permitted site. Sources of ignition are prohibited at the site unless used in accordance with an authorised permit to work.

Hot works are controlled by the site Permit to Work Procedure. The procedure ensures that the sources of fuel are removed or protected prior to the introduction of an ignition source. A hot work permit also ensures that there is suitable monitoring during and after the works have been completed by conducting a fire watch during and after any hot work activity.

Potential hot exhausts are limited to site mobile plant which is diesel powered. Mobile plant is not left idling and are not stored within the process area. Housekeeping is maintained to ensure no build-up of combustibles. Process buildings used for the storage and treatment of wastes are unheated and space heaters are not used in these areas. A space heater may be used within the Construction Products site aide the setting of wet cast during colder periods.

6.5 Housekeeping

The site and process areas are subject to daily inspections focussed on compliance with the Environmental Permit, Housekeeping and Health and Safety issues. Any non-conformances identified are raised with operational management and are scheduled to be rectified. The process equipment is cleaned between batches and at the end of each shift. Control of any loose combustible materials is a priority.

6.6 Management of Adverse reactions

Properties of incoming wastes are identified through the company waste Pre-Acceptance Procedure. Pre-Acceptance testing includes an assessment of

compatibility which is recorded as part of the process. Wastes that present an unacceptable risk are rejected.

Company Waste Acceptance procedures serve to confirm the information gathered during the Pre-Acceptance activities. All wastes are sampled and subject to acceptance testing, deviation from the anticipated parameters will result in a non-conformance being raised which could result in the rejection of the waste.

Further compatibility assessment is undertaken prior to wastes being added to bulk tanks. For bulk wastes this is conducted at the waste acceptance stage, for containers it is undertaken prior to batch treatment. Compatibility assessments involve a documented risk assessment and may involve modelling using a Dewar flask.

6.7 Spillages and Leaks

6.7.1 Containerised Wastes

Spills and Leaks from containerised wastes are prevented as far as practicable. All containers are subject to a visual inspection prior to offloading to ensure they are in sound condition. During sampling exercises staff are informed of the necessity of replacing lids, caps, and bungs in order to prevent fugitive emissions and potential spillages.

All staff permitted to operate Forklift Trucks must have completed a third-party training course and assessment and be deemed competent by site management. Storage areas at the site are organised by hazardous property with the location of bunding and drainage designed to ensure incompatible material cannot come into contact.

The site is divided into sections, each area has a representative assigned to is who is responsibkle for ensuring the area is in good order and undertaking daily inspections of the area. Poor condition containers will be identified via this inspection, if a leak is observed it will be reported to the relevant persons and will require rectifying as soon as practicable.

Cardiff procedure 2.3.1.14 ‘Spillage Procedure’ details the actions to be taken in a range of scenarios where spillages or leaks occur when handling containerised wastes. All staff are trained in the procedure. The accident / incident / near miss reporting procedure is used to capture any leak events.

There are two emergency spill cabins located at the Cardiff site. These house a large volume of spill control media, emergency PPE and other supplies for tackling spillages.

The cabins are subject to maintenance checks to ensure adequate stock levels are maintained.

6.7.2 Bulk tanks and associated infrastructure

The risks of spillages and leaks during bulk storage and associated operations are focussed on small scale leaks from pipework, pumps and valves, overfilling events, and catastrophic failures. Small scale leaks can be prevented by ensuring the use of high integrity components of suitable materials of construction, maintenance and inspection regimes can also serve to prevent failures. For example, noting corrosion and taking action before a leak develops. PPM regimes and planned daily inspections serve to ensure early detection of leaks. When detected leaks and spills are cleaned up as soon as is reasonably practicable.

Overfill protection of bulk storage is provided by a combination of level transmitters, high-level switches, trips, automated valves, PLCs, overflows, and operating procedures. Risk Assessments have been undertaken to determine the combination of measures that are required for each of the tanks. For example, tanks used for the reception of bulk acids are given higher integrity overfill protection than those used for the storage of non-hazardous liquids such as automated trips/interlocks to related pumps. Tanks on a non-hazardous duty may use level transmitters, high level alarms, and procedures and training as the primary control, with overflow in place to protect staff.

The site stored liquified carbon dioxide in bulk. The tank is provided under a hire and maintenance agreement and is subject to a written scheme and provided in accordance with guidance document CP26 ‘Bulk liquid carbon dioxide storage at users' premises’. All delivery drivers are specifically trained in the delivery of liquified gases and the delivery is undertaken via a balance line, the balance line serves to prevent overfilling of the vessel by allowing flow from the storage tank back to the bulk tanker at the point the vessel is full.

Catastrophic tank failure is usually a secondary hazard of another event, for example, a fire, collision, adverse reaction, or poor selection of materials of construction. That being the case, controlling the risk factors relevant to those events will reduce the risk of catastrophic failure. Beyond controlling the primary risks, there are other measures that can be taken to reduce the potential for catastrophic tank failure, these are primarily related to providing pressure and vacuum relief and/or emergency venting as required. Standard practice at Castle is that all powder silos are fitted with reverse jet filters and pressure/vacuum relief (PVRV). All silos have a silo safety system in place which includes pressure transmitters, high level switch, and actuated fill valve. Each

of these components is linked to an audible alarm and interlocked with a pneumatic valve in the silo fill line. All reaction vessels are fitted with PVRV's and breathe via suitable abatement. Emergency venting arrangements are also in place using overflow and knock out pot arrangements.

The carbon dioxide storage tank is specifically designed for the purpose it is employed, the system has a nominal operating pressure of 18-20 bar with 4 off relief valves set at 23.5 bar. Pressure within the system is maintained by the refrigeration unit. The unit is fitted with alarms which will alarm in the event of high or low pressure. The fridge is subject to weekly function tests by site staff and the whole system subject to visual inspection.

In all cases leaks and spillages will be contained within the boundary of the site. The site is covered in impermeable surfacing with a number of self-contained sumps located at key locations. The stormwater collection system and tertiary containment systems provide adequate containment for likely containerised waste spillages. All bulk liquid storage tanks are located within bunds or bunded areas. Individual bunds are designed to contain 110% of the tank contents or 25% of the total volume of tanks located within the bund, whichever is greater. Any issues identified with bund/surface integrity are subject to remedial actions as soon as is reasonably practicable.

Due to the condition of the Cardiff plant when Castle first took over the management of the site, it is necessary to consider aging plant and infrastructure. A large quantity of aged infrastructure and bulk storage has been removed from the site. This has been undertaken using a risk based approach. There remains a small number of bulk storage tanks that are legacy infrastructure. The risk posed by these items is managed by a tank inspection and maintenance regime drawn up by a competent third party. This regime includes annual internal and external inspections completed by a competent third party supported by detailed in-house monthly inspections in accordance with a scheme designed by a competent person.

6.8 Waste storage

6.8.1 General

All wastes at the Castle Waste Services Cardiff site are stored in accordance with the Site Storage and Segregation Policy and Procedures which serve to ensure that incompatible materials cannot come into contact with each other during storage or within the site drainage systems.

6.8.2 Storage of combustible wastes

The site accepts predominately water-based liquids (both non-hazardous and hazardous, including corrosives and oxidisers), it also accepts inorganic waste powders (stored in powder silos). It does not accept for treatment or storage wastes that are identified as readily combustible such as:

- paper or cardboard
- plastics
- rags and textiles
- scrap metals contaminated or mixed with other waste such as oils or plastics
- de-polluted and un-depolluted ELVs
- refuse derived fuel (RDF) and solid recovered fuel (SRF)
- compost and plant material
- biomass
- mixed waste containing any combustible wastes
- WEEE

Materials at the site that could be considered combustible include; empty plastic containers that have previously contained water based liquids, these may be site generated or be sent to the site by third party for re-use. Further to these there may also be used pallets that were previously used to store drummed wastes. The site does not undertake any size reduction or shredding of these materials. They present a negligible self-heating risk.

6.9 Preventing self-combustion

The site does not accept spontaneously combustible wastes. The wastes that fall within the scope of this document are considered to present a low risk of self-heating and therefore self-combustion.

6.10 Detecting fires

The site has a manually activated fire alarm system. The system is bells and visual alarm only and is not remotely monitored.

The site has an on-site emergency plan which contains the specific actions required for a range of different roles in the event of an emergency. Further information is provided in Section 9 of this document.

6.11 Suppressing fires

Fire suppression at the site is provided by a selection of manual fire extinguishers located at strategic locations identified in drawing within Appendix 1.

6.12 Water supply

The site is located directly adjacent to Roath Dock which could be used as a source of fire-fighting water where required.

6.13 Firewater

Potential for fire to occur at the site is limited due to the limited availability of combustible or flammable materials. Hence any fire that was to occur would likely be small in size and would require minimal fire-fighting water. Bulk storage and treatment tanks are located within bunded areas. Container storage is located within bunded areas. There is no storage of flammable wastes at the site. Combustible materials are limited in their nature to empty drums and IBCs.

7.0 Operational Control

To facilitate the successful implementation and maintenance of the Accident Prevention Plan and Health and Safety Policy, Castle Waste Services operate a Health and Safety Management System that is certified to ISO 45001. The management system follows a Plan, Do, Check, Act model.

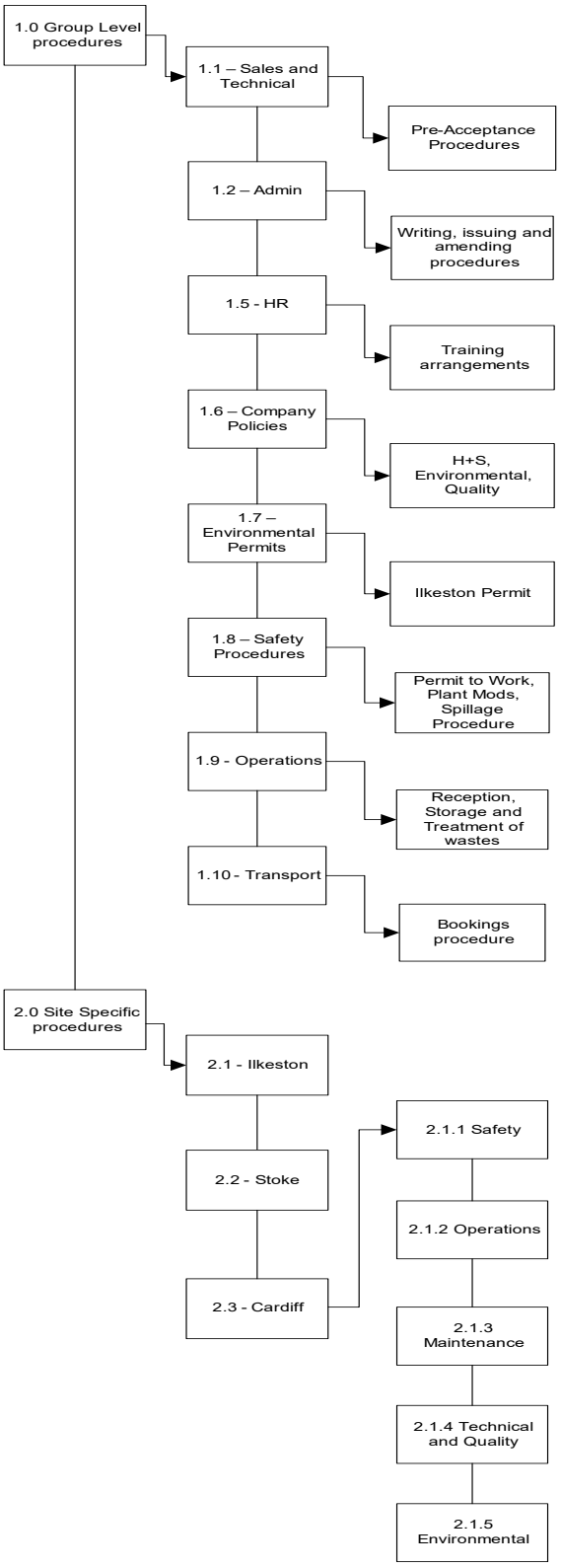
7.1 Procedural Framework

Management of the site is delivered through a wide range of Procedures and Assessments which provide the framework of operational control for the site activities. These form a significant part of the management system and are maintained through it.

Procedures are split out between group level and site specific.

Figure 3 shows the procedural framework operated by the organisation.

Figure 3: Procedural Framework – Cardiff site



7.2 Auditing, Monitoring and Review

Ensuring compliance with legal and procedural requirements is a key aspect of the Health and Safety Management System. This is achieved through a combination of activities including auditing.

This includes audits and inspections such as:

Internal and external management system audits, targeted monthly safety audits and daily site inspections.

Leading indicators such as such as:

Key Performance Indicators (KPIs) relating to training, auditing, PPM completion rates.

Performance meetings – tracking performance and completion of action plans.

Lagging indicators such as:

Near miss or incident reports,

Maintenance requests (breakdown reports),

Amenity complaints.

The results of auditing and monitoring exercises are discussed and reviewed and are instrumental in ensuring the continual review and improvement of the site management systems.

7.3 Training and Competency

A significant aspect of the Health and Safety Management system is the training and competency of staff and contractors who conduct works at the Cardiff site, especially where their roles could lead to realisation of a high consequence hazard. Full details are provided in procedure *1.5.3 Training Awareness and Competence*; however, the section below provides an outline of the requirements and arrangements in place.

7.3.1 Contractors

Contractors undergo a site induction identifying the key features of the site and actions to take in the event of an emergency. They must also provide Method Statements and Risk Assessments for the task they will complete. In addition, they must be able to provide evidence of competence for the task they will be completing or the equipment they will be using.

7.3.2 All Site Personnel Including Administration and Office Based Staff

Induction training against a predetermined list of health, safety and environmental criteria and procedures including the on-site Emergency Plan

7.3.3 All Operations Personnel

- Induction training including the issuing of the Employee Handbook
- IOSH Working Safely
- Training in the content and implementation of the on-site Emergency Procedures
- Training in Spill prevention and remediation procedures
- Training in PPE allocation system
- Basic in-house training in management of hazardous materials
- Training in Non-conformance and Incident Reporting system

7.3.4 Process Chemists and Operators

- Training in Process Specific Procedures and Work Instructions
- Basic Training is Chemical Hazards Identification and Safety Procedures
- Site safety awareness and mobile plant training including forklift trucks.

- IOSH Working Safely course
- Risk Assessments

7.3.5 Manager and Supervisors

- IOSH Managing Safely

7.3.6 Other External Training

- City and Guilds National Vocational Qualifications and Waste Management Industry Training and Advisory Board (WAMITAB) Certificate of Technical Competence
- NEBOSH National General Certificate in Occupational Safety and Health.
- NEBOSH National Diploma for Occupational Health and Safety Management Professionals
- IChemE Hazard Study & HAZOP Study Leader.
- Dangerous Goods Safety Advisor (DGSA) CDG.

7.3.7 Emergency Planning

All staff holding roles within the On-Site Emergency Plan are trained in the plan and their responsibilities under it. All staff are trained in the On-Site Emergency Plan during their induction period. In addition, staff undergo fire safety awareness training during this period.

Additional training is provided in relation to fire prevention. This includes

Fire risk factors

Ignition sources

Fuel sources

Flammable Atmospheres

Controls

Specific controls for the handling of combustible waste

Specific controls for handling of flammable wastes

Housekeeping

Emergency Actions

Raising the Alarm

Site evacuation

Process specific actions

Post Incident actions

8.0 Exercises

Fire Drills are currently conducted at least on an annual basis, an adequate number of drills are undertaken to ensure all staff and shifts are involved.

The site is engaged with the local fire service via familiarisation visits.

9.0 Emergency Actions

9.1 General

In the event that the fire alarm is activated, the alarm will sound, and the site will be evacuated in accordance with document 2.3.1.1 - On Site Emergency Plan. The plan specifies a range of roles and responsibilities that must be adopted in the event of an emergency. Roles include Site and Incident Controllers: actions include ensuring all personnel are accounted for and include contact lists for neighbouring sites and regulatory authorities. Key roles and responsibilities and associated contact lists are contained within Appendix 4 of this document. Laminated copies of roles and responsibilities and key contact lists are included in Emergency Grab Packs which are located at key locations at the site as part of the On-Site Emergency Plan. A log of all actions taken will be maintained by the Site Controller Support. The site Muster Point is located away from the site at a safe location.

Where the alarm has been raised by the manual call point system, the Site Controller will assess the cause of the alarm and whether the assistance of the Emergency Services is required. If so, they will be contacted in accordance with the Emergency Plan.

The Emergency plan specifies a number of actions to be completed by staff (where safe to do so) these include ensuring processes are left in a safe condition with vessels left in a condition that will prevent their involvement in the emergency as far as is practicable.

There are a range of process specific actions that can be undertaken in the event of an emergency. These include:

- The use of cooling waters in the event of adverse reactions,
- The use of spillage control medium to collect spillages and leaks,
- Measures to quench adverse reactions,
- Using mobile plant to relocate combustible or flammable materials.

The Site Controller in co-ordination with the Emergency Services (as required) will determine the appropriateness of any actions undertaken.

Actions by site employees in implementing the emergency actions must not be at the risk of their health and safety or of others. It is anticipated that actions in respect of dealing with a fire at the site will be undertaken under the supervision of the Emergency Services attending the site.

10.0 Post incident actions

In the event of a high consequence incident occurring at the site there are a range of actions that would be undertaken to expediate the remediation of the site and return it to an operational state. Any event would have to be considered on a case-by-case basis and the steps taken would be proportionate to the degree of loss.

An investigation into the cause of the incident would be undertaken in co-ordination with interested parties.

In the event of a fire occurring at the site all fire water would initially be collected within the local bunding serving the affected area. If a fire were to occur within the tank farm enclosure fire water would be stored within that location. Fires in other areas of the site may result in fire water being directed to the surface water collection system. This comprises of storage tanks and interceptors. The site does not operate a trade effluent

discharge so all fire water would be removed from the site to a suitably permitted waste facility. Waste would be removed by road tanker. Following removal of firewater, the surface water collection system would be assessed and decontaminated as required.

Where safe to do so, the area affected by the site will be cleaned and inspected. All wash water would be collected and handled in the same manner as the firewater.

Unburnt combustible wastes would be removed from the site to a suitably permitted facility. In the case of secure destruction wastes, these would be returned to the waste producer.

Wastes affected by fire would be isolated, sampled and tested and removed from site to a suitably permitted facility.

Wastes unaffected by the fire may be stored at the site pending transfer or processing providing their storage does not present a hazard to site remediation measures or impede the necessary works.

An assessment of site infrastructure, process equipment and any mobile plant would be undertaken. Where deemed appropriate items may be refurbished for further use, otherwise items would be removed from site as a waste and despatched to a suitably permitted facility.

Appendices

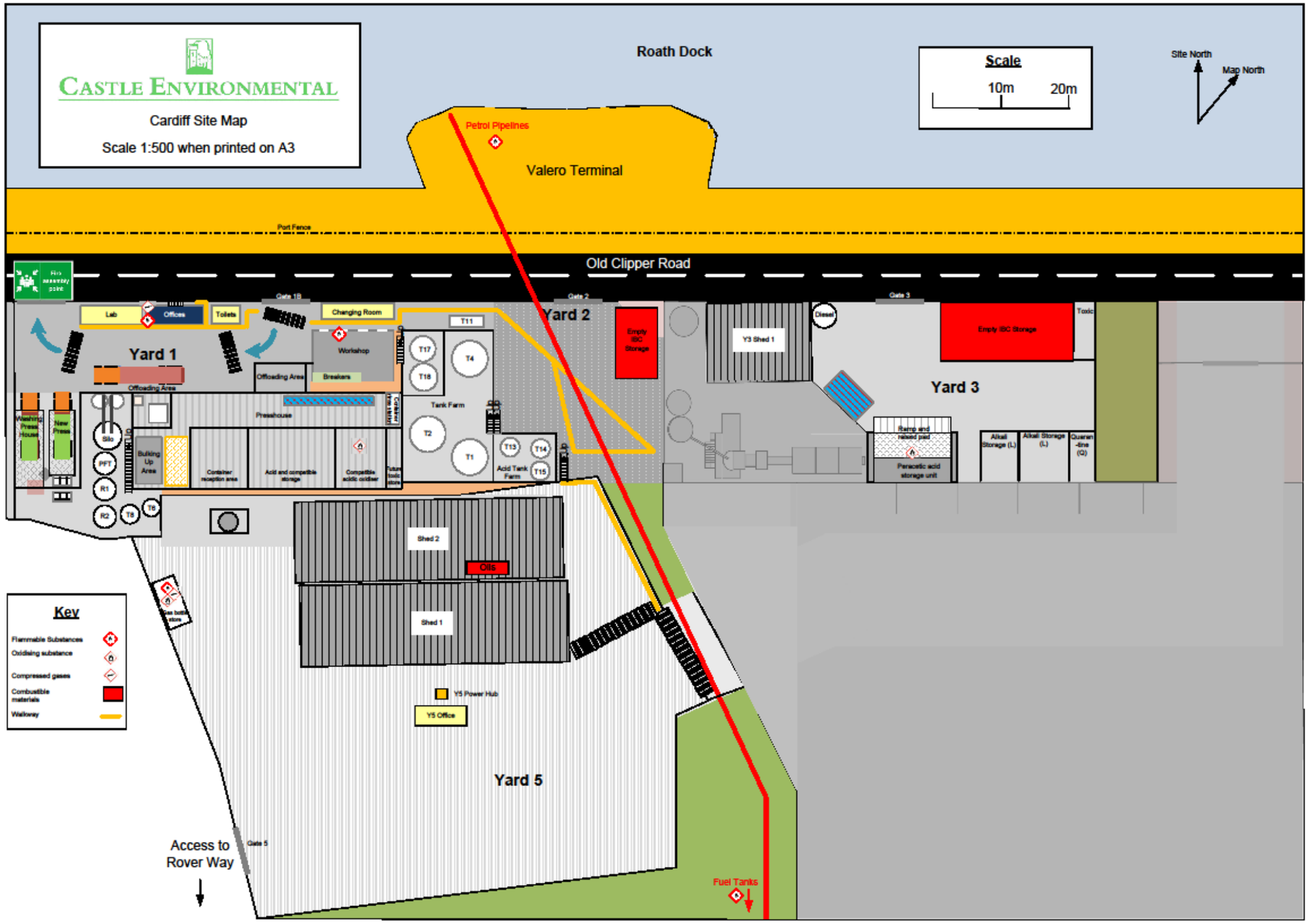
A.1

- A.1(i) Fuel sources and flammable materials
- A.1(ii) Fire Extinguishers and Alarm Call Points
- A.1(iii) Escape Routes

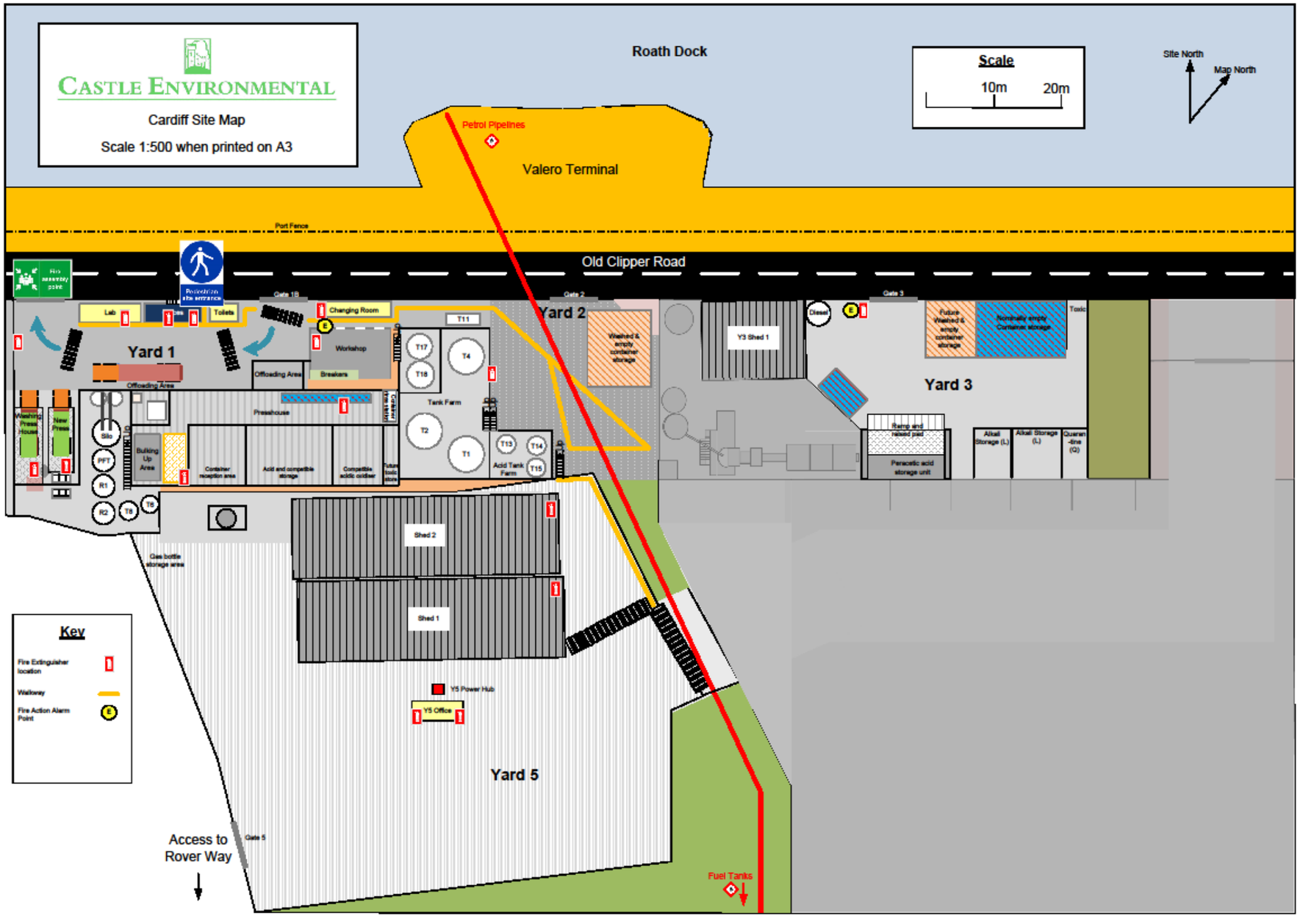
A.2 Emergency Actions

- A.2(i) Roles and Responsibilities Incident Controller
- A.2(ii) Roles and Responsibilities Incident Controller Support
- A.2(iii) Roles and Responsibilities Roll Caller
- A.2(iv) Key contacts in the event of an Emergency

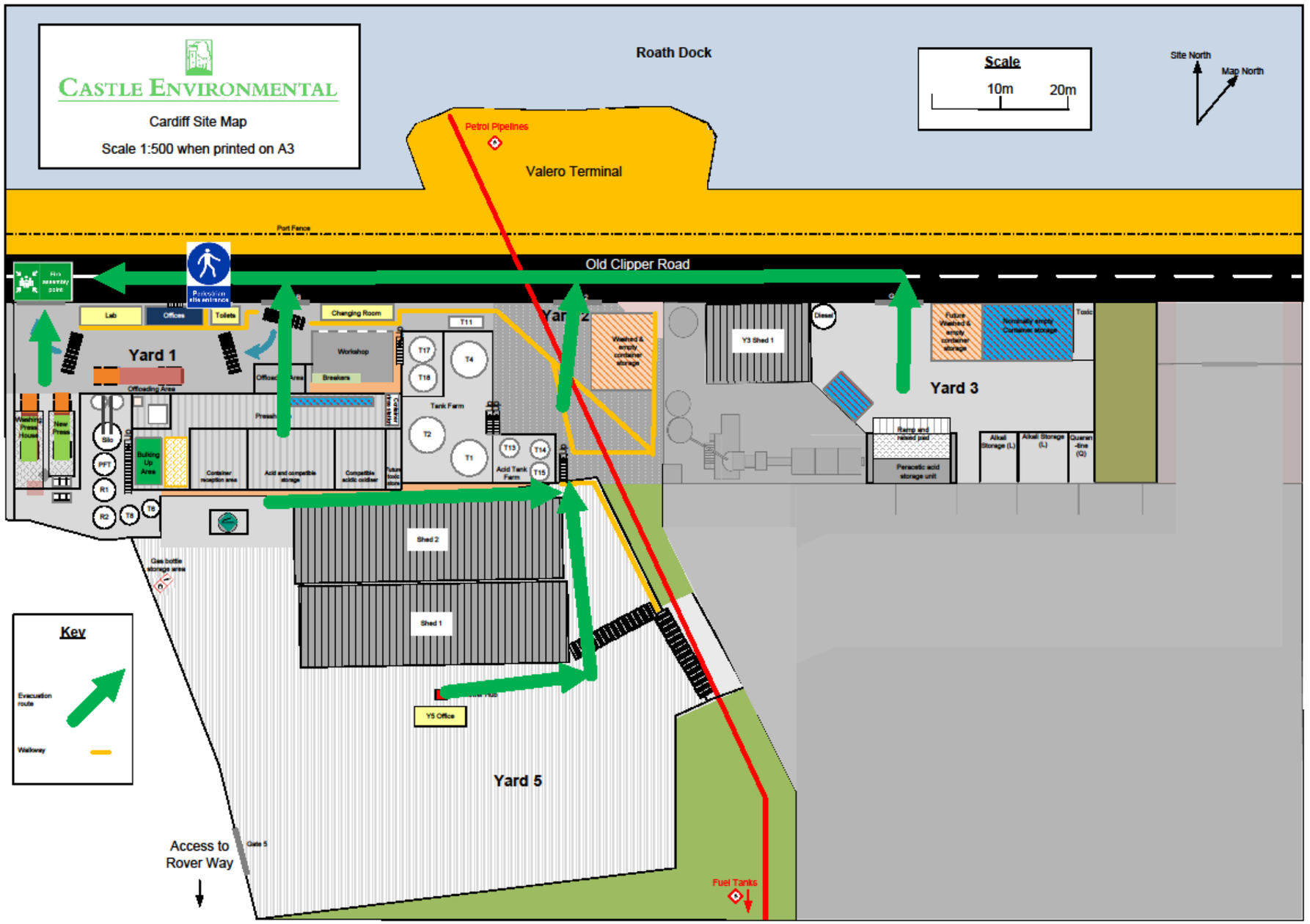
A.1(i) Fuel sources and flammable materials



A.1(ii) Fire Extinguishers and Alarm Call Points



A.1(iii) Escape Routes



A.2(i) Roles and Responsibilities Incident Controller

This role will be held by the Site Manager.

Other members of site Management may be nominated as deputy.

The Incident Controller is in overall charge of the emergency situation working from the designated assembly/Incident control room.

1	Establish Incident Control Room	
2	Determine if it is safe for personnel to approach origin of the incident to investigate the cause with a view to brining it under control	
3	Ensure that all operations have been shut down as far as is safe to do so	
4	Ensure appropriate Emergency Services are contacted	
5	Ensure key personnel, Regulators, Authorities and other bodies (neighbours) as required are contacted	
6	Receive and provide appropriate information to the Emergency Services on their arrival and direct them to the incident location via the most appropriate route	
7	Liaise with the Incident Controller with respect to wind direction and condition and decide the path and effect areas resulting from downwind dispersal	
8	Liaise with Incident Controller Support to confirm extent of release by monitoring downwind as soon as possible if safe to do so	
9	Provide information to the Emergency Services on: safe route to the incident, areas which need to be cordoned off, whether or not site access roadways are or likely to be affected	
10	Advise of any missing persons	
11	Prevent any unnecessary delivery vehicles or visitors to the site	
12	Agree with Emergency Services when the incident has been made safe and the personnel can return to work	
13	Ensure casualties receive adequate attention and if appropriate arrange for additional assistance	
14	Provide for the welfare of the evacuated personnel and a means to keep relatives informed	
15	Direct shutdown of operations	

A.2(ii) Roles and Responsibilities Incident Controller Support

Incident Controller Support

Responsible for assisting the Incident Controller.

This role will be held by a Manager or Supervisor/Senior member of staff as nominated by the Site Manager (Incident Controller)

1	Collect Emergency Response Packs	
2	Adopt responsibilities of roll caller	
3	Collect technical information which may be relevant to the incident	
4	Report to the Incident Controller and provide assistance with regards to information, monitoring and assessment of the emergency.	
5	Contacting key personnel, Regulators, Neighbours. etc., as required by the Site Controller.	
6	Keeping the incident log up to date on the emergency progress	

A.2(iii) Roles and Responsibilities Roll Caller

Roll Caller

Responsible for collecting logs of personnel on-site and reporting to assembly point.

The Incident Controller support will usually adopt this role although it may be delegated to others.

1	On hearing the site alarm collect attendance logs from the following locations and report to the assembly point Driver Reception – Driver signing in sheets and staff clock cards Reception – Visitors book and staff signing in sheets.	
2	Liaise with the staff to confirm evacuation of the site is complete	
3	Carry out a roll call on all available logs	
4	Report to Incident Controller and provide details of any individuals not accounted for.	

A.2(iv) Key contacts in the event of an Emergency

Contact Lists (External)

Company	Name	Number	Email	Address
Valero	Mark McGill	02920 491360/0776 9 956897	Mark.mcgill@valero.com	Valero Energy Ltd, Roath Dock Terminal, Rover Way, CF10 4US
Cargo Services	John Davey	07714 487211/0292 0 487738	john@cargoservicesuk.com	Compass Place, Roath Docks, Cardiff CF10 4LA
EMR	Martin Crossman	02920 488522	Martin.crossman@emrltd.com	Dowlais Wharf, Roath Dock, Cardiff, CF10 4ED
Welsh Water	Sewerage services emergency contact number	0800 085 3968		
National Resources Wales	Dale Padfield (Site inspector) National Emergency Hotline	03000 653420 0800 807 060	dale.padfield@cyfoethnaturiolcymru.gov.uk	

Health and Safety Executive	National Incident Reporting line	0845 300 9923 0151 922 9235. (out of hours if required)		
ABP Cardiff	Security Office	07734 072190		
ABP Cardiff (Security)	Switchboard	0845 6018870		
Cardiff City Council	Duty officer Cardiff CC Emergency Management	02929 827234		

Contact List (Internal)

Sean Penn	Site Manager (Cardiff)	07801 197821
Matt Skinner	Process Manager	07896 526558
Neil Hayward	Maintenance Supervisor	07450 939918
David Humphriss	Chief Executive Officer	07921 022518
Castle Environmental	Group Switchboard	01159 442994