

Site: Illawarra Coal Holdings	Doc. ID: WCPFE018	Reviewed Date: 10/8/06	Approved By: J. MacDonald
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FATAL RISK CONTROL PROTOCOL AUDIT

Business Unit:	Illawarra Coal Holdings
Site:	West Cliff Coal Preparation Plant
Date:	Wednesday 9 th August, 2006
Title:	Hazardous Substances
Intent:	Compliance with BHPB FRCP & Australian Standards
Time:	10 am – 12 noon
Schedule:	n/a
Area:	HBL Fuelling Station- Diesel

Auditors:

Name:	Position:	Years experience:
Syd Gabriel	Transport Operations Coordinator (NSW) – SHELL	31 years
Chris Gibb	HBL Supervisor	30 years
Richard Shaw	Operations Manager – SHELL	4.5 years
Julie MacDonald	WCP HSEC & Training Coordinator	4.5 years

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BHPB FATAL RISK CONTROL PROTOCOLS

FRCP 5 – Hazardous Materials Management

Standard	Requirement	Risk Factor	Finding	Recommendation	Responsibility	Timeframe
A1	The basis of design of a facility or process, permanent or temporary, which transports, produces, stores, uses or disposes of hazardous materials shall be reviewed, amended as necessary and documented utilising a process risk assessment tool such as HAZOP, HAZID, etc.. As-built design drawings (e.g. process and instrumentation diagrams, process flow diagrams, layout drawings, isometrics, etc.) shall be updated as a result of these reviews.	Mod	§ No design for tanks/ process.	Obtain design for tanks	Julie MacDonald	31/12/06
		Low	§ Last inspection of tanks unknown; Integrity Testing last completed unknown as is the details of Who and When completed the last testing. Shell	Obtain information from previous tank integrity tests.	Richard Shaw	31/09/06
		Low	§ No scheduled testing program	Develop testing, inspection & maintenance program for tanks as per EPA Requirements.	Julie MacDonald	31/12/06
		Mod	§ Inability to inspect tanks, tanks could unknowingly leak into ground water with main pond treatment area in close proximity.	Decommission tanks, with new facility to allow adequate inspections to be completed. Upgrades to fit overfill protection and alarm for leaks as per most modern designs. Complete associated capital justification.	Julie MacDonald	31/08/06
		High	§ Potential fatality as personnel load& fuel up. Tanks in area of highest traffic flow onsite; traffic coming from 3 directions. Identified by BHPB FRCP Hazardous Substance &	Decommission and relocate tanks to area clear of traffic and surface mobile equipment interaction. Complete capital justification as soon as possible	Julie MacDonald	31/08/06

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			Surface Mobile Equipment Champions previously.			
		Mod	§ Incompliant with AS1940; area not self-bunded for fuelling trucks.	Decommission, set-up a facility that is self- bunded and meets AS1940 Requirements. There is an inability to self-bunded to due to current surface mobile equipment traffic flow in this area, there is inadequate room.	Julie MacDonald	31/12/06
A2	All specifications for the design and/or modification of hazardous materials facilities shall be subject to risk assessment that includes hazardous materials selection, transport, production, storage, handling, use and disposal. Previous incidents should be reviewed to ensure risk is as low as reasonably practicable (ALARP).	Mod	§ Incompliant with AS1940 for loading bowsers, requirement for spill containment around area.	Decommission, set-up a facility that is self- bunded and meets AS1940 Requirements. There is an inability to self-bunded to due to current surface mobile equipment traffic flow in this area, there is inadequate room.	Julie MacDonald	31/12/06
A2	All specifications for the design and/or modification of hazardous materials facilities shall be subject to risk assessment that includes hazardous materials selection, transport, production, storage, handling, use and disposal. Previous incidents should be reviewed to ensure risk is as low as reasonably practicable (ALARP).	Mod	§ Unit fitted in 1980, compliant at the time, difficult to inspect and meet current AS1940 Requirements as an underground tank facility.	Decommission; set-up a modern facility in compliance with AS1940.	Julie MacDonald	31/12/06
A3	All facilities which have a significant risk from hazardous substances shall provide an emergency response plan which includes: • means of escape in an emergency situation • emergency response teams appropriate to the risk • appropriate of safe refuge and assembly areas for people • emergency response equipment for spillage containment, fires, explosions, burns, etc. • appropriate response arrangements with external medical providers e.g. ambulance, hospitals, fire brigade etc. • emergency response procedures appropriate to the hazardous materials	Low	§ No communication systems in place. However surface mobile equipment in the area have two-ways fitted.	Consider fitting a phone in the event of an emergency.	Julie MacDonald	31/09/06

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	and the risk • recovery procedure and disposal of the hazardous material.					
		Low	§ No process indicating emergency numbers or contacts. However, is covered in induction process	Fir communication of Emergency Management Plan & numbers to facility	Julie MacDonald	31/09/06
A4	Provisions shall be made for safe venting, drainage and containment, where required by normal operation, emergency situations, based on a process risk assessment tool such as HAZOP and HAZID.	Mod	§ No overfill protection in tank due to age of system	Decommission and upgrade system to fit with a modern system.	Julie MacDonald	31/12/06
		Mod	§ Venting seal not in place; positioned on ground off top of vent. Hence, water could be containment product.	Fit seal to prevent contamination.	Julie MacDonald	31/08/06
		Mod	§ Minor spills; rubber boot off fill box is breaking, potentially contaminate ground/soil.	Fit seal to prevent contamination.	Julie MacDonald	31/08/06
A5	Labelling shall be in place on all storage vessels, containers and tanks, as per appropriate national or international standards. This labelling shall clearly identify the carried or stored material. Supporting information (e.g. material safety data sheets [MSDS]) shall also be readily available at the point of use and storage to identify appropriate first aid procedures.	n/a	§ Marker on fuel point and MSDS to indicate product.	n/a	n/a	n/a
A6	Piping containing hazardous substances shall be marked such that the contents and direction of flow of the piping can be identified.	n/a	§ n/a: underground tank	n/a	n/a	n/a
A7	Security and access control systems and hardware shall be in place, appropriate to the risk, to manage access to areas where hazardous materials are stored and used.	n/a	§ n/a: underground tank	n/a	n/a	n/a
A8	Process control systems shall ensure that the potential for personnel to be exposed to hazardous materials is eliminated wherever possible or reduced to ALARP.	Mod	§ No data/ drawings on process flow, temperature, pressure and level control through the actuation of the	Obtain design for tanks	Julie MacDonald	31/12/06

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			valve or other device.			
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		Low	§ No scheduled testing program	Develop testing, inspection & maintenance program for tanks as per EPA Requirements.	Julie MacDonald	31/12/06
A9	Automatic plant control systems should be in place in hazardous material facilities to eliminate the need for operator intervention and maintain operation within the required parameters. Such systems shall incorporate fail to safe systems in the event of emergencies. Where automatic control is not practicable, risk assessment shall be used to identify and implement operational options that reduce HSEC risk to ALARP.	Mod	§ No overfill protection in tank due to age of system	Decommission and upgrade system to fit with a modern system.	Julie MacDonald	31/12/06
		Mod	§ Inability to detect leaks	Decommission and upgrade to system which alarms with leaks that are detected.	Julie MacDonald	31/12/06
		Mod	§ Inability to display tank gauge; dip stick set up used	Decommission and upgrade automatic tank gauging (sensor in tank automatic display)	Julie MacDonald	31/12/06
		Low	§ No automatic reading of volume of fuel for reordering purposes.	Decommission and upgrade fitted with an automatic reading of volume/automatic as with modern systems,	Julie MacDonald	31/12/06
A10	Fixed and personal detection devices shall be considered as options in the selection of potential risk reduction measures. These are the redesign and separation controls, and personal protective equipment as described in the Hierarchy. of Controls	n/a	§ Currently fitted with an emergency stop button on bowsers. Spill kit and PPE in area.	n/a	n/a	n/a
B11	Management of risk associated with hazardous materials shall be supported by a documented process that incorporates risk reduction using the Hierarchy of Controls, applied in the following order (a number of	High	§ Refer to findings of: A1-A9, B12, B14 & B15.	Refer to recommendations of: A1-A9, B12, B14 & B15.	Julie MacDonald	31/12/06

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	these options may be considered and applied individually, or in combination): • Eliminate - the complete elimination of the hazard • Substitute - replacing the material or process with a less hazardous one • Redesign - redesign the equipment or work processes • Separate - isolating the hazard by guarding or enclosing it • Administrate - providing controls such as training, procedures, etc. • Personal Protective Equipment – use appropriate and properly fitted PPE where other controls are not practical; impact minimisation equipment such as spill clean up or dust suppression measures.					
B12	A risk assessment process shall be in place for all hazardous materials to identify: • the selection criteria and life cycle analysis for all hazardous materials • the level of risk associated with the hazardous materials • controls required to manage the risk to levels that are ALARP • the performance requirements (reliabilities and capacities) of specific equipment and systems included in these controls.	N/A	§ In place via MSDS / Substance Evaluation sheets.	N/A	N/A	N/A
B13	A system shall be in place to identify and document maintenance, inspection, testing schedules and procedures for critical equipment associated with hazardous materials.	Mod	§ Critical equipment has not been documented	Identify and document critical equipment for this system,	Julie MacDonald	31/12/06
		Low	§ Last inspection of tanks unknown; Integrity Testing last completed unknown as is the details of Who and When completed the last testing.	Obtain information from previous tank integrity tests.	Richard Shaw	31/09/06

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		Low	§ No scheduled testing program	Develop testing, inspection & maintenance program for tanks as per EPA Requirements.	Julie MacDonald	31/12/06
		Mod	§ Inability to inspect tanks, tanks could unknowingly leak into ground water with main pond treatment area in close proximity.	Decommission tanks, with new facility to allow adequate inspections to be completed. Upgrades to fit overfill protection and alarm for leaks as per most modern designs. Complete associated capital justification.	Julie MacDonald	31/08/06
B14	A system shall be in place whereby the introduction and disposal of hazardous materials, including containers, shall be approved by the site Hazardous Materials Co-ordinator (refer 28 below) prior to introduction or disposal.	n/a	§ IC Hazardous Substances Procedure	n/a	n/a	n/a
B15	A system shall be in place for the management of change of equipment and/or processes for transportation, storage handling, use and disposal shall include specific steps to assess the impact of changes on the risk associated with hazardous materials.	n/a	§ WCP Change Management Procedure	n/a	n/a	n/a
B16	A site register shall be in place for all hazardous materials, and include the following: • name • HAZCHEM / Unites Nations code • MSDS • summary of maximum inventory • storage requirements and precautions • location, physical properties of the materials where they are used • approved disposal methods.	n/a	§ CHEMALERT System	n/a	n/a	n/a
B17	A system shall be in place to ensure that MSDS are available to all personnel (including first aiders and medical personnel) involved in the transportation, storage, handling, use and disposal of hazardous materials on site.	n/a	§ MSDS product at location. In washery control room and can be accessed through CHEMALERT via an site computer.	n/a	n/a	n/a
B18	A system shall be in place to ensure that all relevant design documents and drawings	Mod	§ No design for tanks/ process.	Obtain design for tanks	Julie MacDonald	31/12/06

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	associated with this Protocol, are up to date, controlled and available					
B19	Critical activities involving hazardous material, which have the potential for immediate or long-term harm, shall be identified and safe operating procedures documented, including transportation, storage handling, use and disposal of incompatible hazardous substances.	Mod	§ No formalised procedure for fuelling trucks. Formalised procedure for loading/unloading trucks.	Develop procedure for fuelling trucks via risk assessment process.	Julie MacDonald	31/09/06
B20	Safe operating limits for plant and equipment handling hazardous materials, which have the potential for immediate or long-term harm, shall be clearly defined, documented and available to operations and maintenance personnel.	n/a	§ n/a for underground tanks. § Fuel dispensers / placarding of dip stick points	n/a	n/a	n/a
B21	Monitoring systems for hazardous materials shall be in place to ensure that the status of operation is understood and shown clearly at all times. These systems shall include the procedure for a documented hand-over between shifts that records any relevant information/changes in operating status.	Low	§ No scheduled testing program	Develop testing, inspection & maintenance program for tanks as per EPA Requirements.	Julie MacDonald	31/12/06
		Mod	§ Inability to inspect tanks, tanks could unknowingly leak into ground water with main pond treatment area in close proximity.	Decommission tanks, with new facility to allow adequate inspections to be completed. Upgrades to fit overfill protection and alarm for leaks as per most modern designs. Complete associated capital justification.	Julie MacDonald	31/08/06
B22	A permit to work system shall be in place to ensure proper decontamination of plant and equipment, isolation, use of the correct personal protective equipment, and any special requirements or precautions (e.g. requirements for venting, clearing of piping or when using naked flames) where the occupational exposure limit of a hazardous substance could be exceeded.	n/a	§ Hazardous Substance Permit to Work System in place	n/a	n/a	n/a
B23	A system shall be in place to control simultaneous operations involving hazardous materials to avoid mixing of incompatible materials.	Mod	§ No formal process to prevent loading of bowzers and fuelling of truck simultaneously.	Develop a process and train personnel such that loading of bowzers and fuelling of trucks cannot occur simultaneously.	Julie MacDonald	31/09/06

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B24	Emergency response plans for hazardous materials incidents shall be in place and reviewed, tested and documented annually. This shall include external support services such as local ambulance and hospitals as appropriate to the risk	n/a	§ WCP EMP	n/a	n/a	n/a
B25	A system shall be in place to control and monitor access to areas where hazardous materials are stored and handled. This shall also identify process areas where hazardous materials may be released under certain operational circumstances (e.g. vent opening during process upset, infrequent discharge points) and what restrictions are placed on access to those areas.	Mod	§ Ability for anyone to drive onsite.	Develop a system whereby only authorised personnel can enter the site.	Julie MacDonald	31/09/07
B26	A system shall be in place to authorise and control the training of appropriate personnel in normal transportation, storage handling, use and disposal of, and emergency response procedures for hazardous materials.	Mod	§ No hazardous substances training	Develop hazardous substances training for personnel	Julie MacDonald	31/09/06
B27	A system shall be in place to monitor short and long-term exposure of personnel to hazardous materials, which have the potential for immediate or long-term harm. This system shall ensure that fatality potential is also addressed.	Mod	§ Implement BHPB Health Surveillance Program through Fit For Work Fit For Life Guidelines	Implement BHPB Health Surveillance Program through Fit For Work Fit For Life Guidelines	Julie MacDonald	31/09/07
B28	Procedures shall be in place for transporting hazardous materials. Where required a hazardous material manifest and supporting documentation shall be completed and shipped with the hazardous material. This documentation shall comply with local legislation.	n/a	§ In place	n/a	n/a	n/a
C29	A site Hazardous Materials Coordinator shall be appointed at sites where hazardous materials are processed stored and handled. This person shall have training and be competent to understand and evaluate the risks associated with a wide variety of substances, and be able to identify where additional expert advice can be sourced.	n/a	§ In place	n/a	n/a	n/a

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	The individual shall be responsible for assessing the hazardous properties and disposal requirements of materials used, monitoring the consumption and management of inventory, and also provide an "as needed" service to supply, warehousing, operational and HSEC personnel.					
C30	The risk assessment process shall include people with relevant subject knowledge expertise. Consideration should be given regarding the use of external people (e.g. supplier technical officers).	n/a	§ In place	n/a	n/a	n/a
C31	A competency based training system shall be in place for operations, maintenance and emergency response roles involving hazardous materials. Use should be made of supplier expertise to supply this training with annual refresher courses if required.	Mod	§ No hazardous substances training	Develop hazardous substances training for personnel	Julie MacDonald	31/09/06
C32	Behaviour based observations shall include the operation of equipment and systems handling hazardous materials. Any need for additional specific retraining shall incorporate the results of these observations.	n/a	§ In place via SWELL Behavioural Observation Program	n/a	n/a	n/a

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AUSTRALIAN STANDARDS

Section	Requirement	Risk Factor	Finding	Recommendation	Responsibility	Timeframe
AS1940 - 2004 - The Storage and Handling of Flammable and Combustible Liquids						
3.2.1f	Any installation intended for the storage and handling of flammable or combustible liquids shall be designed and constructed so that it is safe and suitable for the conditions of use. Factors that need to be considered include the identification of the function of every valve, switch or control actuator, including any remote switches or actuators.	Mod	Installed in 1980 and met standards/specs; not current standards	Decommission and install modern system which meets AS1940 Requirements	Julie MacDonald	31/12/06
3.2.1g	Any installation intended for the storage and handling of flammable or combustible liquids shall be designed and constructed so that it is safe and suitable for the conditions of use. Factors that need to be considered include safe access to and egress from all working locations.	High	§ Potential fatality as personnel load& fuel up. Tanks in area of highest traffic flow onsite; traffic coming from 3directions. Identified by BHPB FRCP Hazardous Substance & Surface Mobile Equipment Champions previously.	Decommission and relocate tanks to area clear of traffic and surface mobile equipment interaction. Complete capital justification as soon as possible	Julie MacDonald	31/08/06
3.8.2cii	A sign listing the emergency contact names, titles and phone numbers relevant to the installation should be placed at the entrance to the premises.	Mod	No emergency contact names, titles and phone numbers relevant to the installation should be placed at the entrance to the premises	Place emergency contact names, titles and phone numbers relevant to the installation should be placed at the entrance to the premises	Julie MacDonald	31/09/06

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6.2.2	Joints in piping shall be suitable for the operating pressures, temperatures, materials, and other conditions of use. Particular attention should be paid to the joint's vulnerability to failure in the event of fire and susceptibility to corrosion, particularly if it is buried or submerged. Joint types that are suitable are— (a) threaded joints conforming with AS 1722; and (b) flanged joints conforming with AS 2129. NOTES: 1 Mechanical grooved couplings tested to API 607 should only be used to accommodate misalignment or movement. 2 AS 4041 provides requirements for joints in pressure piping. Any joint in copper pipework shall be made only with a flare compression fitting, or with a capillary fitting using a brazing metal with a melting point of at least 540°C, or by a spigotted joint formed from the pipe itself, and brazed as above. Flare fittings having mismatching cone angles shall not be used.	Mod	Unable to inspect pipe work – underground tank	Decommission and upgrade to a modern system whereby tanks can be readily inspected and alarms sound when leaks occur.	Julie MacDonald	31/12/06
9.3.1	Safe systems of work, including procedures commensurate with the quantity and nature of the liquids being kept, shall be developed, documented and implemented. Written procedures shall be appropriate to the installation and shall include the following: (a) A site plan (or plans) indicating tanks, plant, main pipework, switchboards or substations, emergency stop valves or actuating devices, fire protection systems and drainage. (b) Operating procedures, covering all aspects of the day-to-day operation of the installation. (c) Maintenance procedures, covering regular testing, inspection and monitoring of the equipment. (d) Emergency procedures, covering actions to be taken in the event of fire, spillage, accident, equipment failure or other abnormalities or emergencies (see also Section 10). (e) Construction and maintenance procedures, covering new facilities and repairs to and		§ No formalised or scheduled maintenance program in place	Develop testing, inspection & maintenance program for tanks as per EPA Requirements.	Julie MacDonald	31/12/06

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	modification of existing plant. NOTE: Many states have occupational health and safety legislation that provides for consultative mechanisms at workplaces, enabling management and workers to be jointly involved in the development of procedures and work practices. Procedures shall be documented in notices, manuals or other recorded instructions as appropriate to the particular installation. They shall be either on view or readily available on site. All personnel shall be trained in appropriate procedures (see also Clause 9.10). All personnel shall comply with the procedures established for the installation. An audit system should be established to ensure compliance. Procedures shall be regularly reviewed and modified as necessary, particularly following any equipment or organizational changes.					
9.3.2	Operating procedures shall include, but not be limited to, the following as appropriate: (a) Initial commissioning procedures. (b) Normal handling procedures. (c) Liquid transfer procedures. (d) Monitoring of essential functions and components. (e) Control of hazards, including ignition sources. (f) Manufacturer's operating instructions for equipment. (g) Earthing and bonding. (h) Fault conditions. (i) Housekeeping and site upkeep. (j) Isolation, deactivation and identification of equipment not in use. (k) Maintenance of clear spaces for access. (l) Management of leakage, spillage and clean-up. (m) Personnel safety and protective equipment. (n) Environmental monitoring. (o) Operation of utilities. (p) Fire protection systems. (q) Control of access, movement and activities.	Low	HBL complete inspections but unsure if these inspections meet these standards	Audit compliance of HBL inspection	Chris Gibb	31/09/06
9.3.3	These procedures shall include the following, as appropriate:		Incomplete	Develop standard procedures which meet	Chris Gibb	31/09/06

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	(a) Work authorization, including the issuing of work permits. (b) Work in confined spaces. (c) Testing of instrumentation, protective devices, alarms and monitors. (d) Isolation and tagging of equipment. (e) Control of contractors. (f) Firefighting equipment. (g) Pipework. (h) Storage tanks. (i) Drainage systems and any separators. (j) Bunds. (k) Electrical equipment. (l) Ventilation systems. (m) Fences and security. (n) Lighting. (o) Signs and notices. (p) Plant components, e.g. pumps, fans, package filling equipment.			these requirements		
9.10	9.10.1 Job knowledge All personnel handling flammable or combustible liquids on the premises shall be made fully conversant with — (a) the means of identifying the liquids and the properties of the specific substance handled, by reference to the relevant material safety data sheet (MSDS); and (b) applicable safety regulations and safe-handling procedures. 9.10.2 Training Personnel employed on the premises shall be trained as appropriate, in — (a) the nature of the work and safe methods of operation; (b) the properties and hazards of the substances handled; (c) the location of first aid equipment, and first aid measures to be taken; (d) the correct use of personal protective equipment, its care and maintenance; (e) actions (including evacuation procedures) to be taken in various emergencies, including spills, gas	Mod	No formalise training completed	Develop hazardous substances training for personnel	Julie MacDonald	31/09/06

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	escape, fire and explosion; (f) control measures in place at the facility; and (g) the content and operation of the safety management system. Simulated emergency exercises shall comprise part of the training (see also Section 10). 9.10.3 Contractors Contractors and their staff shall be trained in the following, as appropriate to the specific task to be performed: (a) The safety rules of the installation, including any restrictions on movement, access, activities and use of personal protective equipment. (b) Conditions and obligations associated with work permits and confined space entry permits. (c) Hazards likely to be encountered, including any materials stored or handled on the site. (d) Procedures to be followed in the event of any incident, e.g. spillage, accident or fire. 9.10.4 Refresher training Training procedures shall include provision for refresher training at sufficient intervals to ensure that capability is maintained. 9.10.5 Hygiene All persons whose work involves handling flammable or combustible liquids shall comply with the following directions: (a) Do not introduce, keep, prepare or consume any food or drink, or use tobacco, in any area where the liquids are kept or handled. (b) After handling any liquids, always wash your hands before eating, drinking, smoking or using the toilet, and after work. (c) Immediately attend to injuries caused by contact, or suspected contact, with the liquids. The above directions, or wording to the same effect, shall be prominently displayed in the work area.					
9.11	Records shall be kept of the following: (a) Training and retraining (permanent record). (b) Equipment tests required by this Standard and its referenced documents.	Mod	No formalise training completed	Develop hazardous substances training for personnel	Julie MacDonald	31/09/06

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	(c) In-service inspections (life of installation). (d) Drills (six years). (e) Maintenance and repairs (life of installation). (f) Fires, significant spillage, accident, injury, dangerous occurrence or other incident (life of installation).					
9.18.1a	A safe filling level that allows for thermal expansion shall be established, and shall not be exceeded.	Mod	Marked don dip stick – overfill – unable to install	Decommission and upgrade to modern system with overfill protection – automatic detection available in modern designs	Julie MacDonald	31/12/06
9.18.1c	Filling shall be monitored and controlled so as to prevent the occurrence of overflow, spillage, or excessive pressure in the tank.	Mod	Marked don dip stick – overfill – unable to install	Decommission and upgrade to modern system with overfill protection – automatic detection available in modern designs	Julie MacDonald	31/12/06
10	10.1 SCOPE OF SECTION This Section sets out requirements and recommendations on planning for emergencies. It applies to stores where the volumes of liquid stored are greater than minor storage, or as given in NOHSC:1015. However, this Section may be regarded as advisory for minor storage or those storages having volumes less than those given in NOHSC:1015. NOTE: The fire authority and other emergency service agencies should also be consulted. 10.2 PLANNING FOR EMERGENCIES 10.2.1 Considerations in designing premises The likelihood of an incident occurring in an area used for storage and handling of dangerous goods can be minimized by good design and layout, sound engineering, good operating practices, and proper instruction and training of personnel in the performance of their duties. The design and layout of the facility should consider the following provisions: (a) Sufficient space between bund walls, storage areas and other structures as will allow access for maintenance and during emergencies.	Mod	WCP EMP – no contact list in the event of an emergency	List emergency contact numbers in area. Install phones for communication	Julie MacDonald	31/12/06

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(b) A means for reducing emission of vapours to the outside atmosphere. (c) Alarms connected directly to the fire brigade or 24 h monitoring services. (d) Water supplies. (e) Fire protection equipment. (f) A means of evacuation and assembly points. (g) Protection of personnel responding to an emergency. (h) Access routes for fire brigade appliances. (i) Containment of leaks, spills and run-off of firefighting water (see Clause 5.8 and Section 11). (j) The location of the emergency plan and safety information (see Clause 9.5.2). 10.2.2 Emergency plan 10.2.2.1 General A detailed plan for combating emergencies that could occur on-site shall be prepared. Such a plan should be developed in consultation with the emergency services and relevant regulatory authorities. The emergency plan shall— (a) take into account any potential for the occurrence of fire, explosion, natural disaster, reaction or release of dangerous goods; (b) be appropriate to the size and complexity of the installation, its resources and personnel; and (c) be regularly reviewed and updated as necessary. Plant personnel shall be familiar with the contents of the emergency plan. 10.2.2.2 Review of emergency plan The emergency plan shall be kept up-to-date and reviewed and revised where necessary. For example, a review should be undertaken whenever— (a) a new type of liquid is introduced to the premises; (b) the quantity of liquids being kept is changed; (c) a change is made in the way the liquids are stored or handled; (d) a change is made in a process or procedure,				
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	which might result in a change of risk; (e) new information regarding the hazardous properties of a substance is established; or (f) problems are encountered during training or after an incident. 10.3 MANIFEST A manifest shall be provided and maintained in accordance with NOHSC:3010. 10.4 PLACARDING Stores shall be placarded in accordance with Clause 9.5.1.					
11.3	11.3.1 General Fire protection systems shall be appropriate to the hazard and include consideration of adjoining activities and materials, so as not only to deal with incidents within the storage but also to reduce the potential for the liquids to become involved through the escalation of another incident. 11.3.2 Equipment compatibility In designing a fire protection system, equipment needs to be optimized and adaptable, so that it can be used effectively in a variety of likely events. Materials used in a fire protection system shall be suitable for the conditions of use and compatible with the liquids being stored. All firefighting media, appliances, equipment, components, hoses, connectors, booster connections, and the like shall be compatible with that of the local fire authority at all essential interfaces. Particular attention should be paid to provisions and procedures to cater for possible variations in the type of foam concentrate, mixing ratios, application methods and application rates. 11.3.3 Location of firefighting equipment Any firefighting equipment shall be located so as to be reasonably adjacent to the risk being protected and accessible without undue danger in an emergency. 11.3.4 System integration The fire protection facilities specified in this Section shall be either an independent system or integrated with other fire protection systems covering this or	High	§ Close proximity to waterways; operating SME/Traffic Management Plan	Decommission and relocate to an area away from water treatment ponds and heavy surface mobile equipment interaction	Julie MacDonald	31/12/06

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adjoining installations, to achieve the same result (mutual aid). 11.3.5 Weather protection Any firefighting equipment that is susceptible to corrosion or degradation by weather, the environment, ultraviolet light, fumes and the like, shall be protected by a sheltered location or a protective enclosure, with the contents suitably labelled. 11.3.6 Labelling of firefighting equipment All firefighting equipment shall be marked or labelled in accordance with the relevant Australian Standard. Other firefighting resources, such as water storage tanks, should be clearly identified. NOTE: Advice may be sought from the fire authority. 11.3.7 System drawing illustrations A layout plan showing the locations of all tanks, shut-off valves, pipelines, hydrants, and firefighting systems shall be provided and kept available for ready reference. Adequate wall-charts should be displayed in strategic control locations. 11.3.8 Equipment and piping identification Firefighting equipment and piping shall be provided with the following means of visual identification: (a) Water piping and valves within the foam pumphouse: R13—Signal Red. (b) Pumps, above-ground piping, and valves containing foam concentrate: B15—Mid Blue. (c) Above-ground foam solution lines and valves within the pumphouse: B25—Aqua. (d) Outside hydrants and firefighting equipment: colours as in Item (a) or (c) and the word WATER or FOAM, as appropriate. (e) Cabinets containing firefighting equipment: painted in accordance with Items (a), (b) or (c), as appropriate. (f) Control points for water or foam: the word WATER or FOAM, as appropriate. 11.3.9 Impact protection All equipment, piping and valves shall be adequately supported and protected, taking into				
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	consideration the potential for traffic damage and projectile impact during a fire. 11.3.10 Maintenance of fire protection equipment Fire protection systems and equipment shall be maintained in accordance with the relevant part of AS 1851. In addition the following requirements shall apply to the maintenance of foam systems: (a) At least annually, all foam systems shall be thoroughly inspected and checked for proper operation. The inspection shall include the quality of the foam concentrate or premix solution quality or both. Test results that deviate more than 10% from those recorded in acceptance testing shall be discussed immediately with the manufacturer. (b) The inspection report, with recommendations, shall be filed with the owner. The requirements for performance evaluation of foam concentrate or premix solution shall be in accordance with the maintenance requirements of NFPA 11.				
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RISK CONSIDERATIONS		
General Impact	Safety Impact	Environmental Impact (Contamination or Pollution)
High	Fatality or permanent disability	Off site
Moderate	Serious lost time injury or illness	Major on site
Low	Moderate lost time injury	Minor on site
No Impact	No lost time	Safely contained and cleaned up

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