Procedure

Hazardous Areas

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Contents

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1. Purpose

The purpose of this Procedure is to define systems and processes to effectively manage the risks associated with hazardous areas on Seqwater sites.

2. Scope

This Procedure applies to all employees, contractors and consultants working for or on behalf of Seqwater, unless otherwise stated.

3. Critical Controls for Hazardous Areas

Critical Controls for Hazardous Areas		
	Critical Controls	**Objective**
1	Delineated 'hazardous areas' (explosive atmospheres) ventilated and fitted with compliant IP rated equipment	To identify potentially explosive atmospheres and prevent ignition sources therein.

4. Procedure

4.1. What are hazardous areas?

A hazardous area, for the purposes of this Procedure, is any area where an explosive gas is present or a combustible dust is present, or could reasonably be expected to be present, in a quantity that requires special precautions to be taken for the construction, installation and use of the item of plant.

Hazardous areas must:

- be assessed by a competent person.
- have appropriate signage.
- be supported by a folder that is saved in REX.
- be listed on Seqwater's Hazardous Area Register (REG-01043)
- have an appropriate inspection program established for any explosion-protected ignition sources or electrical equipment located within the hazardous area.

4.2. Identification and classification of hazardous areas

All hazardous areas in Seqwater workplace must be identified and classified into specific zones in accordance with AS/NZS 60079.10.1 Explosive atmospheres – Classification of areas – Explosive gas atmospheres and AS/NZS 60079.10.2 Explosive atmospheres – Classification of areas – Combustible dust atmosphere. The classification of hazardous areas is to allow the proper selection of equipment, particularly electrical equipment, to be installed or used in the areas.

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The following within Seqwater workplaces must be assessed to determine if they are classified as hazardous areas:

- Powder Activated Carbon (PAC) installations and storage areas.
- ammonia tank and building
- methanol installations and storage areas
- fuel storage areas and associated installations (including petrol tanks, diesel tanks etc.)
- laboratory and fume cupboard where flammable liquid is handled.
- any other areas were recommended by a risk assessment.

For an existing area that has a potential to be classified as a hazardous area but has not been assessed by a competent person, the Regional Manager responsible for the area must facilitate an assessment and classification of the hazardous area in consultation with HSW Team and Engineering Standards and Assurance (ESA) Team.

For a new area that has a potential to be classified as a hazardous area, the Project Manager must facilitate the assessment and classification of the area once the initial process and instrumentation line diagrams and initial layout plans are available. The classification must be confirmed before plant start-up.

The assessment must be undertaken by a competent person who has also received appropriate training in accordance with Joint Series of Competency Standards – *AS/NZS 4761: Competencies for working with electrical equipment for hazardous areas (EEHA)*.

The type and extent of the zone is assessed after taking into consideration the following factors:

- the likelihood and amount of vapour / dust produced.
- the class / group of the vapour / dust
- the lower explosive limit of the generated vapour / dust
- the level of ventilation under all conditions
- the temperature class of the zone.

The outcome of the hazardous area assessment and classification must be reviewed by the Seqwater Operations, ESA and HSW Teams.

Once a hazardous area is confirmed, the HSW Team is to update the relevant workplace HSW risk register and the Hazardous Area Register (REG-01043), minimum review for the Hazardous Area register is every 3 years.

4.3. Signage for the hazardous areas

All hazardous areas are to be clearly defined and marked / signed in accordance with *AS 1319: Safety Signs for the Occupational Environment*. Appropriate warning signs, diagrams and line markings must be clearly displayed around the hazardous area so that everyone in the vicinity of the installation or hazardous area is aware of the hazard.

4.4. Hazardous area verification dossier

The Regional Manager is responsible for making sure that a verification dossier is compiled and maintained for every hazardous area within their responsible areas. The dossier should contain the information detailed in the relevant Australian Standard.

As a minimum for the following information should be included in the dossier:

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- area classification and zone diagrams
- installation and maintenance instructions
- record of maintenance and safety inspections.

Detailed verification dossier requirements are outlined in the Appendix A of this Procedure.

The Regional Manager must coordinate the development or update of a hazardous area verification dossier following:

- the building or installation of a new hazardous area
- any changes to the layout or original design to the hazardous area
- repairing, replacement or installation of any items of equipment in the hazardous area
- maintenance and inspection undertaken in the hazardous area.
- changes to the ownership or management of the hazardous area
- any other situations that impact the accuracy of the hazardous area dossier.

The updated verification dossier must be provided to the Asset Management Team in each region and an electronic copy must be kept in REX. It must be readily available to all workers required to enter and / or work in the hazardous area. A hard copy of the dossier must be available for examination by any inspection authority.

4.5. Design, install, construct and modify the structure, plant and installations in a hazardous area.

Any Seqwater worker who develops a business case for a project that may involve the design, construction, installation or modification to a structure, plant or installation within a hazardous area must, so far as is reasonably practicable:

- identify the presence of an explosive atmosphere and the required actions to manage the risks or deliverables.
- identify and state all the relevant Australian Standards and Seqwater engineering standards that are applicable for the type of work.

The Project Manager must ensure, so far as is reasonably practicable during the concept design, detailed design, construction, installation, commissioning of a plant or structure that:

- the presence of explosive atmosphere in quantities is eliminated during the design or modification of the structure, plant and installations in which flammable and / or combustible materials are generated, stored and/or handled.
- where the elimination of explosive atmosphere is not reasonably practicable, containment and other engineering controls are considered to minimise the risks of flammable gasses or dusts.
- the Seqwater Engineering Design, Construction, Operation and Maintenance Procedure (PRO-01617) is followed.
- AS/NZS 60079 and AS/NZS 61241 is followed during the design, selection and installation of electrical equipment within a hazardous area.
- the design, selection and installation of electrical equipment within a hazardous area is carried out by a competent person.
- the electrical installations in hazardous areas are inspected by an accredited auditor in accordance with the Electrical Safety Regulation 2013 (Qld) prior to connection or reconnection to a source of electricity if:

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- the installation is being connected for the first time.
- the electrical installation work has been performed on an electrical installation within a hazardous area.

The Regional Manager, the ESA Team and HSW Team and other stakeholders must be notified of any new hazardous areas or modifications to or within existing hazardous areas.

4.6. Managing the risks of hazardous areas

4.6.1. Ignition source

- Any materials with the potential to be an ignition source must not be taken within 3m of a hazardous area. This includes electrical equipment (such as mobile phones and pagers) and sources of naked flames (such as matches and cigarette lighters).
- All equipment to be taken into a hazardous area is to be rated as Explosion Protected.
- Non-explosion protected portable equipment is only to be taken / used in a hazardous area if a risk assessment indicates that it is safe to do so, and appropriate controls are implemented and monitored.
- Care should be taken using alloy tools, scaffolding, ladders and rusty metal as striking these together could produce a thermite reaction and hence the possibility of an explosion in a hazardous area.
- Battery operated vehicles (e.g., forklifts) to be used in a hazardous area are to comply with AS 1915: Electrical apparatus for explosive atmospheres – Battery operated vehicles.

4.6.2. Avoidance of static electricity

To guard against static electricity discharge:

- all tanks, pipe work, transfer systems and process plant associated with the storage and handling system should be earthed, or otherwise protected, in accordance with AS/NZS 1020 The control of undesirable static electricity.
- antistatic additives should be used in nonconductive liquids and conductive clothing, especially footwear, should be worn.
- ignition sources outside hazardous areas must be controlled.
- all other ignition sources on premises where dangerous goods are stored and handled should be identified and the sources eliminated, or controls put in place where there is any likelihood that those ignition sources could ignite a hazardous area.
- Hot Work Permit

The Management of Hot Work Procedure (PRO-00009) must be followed if any hot work is to be carried out within or in the vicinity of a hazardous area. A SWMS (TEM-00013) and Hot Work Permit (FRM-00040) must be completed and appropriate controls must be implemented.

4.6.3. Workers performing electrical work

Wherever practicable, electrical apparatus is to be installed outside a hazardous area. If this is not reasonably practicable, the electrical apparatus is to be placed in the least hazardous location inside the hazardous area.

Workers performing electrical work e.g., installing and maintaining electrical equipment within a hazardous area must be trained in Electrical Equipment in Hazardous Area (EEHA).

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Only authorised electrical workers who are hazardous area qualified (UEE 42611 Certificate IV in Hazardous Areas) are to perform fault finding tasks in hazardous area.

When electrical installation work is performed in a hazardous area, it must not be connected to a source of electricity unless it has been inspected by an accredited auditor in accordance with the *Electrical Safety Regulation 2013 (Qld)* to confirm that it is electrically safe and complies with relevant standards.

4.7. Inspection and maintenance

All explosion protected ignition sources located in hazardous areas are to be regularly inspected and maintained by a competent person.

All electrical equipment in a hazardous area must be inspected and maintained in accordance with the *AS/NZS 60079. 17 Part 17: Electrical installations inspection and maintenance*. The periodic inspection should be carried out at least once every four years by a competent person. Copies of inspection reports must be included in the hazardous area verification dossier.

A hazardous area inspection must be conducted following any installations in a hazardous area are altered. The completed inspection report must be added to the site hazardous area verification dossier.

5. Training requirements

The below table should be referenced for workers who may be potentially exposed to hazardous areas in the workplace so as to provide appropriate information, supervision, instruction and training.

Requirement	Description	Refresher Timeframe	Target Audience
Certificate IV in Hazardous Areas - Electrical	This qualification provides competencies related to the selection, installation, maintenance, inspection and testing of explosion-protected equipment and systems for control and monitoring of plant and processes.	4 years	Any person on the electrical worker register who have hazardous areas in their area pf operations and undertake electrical work within a Hazardous Area
Hazardous Areas Awareness	This course introduces a range of concepts relating to explosive atmospheres, including the legislative requirements, relevant standards and common safety procedures.	4 years	Non-electrical workers involved with entering (to carry out checks) and maintaining equipment in Hazardous Areas.

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6. Definitions

Term	Definitions
Competent person	A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform a specified task correctly.
Dangerous goods	Substances, mixtures or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment.
Hazardous area	Means an area in which: (a) an explosive gas is present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant; or (b) a combustible dust is present, or could reasonably be expected to be present, in the atmosphere in a quantity that requires special precautions to be taken for the construction and use of plant.
Hazardous chemicals	Means a substance, mixture or article that satisfies the criteria for a hazard class in the Globally Harmonised System (GHS) (including a classification mentioned in schedule 6 of the *Work Health and Safety Regulation 2011* (Qld)), but does not include a substance, mixture or article that satisfies the criteria solely for one of the following hazard classes: (a) Acute toxicity – oral – category 5 (b) Acute toxicity – dermal – category 5 (c) Acute toxicity – inhalation – category 5 (d) Skin corrosion/irritation – category 3 (e) Serious eye damage/eye irritation – category 2B (f) Aspiration hazard – category 2 (g) Flammable gas – category 2 (h) Acute hazard to the aquatic environment – category 1, 2 or 3 (i) Chronic hazard to the aquatic environment – category 1, 2, 3 or 4; or (j) Hazardous to the ozone layer.
Incident and Emergency Response Plan (IERP)	The written document of the emergency arrangements for a workplace or identified activity. It consists of the preparedness, prevention and response activities and includes the agreed emergency roles, responsibilities, strategies, systems and arrangements. Where possible, it will also include fire and evacuation plans for any buildings occupied by Seqwater and covered by an Emergency Response Plan.

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Term	Definitions
Worker	Worker means a person who carries out work in any capacity for Seqwater, including work as: • an employee • a contractor or subcontractor • an employee of a contractor or subcontractor • an employee of a labour hire company who has been assigned to work at Seqwater. • an outworker • an apprentice or trainee • a student gaining work experience. • a volunteer • a worker of a prescribed class.
Workplace	A place where work is carried out by Seqwater and includes any place where a worker goes, or is likely to be, while at work. This includes a vehicle, vessel or other mobile structure.

7. Roles and Responsibilities

Role	Responsibility
Managers	• Ensure, so far as is reasonably practicable, the implementation of the requirements of this Procedure within their area of responsibility. • Facilitate the assessment and classification of existing hazardous areas within their responsible area. • Manage hazardous areas in accordance with the requirements of this Procedure.
Line Supervisors	• Establish a process within their team so that risks associated hazardous areas are identified, assessed, controlled and evaluated. • Facilitate the provision of training, instruction and supervision to workers who are required to work withing a hazardous area.
Project Manager	• Follow the Seqwater Engineering Design, Construction, Operation and Maintenance Procedure (PRO-01617) to make sure that the relevant Seqwater engineering standards are complied with during the project's delivery. • Facilitate the assessment and classification of any new hazardous areas that is created as part of the project works. • Provide a hazardous area verification dossier for any new hazardous areas created as part of the project handover. • Update the relevant hazardous area verification dossier following the completion of any work on an existing hazardous area.

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Role	Responsibility
Health Safety and Wellbeing (HSW) Team	• Provide support and advice on the management of the risks associated with hazardous areas.
Engineering Standards and Assurance (ESA) Team	• Maintain engineering technical standards that are relevant to hazardous area applications. • Provide subject matter expertise (SME) during hazardous area classification and design. • Review hazardous area design, associated electrical installations and the supporting verification dossier. • Provide technical advice to Project Managers to resolve requests for information and variation claims related to hazardous area design and installation during project execution.
Workers	• Do not bring any ignition sources into a hazardous area. • Only perform electrical work within a hazardous area if they are trained and qualified.

8. References and Related Materials

Description	Location
AS 1319: Safety Signs for the Occupational Environment	SAI Global
AS/NZS 2381.1. Electrical equipment for explosive gas atmospheres - Selection, installation and maintenance - General requirements	SAI Global
AS/NZS 4761: Competencies for working with electrical equipment for hazardous areas (EEHA).	SAI Global
AS/NZS 60079.10.1 Explosive atmospheres – Classification of areas – Explosive gas atmospheres	SAI Global
AS/NZS 60079.10.2 Explosive atmospheres – Classification of areas – Combustible dust atmosphere	SAI Global
AS/NZS 60079: Electrical installations inspection and maintenance	SAI Global
Electrical Safety Regulation 2013 (Qld)	Qld Legislation Page
FRM-00040 Hot Work Permit Form	REX & Waternet
PRO-00009 Management of Hot Work Procedure	REX & Waternet
PRO-01617 X-PRO-STD-009 Engineering Design, Construction, Operation and Maintenance Procedure	REX & Waternet
REG-01043 Hazardous Area Register	REX & Waternet
TEM-00013 Safe Work Method Statement (SWMS) Template	REX & Waternet

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Appendix A: Hazardous area verification dossier

A hazardous area verification dossier shall include the following documentation and records as appropriate.

Hazardous area documentation

- A schematic diagram of the zonal area classification. The diagram must identify the areas as follows:
- Zone 0, Zone 1, Zone 2 and Non–hazardous for flammable Gas/Vapour Atmospheres
- Zone 20, Zone 21, Zone 22 and Non–hazardous for Combustible Dust Atmospheres.
- The classification of the hazardous areas, and the standards used for the classification.
- Equipment Group and Temperature Class of equipment.
- LEL (Lower Explosive Limit), UEL (Upper Explosive Limit), flashpoint and auto ignition temperature of flammable gas/vapour or combustible dust
- Explosion protection techniques
- A SDS for the product causing the hazardous area environment must be included in the Verification Dossier.

This information is used to ascertain the appropriate equipment grouping and the temperature class.

Equipment identification

- A legend that identifies the specific item of equipment and the Australian Standard Approval Number (e.g. Aus Ex 1234X).
- Documentation certifying that the equipment is rated for the voltage and frequency applied during normal operation.
- Detailed reference to any item of uncertified equipment including type, number, manufacturer, and justification for its use.
- Documentation relating to the suitability of the equipment for the area and environment to which it is exposed, e.g. T rating, Ex rating, IP rating and corrosion resistance (see AS/NZS 60079.14 for further details).
- Complete Certificates of Conformity for every item of ex-rated electrical equipment, electrical accessories, and ancillary equipment installed in the defined hazardous location.
- Documentation confirming the selection criteria for cable within the specific requirements of AS/NZS 60079.14.
- Documentation confirming the selection criteria for Cable Glands (see AS/NZS 60079.14 for further information).
- The Certificates of Conformity obtained from the provider of the equipment at the time of purchase.

Installation documentation

- Installation instructions and technical drawings for the ex-rated equipment as provided by the manufacturer. Descriptive system document for Intrinsically Safe Systems (if applicable these documents must contain all appropriate requirements for compliance with AS 60079.14).
- The intrinsically safe documentation must provide all necessary calculations and confirm the intrinsically safe rating of equipment (e.g. Ex ib 11C T4).

Maintenance documentation

- Records sufficient to enable the explosion protected equipment to be maintained in accordance with its type of protection.

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- Records of maintenance, overhaul, and repair of the equipment. Overhaul of ex-rated equipment shall comply with the relevant requirements of AS/NZS 3800.

Inspection checklist

- Inspection schedule as per the appropriate Australian Standard for the type of protection in use.

Records of equipment selection criteria

- The records must demonstrate that the selected equipment satisfies the requirements for the explosion technique being used.

Management documentation

- A statement of identity of the person(s) having legal ownership of the installation or parts thereof and where the verification dossier is located
- A declaration of conformity signed by the person responsible stating that the documents contained in the dossier are a true and accurate description of the equipment installed in the defined hazardous location

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