

Work Safety and Wellbeing

Confined Space Management

SPECIAL CONSIDERATIONS

Confined spaces pose a significant risk of injury or death because workers may be exposed to unsafe oxygen levels or atmospheric contaminants and are restricted in their ability to remove themselves from harm if there is a hazard present, particularly if they are alone.

Infrastructure and Assets (I&A) is responsible for identifying work areas that meet the definition of confined space as per the Confined Spaces Code of Practice 2011 and maintaining a register of confined spaces at all West Moreton Health (WMH) facilities, and for installing warning signage at all such locations. All known places of work that are confined spaces have been identified and sign posted as such in WMH.

If an unsigned or unknown confined space location is identified as being a place where work needs to occur, all work must cease, and the identification process outlined in [section 5.2](#) must be followed and the location added to the Confined Space Register and signage attached.

Where any work is to be undertaken that requires entry to a confined space, a risk assessment (SWMS) must be completed for the area and the work to be done. All construction/ maintenance activity within confined spaces at WMH are also subject to a I&A Permit to Work and shall only be undertaken by trained and competent staff.

1. Purpose

This document describes processes to minimise the risk to staff and contractors entering and undertaking work in confined spaces within West Moreton Health (WMH).

It supports the health and safety of all persons entering or working in confined spaces by preventing exposure to hazards which may be experienced when working in a confined space thereby reducing the risk of collapse, injury, illness or death arising from exposure to those hazards.

Background

Confined spaces are dangerous because physical access/egress restrictions or chemical agents within the space may give rise to risks that might not occur if the space was not confined. The result may be unsafe oxygen levels or atmospheric contaminants which are dangerous to life or health but not immediately obvious.

Hazards and risks can rapidly change in a confined space. For example, the atmosphere might have changed since the last entry, or the activities planned to be done in the space might create a different hazard such as toxic fumes from petrol-powered plant, etc.

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Wherever possible, if a task can be performed without entry into the confined space, this is preferable to entering the space. A person is deemed to 'enter' a confined space if their breathing zone (head and upper body) crosses the entry point into the space.

2. Scope

This document relates to all staff including contractors, consultants, labour hire workers and others engaged in work activities that require confined space access or entry at any WMH sites and locations.

3. Statement / Commitment

WMH is committed to the health and wellbeing of all workers (including staff and contractors) through the appropriate management of confined spaces aimed at preventing and minimising hazards and incidents where possible. WMH will ensure all workplace hazards and risks are managed by elimination or control, using a risk management approach, in accordance with this procedure.

4. Principles

The principles of this procedure are based on statutory requirements and standard industry practice. WMH is committed to the highest standards of staff and patient safety and uses best practice methodologies to create a safe work environment for our staff and others. The safety of our people is our highest priority. We strive to and are committed to continuous and sustainable improvement of health and safety management.

5. Process

5.1 Identification of Confined Spaces.

Confined space workplaces within WMH will be determined by an authorised I & A person/contractor who has been deemed competent in the management of Confined Spaces. To determine a Confined Space, the following four questions must be answered YES. If ANY of the four questions is answered NO, then the space is not a legal confined space, but may however be a [restricted space](#) and should be managed through the use of a SWMS.

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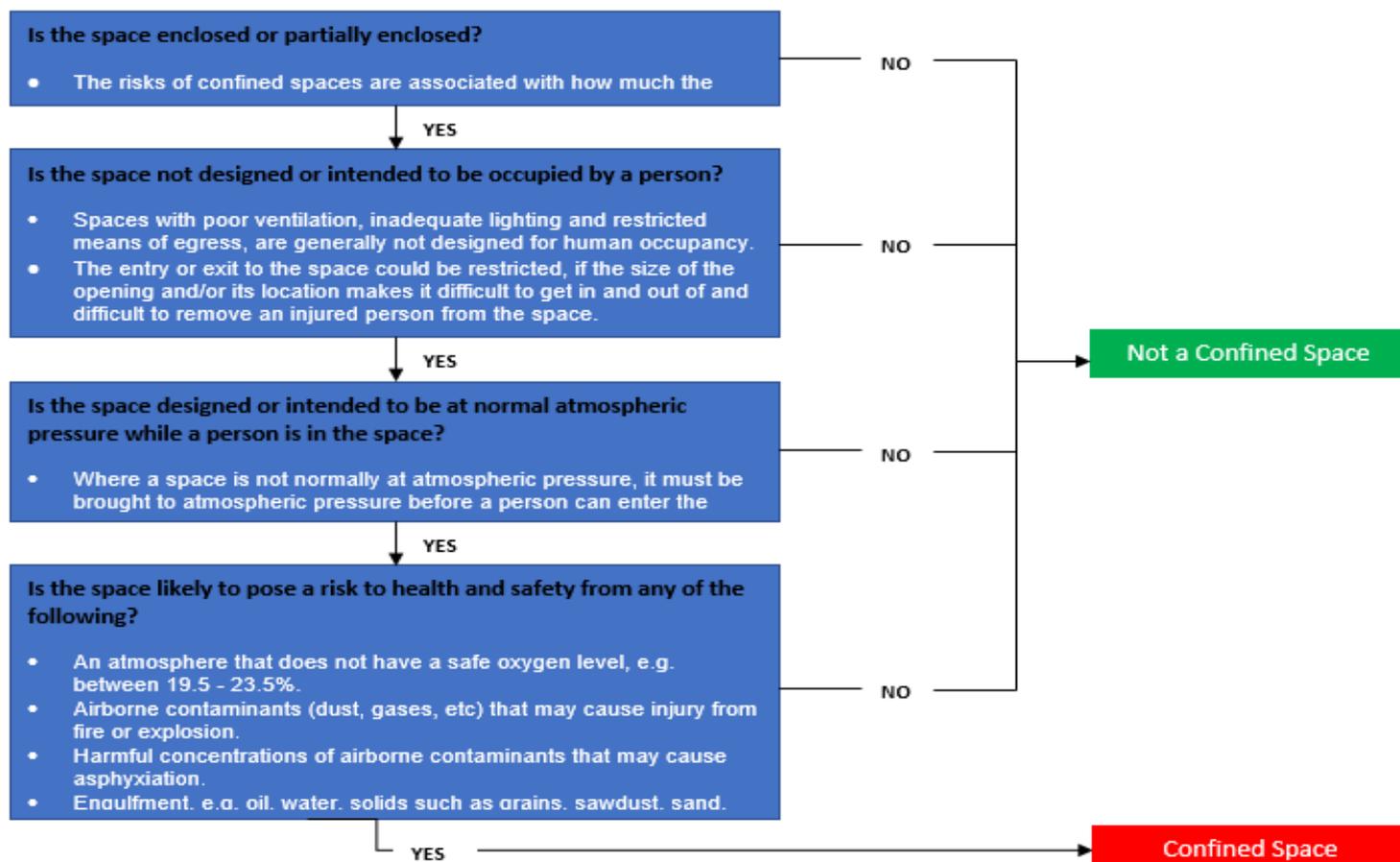


Figure 1: Identification of Confined Spaces

5.2 Is the space, a confined space, based on use?

A confined space is also determined by the hazards associated with the specific situation - not just because work is performed in a small space. It must have a risk to health and safety from an atmosphere that doesn't have a safe oxygen level, contains airborne gases, contaminants, vapours and dusts, or has the risk of engulfment.

Entry to a confined space is considered to have occurred when a person's head or upper body enters the space.

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Confined Space determination criteria for specific locations							
If the answer to A, B, C and at least one of D is YES, then the space is a confined space.							
Description of the space and/or activity	Confined Space Criteria						Confined Space?
	A	B	C	D			
	Is the space enclosed or partially enclosed	Is the space not designed or intended to be occupied by a person	Is the space designed or intended to be at normal atmospheric pressure while a person is in the space?	Does the space present a risk from			
				Harmful airborne flammable contaminants	An unsafe oxygen level	Engulfment	
Sewer with access via a vertical ladder	✓	✓	✓	✓	✓	✓	Yes
Inspecting a used fuel tank	✓	✓	✓	✓	X	X	Yes
Inspecting a new fuel tank prior to commissioning	✓	✓	✓	X	X	X	No
Dislodging a sludge blockage in a drain pit	✓	✓	✓	✓	✓	✓	Yes
Stocktake using an LPG forklift in a store room	✓	X	✓	✓	X	X	No
Installing insulation in a roof cavity	✓	✓	✓	X	X	X	No
Installing or maintaining electrical cables in a roof cavity	✓	✓	✓	X	X	X	No

A space may not be ordinarily seen as a confined space but may become a confined space based on the work that is to be carried out, changing the spaces environment, e.g. via welding gases.

Temporary control measures such as providing temporary ventilation or achieving a satisfactory pre-entry gas test will not cause a confined space to be declassified. For a confined space to be declassified as a non-confined space, it needs to have undergone sufficient changes in structure and use, to eliminate all hazards that define it as a confined space.

The flowchart tool in section 5.1 above, the table above ([section 5.2](#)) or definitions in [Appendix 1](#) extracted from the Confined Spaces Code of Practice will help to determine whether a space is a 'confined space' for purposes of the *WHS Regulations 2011*.

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Where possible, identification of a confined space should be made without entry into that space or area. The entry points to identified confined spaces are to be signposted and secured against unauthorised entry whenever practicable.

5.3 Designated Confined Spaces.

The following asset types are generally identified as confined spaces: (see [section 5.2](#) above)

- Sewers, siphons and combined sewer / stormwater systems
- Sewage Pumping station (SPS), wet wells.
- Treatment process tanks and conduits, including enterable grease traps, grease trap rooms.
- Traversable water mains.
- Enclosed water distribution reservoirs.
- Storage tanks of any kind, including enclosed containment and retention devices.

5.4 Possible Confined Spaces.

I&A Managers/Supervisors must use the definition in Section 8, '[Definition of Terms](#)', to determine if the following assets are also confined spaces:

- Traversable enclosed stormwater drains and pits;
- Water pumping stations, access chambers, and valve chambers;
- Sewage Pumping Station (SPS), dry machinery wells;
- Parts of treatment plants that are not tanks or conduits;
- Enterable vent shafts;
- Building and roof cavities (including ceiling and accessible wall spaces);
- Chemical and solvent stores;
- Assets not designed as confined spaces but may inherit confined space conditions from tasks performed;
- Excavations and assets under construction, including: trenches, boreholes, tunnels, pits, etc.

5.5 Evaluating the hazards that may exist in a Confined Space.

Many factors need to be evaluated when looking for hazards in a confined space. An error in identifying or evaluating potential hazards can have very serious consequences. In some cases, the conditions in a confined space are always extremely hazardous. In other cases, conditions are life threatening under an unusual combination of circumstances. This variability and unpredictability is why the process of hazard and risk identification and assessment is extremely important and must be taken seriously each and every time one is undertaken.

Identifying confined space hazards involves finding all of the things and situations that could potentially cause harm to people. Knowing the types of substances previously stored in a confined space (however briefly) will indicate the sorts of hazards that may be present. Substances stored in a confined space may result in a changed atmospheric condition, within that space. Other hazards may arise from work activities, products or by-products, in or around the confined space.

Small entrances and exits may make it difficult to rescue workers or to get equipment in or out of the confined space. In some cases, entrances and exits may be very large but their location can make them difficult to access. For example, accessing some pits or openings may require the use of ladders, hoists or other devices, and egress from such spaces may be difficult in emergency situations.

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5.5.1 Consider the following types of hazards

- Those, due to the use of the confined space, such as: water, sewage, stormwater, recycled water, flammable gas, air quality hazards, chemicals and trade waste.
- Associated plant, such as: pumps, valves, mixers, and chemical dosing units.
- Asset design and structural hazards, such as: narrow pipes and awkward access.
- Nearby hazards, such as: water or gas mains, large water storages, vapours from fuel or chemical facilities, engine exhaust, traffic, contaminated land, other construction or maintenance work, stormwater runoff, groundwater infiltration.
- Task or site related hazards that may exist for any work, such as: hot work, hot and cold environments, noise, electricity, manual handling, excavation, working at heights, asbestos, poor lighting; working in, near or over water.

5.5.2 Physical hazards associated with a confined space

- | | |
|---|--|
| <ul style="list-style-type: none"> • restricted entry or exit • harmful airborne contaminants • unsafe oxygen level • fire and explosion • engulfment • uncontrolled introduction of substances • biological hazards • mechanical hazards | <ul style="list-style-type: none"> • electrical hazards • skin contact with hazardous substances • manual tasks • radiation • environmental hazards • hazards outside the confined space • additional physiological and psychological demands |
|---|--|

5.6 How to Identify hazards related to Confined Spaces.

- 5.6.1** An I&A person who is competent in identifying compartments/spaces within WMH that meet the definition of a confined space is required to conduct a risk assessment of that space. The chart in [Section 5.2](#) will also assist to determine whether a space is a 'confined space'.

Once the confined spaces have been identified, the location and risk must be recorded, and warning signage installed, as well as be included in a I&A Confined Space Register, along with the risk assessments for each of the spaces. The register and associated risk assessment must be provided to any person proposing to enter and conduct work within the spaces, prior to gaining entry.

When a new confined space is identified, or a space becomes eliminated by re-purposing or re-design, etc, the confined space register must be updated.

- 5.6.2** Only Trained Competent persons shall be allowed to enter a Confined Space. Entry to a Confined Space must comply with *Part 4.3 Confined Spaces WHS Regulations 2011*.
- No Person shall enter a confined space unless the hazards associated with conducting the task in the confined space have been identified.
 - A Risk Assessment has been conducted by a competent person or persons before conducting any tasks associated with the confined space. The assessment must be documented.

- 5.6.3** The documented risk assessment must list the risk control measures that must be taken into account and include at least the following:
- i. the need to enter the confined space. This can be done by considering if work could be carried out from outside the confined space by using remote cameras or a mirror attached to a probe for internal inspections etc.;
 - ii. the hazards of the confined space, such as entering, working in, on or in the vicinity of the confined space (including a risk of a person inadvertently entering the confined space);

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- iii. the tasks required to be conducted;
- iv. the risks involved with the actual method of entry, work selected, and equipment proposed to be used;
- v. the competency of the person to conduct the tasks;
- vi. the availability of a competent safety observer;
- vii. emergency response procedures and protocols.

NOTE: If a risk assessment identifies a risk to health or safety arising from work in a confined space, the risk shall be eliminated or, if this is not possible, minimised by the implementation of appropriate risk control measures, using the hierarchy of control.

5.6.4 Generic risk assessment

A single (or generic) risk assessment may be carried out for a class of confined spaces in a number of different work areas or workplaces where the confined spaces are the same. This is only appropriate if all the hazards being covered are the same. A risk assessment must be carried out on individual confined spaces if there is any likelihood that a worker may be exposed to greater, additional or different risks.

5.6.5 Risk control

WMH follows the Confined Spaces Code of Conduct and *Part 4.3 Confined Spaces WHS Regulations 2011* which requires a Permit to Work to be in place to access a confined space.

Permits to Work can only be approved by [trained](#) and authorised Infrastructure and Assets (I&A) staff after the development and validation of a Safe Work Method Statement (SWMS), for the work to be performed. If entering a confined space cannot be avoided, then the risk must be minimised by a safe system for working inside the space by control in the following ways:

- All potentially hazardous services in the confined space are isolated (electricity, gas, water, sewerage etc) where practical in order to prevent compromising the safety of workers entering the confined space;
- The introduction of any materials, containments, agents or conditions harmful to persons occupying the confined space;
- The activation or energising in any way of equipment or services which could pose a risk to the health and safety of persons within the confined space;
- Atmospheric testing and monitoring shall be carried out consistent with the hazards identified and the risk assessment (only in conjunction with use of an authorised and completed Confined Space Entry "Permit to Work");
- A Confined Space Entry Permit must be completed and lodged with I & A during normal working hours and authorised before work commences;
- No keys or access will be granted without a Confined Space Entry "Permit to Work" being approved.

NOTE: No entry to a confined space can occur, unless:

- A risk assessment (SWMS) has been completed by a competent person;
- A written authority (Permit to Work) is provided to, or completed by, the person responsible and with direct control of, the work in the confined space;
- A record of their presence in the confined space is maintained;
- The confined space contains an oxygen level within the safe oxygen range;
- The atmospheric containments in the confined space are reduced to, or measured as, below the relevant exposure standards;
- No flammable gases are detected in the atmosphere of the confined space.

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Control measures are to be reviewed and if necessary revised:

- when the control measures do not minimise the risk so far as reasonably practicable;
- before a change at the workplace that is likely to give rise to a health and safety risk that the control measures may not effectively control;
- if a new or changed hazard is identified;
- if, as a result of consultation, the information indicates that a review is necessary;
- after an incident or accident.

5.8 Confined space entry permit.

A confined space entry permit must be issued for each entry into a confined space. Each permit only applies to one confined space and allows one or more workers (if specified) to enter that space. A competent person who directs and supervises the work should be nominated and authorised to issue the permit.

Workers and their supervisors must have the skills and knowledge to understand the hazards associated with working in the confined space, the contents of any confined space entry permit, and the control measures implemented for their protection.

Each worker must be able to read and understand the entry permit. The permit must be kept until the work is completed, or if a notifiable incident occurs, for at least 2 years after the confined space work to which the permit relates is completed.

During the validity period of the confined space entry permit workers entering and exiting the confined space are to sign in and out on the entry permit.

The entry permit must:

- specify the confined space to which the permit relates;
- record the names of persons permitted to enter the confined space;
- specify the period of time that the work will be carried out;
- set out risk control measures based on the risk assessment (SWMS);
- contain an acknowledgment that work in the confined space has been completed and all persons have left the space.

A new, revalidated or separate entry permit must be completed whenever:

- The confined space team exits and then re-enters the space, such as: a lunch break;
- More than one team enters the confined space;
- A change of team member or responsible person, such as: a change of shift;
- New hazards arise. In which case the risk assessment (SWMS) must be updated;
- There has been an evacuation and the team plans to re-enter the confined space;
- The responsible person for entry must complete and sign the entry permit before the confined space is returned to service.

5.9 Confined space entry and exit procedures.

No WMH employee is to enter a confined space at any time. If a confined space is required to be entered a competent contractor is to be engaged. The I & A Responsible officer is to require the contractor to supply a Safe Work Method Statement in addition to completing a confined space Entry Permit. The contractor must be a competent person to be nominated as being in control of a confined space.

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Prior to any person entering a confined space, all potentially hazardous services, normally connected to that space shall be isolated to prevent:

- The introduction of any materials, contaminants, agents or conditions harmful to persons occupying the confined space.
- The activating or energising in any way of equipment or services that could pose a risk to the health or safety of persons within the confined space, see “Isolation Permit to Work” for further details.

The entry permit must be used as a written record that all workers have exited the confined space on completion of the work. It should be displayed in a prominent place to facilitate signing and clearance.

5.10 Signs and barricades.

Before work commences signs and barricades (designated ‘Danger Confined Space, Entry by permit only’) must be erected, with measures in place to prevent unauthorised inadvertent entry to persons not involved in the work. The signs are to be placed at each entrance to the confined space and are to remain in place while the confined space is accessible, this includes:

- when preparing to work in the space
- during work in the space, and
- when packing up and on completion of the work



Figure 2: Example of confined space sign

When a worker is in the space, signs or tags must be in place to indicate that a worker is in that space.

5.11 Emergency procedures.

Before a worker enters a confined space, a safety observer must be assigned to continuously monitor the wellbeing of those inside the space and to initiate emergency procedures if required. The safety observer must:

- understand the hazards, and be able to recognise signs and symptoms the worker in the space may display if affected;
- never enter the space to attempt rescue, in the event of an incident, but have required rescue equipment immediately available.

An effective system of communication must be established between the worker inside the confined space and the safety observer, and to summon help in an emergency.

- Appropriate emergency and first aid protocols shall be planned, established and rehearsed through the I&A Manager/Supervisor
- In cases of an emergency, those persons involved in the response shall be made aware of the conditions in the confined space prior to any entry by the safety observer in charge who will accompany those persons on entry to the confined space, i.e. Persons trained in confined space rescue techniques or Qld Fire & Rescue Services officers when they arrive on site.

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- The contractor/person in control of the confined space is to provide a copy of the confined space rescue procedures to the I&A Responsible officer, prior to any work commencing in the confined space.

5.12 Confined space register.

All confined spaces are to be recorded on the Confined Space Register. This register is maintained by the I&A Manager or authorised representative.

5.13 Incident Reporting.

Reporting of Workplace Incidents must comply with the reporting protocols designated by the online Riskman system. This requirement includes non-work related (for example visitors), near miss, work caused injury or illness, occupational violence and plant / equipment or environmental hazards with potential to cause harm. Accurate and early recording of workplace incidents and notification of hazards assists investigation, analysis and proactive risk management to minimise the occurrence of injuries and illnesses.

5.14 Record keeping.

All records are to be retained, archived and disposed of in accordance with the *Queensland State Archives General Retention and Disposal Schedule for Administrative Records (QRDS)*.

The following shall be kept and maintained for the specified time unless longer periods are necessary, as in the case of health surveillance being required:

- Written authorities – for one month (2 years if a Notifiable Incident occurs in connection with the work).
- Current risk assessments (SWMS) – for 5 years from the time of their validity
- Training records – for the term of the employee's employment

5.15 Information, instruction and training.

AS 2865: – All persons with work activities related to confined spaces shall be trained and assessed as competent to perform those activities. Training shall include at least the following:

- Legislative requirements
- The hazards of confined spaces
- Assessment Protocols
- Control measures
- Emergency Response Protocols
- The selection, use and maintenance of safety equipment

I&A staff must have the skills and knowledge to understand the hazards associated with working in confined spaces, the content of any confined space entry permit, and the control measures to be implemented for worker protection.

Training for relevant workers must cover:

- the nature of all hazards associated with a confined space
- the need for, and appropriate use of control measures
- the contents of any relevant confined space entry permit
- the required emergency procedures
- the selection, use, fit testing and storage of any personal protective equipment

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6. Roles and Responsibilities

Role	Responsibility
Authorised Infrastructure and Assets person (Permit Issuer)	<ul style="list-style-type: none"> • Ensure compliance with this procedure. • Consult with staff and contractors and sub-contractors about permits to work and required documentation. • Confirm all required documentation has been provided. • Approve permits. • Ensure storage of permits is performed in accordance with Infrastructure and Assets requirements through the Permit to Work database.
All staff. Compliance with policies and procedures	<ul style="list-style-type: none"> • Monitor all environments and working arrangements that fall within the definition of a Confined Space and report identified work health and safety risks associated to manager/supervisor. • Proactively manage confined space safety risks by conducting and participating in risk assessments and risk management processes.
Managers and supervisors. Embed confined space risk management into operational activities that take place in or around these spaces	<ul style="list-style-type: none"> • Manage identified confined space risks and ensure compliance with this procedure • Consult with staff when undertaking confined space risk management processes • Ensure confined space risks are included in divisional risk registers for regular review and management. • Take all reasonable steps to identify and eliminate confined space hazards so far as reasonably practicable, or if that is not possible, minimise risks through engineering, or isolation methodologies in combination with administration and PPE control strategies as far as reasonably practicable. • Administration and PPE must never be the only controls considered or used when managing confined spaces.

7. Non-Compliance

Failure to adhere to this procedure, may result in penalties being applied under the *Work Health and Safety Act 2011*.

8. Definition/s

Term	Definition
Competent person	A person who has acquired the knowledge and skills to carry out the task through training, qualification or experience. Competency is a combination of these attributes that enables a worker to identify both the risks arising from a situation and the measures needed to deal with them.
Officer in Charge (OIC) (Permit Holder)	<p>The person delegated the responsibility of supervising and/or performing a specific work task, controlling access to the work area, and where applicable supervising and monitoring the work.</p> <p>The OIC is responsible for permits once issued and must complete and surrender the permit once the work is complete.</p>

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Confined space	<p>An enclosed or partially enclosed space that:</p> <ul style="list-style-type: none"> ○ is not designed or intended primarily to be occupied by a person; and ○ is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and ○ is or is likely to be a risk to health and safety from: <ul style="list-style-type: none"> ▪ an atmosphere that does not have a safe oxygen level, or ▪ contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or ▪ harmful concentrations of any airborne contaminants, or ▪ engulfment. <p>A confined space is determined by the hazards associated with a set of specific circumstances and not just because work is performed in a small space.</p> <p>Confined spaces are commonly found in vats, tanks, pits, pipes, ducts, flues, chimneys, silos, containers, pressure vessels, underground sewers, wet or dry wells, shafts, trenches, tunnels, ceiling spaces or other similar enclosed or partially enclosed structures when these examples meet the definition of a confined space.</p> <p><i>Confined Spaces Code of Practice 2011</i></p>
Restricted or constrained workplace.	<p>If you have determined using the “Confined Space” evaluation tools and information in this Procedure that the space is not quite a “Confined Space”, you may be dealing with a restricted workplace. One where it has some of the elements of a Confined Space but not all, so is not legally held as a “Confined Space”</p> <ul style="list-style-type: none"> • For instance, the space may be enclosed or partially enclosed, and not designed or intended to be occupied by a person but have no atmospheric pressure restrictions or restricted airflow. • So, for example, consider how you would rescue a worker if they had a medical issue or there was a building fire whilst in the space, or how you would assist them if they became stuck getting through a small entrance way. <p>To manage a Restricted Workplace such as this, you should conduct a risk assessment of the space and create a SWMS of how you can safely manage all hazards and risks associated with working in this place.</p>
Safe Work Method Statement (SWMS)	<p>The main purpose of a SWMS is to enable supervisors, workers and any other persons at the workplace to understand the requirements that have been established to carry out the high-risk work in a safe and healthy manner.</p> <p>It sets out the work activities in logical sequences and identifies hazards relating to the work and risks to health and safety associated with those hazards. It also describes control measures and how the control measures are to be implemented, monitored and reviewed.</p> <p>A SWMS is to be kept until work is completed or for 2 years if a notifiable incident occurs in relation to the work</p> <p>A SWMS can be developed using the SWMS template</p>
Request to Perform Work (RPW)	Documentation and related permits for high risk works and works that will impact on business continuity, restricted areas and patient care.
Permit to Work (PTW) system	An administrative system to control certain types of work or work in areas that are potentially hazardous with a potential to impact on business continuity. The permit document specifies the work to be done and the precautions to be taken.
Safe oxygen level	An oxygen content in air of between 19.5% - 23.5%

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9. Monitoring and Evaluation

What will be monitored	Compliance with this procedure by WMH staff, contractors and consultants engaged by WMH. The identification and use of Confined Spaces at WMH
How (method)	<ul style="list-style-type: none"> • Ensure a current register is maintained of every Confined Space at WMH locations and site. • Ensure that all staff/contractors likely to come into contact with a confined space are fully trained and inducted into how to identify a confined space and empowered to manage the use of these spaces as per this procedure, including the use of “Permits to Work” and “SWMS” • Ensure confined spaces and suspected confined spaces are reviewed as per the Confined Spaces - Code of Practice 2011, sect. 7, and How to Manage Work Health and Safety Risks - Code of Practice 2011
Frequency	The frequency of inspections of confined spaces at WMH should be by risk assessment or at least annually.
Responsible officer	An authorised Infrastructure and Assets person who has been deemed competent in the management of Confined Spaces.
Reporting to	The Infrastructure and Assets Chief Engineer as well as the I&A Facility Maintenance Manager

10. Compliance Requirements and Obligations

Legislation and other compliance requirements	<ul style="list-style-type: none"> • Work Health and Safety Act 2011 • Work Health & Safety Regulation 2011 (Part 4.3 – Confined spaces (s63, 64, 67, 68) • Work Health & Safety consultation, co-operation and co-ordination Code of Practice 2011 • How to Manage Work Health and Safety Risks - Code of Practice 2011 • Hazardous Manual Tasks Code of Practice 2011
Australian and NSQHS Standards	<ul style="list-style-type: none"> • AS/NZS 4801:2001 - Occupational Health & Safety management systems. • AS/NZS/ISO 45001:2018 Occupational health and safety management systems – Requirements with guidance for use. • AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment • AS2865:2009 Confined Spaces • AS60079 Explosive atmospheres • AS1716 Respiratory Protective Devices <div style="background-color: #0056b3; color: white; padding: 5px; display: inline-block;">  1. Clinical Governance </div>
Dept. of Health Implementation Standards	<ul style="list-style-type: none"> • QH-IMP-401-2 - Work health and safety governance, consultation and capability standard 2018 • QH-IMP-401-3 - Work health and safety risk management standard 2018 • QH-IMP-401-4 - Work health and safety monitoring, evaluation and performance review standard 2018 • QH-IMP-401-5 - Workplace rehabilitation standard 2017 • QH-IMP-401-6 – Work health and safety accountabilities standard 2018

11. References and Resources

Nil

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12. Development, Revision and Approval History

ID & Version No.	Approval Date	Effective Date	Review Date	Document Custodian/Author	Endorsing Committee	Approval Authority
WMHHS2016092v1	02/11/2016		02/11/2019	Chief Engineer		CFO
WMHHS2016092v2	17/06/2019		17/06/2022	Manager WSW / Sen. WHS Advisor		Position: ED People and Culture Signature:
Summary of changes						
<input checked="" type="checkbox"/> Scheduled review						

13. Key Words

Confined Space; Safe Work Method Statement; SWMS, Permit to Work; PTW; Request to Perform Work; RPW; Competent person; Permit Issuer.

14. Appendices

Appendix 1 - Table of harmful environments and atmospheres and processes

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Appendix 1 - Table of harmful environments and atmospheres and processes

The following table illustrates the kinds of harmful atmospheres, environments and processes that may be present in a confined space, and how they may affect the space.

Item	Examples
Substances stored in the confined space or its by-product(s)	<ul style="list-style-type: none"> • build-up of hydrogen sulphide in sewers and pits. • release of toxic substances e.g. hydrogen sulphide in tanks of decomposing organic material, especially when the material is disturbed.
Work performed in the confined space	<ul style="list-style-type: none"> • use of paints, adhesives, solvents or cleaning solutions. • welding or brazing with metals capable of producing toxic fumes. • exhaust fumes from engines used in the confined space. • painting or moulding glass-reinforced plastics.
Entry of natural contaminants e.g. groundwater and gases into the confined space from the surrounding land, soil or strata	<ul style="list-style-type: none"> • acid groundwater acting on limestone with the potential to produce dangerous accumulations of carbon dioxide. • methane released from groundwater and from decay of organic matter.
Release of airborne contaminants	<ul style="list-style-type: none"> • when sludge, slurry or other deposits are disturbed or when scale is removed.
Manufacturing process	<ul style="list-style-type: none"> • residues left in tanks, vessels etc., or remaining on internal surfaces can evaporate into a gas or vapour.
Entry and accumulation of gases and liquids from adjacent plant, installations, services or processes	<ul style="list-style-type: none"> • the contamination of underground confined spaces by substances from plant in the vicinity of the confined space. • carbon monoxide from the exhaust of LPG-powered forklifts operating in, or in the vicinity of, the confined space.
Unsafe oxygen level	<p>Air normally contains 21% oxygen by volume, although oxygen levels of 19.5% — 23.5% by volume are considered to be safe.</p> <p>Some situations can cause the level of oxygen to dramatically decrease, leading to an oxygen-deficient atmosphere and possible asphyxiation. This may occur, for example, if oxygen in the atmosphere is:</p> <ul style="list-style-type: none"> • Displaced by gases produced during biological processes, for example, methane in a sewer. • Displaced during purging of a confined space with an inert gas to remove flammable or toxic fumes. • Depleted inside metal tanks and vessels through surface oxidation (for example, when rust forms). • Consumed during combustion of flammable substances. • Absorbed or reacts with grains, wood chips, soil or chemicals in sealed silos. <p>Too much oxygen can increase the risk of fire or explosion. Oxygen-enriched atmospheres may occur if:</p> <ul style="list-style-type: none"> • Chemical reactions cause the production of oxygen, for example certain reactions with hydrogen peroxide. • There is a leak of oxygen from an oxygen tank or fitting while using oxy-acetylene equipment.
Fire and explosion	<p>A fire or explosion requires the presence of three elements: an ignition source, air and a fuel (gas, vapour or mist) capable of igniting. A flammable atmosphere is one in which the flammable gas, vapour or mist is likely to exceed 5% of its Lower Explosive Limit (LEL).</p> <ul style="list-style-type: none"> • Flammable atmospheres in confined spaces may result from the evaporation of a flammable residue, flammable materials used in the space, a chemical reaction (such as the formation of methane in sewers), or from the presence of combustible dust (such as that in flour silos).

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	<ul style="list-style-type: none"> If an ignition source, such as a sparking electrical tool or static on a person, is introduced into a space containing a flammable atmosphere, an explosion could possibly result.
Engulfment	Engulfment means to be swallowed up in or be immersed by material, which may result in asphyxiation. Examples of materials that may pose a risk of engulfment include plastics, water, sand, liquids, fertiliser, grain, coal, coal products, fly ash, animal feed and sewage.
Uncontrolled introduction of substances	The uncontrolled introduction of substances such as steam, water or other liquids, gases or solids may result in drowning, being overcome by fumes or other harm depending on the nature of the substance. Vehicles and LPG forklifts operating close to the opening of the confined space can cause a build-up of exhaust gases, including carbon monoxide, in the space.
Biological hazards	Contact with micro-organisms, such as viruses, bacteria or fungi, may result in infectious diseases, dermatitis or lung conditions such as hypersensitivity pneumonitis. Sewers, grain silos and manure pits are examples of confined spaces where biological hazards may be present.
Mechanical hazards	Exposure to mechanical hazards associated with plant, may result in entanglement, crushing, cutting, piercing or shearing of parts of a person's body. Sources of mechanical hazards include plant such as augers, agitators, blenders, mixers and stirrers.
Electrical hazards	Electrical hazards may cause electrocution, shocks or burns, and can arise from cables, transformers, inductors, capacitors, relays, exposed terminals and wet surfaces where electrical circuit and electrically powered plant are used.
Skin contact with hazardous substances	The nature of a confined space could give rise to an increased likelihood of skin contact with surface contaminants. Skin contact with hazardous substances may result in immediate health effects such as burns, irritation or allergic dermatitis, or longer-term systemic effects.
Noise	<p>Noise generated in a confined space from the use of plant, the work method or process may be amplified due to reflections off hard surfaces.</p> <ul style="list-style-type: none"> Exposure to hazardous noise may result in hearing loss, tinnitus and other non-auditory health effects. Hazardous noise may also prevent workers hearing warning signals and distract workers from their work. Further guidance is available in the Code of Practice: <i>Managing Noise and Preventing Hearing Loss at Work</i>.
Manual tasks	<p>Hazards arising from manual tasks may be exacerbated by physical constraints associated with working in a confined space. Additional hazards may arise from the use of Personal Protective Equipment (PPE) that restricts movement, grip and mobility.</p> <p>Further guidance is available in the Code of Practice: <i>Hazardous Manual Tasks</i>.</p>
Radiation	The health effects associated with radiation depend on the type of radiation involved. Sources of radiation x-rays, lasers, welding flash, radio frequency and microwaves.
Environmental hazards	<p>Environmental hazards associated with work in a confined space may cause or contribute to harm. Examples of environmental hazards include:</p> <ul style="list-style-type: none"> heat or cold stress arising from the work, process or conditions slips, trips and falls arising from slippery surfaces or obstacles inadequate lighting. <p>Further guidance is available in the Code of Practice: <i>Managing the Work Environment and Facilities</i>.</p>
Hazards outside the confined space	Where the confined space has a vertical opening, there is a risk that people could fall in.

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	<p>Traffic hazards are a concern where confined space entrances or exits are located on footpaths or roads. There is the potential for workers entering or exiting the space to be struck and injured by vehicle traffic.</p> <p>Work done outside the space, but near openings to it, can contaminate the atmosphere inside the space. A common example is the exhaust gases from a vehicle or generator engine. There may also be potential for fire or explosion where hot work is done in areas next to confined spaces that contain flammable atmospheres.</p>
Additional physiological and psychological demands	<p>Working in a confined space may impose additional physiological and psychological demands over and above those encountered in a normal working environment.</p> <p>Consideration should be given to a worker's:</p> <ul style="list-style-type: none"> • physical ability; • ability to work in a restrictive space (for example claustrophobia); • ability to wear the PPE required to do the work (for example respirators).