Plant risk assessment and management strategy

Summary - LP Gas cylinder safety in BBQ appliances			
Local area information - Comcare PROHIBITION NOTICE MC00007121			
File Reference	Barbeque and Gas cylinder	**Date of Assessment**	30 August 2018
Person conducting assessment	Glyn Whitworth, WHS Consultant		
Telephone number	0404031617		
Local area manager and or supervisor	N/A		
Specify College/Service Division/ School/Local Area/ Research Group	University-wide		
Emergency Contact person and Emergency Contact Number	612 **52249**		
Workers consulted with (list workers, plant operators, HSR's, WHS Committee Members etc.)	University-wide Cc WHS Officers and WHS Committee's		

General information	
Item of plant assessed	Portable Barbeque connected to LP Gas cylinder
Product details and specifications	LP Gas cylinder unregulated pressure 1183KPa at 38^{o}C
Applicable legislation	Australian Standard 2658 2008 *LP Gas Portable and mobile appliances* Australian Standard 2658 2004 *Domestic outdoor gas barbeques* Australian Standard 2030.1 2009 *Gas cylinders*

Intended Use - Design and performance parameters					
Intended use	Cooking device				
Location of use	Outdoors				
Appearance (add images)	Metal frame and cast iron construction				
Safe working load limit	N/A				
Electrical power supply	N/A				
Operating Conditions	**Temperature range**	477	**to**	1400	**°C**
	Humidity range	N/A	**to**		**%RH**

	Electromagnetic fields	N/A **(upper limits)**
Other	Liquefied petroleum (LP) gas or Natural gas 9 Kg and 4 Kg cylinders	
Construction parameters and materials	Construction - gas design consists of a number of burners for fuel delivery. Air for combustion introduced by the inspiring effect of a gas injector and/or by natural draught in the combustion chamber without mechanical assistance.	
Total equipment weight	Various makes and models varying in weight	
Construction		
Constructed and tested to achieve less than		
Noise level	**N/A**	**dBA**
Vibration	**N/A**	**dB**
Light/UV/Infrared	**N/A**	
Ionizing radiation levels	**N/A**	**Gy or Sv @ 1 m**
Radio frequency electromagnetic radiation	**N/A**	
Other	**Example of approved appliance certification plates** 	

Risk Assessment

Identification

Use the following to assist with identifying hazards associated with the plant, its operation and operators and any workers working within proximity to the plant.

Hazards
(Check box if hazard present)

Entanglement	☐	**Striking**	☐	**Slipping/tripping/ falling**	☐	**Exposure to ionizing radiation**	☐
Crushing	☐	**Ejection of piece/s**	☐	**High temperature**	☒	**Exposure to EM Radiation**	☐
Trapping	☐	**High Pressure Fluid/Gas**	☒	**Low temperature**	☐	**Exposure to Ultraviolet, light, Infrared**	☐
Rollover	☒	**Shattering/ Fragmentation**	☐	**Suffocation/ confined or enclosed space**	☐	**Manual handling**	☒
Cutting	☐	**Electrical**	☐	**Exposure to chemicals**	☐	**Constrained posture/excessive effort**	☐
Stabbing/Puncturing	☐	**Explosion**	☒	**Exposure to dusts**	☐	**Remote location**	☐
Shearing	☐	**Fire**	☒	**Exposure to significant noise**	☐	**Awkward access**	☐
Friction/abrasion	☐	**Vacuum collapse**	☐	**Exposure to vibration**	☐	**Tearing/Stretching**	☐

Other hazards present: **Radiant and Convected heat**

Assessment					
Consider the interaction of the identified hazards, the operator/s and environment in the use of the plant to identify the likelihood and consequences of an incident occurring to determine the hazard rating. Refer to the WHS Hazard management procedure for likelihood and consequence descriptors and the Hazard Matrix for assistance with hazard ratings.					
Hazard identified (list)	**Consequences and likelihood description.** E.g., what could go wrong? What could be the impact?	**Current Hazard Rating** [Use the Hazard Matrix]	**Existing Hazard Controls**	**Residual Hazard Rating** [Use the Hazard Matrix]	**Additional Hazard Controls** **Action Plan**
Rollover	**BBQ tipping over. Incorrect placement** **Cylinder not maintained upright**	**HIGH (16)**	**Setup BBQ on firm and level surface.** **Suspend gas cylinder from BBQ frame.** **Do not move when in use**	**Low (5)**	
High pressure Fluid/gas release	**Valve stem /or point of connection damage – causing equipment defect**	**High (18)**	**Check that the gas cylinder fittings are not damaged**	**Low (2)**	
	BBQ taps damaged. Incorrectly operating valve control. Resulting in potential leak	**High (18**	**Check BBQ taps do work correctly and for sign/s of damage**	**Low (2)**	
	Burners dislodged/not correctly installed. Redirecting gas flow	**High (18)**	**Check burner placements prior to use**	**Medium (6)**	

	Gas bottle turned on without POL regulator and spigot fitted	Extreme (20)	Turn on gas only when ready to perform leak test	Medium (6)	
	Gas turned on with BBQ taps opened. Fire and potential explosion	Extreme (20)	Check BBQ taps remain in off position after performing leak test, prior to ignition	Medium (6)	Recommend Gas fuse safety device use
	Gas cylinder delivery system damaged or obstructed	High (15)	Do not use obstructed high-pressure fittings. Replace or have repaired.	Medium (6)	
Explosion from gas cylinder leakage	Gas leak in vehicle – Fire or explosion. Damage to people equipment	Extreme (24)	Transport gas cylinder/s in vehicle with window open to ventilate space	Medium (12)	Transport guideline
	Gas leak in storage - Fire or explosion. Damage to people equipment and infrastructure	Extreme (24)	Store gas cylinder/s in a well ventilated space e.g. lockable outdoor cage,	Medium (12)	
Explosion	Delay in lighting gas, gas accumulation causing explosion and burn's	Extreme (20)	Ignite BBQ immediately after turning on gas using piezo ignition, alternatively a long BBQ gas lighter	Low (5)	
	Leaking POL fitting, regulator and hose connections. Fire or explosion risk	High (18)	Where required attach on chain, appropriate gas fitting spanner	Medium (11)	

			Prior to use, leak test after connecting all gas component fittings. Gas turned off if leak detected.		
Fire	Fire or injury from regulator and hose gas leak	Extreme (24)	Conduct leak test on BBQ and gas bottle. Use soapy water in a spray bottle without turning on the BBQ.	Low (5)	Leak test - Develop checklist
	BBQ located close to combustible material. Fire risk	High (16)	Operate away from flammable and combustible material. Place tray/s underneath preventing hot/burning items getting to the ground. Ensure appropriate fire-fighting equipment is nearby e.g. fire extinguisher and fire blanket Clearance from combustible surfaces 1500mm above and 500mm sides.	Low (5)	
	Cooking fat build up on BBQ or Cylinder. Could cause isolated fire	Extreme (22)	Clean BBQ and Cylinder prior to use. Ensure fire blanket or BE type extinguisher is on hand for oil and fat fires. Ensure adequate separation to sides 500mm and above 1500mm	Low (5)	
	BBQ used indoors. Fire risk and Smoke and thermal sensors	Extreme (23)	BBQ prohibited from indoor use.	Low (5)	

	triggering buildings evacuation.				
	Leaking POL fitting, regulator and hose connections. Fire or explosion risk	High (18)	Ensure the O-ring or the bull nose on the POL it fitted and in good condition	Medium (11)	
High temperature	Burn/s from hot surfaces	Extreme (22)	Users should be aware that there are hot cooking surfaces	Low (5)	
	In-experienced or un-trained BBQ user	Extreme (20)	Users should be familiar with BBQ safety operational procedure requirements before use. Do not leave lit BBQ unattended	Low (5)	
Manual handling	Manual handling cylinder or BBQ. Musculoskeletal strain/sprain injuries	Extreme (20)	Instruction on safe movement and handling of BBQ and cylinder	Low (5)	Pulse module - Manual handling
If the overall residual hazard rating of the plant is determined to be >Medium (12), the Operating instructions section below is to be completed. The standard BBQ regulator in Australia is a *(Prest-O-Lite)* POL low-pressure regulator					

Corrective Action Plan

OPERATING INSTRUCTIONS**	
PRECAUTIONS - Specify operational limits and conditions for the following (enter NA if not applicable)	
Noise levels: **Allowed - L_{peak} 140 dBC ,** **$L_{Aeq, 8\ hr}$ 85 dBA**	**N/A**
Vibration:	**N/A**
Light/Ultraviolet/Infrared:	**N/A**
Ionizing radiation levels	**_____Gy or Sv @ 1 m**
Radio frequency electromagnetic radiation:	**N/A**
Housing/environmental requirements:	**N/A**
Personal Protection Equipment requirement:	**N/A**
Storage and transport:	**Yes – Develop storage and transport guideline**
Disposal:	
Fire/explosion hazard:	**Yes – Develop leak test guideline**
OPERATIONAL GUIDELINES FOR THE PLANT	
Competency of the operator, maintenance and cleaning staff	**Reading and understanding operational instruction**
Service, testing and inspections required, along with the appropriate interval	**Inspection and cleaning schedule**
Guards and other control measures	**Pre-operation inspection of BBQ and cylinder**
Emergency procedures	**Establish emergency plan**
Registration and/or licensing of plant	**N/A**
Other Information	• **Ensure LP Gas cylinder is accounted for utilising the University's Chemical Management System (CMS)** • **Install in-line Gas fuse safety device**

	• **Use certified gas appliances only. Display Certification badge or compliance/data plate certification number on appliances.**

(Note. Insert further rows as required)

	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Medium (10)	High (14)	Extreme (21)	Extreme (22)	Extreme (25)
Likely	Medium (7)	High (13)	High (16)	Extreme (20)	Extreme (24)
Possible	Low (4)	Medium (9)	High (15)	High (18)	Extreme (23)
Unlikely	Low (2)	Medium (6)	Medium (8)	High (17)	High (19)
Rare	Low (1)	Low (3)	Low (5)	Medium(11)	Medium (12)

Table 1 Likelihood

Ranking	Description	Probability / frequency of event occurring
Almost certain	The hazard is expected to occur in most circumstances at the University	A daily to weekly occurrence or happening >75%
Likely	The hazard could occur in most circumstances at the University	Between weekly to monthly occurrence or 50% - 75%
Possible	The hazard has occurred at some time at the University	Between monthly to yearly occurrences or 25% - 50%
Unlikely	The hazard could occur at some time	Occurs in up to a 10 yearly cycle, up to 25%
Rare	The hazard may only occur in exceptional circumstances	One in hundred year event, less than 1%

Table 2 Consequences

Ranking	Injury, illness or disease	Plant equipment and materials	Environment
Catastrophic	Fatality / fatalities or permanent disability. Unable to work	Destroyed or cannot be reused	Long-term permanent effect to ecosystems. Significant intervention required to remediate
Major	Lost time injury – injuries where one or more days is lost from work	Damage requiring repairs/rebuild and possible recertification prior to reuse, lost use for one or more days	Notification to environmental agency, ecosystem will need time to recover, intervention required to remediate
Moderate	Medical treatment injury – can return to work at normal duties i.e. treated by a health professional (physiotherapist, doctor, etc.)	Damage requiring a repair/service by a trade/technician within the day	Contamination event that does not impact on ecosystem. Short impact does not need intervention
Minor	Injury needing first aid treatment can return to work within shift	Equipment able to be reset or gotten back into operation by the operator	Minor contained contamination ceasing when the short event is over, can remediate (e.g. spill kit)
Insignificant	Report only, no injury	Report only, no damage	Report only, no contamination

Low	Risks that have the potential to cause minor injury, and/or minor financial loss, and/or minor breach of statutes/regulations, and no or low impact on reputation. *Work is able to proceed without undue monitoring. If there are substantial changes to conditions and/or the situation, the risk level needs to be reviewed.*
Medium	Risks that have the potential to temporarily disable or seriously injure, and/or cause moderate financial loss, and/or formal warning from the regulator, and/or news that causes the university moderate embarrassment. *Work is able to proceed but the leaders/managers/supervisors must continually monitor work to ensure that changed conditions do not raise risk exposure.*
High	Risks that have the potential to cause multiple injuries or a single fatality, and/or cause major financial loss, and/or cause an activity to be suspended with prosecution or financial penalty, and/or have a high negative impact on the university's reputation and image. **Warning.** *Senior management must be notified. Work is able to proceed but the leader/manager/supervisor must reassess the risks and implement controls that reduce the level of risk exposure.*
Extreme	Risks that have the potential to cause multiple fatalities, and/or catastrophic financial loss, and/or cessation of activity with prosecution and financial penalty, and/or have a very high negative impact on the university's reputation and image. **Warning.** ***Work is to cease immediately.*** *Senior management must be notified. Leaders/managers/supervisors must reassess the risks and implement controls that reduce the level of risk exposure before work can recommence.*