Business Procedure

Occupational Dust Management
Document Number – OHS-PROC-229

This document applies to the following site(s):

Brisbane Office	☐	**Meandu Mine**	☐	**Tarong Site**	☒
Barron Gorge Hydro PS	☒	**Kareeya Hydro PS**	☒	**Mica Creek PS**	☒
Koombooloomba Hydro PS	☒	**Swanbank PS**	☒	**Mackay Gas Turbine**	☒
Wivenhoe Small Hydro PS	☒	**Stanwell PS**	☒		

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1.0 Purpose

This Business Procedure describes Stanwell's minimum requirements for the management of occupational dust in the workplace to ensure that workers are not exposed to an airborne concentration that exceeds the exposure standard and exposes significant risk for the substance or mixture in the workplace.

2.0 Scope

This Business Procedure applies throughout Stanwell, all its sites and all activities under Stanwell's control. It applies to all Stanwell employees and contractors, including visitors to Stanwell workplaces.

3.0 Introduction

Workers exposed to respirable dust that exceed exposure limits are potentially at risk of developing lung health issues.

The type of disease that occurs is influenced by the dust particle size and composition.

The size (or aerodynamic diameter) of a dust particle will influence:

- How far into the lungs it can be inhaled;
- Where it will be deposited in the respiratory system; and
- Whether the respiratory system can successfully clear the dust particle.

Furthermore, the composition of a dust particle influences how the respiratory system reacts to the particle once it has been deposited. If a dust particle is unable to dissolve in the respiratory system fluids or is unable to be broken down by inflammatory or immune responses, it remains in the lung tissue, potentially causing fibrosis (or scarring). If a dust particle is toxic it may cause localised cellular dysfunction or death, or it may be able to enter the bloodstream and cause systemic toxicity in the relevant target organ/s, or it may cause an inflammatory or immune response that results in fibrosis. Some toxic dust particles such as crystalline silica (or free silica) are also classified as carcinogenic, which may result in lung cancer (AIOH 2009).

Any dust able to enter the respiratory system poses a potential health risk. However, it is the respirable dust fraction (or dust particles less than 10 micrometres in aerodynamic diameter) capable of reaching the lower bronchioles and alveolar (or gas exchange) regions of the lungs that is a priority to manage (AIOH 2009). Once dust particles enter the lower lungs, it becomes more difficult for the respiratory system to clear that dust. Therefore, exposure to respirable dust and protecting the health of workers is an important part of the risk management process.

4.0 Actions

Stanwell is focussed on:

- Proactive dust management - planned and long-term maintenance programs in place to minimise exposure;
- Regular inspections and monitoring programs to identify leaks early and implement controls immediately;
- Occupational Exposure Monitoring programs that target similar exposure groups (SEG's).
- Regular cleaning, wet washing and vacuuming;
- Hazard identification and corrective action program; and
- Fit for purpose personal protective equipment (PPE).

5.0 Potential Exposure Areas

In general the main classes of dust likely to be encountered include:

- Coal dust and ash (containing > 1 % quartz);
- Nuisance dust, such as coal dust and ash (containing less than 1% quartz) and some abrasive blasting dusts such as ilmenite and garnet;
- Wood dusts;

- Welding fumes;
- Synthetic man-made mineral fibres (e.g. glass wool, rock wool and ceramic fibres);
- Asbestos; and
- Toxic dusts, i.e., lead.

6.0 Dust Types

6.1.1 Coal Dust

Refer to Monitoring for Occupational Coal Dust and Crystalline Silica Business Procedure OHS-PROC-230 for information on Coal Dust exposure.

6.1.2 Siliceous Dusts

Refer to Monitoring for Occupational Coal Dust and Crystalline Silica Business Procedure OHS-PROC-230 for information on Crystalline Silica exposure.

6.1.3 Asbestos

Refer to Asbestos Management Business Procedure OHS-PROC-414 for information on asbestos management and asbestosis.

6.1.4 Synthetic Mineral Fibres

Refer to Synthetic Mineral Fibres Business Procedure OHS-PROC-221 for information on synthetic mineral fibres management.

6.1.5 Lead

Refer to Lead Management Business Procedure OHS-PROC-32 for information on lead management.

6.2 Physical risks

Physical risks associated with excessive dust include:

- Obscuring of signs and instruments;
- Abrasive damage to equipment;
- Reducing light emission from light fittings; and
- In extreme cases, explosions from the ignition of combustible dusts i.e. coal.

It is important to be aware of the different dust characteristics as their effects can vary dramatically. Dust types and characteristics vary from site to site particularly in the areas of coal feedstock.

6.3 Combustible Dusts

The relative hazard posed by a combustible dust depends on its ease of ignition and the severity of the resulting explosion.

The quantity of dust needed to produce an explosive atmosphere is orders of magnitude larger than those allowed by Worksafe Australia (2013) for occupational exposure (ie. coal – 550,000 mg/m3: TWA 3 mg/m3 as respirable dust).

Coal dust (particularly pulverised fuel) should not be allowed to accumulate in large quantities on I-beams, ledges and other surfaces. Good housekeeping is essential.

- Confined spaces should be cleaned such that high levels of dust cannot become airborne and pose a potential hazard; and
- Potential ignition sources must be identified and, where possible, eliminated.

For further information refer to:

- AS/NZS61241.3:1999 Electrical Apparatus for use in the presence of combustible dust-classification of areas where combustible dusts are or may be present for information on the use of electrical apparatus in areas.
- ASM-PROC-STG-MAN-05 Corporate Strategy for Management of Hazardous Areas.

7.0 Dust Mitigation and Control Procedures

Stanwell adopts a "hierarchy of controls" approach that focuses on higher level controls to eliminate exposure to the hazard (by removing people from the area, where possible), engineering controls (e.g. water sprays on conveyors) to reduce the risk and then lower order controls administrative processes and personal respiratory protective equipment (RPE).

The general design of plant aims to keep dusts enclosed which is integral to minimising exposure to workers and others. When a situation occurs where dust escapes from the closed system, or the system is required to be opened for access, processes need to be applied to address the nature of the escape and to mitigate the need for workers to be in the location until controls are implemented.

The primary aim should be to limit dust exposure via the control of excessive dust emissions rather than the utilisation of RPE which should be used as a secondary measure.

Where closed systems are open during or as part of overhaul programs a Dust Management Strategy will be developed and incorporated into the Overhaul Health and Safety Management Plan.

Controls may include but are not limited to:

- **Plant Modification:** Where excessive dust emissions from plant occur, it should be assessed to determine the practicality of modifying the plant to eliminate the cause of the problem. Where this is impractical or cannot be undertaken in the near future, then secondary controls should be put in place to ensure exposure is kept below the prescribed exposure limit.
- **Engineering Control at Source:** Priority should be given to controls that will remove dust at the source, either through extraction and filtration or through the use of ventilation techniques.
- **Housekeeping:** Good housekeeping practices should be maintained in work areas. Dust and solid debris should not be allowed to accumulate and should be cleaned regularly.
- **Dust Removal:** Remove as much of the dust as possible by either vacuuming or spraying with water. Do not use compressed air to blow the dust away.
- **New Plant:** When preparing specifications for the installation of new plant the following factors should be considered:
  - The uncontrolled discharge of airborne dust from plant into the work environment is to be prevented or mitigated;
  - Discharge of dust into working areas shall be prevented by the utilisation of dust suppression systems or dust extraction systems;
  - Maintenance schedules include the inspection and repair of all seals from which dust may escape; and
  - Where there is a potential for explosion, no naked flame or welding is to be permitted until the area has been cleaned of excessive dust.

7.1 Personal Protective Equipment (PPE)

Appropriate PPE should be worn where excessive dust levels may be generated. PPE may include respirators, safety goggles or face shields, gloves, and disposable overalls.

Where activities involve work which could disturb volumes of respirable dust particulates a hierarchical approach to respiratory protective equipment (RPE) should be applied as follows:

- Supplied air
- Positive pressure respirators
- Negative pressure half face respirators
- Disposable particulate respirators

Employees should be trained in the correct use of RPE. RPE shall be correctly fitted via a face fit testing program. The frequency of face fit testing is as follows:

- *Workers within the significant or high risk SEGs will be face fit tested annually.*
- *Workers identified to be in a low risk SEG will be face fit tested biennially.*
- *or:*

- *Each time a new make or model of respirator is issued*
- *Whenever there is a change in the wearer's facial characteristics or features which may affect the facial seal.*

The Occupational *Health Nurses will document face fit tests as part of workers' health records.*

Outcomes of RPE fit testing will be discussed with the worker e.g. if a worker is not clean shaven then options on the types of appropriate RPE to be worn will be discussed.

All RPE shall comply with the provisions of Australian Standards AS1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices, and AS1716:2012 Respiratory Protective Devices.

Replaceable filters, cartridges and disposable respirators should be replaced regularly in accordance with guidelines issued by the manufacturer. Safety goggles or face shields can be worn to avoid eye irritation or injury, especially when performing overhead work, the requirements for these should be considered as part of the Safe Work Method Statement and SafeStart.

Skin irritation can be minimised by the use of gloves, loose fitting long garments or disposable coveralls and hygiene practices post work to minimise exposure. Disposable coveralls may be worn if excessively high dust release is expected during the work; these disposable garments should be disposed of in the plastic bags with the other wastes associated with the job.

Dust booths and/or vacuum systems are available at coal fired generation sites to assist with the removal of dust post work and disrobing.

8.0 It is expected that contractors required to wear RPE are fit tested prior to attending site.

Monitoring Dust Exposure

Where it is determined that there may be a significant risk of exposure to workers from dust, then appropriate actions must be taken to determine the extent of the risk i.e. monitoring by an appropriately qualified person using the relevant Australian Standard for the type of dust.

Detail for monitoring and communication of dust monitoring results for coal dust and crystalline silica are outlined in Monitoring for Occupational Exposure to Coal Dust and Crystalline Silica OHS-PROC-230

Where monitoring indicates the likelihood of exposure above the Worksafe Australia exposure standard, then steps must be taken to ensure the potentially exposed workers are adequately protected by utilising appropriate controls. Records of air monitoring completed must be kept for 30 years and made readily accessible to persons at the workplace who may have been exposed.

9.0 Periodic Health Monitoring

Stanwell currently requires the completion of an annual health assessment for all employees exposed to noise and dust hazards at its generation sites. The health assessment comprises of the following components:

- Respiratory health questionnaire;
- General health status (blood pressure, blood glucose);
- Spirometry lung function test
- Audiometric test (hearing)and
- Chest Xrays for workers identified to be in high risk SEGs.

The results are discussed with the employee during their visit and compared against their baseline pre-employment and historical records to identify any abnormalities. If there are any abnormalities, for example if there is a decline in lung function, a referral may be provided which could be to a General Practitioner or Stanwell's Specialist Occupational Physician.

All workers who have previously worked at generation sites and are still working for Stanwell are encouraged to participate in the program on a voluntary basis; this may have a different testing frequency to workers who are currently exposed to noise and dust at the generation sites.

Stanwell offers a voluntary respiratory assessment program to employee with current or previous dust exposure. The program is administered by Stanwell's Specialist Occupational Physician and may include a chest x-ray according to the ILO International Classification of Radiographs of Pneumoconiosis.

All health monitoring records are centrally managed by the Occupational Health Nurse. Refer to Pre-Employment Medicals and Periodic Health Monitoring OHS-PROC-421.

10.0 Responsibilities

Managers and Supervisors

Shall ensure where work is to be carried out in a dusty environment that:

- Appropriate procedures are complied with;
- All attempts are made to reduce the exposure of workers to excessive dust via the appropriate controls utilising the hierarchy of control;
- Where the potential of exposure to dust containing greater than 1% silica is possible that the workers are informed of the associated risk and attend an information session held in relation to the hazards; and
- If RPE is utilised as part of the control regime that the workers are instructed as to their correct selection, use and maintenance.

Are responsible for ensuring that workers understand the purpose of dust sampling and monitoring, and that workers participate as necessary in the Occupational Exposure Monitoring programs.

Workers

Shall ensure where work is to be carried out in a dusty environment that:

- Personal dust sampling equipment is worn as required.
- Any PPE issued is used and maintained according to manufacturer's instructions.
- Work carried out in a potentially dusty environment is undertaken according to appropriate procedures aimed at minimising the generation of airborne dust.

Consulting Occupational Health and Hygiene Specialist

- Undertake occupational health and hygiene work as directed by Stanwell.
- Assess occupational exposure of workers at Stanwell sites using best practice occupational hygiene methodology and sampling techniques.
- Provide recommendations for improvements to Stanwell's dust management program based on observation of work activity, communication with Stanwell employees and representatives, and information provided by relevant Health and Safety Committees.

11.0 Training

Workers who undertake tasks where they are exposed to significant levels of dust should be provided with adequate information, instruction and training on:

- Health information relating to the excessive exposure to different types of dust and in particular that containing respirable crystalline silica at levels greater than 1%.
- The importance of controlling the creation of dust in the atmosphere to the lowest workable levels.
- Probable exposure levels associated with the type of job being undertaken.
- Correct usage of PPE.
- The role and significance of dust sampling and monitoring.

12.0 Review, Consultation and Communication

Review:
This Document is required to be reviewed as a minimum every 5 years, or as knowledge is gained through the implementation of the site Dust Monitoring programs, and as Stanwell becomes aware of any external developments in dust management.

Consultation:
Consultation will occur in accordance with the Health and Safety Consultation Business Procedure OHS-PROC-21.

Communication/Requirements after Update:
This Business Procedure will be communicated to sites by an e-mail from the Health and Safety Manager and on GenNet.

13.0 References

Source	Reference
Legislation	• Queensland Work Health and Safety Act 2011 • Queensland Work Health and Safety Regulation 2011 • Coal Mining Safety and Health Act 1999 - Recognised standard 14 Monitoring respirable dusts in coal mines • Managing respirable dust hazards in coal-fired power stations: Code of Practice 2018 • Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements: Code of Practice 2023
Business Procedures	• Health and Safety Consultation OHS-PROC-21 • Lead Management OHS-PROC-32 • Hazardous Chemicals OHS-PROC-108 • Pre-Employment Medicals and Periodic Health Monitoring OHS-PROC-421. • Synthetic Mineral Fibres OHS-PROC-221 • Monitoring for Occupational Exposure to Coal Dust and Crystalline Silica OHS-PROC-230 • Asbestos Management OHS-PROC-414 • Corporate Strategy for Management of Hazardous Areas ASM-PROC-STG-MAN-05
Standards and Methods	• How to Safety Remove Asbestos, Queensland Code of Practice 2011 • How to Manage and Control Asbestos in the Workplace Code of Practice 2011 • AS1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices • AS1716:2012 Respiratory Protective Devices • AS/NZS61241.3:1999 Electrical Apparatus for use in the presence of combustible dust-classification of areas where combustible dusts are or may be present • Worksafe Australia: Workplace Exposure Standards for Airborne Contaminants (April 2013) • Worksafe Australia: Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants (April 2013) • Australian Institute of Occupational Hygienists (AIOH) 2009, *AIOH position paper: respirable crystalline silica and occupational health issues,* <www.aioh.org.au/documents/item/10>.

14.0 Definitions

Term	Meaning
Combustible Dust	A dust that is combustible or ignitable in mixtures of air. Examples of such dusts include coal dust, charcoal, grain dust, starch and some metal dusts such as aluminium and magnesium
Exposure Standard	Means an airborne concentration of a particular substance in the worker's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers.
Nuisance Dust	Also referred to as "Dusts Not Otherwise Classified" are dusts which do not contain toxic impurities and are of low toxicity, i.e. dusts containing less than 1% respirable crystalline silica.
Respirable Dust	Particles those are able to penetrate into the alveolar region of the lung i.e. crystalline silica, asbestos.
Silica	Is silicon dioxide, which usually occurs as alpha quartz, a crystalline silica. It is the main component of sand, sandstone, granite and other rocks. It may also be found in varying quantities in coal and coal ash from less than 1% to greater than 20 %, depending on the source of the coal.
Siliceous Dusts	Are dusts which are known to contain crystalline silica.
WES-TWA	Workplace exposure standard - time weighted average – the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

15.0 Revision History

Rev. No.	Rev. Date	Revision Description	Author	Endorse/Check	Approved By
0	24.04.2018	Consolidation of legacy documents	Jan Fullard	Owen Bevan	Michael Joy
	06.03.2019	Minor change only with References updated to include : Managing respirable dust hazards in coal-fired power stations: Code of Practice 2018 as Requested by Jan Fullard via email dated 22.02.2019, cc'd to Jason Paull and Kriss Ussher. No signatures required and Revision number remains at 0 and revision date not altered	D. Wood		
1	13.11.2019	Added face fit test frequency logic to document.	Kirsten Williams	Jason Paull	Kriss Ussher
	11.11.2021	Minor changes only with references to the old health surveillance procedure updated to the new one. And the term 'Health Surveillance' replaced with 'Health Monitoring'. As requested by Kirsten Williams via email 21/139678, cc'd to Letitia Lucke. No signatures required and revision number and date not changed.	S. Scott		
	21.07.2023	Minor change only – added reference to the new managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements: Code of Practice 2023. As requested by Kirsten Williams via email request 23/86098, cc'd to Letitia Lucke & Carl Rothman. No signatures required and revision number and date not changed.	S. Scott		

16.0 Appendices

Appendix 1: Occupational Dust Management Document Flow Chart