



# Best practice guidance for reducing health risk for workers handling sewage, biosolids or recycled water

## Introduction

This fact sheet has been prepared by the Department of Health and the Department of Mines, Industry Regulation and Safety to provide information and best practice guidance for organisations and workers handling human effluent (sewage), biosolids or recycled water.

There is a risk of pathogens being present in treated sewage, biosolids or recycled water even if the human effluent treated at wastewater treatment plants has been disinfected.

People who may be at risk of exposure include:

- Workers at sewage treatment plants
- Workers transporting septage from septic tanks to licenced facilities
- Operators of recycled water schemes
- Workers applying biosolids to land
- Workers and laboratory staff handling sewage or recycled water samples or biosolids or contaminated soil samples
- Plumbers, irrigators and other people involved in maintenance work for wastewater systems or recycled water

This guidance document provides both workers and employers with details on the more common hazards when handling human effluent and the best practice preventive measures required to manage risks.

## Hazards in sewage

Sewage can contain:

- **Biological Hazards.** Pathogens (disease causing organisms such as viruses, bacteria, protozoa or other microorganisms) are found in sewage. Most of the health effects in occupational exposures to sewage are attributed to the microbial hazards. There are four principal categories of microbial hazards found in raw sewage:
  - i. Enteric (intestinal) microbial pathogens, such as rotavirus and *Cryptosporidium* that cause gastroenteritis if ingested;

- ii. Opportunistic pathogens, such as *Pseudomonas aeruginosa* and *Legionella pneumophila*
  - iii. Microbial endotoxins that could be inhaled in the workplace and
  - iv. Parasites such as intestinal worms and *Giardia duodenalis*
- Chemical hazards. Sewage can be deficient in oxygen or contain flammable gases such as methane and toxic gases such as carbon monoxide and hydrogen sulfide. For example, flammable gases may be released during vehicle transport of human sewage due to agitation, presenting a risk of fire or explosion. Sewage may also contain harmful substances from trade waste or industrial and commercial facilities, such as certain solvents, organic chemicals and heavy metals.

These microbiological and chemical hazards can pose an occupational health and safety risk to workers if not managed in a safe manner. The two primary routes of exposure are skin contact or inhalation. Affected areas may include the nose, throat, respiratory tract, eyes and any part of the body directly contacted or splashed by sewage. Inadvertent ingestion through contaminated tools or hands is another route of exposure that can be reduced by good personal hygiene practices and adequate use of personal protective equipment.

## Employer's Responsibilities

Employers must, so far as is practicable, provide and maintain a working environment where their employees, as well as all contractors and visitors, are not exposed to hazards. The general duties of an employer to maintain a safe workplace include:

- Ensure safe systems of work are in place
- Provide safe work practices and information, instruction, training and supervision
- Encourage an environment of consultation and co-operation
- Provide personal protective equipment (PPE), and ensure there are systems for PPE inspection, maintenance, cleaning and storage
- Provide or support occupational immunisations on a risk basis.

*"Where workers are at significant occupational risk of acquiring a vaccine-preventable disease, the employer should implement a comprehensive occupational vaccination program, which includes a vaccination policy, current staff vaccination records, provision of information about the relevant vaccine-preventable diseases, and the management of vaccine refusal (e.g. reducing the risk of a healthcare worker transmitting disease to vulnerable persons). Employers should take all reasonable steps to encourage non-immune workers to be vaccinated."*

- *The Australian Immunisation Handbook (2017)*

- A vaccination program should be in place where there is a significant risk of exposure to Hepatitis A or Tetanus (eg workers in regular contact with sewage). The Australian Immunisation Handbook recommends vaccinations for Hepatitis A and Tetanus (as dT or dTpa - ie with Diphtheria +/- Pertussis) for these workers.

- A vaccination program may include agreement in relation to vaccination as an employment prerequisite.
- Where required on a risk basis, vaccination should be provided free of charge to employees.
- Ensure that safe systems of work are in place for the use of plant, toxic substances and confined spaces
- Ensure the provision of hand washing facilities, showers, change rooms, equipment storage areas and eating facilities. In the case of workers in the field, portable sanitation equipment including clean water and soap should be provided
- Provide suitable labelling and warning signs
- Provide first aid supplies and first aid training on a risk basis
- Ensure the provision of separate areas for storage of clean and contaminated equipment
- Ensure that there are clear procedures in place for reporting incidents, injuries and disease. The employer should develop and implement policies and operational procedures for hazardous material exposure and management
- Provide eye wash stations in splash hazard areas or areas where chemicals are handled

## **Training**

Employers shall ensure that induction and periodic training is provided to all workers, including on-site contractors and where relevant site visitors. The training should include information on the following:

- Appropriate hygiene practices and the reasons they are required
- Human effluent, biosolids and recycled water safe work practices as relevant to the site
- Adequate use, storage, cleaning or disposal of contaminated PPE and other equipment
- Reporting procedures for damaged PPE and other equipment, incidents and potential work-related illness/symptoms
- Signs and symptoms of waterborne diseases and notification procedures
- Evacuation and emergency procedures if fire or explosions are a risk in the workplace
- Confined space procedures, where relevant
- Workers transporting sewage should be trained on how the truck operates, procedures to safely handle the product including methods for venting vacuum pump exhaust vapours and how to drive safely with hazardous materials.

## **Personal Protective Equipment (PPE)**

Employers must ensure that PPE appropriate to the task being undertaken is provided for workers. PPE that is usually required when working with human effluent, biosolids or recycled water includes:

- Work clothes (coveralls or clothes with long sleeves and long pants)
- Enclosed liquid repellent shoes or rubber boots with non-slip soles

- Waterproof gloves. Waterproof gloves should always be worn when cleaning pumps, filters or screens and when handling effluent, recycled water biosolids or grit.
- Eye protection shall be worn at all times where the eyes may be exposed to dust, flying particles, or splashes
- Liquid repellent coveralls, a disposable or reusable respirator and/or splash-proof face shield may be required in some circumstances when dealing with raw sewage or confined spaces. Air purifying respirators may filter for particulates and/or gases, however in confined spaces or where there is a risk of low oxygen levels an air supplied respirator may be required.
- Any other PPE identified as necessary during risk assessment processes

## **Workers' Responsibilities**

### **General**

Workers are required to:

- Follow safe systems of work as per their employer's directions
- Use PPE in the manner in which they have been trained
- Report hazards or work related injury or illness to their employer
- Avoid any actions or omissions that may present a hazard to themselves or others

### **Hygiene Practices**

When handling or working with human effluent, biosolids or recycled water workers should:

- Avoid direct contact with sewage or recycled water and unnecessary exposures to sprays and aerosols. This includes avoiding work around active sprinklers when irrigating or the generation of mists and airborne dust when applying biosolids to land
- Wash hands with soap and clean water immediately and every time after working
- Keep fingernails short. Nails should be scrubbed well with soap after work
- Ensure hands are clean before eating, drinking, smoking or using the toilet
- Avoid touching the face, mouth, eyes, nose, ears or open sores and cuts when handling sewage, biosolids or recycled water
- Before eating, remove soiled work clothes, wash hands and face and only eat in designated areas away from sewage contaminated areas
- Keep open sores, cuts, lacerations, abrasions and wounds covered with clean, dry bandages or waterproof dressings
- Wash eyes with drinking water if sewage or recycled water contact eyes
- Remove work clothing at the end of the shift and if possible leave it at work
- Ensure soles of boots are clean to minimise spread of biosolids outside application areas
- Keep work clothes separate from other clothes

- Wherever possible, separately launder and store work clothes. Clean work clothing with 0.05% chlorine solution (1 part of bleach to 100 parts of water)
- Clean work tools after use
- Shower after work and change clothes before leaving

## Work related symptoms

Workers should visit the medical practitioner if they have one or more of the symptoms below:

- cramping stomach
- fever
- nausea
- diarrhoea
- vomiting
- yellowing of the skin
- symptoms of breathlessness, chest tightness and wheezing
- redness and pain of the eyes
- skin rash and/or pain

Make sure you tell your medical practitioner you work with either human effluent, biosolids or recycled water.

## References/ additional reading

Australian Government Department of Health, [Australian Immunisation Handbook](#) (2017)

Government of Western Australia, [Guidelines for the Non-potable Uses of Recycled Water in Western Australia](#) (2011) Department of Health

Government of Western Australia, [Western Australian guidelines for biosolids management \(2012\)](#). Department of Environment and Conservation

Government of Western Australia, [Code of Practice – First aid facilities and services; workplace amenities and facilities; personal protective clothing and equipment](#) (2002) Commission for occupational safety and health

Government of Western Australia [Health \(Miscellaneous Provisions\) Act 1911](#)

Government of Western Australia, [Occupational Safety and Health Act 1984](#)

Government of Western Australia, [Occupational Safety and Health Regulations 1996](#)

AS/NZS ISO 6529 Protective clothing – Protection against chemicals – Determination of resistant of protective clothing to permeation by liquids and gases

AS/NZS 1337.1 Personal eye protection – Eye and face protectors for occupational applications

AS 1319 1994 Safety signs for the occupational environment

AS/NZS 2161 Occupational protective gloves

AS/NZS 2210 Occupational protective footwear

AS/NZS 4501.1:2008 Occupational protective clothing — Guidelines on the selection, use, care and maintenance of protective clothing

## More information

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