State code 21: Hazardous chemical facilities

Purpose statement

The development is designed and sited, so far as **reasonably practicable**, to ensure:

1. human health and safety, and the built environment are protected from off-site risks resulting from physical or chemical hazards;
2. **hazardous chemical facilities** are protected from:
   a. off-site **hazard scenarios** at existing **hazardous chemical facilities**;
   b. natural hazards.

Using this code

The assessment benchmarks for this code comprise:

- a purpose statement which identifies the overall intent of the code;
- performance outcomes which set benchmarks to achieve the purpose statement of the code.

Development complies with the code where:

- it complies with all the performance outcomes; or
- development does not meet relevant performance outcome(s) and SARA determines, on balance, that the development complies with the purpose statement.

There are no acceptable outcomes for this code.

This code also includes the glossary of terms for definitions relevant to this code and reference documents; including the guideline **Planning guideline State code 21: Hazardous chemical facilities**, which provides direction on how to address this code.

Performance outcomes

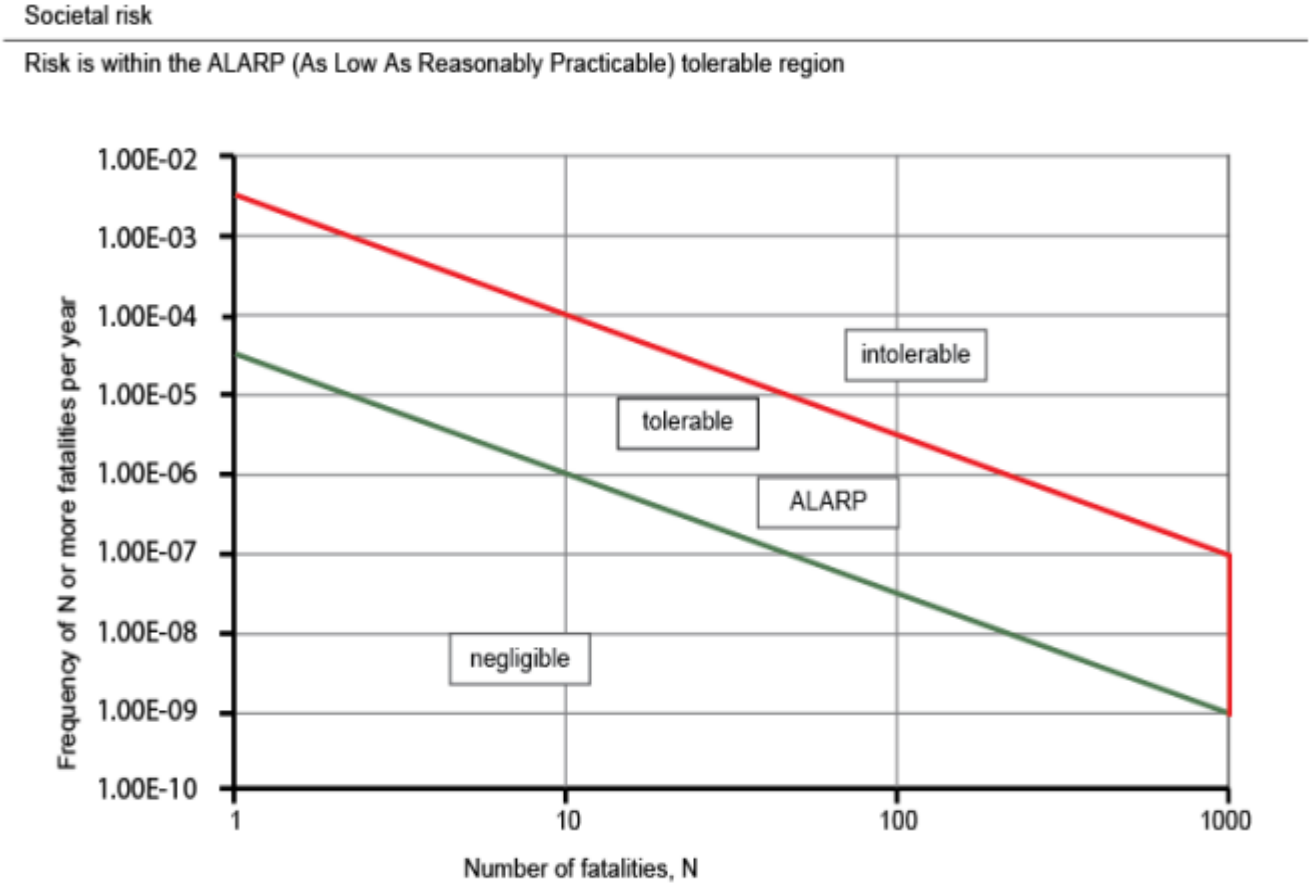
Table 21.1: Material change of use

Performance outcomes
Off-site impacts—vulnerable land use or land zoned for a vulnerable land use
PO1 The **hazardous chemical facility** does not create a **dangerous dose to human health**.
Off-site impacts—sensitive land use or land zoned for a sensitive land use
PO2 The **hazardous chemical facility** does not create a **dangerous dose to human health**.
Off-site impacts—commercial or community activity land use or land zoned for a commercial or community activity land use
PO3 The **hazardous chemical facility** does not create a **dangerous dose to human health**.
Off-site impacts—open space land use or land zoned for an open space land use
PO4 The **hazardous chemical facility**, does not create: a. a **dangerous dose to human health**; or b. where (a) cannot be achieved, an **individual fatality risk level** of 10 x 10^{-6}/year and the societal risk criteria in figure 21.1.
Off-site impacts—industrial land use or land zoned for an industrial land use
PO5 The **hazardous chemical facility**, does not create either of the following: a. a **dangerous dose to the built environment**; and b. an **individual fatality risk level** of 50 x 10^{-6}/year.
Storage and handling areas
PO6 Storage and handling areas for **fire risk hazardous chemicals** are provided with a 24-hour monitored fire detection system that has the ability to detect a fire in its early stages and notify an **emergency responder** at all times.
PO7 Storage and handling areas for **packages** of liquid or solid **fire risk hazardous chemicals** are provided with a spill containment system with a working volume capable of containing a minimum of 100 percent of all **packages** (**prescribed hazardous chemicals** and/or non-hazardous chemicals) within the area plus the output of any **fixed firefighting system** provided for the area over a minimum of 90 minutes.

PO8 Storage and handling areas for liquid or solid **fire risk hazardous chemicals** in **tanks** are provided with a spill containment system with a working volume capable of containing a minimum of: a. 110 percent of the largest **tank** within a spill compound or 25 percent of the aggregate where multiple **tanks** are located within a spill compound, whichever is the greater; and b. the output of any **fixed firefighting system** provided for any bulk **tank** within a spill compound over a minimum of 90 minutes.
PO9 Storage and handling areas for **prescribed hazardous chemicals** that, if in contact with each other, may react to produce a fire, explosion or other harmful reaction, or a flammable, toxic or corrosive vapour are designed to prevent contact between the **prescribed hazardous chemicals**.
PO10 Development is designed and sited to mitigate impacts on **storage and handling areas** from **natural hazard** including, but not limited to: a. flood; b. bushfire; c. erosion; d. storm tide inundation; e. landslide; f. earthquake; g. **wind action**.
All development
PO11 Development is designed and sited to mitigate the risks from **hazard scenarios** occurring at existing **hazardous chemical facilities**.

Figures

Figure 21.1: Societal risk criteria



Reference documents

Workplace Health and Safety Queensland, Planning guideline – State code 21: Hazardous chemical facilities

National Transport Commission, Australian code for the transport of dangerous goods by road and rail

Glossary of terms

AEGL means Acute Exposure Guidelines Level which identifies threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to eight hours as published by the United States Environmental Protection Agency.

AEGL-2 means the airborne concentration (expressed as ppm or mg/m3) of a substance above which it is predicted the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

Commercial or community activity land use means any of the following as defined in the Planning Regulation 2017:

1. shopping centre;
2. shop;
3. office;
4. major sport, recreation and entertainment facility;
5. market;
6. showroom;
7. tourist attraction;
8. entertainment facility;
9. place of worship;
10. community use;
11. theatre.

Dangerous dose to human health means:

1. for fire or explosion – an effect that equals or exceeds the following:
   a. 4.7 kilowatts per square metre for heat radiation; or
   b. 7 kilopascals for explosion overpressure;
2. for toxic or corrosive gases – an effect that equals or exceeds the following:
   a. **AEGL-2** (60 minutes); or
   b. where a corresponding **AEGL** is not available – **ERPG-2**; or
   c. where a corresponding **ERGP-2** is not available – a concentration that is likely to produce the following effects:
      i. severe distress to almost all people; or
      ii. a substantial proportion of people require medical attention; or
      iii. some people are seriously injured, requiring prolonged treatment; or
      iv. highly susceptible people might be fatally injured.

Dangerous dose to the built environment means an effect from fire or explosion that equals or exceeds the following:

1. 12.6 kilowatts per square metre for heat radiation; or
2. 14 kilopascals for explosion overpressure.

Emergency responder means a person capable of assessing the severity of an emergency situation and providing a response or requesting assistance.
Note: An **emergency responder** includes a person employed by or on behalf of a **hazardous chemical facility** or Queensland Fire and Emergency Services.

ERPG means the Emergency Response Planning Guidelines developed by the American Industrial Hygiene Association and includes **ERPG-2**.

ERPG-2 means the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.

Fire risk hazardous chemical see schedule 19 of the Work Health and Safety Regulation 2011.
Note: **Fire risk hazardous chemical** means a hazardous chemical that:
1. is any of the following:
    a. a flammable gas;
    b. a flammable liquid (hazard category 1 to 3);
    c. a flammable solid;
    d. a substance liable to spontaneous combustion;
    e. a substance which, in contact with water, emits flammable gases;
    f. an oxidizing substance;
    g. an organic peroxide; and
2. burns readily or supports combustion.

Fixed firefighting system means any water-supplying engineering control such as a drencher system, sprinkler system, foam making system, cooling ring, fire hydrant, hydrant monitor or hose reel that has been installed for a prescribed hazardous chemical storage and handling area for the purposes of mitigating fire hazards associated with that area. It does not include any fixed or portable firefighting system located outside the boundaries of the development.

Hazard scenario means a reasonably foreseeable scenario involving **prescribed hazardous chemicals** resulting in an uncontrolled fire or explosion, or release of corrosive or toxic vapours, dusts or gases from the development.

Hazardous chemical facility see the Planning Regulation 2017.
Note: **Hazardous chemical facility** means the use of premises for a facility at which a **prescribed hazardous chemical** is present or likely to be present in a quantity that exceeds 10 percent of the chemical's threshold quantity under schedule 15 of the Work Health and Safety Regulation 2011.

Individual fatality risk level means the risk of death to a person at a particular point.

Industrial land use means any of the following as defined in the Planning Regulation 2017:
1. an extractive industry;
2. a high impact industry;
3. a low impact industry;
4. a marine industry;
5. a medium impact industry;
6. a research and technology industry;
7. a service industry;
8. a special industry;
9. a warehouse.

Natural hazard see glossary in the State Planning Policy.
Note: Natural hazard means a naturally occurring situation or condition, such as a flood, bushfire, landslide, coastal erosion or storm-tide inundation, with the potential for loss or harm to the community, property or environment.

Open space land use means any of the following as defined in the Planning Regulation 2017:
1. outdoor sport and recreation (not including sporting stadiums);
2. park;
3. environment facility;
4. rural industry.

Package means a transportable container designed to contain a **prescribed hazardous chemical** that has a water capacity:
1. not exceeding 500 litres; or
2. exceeding 500 litres and is an intermediate bulk container (IBC) as defined by the ADG Code.

Placard quantity means a **placard quantity** for a **prescribed hazardous chemical** or group of prescribed hazardous chemicals as per schedule 11 of the Work Health and Safety Regulation 2011.

Prescribed hazardous chemical means any of the following:
1. a chemical listed in schedule 11 of the Work Health Safety Regulation 2011; or
2. a chemical classified as explosives under the ADG Code or GHS; or
3. a chemical classified as hazardous to the aquatic environment under the ADG Code or GHS.

Reasonably practicable see section 18 of the *Work Health and Safety Act 2011*.
Note: **Reasonably practicable**, in relation to a duty to ensure health and safety, means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including:
1. the likelihood of the hazard or the risk concerned occurring
2. the degree of harm that might result from the hazard or the risk
3. what the person concerned knows, or ought reasonably to know, about:
    a. the hazard or the risk
    b. ways of eliminating or minimising the risk
4. the availability and suitability of ways to eliminate or minimise the risk
5. after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Sensitive land use means any of the following as defined in the Planning Regulation 2017:
1. community residence;
2. dual occupancy;
3. dwelling house;
4. educational establishment;
5. multiple dwelling;
6. relocatable home park;
7. residential care facility;
8. rooming accommodation;
9. short-term accommodation;
10. tourist park.

Storage and/or handling means storing, processing, generating, using, transferring or unloading activities, but does not include transporting **prescribed hazardous chemicals** by road, rail, sea or air if the transport is regulated under the:
1. *Explosive Act 1999*; or
2. *Transport Operations (Marine Safety) Act 1994*; or
3. *Transport Operations (Road Use Management) Act 1995*; or
4. *Transport (Rail Safety) Act 2010*.

Storage and handling area means any area designed for the **storage and/or handling** of a particular **prescribed hazardous chemical** or group of **prescribed hazardous chemicals** in a quantity that exceeds a **placard quantity** and includes any separation distances, barriers and spill containment systems required to adequately isolate the area.
Further clarification: Multiple **storage and handling areas** located within a development's boundaries may be considered individual **storage and handling areas** where, after taking account of the chemical(s) within the area, each area is adequately isolated and provided with a self-contained spill compound. For example, where a **storage and handling area** for flammable liquids in **packages** and a **storage and handling area** for corrosive substances in **tanks** are located within the same facility, each area may be considered a separate **storage and handling area** provided it is appropriately isolated from the other and provided with a self-contained spill compound. However, if an area contained **packages** and/or **tanks** of flammable liquids, toxic liquids and corrosive solids all within the same spill compound; such an area is to be considered a single **storage and handling area**.

Tank means any container (e.g. tank, vessel or drum) designed to contain a **prescribed hazardous chemical** that has a water capacity exceeding 500 litres, however, does not include an intermediate bulk container (IBC) as defined by the ADG Code.

Vulnerable land use means any of the following as defined in the Planning Regulation 2017:
1. childcare centre;
2. community care centre;
3. educational establishment;
4. health care service;

5. hospital;
6. retirement facility.

Wind action means the influences of site wind speeds, design wind speeds, design wind pressures and distributed forces as described in the Australian and New Zealand Standard AS/NZS1170.2: Structural design actions: Part 2, Wind actions.

Abbreviations

ADG Code – Australian code for the transport of dangerous goods by road and rail as published by the National Transport Commission

AEGL – Acute Exposure Guidelines Level

ERPG – Emergency Response Planning Guidelines

GHS – Globally Harmonised Classification System as referenced in the Work Health and Safety Regulation 2011