

## 10 Pollution, Hazardous Substances and Waste Management 10-1

|          |  |       |
|----------|--|-------|
| 10.1     | Introduction.....  | 10-1  |
| 10.2     | Pollution, Hazardous Substances and Waste Management Issues .....                      | 10-1  |
| 10.3     | Pollution, Hazardous Substances and Waste Management: Objectives<br>and Policies ..... | 10-2  |
| 10.3.1   | Air Emissions .....  | 10-2  |
| 10.3.2   | Noise .....  | 10-5  |
| 10.3.3   | Outdoor Lighting .....   | 10-7  |
| 10.3.4   | Vibration .....  | 10-7  |
| 10.3.5   | Hazardous Facilities and Contaminated Sites .....                                      | 10-7  |
| 10.3.6   | Waste Management .....   | 10-9  |
| 10.4     | Air Quality: Rules.....  | 10-11 |
| 10.4.1   | Discharge of Contaminants to Air .....   | 10-11 |
| 10.4.2   | Odour .....  | 10-11 |
| 10.4.3   | Dust .....   | 10-11 |
| 10.5     | Noise: Rules .....   | 10-12 |
| 10.6     | Outdoor Lighting: Rules.....   | 10-18 |
| 10.7     | Vibration: Rules .....   | 10-19 |
| 10.8     | Hazardous Facilities and Contaminated Sites: Rules.....                                | 10-20 |
| 10.8.1   | Hazardous Facilities: Activity Status .....  | 10-20 |
| 10.8.2   | Radioactive Material: Activity Status .....  | 10-21 |
| 10.8.2.1 | Permitted Activities .....   | 10-21 |
| 10.8.2.2 | Discretionary Activities .....   | 10-21 |
| 10.8.2.3 | Prohibited Activities .....  | 10-21 |
| 10.8.3   | Contaminated Sites: Activity Status .....  | 10-22 |
| 10.8.3.1 | Controlled Activities .....  | 10-22 |
| 10.8.4   | Information Requirements .....   | 10-22 |
| 10.8.4.1 | Information Requirements for Contaminated Sites .....                                  | 10-22 |
| 10.8.4.2 | Information Requirements for Discretionary<br>Activities .....                         | 10-22 |
| 10.8.5   | Controls for Hazardous Facilities .....  | 10-23 |
| 10.8.6   | Assessment Criteria .....  | 10-24 |
| 10.8.6.1 | Assessment Criteria for Controlled Activities .....                                    | 10-24 |
| 10.8.6.2 | Assessment Criteria for Discretionary Activities .....                                 | 10-25 |
| 10.9     | Waste Management: Rules .....  | 10-25 |
| 10.9.1   | Activity Controls .....  | 10-25 |
| 10.9.1.1 | Waste Storage .....  | 10-25 |
| 10.9.1.2 | Process Waste Discharges .....   | 10-25 |
| 10.10    | Assessment Criteria .....  | 10-25 |

### Appendices

|      |  |       |
|------|--|-------|
| 10A  | Air Quality Guidelines .....                           | 10-26 |
| 10B: | Contaminants .....                                     | 10-27 |
| 10C: | Discharges to Air Categories.....                      | 10-31 |
| 10D: | High Noise Routes .....                                | 10-37 |
| 10E: | High Background Noise Area .....                       | 10-38 |
| 10F: | Noise Measurement Boundary - RNZN Base, Devonport..... | 10-39 |
| 10G: | Hazardous Facility Screening Procedure (HFSP) .....    | 10-40 |
| 10H: | Chelsea Estate, Noise Measurement Line .....           | 10-57 |
| 10I: | Business 11 Zone Noise Control Boundary .....          | 10-58 |



## 10. Pollution, Hazardous Substances and Waste Management

---

### 10.1 Introduction

---

This section deals with sustainable management issues relating to pollution, hazardous substances and waste generation. The manner in which these are addressed can significantly affect the environmental quality of North Shore City, as well as the health, safety and general well-being of its various communities. Management measures in relation to these matters are therefore central to achieving the purpose of the Resource Management Act 1991 (RMA). Given the potential for contaminants to harm the environment in a number of ways, the following sections of the RMA are relevant to this section:

- *Section 5*: the sustainable management purpose of the RMA
- *Section 6, 7 and 8*: most of the matters set out in these sections of the RMA

The *Auckland Regional Policy Statement* contains a number of policies which need to be taken into account in this section of the Plan. They include the following:

- Objectives aimed at protecting water quality from the discharge of contaminants. In the case of industrial, trade and rural production and processing activities, the requirement that they utilise clean production and site management measures, that trade wastes be suitably disposed of, and that where industrial activities are located next to water, suitable separation should be provided
- Objectives aimed at protecting air quality, including the need to avoid, remedy or mitigate industrial emissions
- Objectives aimed at reducing the quantity of waste produced and avoiding or mitigating adverse effects from waste disposal
- Objectives aimed at preventing or mitigating risks relating to the use, storage, disposal and transporting of hazardous substances.

The Council's goals for enabling and promoting the purpose of the Resource Management Act 1991 are set out in Section 6 and include a number of goals which provide guidance for the development of objectives and policies in this section. Specifically, these are the Natural Environment, Built Environment, Ease of Movement, Employment and Economic Growth goals.

The objectives and policies for this section are set out under the following heading: Pollution, Hazardous Substances, and Waste Management.

Pollution covers a range of adverse emissions to the environment, which are dealt with under the headings of air emissions, noise, outdoor lighting, vibration, hazardous facilities, contaminated sites and waste management.

---

### 10.2 Pollution, Hazardous Substances and Waste Management Issues

---

The significant issues for pollution, hazardous substances and waste management within North Shore City addressed in the objectives and policies of this Plan are as follows:

- How to manage emissions to air in a manner which ensures that adverse effects on the environment are avoided or mitigated, and that the general well-being and amenity aspirations of the community are protected
- How to manage noise generation within a growing city so as to protect the general well-being and amenity aspirations of the community and at the same time enable

business and industrial activity to operate satisfactorily

- How to avoid, remedy or mitigate the effect of unreasonable levels of traffic noise
- How to manage the adverse effects of outdoor lighting on amenity and safety
- How to ensure that vibration caused by activities and equipment does not adversely affect human health or amenity
- How to manage instances of contamination of sites caused by previous land use
- How to ensure that current activities do not cause contamination of land
- How to manage use and discharge of water so as to protect public health, safety and the environment
- How to manage hazardous substances in conjunction with the Auckland Regional Council so that significant risk to the environment and people is avoided
- How to manage waste generation in conjunction with the Auckland Regional Council, recognising that movement of by-products of activity (such as energy and materials) through the environment can cause adverse effects.

This section of the Plan deals directly with the effects of particular activities. Essentially all of the issues listed above are concerned with the best means of managing those effects. By their nature, the matters dealt with in this section are technical and complex. This poses particular problems in finding management methods which are appropriately designed to control the range of anticipated effects and yet able to be understood and complied with relatively easily.

---

## 10.3 Pollution, Hazardous Substances and Waste Management: Objectives and Policies

---

### 10.3.1 Air Emissions

#### **Objective**

To avoid, remedy or mitigate the adverse effects of activities on air quality in the urbanised areas of the city, and to ensure that high quality air standards are achieved in areas where land is being converted to urban purposes.

#### **Policies**

1. By adopting ambient air quality guidelines to assess air discharges which fall within the Council's consent responsibility.
2. By adopting appropriate, internationally recognised standards to avoid, remedy or mitigate and control the discharge of contaminants and dust from air discharges which fall within Council's consent responsibility until standards or guidelines are prescribed in a Regional Air Quality Plan.
3. By requiring all operators of industrial and trade premises to minimise the discharge of contaminants to air from air discharges which fall within Council's consent responsibility in order to meet adopted standards.
4. By assessing air discharges which fall within Council's consent responsibility on the basis of existing or proposed point-source mitigation measures and the extent of compliance with adopted ground level concentration standards.
5. By ensuring that the more noxious, dangerous and offensive industrial processes are Discretionary or Non-Complying activities.
6. By controlling open air burning, including domestic incineration by bylaw, until a Regional Air Quality Plan is prepared.
7. By restricting all new activities which cannot satisfactorily mitigate objectionable or offensive odours, or significant air emissions, to locations which provide appropriate buffer distances between such activities and residential or other sensitive locations.

8. By increasing opportunities for people to work close to their home through wider provision for mixing of residential and business activities in the city, as a means of reducing vehicle emissions.
9. By promoting solid waste disposal options which will minimise discharges to air as part of a comprehensive strategy for waste management.
10. By implementing, in conjunction with the Auckland Regional Council, an education programme for the general public and businesses on how to reduce air emissions.
11. By avoiding the loss of trees and vegetation throughout the city and in situations where this is not possible, remedying the effects of tree and vegetation removal through re-vegetation programmes.
12. By avoiding adverse effects on human health and the environment associated with the use of chemical sprays.

### **Methods**

- Policies 1, 2, 3, 4 and 6 will be implemented by rules until they are superseded by a Regional Air Quality Plan
- Policies 5 and 8 will be implemented by rules
- Policy 7 will be implemented by bylaws, until they are superseded by a Regional Air Quality Plan or similar
- Policy 9 and 10 will be implemented by education strategies and co-ordinating initiatives undertaken by the Council
- Policy 11 will be implemented by rules, education initiatives and Council works
- Policy 12 will be implemented by education initiatives and Council policies on the use of chemical sprays.

### **Explanation and Reasons**

*The release of contaminants into the atmosphere can cause damage to natural and physical features of the environment, and contribute to global as well as localised pollution.*

*While the ambient air quality of the North Shore compares very favourably with other cities in New Zealand and overseas, there are a few areas which, due to local topography, are sheltered from prevailing winds and become affected by seasonal temperature inversions. A thermal inversion is a stable atmospheric layer which suppresses the vertical motion of emissions and natural turbulence, thereby limiting dispersion of pollutants. The Albany Basin and Wairau Basin experience not infrequent seasonal meteorological conditions of this kind, which can result in raised, localised pollution levels. These areas in particular require careful air quality management.*

*The management of discharges to air within the region is a function of the Auckland Regional Council. That Council has delegated responsibility to the North Shore City Council for all but the more noxious, dangerous and offensive activities. Until such time as the Auckland Regional Council prepares a Regional Air Quality Plan prescribing air emission standards or other control parameters in the region, interim controls for air discharges are included in this Plan. While the Council has limited powers of control over the impact that vehicle emissions may have on ambient air quality, resource consent procedures will be used to control air emissions from industrial and trade processes.*

*Incineration, open burning, minor air emissions and dust generation from activities are areas where the Council can adopt measures to maintain and possibly improve air quality. Rules, bylaws and education are considered the most effective means for dealing with these matters.*

*Odour and emissions of contaminants can seriously detract from people's enjoyment of residential and other areas of the city, but both are difficult to measure in any quantitative way. The most common sources of complaint about odour and air emissions are the wastewater treatment plant, refuse tip and composting operations. Policy to address nuisance from these sources is included in the Plan. The Council has undertaken steps to mitigate nuisance effects from the wastewater treatment plant.*

The Council has adopted a set of ambient air quality guidelines prepared by the Ministry for the Environment. These guidelines, set out in [Appendix 10A](#), include the most common and widespread air pollutants, whose health effects are well documented, although at this stage the guidelines do not include greenhouse gases and ozone depleting substances. These guidelines are recommended minimum levels for ambient air quality. They are not emission limits for particular processes.

As an interim measure until a Regional Air Quality Quality Plan has been prepared, a dual approach is adopted to controlling point source emissions. This approach includes, first, the adoption of a set of indicators used by the State of Victoria, Australia set out in [Appendix 10B](#). These are a widely recognised and workable set of indicators able to be applied to point-source control. Second, a concept of separation distances between incompatible activities will be used as an additional measure to strengthen controls and enforcement. The reasons for this are that the possibilities of accidental discharges in emergencies and problems of expense and technological feasibility suggest that a cautious approach to the location of industrial activities be adopted. Therefore, many air processes within the city will require land use applications, in addition to any required discharge permit applications.

Categories of processes resulting in air discharges are specified in [Appendix 10C](#). The most noxious, dangerous, objectionable and offensive processes that remain under Auckland Regional Council control are not provided for within the city, and have a Non-Complying status. Dependent on locations, Part B and in some cases Part C, air processes are restricted to a Discretionary status in the business zones to enable location, mitigation measures and buffer distances to be assessed, and operating conditions imposed. Conversely, while the zones which provide principally for industrial activities are open to a wide range of activities, where residential activities are proposed within these zones, they will be required to acknowledge a lower level of amenity protection.

Reasons for using this approach are to ensure that aspirations of the community for clean, aesthetically pleasing air quality can be taken into account. Use of recognised Australian guidelines means both residents and owners of activities discharging contaminants to air have some certainty as to acceptable standards. Reasons for adoption of separation distances through use of zonings is to protect residential amenity under normal operating conditions, and residential safety in the event of an accident.

Trees and vegetation play an important role in mitigating the effects of carbon dioxide on overall air quality. The policy not only promotes the retention of existing trees and vegetation but also seeks to increase the total vegetation biomass of the city through planting programmes.

Spray drift from the application of chemicals such as pesticides, herbicides and insecticides during the maintenance of parks and gardens and roadside weed control operations within the city can adversely effect public health and well-being and the quality of the natural environment. Mitigation of adverse effects can be achieved through measures such as the use of non-chemical means of weed control, codes of practice, appropriate standards for equipment, notification of adjacent residents and the public in general that spraying is to be undertaken, and spray exclusion zones.

#### **Expected Environmental Results**

- New processes which discharge to air located in areas sufficiently distant from residential areas to provide a buffering effect, as measured by an annual assessment of resource consent compliance and Council's complaints register
- New industries and increasing numbers of existing industries meeting adopted air emission controls for point source emissions, odour and dust, as measured by an annual assessment of consents issued and information collated on officer visits
- An increase in awareness by industrial operators of the need to control and minimise emissions at source, as measured by an annual assessment of information collated from officer site visits
- Where basic ambient monitoring stations are established, evidence of maintenance or improvement in air quality standards on an annual basis



- Increases in the total biomass of the city and reduction of greenhouse gases, as measured by 5-yearly vegetation surveys
- Reduction in the number of people adversely effected by chemical sprays, as measured by annual assessment of Council's complaints register.

### 10.3.2 Noise

#### **Objective**

To protect from excessive and unreasonable noise levels, the health and well-being of the community and the enjoyment of residential, recreation and other locations of high amenity value.

#### **Policies**

1. By setting noise performance standards which reflect existing ambient noise levels, protect existing residential, recreation and other amenity locations of high amenity value and enable the establishment of less noise sensitive activities in specified locations.
2. By identifying residential locations exposed to high levels of traffic noise on a 'High Noise Route' map and ensuring that techniques to avoid or mitigate adverse noise effects are used for new residential development on these high noise routes.
3. By identifying and mitigating the potential adverse effects of excessive or unreasonable noise levels at the design and consent stage of developments or activities at risk from excessive or unreasonable noise.
4. By ensuring that consideration is given to appropriate avoidance and mitigation techniques and, where possible, achieving compliance with noise controls by managing noise at the point of emission in preference to providing defensive infrastructure against noise intrusion.
5. By ensuring that buildings constructed or altered for residential activity in business zones are designed to avoid and mitigate the impacts of business activity noise and to avoid conflicts with already established and future business activities.
6. Activities should be located in areas where their effects are compatible with the character of the area.
7. Activities establishing in environments where the amenity of the area is diminished, or is likely to be, by the adverse effects of a state highway are to have regard to the character of the receiving environment and should be designed, located and maintained to avoid, remedy or mitigate reverse sensitivity between land uses.

#### **Methods**

- Policies 1, 2, 3, 4 and 5 will be implemented by rules.

#### **Explanation and Reasons**

*Noise is an adverse effect of most human activity. Exposure to very high levels of noise can cause health problems through stress and disruption to sleep. At lower levels of exposure noise nuisance can still occur through reduced levels of amenity. People's perception of excessive noise levels can vary according to the setting, duration, time of day, and individual tolerance to different types of noise.*

*The two management options for dealing with excessive or unreasonable noise include dealing with the noise generation at its source and reducing exposure to noise at receiving locations. Insulation of residences against noise intrusion, or separation distances are all examples of defensive measures. However, attenuation of the noise at its source is considered the best management technique.*

*As with many cities, road traffic is the most common noise source on the North Shore. Surveys of noise exposure indicate that a number of residential sites adjacent to major roads are subjected to high levels of traffic noise. In some cases noise exposure is at or above maximum guidelines and, with increasing traffic, the situation is likely to deteriorate further. Because of the high costs associated with reducing noise emission from traffic movement, by means of alternative road surfacing, earth mounding, noise barriers, or traffic calming measures, acceptable solutions in established areas can only*

*be achieved through long-term improvement programmes. Newly developing areas, on the other hand, can be designed at the outset to meet acceptable acoustic performance standards. In these areas an assessment of the impact of road traffic noise is required as part of any subdivision consent application along with proposed noise mitigation measures to ensure that future residents will be protected from unreasonable levels of traffic noise.*

*The District Plan establishes a range of maximum noise levels for different activities and locations throughout the city. The aim is to enable the establishment of most activities provided that adverse noise effects can be avoided and mitigated. In the business zones the controls are aimed at enabling the establishment of higher noise generating activities provided that the effects on adjacent residential zone amenity can be avoided and mitigated. Residential activities are also able to establish in higher noise locations such as in the business zones provided that the owner or developer of the residential building takes into account the higher noise levels of this area. The responsibility for mitigating the noise is placed with the owner of the residential property and not businesses legitimately operating within the business zones. Similarly, residential development is permitted on the high noise routes provided that acoustic controls are implemented.*

*Different noise controls are adopted for different zones as a technique which recognises that differences in the type and intensity of activities and hours of operation, and acceptability with different zones of actual and perceived noise generation.*

*Rules adopted in the Plan are based on New Zealand noise guidelines for maximum acceptable noise exposure levels for different activities.*

*The accumulation of activities with like effects can minimise and avoid conflict.*

*Performance standards are used to determine what is appropriate based on the character and amenity values that the community seeks to protect; these standards provide a baseline. Provided an activity can meet the required standards, it may locate in a particular area.*

*Where an activity does not meet these baseline standards, landowners and developers will be required to apply for resource consent to demonstrate that any adverse effects of their activity can be avoided, remedied or mitigated.*

*The character of an area can be adversely affected by activities that generate effects that are incompatible with that character. Such effects can be from an activity located within that area, or from activities in a neighbouring area or where there is an interface between areas of different character (such as a residential area located close to a state highway).*

*It is important to ensure that those amenity values that determine the character of an area are protected from activities that are acknowledged to create effects that may degrade or detract from them. It is also important that activities that may be sensitive in nature recognise the characteristics of the area in which they are locating and make provisions accordingly.*

#### **Expected Environmental Results**

- That residential amenity will be protected from the adverse effects of excessive noise, as measured by five-yearly resident surveys and a biennial noise survey
- That new residential environments will be designed and built so that the potential impacts of traffic noise will be avoided and/or mitigated, as measured by five-yearly resident surveys, an annual assessment of Council's Complaints Register and a biennial noise survey
- That non-residential activities will be able to locate in less noise sensitive locations to avoid affecting residential amenity, as measured by five-yearly resident surveys
- That new roads will be designed and constructed to mitigate and/or avoid the effects of unreasonable levels of traffic noise, as measured by biennial noise surveys and an annual assessment of Council's Complaints Register.

### **10.3.3 Outdoor Lighting**

#### **Objective**

To avoid, remedy or mitigate the nuisance effects of outdoor lighting.



### **Policy**

1. By imposing controls on outdoor lighting adjoining any residentially zoned site.

### **Method**

- Policy 1 will be implemented by rules.

### **Explanation and Reasons**

*Misdirected outdoor lighting falling on adjoining residentially zoned properties can cause nuisance. Until such time as a New Zealand standard on the adverse effects of outdoor lighting has been adopted, interim measures are required. This is to protect the amenity of residents within residential zones.*

### **Expected Environmental Results**

- Adverse effects from outdoor lighting managed to avoid nuisance to adjacent residential zones, as measured by an annual assessment of Council's Complaints Register.

## **10.3.4 Vibration**

### **Objective**

To ensure that any adverse effects from the vibration of equipment is avoided, or reduced to an acceptable level.

### **Policy**

1. By adopting maximum acceptable vibration levels for equipment to reduce vibration discomfort to occupants of adjacent sites.

### **Methods**

- Policy 1 will be implemented by rules.

### **Explanation and Reasons**

*Vibration caused by machinery and equipment exposes people to mechanical vibration which can adversely affect human comfort and working efficiency. The adoption of vibration levels facilitates the proper balancing and/or insulation of machinery. Vibration caused by vibratory equipment and impactive machinery can often be reduced by altering the operating conditions of equipment.*

*The reason for adopting rules for vibration is to protect amenity and public health.*

### **Expected Environmental Results**

- Building vibration restricted to a level with low probability of human reaction on adjoining sites, as measured by an annual assessment of Council's Complaints Register.

## **10.3.5 Hazardous Facilities and Contaminated Sites**

### **Objective**

To minimise potential for adverse effects to people and the environment from the use, storage, transport, disposal or accidental release of hazardous substances.

### **Policies**

1. By using a preliminary hazardous facility screening procedure to determine which zones an activity can establish in and which kind of resource consent is required.
2. By specifying rules and guidelines to ensure the best operational and managerial practices for handling hazardous substances are adopted.
3. By specifying thresholds for Permitted, Discretionary and Prohibited status for radioactive materials.
4. By requiring any new hazardous facility or any existing hazardous facility which substantially alters its operation to prevent or mitigate adverse environmental effects.

5. By monitoring hazardous facilities to ensure that the cumulative effect of their operations does not pose unacceptable risks to the environment or community.
6. By identifying sites known to be contaminated or with potential to be affected by contamination.
7. By requiring remedial action within an agreed time-frame to remove or mitigate the effects of contamination based on the sensitivity of the immediate environment and intended use of the contaminated site.
8. By promoting excellence in the management operation of hazardous facilities in handling of substances so as to enhance the protection of the environment within the city.

### **Methods**

- Policies 1, 2, 3, 4 and 5 will be implemented by rules
- Policy 2 will be partly implemented by education
- Policy 5 will be partly implemented by Council initiatives
- Policy 6 and 7 will in part rely on information provision using project and land information memoranda, a hazards register (which is to be continually updated) and use of guidelines for remediation requirements, and in part be implemented by rules. For sites not owned by the Council, Policy 7 will be implemented using enforcement powers under the RMA and Health Act
- Policy 7 will be implemented by Council works, to be undertaken through the Annual and Strategic Plan process for the purpose of remediating contaminated sites in Council ownership
- Policy 8 will be implemented by education and Council initiatives.

### **Explanation and Reasons**

*Local authorities have the power to control and influence effects of land use activities. The nature and scale of environmental effects associated with hazardous facilities and contaminated sites are influenced by their location, for example, their proximity to sensitive environmental areas or residential areas. It is acknowledged, however, that statutory controls, industry codes of practice and New Zealand standards will assist in controlling the operation of hazardous facilities and consequently this part of the plan must be seen as complementary rather than in place of those controls. In this respect it is also acknowledged that national and regional policy statements may impact upon this part of the plan and require it to be modified.*

### **Hazardous Facilities**

*Facilities involving hazardous and environmentally damaging substances may cause adverse environmental effects when substances are not adequately controlled and escape into the environment. Such releases, whether accidental or brought about by poor management practices, cause environmental contamination of varying degrees. Objectives, policies and rules in this section and the Subdivision and Development section of the Plan seek to avoid these adverse effects.*

*Although some hazardous facilities are permitted without a resource consent because the risk they pose is deemed to be low, an aggregation of such facilities may generate adverse effects if operational procedures do not conform to defined minimum performance standards. Ongoing monitoring is important to identify any such situation developing.*

*Reasons for rules relating to the location and handling of hazardous substances are to ensure that appropriate protective measures are implemented relative to the nature and scale of risk and environmental effects. Particular emphasis is given to protecting air and water quality as well as public safety and health. The potential effects can be of sufficient magnitude to justify requiring changes to both existing and new activities and are therefore all subject to the assessment provisions.*

*The importance of a regular monitoring programme is to ensure that any potential cumulative effects can be avoided, remedied or mitigated upon detection, and that consent conditions are being implemented.*

*Reasons for promoting use of education initiatives, such as hazardous substance guidelines, are to ensure resource users are aware of plan provisions and fully understand their implications.*

### **Contaminated Sites**

*The actual or potential risks, to both the environment and community, posed by contaminated sites can be substantial. Proper consideration must be given to proposals to re-use such sites to ensure that measures are taken so that the site is safe for the proposed activity. In addition, because contamination can, in some instances, do further damage to the environment, the Council wishes to ensure that the decontamination of sites is undertaken in accordance with Auckland Regional Council guidelines.*

*The timeframe and resources necessary for decontaminating contaminated sites in Council ownership will be addressed through the Strategic and Annual Plan process, whilst those in private ownership will be required to be decontaminated under the Resource Management and/or Health Acts if they pose an unacceptable environmental or health risk.*

*Known and potential contaminated sites are identified in the Council's Property Information Register. Not all of the contaminated sites have at present been identified. It is intended, however, that this Register be amended as additional information is available.*

*Reasons for identifying actual and potentially contaminated sites are to inform the public of site contamination liabilities. Site identification also allows the Council to ensure public health and safety is protected and that appropriate remedial action is undertaken.*

*Reasons for requiring remediation of sites with reference to impacts of contamination on the immediate environment and public health are to meet part of the RMA's purpose to safeguard the life supporting capacity of air, water, soil and ecosystems, including people.*

### **Expected Environmental Results**

- Minimised potential for adverse effects of hazardous substances, as measured by an annual assessment of compliance with resource consent conditions and an annual assessment of hazardous substance incident records
- Hazardous substance activities with greatest risk to people and the environment occurring in appropriate business zones, as measured by an annual assessment of resource consents and an annual assessment of hazardous substance incident records
- Increase in the level of awareness and knowledge of hazardous substances, as measured by an annual review of officer assessments and five-yearly assessment of incident records
- Maintenance of water and air quality within urban areas, as measured by annual surveys undertaken by the Auckland Regional Council
- The identification of contaminated sites so that appropriate effects management measures are put in place, as measured by completion of an evaluation of Council records on known risk sites by December 1995
- That the number of non-remediated contaminated sites declines over the life of the Plan, as measured annually through resource consents.

## **10.3.6 Waste Management**

### **Objective**

To promote the Government Policy (1992) of a waste hierarchy which consists of waste:

- Avoidance
- Reduction

- Reuse
- Recycling
- Disposal

with emphasis placed at the higher levels of the hierarchy so as to encourage more sustainable resource use and to protect the environment.

### **Policies**

1. By requiring all activities that generate waste to meet the costs of disposal and encouraging all activities, particularly those generating significant amounts of solid waste, to carry out waste audits enabling assessment of better waste management options.
2. By including rules in the Plan designed to reduce potential for contamination from the collection, storage or disposal of waste materials.
3. By raising community awareness of options for more sustainable waste management practice.

### **Methods**

- Policies 1 and 2 will be implemented by charges and education
- Policy 3 will be implemented through education strategies, by Council works in the form of service provisions, and by Council initiatives in the form of advocacy.

### **Explanation and Reasons**

*Present waste production can be significantly reduced and a significant amount of waste could be reused or recycled so that, in the case of solid waste, it need not take up space in landfills.*

*While in part constituting an under-utilised resource, waste also has adverse economic and environmental effects. This is in terms of demand for services, land for disposal, or adverse effects on the receiving environment. To address these issues the Ministry for the Environment is promoting a waste hierarchy concept which emphasises avoidance, reduction, reuse and recycling of waste to reduce disposal requirements.*

*The reason for including waste management measures is to ensure efficient and environmentally sound integration of resource use within North Shore City and to support the waste hierarchy concept. Opportunities exist to improve levels of waste reduction, re-utilisation and recycling and to apply the principles of clean engineering. A range of environmental and economic benefits accrue to such an approach.*

*Waste audits are a means of identifying alternatives for avoiding, or reducing generation of waste and are therefore supported by the Ministry for the Environment which has promoted the waste hierarchy concept. The reasons for encouraging waste audits, particularly for large generators of waste is that 1994 figures show that business activities create around 70% of the total waste stream. The Ministry of the Environment's document entitled "Waste and the RMA (1994)" acknowledges that waste audits have a major role to play in providing information on the waste stream but that it is not considered possible or desirable to require comprehensive audits under the RMA. Therefore non-statutory methods such as education and guidelines are considered more appropriate and effective.*

### **Expected Environmental Results**

- That waste volumes will decline per head of population and per business, as measured by an annual assessment of available use and disposal data
- That collection, storage and disposal of waste materials does not harm the natural and physical environment, as measured by a biennial assessment of contamination incidents due to this source.

---

## 10.4 Air Quality: Rules

---

Unless otherwise stated, where any activity or proposed activity within a business zone fails to comply with the rule specified in the section, the activity will be considered as a Limited Discretionary activity. The Council reserves its discretion to impose conditions which are necessary or desirable to ensure that the adverse effects generated by the proposal are of the order anticipated.

### 10.4.1 Discharge of Contaminants to Air

All Permitted and Controlled activities in all zones shall comply with the following:

Where the Council has delegated authority over air discharges no activity shall discharge any contaminant containing a substance listed in [Appendix 10B](#).

#### **Explanation and Reasons**

*Air discharge limits ensure that discharges of pollutants from industrial processes do not affect public health, cause nuisances or affect the amenity of areas. Although control of air discharges is a function of the Auckland Regional Council, responsibility for administering all but the most noxious and offensive emissions within the city has been delegated to North Shore City Council. This control is intended to complement other measures aimed to achieving appropriate separation distances between incompatible activities and setting appropriate air quality standards.*

*Reasons for adopting this control are to ensure protection of the environment, public amenity and safety until such time as the Auckland Regional Council prepares a Regional Air Quality Plan. The air emission control is set to manage emissions at source and ensure that where necessary technological means are used to reduce the emission of pollutants.*

### 10.4.2 Odour

All Permitted and Controlled activities in all zones shall comply with the following:

- a) No activity shall create any intrusive odour which is, or is likely to be, either objectionable or offensive in the opinion of an enforcement officer, and is able to be detected beyond the boundary of any site within a residential, urban expansion, rural or recreation zone.
- b) No activity within the Sub-regional 6, or Business Park 7 zones shall create any intrusive odour which is, or is likely to be, either objectionable or offensive in the opinion of an enforcement officer, and is able to be detected beyond the boundary of the site on which the activity is carried out.

#### **Explanation and Reasons**

*The measurement of odour by technical means is extremely difficult and complex. The problem is exacerbated by differing perceptions of odour from person to person. The human nose is still the best known instrument as far as sensitivity to odours is concerned. The control adopted has been devised to take account of the variability of human perception and as a workable means of controlling odour.*

*The reason for adopting odour controls is to provide a practicable means of controlling odours which would not be satisfactorily regulated by the air discharge control. This is because odours can clearly have an adverse effect on the environment, including amenity values.*

### 10.4.3 Dust

All Permitted and Controlled activities in all zones shall comply with the following except that this rule shall not apply to any construction, maintenance or demolition activities provided that the Best Practical Option is applied and all practical measures are applied to avoid, remedy or mitigate any dust nuisance beyond the boundary of the activity.

No activity shall create dust which is, or is likely to be, either objectionable or offensive in the opinion of an enforcement officer, beyond the site boundary of the activity.



### **Explanation and Reasons**

*Discharges of dust to air are potentially injurious to health and affect amenity as shown by complaints relating to air quality. Standards used are from the International Standards Organisation.*

*Reasons for using dust emission standards are to protect amenity values, public health and overall environmental quality. The standards used ensure that a consistent, internationally recognised assessment is made.*

---

## **10.5 Noise: Rules**

---

Unless otherwise stated, where any activity or proposed activity within a business zone or the Residential 8 zone fails to comply with the rule specified in the section, the activity will be considered as a Limited Discretionary activity. The Council reserves its discretion to impose conditions which are necessary or desirable to ensure that the adverse effects generated by the proposal are of the order anticipated.

All Permitted and Controlled activities are subject to the following controls, as are Limited Discretionary activities in the Residential 8 zone:

- a) All activities shall comply with the noise levels specified in **Table 10.1** and Table 10.2.
- b) Residential Zones and Business Zones in the Albany Centre

### **Existing High Noise Routes**

In circumstances where a residential unit is to be constructed on any site near to an existing and/or potential high noise route as specified in **Appendix 10D** and subject to a daily noise exposure level (Leq (6am-10pm)) as defined in *New Zealand Standard 6801:1991* equal to or greater than (Leq (6am-10pm)) 65 dBA on any part of the site, an Acoustic Design Report is to be obtained from a suitably qualified Acoustic Engineer confirming that the building will be constructed not to exceed a daily noise exposure of (Leq (6am-10pm)) 40 dBA in all habitable rooms with ventilating windows open.

- c) Business zones (including the Long Bay 5 zone)
  - i) New buildings and alterations to existing buildings to be used for residential purposes in any business zone except the Business 11 zone and the Business 12 - Mixed Use zone must meet the following:
    - Noise received in all habitable rooms shall not exceed 35 dBA L10 between 2300 hours and 0700 hours with ventilating windows open.
    - An Acoustic Design Report shall be obtained from a suitably qualified Acoustic Engineer confirming that the building will be constructed to meet the above requirement.
  - ii) New buildings and alterations to existing buildings to be used for residential purposes in the Business 11 zone shall meet the following:
    - The building shall be designed and built to achieve a minimum sound rating of  $D_{nTw} + C_{tr} \geq 28$  to habitable areas except bedrooms.
    - The building shall be designed and built to achieve a minimum sound rating of  $D_{nTw} + C_{tr} \geq 30$  to bedrooms.
    - The glazing of the facades in all residential units shall be of laminated construction, or an approved construction that enables compliance with the above minimum sound ratings.
    - Mechanical ventilation shall be provided for all habitable rooms where necessary to ensure compliance with Section G4 of the Building Code and the above minimum sound ratings.
  - iii) The noise level generated from any activity, including the playing of music, within the Business 11 Zone, measured at the facade of any residential unit or other



building, shall not exceed the following limits:

| <b>Table 10.1 Business 11 Noise Limits</b> |                          |   |
|--|--------------------------|---|
| <b>Zone</b>                                | <b>0700hrs - 2300hrs</b> | <b>2300hrs - 0700hrs</b>  |
| 11A,11B and 11C                            | 65 dBA $L_{10}$          | 55 dBA $L_{10}$<br>65 dBA $L_{10}$ at 63Hz<br>60 dBA $L_{10}$ at 125 Hz<br>75 dBA $L_{max}$ |
| 11D  | 65 dBA $L_{10}$          | 65 dBA $L_{10}$   |

- iv) In the Business 12 - Mixed Use zone
- New buildings and alterations to existing buildings to be used for residential purposes must meet the following:
    - The facades of bedrooms within all residential units shall be designed and built to achieve a minimum sound rating of  $DnTw + Ctr > 30$ .
    - The facades of living spaces within all residential units shall be designed and built to achieve a minimum sound rating of  $DnTw + Ctr > 28$ .
  - Any business premises containing activities involving the playing of music shall be constructed and operated so as to ensure that the limits of Table 10.3 are not exceeded. A certificate from a suitably experienced and qualified acoustician shall be provided demonstrating compliance before the issue of a building consent.
  - The noise level generated from any activity within the Business 12 - Mixed Use zone shall not exceed the limits in Table 10.3:
- d) In the Residential 8 zone
- New buildings and alterations to existing buildings to be used for residential purposes must meet the following:
    - The facades of bedrooms within all residential units shall be designed and built to achieve a minimum sound rating of  $DnTw + Ctr > 30$ .
    - The facades of living spaces within all residential units shall be designed and built to achieve a minimum sound rating of  $DnTw + Ctr > 28$ .
  - Any business premises containing activities involving the playing of music shall be constructed and operated so as to ensure that the limits of Table 10.3 are not exceeded. A certificate from a suitably experienced and qualified acoustician shall be provided demonstrating compliance before the issue of a building consent.
  - The noise level generated from any activity within the Residential 8 zone shall not exceed the limits in Table 10.3:
- e) North Harbour Stadium
- Where a residential unit is to be constructed on Business 11C zoned land lying to the west of the north south axis as shown on the Albany Centre structure plan (i.e. the north south axis that runs along the centre line of Munroe lane, through the lakes reserve and the centre of the Business 4 zone) the building shall be constructed so that a level of 50 dBA  $L_{10(5 \text{ minute})}$  is not exceeded in all habitable rooms based on the 85 dBA  $L_{10(5 \text{ minute})}$  noise contour as specified in Appendix 10I. An Acoustic Design report by a suitably qualified Acoustic Engineer shall be provided in this

regard.

f) All zones

Prior to the establishment of any activity (for example restaurants and bars) which will exceed a level 5 dBA less than the noise standards specified in **Table 10.1**, an Acoustic Design Report shall be obtained from a suitably qualified Acoustic Engineer confirming that the activity will not exceed the noise levels specified in **Table 10.1** or 10.2.

g) Noise levels specified for each zone in this table shall be measured and assessed in accordance with the requirements in NZS 6801:1991: 'Measurement of Sound' and NZS 6802:1991: 'Assessment of Environmental Sound'. The noise shall be measured with a sound level meter complying with the international standard Sound Level Meters, Type 1.

h) The maximum noise levels specified in **Table 10.1**, Table 10.2 and Table 10.3 shall not apply to:

i) Noise from safety signals, warning devices, or emergency pressure relief valves, provided they do not sound for more than a reasonable period.

ii) Noise associated with outdoor recreational activities and sporting events.

iii) Any noise emitted by:

- Any aircraft being operated during or immediately before or after flight; or
- Any vehicle being driven on a road (within the meaning of Section 2(1) of the Transport Act 1962); or
- Any train other than at a railway station or in railway yards.

iv) The Special Purpose 12 zone.

i) Any construction, maintenance and demolition noise shall comply with the provisions of NZS 6803 P 1984 'The Measurement and Assessment of Noise from Construction, Maintenance and Demolition Work'.

j) Residential 2A Chelsea Special zone, noise measurement:

The measurement of the 'maximum permitted noise levels' at residential zone boundaries as set out in clause (i) of section A of Table 10.1 shall occur at the 'noise measurement' line shown in Appendix 10 H notwithstanding that the (intervening) land between the Chelsea sugar refinery operation and the defined 'boundary line' is zoned 'residential'; provided that the 'noise measurement' line will cease to apply in the event of either

1.the receipt of any application for resource consent for any new residential activity within the 'intervening' land, or

2.the sugar refining operation ceasing.

k) New buildings and alterations to existing buildings to be used for residential purposes in the Milford Intensive Residential Development Overlay Area must meet the following:

- Noise received in all habitable rooms shall not exceed 35 dBA L10(15min) between 2300 hours and 0700 hours. If this cannot be achieved with ventilating windows open, the noise limit shall be complied with including the noise generated by any mechanical ventilation system.
- The external noise level incident on the facade shall be based on the following spectrum:

| Octave Band Centre Frequency |       |       |       |        |        |        |             |
|------------------------------|-------|-------|-------|--------|--------|--------|-------------|
| 63Hz                         | 125Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | A- weighted |
| 74dB                         | 67dB  | 66dB  | 61dB  | 59dB   | 59dB   | 54dB   | 65dB        |

- An Acoustic Design Report shall be obtained from a suitably qualified Acoustic Expert confirming that the building will be constructed to meet the above requirements.

| <b>Table 10.2 Maximum Permitted Noise Levels by Zone</b> |  |  |  |                            |
|--|--|--|--|----------------------------|
|  | <b>Mon-Sat<br/>Inclusive<br/>0700hrs -<br/>2000hrs</b> | <b>Mon-Sat<br/>Inclusive<br/>2000hrs -<br/>2300hrs</b> | <b>Sun &amp;<br/>Public<br/>Holidays<br/>0700hrs -<br/>2400hrs</b> | <b>All Other<br/>Times</b> |

**A: All Zones Except Residential**

(as measured at any residential zone boundary and any residential site boundary in the rural zones)

|      |   |            |            |            |                              |
|------|---|------------|------------|------------|------------------------------|
| i)   | As measured at any residential zone boundary except for those within the high background noise area identified in <a href="#">Appendix 10E</a> .    | 50 dBA L10 | 45 dBA L10 | 45 dBA L10 | 40 dBA L10<br>75 dBA<br>Lmax |
| ii)  | As measured at any residential zone boundary located in the high background noise area identified in <a href="#">Appendix 10E</a> .                 | 55 dBA L10 | 50 dBA L10 | 45 dBA L10 | 45 dBA L10<br>75 dBA<br>Lmax |
| iii) | HMNZ Naval Base, Devonport. As measured at the noise measurement boundary identified in <a href="#">Appendix 10F</a> in relation to the South Yard. | 55 dBA L10 | 50 dBA L10 | 50 dBA L10 | 45 dBA L10<br>80 dBA<br>Lmax |

**Table 10.2 Maximum Permitted Noise Levels by Zone**

|  | <b>Mon-Sat<br/>Inclusive<br/>0700hrs -<br/>2000hrs</b> | <b>Mon-Sat<br/>Inclusive<br/>2000hrs -<br/>2300hrs</b> | <b>Sun &amp;<br/>Public<br/>Holidays<br/>0700hrs -<br/>2400hrs</b> | <b>All Other<br/>Times</b> |
|--|--|--|--|----------------------------|
|--|--|--|--|----------------------------|

**B: Business Zones and Mixed Use Overlay Area except the Business 12 - Mixed Use Zone**

(as measured at any site boundary zoned Business or Mixed Use (excluding the Business 12 - Mixed Use zone))

|     |  |            |            |            |            |
|-----|--|------------|------------|------------|------------|
| i)  | Business Zones 1, 2, 3, 4, 5, 6, 7, 8 and 11 and Mixed Use Overlay Area. | 65 dBA L10 | 65 dBA L10 | 65 dBA L10 | 65 dBA L10 |
| ii) | Business Zones 9 and 10  | 70 dBA L10 | 70 dBA L10 | 70 dBA L10 | 70 dBA L10 |

**C: Residential Zones**

(as measured at any residential zone site boundary)

|    |                       | <b>Mon-Fri<br/>0800hrs -<br/>1800hrs</b> | <b>Saturday<br/>0900hrs -<br/>1800hrs</b> | <b>All Other Times</b> |
|----|-----------------------|--|---|------------------------|
| i) | Home Occupations Only | 45 dBA L10                               | 45 dBA L10                                | No Audible noise       |

Note: Where reference is made in Table 10.2 to residential zones, this shall include the Long Bay 1-4 zones. Where reference is made to business zones, this shall include the Long Bay 5 zone.

**Table 10.3 Business 12 Mixed Use Zone and Residential 8 zone Maximum Permitted Noise Level By Use**

|  | <b>0700 hrs - 2300 hrs</b> | <b>2300 hrs - 0700 hrs</b>   |
|--|----------------------------|--|
| Commercial: measurement taken at the façade of any other residential unit              | 65 dBA L10                 | 65 dBA L10   |
| Residential (Mixed use): measurement taken at the façade of any other residential unit | 65 dBA L10                 | 55 dBA L10<br>65 dBA L10 at 63 Hz<br>60 dBA L10 at 125 Hz<br>75 dBA Lmax |

### Explanation and Reasons

**Table 10.2** sets out the maximum acceptable noise output for particular time periods for each zone. Acceptable noise levels for different locations and times are based on New Zealand Noise Guidelines, North Shore City noise surveys and Council experience in dealing with issues arising due to noise. More liberal controls are permitted in the area specified in [Appendix 10E](#), due to the high background noise levels generated by the motorway. It would be unreasonable to expect the lower residential level to be maintained within this high background noise area. The standards are not intended to control crowd noise associated with outdoor events.

Excessive or unreasonable noise levels can have an adverse effect on the amenity of the receiving environment. Maximum noise levels are specified in the District Plan to ensure that reasonable levels of amenity are maintained throughout the city. All activities are required to comply with two sets of noise controls unless otherwise specified for individual zones.

The two sets of noise controls are:

- The maximum noise level permitted at the boundary at the individual site; and
- The maximum noise level permitted, as measured at any residential zone boundary (or facade in the Business 11 zone).

The close proximity of many parts of residential zones to other zones often results in complaints from residents about excessive or unreasonable noise levels from non-residential activities. The noise levels specified in the Plan are aimed at protecting residential amenity. More liberal noise provision is made in business zones, provided that lower levels can still be maintained at residential zone boundaries.

New residential developments on high noise routes are required to be acoustically designed to ensure protection of public health from high traffic noise. New residential subdivisions on high noise routes are required to be designed using urban design methods to ensure that the potential effects of high or unreasonable traffic noise on future residents are avoided and/or mitigated. By this means it is intended that adverse noise effects are addressed at the early stages of development. New residential subdivisions that are designed to avoid high traffic noise reduce the need for acoustically designed residential buildings and provide a more pleasant residential living environment. The Home Occupation maximum noise levels are relatively lower due to resident amenity expectations in residential zones.

The noise controls that apply to new buildings and alterations to residential units within the Business 11 zone reflect that of a city centre environment, an environment typically noisier than suburban residential zones. Living in a central location can bring with it issues such as late night entertainment noise, traffic noise, noise from North Shore Domain and North Harbour Stadium and early morning rubbish collection. It is important that residents are aware of the range of noise issues before they move into these locations. Most noise problems can however be significantly reduced through appropriate layout, sound insulating materials and construction techniques to protect residents from external noise and contain noise sources in developments that may affect new and neighbouring dwellings.

Internal noise standards requiring facade designs based on a confirmed ambient acoustic environment, have been set for residential activities. Facade sound insulation criteria is an acceptable means for controlling internal noise to habitable rooms for mixed use areas where the ambient environment is largely controlled by the environment noise rules for commercial activities. For most of the Business 11 zone, where the acoustic ambient environment is controlled by permitted commercial activities, the facade specification will be adequate and provide reasonable amenity to residential dwellings.

Specific noise control standards are also imposed to help mitigate any affect of high noise routes which provide a continuous source of noise. Noise generated from the North Shore Domain and North Harbour Stadium is controlled by Section 20 of the District Plan.

The facade specification is not considered adequate for areas where the acoustic ambient environment is controlled by noise sources outside the permitted commercial activities. For the proposed Business 11 zone, those noise sources are considered to be the High Noise Routes and the North Shore Domain and North Harbour Stadium. Specific noise

controls are imposed to mitigate noise from these sources to the extent that a reasonable standard of residential amenity is provided and the source is afforded a degree of protection from reverse sensitivity complaints.

The close proximity of the Albany Centre to the high noise generating activity of the North Shore Domain and North Harbour Stadium means that noisy activities at these facilities, including concert and sporting events, have the potential to generate complaints from residents about unreasonable noise. Concerts are likely to be the single most significant source of noise from the facility. Concerts need not necessarily be held inside the Stadium structure and there is the potential for up to 16 such events per year. There is no limit to the number of other events held on the Domain or at the Stadium per year. To minimise reverse sensitivity effects, new residential development should use urban design techniques and building construction methods to ensure that the potential effects on residential activities of the noise associated with the ongoing use and development of the Domain and Stadium facilities are appropriately addressed at the early stages of development. Specific design and construction solutions will be required to ensure that both the amenity and noise requirements in the plan can be met, while achieving a good design outcome.

While the noise standards are designed to provide a degree of protection from reverse sensitivity effects arising from allowing residential development in close proximity to the Domain and Stadium, they are not intended to control crowd, music or any other noise associated with outdoor events held at these facilities. This includes noise generated by off-site activities associated with Domain and Stadium events such as pedestrian and vehicle movements through, or adjacent to, residential developments. These matters can only be addressed through planning controls that create effective buffers between the key access routes to the Stadium and the residential receivers. In this situation, the high levels of noise and activity associated with the Stadium will continue to generate the potential to cause adverse reactions from residents using outdoor areas, including balconies or indoor areas if they choose to keep their windows open. This matter will largely be addressed through a combination of good design and covenants.

The RMA provides for abatement action against activities that exceed the maximum permitted noise standards and disrupt amenity. The enforcement provisions of the RMA will be implemented to avoid and/or mitigate excessive or unreasonable noise.

Reasons for adopting maximum allowable noise are to provide certainty to both residents and activity operators as to acceptable noise exposure levels by zone, to recognise New Zealand guidelines on noise exposure based on human health effects and to provide an objective and consistent basis for enforcement.

The Chelsea Sugar Refinery business should continue to benefit from the largely undeveloped and bush-covered land it has maintained as a 'buffer' with respect to the measurement of industrial noise from its operations. However, if the status quo changes significantly, due either to new residential development of this land or the refinery operation ceasing, then the 'exemption' the noise measurement line creates will cease to have effect. Any future Plan Change affecting any part of the Chelsea Estate might also change the circumstances in such a way that this 'exemption' would need to be reconsidered.

In the event of a resource consent application for any (non-complying) residential development preceding the approval of a "integrated development scheme" (Residential 2A Chelsea Special Zone), consent may be granted to the 'residential' activity (and to the refinery for any exceedance of the permitted 'business' noise, as a Limited Discretionary activity) where it can be demonstrated that adverse effects of noise levels as measured at the site of the residential activity (within the 2A zone) either do not exist or would be adequately avoided or mitigated.

---

## 10.6 Outdoor Lighting: Rules

---

Unless otherwise stated, where any activity or proposed activity within a business zone fails to comply with the rule specified in the section, the activity will be considered as a Limited Discretionary activity. The Council reserves its discretion to impose conditions which are necessary or desirable to ensure that the adverse effects generated by the



proposal are of the order anticipated. The Council shall consider any application for the following Limited Discretionary resource consents without public notification. Notice of such an application shall be served on all affected parties unless the statutory tests for non-notification are met. If the Council considers special circumstances exist it may require the application to be publicly notified.

Refer to Rule 3.3.2 Notification Processes for Resource Consents - Applications Requiring Multiple Resource Consents.

All Permitted and Controlled activities in all zones are subject to the following controls, except that these rules shall not apply to the Special Purpose 12 zone:

- a) At no time between the hours of 0700 and 2200 shall any outdoor lighting be used in a manner that causes an added illuminance in excess of 125 lux, measured horizontally or vertically at any point within the boundary of any adjoining site which is zoned Residential. This provision shall not apply at the north-western boundary of Lot 2 DP 184027 (boundary abutting the Residential 5 zone) while the land is under the control of Rangitoto College and activities occurring on the land have been approved by Rangitoto College.
- b) At no time between the hours of 2200 and 0700 shall any outdoor lighting be used in a manner that the use of such lighting causes an added illuminance in excess of 20 lux measured horizontally or vertically at any point along any residentially zoned boundary or site used for residential purposes, except for those in the business zones.
- c) Where measurement of any added illuminance cannot be made because any person refuses to turn off outdoor lighting, measurements may be made in locations of a similar nature which are not affected by such outdoor lighting. Those measurements may be used to determine the added luminance, if any, of such outdoor lighting.
- d) The outdoor lighting on any site adjoining any site zoned Residential or adjacent to land on which there is a residential use, shall be so selected, located, aimed, shielded, adjusted and screened as to ensure that glare resulting from the lighting does not exceed the levels specified in 10.6 (a) and (b). This provision shall not apply at the north-western boundary of Lot 2 DP 184027 (boundary abutting the Residential 5 zone) while the land is under the control of Rangitoto College and activities occurring on the land have been approved by Rangitoto College in respect to 10.6(a).
- e) All outdoor lighting shall be shielded in such a manner that light emitted by the fixture is projected below a horizontal plane running through the lowest point on the fixture where light is emitted, or is shielded in such a manner that the lowest edge of the shield is at or below the centre line of the light source.

#### **Explanation and Reasons**

*This control is an interim control until a national standard for the environmental effects of outdoor lighting is adopted. It is based on past practice and assessment techniques previously accepted by the Planning Tribunal (now called the Environment Court). The control takes the time of day into account so that activities extending their operating hours do not detrimentally affect adjoining residential activities.*

*The reason for adopting this control is to avoid the spill of light and glare on to residentially zoned sites in a manner which could reduce amenity and disrupt sleep.*

---

## **10.7 Vibration: Rules**

---

Unless otherwise stated, where any activity or proposed activity within a business zone fails to comply with the rule specified in the section, the activity will be considered as a Limited Discretionary activity. The Council reserves its discretion to impose conditions which are necessary or desirable to ensure that the adverse effects generated by the proposal are of the order anticipated.

All Permitted and Controlled activities in all zones are subject to the following controls:

- a) No activity shall be permitted to create vibration levels (acceleration in metres per second squared) relative to frequency which affect occupants of adjacent buildings by exceeding the base curves of Figures 2a (z axis), 3a (x and y axis), and 4a (combined xyz axis) of International Standard ISO 2631-2:1989 - Evaluation of human exposure to whole-body vibration - Part 2: Continuous and shock-induced vibration in buildings (1 to 80 Hz).
- b) Annex A and Table 2 of ISO 2631-2:1989 shall be used for the assessment of continuous, intermittent and transient (impulsive) vibrations.
- c) Instruments to measure such vibration, and methods of measurement shall comply with Australian Standard AS 2973:1987 and AS 2187.2:1993.

#### **Explanation and Reasons**

*This control deals with human response to building vibration. Standards formulated to control vibration are generally related to the tolerance of a sitting or standing person.*

*Annex A and Table 2 of the Standard give consideration to the time of the day and use made of the occupied space in the building.*

*Situations may exist where vibration levels above those specified can be tolerated for temporary disturbances and infrequent events of short-term duration, e.g. blasting, construction and excavation projects.*

*The reason for adopting the ISO and Australian Standards is to ensure a consistent and internationally recognised assessment procedure is used.*

## **10.8 Hazardous Facilities and Contaminated Sites: Rules**

### **10.8.1 Hazardous Facilities: Activity Status**

The activity status of any hazardous facility shall be established by determining the Effects Ratio trigger value of the activity from the Hazardous Facility Screening Procedure set out in [Appendix 10G](#) of the Plan. The Effects Ratio determines consent status as shown in [Table 10.4](#).

Except that the following activities shall be exempt from the HFSP:

The retail sale of petrol, up to a storage of 100,000 litres of petrol in underground storage tanks and up to 50,000 litres of diesel, provided that the Code of Practice for the Design, Installation and Operation of Underground Petroleum Systems published by the Department of Labour - OSH, is adhered to.

Retail LPG outlets, with storage of up to 6 tonnes (single vessel storage) of LPG, provided compliance with the Dangerous Goods Act 1974 and Regulations.

| <b>Table 10.4</b>   |   |   |
|---|---|---|
| <b>Zone</b>   | <b>Permitted activity Effects Ratio</b> | <b>Discretionary activity Effects Ratio</b> |
| Business 9 and 10 and Long Bay 5 zone   | 1                                       | >1  |
| Business (excluding 9 and 10), Long Bay 5 and Special Purpose zones, Rural  | 0.2                                     | >0.2  |
| Residential, Urban Expansion Recreation Structure Plans Zone: Areas A, B, C, D, Mixed Use Overlay Area and Long Bay 1 - 4 zones | 0.05                                    | >0.05                                       |

In cases where an activity is less than twice the specified zone *Effects Ratio*, the Council reserves the option of using non-notified procedures.

#### **Explanation and Reasons**

*The Hazardous Substance Screening Procedure is set out in [Appendix 10G](#). The Plan requires all new facilities and alterations to existing facilities, which use, store or dispose of potentially hazardous substances, to be subject to the screening procedure. This procedure is used to identify those activities using hazardous substances which require additional assessment work and thus a resource consent, or those which may locate within a particular zone as a Permitted activity. To ascertain this, the Plan identifies hazard categories. These categories specify the level of hazard considered acceptable for Permitted activities in a particular activity zone and the levels where a Discretionary activity resource consent is necessary prior to operation.*

*Hazardous facilities which require a resource consent will be required to undertake a more detailed form of quantitative or qualitative risk assessment, including reference to the effect on surrounding land uses, the environment and community. Consideration of any application will focus on risk mitigation, emergency and performance assurance procedures. Management and operational practices will also be assessed to identify where risks may be avoided or reduced.*

*One reason for the preliminary risk assessment procedures is to act as a signal for hazardous facility operators as to the most appropriate zones for their activity. The procedures will also indicate to operators acceptable risk levels in the various zones. These indications or signals are seen to offer operators some certainty over the regulatory requirements they face and likely outcome of any application. In addition, the community will be given some certainty over where hazardous facilities are likely to be established and the level of public participation invited.*

### **10.8.2 Radioactive Material: Activity Status**

#### **10.8.2.1 Permitted Activities**

Any use or storage of radioactive material below that specified as an exempt activity in the Radiation Protection Regulations 1982, is a Permitted activity, provided that any use of radioactive material in smoke detectors shall be a Permitted activity.

#### **10.8.2.2 Discretionary Activities**

Any use or storage of radioactive material in excess of that specified in the Radiation Protection Regulations 1982 and below 10 terabecquerel is a Discretionary activity.

#### **10.8.2.3 Prohibited Activities**

Any facility using radioactive material with an activity in excess of 1000 terabecquerel ( $1 \times 10^{15}$ ) is prohibited.

#### **Explanation and Reasons**

*Radioactivity has been deliberately excluded from the Hazardous Facility Screening Procedure for two reasons. First, the type and degree of risk that is posed by radioactive material is different from, and additional to, that of other chemical compounds.*

*Second, the use, storage and transport of radioactive material is controlled and licensed by the Department of Health through the National Radiation Laboratory. However, while the licensing of uses and users is properly the responsibility of Central Government, the Council will still control the location of these activities in order to ensure the protection of neighbouring residents and workers.*

*The levels set for Prohibited activities will exclude facilities such as irradiation plants and nuclear power plants.*

*The reasons for rules for activities involving radioactive material is to ensure the scale and location of such activities are appropriate and take account of public concerns.*

### 10.8.3 Contaminated Sites: Activity Status

#### 10.8.3.1 Controlled Activities

Any activity undertaken for the purpose of decontaminating a contaminated site is a Controlled activity.

##### **Explanation and Reasons**

*An application to locate on or redevelop a known contaminated site will be assessed in terms of Section 10.8.4 of this Plan and must demonstrate the measures that will be taken to ensure the safe operation of the proposal on the contaminated site. A discharge consent from the Auckland Regional Council may also be required and should be investigated. In any event, for sites which exhibit contamination problems, the Council has the ability to use its enforcement powers under the RMA to ensure that no adverse effect on the environment occurs.*

*A Hazard Register identifies potentially contaminated sites which have yet to be verified. This document is considered as a guide only until verification has been undertaken. It is intended to convey information for Project and Land Information Memorandum regarding potentially contaminated sites and is to be updated and amended on a regular basis.*

*The reasons for requiring assessment and consents is to ensure that proper and safe measures are being undertaken and that decontamination practices will not lead to further degradation of the site or surrounding area or threaten human safety.*

### 10.8.4 Information Requirements

#### 10.8.4.1 Information Requirements for Contaminated Sites

Any application to decontaminate a contaminated site shall submit in addition to the information required by Section 3.10.7 to Section 3.10.10, a Risk Assessment which shall include the following:

a) Risk Assessment

An assessment of the risk of the proposed activity or remediation in descriptive forms with particular emphasis on:

- The sensitivity of the surrounding natural and physical environment (e.g. aquifers, streams, wetlands, habitats)
- The number of people potentially at risk from the activity or remediation
- Any risk to adjacent property
- Cumulative effects of the activity or remediation in the area
- Site drainage and off-site infrastructure (e.g. stormwater, sewer type and capacity)
- The ability of the site to meet the Auckland Regional Council guidelines and the *Australian and New Zealand Guideline for Assessment of Contaminated Sites*.

b) Risk Mitigation

- Any risk mitigation measures proposed with reference to site layout, site management and contingency planning, monitoring and maintenance schedules.

#### 10.8.4.2 Information Requirements for Discretionary Activities

a) A qualitative or quantitative risk assessment, as specified by the Council, will be required as part of the information to be supplied with the consent application. This assessment should place particular emphasis on those issues not addressed in the Hazardous Facility Screening Procedure, including:

- Identification of potential exposure pathways
- The separation distance between the proposed activity and neighbouring activities, with emphasis on activities, involving groups of people, e.g. schools, rest homes, hospitals, shopping centres and residential areas

- The location of any hazardous facility in relation to the nearest aquifer, waterbody, coast or other sensitive environment
  - The nature of the sub-soil and site geology
  - The distance to ecologically sensitive areas such as wildlife habitats or water catchments
  - Reference to possible cumulative synergistic effects, or bioaccumulation of any hazardous substance
  - The transport of any hazardous substance
  - The disposal of any waste containing any hazardous substance.
- b) Risk Mitigation
- Consideration should also be given to:
- Adherence to management systems such as the NZCIC Responsible Care Programme, or quality certification such as ISO 9000
  - The equipment relating to the particular risk posed by the facility
  - Stormwater detention and treatment.
- c) Emergency Planning
- Emergency plans, including the description of emergency procedures, available emergency equipment and clean-up materials, and relevant staff training are an important component of emergency preparation. The effectiveness of emergency preparation measures can contribute significantly to the avoidance, remediation or mitigation of adverse environmental effects resulting from a spillage or other accident.
- d) Alternatives
- A description of any possible alternative locations or methods for undertaking the activity should be submitted, where it is likely that an activity will result in any significant adverse effects on the environment.
- e) Traffic Safety
- The application should demonstrate that the proposal will generate no significant adverse effects on the safety of any road and that as far as practicable a vehicle transporting any hazardous substance will not use local roads in any residential area. Conditions relating to the requirement for specified transport routes may be imposed.
- f) Access
- Sites should be accessible from the major roading network to avoid heavy traffic volumes on local roads, particularly local residential roads.
- g) Monitoring
- The nature and frequency of proposed monitoring is an important consideration in setting appropriate consent conditions.
- h) Contaminated Sites
- Where contaminated sites are involved the proposal must demonstrate that it can comply with the *Australian and New Zealand Guideline for Assessment of Contaminated Sites* and Auckland Regional Council guidelines for site decontamination.

### 10.8.5 Controls for Hazardous Facilities

All hazardous facilities shall comply with the following site design measures as relevant:

- a) The ground surface of any part of any site which is expressly used for the storage or use of any hazardous substance shall be effectively sealed with materials resistant to such hazardous substances. In the case of underground tanks this rule



shall apply to the ground surface immediately above the tank.

- b) Any part of any site where any hazardous substance is stored or used shall be compounded so that a volume not less than that of the largest hazardous substance container within the compounded area can be contained within the compounded area and excluded from any stormwater system when a spill occurs. In any case of hazardous substance storage in drums, the required volume of the compounded area shall be not less than half the total volume of all hazardous substances stored. Except that this rule shall not apply to LPG facilities and where oil separators are installed in accordance with the Auckland Regional Council Code of Practice.
- c) Every compound shall be constructed from materials which are resistant to the hazardous substance that the compound is designed to contain, so as to prevent any hazardous substance discharge to land.
- d) All stormwater grates shall be clearly marked.
- e) Storage of petroleum products in underground tanks shall comply with the 'Code of Practice for Design, Installation, and Operation of Underground Petroleum Systems' from Department of Labour, OSH 1992.
- f) Any part of any site where any hazardous substance is used, manufactured, mixed or re-packaged shall be roofed.
- g) Any part of any site where hazardous substances are loaded or unloaded shall be sealed, compounded and have cut off drains installed which are not directly connected to any stormwater system. Except that this rule shall not apply where oil separators are installed in accordance with the Auckland Regional Council Code of Practice.
- h) Any part of any site where vehicles, equipment or containers contaminated with hazardous substance are washed, shall be sealed, compounded and drained so that process effluent (run-off) from the wash-down area is discharged into trade waste sewer, subject to any relevant statutes, regulations and bylaws, or is collected and stored in tanks for removal by a suitable trade waste contractor.
- i) All hazardous facilities shall be adequately signposted according to the most recent version of the Code of Practice for 'Warning Signs for Premises Storing Hazardous Substances' of the New Zealand Chemical Industry Council.
- j) For activities involving potentially contaminating substances, an environmental operating plan shall be prepared, implemented and maintained. The plan shall include:
  - Containment systems
  - Monitoring and maintenance of containment systems
  - Site housekeeping
  - Spill contingency measures and emergency planning
  - Staff responsibilities education and training.

#### **Explanation and Reasons**

*Standards specified operate in addition to any other requirements of the District Plan. Where any hazardous facility is subject to a Discretionary activity consent, these performance standards will be used as a basis for consent conditions.*

*Reasons for including site design and signage requirements are to ensure all hazardous facilities comply with certain minimum performance standards to protect environmental and human safety.*

### **10.8.6 Assessment Criteria**

#### **10.8.6.1 Assessment Criteria for Controlled Activities**

All Controlled activities must comply with all relevant controls of the Plan. In addition, the Council may impose conditions, in respect of the matters specified in Sections 108 and 220 of the RMA and any of the following matters:



- The methods used to remediate any site must be effective and pose no unacceptable risk to human health or the environment, and similarly the resulting site must pose no unacceptable risk to human health or the environment.

#### **10.8.6.2 Assessment Criteria for Discretionary Activities**

Without restricting the exercise of its discretion to grant or refuse consent or impose conditions, the Council will have regard to the assessment criteria set out below when considering an application under Sections 104 and 105 of the RMA:

- a) That the applicant can satisfactorily demonstrate that the matters relating to risk and site management required by [Section 10.8.4](#) can be achieved.
- b) That appropriate mitigation and monitoring measures are proposed for the activity.

---

## **10.9 Waste Management: Rules**

---

Unless otherwise stated, where any activity or proposed activity within a business zone fails to comply with the rule specified in the section, the activity will be considered as a Limited Discretionary activity. The Council reserves its discretion to impose conditions which are necessary or desirable to ensure that the adverse effects generated by the proposal are of the order anticipated.

### **10.9.1 Activity Controls**

All Permitted and Controlled activities in all zones are subject to the following controls:

#### **10.9.1.1 Waste Storage**

Collection of waste on any site shall be stored, located, screened and or covered in a manner that prevents the waste from being deposited beyond the site and adversely affecting the environment.

##### ***Explanation and Reasons***

*Exposure of waste material to the elements can increase the likelihood of contaminant movement via water, or affect amenity due to visual impact, odour or safety. Requiring use of containers or covers is intended to reduce likelihood of pollution or nuisance where the site is not primarily designed to handle waste products.*

#### **10.9.1.2 Process Waste Discharges**

Process waste shall not be discharged into any stormwater system provided by the Council or any network utility operator.

##### ***Explanation and Reasons***

*Process waste usually contains elements which can modify ecosystems either directly, or cumulatively with other substances. The reason for including a rule on process waste discharges is because the stormwater system shifts such contaminants to waterways, estuaries and the sea. To protect these ecosystems, process waste discharges to such receiving environments are not allowed. Provision for trade waste disposal is made instead.*

---

## **10.10 Assessment Criteria**

---

The criteria for assessment of any activity or proposed activity within a business zone which fails to comply with the relevant rule shall be whether the potential adverse effects of the activity or proposed activity can be mitigated by conditions to such an extent that they are equivalent to or less than the level of adverse effects that could be generated by an activity complying with the relevant rule or rules.

**Appendix 10A: Air Quality Guidelines**

| Indicator                                 | Level<br>$\mu\text{g}/\text{m}^3$ | Averaging Time  | Method of Measurement*                  |
|---|-----------------------------------|---|---|
| <sup>h</sup> Suspended Particulate (PM10) | 40<br>120                         | Annual Mean<br>24 hour Mean   | AS 3580.9.6-1990 or<br>AS 3580.9.7-1990 |
| <sup>h</sup> Carbon monoxide              | 10<br>30                          | 8 hour Average<br>1 hour Average  | AS 2695-1984                            |
| <sup>v</sup> Fluoride                     | 05<br>0.84<br>1.7<br>2.9<br>3.7   | 3 month Average<br>1 month Average<br>7 day Average<br>24 hour Average<br>12 hour Average | AS 3580-13.1-1993<br>AS 3580-13.2-1991  |
| <sup>n</sup> Hydrogen sulphide            | 7                                 | 30 minute Average   | AS 3580.8.1-1990                        |
| <sup>h</sup> Lead                         | 1.0                               | 3 month Moving Average  | AS 2800-1985                            |
| <sup>h</sup> Nitrogen dioxide             | 100<br>200                        | 24 hour Average<br>1 hour Average   | AS 3580-6.1-1990                        |
| <sup>h</sup> Ozone                        | 100<br>150                        | 8 hour Average<br>1 hour Average  | AS 3580-6.1-1990                        |
| <sup>h</sup> Sulphur dioxide              | 50<br>125<br>350<br>500           | Annual Mean<br>24 hour Mean<br>1 hour Mean<br>10 minute Mean                              | AS 3580-4.1-1990                        |

<sup>h</sup> guideline is set to prevent adverse effects to human health

<sup>v</sup> guideline is set to prevent adverse effects to sensitive vegetation

<sup>n</sup> guideline is set to prevent nuisance to affected communities

\* The methods of measurement quoted here are published by the Standards Association of Australia, Standards House, P O Box 485, 80 Arthur Street, North Sydney 2060, New South Wales, Australia

Source: Ministry for the Environment

## Appendix 10B: Contaminants

(Based on the State of Victoria, Australia Class 2 Indicators, Design Ground Level Concentrations as set out in the State Environment Protection Policy)

### Indicator

Acetaldehyde<sup>b</sup>

Acetic acid<sup>b</sup>

Acetone<sup>b</sup>

Acrolin

Acrylic acid<sup>b</sup>

Acrylonitrile

Ammonia

Aniline

Asphalt (petroleum) fume

Barium (soluble compounds)

Benzyl chloride<sup>b</sup>

Biphenyl

Bromochloromethane

Bromoform

Bromotrifluoromethane

1,3-Butadiene<sup>b</sup>

n-Butanol<sup>b</sup>

Butyl mercaptan<sup>b</sup>

Carbon black

Carbon disulfide<sup>b</sup>

Carbon tetrachloride

Chlorine

**Indicator**

Chlorine dioxide

Chlorobenzene

Chloroform

Chloromethane

Chromic acid and chromates (as  $\text{CrO}_3$ )

Chromium, soluble chromic and  
chromous salts (as Cr)

Copper fume

Dusts and mists

Cotton dust (raw)

Crotonaldehyde

Cumene<sup>b</sup>

Dichlorvos

Diethylamine<sup>b</sup>

Dimethylamine<sup>b</sup>

Dinitrobenzene (all isomers)

Dinitrotoluene

Dusts<sup>c</sup>

Diphenyl ether<sup>b</sup>

Epichlorhydrin

Ethanol<sup>b</sup>

Ethanolamine

Ethyl acetate<sup>b</sup>

Ethyl acrylate<sup>b</sup>

Ethylbenzene

Ethyl butyl ketone

**Indicator**

Ethyl chloride

Ethylene glycol (vapour)

Ethylene oxide

Fluorine

Formaldehyde

n-Hexane

2-Hexanone

Hydrogen chloride

Hydrogen cyanide

Hydrogen sulfide<sup>b</sup>

Iron oxide fume

Magnesium oxide fume

Maleic anhydride

Methanol<sup>b</sup>

Methyl acrylate

Methylamine<sup>b</sup>

Methylene chloride

Methyl ethyl ketone<sup>b</sup>

Methyl mercaptan<sup>b</sup>

Methyl methacrylate<sup>b</sup>

Methyl styrene<sup>b</sup>

Methyl isobutyl ketone<sup>b</sup>

Nickel carbonyl

Silver, metal and soluble compounds  
(as Ag)

Styrene (monomer)<sup>b</sup>

**Indicator**

Sulfuric acid

Toluene<sup>b</sup>

1.1.1-Trichloroethane

1.1.2-Trichloroethane

Trichloroethylene

Trichlorofluoromethane

Triethylamine<sup>b</sup>

Trimethylbenzene (mixed isomers)

Vinyl Toluene

Welding fume (total particulate)

Wood dust, non-allergenic

Xylene<sup>b</sup>

Zinc chloride fume

Zinc oxide fume

<sup>a</sup>based on consideration of toxicity unless otherwise specified

<sup>b</sup>based on consideration of odorous properties of the indicator

<sup>c</sup>other than cotton, coal, quartz bearing, asbestiform, talc, mica, cristobalite and tridymite

<sup>d</sup>parts per million (volume/volume)

Gas volumes are expressed at 25 degrees C and at an absolute pressure of 1 atmosphere (101.325 kPa).



## Appendix 10C: Discharges to Air Categories

### I. PART A, B & C PROCESSES

#### PART A PROCESSES

1. Any combustion processes (not being combustion processes for the drying of grain) involving fuel burning equipment, including flaring or incineration of trade wastes or refuse, which singly or together can be used to burn any combustible matter:
  - a) At a rate of heat release exceeding 50 MW; or
  - b) At a rate exceeding 100 kg an hour where pathological material, garbage, refuse, or trade wastes are incinerated; or
  - c) At a rate of heat release exceeding 500 kW where the products of combustion are used:
    - i) To stove enamel; or
    - ii) To bake or dry any substance that on heating releases dust or other air pollutants; or
    - iii) To maintain reducing conditions in any manufacturing process; or
  - d) At a rate, where the combustible matter is a combination of combustible materials which contains sulphur or arsenically treated wood or rubber or oil sludge or pitch or paint residues, that will incinerate in excess of 100 kg an hour of:
    - i) Sulphur; or
    - ii) Arsenically treated wood; or
    - iii) Rubber; or
    - iv) Oil sludge; or
    - v) Pitch; or
    - vi) Paint residues; or
  - e) At a rate, where the combustible matter is a combination of combustible materials which contain chemicals, plastics, or fibre in which fluorine, chlorine, phosphorus, or nitrogen has been chemically combined, that will incinerate in excess of 25 kg an hour of such chemicals, plastics or fibre.
2. Any industrial chemical processes, excluding electro-plating processes, having as a product or by-product or emission any substance that can cause air pollution, including any processes used in:
  - a) Bodying of natural oils or manufacture or reaction of monomers for production of synthetic resins, varnishes, and plastics; or
  - b) Production of soap, grease, detergents, and surface active agents; or
  - c) Synthesis or extraction of organic chemicals, including formulation of insecticides, herbicides, plant hormones, and like toxic or offensive organic compounds; or
  - d) Production of inorganic chemicals, including concentration of acids and anhydrides, ammonia, and alkalis; or
  - e) Production of phosphatic or nitrogenous synthetic fertilizers, including granulation of single or mixed fertilizers; or
  - f) Any chemical manufacturing processes using or producing chlorine and any industrial processes using chlorine but only for other than water sterilization and at rates exceeding 5 kg an hour; or
  - g) Separation or concentration for manufacture or disposal of any uranium metal or compound or any radioactive substance.

3. Any animal or plant matter processes having singly or together a raw material capacity in excess of:
  - a) 0.5 of a tonne an hour, and being processes for rendering or reduction or drying through application of heat to animal matter (including leathers, blood, bone, hoof, skin, offal, whole fish, and fish heads and guts and like parts, and organic manures); or
  - b) 5 tonnes an hour, and being processes for deep fat frying, oil frying, curing by smoking, roasting of berries or grains, or where organic matter including wood is subject to such temperatures or conditions that there is partial distillation or pyrolysis; or
  - c) 2 tonnes an hour, and being processes for the drying of milk or milk products.
4. Any process involving the extraction from the surface of the ground or from an open pit of minerals (including coal, coke, and carbon), or the size reduction and screening of such minerals, or the storage outside and above the ground of such minerals, or the drying or heating of minerals that on heating release dust or any air pollutant, being processes which singly or together:
  - a) Have or require:
    - i) An opencast extraction capacity in excess of 100 tonnes an hour; or
    - ii) A size reduction and screening capacity in excess of 200 tonnes an hour; or
    - iii) A storage capacity in excess of 10,000 tonnes; or
    - iv) A rate of heat release in excess of 2,000 kW; or
  - b) Are part of a manufacturing process for Portland or similar cements and pozzolanic materials; or
  - c) Are part of a manufacturing process of the sintering, calcining, or roasting of metal ores in preparation for smelting or for burning of calcium or calcium-magnesium carbonates to produce calcium or magnesium oxides or hydroxides, or the expansion or exfoliation of minerals, or the dehydration of gypsum; or
  - d) Are part of a manufacturing process for making hot-mix asphalt paving mixes; or
  - e) Are a part of a manufacturing process for making glass or frit from raw materials or making mineral wool or glass fibre, including application of any surface coating to the fibres.
5. Any industrial metallurgical processes, including associated foundry practices, which involve:
  - a) The extraction, including electro-chemical methods of reduction, of any metal or metal alloy from its ore, oxide, or other compound; or
  - b) The making of steel or the refining of any metal or modification of any alloy in the molten state by blowing with air, oxygen, or oxygen enriched air, or chlorine or other gases, or by addition of reactive chemicals or volatile fluxes and the use of oxygen lancing in scarfing and similar operations; or
  - c) The manufacture of silicon or ferrosilicon or of metal powders or of alloys rich in any metals specified or described in clauses 1 to 3 of II of this Appendix; or
  - d) The melting of any metal or metal alloy, including secondary melting, and the sweating of scrap metal, where the aggregated melting capacity exceeds 1 tonne an hour; or
  - e) Hot dip galvanizing or other processes for the protection of surfaces by metal coating using fluxes.
6. Any industrial carbonizing or gasification processes in which natural gas, petroleum oil, shale, coal, wood, or other carbonaceous material is subject to:
  - a) Pyrolysis, carbonization, or destructive distillation, the solid liquid or gaseous

- products being recovered; or
- b) Gasification by partial combustion with air or oxygen or reaction with steam.
7. Any process (not being the purification by distillation of dry-cleaning solvents at retail outlets) for the refining, purification, or reforming of hydrocarbons in or derived from natural gas, petroleum, shale, coal, wood, or other organic substances, and including:
- a) Hydrocarbon separation or recovery by distillation or absorption and desorption or removal of carbon dioxide or condensable hydrocarbons from natural or manufactured gas; or
- b) Reforming including viscosity breaking by thermal and catalytic cracking and hydrogenation and alkylation and like processes, including preparation of ethylene or other feed stock for chemical syntheses; or
- c) Refining to reduce sulphur or to improve other qualities with the aid of any substance specified in II of this Appendix or by air blowing.
8. Any industrial wood pulp or particle board processes in which:
- a) Wood or other cellulose material is cooked with chemical solutions to dissolve lignin and the associated processes of bleaching and chemical and by-product recovery; or
- b) Hardboard or particle board or wood pulp are made by processes involving emission of air pollutants.
9. Any use of geothermal steam at a rate of heat release exceeding 5 MW
10. Any industrial or trade processes involving the use of:
- a) Di-isocyanates at a rate exceeding 100 kg an hour; or
- b) Organic plasticisers at a rate exceeding 100 kg an hour.
11. Any process:
- a) Which involves the production of compost from raw materials that contain municipal or domestic refuse and which has a raw materials capacity exceeding 10 tonnes per day; or
- b) Which involves the production of compost from raw materials that do not contain municipal or domestic refuse and which has on the premises at any time a volume of compost and raw materials exceeding 750 cubic metres.
12. Any process specified or described in Part B of this Schedule that is owned or operated by a local authority where the process is situated within the area administered by that local authority.
13. Any fellmongery processes involving:
- a) The use of sulphides; or
- b) The treatment of fellmongery liquid wastes containing sulphides.
14. Any process which emits any of the following substances at the concentrations specified:

| Design Ground Level Concentrations |                   |       |                 |
|------------------------------------|-------------------|-------|-----------------|
| Indicator                          | mg/m <sup>3</sup> | ppm   | Other           |
| Asbestos                           | -                 | -     | 33 fibres/litre |
| Benzene                            | 0.10              | 0.033 | -               |

|  |         |         |   |
|--|---------|---------|---|
| Beryllium                              | 0.00007 | -       | - |
| Mercury                                |         |         |   |
| - organic                              | 0.0003  | 0.00003 | - |
| - inorganic                            | 0.017   | -       | - |
| Radionuclides                          | -       | -       | - |
| TDI (toluene 2, 4 di-isocyanate)       | 0.005   | 0.0007  | - |
| Vinyl chloride                         | 0.1     | 0.033   | - |
| MDI<br>(diphenylmethane di-isocyanate) | 0.007   | 0.0007  | - |

## PART B PROCESSES

1. Any combustion processes involving fuel burning equipment, including flaring or incineration of trade wastes or refuse, not otherwise specified or described in the schedule but which singly or together can be used to burn combustible matter:
  - a) For any purpose at a rate of heat release exceeding 5 MW; or
  - b) For the purpose of:
    - i) The recovery of metals from insulated cable, motor vehicles, or any other mixture or combinations of metals and combustibles; or
    - ii) The cleaning of drums or containers; or
    - iii) Frost protection on more than one occasion in any period of 12 months by the use of fire pots; or
  - c) At a rate not exceeding 100 kg an hour, where pathological material, garbage, refuse, or trade wastes, are incinerated; or
  - d) At a rate, where the combustible matter is a combination of combustible materials which contain sulphur or arsenically treated wood or rubber or oil sludge or pitch or paint residues, that will incinerate in excess of 25 kg an hour but not in excess of 100 kg an hour of:
    - i) Sulphur; or
    - ii) Arsenically treated wood; or
    - iii) Rubber; or
    - iv) Oil sludge; or
    - v) Pitch; or
    - vi) Paint residues; or
  - e) At a rate, where the combustible matter is a combination of combustible materials which contain chemicals, plastics, or fibre in which fluorine, chlorine, phosphorus, or nitrogen has been chemically combined, that will incinerate in excess of 5 kg an hour but not in excess of 25 kg an hour of such chemicals, plastics, or fibre.
2. Any industrial or trade processes (not otherwise specified or described in I of this Appendix) for the blending, packaging, or handling of air polluting substances specified in II of this Appendix including grain elevators or seed dressing plant but not processes solely concerned with retail distribution or with distribution of fuels.

3. Any industrial or trade animal or plant matter processes:
  - a) Described in clause 3(a) of Part A Processes of this Appendix, but having a raw material capacity not in excess of 0.5 of a tonne per hour; or
  - b) Described in clause 3(b) of Part A Processes of this Appendix, but having a raw material capacity in excess of 250 kg an hour but not in excess of 5 tonnes an hour; or
  - c) Described in clause 3(c) of Part A Processes of this Appendix, but having a raw material capacity not in excess of 2 tonnes an hour.
4. Any industrial or trade mineral processes described in clause 4(a) of Part A Processes of this Appendix, but having or requiring:
  - a) An opencast extraction capacity in excess of 5 tonnes an hour but not in excess of 100 tonnes an hour; or
  - b) A size reduction and screening capacity in excess of 5 tonnes an hour but not in excess of 200 tonnes an hour; or
  - c) A storage capacity in excess of 500 tonnes but not in excess of 10,000 tonnes; or
  - d) A rate of heat release less than 2,000 kW.
5. Any industrial or trade processes for manufacture of flock or for the teasing of textiles or shredding of paper or for cleaning sacks or crushing or separating dags from wool.
6. Any industrial or trade process which is not otherwise specified or described in I of this Appendix and which involves dry abrasive blasting.
7. Any industrial or trade process using di-isocyanates at a rate not exceeding 100 kg an hour.
8. Any process of wool scouring.
9. Any process:
  - a) Which involves the production of compost from raw materials that contain municipal or domestic refuse and which has a raw materials capacity not exceeding 10 tonnes per day; or
  - b) Which involves the production of compost (except silage) from raw materials that do not contain municipal or domestic refuse and which has on the premises a volume of compost and raw materials exceeding 100 cubic metres but not exceeding 750 cubic metres.

### **PART C PROCESSES**

1. Any combustion processes involving fuel burning equipment, including flaring or incineration of trade wastes or refuse, not otherwise specified or described in this Appendix which singly or in combination in any one unit can burn combustible matter having a rate of heat release exceeding 40 kW.
2. Any industrial or trade processes not otherwise specified or described in this Appendix for pneumatic conveying of any air polluting substance specified in II of this Appendix.
3. Any industrial or trade processes described in clause 3 of Part A Processes of this Appendix but having a raw material capacity less than 250 kg an hour.
4. Omitted.
5. Omitted.
6. Any industrial or trade processes not otherwise specified or described in I of this Appendix which may separately or together discharge to the atmosphere hydrocarbons and related substances in quantity exceeding 5 kg an hour.
7. Any industrial or trade processes not otherwise specified or described in I of this Appendix or for which a lower emission limit is not specified in this Appendix but

which may discharge to the atmosphere air pollutants specified in the II of this Appendix.

8. Any process which involves the production of compost (except silage) from raw materials that do not contain municipal or domestic refuse and which has on the premises at any time a volume of compost and raw materials not exceeding 100 cubic metres.
9. Any industrial or trade process which is not otherwise specified or described in I of this Appendix and which involves wet abrasive blasting.

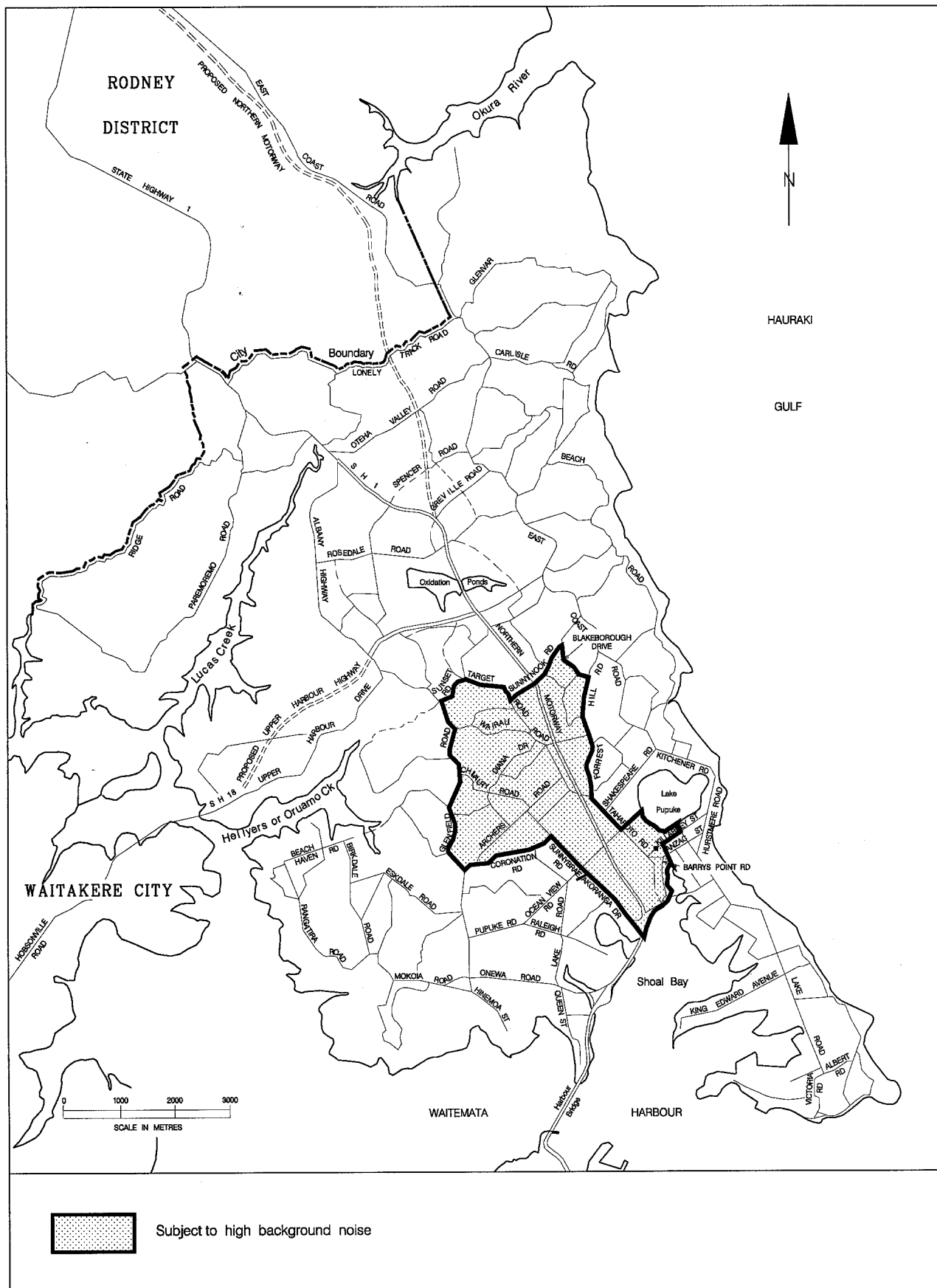
## **II. CLASSES OF SPECIFIED AIR POLLUTANTS**

1. Radioactive, carcinogenic, teratogenic, or mutagenic substances.
2. Antimony, arsenic, beryllium, cadmium, lead, mercury, thallium, selenium, uranium, and their compounds.
3. Boron, chromium, cobalt, copper, magnesium, manganese nickel, potassium, sodium, tellurium, tin, vanadium, zinc, and their compounds.
4. Dust containing asbestos, quartz, or other of the pneumoconioses inducing or asthmagenic substances.
5. Dusts, and fumes, containing metallic elements; and dust, and fumes, containing organic and inorganic materials including fertilizers, cement, coal, coke, soot, carbon, tars, wood, fibres, and pathogenic substances.
6. Sulphur, sulphur oxides (sulphur oxy acids), carbon disulfide, hydrogen sulphide, disulphides, poly-sulphides, mercaptans, and other acidic, toxic, or odorous sulphur compounds.
7. Nitrogen oxides, nitric acid, ammonia, and hydrazine, and their compounds, volatile amines, cyanides, cyanates, di-isocyanates, or other toxic or odorous compounds of nitrogen.
8. Fluorine, chlorine, bromine, iodine, and their compounds.
9. Phosphorus and its oxides and organic compounds.
10. Alkyl, carbonyl, and other toxic organo-metal compounds.
11. Hydrocarbons and their partially oxidised or halogenated derivatives, particularly acrolein, esters of acrylic acid, formaldehyde, and volatile carboxylic acids, and anhydrides and industrial solvents.
12. Ozone, carbon monoxide.





## Appendix 10E: High Background Noise Area



## Appendix 10F: Noise Measurement Boundary - RNZN Base, Devonport



## Appendix 10G: Hazardous Facility Screening Procedure (HFSP)

### 1. Introduction

The Hazardous Facility Screening Procedure (HFSP) has been designed as a screening tool to assist the Council in making decisions on whether a proposed hazardous facility is permitted, or whether it is a controlled or Discretionary activity requiring additional assessment of risks.

The HFSP will be applied to any proposed facility using or storing hazardous substances. Its purpose is to determine whether the facility will be permitted subject to defined minimum performance standards, or will require a land use resource consent.

Hazardous facilities range from home occupations using hazardous or environmentally damaging substances to large chemical factories. Common examples of hazardous substances are acids, solvents, paints, fuels and pesticides. Environmentally damaging substances include seemingly harmless substances such as foodstuff, which kill aquatic life when released into waterways in large quantities, for example, due to depletion of oxygen.

### 2. Overview and Terminology

The HFSP is based on the assessment of hazardous substances in terms of three major *Effects Groups*: **fire/explosion, human health, and the environment**. Each substance is assigned a *Base Threshold* (B) - expressed as a weight or volume - for each of the three defined *Effect Groups*. The *Base Threshold* is dependent only on the intrinsic hazardous properties of a substance.

Depending on the physical state of the substance(s), the type of storage and activity, site separation distances and the environmental sensitivity of the location, *Adjustment Factors* (F) are applied to the *Base Thresholds*. *Base Thresholds* and *Adjustment Factors* are then multiplied to generate an *Adjusted Threshold* (T) for each of the *Effects Groups*.

The next step is the calculation of the *Effects Ratio* R, which represents the proposed quantity of a substance to be used/stored in relation to the *Adjusted Threshold*. The *Effects Ratio* forms the basis to determine the consent status of a particular facility, and to evaluate the cumulative effects presented by multiple substances. An overview of the HFSP concept is shown in [Figure 10.1](#).

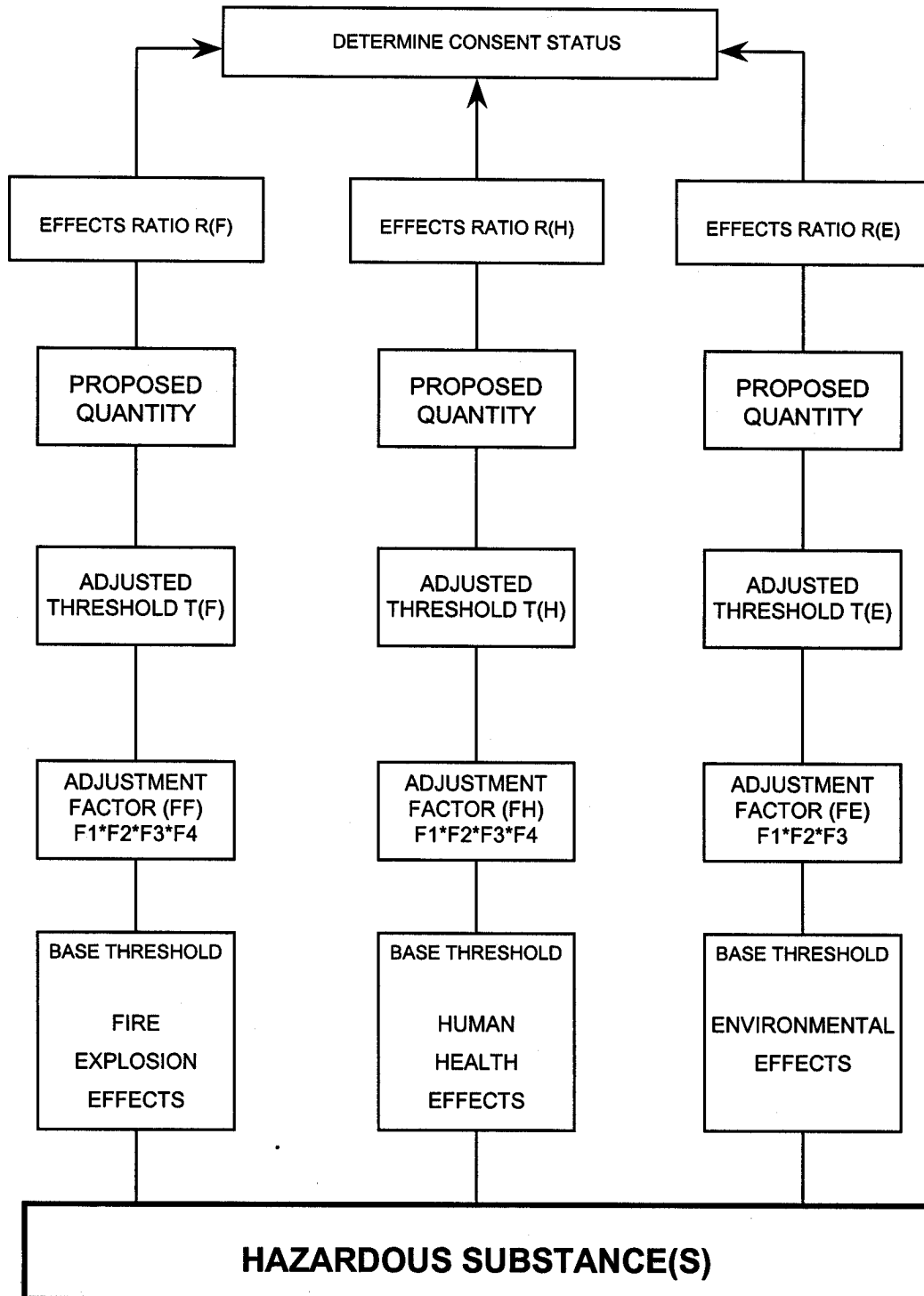
### 3. Effects Groups

The effects of any particular substance can be categorised into three groups:

|                         |   |
|-------------------------|---|
| Fire/Explosion Effects: | This <i>Effects Group</i> is concerned with damage to property, the built environment and the safety of people. |
| Human Health Effects:   | This <i>Effects Group</i> is concerned with the well-being, health and safety of people.                        |
| Environmental Effects:  | This <i>Effects Group</i> is concerned with damage to ecosystems and natural resources.                         |

Each *Effects Group* is divided into four levels: **extreme, high, medium** and **low**. Mostly, the division into low, medium, and high levels is based on the UN (United Nations) Classification System. However, to enable better scrutiny of extremely hazardous substances, an extreme level was added to each *Effects Groups*. Table 1 shows how the standard UN Classes are used to define the four levels in each of the three *Effect Groups*.

Figure 10.1 HFSP Conceptual Overview



A detailed description of UN Classes and associated Packaging Groups is provided in Attachment A. The reader will need to read in detail though Attachment A, as the standard UN Classification System is insufficient for certain Hazardous Substances Classes (particularly for toxic substances), so that additional definitions have been added.

Hazardous substances lists based on the UN Classification System will often only list the primary hazard of a substance, and sometimes one subsidiary hazard. However, it is of importance to note that a substance may exhibit different levels in each of the *Effects Groups*; for example, a substance may present a medium explosion effect, an extreme human health effect, and a high environmental effect. Hence, it is often possible that a substance will fit into more than one *Effects Group*, based on the definitions provide in Table 1 and Attachment A.

4. Base Threshold

The *Base Threshold* B represents base quantities of a substance for each level in the three *Effects Groups*. These *base threshold*, in combination with relevant Adjustment Factors have been assessed to present non-significant off-site environmental effects.<sup>1</sup> The *Base Thresholds* for the individual *Effects Groups* are shown in Table 1.

5. Adjustment Factors (FF, FH, FE)

*Adjustment Factors* (FF, FH and FE) differ for each of the *Effects Groups* to take account of the specific circumstances influencing the severity of the effect. *Adjustment Factors* take into account the following considerations:

- Physical state of the substance
- Pressure and temperature required for storage and usage
- Type of storage
- Type of activity or use
- Separation distances to site boundary
- Environmental sensitivity of the site location.

For each *Effects Group*, different types of *Adjustment Factors* are relevant. For example, for the Fire/Explosion *Effects Group*, the temperature is relevant, while for the *Human Health Effects Group*, proximity to a potable water resource is deemed important. In some instances, more than one *Adjustment Factor* will need to be applied. Where this is the case, the *Adjustment Factors* are multiplied to generate one combined Adjustment Factor (FF, FH or FE) for each *Effects Group*. Table 2 presents the *Adjustment Factors* for each *Effects Group*.

---

<sup>1</sup>. These *Base Thresholds* and *Adjustment Factors* were developed based on scientific evidence (risk modelling), professional judgment and experience, and in discussion with both New Zealand and Australian technical experts in the field.



**Table 1 Assignment of base thresholds for hazardous substances if UN classification known****Note:**

The other subsidiary effects of the hazardous substance is determined separately from the tables in Attachment A: Classification of hazardous substances. Using Table 1 and Attachment A enables all three Effects Categories for a hazardous substance to be determined, i.e fire/explosion effect, human effect and environmental effect.

**Fire and explosion effects group**

| UN CLASS or HFSP hazard              | EFFECT CATEGORY: FIRE |           |                    |          |
|--------------------------------------|-----------------------|-----------|--------------------|----------|
|                                      | Low                   | Medium    | High               | Extreme  |
| LPG                                  |                       | LPG       |                    |          |
| 2                                    |                       |           | 2.1<br>Exclude LPG |          |
| 3C                                   | 3C                    |           |                    |          |
| 3                                    |                       | 3PGIII    | 3PGI-PGII          |          |
| 4                                    |                       |           | 4.1                | 4.2-4.3  |
| 5                                    |                       |           | 5.1                | 5.2      |
| <b>B (tonnes)<sup>1</sup></b>        | <b>100</b>            | <b>30</b> | <b>10</b>          | <b>1</b> |
| <b>B (m<sup>3</sup>)<sup>2</sup></b> |                       |           | <b>10,000</b>      |          |

| UN CLASS or HFSP hazard       | EFFECT CATEGORY: EXPLOSION |          |          |            |
|-------------------------------|----------------------------|----------|----------|------------|
|                               | Low                        | Medium   | High     | Extreme    |
| 1                             |                            | 1.3      | 1.2      | 1.1        |
| <b>B (tonnes)<sup>1</sup></b> |                            | <b>3</b> | <b>1</b> | <b>0.1</b> |

**Human health effects group**

| UN CLASS or HFSP hazard             | EFFECT CATEGORY: HUMAN HEALTH |           |             |            |
|-------------------------------------|-------------------------------|-----------|-------------|------------|
|                                     | Low                           | Medium    | High        | Extreme    |
| 2                                   |                               |           | 2.3.(b)-(d) | 2.3(a)     |
| 6                                   | 6.1PGIII                      | 6.1PGII   | 6.1PGI(b)   | 6.1PGI(a)  |
| 8                                   |                               | 8PGI-PGII |             |            |
| <b>B (tonnes)<sup>1</sup></b>       | <b>30</b>                     | <b>10</b> | <b>1</b>    | <b>0.1</b> |
| <b>B(m<sup>3</sup>)<sup>2</sup></b> |                               |           | <b>500</b>  | <b>50</b>  |

**Environmental effects group**

| UN CLASS or HFSP hazard | EFFECT CATEGORY: ENVIRONMENTAL |                |            |                        |
|-------------------------|--------------------------------|----------------|------------|------------------------|
|                         | Low                            | Medium         | High       | Extreme                |
| 3C                      |                                | 3C             |            |                        |
| 8                       |                                |                | 8 PGI-PGII |                        |
| Pesticide               |                                |                |            | Pesticide <sup>3</sup> |
| Eco-toxic               | Groups 1d & 2d                 | Groups 1c & 2c | Group 1b   | Group 1a               |
| <b>B<sup>1</sup></b>    | <b>100</b>                     | <b>30</b>      | <b>3</b>   | <b>0.3</b>             |

Note:

<sup>1</sup> B = Base Threshold in tonnes<sup>2</sup> B = Base Threshold in m<sup>3</sup> for permanent or compressed gases<sup>3</sup> For pesticides in which there is available information to demonstrate or substantiate that any uncontrolled releases, accidental or otherwise will not adversely affect the sensitivity of the surrounding environment in which proposed activity is to be located then a Medium Environmental effects group rating may be used.**Table 2 Adjustment Factors**

| ADJUSTMENT FACTORS FOR FIRE/EXPLOSION EFFECTS GROUP              |       | ADJUSTMENT FACTOR FOR HUMAN HEALTH EFFECTS GROUP                       |       | ADJUSTMENT FACTORS FOR ENVIRONMENTAL EFFECTS GROUP   |       |
|--|-------|--|-------|--|-------|
| F1: SUBSTANCE FORM   |       | F1: SUBSTANCE FORM   |       | F1: SUBSTANCE FORM   |       |
| Solid  | = 1   | Solid  | = 3   | Solid  | = 3   |
| Liquid, Powder   | = 1   | Liquid, Powder   | = 1   | Liquid, Powder   | = 1   |
| Gas (at 101.3kPa and 20°C)                                       | = 0.1 | Gas (at 101.3 kPa and 20°C)  | = 0.1 |  |       |
| F2: HANDLING/STORAGE CONDITIONS (Class 3 Flammable liquids only) |       | F2: SEPARATION DISTANCE FROM SITE BOUNDARY (For gases only)            |       | F2: ENVIRONMENTAL SENSITIVITY  |       |
| Temp < flash point   | = 1   | < 30m  | = 1   | More than 30m from a waterbody adjacent to or within 30m of a waterbody  | = 0.3 |
| Temp > flash point < boiling point                               | = 0.3 | > 30m  | = 3   | <i>Note:</i> Waterbody includes streams, spring, sea, lakes, estuaries, wetlands, etc. but excludes aquifers and entry points to stormwater drainage network |       |
| Temp > boiling point   | = 0.1 |  |       |  |       |
| F3: SEPARATION DISTANCE FROM SITE BOUNDARY                       |       | F3: PROXIMITY TO POTABLE WATER RESOURCE                                |       | F3: TYPE OF ACTIVITY   |       |
| < 30m  | = 1   | Normal   | = 1   | Use  | = 0.3 |
| > 30m  | = 3   | Proximity to potable water resource                                    | = 0.3 | Above ground storage   | = 1   |
|  |       | <i>Note:</i> Potable water resource as defined by the regional council |       | Underground storage  | = 3   |
|  |       |  |       | <i>Note:</i> Underground storage only applicable to Class 3 substances   |       |

| F4: TYPE ACTIVITY  |       | F4: TYPE OF ACTIVITY   |       |                      |  |
|--|-------|--|-------|----------------------|--|
| Use  | = 0.3 | Use  | = 0.3 |                      |  |
| Above ground storage   | = 1   | Above ground storage   | = 1   |                      |  |
| Underground storage  | = 10  | Underground storage  | = 10  |                      |  |
| <i>Note: Underground storage only applicable to Class 3 substances</i> |       | <i>Note: Underground storage only applicable to Class 3 substances</i> |       |                      |  |
| <b>F1*F2*F3*F4 = FF</b>  |       | <b>F1*F2*F3*F4 = FH</b>  |       | <b>F1*F2*F3 = FE</b> |  |

#### 6. Adjusted Threshold (T)

The *Adjusted Threshold* (T) is calculated for each *Effects Group* by multiplying the *Base Threshold* with the relevant *Adjustment Factor*, as follows:

$$T = B \times FF$$

- provides the *Adjusted Threshold* for a substance in the Fire/Explosion Effects Group.

$$T = B \times FH$$

- provides the *Adjusted Threshold* for a substance in the Human Health Effects Group.

$$T = B \times FE$$

- provides the *Adjusted Threshold* for a substance in the Environmental Effects Group.

#### 7. Effects Ratio

The *Effects Ratio* R is obtained by dividing the proposed quantity of substance (Q) or group of substances by the *Adjusted Threshold*. *Effects Ratios* fulfil two important purposes:

- They form the basis to define the trigger levels in the Consent Status Matrix which are used to determine the consent status of a particular facility. The consent status is determined by the highest *Effects Ratio* in any of the three *Effects Groups*.
- By using a ratio of the proposed quantity of a hazardous substance over the *Adjusted Threshold* instead of the *Adjusted Threshold* itself, it is possible to aggregate the effects presented by multiple substances held on the same site. Hence, it becomes possible to assess the cumulative potential effects which may be created by several substances present on the same site, and with similar intrinsic properties.

#### 8. HFSP Step-by-Step Guide

The following provides a brief step-by-step guide on how to use the HFSP. The sequence of necessary steps is shown in [Figure 10.2](#). A substance worksheet form is attached which provides users with an information check list used for the classification of hazardous substances (Attachment B).

##### 8.1 Hazardous Substances Inventory

To use the HFSP, it is necessary to create a full inventory (list) of hazardous substances held on a site. Such an inventory comprises the names, quantities and UN Classifications of hazardous substances. Standard UN Classifications have been adopted for use in the HFSP procedure (Table 1 and Attachment A). However, UN Classifications are inadequate for environmentally toxic/

damaging substances. Such substances have been incorporated into the Eco-toxic grouping for the purposes of the HFSP. Under these additional classifications, foodstuffs such as milk is captured as an “environmentally damaging” substance.

## 8.2 Select Priority Substances

It is very common that multiple hazardous substances are held on a single site. It is neither practical nor necessary to submit every substance to the HFSP, provided that it does not have “priority status”. The following guidelines apply for sites where multiple hazardous substances are held:

- a) If the number of substances is below 10, the HFSP will be carried out on all 10 substances (unless it is evident that one single substance is likely to exceed the relevant trigger levels in the Consent Status Matrix).
- b) If the number of substances is above 10, the HFSP will be carried out on those substances which either have (a) a high or extreme effect rating, or (b) are held in quantities exceeding 10% of the total hazardous substances inventory.

## 8.3 Substance Specific Information

It is necessary, as part of the HFSP, to collect substance specific information. The information required is collated on a *Substance Data Record Sheet* (Attachment B). These sheets form the basis to determine the hazard levels within each *Effects Group* for each substance concerned. Relevant information for the *Substance Data Record Sheets* can be extracted from Material Safety Data Sheets, national and international databases, and text/reference books (refer Attachment B).

## 8.4 Site Specific Information

In addition to substance specific information, there is a need to assemble site specific information. For this purpose, a *Site Information Form* (Attachment C) will be filled in. The information compiled in this form will be used together with the *Substance Data Record Sheets* to carry out the necessary HFSP calculations.

## 8.5 HFSP Calculations

The HFSP calculations are undertaken using the *HFSP Evaluation Form* (Table 3). The necessary calculations are made to establish the *Adjusted Thresholds*, and the *Effects Ratios* for each substance. Table 3 is available in a computer spreadsheet form.

## 8.6 Aggregation of Effects Ratios

In the event of multiple hazardous substances being assessed on the same site, it will be necessary to aggregate the *Effects Ratios* by summing them for each *Effects Group*. This can be achieved by either linking spreadsheets or manual calculation.

## 8.7 Determination of Consent Status

The *Effects Ratio* of both individual and multiple substances forms the basis to determine the consent status of a particular site. For this purpose, the *Effects Ratio* is compared against the trigger levels in the Consent Status Matrix. Overall, the highest *Effect Ratio* in any of the three *Effects Groups* determines the consent status, and whether an activity is permitted, controlled or discretionary. Where the ratios indicate that an activity is discretionary, it is possible to review opportunities to reduce cumulative potential effects. This may be achieved by reducing the number and quantity of substances used/stored, or by carrying out the HFSP for individual (sub) facilities on the site, as opposed to the site as a whole. The subdivision of one site into more than one facility can be justified on the basis of separation distances (within the site), or the lack of interaction between the individual facilities (for example, between above ground and below ground storage tanks). However, the subdivision of a

site into separate facilities cannot be done without prior consultation with council officers.

9. Additional Information

9.1 Diluted or Mixed Substances

If a substance is diluted or mixed with other substances, the HFSP has to be applied to the percentage of the pure substance in the mixture (with the exception where the UN Classification already accounts for mixed/diluted substances). In a case where synergistic (additive) effects result in a mixture which is more hazardous than its components, the mixture may need to be assessed through appropriate testing procedures. In some instances, relevant information on mixtures is readily available (for example, formaldehyde).

Where an *Adjusted Threshold* has to be established for a mixture of substances where individual components are unknown, or the number of components is too high to be evaluated individually, the *Adjusted Threshold* of the mixture itself should be established.

9.2 Unavailability of Relevant Information

If the potential effects of a substance are not known, or cannot be readily established, with publicly available information, the substance should be rated at least medium for each of the three *Effects Groups*. This mainly applies to the Environmental, and Human Health *Effects Group*, and to a lesser degree to the Fire/Explosion Effects Group as information on flammability is generally readily available.

9.3 Temporarily Stored Substances

The temporary storage of hazardous substances should be included in the HFSP.

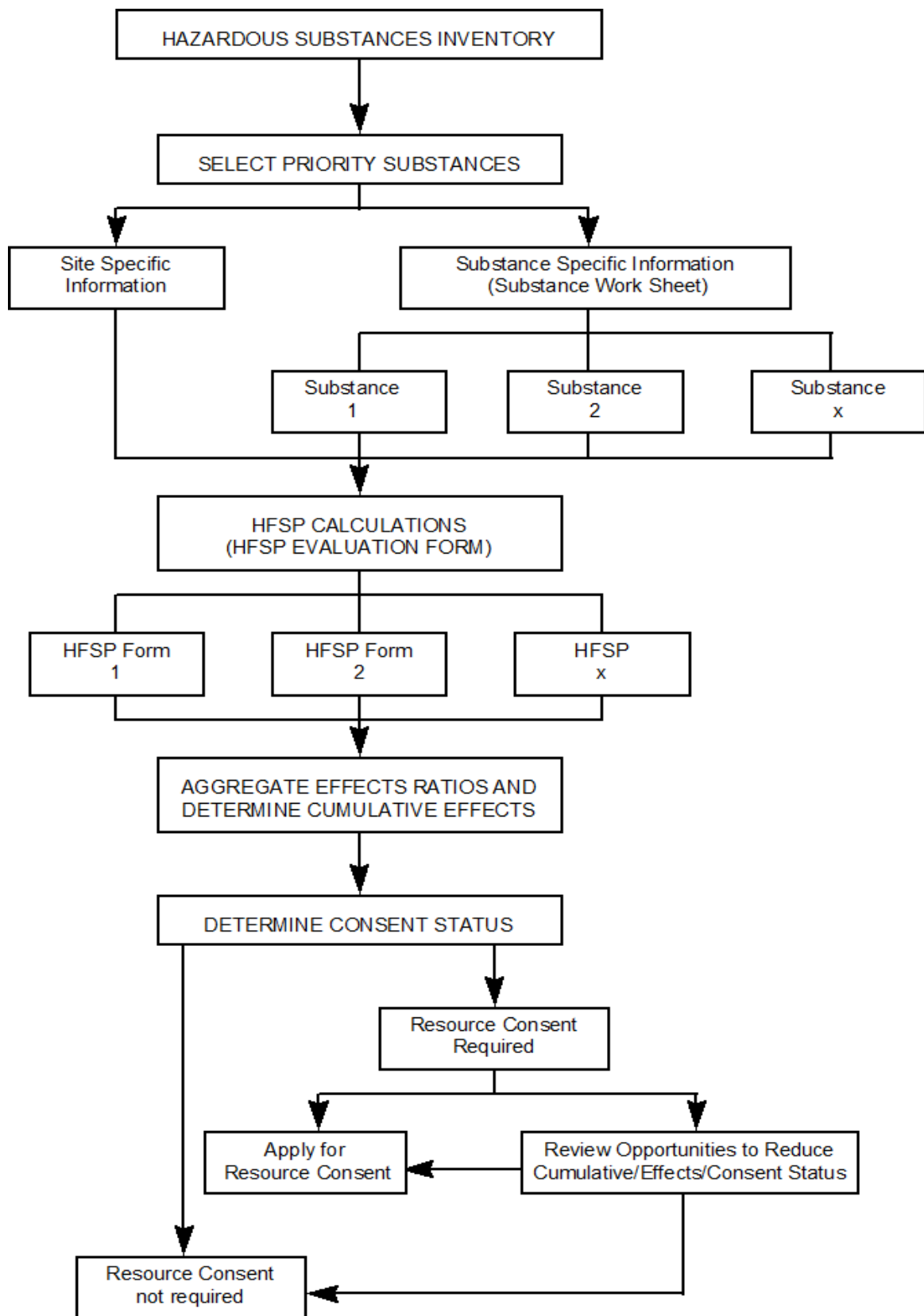
9.4 Application to small package users

The HFSP is applied to small package users of hazardous substances as if it were a bulk quantity. While small hazardous substances packages reduce the risk of a major spill, they may in the case of fire react like a bulk quantity. Therefore, a conservative approach has been taken. However, users of small hazardous substances packages which are not stored/used in large quantities such as home users, supermarkets, chemist shops and hardware shops are exempt from the procedure.

9.5 Quantity versus Volume Units

As a rule, the HFSP is applied to weights of hazardous substances. However, for permanent and compressed gases, Base Thresholds and *Adjusted Thresholds* will be applied as a volume (m<sup>3</sup>).

**Figure 10.2 HFSP Step by Step**





**Table 3 HFSP Evaluation Form****Substance**

| FIRE/EXPLOSION EFFECTS                        |                              |   | HUMAN HEALTH EFFECTS                          |                         |   | ENVIRONMENTAL EFFECTS                         |         |   |
|---|------------------------------|---|---|-------------------------|---|---|---------|---|
| BASE THRESHOLD                                |                              | B | BASE  |                         | B | BASE THRESHOLD                                |         | B |
| Extreme                                       | 0.1/1                        |   | Extreme gases liquids/solids/powders          | 50m <sup>3</sup><br>0.1 |   | Extreme                                       | 0.3     |   |
| High gases liquids/solids/powders             | 10,000m <sup>3</sup><br>1/10 |   | High gases liquids/solids/powders             | 500m <sup>3</sup><br>1  |   | High  | 3       |   |
| Medium  | 3/30                         |   | Medium  | 10                      |   | Medium  | 30      |   |
| Low   | 100                          |   | Low   | 30                      |   | Low   | 100     |   |
| <b>Base Threshold B</b>                       | m <sup>3</sup> /Tonnes       |   | <b>Base Threshold B</b>                       | m <sup>3</sup> /Tonnes  |   | <b>Base Threshold B</b>                       | Tonnes  |   |
| ADJUSTMENT FACTORS                            |                              | F | ADJUSTMENT FACTORS                            |                         | F | ADJUSTMENT FACTORS                            |         | F |
| F1  | 1/1/0.1                      |   | F1  | 3/3/0.1                 |   | F1  | 3.0/1.0 |   |
| F2  | 1/0.3/0.1                    |   | F2  | 1.0/3.0                 |   | F2  | 1/0.3   |   |
| F3  | 1/3                          |   | F3  | 1/0.3                   |   | F3  | 0.3/1/3 |   |
| F4  | 0.3/1//10                    |   | F4  | 0.3/1/10                |   |   |         |   |
| <b>Combined Adjustment Factor FF</b>          |                              |   | <b>Combined Adjustment Factor FH</b>          |                         |   | <b>Combined Adjustment Factor FE</b>          |         |   |
| <b>Adjusted Threshold T (Fire) = B * FF</b>   |                              |   | <b>Adjusted Threshold T (Health) = B * FH</b> |                         |   | <b>Adjusted Threshold T (Envir) = B * FE</b>  |         |   |
| <b>Quantity Held (Q) m<sup>3</sup>/Tonnes</b> |                              |   | <b>Quantity Held (Q) m<sup>3</sup>/Tonnes</b> |                         |   | <b>Quantity Held (Q) m<sup>3</sup>/Tonnes</b> |         |   |
| <b>EFFECT RATIO R (Fire) Q/T</b>              |                              |   | <b>EFFECT RATIO R (Health) Q/T</b>            |                         |   | <b>EFFECT RATIO R (Envir) Q/T</b>             |         |   |

| ATTACHMENT A: CLASSIFICATION OF HAZARDOUS SUBSTANCES |                             |                          |   |
|--|-----------------------------|--------------------------|---|
| HFSP Hazard  | HAZARD                      | UN Class                 | DESCRIPTION   |
|  | Explosive                   | 1.1                      | Articles and substances having a mass explosion hazard  |
|  |                             | 1.2                      | Articles and substances having a projectile hazard, but not a mass explosion hazard   |
|  |                             | 1.3                      | Articles and substances having a fire hazard and either a minor blast hazard or minor projection hazard or both, but not a mass explosion hazard. This division comprises articles and substances that: <ul style="list-style-type: none"> <li>• give rise to considerable radiant heat, or</li> <li>• burn one after another, producing minor blast and/or projection effects</li> </ul>   |
|  |                             | 1.4, 1.5 & 1.6           | Not applicable  |
|  | Flammable gas               | 2.1                      | Flammable gas: gases which at 20°C and a standard pressure of 101.3 kPa: <ul style="list-style-type: none"> <li>• are ignitable when in a mixture of 13% or less by volume with air, or</li> <li>• have a flammable range with air of at least 12% regardless of the lower flammability limit</li> </ul> This class includes aerosols containing flammable propellants  |
|  | Non-flammable non-toxic gas | 2.2                      | Not applicable  |
|  | Toxic gas                   | 2.3                      | Toxic gas: gases which are known to be toxic or corrosive to humans as to pose a hazard to health. This division is divided into four categories: <p><b>a) Extreme:</b><br/>Inhalation toxicity vapours LC<sub>50</sub>:<br/>&lt; 200 ppm(=ml/m<sup>3</sup>) and V<sup>(1)</sup>&gt;10xLC<sub>50</sub> (extreme)</p> <p><b>(b-d) High:</b><br/>Inhalation toxicity vapours LC<sub>50</sub>:<br/>&lt;5,000ppm(=ml/m<sup>3</sup>) and V<sup>(1)</sup>&gt;LC<sub>50</sub></p> <p><sup>(1)</sup>V = (p/P)x10<sup>6</sup>ppm or ml/m<sup>3</sup>, where P=760mmHg and p = Vapour Pressure (20°C)</p> |
|  | Flammable Liquid            | 3 PGI<br>3PGII<br>3PGIII | Flammable liquids comprising liquids, mixtures of liquids, or liquids containing solids in suspension which give off a flammable vapour at specific temperatures. This class is divided into packaging groups (PG). <p>Flash point: &lt;23°C<br/>Initial boiling point: &lt;35°C<br/>Flash point: &lt;23°C<br/>Initial boiling point: &gt;35°C<br/>Flash point: &gt;23°C; &lt;61°C<br/>Initial boiling point: &gt;35°C</p>  |

| ATTACHMENT A: CLASSIFICATION OF HAZARDOUS SUBSTANCES |   |                |   |
|--|---|----------------|---|
| HFSP hazard  | HAZARD  | UN Class       | DESCRIPTION   |
| 3C<br>Combustible<br>Liquid                          |   |                | Flash point >61°C; <200°C   |
|  | Flammable<br>Solid, Solid<br>Self-<br>Reactive,<br>Solid<br>Desensitised<br>Explosive,<br>Spontaneous<br>Combustible<br>Dangerous<br>When Wet | 4.1<br>PGI-III | <ul style="list-style-type: none"> <li>Flammable solids that are readily combustible or may cause fire easily through an ignition source or friction</li> <li>Self-reacting substances that are thermally unstable and are liable to undergo a strongly exothermic decomposition even without the participation of oxygen</li> <li>Desensitised explosives are substances which are wetted with water or alcohol or are diluted with other substances to suppress their explosive properties</li> </ul>   |
|  |   | 4.2<br>PGI-III | <ul style="list-style-type: none"> <li>Pyrophoric substances: liquid or solid substances which, even in small quantities, ignite within 5 minutes of coming in contact with air</li> <li>Self-heating substances: solid substances which generate heat when in contact with air without additional energy supply</li> </ul>   |
|  |   | 4.3<br>PGI-III | Substances, which in contact with water, become spontaneously flammable, or emit flammable gases  |
|  | Oxidising<br>Agent  | 5.1            | Substances which, while in themselves are not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material   |
|  | Organic<br>Peroxide   | 5.2            | <p>Organic peroxides are liable to exothermic decomposition at normal or elevated temperatures. The decomposition can be initiated by heat, contact with impurities (e.g. acids, heavy-metal compounds, amines), friction or impact. The rate of decomposition increases with temperature and varies with the organic peroxide formulation. Decomposition may result in the evolution of harmful, or flammable gases or vapours. In addition they may have one or more of the following properties:</p> <ul style="list-style-type: none"> <li>be liable to explosive decomposition</li> <li>burn rapidly</li> <li>be sensitive to impact or friction</li> <li>react dangerously with other substances</li> <li>cause damage to the eyes</li> </ul> |

| ATTACHMENT A: CLASSIFICATION OF HAZARDOUS SUBSTANCES |                      |           |   |
|--|----------------------|-----------|---|
| HFSP hazard  | HAZARD               | UN Class  | DESCRIPTION   |
| Recognised carcinogen, teratogen or mutagen          | Toxic                | 6.1       | Poisonous substances: Poisonous substances which are liable to cause death or injury or harm to human health if swallowed, inhaled, or contacted by the skin. This division is divided into three packaging categories.   |
|  |                      | 6.1 PGI   | <p>a) <b>Extreme</b></p> <p>Oral toxicity LD<sub>50</sub>(mg/kg): &lt; 1</p> <p>Dermal toxicity LD<sub>50</sub>(mg/kg): &lt; 10</p> <p>Inhalation toxicity dust/mist LC<sub>50</sub>(mg/l): &lt;0.5</p> <p>Inhalation toxicity vapours LC<sub>50</sub>: &lt;200ppm(=ml/m<sup>3</sup>)</p> <p>and (extreme) V<sup>(1)</sup>&gt; x LC<sub>50</sub></p> <p>b) <b>High</b></p> <p>Oral toxicity LD<sub>50</sub>(mg/kg): &lt; 5</p> <p>Dermal toxicity LD<sub>50</sub>(mg/kg): &lt; 40</p> <p>Inhalation toxicity dust/mist LC<sub>50</sub>(mg/l): &lt; 0.5</p> <p>Inhalation toxicity vapours LC<sub>50</sub>(ml/m<sup>3</sup>) (high): &lt;1,000ppm(=andV<sup>(1)</sup>)</p> <p>&gt;10xLC<sub>50</sub></p> |
|  |                      | 6.1P GII  | <p>c) <b>Medium</b></p> <p>Oral toxicity LD<sub>50</sub>(mg/kg): &lt; 50</p> <p>Dermal toxicity LD<sub>50</sub>(mg/kg): &lt; 200</p> <p>Inhalation toxicity dust/mist LC<sub>50</sub>(mg/l): &lt; 2</p> <p>Inhalation toxicity vapours LC<sub>50</sub>: &lt;3,000ppm(=ml/m<sup>3</sup>)</p> <p>and V<sup>(1)</sup>&gt;10xLC<sub>50</sub></p>  |
| Pesticide  | Infectious substance | 6.1P GIII | <p>d) <b>Low</b></p> <p>Oral toxicity LD<sub>50</sub>(mg/kg): &lt; 500 (liquids) or &lt; 200 (solids)</p> <p>Dermal toxicity LD<sub>50</sub>(mg/kg): &lt; 1,000</p> <p>Inhalation toxicity dust/mist LC<sub>50</sub>(mg/l): &lt; 10</p> <p>Inhalation toxicity vapours LC<sub>50</sub>(ml/m<sup>3</sup>): &lt;5,000ppm and V<sup>(1)</sup>&gt;10xLC<sub>50</sub></p> <p>(<sup>1</sup>)V = (p/P) x 10<sup>6</sup> ppm or ml/m<sup>3</sup>, where P = 760 mm Hg and p = Vapour Pressure (20°C)</p>  |
|  |                      | 6.2       | Not applicable  |
|  | Radioactive          | 7         | Not applicable  |

| ATTACHMENT A: CLASSIFICATION OF HAZARDOUS SUBSTANCES |           |          |  |
|--|-----------|----------|--|
| HFSP hazard  | HAZARD    | UN Class | DESCRIPTION  |
|  | Corrosive | 8PGI     | Substances which, by chemical action, can cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage or even destroy other materials. They may also cause other hazards:<br><br>Very dangerous substances and preparations.<br>Substances that cause full thickness destruction of intact skin tissue within an observation period up to 60 minutes starting after the exposure time of three minutes or less.                             |
|  |           | 8PGII    | Substances and preparation presenting medium damage.<br>Substances that cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than three minutes but more than 60 minutes.  |
|  |           | 8PGIII   | Substances and preparations presenting minor danger.<br>a) Substances that cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 60 minutes but not more than 4 hours.<br>b) Substances which are judged not to cause full thickness destruction of intact skin tissue but which exhibit a corrosion rate on steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55°C. |

| ATTACHMENT A: CLASSIFICATION OF HAZARDOUS SUBSTANCES |          |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
|--|----------|----------|---|---|----------|--|---------|--------------------------------------|-------|---|-------|--|-------|--------------------------------------|-------|---|--------|--|--------|--------------------------------------|--------|---|---------|--|---------|--------------------------------------|---------|
| HFSP hazard  | HAZARD   | UN Class | DESCRIPTION   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| Eco-toxic  |          |          | <p><b>Group 1</b></p> <p>Ecotoxic substances: any substance exhibiting a toxic effect on the ecosystem, based on the toxicity to aquatic life. This division is sub-divided into four categories:</p> <p>a) <b>Extreme:</b></p> <table><tr><td>96 hr LC<sub>50</sub> salmonoid fish (mg/l):</td><td>&lt; 0.1</td></tr><tr><td>48 hr EC<sub>50</sub> daphnia (mg/l):</td><td>&lt; 0.1</td></tr><tr><td>72 hr EC<sub>50</sub> algae (mg/l):</td><td>&lt; 0.1</td></tr></table> <p>Pesticides (unless toxicity data can be demonstrated to show lesser toxicity)</p> <p>b) <b>High:</b></p> <table><tr><td>96 hr LC<sub>50</sub> salmonoid fish (mg/l):</td><td>&lt; 1.0</td></tr><tr><td>48 hr EC<sub>50</sub> daphnia (mg/l):</td><td>&lt; 1.0</td></tr><tr><td>72 hr EC<sub>50</sub> algae (mg/l):</td><td>&lt; 1.0</td></tr></table> <p>c) <b>Medium:</b></p> <table><tr><td>96 hr LC<sub>50</sub> salmonoid fish (mg/l):</td><td>&lt; 10.0</td></tr><tr><td>48 hr EC<sub>50</sub> daphnia (mg/l):</td><td>&lt; 10.0</td></tr><tr><td>72 hr EC<sub>50</sub> algae (mg/l):</td><td>&lt; 10.0</td></tr></table> <p>d) <b>Low:</b></p> <table><tr><td>96 hr LC<sub>50</sub> salmonoid fish (mg/l):</td><td>&lt; 100.0</td></tr><tr><td>48 hr EC<sub>50</sub> daphnia (mg/l):</td><td>&lt; 100.0</td></tr><tr><td>72 hr EC<sub>50</sub> algae (mg/l):</td><td>&lt; 100.0</td></tr></table> | 96 hr LC <sub>50</sub> salmonoid fish (mg/l): | < 0.1    | 48 hr EC <sub>50</sub> daphnia (mg/l): | < 0.1   | 72 hr EC <sub>50</sub> algae (mg/l): | < 0.1 | 96 hr LC <sub>50</sub> salmonoid fish (mg/l): | < 1.0 | 48 hr EC <sub>50</sub> daphnia (mg/l): | < 1.0 | 72 hr EC <sub>50</sub> algae (mg/l): | < 1.0 | 96 hr LC <sub>50</sub> salmonoid fish (mg/l): | < 10.0 | 48 hr EC <sub>50</sub> daphnia (mg/l): | < 10.0 | 72 hr EC <sub>50</sub> algae (mg/l): | < 10.0 | 96 hr LC <sub>50</sub> salmonoid fish (mg/l): | < 100.0 | 48 hr EC <sub>50</sub> daphnia (mg/l): | < 100.0 | 72 hr EC <sub>50</sub> algae (mg/l): | < 100.0 |
| 96 hr LC <sub>50</sub> salmonoid fish (mg/l):        | < 0.1    |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 48 hr EC <sub>50</sub> daphnia (mg/l):               | < 0.1    |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 72 hr EC <sub>50</sub> algae (mg/l):                 | < 0.1    |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 96 hr LC <sub>50</sub> salmonoid fish (mg/l):        | < 1.0    |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 48 hr EC <sub>50</sub> daphnia (mg/l):               | < 1.0    |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 72 hr EC <sub>50</sub> algae (mg/l):                 | < 1.0    |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 96 hr LC <sub>50</sub> salmonoid fish (mg/l):        | < 10.0   |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 48 hr EC <sub>50</sub> daphnia (mg/l):               | < 10.0   |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 72 hr EC <sub>50</sub> algae (mg/l):                 | < 10.0   |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 96 hr LC <sub>50</sub> salmonoid fish (mg/l):        | < 100.0  |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 48 hr EC <sub>50</sub> daphnia (mg/l):               | < 100.0  |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| 72 hr EC <sub>50</sub> algae (mg/l):                 | < 100.0  |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
|  |          |          | <p><b>Group 2</b></p> <p>Environmentally damaging or persistent substances: any substance exhibiting a damaging (other than toxic) effect on the ecosystem. This division is sub-divided into two categories:</p> <p>c) <b>Medium:</b></p> <table><tr><td>BOD<sub>5</sub><sup>(1)</sup>(mg/l)</td><td>&gt; 10,000</td></tr></table> <p>d) <b>Low:</b></p> <table><tr><td>BOD<sub>5</sub>(mg/l)</td><td>&gt; 1,000</td></tr></table> <p>(<sup>1</sup>) BOD<sub>5</sub> stands for 5-day biochemical oxygen demand</p>  | BOD <sub>5</sub> <sup>(1)</sup> (mg/l)        | > 10,000 | BOD <sub>5</sub> (mg/l)                | > 1,000 |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| BOD <sub>5</sub> <sup>(1)</sup> (mg/l)               | > 10,000 |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |
| BOD <sub>5</sub> (mg/l)                              | > 1,000  |          |   |   |          |  |         |                                      |       |   |       |  |       |                                      |       |   |        |  |        |                                      |        |   |         |  |         |                                      |         |



| ATTACHMENT B: SUBSTANCE WORKSHEET  |  |
|--|--|
| <b>SUBSTANCE NAME</b><br><b>PROPRIETARY NAME</b><br><b>SUBSTANCE FORM (Solid, Liquid, Gas)</b> |  |
| <b>PHYSICAL/CHEMICAL CHARACTERISTICS</b>   |  |
| <b>UN NUMBER</b>   | <b>NU CLASS</b><br><b>Subs. Risk</b><br><b>Pack. Group</b> |
| <b>Initial Boiling Point (°C)</b>  | <b>Flash Point (°C)</b>                                    |
| <b>Specific Gravity</b>  | <b>Vapour Pressure (mm Hg)</b>                             |
| <b>HUMAN HEALTH TOXICITY</b><br>(indicate duration)  |  |
| <b>Oral Toxicity LD<sub>50</sub> (mg/kg)</b>   |  |
| <b>Dermal Toxicity LD<sub>50</sub> (mg/kg)</b>   |  |
| <b>Inhalation Toxicity LC<sub>50</sub> (ppm)</b>   |  |
| <b>Carcinogen, Mutagen, or Teratogen (Yes/No)</b>  |  |
| <b>ECOTOXITY (indicate duration)</b>   |  |
| <b>LC<sub>50</sub> Salmon Fish (mg/l)</b>  |  |
| <b>EC<sub>50</sub> Daphnia (mg/l)</b>  |  |
| <b>EC<sub>50</sub> Algae (mg/l)</b>  |  |
| <b>BOD<sub>5</sub> (mg/kg)</b>   |  |
| <b>Pesticide (Yes/No)</b>  |  |

**EFFECTS RATING**

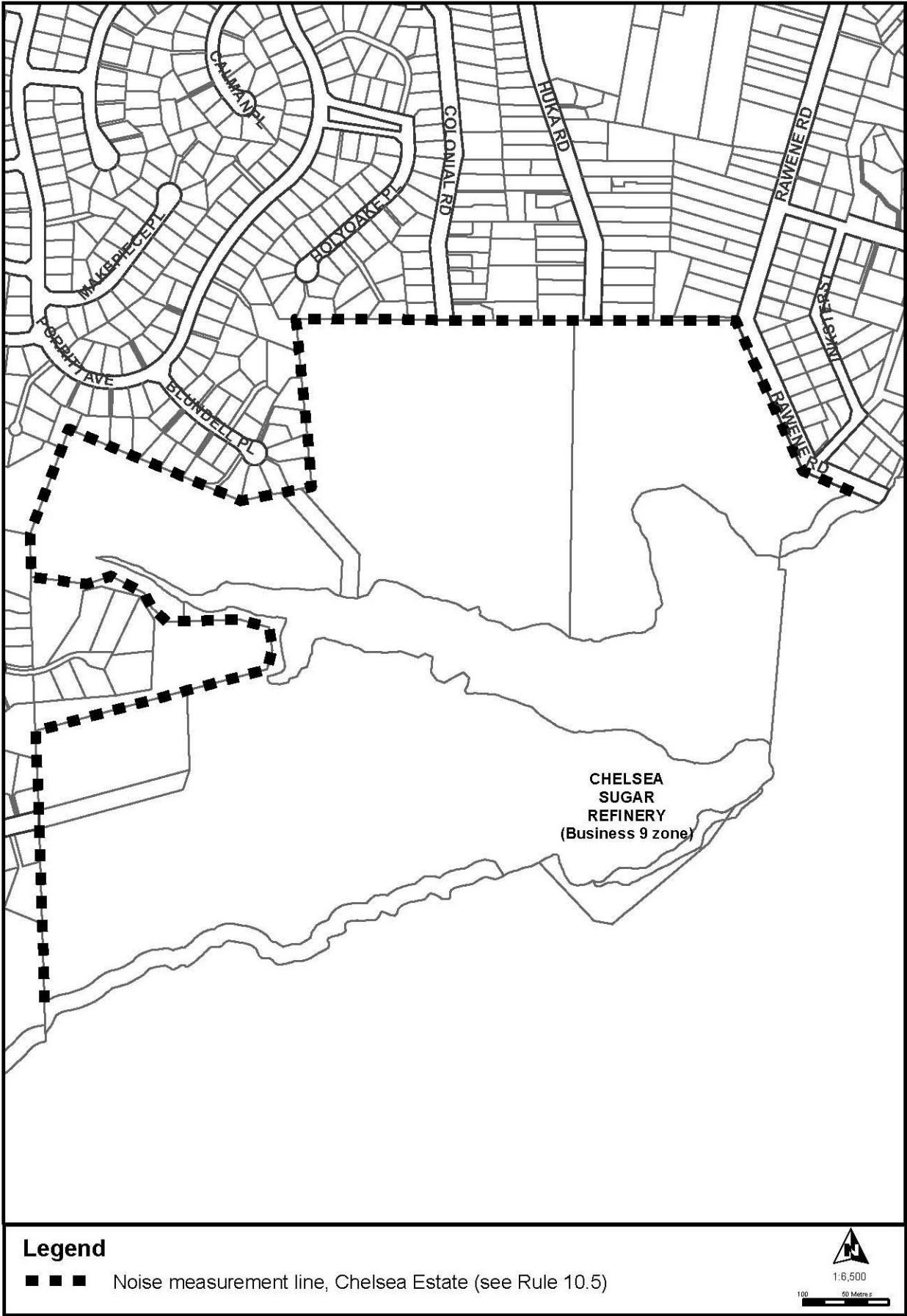
| Explosion/Fire Effect |   | Human Health Effect |   | Environmental Effect |   |
|-----------------------|---|---------------------|---|----------------------|---|
| Extreme               | q | Extreme             | q | Extreme              | q |
| High                  | q | High                | q | High                 | q |
| Medium                | q | Medium              | q | Medium               | q |
| Low                   | q | Low                 | q | Low                  | q |
| N/A                   | q | N/A                 | q | N/A                  | q |

**Note:**

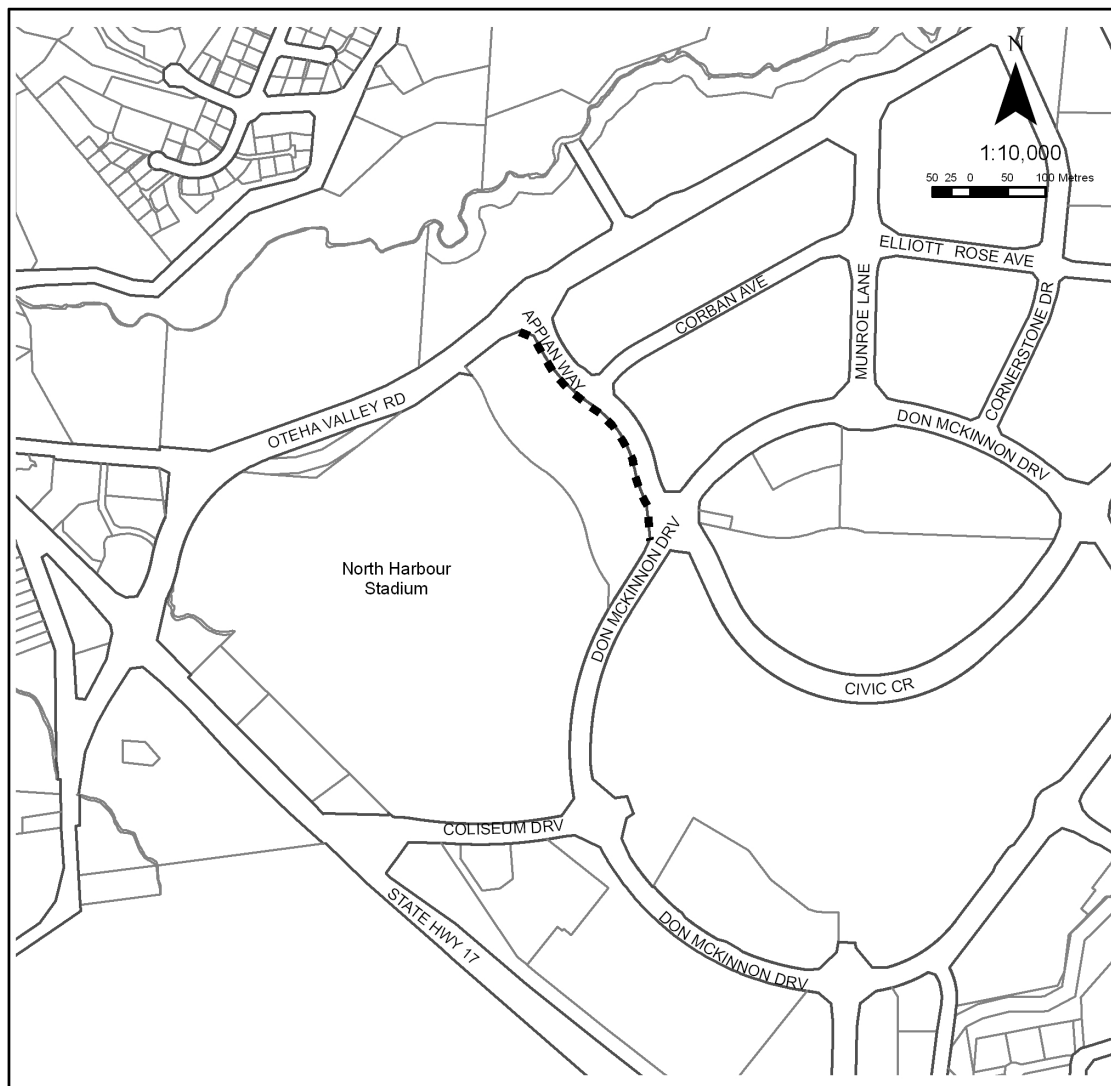
When using LD<sub>50</sub> or LC<sub>50</sub> data, the HFSP has been based on using the lowest value irrespective of animal species. This is because many chemicals have had LD<sub>50</sub> and LC<sub>50</sub> tests based on different animal species. This approach gives conservative results for the HFSP.

| ATTACHMENT C: SITE INFORMATION FORM                 |             |
|---|-------------|
| ITEM  | INFORMATION |
| Company Name  |             |
| Contact Name  |             |
| Phone/fax number                                    |             |
| Address   |             |
| Substance Name                                      |             |
| Manufacturer or Importer of substance               |             |
| Maximum quantity stored (tonnes or m <sup>3</sup> ) |             |
| Type of facility (storage, processing, etc.)        |             |
| Separation distance from site boundary              |             |
| Vicinity of potable water source                    |             |
| Distance from environmentally sensitive water body  |             |

**Appendix 10H: Chelsea Estate, Noise Measurement Line**



## Appendix 10I: Business 11 Zone Noise Control Boundary



### Legend

■ ■ ■ 85 dBA L<sub>10</sub> Noise Control Boundary