STATE ENVIRONMENTAL PLANNING POLICY NO.33 REVIEW - PROPOSED CENTRE FOR OBESITY, DIABETES AND CARDIOVASCULAR DISEASE

UNIVERSITY OF SYDNEY

November 2009

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Sinclair Knight Merz
ABN 37 001 024 095
100 Christie Street
PO Box 164
St Leonards NSW
Australia 1590
Tel: +61 2 9928 2100
Fax: +61 2 9928 2500
Web: www.skmconsulting.com

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Contents

1. Introduction

The proposal for the Centre for Obesity, Diabetes and Cardiovascular Disease (CODCD) has resulted from strong and longstanding collaborative links that have led to a partnership between:

- The University of Sydney (UoS);
- Sydney South West Area Health Service (SSWAHS) along with its premier teaching hospital, Royal Prince Alfred (RPAH);
- The Sydney Institutes for Health and Medical Research (SIHMR), a consortium of University affiliated research institutes largely located on the RPAH and University campuses.

The CODCD will occupy a new facility to be built on the UoS campus, adjacent to the RPAH campus. The new facility will be funded partly by a substantial grant from the Federal Government's Education and Infrastructure Fund and represents the first phase of a wider Life Sciences Research Precinct (LSRP, previously referred to as the Arc precinct) identified in the University's Campus 2020 Masterplan.

As part of the planning process for Part 3A Development (Developments of State Significance) it will be necessary to ensure the proposed facility, which will comprise dangerous goods stores, flammable liquids stores and other waste and handling facilities complies with the requirements of State Environmental Planning Policy No.33 (SEPP33) "Hazardous and Offensive Developments"

To assist with the assessment of SEPP33 for the proposed facility, the University of Sydney (UoS) has engaged Sinclair Knight Merz (SKM) to determine whether SEPP33 applies to the project.

This document details the SEPP33 screening review of the proposed research centre.

2. Objectives

The objectives of the study are to identify whether SEPP33 applies to the proposed Centre for Obesity, Diabetes and Cardiovascular Disease (CODCD) at the University of Sydney (UoS), and to report on the findings of the study for submission to the NSW DoP, and various State & Federal Government bodies in support of the Development Application.

3. Scope of Work

The scope of work is to provide a SEPP33 screening review of the proposed Centre for Obesity, Diabetes and Cardiovascular Disease (CODCD) at the University of Sydney (UoS). As part of this proposal, it is proposed to store and handle Class 3 Flammable liquids, medical gases and infectious substances at the site for medical research activities. The SEPP 33 review will apply screening techniques to determine whether further risk analysis is required to address dangerous goods storage and land use safety issues.

4. Methodology

The methodology used for the assessment is that described in "Applying SEPP33" (Ref.2). This document provides a number of threshold charts, tables and graphs against which the proposed storage quantity of dangerous goods can be assessed to determine whether the threshold levels are exceeded. The screening threshold quantities are shown in Table 1 – Screening Threshold Quantities for the relevant Dangerous Goods classes.

The Screening method is used to determine whether a proposed development is potentially hazardous, and hence whether dangerous goods storages should be subject to a Preliminary Hazard Analysis (PHA) study.

Class	Screening Threshold	Description
1.2	5 tonnes	or are located within 100 m of a residential area
1.3	10 tonnes	or are located within 100 m of a residential area
2.1	(LPG only — not including automotive retail outlets)	
	16 m^3	if stored above ground
	64 m^3	if stored underground or mounded
2.3	5 tonnes	anhydrous ammonia, kept in the same manner as for liquefied flammable gases and not kept for sale
	1 tonne	chlorine and sulfur dioxide stored as liquefied gas in containers <100 kg
	2.5 tonnes	chlorine and sulphur dioxide stored as liquified gas in containers >100 kg
	100 kg	liquefied gas kept in or on premises
	10 m^3	other poisonous gases (measured at metric standard conditions of 101.3 kPa at 15° C)
4.1	5 tonnes	
4.2	1 tonne	
4.3	1 tonne	
5.1	25 tonnes	ammonium nitrate — high density fertiliser grade, kept on land zoned rural where rural industry is carried out, if the depot is at least 50 metres from the site boundary
	5 tonnes	ammonium nitrate — elsewhere
	2.5 tonnes	dry pool chlorine — if at a dedicated pool supply shop, in containers <30 kg
	1 tonne	dry pool chlorine — if at a dedicated pool supply shop, in containers >30 kg
	5 tonnes	any other class 5.1
5.2	10 tonnes/10 m^3	
6.1(a)	0.5 tonnes/0.5 m^3	
6.1(b)	2.5 tonnes/2.5 m^3	
6.2	0.5 tonnes/0.5 m^3	includes clinical waste
7	all	should demonstrate compliance with Australian codes
8	5 tonnes/5 m^3	packaging group I
	25 tonnes/25 m^3	packaging group II
	50 tonnes/50 m^3	packaging group III

Table 1 – Screening Threshold Quantities

Note for the purpose of the SEPP 33 screening review the following Dangerous goods classes are excluded from the analysis. The class and reason for exclusion are as follows;

- Class 1.4, 1.5, & 1.6 – explosives. These are already covered under Schedule 3, and are designated development under the Environmental Planning and Assessment Regulation 1994.

- Class 2.2 – Non-Flammable / Non-Toxic Gases – These are not considered to be potentially hazardous nor contribute significantly to off-site risk. These include medical gases, such as Oxygen and Nitrogen. Australian Standards will however apply to the design, installation, and operations of the bulk Oxygen and Nitrogen storage facilities at the CODCD. And hence these are not carried forward for screening

- Class 7 – Radio Active Substances – these include materials such as uranium hexafluoride. The CODCD will use radioisotopes in the iodination laboratory, however these dangerous goods are adequately covered by national regulations and guidelines, such as the Radiation Control Act, 1990 and regulations, and various Australian Standards such as AS 2243.4-1998: Safety in Laboratories – Part 4 –Ionizing Radiations. Again, these dangerous goods are not carried forward for screening.

- Class 9 – Miscellaneous Dangerous Goods include waste oils and spent solvents, some aerosols and polyester beads. Such materials do not pose a significant effect to people or property, but may be an environmental hazard.

In addition to the screening threshold for dangerous goods storage, there are also screening thresholds for dangerous goods truck movements by road to and from the CODCD. At this stage these transport movement details are not fully documented. However noting that the flammable goods store located in the Central Store receival area is of 2000 litres capacity, it is unlikely to generate more than 30 dangerous goods movements per week of Class 3 deliveries, and hence unlikely to exceed the threshold limits.

The SEPP 33 guidelines do however require the UoS to contact the NSW DoP for advise on any transport movements of Class 6.2 – Infectious Substances – i.e. substances containing micro-organisms, bacteria, viruses etc that are believed to cause disease in humans or animals. Note that class 6.2 - Infectious Substances also includes Clinical Wastes.

If any of the above test result in a screening threshold being exceeded, the proposed CODCD may be considered potentially hazardous and SEPP 33 will apply, i.e. a preliminary hazard analysis (PHA) is required to be submitted with the development application.

5. Project Description

5.1. Site Location

The proposed site is an approximately 3.85ha area of land within the Camperdown Campus of the University of Sydney, located at the junction between St John's College, The University, and the RPAH, as depicted in Figure 1- CODCD Facility – Site Layout.

The CODCD facility will comprise a number of tertiary units, labs and research facilities as shown in Figure 2 – Make up of CODCD facility, and located over 7 stories, including a basement area for stores and waste storage areas.

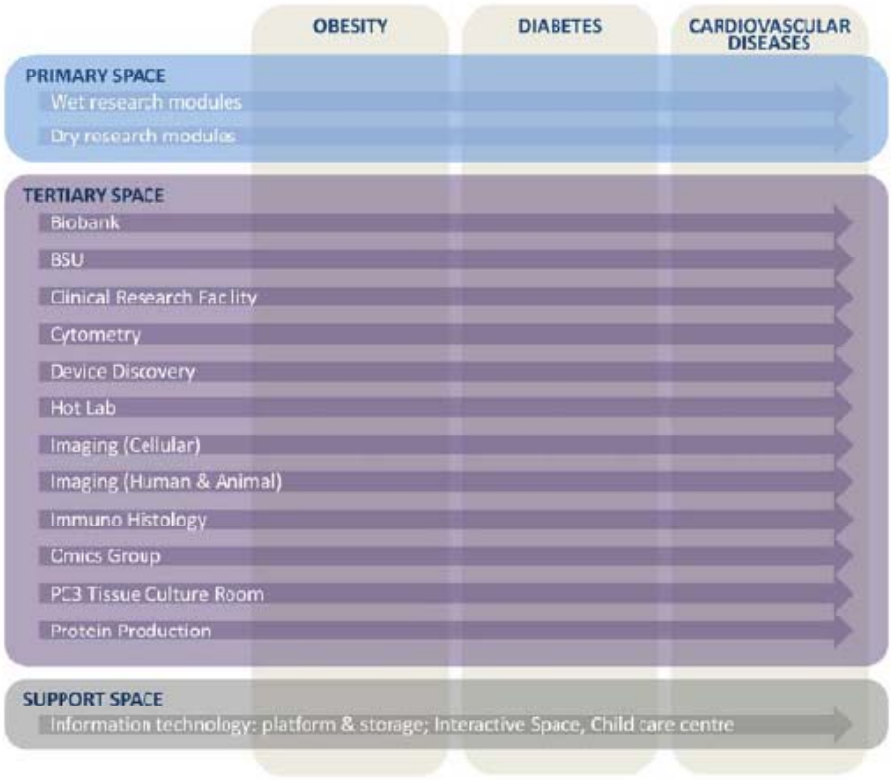


Figure 2 – Make up of CODCD facility

5.2. Boundaries of the Site

Provision of additional land for the LSRP has been negotiated and agreed with St John's College. As part of this negotiation, a site-specific development control schedule has been created, which sets out the parameters of the potential development. These controls include height, envelope, view corridor and landscaping constraints, but do not limit the maximum gross floor area of development. Details of the development control schedule are contained in the land exchange deeds. The location of the centre to the nearest boundary of The Royal Prince Alfred Hospital is approximately 20 m.

5.3. Dangerous Goods Storage Arrangements

The Central Stores will carry two classes of goods:

- Laboratory goods including dangerous goods, and
- General goods

All packaged dangerous goods will be delivered to the labs & research centres via the Central Store.

Bulk deliveries of medical gases, Oxygen, Nitrogen etc will be made directly to the bulk tanks. From the bulk tanks there will be reticulation lines to various decanting points throughout the facility.

5.3.1. Central Store

The CODCD's Goods Delivery area needs to be suitably equipped to accept dangerous goods. The Goods Delivery area will include:

- a loading dock large enough to accommodate a large gas cylinder delivery truck or waste collection truck, whichever has the greater requirement in terms of weight, turning circle, height and lifting height
- a gantry and hoist able to accommodate a standard tray-top truck (4.5mx15m)
- sufficient turning space for a motorised trolley

Some goods need to be stored safely immediately on arrival. The Central Store will to be equipped with:

- a cold room
- a –20º chest freezer within the cold room
- a separate Dangerous Goods Store which, in turn, must contain two flammable-rated areas that comply with AS 1940-2004: The storage and handling of flammable and combustible liquids:
  - one flammable rated area to store intermediate bulk containers of ethanol, of up to 2,000 litres capacity each, and will include an adjacent decanting space.
  - another flammable rated area to store other flammable material Material that requires –70º storage will be transferred to the Biobank immediately on receipt.

The Biobank therefore needs to have direct access to the Goods Delivery area.

The Central Stores, and the Dangerous Goods Store as part of it, will both use the CODCD's electronic access card system. Within the General and Dangerous Goods sections of the Central Stores, separate areas are required for each user group, to optimise stock control.

5.3.2. Laboratories

The CODCD policy is that laboratories must hold only the lowest feasible volumes of flammable liquids and gases. Wherever possible, storage, and decanting of such materials will be done in facilities external to laboratories. Laboratories must have suitable flammable-rated under-bench or stand alone cabinets for dangerous goods in major quantities (up to 100 litres for under bench cabinets and up to 250 litres in larger flammable liquids cabinets), appropriately located with respect to electrical power outlets and egress routes, in accordance with Australian Standards for laboratory safety. Ventilation must be appropriate for the storage and use of chemicals.

Fridges and freezers in laboratories must be flame-proof and isolated from ignition sources.

All flammable liquids cabinets and containers are to comply with AS /NZS 1940: 2004" The handling and Storage of flammable and combustible Liquids".

5.3.3. Medical Gases - bulk

There needs to be an external storage area for bulk gases (likely to be liquid nitrogen, N2, and carbon dioxide, CO2) suitably isolated from public areas, with access for road tankers. The storage area needs to suitably ventilated. It is anticipated that CODCD wet researchers will use approximately 4000 litres of N2 per week 5. There will be a vacuum line from the N2 storage tank to the vapour phase dewars in the Biobank, which automatically manage their N2 supply. The Biobank will therefore need to have air flow monitoring and a fail-safe ventilation system that can operate in the event of an electricity outage. There will be a second line to a central decanting point, where gas technicians can decant N2 into 25 to 50 litre dewars, and transport these via the dangerous goods hoist to laboratory decanting rooms on each floor, or directly into certain laboratories that have equipment using considerable quantities of gas. The central decanting point and the decanting rooms will require suitable ventilation and airflow monitoring. Alternatively, N2 may be reticulated by a vacuum line to each decanting room. The design team is to evaluate each option and agree the most appropriate solution with the PUG. The reticulation network is considered part of the dangerous goods storage area up to the point of delivery, so will need to be of a suitably high quality.

5.3.4. Medical Gases - Cylinder

Each wet pair of research modules will have a ventilated gas cylinder cupboard from which cylinder gas is reticulated in flexible lines, in accordance with AS 4332-2004: The storage and handling of gases in cylinders. A ventilated cupboard within the lab (rather than outside the lab) will minimise the opportunity for errors in connecting the correct cylinder to the correct equipment. Operational policies will need to be developed to ensure reticulation lines are purged safely on changeover of cylinders from one gas to another.

5.3.5. Infectious Substances

Infectious substances will comprise clinical and related wastes, and General clinical wastes, human tissue, and cytotoxic wastes, as described in the following 4 sections.

5.3.5.1. Clinical and related Waste

There will be an internal Clinical Waste Collection Room with direct access to a central decontamination area to perform pressure steam sterilisation. The collection room shall allow for physical separation of different types of waste in accordance with AS/NZS 3816:1998 Management of clinical and related wastes.

The Clinical Waste Collection Room will be secured using the CODCD's electronic access card system.

When transporting clinical and biological waste to centralised decontamination areas, the waste shall be contained in accordance with UoS OH&S policy. Circulation routes between the point at which the waste is generated and the point at which it is decontaminated and disposed of must be as discreet and direct as possible.

5.3.5.2. General Clinical Waste

Unidentifiable human tissue shall be steam sterilised, then bagged and placed in yellow-lid Clinical Waste bins provided by UoS OH&S. Laboratory waste potentially containing live micro-organisms must also be sterilised. Solid contaminated waste shall be sterilised by pressure steam sterilisation in the central decontamination area, bagged, then disposed of in general waste bins. Liquid contaminated waste shall be treated with a chemical disinfectant, and then disposed to sewer. If proposed volumes of sterilised liquid waste is large or ongoing (e.g. more than 20 litres per week, per laboratory), approval must be sought from Sydney Water prior to commencing the proposed process and an internal sump will be required to allow separation before entry to sewer.

The collection room will require storage space for 80 general Clinical Waste bins of 120 litres capacity – 40 empty, and 40 full. This gives a total waste holding capacity of 9600 litres (10 m3).

5.3.5.3. Human Tissue

Identifiable human tissue shall be sterilised by pressure steam sterilisation in the central decontamination area before being bagged and placed in orange lid Anatomical Clinical Waste bins provided by UoS OH&S. The collection room will require storage space for 14 Anatomical Clinical Waste bins of 120 litres capacity – 7 empty, and 7 full. This gives a total waste holding capacity of 1680 litres (1.6 m3).

5.3.5.4. Cytotoxic Waste

Cytotoxic waste, including prion waste and animal waste/bedding that may have come into contact with cytotoxic materials, shall be disposed of in purple cytotoxic bags/sharps bins before being disposed of in purple Cytotoxic Waste bins. Prions shall be steam sterilised before being disposed of in a cytotoxic bin.

Cytotoxic Waste bins will be contained in the laboratories until immediately before the notified date of contractor removal, to limit the duration of centralised holding. Researchers generating the waste will transport the cytotoxic waste bins to the Clinical Waste Disposal Room, and deposit them in the segregated area for cytotoxic waste.

The collection room will require storage space for 14 Cytotoxic Waste bins of 120 litres capacity – 7 empty, and 7 full. This gives a total waste holding capacity of 1680 litres (1.6 m3).

6. Review Results

As this development is to be submitted under Part 3A of the Environmental Planning and Assessment Act 1979 & Regulations a SEPP33 screening review is required (Reference 2).

The initial preparation of the review shows that the following Dangerous goods classes are excluded from the analysis.

- Class 1.4, 1.5, & 1.6 – explosives. These are already covered under Schedule 3, and are designated development under the Environmental Planning and Assessment Regulation 1994. Not applicable to this proposal.

- Class 2.2 – Non-Flammable / Non-Toxic Gases – These are not considered to be potentially hazardous nor contribute significantly to off-site risk. These include medical gases, such as Oxygen and Nitrogen. Australian Standards will however apply to the design, installation, and operations of the bulk Oxygen and Nitrogen storage facilities at the CODCD. And hence these are not carried forward for screening

- Class 7 – Radio Active Substances – these include materials such as uranium hexafluoride. The CODCD will use radioisotopes in the iodination laboratory, however these dangerous goods are adequately covered by national regulations and guidelines, such as the Radiation Control Act, 1990 and regulations, and various Australian Standards such as AS 2243.4-1998: Safety in Laboratories – Part 4 –Ionizing Radiations. Again, these dangerous goods are not carried forward for screening.

- Class 9 – Miscellaneous Dangerous Goods include waste oils and spent solvents, some aerosols and polyester beads. Such materials do not pose a significant effect to people or property, but may be an environmental hazard.

Hence these above classes will not be carried forward for detailed description or review.

6.1. Dangerous Goods Included in Screening Review

The potential maximum quantities for dangerous goods envisaged are as described in Table 2 are derived from estimates from similar facilities and research centres in Australia, and as provided by the project architects (see Appendix A).

The notes in arriving at the storage quantities listed in Table 2 are as follows;

Note 1: Class 3 Storages are computed on the basis of Lab use described in Appendix A.

Note 2: Class 6.2 Storages are derived from the design brief (Reference 4)

Note 3 : “the distance of the stored material from the site boundary for any of the materials in dangerous goods classes 1.1, 2.1 and 3; Note: Where liquids are contained in a bunded area, the distance is measured from the bund wall rather than from the tank. For materials stored in underground tanks, the distance is measured from the above ground filling/dispensing point.”

For this site, the dangerous goods of class 3 and are stored in a Central DG store and therefore the distance has been measured from the boundary to the Central Store.

FIGURE 1 - CODCD - PROPOSED LAYOUT

Table 2 - Dangerous Goods Stored within CODCD and included in Screening Review

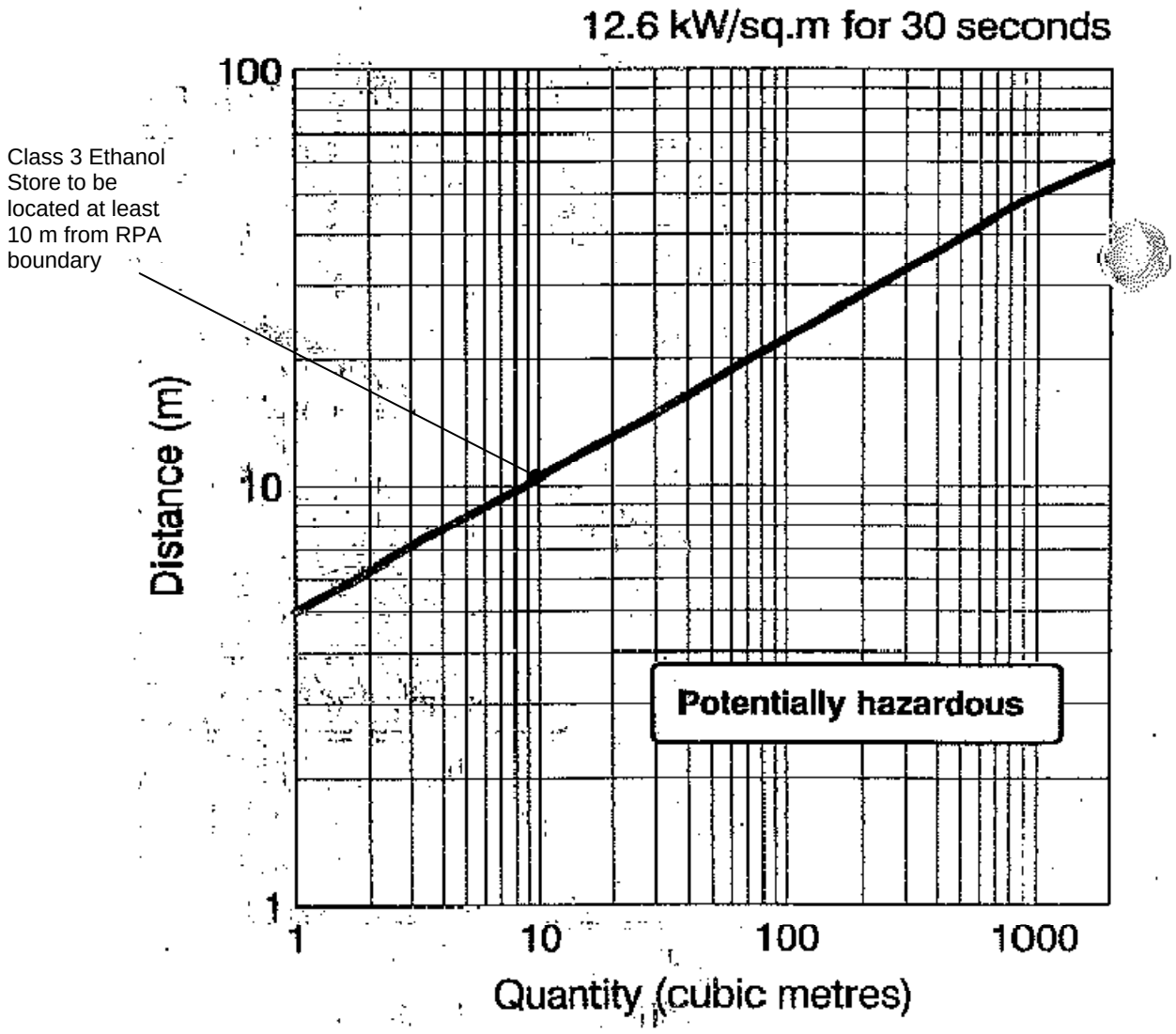
DG Class	Materials Stored	Qty (kg orL) stored	Threshold Quantity	Comment	Conclusion
2.1	LP gases / acetylene/ Hydrogen in bulk or in cylinders	200 L	16000 L	Under threshold	Complies
2.2	N2 / O2 in bulk or cylinders	10000 L (in 2 bulk tanks)	no limit	not subject to screen review	not subject to screen review
2.3	Toxic Gases , Chlorine, Ammonia	200 L	1 tonne	Minor quantities only	Complies
3 PG I	Ethanol	10,000	10,000	Boundary of site (St Johns College or RPA boundary) must be more than 10 m away. This appears to be the case.	Complies
3 PG II	Various				Complies
3 PG III	Various				Complies
C1 / C2	Diesel fuel	5000	50000	Required only for a number of Diesel gensets. Under threshold	Complies
4	Flammable Solids	not applicable	5 tonnes	not stored	NA
5.1	Oxidising Agents	500 L	5 tonnes	May include cleaning chemicals	Complies
5.2	Organic Peroxides	50 L	10 tonnes	May include cleaning chemicals	Complies
6.1	Poisons		0.5 tonnes	Minor quantities only	Complies
6.2	Infectious Substances	13.2 m3	0.5 tonnes / 0.5 m3	Waste streams may need to be further reviewed	Exceeded
7	Radio-isotopes			not subject to screen review	NA
8	Corrosives	2000 L	5 tonnes	May include minor quantities of acids / alkalis	Complies
9	Waste oils/ solvents etc			not subject to screen review	NA

6.2. Review of SEPP33

The document "Applying SEPP33" includes a number of tables and graphs against which stored quantities can be compared to determine whether SEPP33 applies to the site.

Table 1 in "Applying SEPP33" details the screening methods that should be used to determine whether SEPP33 applies to a site. For Class 3 flammable liquid, such as ethanol, Figure 8 in Applying SEPP33 should be used. This figure has been repeated below that provided storage quantities for class 3 can be accommodated on the site up to 100,000 litres provided the Class 3 central store is located at least 20m from the RPA Hospital boundary. The NSW DoP would deem the facility as non-hazardous in such circumstance and further risk assessment is not required.

FIGURE 8. CLASS 3PGI FLAMMABLE LIQUIDS



6.3. Conclusions & Recommendations

It can be seen from Figure 8 (SEPP33) above, that for storages of 100 m3 or less, of flammable liquids, the facility does not fall into the “Potentially Hazardous” area of the graph.

However the potential quantity of clinical waste (Class 6.2 Infectious Waste, which includes clinical wastes does exceed the NSW Department of Planning (NSW DoP) threshold. Under such circumstances SEPP 33 would apply and a preliminary risk assessment is required to accompany the Development Application. However the details of the clinical waste handling, storage and waste disposal procedures will not be known fully until some stage during detailed design. Indeed the type and quantity of waste subject to autoclave sterilisation, the equipment used , and the number of quantity of waste disposal trips per month will not be known until detailed design is undertaken.

Given these circumstances the UoS request that consultation occur with the NSW DoP and the Major Hazard Unit at the detailed design stage to confirm the scope, details and submission of the Preliminary Hazard Analysis (PHA) to the NSW DoP (ideally prior to construction).

Note also there are comprehensive NSW Health Department requirements for handling, storing and disposal of clinical and infectious waste. These procedures include;

- *Occupational Health and Safety Regulation 2001*
- *PD2005_132 Waste Management Guidelines for Health Care Facilities*
- *PD2005_247Infection Control Policy*
- *PD2005_596 Tuberculosis – Infection Control*
- *PD2005_354 WorkCover NSW Reporting Requirements: Occupational Exposureto Blood Borne Pathogens*

Hence there is unlikely to be significant risks posed to adjacent land users.

It is concluded that SEPP33 does apply to the CODCD proposal, but that UoS should consult with NSW DoP Major Hazard Unit during the detailed design phase to discuss likely land use safety controls (noting the comprehensive and detailed requirements of the NSW Dept of Health and WorkCover listed above) and suitable submission of the PHA for the clinical waste handling, storage and disposal. In any case, the UoS are required to contact the NSW DoP for advise on any transport movements of Class 6.2 – Infectious Substances – i.e. substances containing micro-organisms, bacteria, viruses etc that are believed to cause disease in humans or animals. Again this issue is best undertaken during the detailed design phase in close consultation with the NSW DoP when the nature, quantity and transport movements of clinical wastes are known exactly.

The NSW Occupational Health and Safety (Dangerous Goods Amendment) Regulation – 2005 also requires that a Safety In design workshop will need to be undertaken for the CODCD proposal to ensure the requirements of NSW WorkCover and the NSW DoP are covered. It is also anticipated that this will occur during the detailed design phase.

SKM are able to assist in relation to the preparation of both of the above studies when requested.

7. References

1. The Australian Code for the Transport of Dangerous Goods by Road and Rail (known as the Australian Dangerous Goods Code), 7th ed, Federal Office of Road Safety, Canberra, ACT (2007)

2. "Applying SEPP33 – Hazardous and Offensive Developments", NSW Department of Planning, 1992

3. AS/NZS 1940-2004, "The storage and handling of flammable and combustible liquids", Standards Associated of Australia, Sydney.

4. Aurora Planning, Centre for Obesity, Diabetes and Cardiovascular Disease – Design Brief V2.0 September 2009

5. NSW Department of Health, : Hazardous Substances and Dangerous Goods - Guidelines for Safe Use # 03/9236, July 2006

Appendix A – Dangerous Goods Storage Quantities

From: Mark Roehrs [mailto:mroehrs@hassell.com.au]
Sent: Tuesday, 24 November 2009 4:51 PM
To: John Sung; Phil Jones
Cc: Rob Hawkins
Subject:

John/ Phil

The attached files represent hazardous goods data from 3 projects: QBP, KBRB Ecosciences and TRI.
This information is indicative only and provided only for the purposes of making broad comparisons. In the case of KBRB and TRI it is data provide by users ahead of building occupancy and is not real building occupancy data.
Note none of the data includes diesel tanks for generators.

QBP (Queensland Bioscience Precinct)
The QBP data is the inventory actually held in specific rooms at QBP. “DGC” is dangerous goods class.
It does not represent the inventory of the total building but gives a sufficient base to extrapolate out a lab floor equivalent for CODCD

2.002, 3.002, 4.002, 5.002, 6.002 are 500 litre flammable goods stores on microbiology generic lab floors each room serving equivalent of 72 person generic lab
5.020 and 5.033 are each 36 person open generic lab areas on level 5.

Ie if you combine 5.002(or the worst case of either 2.002, 3.002, 4.002 or 6.002) + 5.020 + 5.033 you have a typical 72 person microbiology lab for which CODCD has 7 units

7.002 is a chemistry floor 500 litre flammable goods store which together with the rooms 7.004 through to 7.031 represent a typical chemistry generic lab floor equivalent to level 6 south in CODCD (1 only)

The QBP store is the central stores holding at the loading dock level.

Note that CODCD will not have 500 litre stores on each level but would have a hazardous goods holding strategy in line with AS2243.10 which would allow the equivalent sort of holding through 250 litre safety cabinets and in goods distributed across floors.
Indeed the dangerous goods holding capacity of CODCD could be calculated using this standard however you would come up with a figure much higher than actual likely and one would have to make assumptions as to the distribution of chemical safety cabinets

KBRB Ecosciences Precinct
This schedule is a summary of data collected from users at the 50,000m2 KBRB Ecosciences Precinct which gives an indication of intended holding in the building. This data is somewhat unreliable as the user feedback was inconsistent and early in the briefing process.

TRI (Translational Research Institute)
Attached is a class 3 only schedule estimate for the TRI project which also has a similar lab area to CODCD.

Please call if I can assist in clarifying any of the above.

Mark Roehrs Principal

SINCLAIR KNIGHT MERZ

E mroehrs@hassell.com.au D +61 7 3914 4018 M +61 439 753 184

36 Warry Street Fortitude Valley QLD Australia 4006
PO Box 865 Fortitude Valley QLD 4006
T +61 7 3914 4000 F +61 7 3914 4100 www.hassell.com.au
Architecture Interior Design Landscape Architecture Planning Urban Design
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