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ENVIRONMENTAL

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RTB/snb

Ref: 178081_Let1_Rev1

24 July 2020

ATTN: Cameron Kline
Head of Planning and Development
Property | Building Y6A, 2 Link Road
MACQUARIE UNIVERSITY NSW 2109

E: Cameron.kline@mq.edu.au

Re:Clarification of Dangerous Goods Storage Details – New Office and Laboratory Building (SSD8313) 8-12 University Avenue, Macquarie University NSW 2109

Dear Sir,

The following correspondence deals with the DPIE submissions relating to the Preliminary Hazard Analysis prepared by Benbow Environmental on 2 February 2018 (Ref: 178081_PHA_Rev3).

The submission from the DPIE raised the following matters in an Attachment to their reference SSD9313. In summary:

Item 4(2) Provide clarification if Class 3 dangerous goods will be stored external

Response: No Class 3 dangerous goods would be stored outside. A fire rated storage area, mechanically ventilated and bunded in accordance with the requirements of AS1940-2017 *The storage and handling of flammable and combustible liquids*. The attached drawing shows the layout of one of the levels of the carpark inside the basement where this storeroom would be located.

There would be no bulk storage of any classes of dangerous goods. Table 3-1 and Table 3-2 of the PHA have therefore been updated and are attached. The original PHA was prepared at a time in the design of this development when there was uncertainty as to the extent of the dangerous goods storage. Since the receipt of the correspondence from DPIE, firm decisions have now been made.

Now excluded are the following:

- Storage of dangerous goods in bulk either external or internal within the building.

Diesel fuel for a standby diesel generator would be within a fuel tank attached to the diesel generator. Similarly, if there are fire water pumps, these would have diesel fuel tanks as an integral part of the pump which are often diesel powered.

Table 3-1 has been revised and is provided as an attachment.

Clarify details of any other Classes of dangerous goods to be stored outside.

Response: No Classes of dangerous goods would be stored outside. There would be a gas cylinder store located in the same basement carpark. This storeroom is also fire rated and mechanically ventilated. This storeroom would be constructed to comply with AS4332-2004 (R2016) *The storage and handling of gases in cylinders*.

b) The quantities now to be stored do not trigger the screening thresholds in applying SEPP33. Formal approval in relation to hazards is therefore not required. A very useful outcome has eventuated from the matter raised by the DPIE.

There is no external storage.

The storage within the building will be confined to the following

- Two fire-rated, mechanically ventilated stores designed and constructed in accordance with the relevant Australian Standards as listed in this correspondence.
- Within the floors of the building, approved storage cabinets will be used.
- On shelves, storage would be strictly limited in accordance with the document provided with the PHA – Attachment 2, Laboratory Safety Standards for the Storage of Dangerous Goods.
- The Class 8 quantity has been substantially reduced to 1.005 tonnes.
- The packaging sizes are usually
 - ▶ 2 L glass Winchester type laboratory bottles
 - ▶ 500 mg and 5 kg plastic packaging
 - ▶ Liquids may be up to 20 L in plastic packaging.

The reference to the boundary was to the (Page 4) boundary of the building.

Applying SEPP33 is not completely clear on this matter.

For the campus, risk of a fire needs to be reduced regardless of whether the separation distance would adequately reduce the heat of radiation and the risk to adjoining buildings would be the sensible viewpoint to take.

The response to the DPIE question has enabled the author to recommend fire rated storage rooms so that the risk of fire causing building damage or a BLEVE of a gas cylinder would be minimised by following the design guidelines of relevant Australian Standards.

The units of measurement were included in the table of the PHA. In the column labelled “Quantity”, “L” is used for litres.

In Table 3-2 in the column labelled “Quantity to be stored” two units are used, “L” for litres and “T” for tonnes.

The class 2.2 would be equally shared with the gases now listed in a revised Table 3-1.

Hazards were considered to be adequately addressed in the original PHA. The events that could give rise to hazards are now substantially reduced.

Yours faithfully,
for Benbow Environmental

A handwritten signature in black ink, appearing to read 'R T Benbow', written in a cursive style.

R T Benbow
Principal Consultant
Founding Member of AIDGC (Australasian Institute of Dangerous Goods Consultants)

ATTACHMENTS

Attachment 1: Revised Table 3-1 and Table 3-2 from PHA (Ref: 178081_PHA_Rev3)

Table 3-1: Quantities of Dangerous Goods Expected to be Stored

Dangerous Goods Class	Storage Type	Quantity	Location
Class 2.1 Flammable gases Acetylene, Hydrogen	Connected for use at a central store	2,000 L	Basement car park within building
	Industrial gas cylinders connected for use on various levels. Quantity would be a maximum per level of the Laboratory building	350 L ^(a)	
Class 2.2 Inert compressed gases Helium, argon, nitrogen, carbon dioxide and Class 2.2 (5.1) oxidising gases Oxygen, air, nitrous oxide	Connected for use at a central store	2,000 L	External or in car park
	Industrial gas cylinders connected for use on various levels. Quantity would be a maximum per level of the Laboratory building	350 L ^(a)	
Class 2.3 toxic gases May be ammonia or chlorine. Details unknown.	Connected for use at a central store	100 L	Basement carpark within building
	Industrial gas cylinders connected for use on various levels. Quantity would be a maximum per level of the Laboratory building and must be located within a mechanically ventilated enclosure	100 L ^(c)	Basement
Class 3 PG II or III and C1, C2 combustible liquids Container size usually 1 L – 25 L Class 3 PG I usually ~50 L maximum	Flammable liquid store	4,000 L	Basement carpark within the building
	Flammable liquid cabinets Aggregate quantity: • 850 L ground floor 250 L / 250 sq m of floor area all other levels	60 L – 250 L capacity	Internal
	On benches	Refer to Attachment 2 ^(d)	Internal
	• Within a fire rated mechanically ventilated chemical store	100 kg	Internal
Class 4.1	On benches	Refer to Attachment 2 ^(d)	Internal
	Within cabinets	60 L – 250 L	Internal

Table 3-1: Quantities of Dangerous Goods Expected to be Stored

Dangerous Goods Class	Storage Type	Quantity	Location
Class 5.1	Within a fire rated and mechanically ventilated chemical store	100 kg – 200 kg	Internal
	On benches	Refer to Attachment 2 ^(d)	Internal
	Within cabinets	60 L – 250 L	Internal
Class 6.1	Within a fire rated and mechanically ventilated chemical store	100 kg – 200 kg	Internal
	On benches	Refer to Attachment 2 ^(d)	Internal
	Within cabinets	60 L – 250 L	Internal
Class 8	Within a fire rated and mechanically ventilated chemical store	100 kg – 200 kg	Internal
	On benches	Refer to Attachment 2 ^(d)	Internal
	Within cabinets	60 L – 250 L	Internal
Class 9	Within a fire rated and mechanically ventilated chemical store	100 kg – 200 kg	Internal

NOTES:

(a) This is equivalent to 10 size G gas cylinders.

(b) Within a gas cylinder store located within a carpark.

(c) This is equivalent to 3 size G gas cylinders and must be located within a mechanically ventilated enclosure.

(d) Attachment 2 is a document on laboratory safety standards for the storage of dangerous goods.

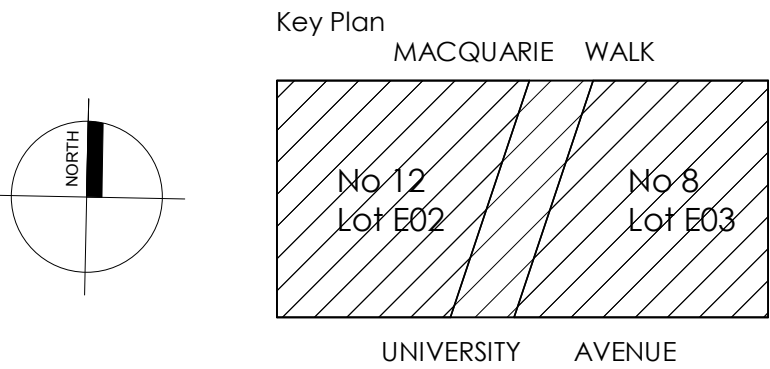
Table 3-2: Comparison of Screening Threshold Quantities by SEPP 33

Class	Description	Quantity to be stored	Threshold Quantity	Triggers SEPP33
Class 1.2	Explosives	None	N/A	N/A
Class 1.3	Explosives	None	N/A	N/A
Class 2.1	Flammable Gases	2,000 L	16 m ³ (16,000 L)	No
Class 2.2	Non-Flammable Gases	2,000 L	N/A	No
Class 2.3	Toxic gases	100 L	100 kg	No
Class 3 PG I	Flammable Liquid	0.005 T	N/A	No
Class 3 PG II and PG III	Flammable Liquids	4 T ¹	Adequately separated from boundaries	No
Class 4.1	Flammable Solid	0.1 T	5 Tonne	No
Class 4.2	Flammable Solid	None	N/A	N/A
Class 4.3	Dangerous when wet	None	N/A	N/A
Class 5.1	Oxidising Substances	0.5 T	5 Tonne	N/A
Class 5.2	Organic Peroxides	None	N/A	N/A
Class 6.1 PGII and PG III	Toxic Substances	0.5 T	2.5 T	No
Class 6.2	Infectious Substances	None	N/A	N/A
Class 8 PG I	Corrosive Substances	0.005 T	25 T	No
Class 8 PG II	Corrosive Substances	0.5 T	25 T	No
Class 8 PG III	Corrosive Substances	0.5 T	50 T	No

T: tonne

NOTE: ¹ Based on two 2,000 L storage areas within the facility.

Scale 1:250
0 2.5m 5m 12.5m 25m



PARKING SCHEDULE

Basement 1	
ACCESSIBLE	2
SMALL	1
STANDARD	112
	115

Basement 1 Lower	
STANDARD	117
	117

Basement 2	
ACCESSIBLE	5
COURIER	2
SMALL	2
STANDARD	132
	141

Basement 2 Lower	
SMALL	1
STANDARD	125
	126

Basement 3	
SMALL	6
STANDARD	114
	120
Total	619

PARKING REQUIRED

TOTAL GFA(LOTS E2 + E3)/80
49445/80 = 619 SPACES /619 PROVIDED

ACCESSIBLE CAR PARKING SPACES
BASED ON BCA TABLE 3.5 REQUIREMENTS
ONE SPACE FOR EVERY 100
CARPARKING SPACES OR PART THEREOF

- ANCILLARY
- BOH CIRCULATION
- ELECTRICAL
- END OF TRIP FACILITIES
- FIRE
- HYDRAULIC
- MECHANICAL
- PARKING
- RETAIL
- VERTICAL CIRCULATION

K	Dangerous goods Store Added	SJ	22.04.2020
J	Issued For SSD Approval	SJ	2.11.2018
I	Issue for approval	SJ	31.01.2018
H	Issue For Approval	SJ	22.11.2017
Rev.	Revision Description	Chk.	Date

DO NOT SCALE from this drawing. Use given dimensions only.
Check all dimensions on the job prior to commencement of shop
drawings or fabrication. Any discrepancies are to be referred to
the Architect/Engineer/Designer prior to commencement of work

Client



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University

Project
Manager

CADENCE
AUSTRALIA

Architects

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Nominated Architect: Stephen Jamison NSW ARB Reg No 5108

Consultant

Project

8 - 12 UNIVERSITY AVENUE
MACQUARIE UNIVERSITY

Drawing

LOWER GROUND AND BASEMENT 2

Drawing No.
KFS-812UA-AR-DWG-DA02.02

Scales 1 : 250 @ A1

Drawn SG

Checked

Revision

K

Project No.

6508

22/04/2020 3:23:54 PM: Plot Date