APPENDIX G

Waste and Hazards Report

Safety Engineering & Technical Services Pty Ltd

OCCUPATIONAL **H**EALTH, **S**AFETY & **E**NGINEERING **C**ONSULTANTS

ABN: 90 003 112 945

17June 2010

The Manager
Capital Insight Pty Ltd
77 Berry Street
NORTH SYDNEY NSW 2060

Attention: Ms Elizabeth Wallace

Dear Sir

re: Dangerous Goods & Hazardous Substances – Contribution to Environmental Assessment – Response to DGEARs Relating to Dangerous Goods and Hazardous Substances for Inclusion in the Part 3A Planning Submission – The Chris O'Brien Lifehouse at RPA Hospital

This letter of advice has been prepared pursuant to your request to contribute to the written Part 3A submission for planning approval for the proposed Chris O'Brien Lifehouse at RPA Project,.

EXECUTIVE SUMMARY

This report addresses those parts of the Director General's Environment Assessment Requirements (DGEARs) for hazards posed by the proposed use of dangerous goods and hazardous substances at the Chris O'Brien Lifehouse at RPA, including issues pertaining to wastes.

The report:

- describes the nature and quantities of goods and substances that will be present at the premises
- provides a reasoned conclusion that State Environmental Planning Policy 33 (SEPP 33) does not apply to the proposed development
- identirfies hazards posed by the presence of dangerous goods and hazardous substances and describes the means (generally through compliance with relevant Australian Standards, health policies, and other codes of practice) by which those hazards are to be managed, and
- concludes that the proposed facilities for the storage, handling and use of dangerous goods and hazardous substances, will be, by design, in compliance with all relevant legislative requirements in accordance with best practice principles for the management of risk to health and safety posed by the materials to be kept and used, and will as a consequence secure a level of safety and environmental performance described in the relevant standards and codes of practice applying to clinical facilities.

SCOPE OF THIS ADVICE

The DGEARs have specified that information be provided in respect of the following issues:

8. Hazards, *including*

- *An assessment against the SEPP 33 – Hazardous and Offensive Development; and*
- *A description of the measures to be implemented to manage hazards and risks associated with the storage and use of hazardous materials and particularly from the operation of chemotherapy apparatus and other potentially hazardous apparatus.*

9 Waste, *including*

- *Identity, quantify and classify the likely waste streams to be generated during construction and operation;*
- *Describe the measures to be implemented to minimize, reuse, recycle and safely dispose of this waste;*
- *Describe the measures to be implemented to manage the disposal of nuclear waste;*
- *Describe the measures to be implemented to manage the disposal of contaminated and potentially contaminated biological and sewage waste.*.

A DESCRIPTION OF THE LIFEHOUSE FACILITIES RELEVANT TO THIS REPORT

The proposed Lifehouse at RPA is an Integrated Cancer Centre, that, when all development stages are completed, will be composed of 10 floors above ground and 3 basement (below ground) levels.

The vision for Lifehouse is to be delivered through several stages of development, the timing of which is to coincide with the projected growth of service. These stages are:

- Stage A - Cancer services and research facility on the site of the existing Page Chest Pavilion and Brown Street Outpatient buildings (of approximately 24,000 m^2)
- Stage B - expanded capacity of service delivery areas to meet 2016 Demands (of approximately 16,000 m^2).

Services provided by Lifehouse are to include:

- Wellness Centre for alternative therapies such as remedial massage and acupuncture;
- A day therapy suite for chemotherapy;
- A pathology collection service;

- A pharmacy keeping and dispensing chemotherapy drugs pre manufactured and delivered to site – the pharmacy will only adjust dosages if the blood count of the patient requires;
- Ambulatory Care Clinics;
- Offices associated with the clinics;
- On site residential services for out of town patients;
- Dry research facilities;
- An interventional floor (3 day theatres for stage A and then 7 more theatres during the second stage);
- SSD department to serve the interventional floor;
- An ICU department (second stage);
- 96 inpatient beds (second stage); and
- Various back of house departments to service the above (IT, maintenance etc).

I am advised that, the usage of the various floors will be:

- Basement (B3) – Car parking
- Basement (B2) – Car parking and back of house including plant rooms, Staff amenities, store rooms and workshops
- Basement (B1) – Diagnostic Imaging, kitchen and office areas
- Ground floor (GF)– Loading dock, main entrance, wellness centre and retail
- Level 1 (L1) - Day therapy, pharmacy and pathology collection
- Level 2 (L2) – Ambulatory Care Clinics
- Level 3 (L3) – Theatres and recovery
- Level 4 (L4) – Plant, residential, theatre front of house and offices
- Level 5 (L5) – Plant, residential and offices
- Level 6 (L6) – Offices
- Level 7 (L7) – Office and ICU
- Level 8 (L8) – Inpatient wards
- Level 9 (L9) – Inpatient wards and plant

HAZARDS

There is a statutory obligation in respect of all developments, to identify hazards, assess risks, and implement and maintain control measures that adequately minimise the risk to people, property, and the natural and built environment. All development proposals are required to document information about these identified hazards in the form of a statement of environmental effects to assist consent authorities fully understand the extent of any environmental or societal risk posed by the proposed activities so that they can make an informed consent decision (with specific conditions imposed as deemed to be appropriate, to adequately manage all hazards).

This report, by addressing the items specified in the DGEARs, that directs the proponent to properly consider specific hazards and to provide an assurance that the design of the facilities is fit-for-purpose and adequate to maintain an acceptable level of

safety, is part of a process for ensuring that all the implications of their intended usage of dangerous goods and hazardous substances are fully described before any consent is granted.

Certain high hazard activities are additionally required to undergo a more rigorous process of safety assurance than others of inherently lower risk potential as part of the development consent process. These high hazard activities are identified by a screening process pursuant to a planning instrument, State Environmental Planning Policy 33 (SEPP 33). All development proposals are required to determine whether SEPP 33 applies.

The Applicability of State Environmental Planning Policy 33 (SEPP 33)

State Environmental Planning Policy (SEPP) 33 is an enabling instrument that links the safety and pollution control performance, to the permissibility of an industrial proposal. SEPP 33 applies to any proposals that fall under the policy's definition of 'potentially hazardous industry' (where the quantities of dangerous goods or transport movements involving dangerous goods exceeds the threshold limits described in the document Applying SEPP 33) or 'potentially offensive industry' (a proposal that, in the absence of safeguards, would emit a polluting discharge which would cause a significant level of offence).

Assessing whether a proposal is potentially hazardous industry

The screening process relies on a sorting procedure related to the nature and quantity of dangerous goods present on the site of the proposed development. Dangerous goods are a group of substances that have been recognised as having some immediate public safety threat due to their hazardous properties. Dangerous goods have been listed in a number of national and international publications (in Australia this list is set out in the Australian Dangerous Goods Code – currently in the 7th edition).

A system of classification and labelling of dangerous goods has been adopted throughout Australia which is consistent with systems used throughout most of the world. This system has been devised to help people quickly recognise dangerous goods and their properties and hazard potential. All dangerous goods that are handled or transported must be accurately classified into classes that reflect their characteristics (it being the responsibility of the manufacturer or importing agent to ensure that the dangerous goods are accurately classified).

Dangerous goods are divided into nine '**classes'** (and in the case of dangerous goods of Classes 1, 2, 4, 5 and 6 these classes are further subdivided into '**divisions**'). Each 'class group' is comprised of substances which have similar properties or hazards. Goods having more than one hazardous property are classified under their primary class and where they have some additional hazard, they are also assigned a '**subsidiary risk**'. An example occurring frequently in clinical areas is compressed oxygen which is assigned to Class 2 gases, Class 2.2, Sub risk 5.1, to indicate that not

only is it a compressed non-flammable gas, but that it also has oxidising properties (that render it capable of making say the severity of a fire situation, worse).

Substances within Classes 3, 4, 5, 6 and 8 are further subdivided into **Packing Groups** (abbreviated as PG) to indicate their relative inherent risk (PG I - high risk, PG II - moderate risk, and PG III - least risk).

The various dangerous goods classes are:

Class 1 – Explosives - are substances and articles used to produce explosions or pyrotechnic effects.

Class 2 – Gases - includes gases which are compressed, liquefied or dissolved under pressure. Some gases have subsidiary risk classes (i.e other risk characteristics such as 'flammable' or 'corrosive'):

- Division 2.1 - Flammable gases are gases which ignite on contact with an ignition source (such as acetylene, hydrogen, LPgas)
- Division 2.2 - Non-flammable gases are gases which are neither flammable nor poisonous (such as oxygen, nitrogen, medical air, argon)
- Division 2.3 - Poisonous gases are gases liable to cause death or serious injury to human health if inhaled - such as ammonia, chlorine, carbon monoxide

Class 3 - Flammable liquids – are liquids which can be ignited and will burn on contact with ignition sources

C1 & C2 combustible liquids – are liquids that will burn (often fiercely) when they are heated and ignited – C1 combustible liquids are of relatively lower flashpoint and include liquids such as diesel fuel, olive oil and other vegetable oils while C2 combustible liquids have a high flashpoint and include substances such as lubricating and hydraulic oils

Class 4 - Flammable Solids – are solids that have characteristics that pose a risk of fire
and/or explosion and includes:

- Division 4.1 - flammable solids that are easily ignited and readily combustible - such as nitrocellulose, phosphorus, matches, hexamine;
- Division 4.2 - spontaneously combustible substances - such as aluminium alkyls, white phosphorus);
- Division 4.3 - substances emitting a flammable gas when wet, or which react violently with water (such as aluminium phosphide, calcium carbide).

Class 5 – Oxidisers – are substances that can promote or exacerbate the effect of fire and include

- Division 5.1 - Oxidizing agents other than organic peroxides (such as calcium hypochlorite (pool chlorine), ammonium nitrate, hydrogen peroxide); and.
- Division 5.2 - Organic peroxides, (liquid or solid) (such as methyl ethyl ketone peroxide, benzoyl peroxides, cumyl hydroperoxide).

Class 6 – Toxic and Infectious Substances - (this classification does not include poisonous gases), and are further classified as being either:

- Division 6.1 - Toxic substances - which may be liquids or solid) and which are liable to cause death or serious injury to human health if inhaled, swallowed or absorbed through the skin (such as cyanides, arsenic compounds), or which are harmful to human health (such as low toxicity pesticides).
- Division 6.2 – are Infectious substances (such as vaccines, pathology specimens).

Class 7 – Radioactive Substances – are substances that either alone, or in a combination of substances, emit ionising radiation (such as uranium, radioisotopes).

Class 8 – Corrosives - are substances (either solids or liquids) which may harm living tissue or damage equipment - such as hydrochloric acid, sodium hypochlorite (liquid pool chlorine), sodium hydroxide, and lead acid batteries.

Class 9 - Miscellaneous Dangerous Goods - are substances that are not classified elsewhere but which are known to have a safety risk when being transported - such as molten naphthalene, molten bitumen, polyester beads, and lithium batteries.

Nature and quantities of dangerous goods being stored and handled at Lifehouse

A manifest of dangerous goods present at the premises has been developed (see APPENDIX A) using the convention that the facilities for keeping any dangerous goods of any particular classes or divisions of dangerous goods have not been listed if their quantity is less than 10% of the minor storage limit. *(Minor storage is a concept incorporated in all the relevant standards for keeping the various classes of dangerous goods. Minor storage recognizes that for small quantities of dangerous goods and where the goods are sufficiently dispersed, the presence of the dangerous goods adds marginally little to the overall hazard of the proposed facility and/or its operations).*

The dangerous goods described in APPENDIX A include:

- cryogenic liquefied nitrogen
- C1 combustible liquid (diesel for the emergency generator set)
- Flammable liquids (in very small quantities only)
- Class 6.1 cytotoxic drugs (with small quantities of active ingredients) and cytotoxic contaminated waste, and
- Class 6.2 infectious substances.

It has been confirmed that no radioactive wastes of Class 7 (radioactive substances) are to be generated or kept in the building.

Based on the quantities of goods listed in APPENDIX A, and in accordance with the outcome of the screening method for potentially hazardous development summarised in Table 1 overleaf, the provisions of SEPP 33 do not apply to the proposed development.

SEPP 33 applies if	**Threshold**	**Actual**
Class 2 non-flammable gases and cryogenic liquids exceed limit described in Table 1 in the section Risk Screening - Figure 9 of the document *Applying SEPP 33*	No limit is set	SEPP 33 - does not apply
Class 3 dangerous goods (flammable liquids) exceed the lower threshold limit) and are not sufficiently separated from the boundary by the distance given in the section Risk Screening - Figure 9 of the document *Applying SEPP 33*	In the case of Class 3 PG II/PG III flammable liquids, the lowest threshold limit below which SEPP 33 does not apply is 2,000 L	Quantities below threshold limit - SEPP 33 does not apply
Quantity of goods of Class 6.1 exceeds threshold limit	Threshold quantities 0.5 tonnes for PG I; 2.5 tonnes PG II/III	Quantities below threshold limit - SEPP 33 does not apply
Quantity of goods of Class 8 exceeds threshold limit	Threshold quantities 5 tonnes for PG I; 25 tonnes PG II; 50 tonnes PG III	Quantities below threshold limit - SEPP 33 does not apply
Number of significant transport movements meeting the specified criteria are exceeded	Number of traffic movements of dangerous goods greater than 1 tonne capacity exceed the frequencies set in the screening threshold	SEPP 33 does not apply – number of transport movements are below threshold limit

Table 1 – Applicability of SEPP 33 for potentially hazardous industry

Assessing whether a proposal is potentially offensive industry

The primary consideration in assessing whether any proposal falls within the 'potentially offensive industry' category is whether the consent authority is satisfied that there are adequate safeguards to ensure that any emissions from a facility can be controlled to a level at which they are not significant. Where proposed activities do not require a licence pursuant to protection of the environment legislation, or where they do require a licence but in the opinion of the environmental regulator the proponent can fully meet its licence requirements, a proposal is not deemed to be 'offensive industry'.

I am advised that no licence is required pursuant to the Chapter 3 of the *Protection of the Environment Operations Act* hence the Lifehouse activity is not potentially offensive development in accordance with the screening method for the application of SEPP 33.

Conclusion on the applicability of SEPP 33

As a consequence of being neither potentially hazardous nor potentially offensive industry, SEPP 33 does not apply to the Lifehouse project.

THE PROPOSED STORAGE, USE AND MANAGEMENT OF HAZARDOUS MATERIALS

The design of the facilities for the receiving, storage, handling and use of hazardous materials, and the proposed operations of the Lifehouse at RPA activity, will be in accordance with:

- the Building Code of Australia
- the NSW *Occupational Health and Safety Act* 2000 and the *Occupational Health and Safety Regulation* 2001 (particularly Part 6 – *Hazardous* substances and Part 6A *Dangerous goods)*
- the various standards relating to the storage and handling of specific classes of dangerous goods, including:
    - AS 1894-1997 *The storage and handling of non-flammable cryogenic and refrigerated liquids*
    - AS/NZS 4332-2004 *The storage and handling of gases in cylinders*
    - AS 1940-2004 *The storage and handling of flammable and combustible liquids*
    - AS/NZS 4452-1997 *The storage and handling of toxic substances*
    - AS 3780-2008 *The storage and handling of corrosive substances, and*
    - AS/NZS 4681-2000 *The storage and handling of Class 9 (miscellaneous) dangerous goods and articles*
- standards covering the design and operation of laboratories and equipment for use in laboratories, particularly:
    - AS/NZS 2982.1-1997 *Laboratory design and construction – Part 1: General requirements* (especially Section 7 - Storage of hazardous substances), and
    - The AS/NZS 2243 series of standards *Safety in Laboratories*
    - AS 4775-2007 *Emergency eyewash and shower equipment*
- standards covering the classification of hazardous areas that describe the spaces from which ignition sources must be excluded, particularly AS/NZS 60079.10.1-2009 Explosive Atmospheres – *Part 10.1 : Classification of areas – Explosive gas atmospheres (IEC 60079-10-1, Ed. 1.0(2008) MOD)*
- the *Code of Practice – Storage and Handling of Dangerous Goods* (2005) – WorkCover NSW.

- the Department of Health and Aging, Office of Gene Technology Regulator, Guidelines for Certification of a Physical Containment Level 2 Laboratory, Version 3.1– Effective 1 July 2007

Radiation hazards

Diagnostic and clinical treatment radiation equipment will be present and used in Lifehouse. A radiation consultant has been engaged by Lifehouse and once the selection of diagnostic imaging equipment has been finalised, an expert report of the shielding requirements for the structure internally and surrounding this department will be prepared for coordination with the architect.

Shielding requirements for imaging equipment is make/model dependant and is identified and specified by the equipment suppliers. When the equipment selection is finalised, Lifehouse will following the shielding guidelines nominated by the equipment supplier/s.

The design will be developed so as to fully comply with the following Australian Standards:

- AS/NZS 3200.1.3:1996 - *Approval and test specification - Medical electrical equipment, Part 1.3: General requirements for safety - Collateral Standard: Requirements for radiation protection in diagnostic X-ray equipment*
- AS 2814-1985 - *Diagnostic X-Ray facilities – Safe practices* (reference only – standard withdrawn)
- AS 1319 – 1994 - *Safety signs for the occupational environment.*
- AS 2243.4 – 1998 - *Safety in laboratories. Part 4: Ionizing radiations*
- AS/NZS 2211.1:2004 – *Safety of laser products – Equipment classification, requirements and users guide (EC 60825-1:2005, MOD)*
- AS/NZS 4173:2004 - *Guide to the safe use of lasers in health care.*
- AS/NZS 4543.1:1999 - *Protective devices against diagnostic medical X-radiation. Part 1: Determination of attenuation properties of materials.*
- AS/NZS 4543.2:1999 - *Protective devices against diagnostic medical X-radiation - Part 2: Protective glass plates.*

Adherence to these standards and to those listed earlier in relation to dangerous goods safety, ensures that the facilities and activities of Lifehouse will be in accordance with best-practice achievable for a bio-medical clinical facility, and will secure an acceptable level of safety.

WASTES

This section of the report describes:- the likely waste streams to be generated during construction and operation; the measures to be implemented to minimize, reuse, recycle and safely dispose of this waste: and, the measures to be implemented to manage the disposal of contaminated and potentially contaminated biological and sewage waste

Construction

A Waste Management Plan (Construction) will be prepared as part of the Construction Environment Management Plan. This plan will in addition to describing the objectives of the plan, detail the involvement of the waste contractor and any other specific requirements as identified during the pre-planning of demolition and construction works. The preparation of a WMP (Construction) within the CEMP is a draft commitment to be included in the Part 5.0 Draft Commitments of the Part 3A Planning Submission report

This separate study which will be undertaken with the full participation of the successful tenderer prior to construction or demolition works commencing, will address the waste streams likely to be generated, including those that may that contain dangerous goods and hazardous substances expected to be created during demolition and construction.

Wherever practicable measures will be implemented to minimise, re-use, and recycle any construction and demolition wastes. Where this is cannot be reasonably achieved, wastes will be disposed of responsibly and in full compliance with all statutory requirements, using licensed waste transport and waste disposal contractors with fully compliant documentation to prove due diligence has been exercised over the transport, custody and disposal processes.

Operations

Waste streams from operations will include:

- general waste (including putrescible garbage and recyclable waste)
- confidential waste
- contaminated waste including clinical waste and sharps (Class 6, Division 6.2 infectious waste)
- cytotoxic waste (Class 6, Division 6.1)
- chemical waste, and
- trade waste and sewage.

No nuclear waste streams are to be generated by, or emanate from, Lifehouse facilities or its operations.

Estimates of the quantity of each of the waste streams have been based on the typical reported waste streams being generated by the Royal Prince Alfred Hospital, pro-rated on the basis of either the floor space ratio or in the case of theatre wastes, pro-rated on the number of operating theatres in use and their hours of operation.

The 'scale-down' factors used are:

- 0.2 for floor space ratio (RPAH is approximately 214,000 m^2 and Lifehouse will be 42,000 m^2 once fully fitted out), and
- 0.17 – based on adjusting for 5 x 12 hour days (Lifehouse) cf 7 x 24 hour days (RPA), and for 10 theatres (Lifehouse) from 21 (RPA)

The tabulation on the following pages describes the nature and quantity of each of these waste streams, along with the measures to be implemented to minimise, reuse, recycle and safely dispose of these waste streams (including, as appropriate, the measures to responsibly manage the disposal of hazardous and/or contaminated waste).

Each of the designated waste streams will be segregated in appropriate waste containers at the point of generation placed in waste holding bays located adjacent to work areas on each level of the building. This is to ensure that there is no cross contamination of the various streams nor the inadvertent creation of unnecessary quantities of higher hazard wastes. The wastes will be conveyed to the loading dock on the Ground Floor for pick up by authorised waste disposal contractors.

Putrescible and clinical waste will be picked up for disposal daily. Compacted general waste, recycled waste, confidential waste will be picked up on demand:

Waste type	Description	Average Qty/month RPA	Scale factor	Lifehouse Qty/month	Comment
General waste	General waste from the Lifehouse facility collected from specific departments daily by Lifehouse hotel services.	107 tonnes *(average for 11 months July 2009 to May 2010)-*	0.2	21 tonnes	• A general waste compactor is located in the loading dock, which will be exchanged on an as-needs basis by a reputable collection company such as Transpacific who will transport the waste to landfill.
Recyclable Waste	Low density polyethylene sheet (pallet wrapping), paper, cardboard, commingled plastic, glass and aluminium cans and bottles	24 tonnes *LDPE 0.11 t paper/cardboard 21.1 t; cans/bottles 1.95 t*	0.2	4.8 tonnes	• Lifehouse will promote recycling of all waste by public and staff where possible throughout the facility. Appropriately colour coded bins will be located in departments - recyclable glass, paper and plastic will then be collected by cleaners and relocated to the loading dock storage area for collection and appropriate disposal by a contracted company.
Confidential waste	Lockable bins of confidential records and patient information	64 bins/month	0.2	12 bins (240 L/bin)	• These bins will be located in each department generating confidential waste. As bins are filled they will be conveyed to the Ground Floor for pick up by a contracted company that then shreds and recycles this waste.
Contaminated waste including sharps and Clinical Waste	Contaminated (clinical) waste collected in colour coded bins (yellow with an orange lid) held in the departments	5,000 kg/month	0.17	850 kg	• Maximum stored inventory based on accumulating maximum 2 days waste is 56 kg • Assume at worst all wastes classified as Class 6.2 infectious waste
	Sharps containers (yellow)	11,000 L/month	0.17	1970 L (155 kg)	• Assumes a waste density based on a 240 L bin containing ~ 20 kg waste • Maximum accumulated inventory assuming 2 pick-ups per week –is 20 kg • Assume at worst all wastes classified as Class 6.2 infectious waste

Waste type	Description	Average Qty/month RPA	Scale factor	Lifehouse Qty/month	Comment
Contaminated waste including sharps and Clinical Waste (continued)	Sharps container (grey)	3,280 L/month	0.17	560 L (47 kg)	• Assumes a waste density based on a 240 L bin containing ~ 20 kg waste • Maximum stored inventory based on 2 days accumulation is ~ 4 kg • Assume at worst all wastes classified as Class 6.2 infectious waste
Cytotoxic Waste	Waste material including sharps contaminated with a cytotoxic drug	3,580 L/month	0.17	610 L/month (50 kg)	• Cytotoxic waste will be collected in colour coded bins (purple bins with purple screw top lids) held in the departments generating the waste. These will be collected daily and stored in a separate enclosure in the Ground Floor loading dock for collection. This waste is then collected (also daily) by a contracted company for incineration • Maximum stored inventory based on 2 days accumulation is ~ 4 kg • Assume at worst case all cytotoxic waste is classified as dangerous goods Class 6.1 PG II
Chemical Waste	Other than cryogenic gas, a small quantity of flammable liquid, the diesel fuel in the generator fuel tank, cytotoxic drugs and wastes and infectious wastes, no other dangerous goods are kept in quantities above a fraction of Minor Storage limits.	Not quantified	Not assessed	Nil	• There is no requirement for chemicals to be stored and used. It is not expected that any chemical wastes will be generated or stored

Waste type	Description	Average Qty/month RPA	Scale factor	Lifehouse Qty/month	Comment
Trade Waste Plumbing and Drainage	Waste from fixtures and equipment that generate non domestic waste (sewage) are considered Trade Waste discharges.	Not quantified	Not assessed	Not quantified	• Lifehouse will discharge trade waste and sewage to a Sydney Water asset pipeline in a private road (Susan Street). Discharge will be subject to quality standards that will be the subject of a trade waste agreement to be entered into by Lifehouse. In order to comply with discharge conditions: • grease and/or high temperature discharges will be treated on site to the meet requirements of Sydney Water Corporation before discharging to the Authority Sewer. • Kitchen trade waste from retail or food outlets – trade waste generated in retail food outlets will be collected by a special system of arrestor basket floor drainage, which discharges to a grease arrestor. Grease waste will be separated in the grease arrestor before being discharged into the sewer system • Laundry waste products – hot waste from dirty utilities will be cooled to comply with Sydney Water sewer discharge regulations. Additional pipe support and additional allowance for thermal expansion will be considered in the immediate vicinity of very hot discharges. Pipe materials will be selected on their ability to handle the high discharge temperatures. • Plaster rooms discharge – plaster sinks will be provided with plaster traps located beneath the sink. The plaster traps will be stainless steel with castor mounts and union disconnection pipe work for ease of removal and service • Arrestor basket traps will be provided in the loading dock garbage rooms and all floor drains which service areas that may be contaminated with solid materials other that those located in the refrigerated rooms.

Sewage discharge quality

Lifehouse, like the other clinical activities of the Royal Prince Alfred Hospital, discharge sewage to the Sydney Water Corporation system. These clinical operations are known to discharge e-coli and other pathogens present in any human excrement, but at potentially higher levels than domestic sewage.

Notwithstanding this, Sydney Water do not call for the treatment of pathogens in the Hospital's sewage effluent, in that any e-coli or other dangerous pathogens are already contained within all human waste as a normal event, and that Public Health safeguards already incorporated within the design rules for sanitary drainage systems are sufficient to manage this hazard.

There are some exceptions to the above; for

1) Viral haemorrhaging diseases which have a high mortality rate and can be spread by water, require patient isolation and heat sterilisation of all waste matter from infected patients. Such installations are not common. There is a unit on standby at Westmead Hospital and there may be similar units at other Hospitals. *It is proposed that where patients are diagnosed with any such disease, they will be transferred to a Hospital adequately equipped to manage this hazard.*

2) Highly infectious water borne diseases which require patient isolation – any instances where such a disease was diagnosed would be drawn to the attention of Sydney Water - *it is noted that neither AS/NZS 3500* Plumbing and Drainage *set and NSW* Engineering Services & Sustainable Development Guidelines - Technical Series **TS11** *calls for any specific precautions in respect to pathogen treatment.*

3) Patients treated by radioactive isotope Iodine 131 require isolation and the bodily fluids contained for the half life of the isotope in a suitable plant - *it is proposed that no Iodine 131 treatment will be administered within the Lifehouse building.*

4) Laboratories - The waste water products from all laboratories requires approval of appropriate trade waste treatment, in the case of infectious material this may require chlorine, ozone or ultra violet irradiation as is appropriate. *It is noted that there are no laboratory facilities located within the Lifehouse building precinct*

5) Laundry Waste - Where fouled bed linen and similar is dealt with in-house, some hospitals laundries undertake Ozone treatment of the waste stream as a precautionary biocide. Ozone is a gas treatment that is in common use in swimming pool water sterilisation, the gas being generated by discharging an electrical current in dry air, the product of this process being then diffused through

the water to be treated for an instant bacteria kill. *No linen service will occur within Lifehouse – it will be collected for off-site processing*.

Statutory dangerous goods signage

The inventory of dangerous goods for the Lifehouse at RPA building facility exceeds the placarding threshold limit but does not exceed the manifest level as described in Part 6A of the *Occupational Health and Safety Regulation 2001.*

As a consequence of exceeding the placard quantity there is a requirement for a HAZCHEM sign and storage location placarding at building entry points, and for individual depot signage (dangerous goods class labels) to be displayed.

General conclusion

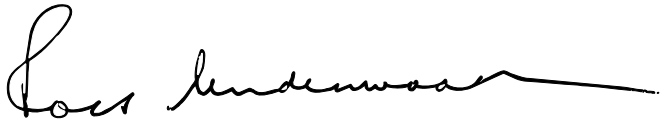
As stated earlier in this advice, based on the information provided to me as described in this report, it is my opinion that SEPP 33 does not apply to the proposed Lifehouse at RPA development.

Further, the proposed facilities for the storage, handling and use of dangerous goods and hazardous substances, will be designed and constructed in compliance with all relevant legislative requirements. This is consistent with best practice principles for the management of risk to health and safety posed by the materials to be kept and used. It will therefore secure a level of safety and environmental performance described in the relevant standards and codes of practice applying clinical facilities, thereby meeting deemed compliance with relevant statutory instruments and obligations.

Should you need to clarify any of this advice, or raise any other issues, I would be happy provide further assistance.

I thank you for the opportunity of providing advice in these matters.

Yours sincerely
Safety Engineering & Technical Services Pty Ltd



Ross Underwood, MIEAust, CPEng, MSIA, MAIDGC
General Manager

DISCLAIMER

This opinion in relation to the compliance of the facilities to be provided at the Chris O'Brien Lifehouse at RPA was prepared impartially and the assessment completed independently by Safety Engineering & Technical Services Pty Ltd. The report reflects our best judgement based on the information available at the time of preparation. However, any use that any party makes of the documentation is the responsibility of such party. Safety Engineering & Technical Services Pty Ltd accepts no responsibility whatsoever for damages (if any) suffered by any party in reliance on information contained in this report.

APPENDIX A List of dangerous goods storage depots at Lifehouse at RPA

Room Name/Facility	DG Class	PG	Hazardous contents	Q'ty	Comments
Basement B3 Reserve diesel tank for emergency generating set	C1	-	Diesel fuel	20,000 L	• In-ground tank installed in a tank chamber below floor of Basement Level 3 (B3) – Drawing SK 104 Grid X13-Y1 all in accordance with AS 1940-2004
Basement B2 Pharmacy Store	3	II	Ethanol in small quantities (wipes)	30 L	• Approved flammable liquid cabinet to AS 1940-2004 – Drawing SK X11-Y2
Ground Floor Liquid Nitrogen Supply Tank	Class 2, Division 2.2 cryogen	-	Liquefied refrigerated nitrogen	4,162 L	• Bulk liquefied nitrogen supply tank located on Ground Level, external to the building to the west of the loading dock - shown on Drawing SK 107 Grid X6-Y1 – in accordance with AS 1894-1997
Ground Floor Toxic Waste Store	6.1	II	Cytotoxic waste	4 kg	• Refer to wastes listing on page 12 – Drawing SK107 Grid X6-Y1
	6.2	-	Infectious wastes	80 kg	• Refer to wastes listing on page 11 – Drawing SK 107 Grid X6-Y1
Level 1 Tissue Bank	Class 2, Division 2.2 cryogen	-	Liquefied refrigerated nitrogen	1,740 L	• Up to 6 vapour phase freezers each containing about 290 L of liquefied nitrogen – each freezer consumes about 10 L of liquid nitrogen per day and is connected to automatic top up facilities from liquid bulk tank on Ground Floor Drawing SK 108 Grid X5-Y1 – in accordance with AS 1894-1997
Level 1 Cytotoxic Preparation Room	6.1	II	Cytotoxic drugs	30 L	• Quantity of active ingredient less than 100 gm in approved toxic Class 6.1 cabinet - Drawing Grid SK 108 Grid X2-Y1

Room Name/Facility	DG Class	PG	Hazardous contents	Q'ty	Comments
Level 1 Pharmacy	3	II	Ethanol solutions	30 L	• Small quantity only – Minor storage quantities as defined in AS 1940-2004 and described in Section 2 of that standard – Drawing SK 108 Grid X5-Y2

NOTES:

PG - Packing Group – a measure of the relative hazard of a dangerous good of Class 3, 4, 5, 6, 8 & 9 – *(PG I goods are those of highest hazard, PG II goods are of moderate hazard, and PG III are goods of relatively low hazard)*

APPENDIX B Who provided the advice in this report?

This report was prepared by Ross Underwood, a graduate mechanical engineer with postgraduate qualifications in industrial engineering from the University of New South Wales, with over 43 years experience in industrial practice.

The first 12 years of his professional career were spent in the petrochemical industry where he was involved in a variety of different functions including engineering maintenance, major new plant construction, project work associated with energy conservation and improving environmental performance, and chemical plant production management. He then spent 3 years managing reconstruction works at the Pyrmont Sugar Refinery, before being appointed as Personnel and Administration Manager for a major manufacturing activity, a position he held for 5 years.

In 1986 he established Safety Engineering and Technical Services Pty Ltd, a safety consulting and engineering contracting/consulting business. His company has undertaken a substantial number of consulting tasks in safety management for a very diverse range of private sector industrial and government clients including what was then the NSW WorkCover Authority.

Ross has conducted specific training programs and seminar sessions in safety awareness, accident investigation & other safety skills at all organisational levels. He was formerly accredited by WorkCover NSW as a trainer in workplace consultation, building industry induction, hazardous substances and risk management courses. He has trained management & employee safety committee representatives from over 80 different organisations. He has lectured in OH&S for both undergraduate and postgraduate students at the universities of UNSW, Sydney, Western Sydney and the University of Technology. He has undertaken longer term engineering contracting/consulting assignments in the brewing, building and manufacturing/industrial, warehousing and transport, government and military sectors.

His particular areas of expertise include:- dangerous goods storage, handling and transport matters; laboratory design; occupational health and safety performance auditing; construction management; plant & machinery safety, maintenance; industrial relations; accident investigation; workplace and safety system auditing; product packaging and labelling; and, the formulation and maintenance of safe work systems (including the preparation of emergency response and environment management plans). He has also been involved in the pre-planning and design of a number of major manufacturing plant and warehouse projects and has prepared risk and hazard analyses as part of the process for securing development approval for these facilities. He has provided a number of expert opinion reports for litigated matters related to oh&s and dangerous goods matters.

He has provided specialist advice on dangerous goods and more general occupational health and safety issues associated with several major building/re-building projects most recently including:- the Ingham Health Research Institute at Liverpool Hospital;

the Hunter Medical Research Institute; the Australasian Institute for Innovative Materials at the University of Wollongong; a Veterinary Diagnostic laboratory at Charles Sturt University at Wagga Wagga; the Special Operations Working Accommodation Upgrade Project; the 171 Aviation Squadron (Blackhawk helicopter) Relocation Project; HMAS CRESWELL Redevelopment at Jervis Bay, the ASC Shipyard Redevelopment, and the upgrade of HMAS PENGUIN – all for the Australian Defence Forces; and, the major redevelopment of the University of New South Wales North Mall (including new facilities for Applied Science and Chemistry)

Ross has contributed as an author to a number of technical journals and to the CCH International *Occupational Health & Safety Manual*, the *Plant Safety* manual, the *OHS Manager- The Hands on Guide* and the *2003 Australian master OH&S & environment guide*.

He is a Member of the Institution of Engineers, Australia, a Member of the Safety Institute of Australia, a Chartered Member of the Australian Human Resources Institute, and a founding member of the Australasian Institute of Dangerous Goods Consultants.

He has completed Certificate IV courses in Workplace Safety, and Workplace Assessment and Training, and the Risk & Liability Management short course convened by Engineering Education Australia.