24 November 2009

Mr Phil Jones
PJEP Environmental Planning
48 Marine Parade
AVALON NSW 2107

Air quality issues – Centre for Obesity, Diabetes and Cardiovascular Disease, University of Sydney

Dear Phil,

This letter report has been prepared in response to a request from Sydney University to undertake a review of potential air quality issues associated with the operation of the proposed Centre for Obesity, Diabetes and Cardiovascular Disease. This facility is to be housed in what is referred to as the CODCD Building.

Figure 1 shows the approximate location of the building within the Sydney University campus. The activities which will take place within the new building comprise research operations which will result in some level of air emissions from the vents from the 200 or more fume cupboards which will be dispersed throughout the building.

There will be a wide range of laboratory activities undertaken within the building and it is not possible to estimate precisely the quantity of emissions which would take place at any one time. **Table 1** provides a list of laboratory solvents which are likely to be used. The list is not exhaustive but is indicative of typical laboratory processes. Also included are ambient air quality goals set by the Department of Environment, Climate Change and Water (DECCW) which relate to those solvents.

The goals set by DECCW are referred to as design ground level concentrations (glc) as they are goals for the ambient air to which stacks or other emission points are designed (usually in terms of height) for compliance with that goal. The goals are based on either the toxic or odorous properties of the compound whichever results in the more stringent (lower) goal.

Table 1:Air quality goals set by DECCW

Compound	Ambient air quality goal (mg/m^3) 1-hour average
Dichloromethane	12.0
Chloroform	1.59
Ethyl Acetate	22.1[a]
Diethyl Ether	40[b]
Ethanol	3.8[a]
Methanol	5.5[a]
Diethyl Ether	40[b]
Acetone	48[a]
Toluene	0.65[a]
Methyl ethyl ketone	5.9[a]
Hexane	12.0

[a] based on odour
[b] workplace goal divided by 30

PAEHolmes

SYDNEY

Suite 2B, 14 Glen St
Eastwood NSW 2122

Ph: + 61 2 9874 8644
Fax: + 61 2 9874 8904

info@paeholmes.com
www.paeholmes.com

BRISBANE

GOLD COAST

TOOWOOMBA

A PEL COMPANY

It is my understanding from discussion with Dan McKenzie of Steenson Varming (mechanical ventilation designers) that the preliminary design of the outlets from the fume hoods are conservative and will take account of:

1. Proximity to air intake points
2. Sufficient height above the top of the building to ensure good dispersion conditions.

I also understand that at this stage the height of the ventilation outlets would be 6 metres above the top of the building and the diameter would be of the order of 350 mm to ensure a resultant exit velocity of 15 m/s. This is consistent with good engineering practice.

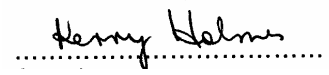
It is considered unlikely that the emissions from the new building would result in any changes to off-site air quality impacts and that there would be no difficulty in meeting the design glcs at ground level.

This is based on the fact that the building is 31 m in height and that the vents would be 6 metres above this with a sufficient exit velocity to ensure good dispersion. However a more significant issue is that the emissions from the vents could enter air conditioning intake points or openable windows on the new building and adjacent and nearby buildings, including a residential college and hospital.

In order to assess this in detail it is recommended that computational fluid dynamic (CFD) modelling, be undertaken on the final building configuration in order to ultimately refine the design. Input to the model would include worst-case estimates of volatile emissions.

This approach has been adopted on other projects (Holmes Air Sciences, 1999a, 1999b, 2001). On the basis of the findings from previous studies it is anticipated that there is unlikely to be any significant impact.

Yours faithfully



Kerry Holmes PhD
Environmental Chemist

References:

Holmes Air Sciences (1999a)
"Report on Air Emissions from Proposed Joint Facility Centre for Molecular Science and Food Sciences Australia, CSIRO Delhi Road North Ryde" prepared for Cox Richardson August 1999.

Holmes Air Sciences (1999b)
"Supplementary Report on Air Emissions from Proposed Joint Facility Centre for Molecular Science and Food Sciences Australia, CSIRO Delhi Road North Ryde" prepared for Cox Richardson November 1999.

Holmes Air Sciences (2001)
“Air Quality Issues Steel River Project” prepared for Cox Richardson October 2001.

(Note that Holmes Air Sciences is now part of PAEHolmes)

Figure 1 Location of proposed building