

JRPP Ref. No.:	2012SYW078
DA No.:	DA11/1445
PROPOSED DEVELOPMENT:	Lawn Cemetery, Memorial Gardens, Associated Buildings and Crematorium
PROPERTY ADDRESS	2207-2223 Elizabeth Drive Luddenham
DEVELOPMENT CATEGORY	Integrated Development
APPLICANT:	Stimson Consultant Services Pty Ltd
REPORT BY:	Gurvinder Singh – Senior Environmental Planner
JRPP MEETING DATE:	5 December 2013
RECOMMENDATION	Refusal

Executive Summary

This report is an addendum to the previous development assessment report prepared by Council Officers and reported to the JRPP on 26 September 2013. A copy of that report is attached at Appendix E.

In its 26 September 2013 meeting the JRPP deferred determining the application and required the applicant to submit the following documentation:

- An amended plan of the grave burial sites which complies with all World Health Organisation Criteria and particularly that relating to separation of grave depths from the groundwater table
- Further information on the future air quality in the locality having regard to the mercury scrubber technology proposed to be installed in the crematorium emissions system
- A management plan demonstrating that the proposed facility will not pose material risks to the environment (primarily water and air), human health and nearby land uses. The plan is to include provision for monitoring against predicted outcomes and public reporting of performance and monitoring results at specified intervals. That plan is to provide for independent auditing of compliance by relevant expert(s) whose qualifications and experience are to be approved by Council and funded by the facility operator.

The above information was to be provided to Council by close of business on 26 October 2013. In order to enable the matter to be determined at its next meeting scheduled to consider this matter, irrespective of the final recommendation of Council's assessment staff and without prejudice to its final decision, the Panel

required the preparation of draft conditions of consent that would apply should the application be approved.

The subject application was placed on public exhibition on three separate occasions previously. Council has received numerous letters of objection including petitions from the concerned residents during these exhibition periods. These concerns were addressed in previous reports to the JRPP.

Council received the amended details from the applicant on 25 October 2013. The amended details were advertised in the local newspapers and notified to the adjoining and nearby property owners and occupants in the Penrith and Liverpool Local Government Areas from 7 to 20 November 2013. New concerns received during the latest public exhibition of the application are addressed in this report.

Council appointed an independent consultant (JBS&G) to overview the recent amended details submitted by the applicant relating to groundwater and air quality. Assessments of these amended details are included in this report. Overall this assessment has revealed that the proposal does not satisfy WHO criteria. The likely environmental impacts of the proposed development will be adverse for the neighbouring residents, businesses including poultry farms and other horticultural farms in the vicinity of the site.

Council's report presented to the JRPP on 26 September 2013 carried out an assessment under Section 79C of the Environmental Planning and Assessment Act 1979 and the following issues - discussed in detail in that report - emerged as a result of that assessment process:

- Inconsistencies with the objectives of the zone
- Land contamination
- Air quality
- Groundwater contamination
- Land use conflicts
- Bio security impacts and food safety
- Rural character and visual impacts
- Accessibility
- Social and economic impacts
- Loss of productive agricultural land in the Sydney Basin.

The proposed development remains inconsistent with some provisions of the Environmental Planning Instruments and Development Control Plan applicable to the subject site. The site is not considered suitable for the proposed development and the proposal will not be in the public interest. This report recommends that the development application be refused.

There are seven appendices to this report, as detailed below:

- Appendix A – Amended Architectural Plans
- Appendix B - Amended Ground Water Constraints Plan
- Appendix C – Amended Air Quality Report

- Appendix D – Photographs depicting visual impact from neighbouring residences.
- Appendix E – Development Assessment Report presented to JRPP on 26 September 2013.
- Appendix F – News Article on ‘Water Tainted by Corpse Bacteria’ by BBC West Midlands Science Correspondent.

Proposed Development

The proposed development as amended involves use of the land as a lawn cemetery incorporating a crematorium. The amended plans indicate the following key elements:

- A revised burial layout. Below ground burials plots totalling 25,000. Columbariums accommodating 13,000 plots. Total capacity of 38,000 burial plots.
- Relocated chapel and crematorium building to be situated centrally on the site. A revised chapel and crematorium building accommodating one chapel with a 60 seat capacity and one crematorium furnace.
- Adaptive re-use of the existing dwelling and garage to accommodate the administration, florist and maintenance functions of the facility.
- An overall reduction in the road network and ancillary development required for the operation of the facility.
- A mercury scrubber system

Planning Assessment

The proposed development has been assessed against the relevant heads of consideration contained in Section 23G, Section 79C and Section 91 of the *Environmental Planning and Assessment Act 1979*. Details of that assessment are available in Council’s previous report attached at Appendix E. The following issues have been identified for further consideration based on the amended details submitted by the applicant on 25 October 2013 and should be read in conjunction with those in the report attached at Appendix E.

Section 79C(1)(b) – The Likely Impacts of the Development

Air Quality

JBS&G undertook a review of the report titled ‘Air Quality Impact Assessment – Luddenham Memorial Park Luddenham Property Group, 6 August 2013, Pacific Environment Limited (PEL 2013a) and provided comments which were included in the report presented to the JRPP on 26 September 2013.

JBS&G has most recently undertaken a review of the additional Information on air quality prepared by Pacific Environment Limited (PEL 2013b) and Environmental Management Plan October 2013 submitted by the applicant. Comments from JBS&G are as follows:

Previous Unresolved Comments:

With respect to previous comments made by JBS&G (2013), the following comments have not been addressed:

- JBS&G do not agree that the methodology to estimate potential impacts from deposition of particulates on roof structures and accumulation within tanked water supplies is appropriate. The methodology averages deposition and rainfall over a period of 12 months and essentially assumes perfect mixing between rainfall and deposited particulates. A more likely scenario will be the accumulation of deposited particulates on a roof area over a dry period, and concentration of deposited particulates within the initial flush of rainwater on the roof. This will cause increased concentrations of constituents in the water held within associated tanks. A dry period prior to flushing of accumulated deposited material needs to be incorporated into the assessment. Further consideration should be given to the behaviour of particulate based emissions within the tanked water supplies, with the potential for gravitational settling and accumulation in water discharge from the base of water tanks
- The assumption of tank water will be flushed for '2 to 3 minutes' prior to use is not appropriate and cannot be relied upon to manage potential impacts. Further the recommendation that tank water contain first flush devices / filters be applied to tank water is not appropriate for properties where the proponent has no control over the operation of water tanks and use of associated water supply
- The potential air quality impact of existing poultry farms / agricultural operations upon the operation of the site has still not been assessed. PEL (2013) indicates that this has not been undertaken as it considered that proposed mourning activities as associated with the site are not considered to be a potentially sensitive land-use and site users will presumably be tolerant of odours / environmental impacts during these activities. It is considered that this assessment would be most appropriately informed by quantification of potential odour impacts (i.e. strength / frequency / character) on the site, as requested in JBS (2013); and
- PEL (2013) have not undertaken a health risk assessment of potential cumulative effects of air pollutants on potential receptors. PEL (2013) notes that predicted levels of pollutants are low, apparently considering only the potential airborne levels of constituents. As discussed in the earlier comments, exposure to air pollutants will not be restricted to inhalation of airborne pollutants, with potential oral and dermal exposures associated with particulate deposition in potable water catchments. As also discussed earlier, it is also considered that the assessment of this potential exposure scenario is overly simplistic. The health risk assessment would require the summing of

exposures across each of the potential exposure pathways (i.e. inhalation, oral and dermal). The requirement, or otherwise, of the requirement for health risk assessment would be more appropriately re-assessed where the potential deposition / tank water exposure scenario is more appropriately assessed.

Air Emissions Treatment

PEL (2013b) provides a summary of the proposed air emissions treatment for Cremator emissions. The adopted technology appears appropriate, however it would be most appropriately assessed through the testing and validation requirements proposed with the EMP. Comments are provided in the following sections on the adequacy of the EMP.

Air Quality Monitoring to Environmental Management Plan

The procedures for air quality and emissions management provided to Martens (2013) are considered to be brief. The scope of this monitoring / management procedure has been assessed to the requirements detailed in Process Guidance Note 5/2 (12) Statutory Guidance for Crematoria, February 2012, UK Department for Environment, Food and Rural Affairs (DEFRA 2012). Background documents to DEFRA (2012) have been reported by PEL (2013a) to be consistent with best practice. The following comments are provided:

- The criteria to Martens (2013) do not include averaging times. The procedure should be amended to include averaging times for each of the constituents
- DEFRA (2012) nominates continuous monitoring for temperature, oxygen, particulates and carbon monoxide. Martens (2013) does not include continuous monitoring for particulates and carbon monoxide
- Relevant standards / guidelines for the sampling and analysis of air emissions should be included in the EMP. Cited standards are currently restricted to installation of the sampling point
- Martens (2013) provide limits as allowable concentrations. Concentrations of discharged constituents can be reduced by the addition of dilution air to the exhaust gas stream. DEFRA (2012) prohibits the use of dilution air to exhaust gases. Similar guidance should be provided to Martens (2012), either by nominating a maximum allowable discharge velocity and stack diameter, or providing compliance limits in alternate units (i.e. grams per hour) with an associated minimum discharge velocity; and
- Provisions should be detailed in the EMP for the review of air monitoring results. At the least, an independent review should be undertaken of the assessment of air emissions assessment undertaken with plant commissioning. Approval of the acceptability of air emissions should be provided prior to full operation of the site.

Proposed Emission Limits

A comparison has been undertaken of the discharge criteria provided to Martens (2013) and the assumed levels of constituents in stack emissions as used as the basis of previous dispersion modelling. This is summarised in Table 1 following:

Table 1: Summary of Modelling Assumptions and Proposed Discharge Criteria

Constituent	PEL (2013a) Modelled Discharge Concentrations	Martens (2013) Nominated Criteria
Temperature	400°C	Minimum 850°C
Oxygen		6% Minimum
Opacity	Assessed, but no criteria	Not provided
Total particulate matter	9.0 mg/m ³ (as PM10) 8.1 mg/m ³ (as PM2.5)	20 mg/m ³
Hydrogen Chloride	7.6 mg/m ³	30 mg/m ³
Carbon monoxide	23.3 mg/m ³	100 mg/m ³
Oxides of nitrogen	121.4 mg/m ³	350 mg/m ³
Mercury	0.4 mg/m ³	0.05 mg/m ³
VOCs	23.7 mg/m ³	20 mg/m ³
Metals (Type 1 and 2)	-	1 mg/m ³
Mercury	0.4 mg/m ³	
Arsenic	0.003 mg/m ³	
Beryllium	0.0001 mg/m ³	
Cadmium	0.001 mg/m ³	
Chromium (III)	0.003 mg/m ³	
Chromium (VI)	0.001 mg/m ³	
Copper	0.003 mg/m ³	
Lead	0.007 mg/m ³	
Nickel	0.004 mg/m ³	
Antimony	0.003 mg/m ³	
Cobalt	0.00015 mg/m ³	
Selenium	0.005 mg/m ³	
Zinc	0.037 mg/m ³	
Dioxins / Furans	1.1 ng/m ³	0.1 ng/m ³
Fluoride	0.3 mg/m ³	No criteria
PAHs	0.01 mg/m ³	No criteria
Sulphur dioxide	17.2 mg/m ³	No criteria
Formaldehyde	0.004 mg/m ³	No criteria
Acetaldehyde	0.014 mg/m ³	No criteria

Table 1 has been reviewed to determine potential discrepancies between modelling assumptions and proposed emission limits. Each is discussed further by further reference to fate and transport modelling undertaken in PEL (2013a):

- The required emission temperature is substantially higher than the modelled stack temperature. However the temperature is proposed to be monitored at the exit to the secondary chamber, which is prior to the stack emission point. The higher temperature would cause greater dispersion of emissions, which should cause maximum ground level concentrations to be reduced, but the area of effect to increase

- The allowable level of hydrogen chloride is approximately five times higher than that modelled. However the modelling predicted that the ground level concentration (GLC) would be up to 0.9% of the allowable limit. The increased emission limit would not be anticipated to cause an unacceptable GLC
- The allowable level of nitrous oxides is approximately three times higher than that modelled. However the modelling predicted that the GLC would be up to 9.1% of the allowable limit. The increased emission limit would not be anticipated to cause an unacceptable GLC
- Mercury was identified in PEL (2013a) as the constituent most likely to cause air quality criteria to be exceeded, with the predicted GLC up to 32% of the allowable GLC. However, mercury emission controls are proposed. The allowable level of mercury is eight times lower than the modelled level
- The proposed emission limit for dioxins and furans is an order of magnitude lower than that adopted in the modelling
- The allowable total level of heavy metals is greater than the sum of the modelled levels of the remaining heavy metals (excluding mercury). It would be more appropriate to set emission limits on the basis of specific metals. This is particularly relevant noting the potential toxicity of cadmium as reported in PEL (2013)
- Modelling was additionally undertaken for other constituents not provided with recommended emission limits including fluoride, PAHs, sulphur dioxide, formaldehyde and acetaldehyde. However the predicted GLC's of these constituents are well below the adopted criteria. These constituents are not considered significant omissions, and the constituents nominated by Martens (2013) are considered to be appropriate indicators of the potential levels of these other constituents.

Groundwater Contamination

JBS&G undertook a review of Groundwater Assessment, July 2013, Martens Consulting Engineers (Martens 2013) and provided several comments which were included in the report presented to the JRPP on 26 September 2013.

JBS&G has most recently undertaken a review of the Amended Groundwater Constraints Plan (doc ref P1203651JR05V01), Martens & Associates Pty Ltd (25 October 2013) and Environmental Management Plan: Martens & Associates Pty Ltd (Martens 2013) and provided the following comments:

Previous Unresolved Comments:

With respect to previous comments made by JBS&G (2013) the following issues remain unresolved:

- Hydrogeological data presented in Martens (2013) includes site measurements and public domain bore data. Previous comments on groundwater reports prepared for the proposed development (GHD 2013 and JBS 2013) have highlighted that groundwater extraction bores may be present on neighbouring properties that have not been identified. Identifying whether there are bores (even if unlicensed) on neighbouring properties is considered an important aspect of assessing whether the proposed development may impact (stock or people) on neighbouring properties
- Table 6 of Martens (2013) should be amended to groundwater levels to a common datum(preferably m Australian Height Datum)
- While the statistical information for groundwater level data is useful, hydrographs (relative to mAHD and with rainfall plots) are more typically used to represent logger data and it is recommended that these plots are included in an amended report to allow interpretation of the water level response to rainfall. It is noted that water level variations exceed 1 m at a number of locations and varied by up to 1.69 m at BH120. Considering the short duration of monitoring these are considered to be very significant variations that indicate significant recharge rates. High recharge rates are contrary to the conceptual model presented in Section 3.7 of Martens (2013)
- The comments with respect to the timing water level rise compared to rainfall cannot be assessed without reference to a plot of water levels. The text infers that these plots were generated but it is unclear why they have not been included in the report
- Significant variations in groundwater quality are evident in the data presented in Martens (2013) and there are a number of locations reporting relatively low (<2500 micro Siemens per cm) fluid EC values. Importantly, locations with low fluid EC correspond to locations with shallow groundwater levels. In addition, a number of these locations (in particular BH110, BH119, MW1 and MW3) also have shallow water levels and have reported significant water level variations with rainfall. Given these observations it is considered highly likely that two aquifers exist at the site with the shallower system being characterised by shallow water levels and relatively good water quality. Given the range of water level variations, the shallow system may also discharge (even on an intermittent basis) to surface water features. This is contrary to the conceptual model presented in Section 3.7 of Martens (2013)
- The measurement and comments on hydraulic conductivity are inconsistent with the water level ranges presented in the report (Marten 2013). It is important that this contradiction is addressed in an amended report.
- The field data do not support the conceptual groundwater model presented in the report (Martens 2013). While it is clear that a relatively saline aquifer is present, a discussed above, it is also likely that a shallow system is present in unconsolidated material at the site. This shallow system should be incorporated into the groundwater assessment and its potential to transport

contaminants derived from the proposed development to offsite receptors requires consideration

- Given that the conceptual model is not considered reliable the usefulness of a numerical model is uncertain. The documentation of the numerical groundwater is not sufficient to allow review. For example, it is not stated what datum was used for the model. In the case that it was mAHD then survey data for the wells must be available to allow conversion of the standing water levels measurement to mAHD. If this data is available then it should be presented in earlier tables in the report. If survey data for the wells is not available then there would be some doubt regarding the presented calibration statistics. It is recommended that the consultant revisit the modelling with reference to the Australian Groundwater Modelling Guidelines (Waterlines Report Series No. 82, June 2012)
- As it is likely relatively good quality groundwater is present in a shallow groundwater system it is considered that it is reasonable to conclude that the proposed grave sites could impact farm dams
- Without a detailed field survey of bore locations the conclusions presented in Section 4.3 of the Martens 920130 report are considered premature. In addition, the significant water level variations observed during the short period of monitoring at the site imply that hydraulic conductivity at the site is higher/more variable than acknowledged in the report.

In addition to the items discussed above, the following issues identified in JBS (2013) remain outstanding:

- Prior to assessing the development application it is considered important that the recommendations presented in Section 4 of the GHD (2013) are addressed on a point by point basis in a revised groundwater assessment
- The relationship between groundwater on the proposed development site and offsite groundwater users (both licensed and unlicensed users) needs to be defined and assessed
- The relationship between groundwater (during all climatic conditions) and surface water (including permanent creeks, ephemeral creeks and dams) needs to be defined and assessed
- The assessment of potential groundwater quality impacts should include inorganic, organic and microbiological contamination. All potential sources of groundwater contamination require assessment including both burials and the effluent treatment /irrigation system
- Field measurements of hydraulic conductivity in the shallow and deep aquifers
- Collection of data (such as cation exchange capacity, fraction organic carbon) relevant to assessing the fate and transport of contaminants entering the subsurface as a result of operation of the proposed development

- Assessment of hydraulic gradients and groundwater flow paths
- The above requires incorporation into a detailed hydrogeological site conceptual model that would provide a basis for assessing potential impacts to groundwater quality and associated receptors (such as surface water, groundwater users (licensed and unlicensed), local agriculture) of the proposed development. The conceptual model may require a detailed assessment of the fate and transport of contaminants (inorganic, organic and microbiological) associated with the proposed development.

Amended Groundwater Constraints Plan

Martens (25 October 2013) provides “an amended plan of the grave burial area that demonstrates compliance with relevant groundwater management standards (including the World Health Organisation).” The plan was developed to satisfy a requirement from the JRRP to provide an amended plan that “complies with all World Health Organisation criteria and particularly that relating to separate of grave depths from the groundwater table”.

It is important to highlight that the World Health Organisation document (The Impact of Cemeteries on the Environment and Public Health 1998) referred to by Martens and the JRRP is not a document endorsed by regulatory authorities in Australia. As a result it should not be considered a default standard for assessing potential groundwater/surface water quality impacts from the proposed development. These impacts should be assessed by undertaking a suitably detailed assessment of the potential impacts of the development on groundwater and surface water at the site. The current assessment is considered deficient and is not suitable for assessing the potential impacts of the proposed development on surface water and groundwater.

Notwithstanding the above the following discussion is provided with respect to the proposed development and the five (5) draft conditions presented in the WHO (1998) document:

1. *Human or animal remains must not be buried within 250 metres of any well, borehole; or spring from which a potable water supply is drawn.*

The documentation provided by Martens (25 October 2013) does not directly address this draft condition but adopts an alternate definition of horizontal setback provided by Dent (2002) that uses a greater than 100 day travel time from the burial sites to a potable water supply. The amended constraints plan report indicates that no potable (or non-potable) bores are affected by the proposed development using the Dent (2002) definition.

As discussed above, it is recommended that additional review of the potential for bores to be present in areas surrounding the proposed development that are not licensed (and therefore not listed as groundwater works with the NSW Office of Water) should be undertaken. Following this review, assessment against the WHO (1998) draft condition would then be appropriate. The use of the Dent (2002) definition relies on the results of the groundwater modelling presented in Martens (2013) which are not considered to be useful or defensible.

2. *The place of interment should be at least 30 metres away from any other spring or watercourse and at least 10 metres from any field drain.*

The proposed layout presented in Martens (25 October 2013) is considered appropriate with respect to setbacks from local drainage features. However, it is considered important that the potential for shallow groundwater discharge into local features is further assessed to ensure that potential impacts to local surface water are acceptable.

3. *All burial pits on the site must maintain a minimum of one metre of subsoil below the bottom of the burial pit (i.e. the base of the burial must be at least one metre above solid rock).*

The subsoil in the proposed burial site area is largely comprised of residual soils and weathered rock. The majority of burials will occur in the weathered rock. As the WHO (1998) guidance does not provide a definition of 'solid rock' it is unclear whether this condition is satisfied by the proposed development. It is noted that Martens (25 October 2013) does not address this condition in their documentation.

The draft condition presented in WHO (1998) is intended to ensure that sufficient attenuation capacity is present beneath a coffin to prevent contamination reaching solid rock (which has a relatively low attenuation capacity). The weathered rock identified on the borelogs presented in Marten (2013) is largely identified by its relative strength and not due to its soil like qualities. On this basis, it is considered reasonable to assume that the attenuation properties of the weathered rock are similar to "solid rock" and as a result the burial sites would be considered unacceptable according to the WHO (1998) guidance.

4. *The base of all burial pits on the site must maintain a minimum of one metre clearance above the highest natural water table. (Any variability in the water table should be taken into account).*

Based on the data provided in Martens (2013) the requirements of this draft condition are satisfied. However, it is noted that there are a range of issues identified with the water level monitoring and groundwater modelling that call into question the data presented in Martens (2013). It is recommended that these issues are addressed prior to approval of the proposed development.

5. *Burial excavations should be backfilled as soon as the remains are interred, providing a minimum of one metre soil cover at the surface.*

The proposed soil cover is 0.9 m. This depth of soil does not satisfy the WHO (1998) draft condition.

Groundwater Monitoring to Environmental Management Plan

The procedures for groundwater management provided to Martens (2013) are considered to be brief. The following comments are provided:

- The monitoring locations are located too distance from the potential contaminant sources and are not suitable for early identification of contamination. Additional locations are required within and/or directly adjacent to the effluent irrigation and burial areas. It is recommended that at least nine (9) monitoring wells are installed at the site
- Some monitoring wells should be sited to ensure that they are downgradient of initial burials so that potential impacts can be identified during early operations at the proposed development
- The frequency of monitoring is considered appropriate although mechanisms to vary the frequency (short/longer duration depending on the results of prior monitoring) should be incorporated into the plan
- The trigger mechanisms proposed in the document are considered inadequate and the use of three standard deviations from the mean is not appropriate for the site. Alternate statistical analysis such as that provided in Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009, EPA 530/R-09-007 should be adopted to assess whether concentrations changes are significant.

World Health Organisation (WHO) 1998, 'The Impact of Cemeteries on the Environment and Public Health – An Introductory Briefing'

The above document published by WHO in 1998 is an introductory briefing. It is neither a standard nor a guideline. This document discusses the impact of cemeteries on the environment and public health. It does not assess environmental impacts of the cemeteries on existing poultry farms in the immediate vicinity of the site. This document suggests topics for future research including the desirable minimum thickness of the unsaturated zone beneath cemeteries and the safe distances between aquifers and cemeteries in various geological and hydrological situations.

This document published in 1998 cannot be used as a standard or a guideline as it is an introductory briefing only.

Avian Influenza and other Bacteria

The amended details submitted by the applicant on 25 October 2013 were forwarded to the Department of Primary Industries for comment. The Department of Primary Industries has advised that 'as the proposed cemetery will include a large number of tree plantings, there may be a risk associated with a large stand of trees as these may attract wild birds. There have been several recent outbreaks of avian influenza caused by contact between free range birds and wild birds, often nearby wetlands or areas where wild birds congregate. The last two avian influenza outbreaks in NSW were associated with free range layer farms. The source of the disease in both instances was attributed to wild birds, particularly waterfowl. The direct cost to the industry and to government was approximately \$6 million. This cost does not take into account the loss of export revenue associated with a ban on poultry exports from Australia for 6 months following each outbreak. This cost is also substantial.

One of the largest risks to poultry production is the risk of avian diseases, most notably avian influenza, Newcastle disease, ILT and a host of other diseases. These diseases have the potential to cripple the industry, particularly where many sheds and farms are clustered in close proximity to each other. A risk assessment may need to be considered to determine if the nearby cemetery may increase the risk of disease spread to the nearby farms. The poultry industry is highly regulated, partly because of biosecurity risks and the supply of food for human consumption. This will need to be considered when making a determination.

Poultry farms are now required to comply with new primary production and processing standards under Food Standards Australia New Zealand (FSANZ). The standards have been applied nationally and are designed to reduce the risks of food borne pathogens, particularly *Campylobacter* and *Salmonella*. If there is a heightened risk of these pathogens entering surface or groundwater supplies, particularly those associated with the nearby poultry farms then this will need to be considered.

Decision makers should not only consider the potential risks of the cemetery on the farms, but also consider the impacts of the farms on the cemeteries. Poultry farms are typically associated with odour, particularly towards the end of every batch of chickens produced. This is largely unavoidable and is a typical consequence of poultry production. To limit impacts, farms are typically required to conduct odour impact assessments and to develop their farms and sheds so that they comply with minimum odour buffer distances to limit their impacts on nearby sensitive landuses, including residences. Council or the JRPP may need to consider this when assessing the application so that the current/existing land use is not unreasonably impacted by a proposed adjoining landuse in terms of complaints about odour, dust and noise which is commonly associated with many agricultural production activities, including production.

The poultry industry is undergoing significant changes following recent announcements by the two major supermarket retailers. This is resulting in some fundamental changes to the industry, including changes to stocking densities and a strong consumer push towards barn raised and free range poultry products. This essentially means that significant parts of the industry are changing their operations to free range to meet current consumer and retailer demands. This in turn means that regulators will need to consider not only the current industry practices but also potential future changes to land use by poultry farms, associated with an increase in free range chicken meat and egg production. Assessment of the proposal may therefore need to consider the impacts of the proposal on future production practices and the impacts on these, in terms of poultry production.'

The operators of the nearby poultry farms have raised concerns as follows:

'The introduction of screen trees will attract a lot of bird life. In poultry farms we do not like wild birds, they carry disease and jeopardise the flock. In just the last month, a property in Young NSW was closed down due to Avian Bird Flu, with the loss of over 480,000 birds. The disease was due to wild birds infecting a free range area. The estimated loss to the property is expected to be over \$6 million. We ask that you

reject this application. The possibilities it introduces to effect and even close down our business is too great and this project is not suitable to be placed directly beside a poultry farm.'

Based upon the comments provided by the DPI and the operators of the poultry farms it is considered there will be a high risk of wild birds nesting in the extensive landscaping required to screen the cemetery from the neighbouring properties. The wild birds can hugely impact on the operations of free range egg production of the neighbouring farm by spreading diseases which may cause closure of that farm. Introducing a cemetery next to a free range egg production farm will heighten the environmental risks which are not present currently. Introduction of such impacts on existing farms are unacceptable.

A news article on 'Water Tainted by Corpse Bacteria' by BBC West Midlands Science Correspondent is attached at Appendix F. This article cites that scientists studying a graveyard in U.K. found that water was being contaminated underground by bacteria from decaying bodies.

Section 79C(1)(d) – Matters Raised in Submissions

There are two houses located on the properties to the west of the site. One house is located at RL 85. The west boundary of the site is at RL 68 and burials near to this boundary will be located at RL71. The difference between these RLs is 14m. The height of the trees required to screen the burial activities and areas from the second storey of this house will be 19m at the western boundary. Nineteen metre high trees will take many years to grow. These trees will still have filtered views to the burial areas once they are mature.

The concerns raised by the home owner are reproduced below:

'My property is next door to the proposed site with a full view of the entire cemetery available to me. My concerns are as follows;

- Screening - I can see the entire cemetery from my, kitchen, dining room, rumpus room and my teenage son's bedroom windows. Not to mention when I entertain guest outside. It is a intrusion on my life because you not only can see it but the noise coming from the site, from families visiting, and of course, funerals taking place
- The trees and scrubs they will be planting are not clear to me. I have never been given botanical names of these trees and scrubs. I don't know how high they are, or if they will give I and my family the screening that we need to secure our privacy
- The views from my home and my parent's home, which is elevated higher than my own home, will be altered forever. This is why my family chose to live here

- My parents will not only have the view of the cemetery, but also the stacks for the crematorium, the chapels and all the car parking and memorial gardens and buildings. Where is the privacy that my parents and my family will have? Will we be screened properly, and if so, how long will these trees take to grow to secure our privacy
- What effect will this have on my family life? How will this affect my children? Will their recreational activities have to stop because of the cemetery?
- How will I know if my father's fruit and figs be safe to eat? Will we get the runoff from the cemetery?
- We are so concerned about contamination from surface water running into our dams which we use that for agricultural purposes.'

This objection is supported by photographs of the views from various parts of the dwellings highlighting the visual intrusion. These photographs are attached at Appendix D.

A similar objection is received from the owner/ occupier of the residence on the eastern side of the subject site. This objection cites that 'The visual impact on our property will be immense and will take away the rural aspect of this property. To screen the cemetery view from our residence, trees of over 12 to 15m high would be required .We do not want a view of a heavily treed area, we do not want to lose the rural aspect we currently have.'

In a recent Land and Environment Case *NSW United Turkish Islamic Centre v Liverpool City Council [2013] NSWLEC 1150* the Commissioner cited the following:

- '65 *The landscaping, given the constrained nature of the site, is of critical importance - particularly with respect to the residences to the east and the west of the site.*
- 146 *It is, however, completely clear to me that a cemetery of the size and scale of that which is proposed in these proceedings (even if all the evidentiary conflicts and inadequacies were able to be resolved) is incapable of approval because of the unacceptable impact on the neighbouring properties because of the inability to provide appropriate landscaping.*
- 147 *I have therefore concluded that the orders of the Court are to be that:*
- (1)*The appeal is dismissed;*
- (2)*The Development Application for a cemetery at 31 Greendale Road Bringelly is determined by the refusal of development consent.'*

The subject site is similar to No.31 Greendale Road as far as visual impacts are concerned. The neighbouring properties will experience adverse visual impacts and invasion of privacy as a result of the proposal. These properties can never be adequately screened due to the undulating topography of the site and surrounds and

location of houses on ridges, thus requiring very high trees for screening purpose. These trees may not grow for many years. Any proposed landscaping to screen the cemetery, in turn will exacerbate the presence of wild birds by providing additional habitat. The presence of wild birds will increase the risk of *Avian Influenza* which can wipe out the neighbouring poultry operations.

Clearly there are conflicting matters affecting this proposal where multiple variables cannot be addressed satisfactorily and can only cause unacceptable impacts on neighbouring rural properties and poultry farms along with the failure of the proposal to address air, ground and surface water contamination. These impacts will result in adverse social and psychological impact for the occupiers including children of the neighbouring houses who will witness burial and cremation of dead bodies' day in and day out, thus affecting their amenity and enjoyment of their properties.

Liverpool City Council has submitted an objection to the proposal as follows:

'Council writes to object to DA11/1445 which seeks to construct a cemetery and crematoria. In particular, attention is drawn to Liverpool's recently prepared *Cemeteries and Crematoria Planning Proposal* and supporting documentation which has been attached to this letter and sent to the Department of Planning & Infrastructure for Gateway Determination. Part of this proposal seeks to remove the permissibility of cemeteries and crematoria from all rural zones, although it should be noted that the Liverpool LEP 2008 already prohibits cemeteries and crematoria from RU2 Rural Landscape.

This objection is based upon an analysis of the mortality projection of the South West Sydney region which anticipates 48,000 deaths over the next 18 years to 2031. A copy of this analysis can be found in the attachments. The Australian Bureau of Statistics denotes that cremation trend has been apparent across Australia for many decades, is approximately two out of every three deaths. Therefore, of these 48,000 deaths only 16,000 are likely to result in burial. Since 2010, the Liverpool LGA has been subject to three development approvals for cemeteries and crematoria in the nearby area of Bringelly and Greendale. This has approved 3 new crematoria and ash internments for 45,000 receptacles as well as 3 new cemeteries which provide for 80,000 burial plots. This is more than adequate to provide for the predicted 16,000 burials and 32,000 cremations of South West Sydney for the 18 year period, with further space available. The current capacity of existing cemeteries and crematoria within the LGA and surrounding LGAs has not been included.

Of the 3 mentioned development approvals, they are all located within close proximity to DA11/1445 creating a 'cemeteries cluster' which has many undesirable impacts on the perception and character of the local area. The residents of both Liverpool and Penrith LGA should not have to experience an unfair share of the impacts of this type of development where there is no apparent social need to deliver them, locate them in concentration, nor convert further agricultural rural lands to this type of use in the interest of protecting the local agricultural economy.

The proposed development will have detrimental impacts on the surrounding area in terms of:

- Creating unanticipated car parking and traffic volumes on local roads
- The proposed land use activities will place undue stress on the servicing capabilities of rural areas; and
- Creating unanticipated car parking and traffic volumes on local roads
- The proposed land use activities will place undue stress on the servicing capabilities of rural areas; and
- The amenity of rural areas will be negatively affected, causing ongoing land-use conflicts with adjoining lots
- The environmental concerns regarding the off-site migration of bacteria and viruses into water, land and air environs are a great concern, especially given the primary agricultural activities of the neighbouring poultry farms and their highly regulated health industry regulations that they operate under.

Environmental Impacts

The apparent concentration of cemeteries and crematoria within the surrounding area should give great impetus to ensuring the environmental impacts are not then magnified by the close proximity of these new approvals, particularly in regards to air quality and groundwater movements. Until such time when definitive research has been undertaken that demonstrates the regulatory framework surrounding cemeteries and crematoria is sufficient to ensure no contamination issues will occur on the surrounding area and the local community, it is considered inappropriate to progress this development application further.

It is understood that if contamination of the air, land or water occurs as a result of cemeteries and crematoria uses, it will be regulated under the Protection of the Environment (Operations) Act 1997 which, generally, holds accountable the land owner or consenting authority responsible for compensation and rehabilitation/restoration costs.

Agricultural Land

The Sydney Metropolitan Strategy encourages agricultural uses and the protection of rural and resource lands. Cemetery and crematorium proposals in the rural areas of Liverpool and Penrith are impacting on the potential for agricultural activities to occur. Cemeteries and crematoria take up large land holdings and generally utilise the land in perpetuity which removes the potential for other uses in the future. It is unfortunate that these uses have higher return on investment than many other uses permissible in rural zones and have therefore taken preference as a developable option over rural activities.

Maintaining rural activities and resource lands, protecting resource lands from incompatible and inappropriate are important strategies for the South West Subregion. With the proliferation of cemeteries and crematoria being experienced in Liverpool, the extension into Penrith is undesirable as these uses are incompatible and inappropriate in the surrounding area's context.

State Regional Environmental Policy 9 Extractive Industries

An objective of SREP 9 Extractive Industries is to ensure consideration is given to the impact of encroaching development on the ability of extractive industries to realise their full potential. By allowing the permissibility and development of cemeteries within rural areas is considered directly inconsistent with the above objective of the SREP.

Providing Burial Space for the Sydney Metropolitan Area

The provision of burial space is recognised as an issue for the wider Sydney metropolitan area, however, Liverpool and Penrith City Councils and residents of our rural areas should not be experiencing an unfair share of the impacts of this type of development. The Draft South West Subregional Strategy states that the issue of the lack of burial space is a matter for the Department of Planning and Infrastructure and the Department of Lands.

According to Action E3.6 (SW E3.6.1) the DP&I and former DL are to establish site selection criteria for new cemeteries in the Sydney Region which are to be used in the assessment of opportunities for identifying future sites in strategic planning. It is understood that the Crown Lands Division are investigating a regional facility to cater for required burial space over the next century, and additionally, in September 2013, the NSW draft Cemeteries and Crematoria Bill 2013 was released stating that one of its primary functions will be to address the shortage of burial space.

Until such time when robust government policy regarding the location and requirements for establishing a cemetery or crematorium has been established and site selection criteria published, it is considered inappropriate to approve this development application given environmental concerns and the existing concentration of approved cemeteries in the area.

Given the above mentioned justification Liverpool City Council suggests that DA 11 /1445 be refused by the Joint Regional Planning Panel until such time that a broader regional strategy for burial space in South West Sydney exists.'

Draft Cemeteries and Crematoria Bill 2013

Concerns about an under supply is covered under the above Draft Cemeteries Bill and allows the future Cemeteries Agency to have the power to acquire land by agreement for the purpose of providing land for cemetery purposes, and transfer the land to a Crown cemetery trust or other operator or prospective operator of a cemetery.

Conclusion

The development application seeks consent for a lawn cemetery incorporating a memorial garden, crematorium, a chapel, associated buildings and car parking on the subject site. The application was placed on public exhibition on three occasions and over 500 objections were received.

An assessment against the relevant provisions of the environmental planning instruments was undertaken which has revealed that the proposed development will be located in the vicinity of a number of sensitive land uses including poultry farms, other farms and rural residential uses. Such uses would be sensitive to potential environmental impacts that may result from the proposal mainly via potentially elevated contaminant emissions from the cremator and potential contaminant emissions to surface water and groundwater. The end result of these contaminants could be contamination of food supply.

There will be land use conflicts of the proposed development with the neighbouring farming, poultry and recreational uses. The likely impacts of the development in terms of air quality and groundwater contamination will be detrimental to the environment. The site is not suitable for the proposed development and the proposal is not in the public interest.

The neighbouring properties will experience adverse visual impacts and invasion of privacy as a result of the proposal. These properties can never be adequately screened due to the undulating topography of the site and surrounds and location of houses on ridges, thus requiring very high trees for screening purpose. These trees may not grow for many years. Any proposed landscaping to screen the cemetery, in turn will exacerbate the presence of wild birds by providing additional habitat. The presence of wild birds will increase the risk of *Avian Influenza* which can wipe out the neighbouring poultry operations.

Clearly there are conflicting matters affecting this proposal where multiple variables cannot be addressed satisfactorily and can only cause unacceptable impacts on neighbouring rural properties and poultry farms along with the failure of the proposal to address air, ground and surface water contamination. These impacts will result in adverse social and psychological impact for the occupiers including children of the neighbouring houses who will witness burial and cremation of dead bodies' day in and day out, thus affecting their amenity and enjoyment of their properties.

The development is proposed to be located in a scenic landscaped area. This location will have a detrimental impact on the scenic and landscape values of the land and the rural character of area would also be detrimentally affected. The proposed development will not protect agricultural land. The assessment has concluded that the proposed development is not worthy of support.

The proposed facility is unable to be accommodated within the rural setting and rather significantly will impact on the future operation for nearby Poultry Farms operated by way of bio security threats and must be refused.

Recommendation

That the report for DA11/1445 which proposes a lawn cemetery incorporating a memorial garden, crematorium, three chapels, associated buildings and car parking at Nos. 2207-2223 Elizabeth Drive Luddenham be received; and the proposed development be refused on the following grounds: -

1. The application is not satisfactory for the purpose of Section 79C (1) (a) of the Environmental Planning & Assessment Act 1979 as the proposed development is inconsistent with the following provisions of Penrith Local Environmental Plan 2010:
 - i) Objectives of the RU2 Rural Landscape zone
 - ii) Clause 6.5 – Protection of scenic character and landscape values
2. The application is not satisfactory for the purpose of Section 79C (1) (a) of the Environmental Planning & Assessment Act 1979 as the proposed development is inconsistent with the following provisions of Sydney Regional Environmental Plan (SREP) No.20 – Hawkesbury/Nepean River

Clause 6 Specific planning policies and recommended strategies

(3) Water quality

- (a) Quantify, and assess the likely impact of, any predicted increase in pollutant loads on receiving waters.*
- (d) Do not carry out development involving on-site disposal of sewage effluent if it will adversely affect the water quality of the river or groundwater. Have due regard to the nature and size of the site.*
- (g) Minimise or eliminate point source and diffuse source pollution by the use of best management practices.*

(8) Agriculture/aquaculture and fishing

- a) Give priority to agricultural production in rural zones.*
 - b) Ensure zone objectives and minimum lot sizes support the continued agricultural use of Class 1, 2 and 3 Agricultural Land (as defined in the Department of Agriculture's Agricultural Land Classification Atlas) and of any other rural land that is currently sustaining agricultural production.*
 - c) Incorporate effective separation between intensive agriculture and adjoining uses to mitigate noise, odour and visual impacts.*
 - d) Protect agricultural sustainability from the adverse impacts of other forms of proposed development.*
3. The application is not satisfactory for the purpose of Section 79C (1) (a) of the Environmental Planning & Assessment Act 1979 as the proposed development is inconsistent with the following provisions of Penrith Development Plan 2010:

- C1 Site Planning and Design
 - C4 Land management
4. The application is not satisfactory for the purpose of Section 79C (1) (b) of the Environmental Planning & Assessment Act 1979 as the likely impacts of the proposed development on the environment and surrounding uses will be detrimental in relation to the following:
 - Air quality
 - Groundwater contamination
 - Land contamination
 - Bio-security, food safety and related economic impacts on poultry farms
 - Visual, social and psychological Impacts for Neighbours
 - Rural character
 - Loss of productive agricultural land
 - Land use conflicts
 5. The application is not satisfactory for the purpose of Section 79C (1) (c) of the Environmental Planning & Assessment Act 1979 as the site is unsuitable for the proposed development having regard to the adverse environmental and visual impacts of the proposed development and land use conflicts.
 6. The application is not satisfactory for the purpose of Section 79C (1) (e) of the Environmental Planning & Assessment Act 1979 as the proposal is not in the public interest having regard to the extent of submissions and petitions received and concerns raised in those submissions.