

11 December 2009

REFERRAL RESPONSE - HEALTH

FILE NO: DA 602/2009/1

ADDRESS: 8 Castra Place DOUBLE BAY 2028

PROPOSAL: Replacement of existing fixed wharf structure with berthing for 40 vessels & moorings for 25 vessels with a new floating structure with berths for 45 vessels and moorings for 20 vessels.

FROM: Louie Salvatore

TO: Mr P Kauter

Comments are provided in relation to DA 602/2009/1 proposing redevelopment of the Double Bay Marina, 8 Castra Place, Double Bay. The Marina currently consists of 40 wet berths in a fixed structure and 25 commercial swing moorings for vessels.

The proposed Marina upgrade will comprise of the following:

- Partial removal of existing structures;
- Construction of a new floating structure to accommodate 45 wet berths;
- Installation of a new access gangway from the existing timber deck to the new structure;
- Provision of a disabled toilet.
- Proposed hours of operation for the office are 9 am to 6 pm, 7 days during summer and 9 am to 5 pm, 7 days during winter;
- Marina users will have 24 hour access to the moored vessels by way of security gates;
- Maintenance activities at the Marina are to occur between the hours of 9 am to 6 pm, Monday to Friday and 9 am to 12.30 pm on Saturday.

ACOUSTIC REPORT

Heggies (Report 10-5093R2 Revision 0) – Proposed Upgrade of Double Bay Marina Operation and Construction Noise Assessment

I refer to the acoustic report prepared by Heggies (Report 10-5093R2 Revision 0) – Proposed Upgrade of Double Bay Marina Operation and Construction Noise Assessment examining the potential noise impacts from the proposed redevelopment of the Double Bay Marina, 8 Castra Place, Double Bay.

The report has identified three potential noise sources likely to impact on nearby residential receivers. These sources identified are Operational Noise, Maintenance Activities and Construction Noise.

Noise Objective for Redevelopment of Double Bay Marina

Unattended noise monitoring was carried out in 10 Castra Place which is the adjacent residence to the east of the Marina. The monitoring was conducted from Wednesday 6 December 2006 to Wednesday 20 December 2006. As a result of the monitoring a ***Rated Background Level (RBL) of 45 dB(A) and a LAeq of 54 dB(A) was determined for the location at 10 Castra Place.*** (Refer to Table 3 in the report).

As part of a Joint Conference Report, an additional ambient noise survey was conducted at 6 Castra Place in November 2008. This Joint Conference Report has placed more importance on the weekend, rather than weekday ambient noise, as this corresponds to busy use times of the Marina. The report has used the Joint Conference Report noise levels as the 'project noise criterion' that was established in November 2008. The levels are summarised below:

| Daytime 0700 - 1800 | Evening 1800 - 2200 | Pre Midnight 2200 - 0000 | Night - time 0000 - 0700 |
|------------------------|------------------------|-----------------------------|-----------------------------|
| RBL | RBL | RBL | RBL |
| 42 | 37 | 35 | 33 |

Noise emissions from the site have been assessed against the DECC Industrial Noise Policy 'Intrusive & Amenity' Criterion. The 'Intrusive Criterion' controls noise impacts in the short term for residences while the 'Amenity Criterion' aims to limit continuing increases in noise levels (maximum ambient noise level) within an area from industrial sources specified in Table 2.1 of the INP.

As a result of the unattended noise survey conducted in November 2008, the following Project Specific Intrusive & Amenity Noise Goals are applicable to the proposed redevelopment pertaining to ***Operational Noise and Maintenance Noise Activities:***

| Time Period | Intrusive LAeq(15min) Criteria in dBA (RBL + 5 dBA) | Sleep disturbance LAmax criteria in dBA (RBL + 15 dBA) |
|------------------------------------|---|--|
| Day 7am - 6pm | 47 | - |
| Evening 6pm - 10pm | 42 | - |
| Pre Midnight 10pm - 12 midnight | 40 | 50 |
| Night 12 midnight - 7am | 38 | 48 |

Regarding ***Construction Noise Objectives***, reference is made to the NSW DECC "Interim Construction Noise Guideline July 2009" which sets out Noise Management Levels (NML) at residences and provides respite for residents exposed to excessive construction noise outside the recommended standard hours whilst allowing construction during the recommended standard hours without undue constraints. The ***Construction Noise Objectives*** are summarised below:

| Time of Day | Management Level LAeq(15min) | How to Apply |
|--|-------------------------------------|---|
| Recommended Standard Hours: Monday to Friday 7am – 6pm Saturday 8am – 1pm No work on Sundays or Public Holidays | Noise affected RBL + 10 dBA | <p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <p>Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise.</p> <p>The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</p> |
| Recommended Standard Hours: Monday to Friday 7am – 6pm Saturday 8am – 1pm No work on Sundays or Public Holidays | Highly noise affected 75 dBA | <p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <p>Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level.</p> <p>If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.</p> |
| Outside recommended standard hours | Noise affected RBL + 5 dBA | <p>A strong justification would typically be required for works outside the recommended standard hours.</p> <p>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.</p> |

Operational Activities

- The Marina office will be open from 9 am to 6 pm, 7 days during summer and 9 am to 5 pm, 7 days during winter with Marina users having 24 hour access via security gates.
- “On water” operation of the Marina has been described as passive with the primary noise source being boat engine noise as boats leave and arrive at the Marina and boat tender.
- Noise from combined use of mechanical plant equipment, including air conditioning, sewerage pumps and fuel pumps.
- The proposed redevelopment maintains essentially the same vessel layout as currently employed and therefore no significant change in noise levels are expected at both the southern and western residences.

Based on measurements of the Marina’s tender vessel and assuming a scenario with constant operation for 5 minutes, the LAeq(15min) noise level at the nearest residences is predicted to be 40 dBA, which complies with the LAeq(15min) daytime, evening and pre-midnight operational goals of 47 dBA, 42 dBA and 40 dBA respectively.

Given that the report itself specifies that Marina users have 24 hour access and boats may therefore leave and return at any time, it does not appear that measurements

based on a single vessel, being the Marina's tender vessel, would represent a worst case scenario where evening and pre-midnight operational goals may be exceeded. Indeed the operational goal for post midnight to 7 am would be exceeded by 2 dBA based on this measurement alone.

It is my opinion that the assessment should address noise resulting from speeds of vessel manoeuvring in proximity to the marina representing a worst case scenario, typical vessels and their noise generating capacity as well as Marina management regarding standard boating rules with respect to speed in proximity to the marina as issued by NSW Maritime and possible noise source computations.

Reference is made to Section 7.1.1 of the report where the Sleep Disturbance Noise Criterion is addressed in relation to Operational Noise. The report has applied the criteria only to people talking aboard a vessel moored at the Marina; for people talking outside the office; for people talking in the pedestrian access laneway and to the disposal of garbage.

In my opinion the Sleep Disturbance Noise Criterion should have also been applied for the assessment of boat engine noise when manoeuvring to and from the marina remembering that users having 24 hour access to the Marina and such events occur in the sudden acceleration of a boat engine. Therefore the Sleep Disturbance Criterion should be applied between the hours of 10 pm and 7 am using the maximum noise level or LA1, (1 minute), that is, the extent to which the maximum noise level exceeds the background level and the number of times this happens during the night time period (10 pm to 7 am).

For people talking aboard a vessel moored at the Marina; for people talking outside the office; and for people talking in the pedestrian access laneway and to the disposal of garbage, the report has recommended that noise arising from such activities be addressed through the Marina's Noise Management Plan and Code of Conduct. In my opinion this seems an appropriate noise mitigation strategy.

Reference is made to Section 7.2.2 of the report where noise from mechanical plant equipment is addressed, including air conditioning, sewerage pumps and fuel pumps. The report states that the combined use of such mechanical equipment should not exceed 47 dBA (daytime noise objective) at the boundary of the nearest affected residence. No noise attended measurements have been undertaken of such equipment to determine compliance or otherwise with the stated objective. Further, the report does not specify if such equipment operates past the daytime hours where Marina users might have access to fuel pumps and the like therefore requiring compliance with both pre-midnight and post midnight noise operational noise goal.

It should also be noted that the report has referred to the daytime noise objective of 47 dBA based on the NSW Intrusive Noise Criterion where the RBL plus 5 dBA is applied to the 15-minute LAeq noise emission of the noise source(s) at the boundary of residential receivers. If such mechanical plant is operational after daytime hours where background noise levels are at a lower level, it would be appropriate in order to maintain consistency that any noise emissions from such mechanical plant complies with Council's Noise Criterion for Mechanical Plant & Equipment, that is the noise

level measured at any boundary of the site at any time while the mechanical plant and equipment is operating must not exceed the *background noise level*.

Maintenance Activities

Maintenance activities will only occur during work hours which are 9 am to 6 pm, Monday to Friday and 9 am to 12.30 pm on Saturday. The current application proposes no change to the vessel maintenance operation with existing activities to continue which comprise of general repairs, cleaning and anti-fouling. The working area is approximately 6 m by 20 m adjacent to the office/workshop buildings and has a 3.5 m wall on the opposite side separating the slipway from the adjacent residence. During busy periods, up to 2 boats a day can be worked on in the maintenance area. Depending on the work that is to be carried out a range of tools can be used. The activities can include:

- Workshop Area: Winch lowering a boat back into the water; a winch raising a boat from the water; fuel pump under work area; garden hose on hull of vessel; high pressure cleaner on hull of vessel; 2HP 50L air compressor; and 125mm angle grinder.
- Wharf Area: 60HP outboard pass by; 60HP outboard tow boat bringing vessel to mooring; wave boat noise; and boat loading onto slipway.

The noise generated by the workshop is non-continuous where loud periods of work are inter-dispersed with quiet periods. The noisiest operation is the use of the high pressure water cleaner to remove mould and barnacles. The noise is generated from the machine vibrating on the ground as it operates as well as from the rotary head as it generates a pulsating water jet, resulting in regenerated noise from the ship's hull.

The daytime operational noise goal of 47 dBA has been used to determine compliance of maintenance activities occurring at the Marina which appears appropriate considering that such maintenance activities occur during work hours which are 9 am to 6 pm, Monday to Friday and 9 am to 12.30 pm on Saturday.

Based on calculated noise measurements, distance attenuation and perimeter fence shielding, noise level exceedances range from 3 dBA to 28 dBA as follows:

- Garden hose on hull: 50 dBA (+ 3 dBA)
- 50L Air compressor: 55 dBA (+ 8 dBA)
- Angle grinder: 57 dBA (+ 10 dBA)
- Pressure cleaner: 75 dBA (+ 28 dBA)

The only solution offered by Heggies in the report on the use of power tools at the Marina slipway to mitigate the noise is for such work where possible to occur inside the workshop. Where power tools are to be used external to the workshop, it is recommended to restrict the hours of use from 10 am to midday and 2 pm to 4 pm Monday to Friday. The cleaning of boat hulls using the water blaster at the Marina slipway is to be restricted between the hours of 10 am to midday and from 2 pm to 4 pm, Monday to Friday.

The above assessment cannot be accepted to represent the worst noise exceedances likely to occur from maintenance activities for the following reasons. The report has identified that primary noise sources from Maintenance Activities at the Marina to include winch lowering a boat back into the water; a winch raising a boat from the water; fuel pump under work area; garden hose on hull of vessel; high pressure cleaner on hull of vessel; 2HP 50L air compressor; and 125mm angle grinder. To represent 'worst case scenario' it would have been expected that the assessment would have predicted the cumulative effect of a number of maintenance activities likely to occur at the any one time. As an abundant precaution, the assessment could have been conducted on the assumption that three of the loudest plant items being operating simultaneously to demonstrate compliance or otherwise with the Intrusiveness Criteria of 47 dBA for the daytime period.

It is my opinion that Council should not accept noise exceedances of up to 28 dBA from maintenance activities for up to 4 hours a day, Monday to Friday. This is not considered an appropriate noise mitigation strategy. I would expect that the level of exceedance being exaggerated if a review of the noise assessment from maintenance activities is conducted by Heggies taking into consideration that three of the loudest plant items are operating simultaneously. It is recommended that a revised acoustic report explore alternative noise mitigation strategies in reducing the level of noise impacting on residential receivers as a result of maintenance activities to achieve the adopted operational daytime noise objective as stated in the report.

Construction Noise

To determine the acoustical impact of the upgrading of the Marina in relation to construction noise on surrounding residences, hand calculations were performed to identify significant noise sources and scenarios that could potentially affect the nearest residential properties.

The overall construction period is estimated at 9 weeks; 3 weeks for setup and removal of existing structures and 6 weeks for the installation of the new floating structure and landside work. For the upgrading of the Marina, the following items have been identified as the main sources of noise:

- Excavator (30t)
- Angle grinder
- Impact piling rig

A combination of the plant operating simultaneously has been adopted in the report to represent different scenarios. Scenario 1: Removal of existing structures + angle grinder; Scenario 2: Impact piling rig + Excavator (30t).

The noisiest operation will involve the impact piling with excavator. There will be approximately 55 piles to be installed and it is possible that two pile installation barges will be used, which will result in two piles being installed in any one day. The method of pile installation is explained in Section 8.2 of the report.

Most of the construction activity will be over water during the Marina refurbishment. There will be minimal shielding of noise where activities will affect most of the residents in the immediate area. The predicted noise levels are summarised below:

| Scenario | Plant Items | Sound Pressure Levels At 30m | Correction Factor | NML (dBA) | Predicted LAeq noise level (dBA) at the nearest residence | Exceedance |
|------------|-------------------|------------------------------|-------------------|-----------|---|------------|
| Scenario 1 | Angle grinder | 102 | -8 | 53 | 63 | 10 |
| Scenario 2 | Excavator 30t | 110 | -8 | 53 | 90 | 37 |
| | Impact piling rig | 134 | -6 | | | |

The Noise Management Level (NML) is derived from the daytime RBL being 42 dBA plus 10 dBA in accordance with the "Interim Construction Noise Guideline July 2009". This being the case the NML in the Table above should be 52 dBA, therefore affecting exceedances by an additional 1 dBA. The noisiest scenario involves the Excavator 30t and Impact pile rig with exceedances of the design target of up to 38 dBA, and not 37 dBA as stated in the report. The use of the angle grinder will exceed the daytime design goal by 11 dBA, and not 10 dBA as stated in the report.

The report does state that there will be approximately 55 piles to be installed and it is possible that two pile installation barges will be used, which will result in two piles being installed in any one day. Clarification is required by the proponent regarding the installation of the piles where two piles may be installed in any one day. Does this mean that simultaneously or overlapping those two piles may be installed in any one day? This being the case the Predicted Noise Levels as detailed in Table 8 of the report would be exaggerated and exceedances far greater than 38 dBA would be expected.

The noise mitigation strategies in Section 8.4.1 of the report details examples of strategies that could be implemented during the construction phase of the project. Although the Operational Strategies listed in Section 8.4.1 of the report seem practicable, I refer to the Table 2 in the report where according to the "Interim Construction Noise Guideline July 2009", where noise exceeds 75 dBA, the proponent should consider very carefully if there are any other feasible and reasonable ways to reduce noise to below this level. It is my opinion that the report has failed to explore practical engineering controls to limit noise emissions from piling activities in particular to near or below 75 dBA.

I am in agreement with the report to conduct regular compliance checks on the noise emissions; it is recommend that during 'high noise activity' that continuous noise monitoring should be undertaken at residential noise sensitive receivers to 'alert' of exceedences of projected noise goals. However, the report fails to explain of what actions will be taken to control noise emissions should exceedances occur during 'high noise activity'.

It is clear that Construction Noise during the 6 weeks for the installation of the new floating structure and landside work will create the loudest noise and although examples of noise control strategies have been identified in the report, a more project specific noise control strategy would be favourable. As such I would recommend that a Construction Noise and Vibration Management Plan being prepared by the proponent detailing the assessment methodology and noise control measures that would be applied during the construction phase of the proposed development. The reporting of the monitoring program during the Construction Phase shall identify all

exceedences and be made available at all times to the appropriate certifying authority. The reporting shall describe the date, time and nature of exceedence/incident; identify the cause (or likely cause) of the exceedence/incident; describe what action has been taken and describe the proposed measures to address the exceedence/incident.

An important part during the Construction Phase of the project is community consultation and I am in total agreement with the community consultation process as detailed in Section 8.4.1 of the report. It is recommended that the Community Consultation process be clearly explained in the Construction Noise and Vibration Management Plan to be prepared by the proponent.

Clarification is also sought by the proponent regarding comments made in the 'Conclusion' of the Heggies Report where the following comment is made regarding noise design criteria:

"An ambient noise survey was conducted and operation and construction design criteria developed in accordance with the NSW DEC's Industrial Noise Policy and Environmental Noise Control Manual. A daytime operational goal of 50dBA and construction goal of 55 dBA were set".

It appears from Section 6 of the report that the Project Specific Operational and Construction Noise Goals that a daytime Noise Management Level (NML) of 52 dBA applies to the Marina upgrade. This also applies to the daytime Operational Goal where 47 dBA should be the Project Specific Noise Goal.

DOUBLE BAY MARINA MANAGEMENT PLAN

I refer to the Double Bay Marina Management Plan of November 2009.

Section 1.3.4 Contact person (phone number): The management plan states that the contact number is to be advised. It is important that any revised Management Plan detail the contact person and contact number, including an after hours contact number as the Marina is available to users 24 hours a day. This is essential in particular when dealing with unruly behaviour or unacceptable noise by users of the Marina after hours.

Section 2.4 Sound Levels: This part of the management plan states that, "at the boundary of the nearest residence, the noise generated by the combined use of mechanical plant (air conditioning, pumps, maintenance plant, compressors and the like) shall not exceed the levels set out in the table below":

| PERIOD | LAeq (15 minute) dBA |
|-------------------|----------------------|
| 7 am to 6 pm | 47 |
| 6 pm to 10 pm | 42 |
| 10 pm to midnight | 40 |

Where noise from mechanical plant equipment is addressed, including air conditioning, sewerage pumps and fuel pumps the Project Specific Operational Goal is not considered appropriate for reason that it does not promote consistency with

Woollahra Council's Noise Criterion for Mechanical Plant & Equipment. It is recommended that the management plan be amended to state the following noise criterion for mechanical plant & equipment:

The noise level measured at any boundary of the site at any time while the mechanical plant and equipment is operating must not exceed the background noise level. Where noise sensitive receivers are located within the site, the noise level is measured from the nearest strata, stratum or community title land and must not exceed background noise level at any time.

The background noise level is the underlying level present in the ambient noise, excluding the subject noise source, when extraneous noise is removed.

This condition has been imposed to protect the amenity of the neighbourhood.

Note: Words in this condition have the same meaning as in the:

NSW Industrial Noise Policy

(http://www.environment.nsw.gov.au/resources/ind_noise.pdf)

ISBN 0 7313 2715 2, dated January 2000, and

Noise Guide for Local Government

(<http://www.environment.nsw.gov.au/noise/nlg.htm>)

ISBN 1741370671, dated December 2004.

ASSESSMENT OF SEDIMENT CONTAMINATION AND WASTE CLASSIFICATION

I refer to the Final Report (No. 43217511) prepared by URS dated 1 May, 2007.

Sediment investigation indicates generally higher concentrations of contaminants occur in sediments on the eastern side of the proposed dredge footprint area. Following waste classification assessment of the sediments after the first round of sampling in March 2006, concentrations of benzo(a)pyrene, lead (TCLP) and total PAH at the south eastern location (Site 2) and benzo(a)pyrene and total PAH at the north western location (Site 4) within the proposed dredge footprint showed an exceedance of the Solid Waste classification of the Waste Guidelines and accordingly would be classified as Industrial Waste (Site 4) and Hazardous Waste (Site 2).

Additional sampling of sediments was conducted near Sites 2 and 4 in May 2006 for benzo(a)pyrene and lead which resulted in an Industrial Classification for both sites due to the exceedances of the guideline values of benzo(a)pyrene at both sites.

The current waste classification based on the combined first and second round sampling at Sites 1, 2, 3 and 4 is:

- Sites 1 and 3: Solid Waste
- Sites 2 and 4: Industrial Waste

The investigation does state however that due to the spatial extent of the areas that comprise Solid Waste at Sites 1 and 3 and Industrial Waste at Sites 2 and 4 is unknown and would require additional sampling and analysis of sediments. Further, the report states that due to the small scale spatial variability of concentrations of

benz(a)pyrene and lead are likely to be high, both laterally and vertically, it is difficult to determine a separate waste stream into Solid and Industrial Waste. The report recommends that the entire dredge area be considered as a single waste stream.

The alternative would be to reassess the dredged sediments where additional sampling and analysis of the material prior to disposal at landfill would be required. This approach would require the storage of the dredged material pending the re-sampling, re-analysis and re-assessment of the dredged sediments.

Comments

As stated above, waste classification prior to landfill disposal would require additional sampling of dewatered dredge material. As the current sampling density is not sufficient to classify the dredged materials for landfill disposal, additional sampling and analysis would be required to minimise the uncertainty of contaminant concentrations. As such the proponent would require the preparation of an Acid Sulfate Soils Management Plan (ASSMP) to develop planned strategies for the disturbance of potentially acid sulfate soils.

Based on the findings in the Final Report (No. 43217511) prepared by URS dated 1 May, 2007, the recommendations detailed in Section 5 of the report are adopted:

- i. Sediments at Sites 1 and 3 would be classified as Solid Waste and sediments at Sites 2 and 4 would be classified as Industrial Waste.
- ii. Further sediment sampling and analysis would be required to determine the vertical and lateral extent of the Industrial Waste at Sites 2 and 4. Therefore an overall classification of Industrial Waste for dredged material within the proposed dredge area is recommended in order to generate a single waste stream.
- iii. The applicant prepares an Acid Sulfate Soil Management Plan (ASSMP) which is recommended to provide a methodology for mitigation of the impacts of acid sulfate soil disturbance.
- iv. The applicant provide information to the Aquatic Habitat Protection Unit of NSW Department of Industry and Investment as detailed in Attachment 1: Industry & Investment NSW Requirements for Reviewing Foreshore Developments accompanying letter dated 15 September, 2009 (Ref. No. OUT09/12168).