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From: David White <davidw@benedict.com.au>
To: David.Mooney@planning.nsw.gov.au
Date: 11/11/2013 9:48 AM
Subject: Moorebank Recyclers 0157

David,

In response the exhibition of the PPR we have asked an acoustic expert to look at the issues raised in the PPR in relation to noise. This report which includes modelling of the impacts of the new access arrangement is expected to be completed today I anticipate having it to you by COB.

In summary the report will confirm our contention that the proposed development cannot meet the required noise amenity guidelines given the proximity of the surrounding residential and recreational zones . We also correct some factual errors - one being that Moorebank contends there are no residences on the Tanlane (Benedict) property. We confirm that there is a residence currently on this property.

Any questions please don't hesitate to contact me.

Regards

Sent from my iPad

David White 0434 560 022

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BENEDICT INDUSTRIES PTY LTD

ABN 46 001 926 503

8 November 2013

Mr David Mooney
Senior Planner Industry Projects
Department of Planning & Infrastructure

By email: david.mooney@planning.nsw.gov.au

Re: Major Project 0157 - Exhibition of Preferred Project Report

Dear David

We wish to make the following submissions in relation to the Preferred Project Report:

1. **Air Quality**

   We note that the air quality report prepared by Pacific Environment Limited states that it was prepared by a Ms J Cox and it was reviewed by Mr B Lawson and Mr N Kennan, neither of whom have qualifications or experience in air quality science and who are clearly associated with the proponent. On this basis we would question the technical integrity of the report. Accordingly, we submit that this report cannot be relied upon as an experts report.

2. **Noise Issues**

   We contend that the noise impact assessment prepared by Wilkinson Murray (Report No. 03124/DA Version D, August 2013) contains significant errors and omissions. This report indicates that, based on advice from the EPA, there is no need to consider that the Tanlane land (which is currently zoned R3 Residential in the Liverpool LEP) as being considered as residential premises for the purposes of the noise assessment. The apparent rationale expressed by the EPA is that the proponent is somehow not obliged to consider the Tanlane land as residential as approval for residential development is not guaranteed or may not occur for some time. This is clearly a major error as the LEP identifies a significant portion of the northern part of the Tanlane site as Residential Zone R3. In addition, the northern portion of the site currently has an existing residence which has been overlooked by the proponent and various consultants undertaking the noise impact assessments. The existence of this longstanding residence has been pointed out to the proponent but has been deliberately ignored in the noise impact assessments undertaken to date. We also note that the EPA's own Industrial Noise Policy (INP) mandates that the appropriate noise amenity criteria is based on the existing zoning of the land.

   In relation to the residential R3 zoned land on the northern portion of the Tanlane site not yet being approved for residential development, we note that a Voluntary Planning Agreement has been executed with the Council which provides for up to 225 separate dwelling lots. This fact, in addition to the already existing residence on the property confirms the need for the proponent to adequately assess the impacts of the proposed development on this residential zone.

   In addition, no mention is made of the noise impacts on the areas zoned public and private recreation. In particular we are very concerned that the impact on the amenity on the public recreation areas will exceed the amenity criteria outlined in the EPA's Industrial Noise

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Policy which is set at 50dBA and 55dBA for passive and active recreation respectively.. We request that additional noise studies be undertaken to ascertain the impact on the public and private recreation areas. We note that the noise monitoring and predicted noise locations set out on page 9 of the report do not include any of the public recreation areas. This is a major oversight and requires rectification before any approval could be granted.

We note that Table 4-1 of the Wilkinson Murray report summarises the noise criteria adopted for the assessment of the materials recycling facility. The report goes on to state that "this also includes amenity criteria for active and passive recreation." However, the report itself does not have any monitoring or predictive levels for the private and public recreation zones immediately adjoining the proposed Moorebank Recyclers development.

In fact, Figure 2-23 shows clearly that the private recreation zones on the Benedict land will experience noise levels predicted by the proponent themselves which clearly exceed the amenity criteria outlined in the EPA's Industrial Noise Policy, being 50 and 55 dbA respectively for passive and active recreation areas. As the proponent has not addressed either of these recreational area issues the assessment is seriously deficient and the proposal should not be approved.

These issues have been addressed in a report by our acoustic expert which is attached. The Results of this assessment as as follows:

- ***Noise levels are predicted to exceed criteria at proposed Georges Fair residences adjacent Brickmakers Drive by up to 9 dB (location GF_01). The barrier versus no barrier result is unchanged as this receiver as it is almost directly opposite the bridge crossing and hence the barrier does not provide any shielding to this property from the closest trucking operations on the ramps. Our results are higher than those presented by both Wilkinson Murray and Renzo Tonin, which cannot be explained;***

- ***Noise levels are predicted to exceed criteria at existing Elouera Crescent residences;***

- ***Noise levels are predicted to exceed criteria at future Tanlane residences by up to 9 dB (location T_14) with no access road barrier. This Tanlane location is potentially the closest future receiver to the access road and bridge crossing. The noise contours (Figure A in Appendix A) shows that the criteria (49 dB(A)) is predicted to be exceeded across approximately 50% of the Tanlane land, which is a significant impact. Discussions around the feasibility of a road barrier or tunnel is provided below. Our predictions are 6 dB higher than Renzo Tonin's barrier scenario.***

- ***Noise levels are predicted to exceed criteria at existing Bradbury Street residences by 3 dB, without a barrier and by 2 dB with a barrier.***

- ***Noise levels are predicted to exceed criteria at future passive recreation areas (foreshore area) of the proposed marina.***

There is a significant discussion around adoption of road side noise barriers or even a tunnel to achieve compliance with noise criteria. One consideration of this is cost. Typical road side barrier cost estimates we have been provided on other projects suggest a minimum cost of approximately $2000 per lineal metre of barrier. For the current project, this would total $4M for both sides of the access road and ramps. We cannot hazard a guess at the cost of a tunnel as suggested required by Renzo Tonin to achieve criteria. In our opinion a barrier or tunnel option do not constitute reasonable and feasible noise mitigation and should not be considered further.

The full report is attached

3. **Water Management**

The water management and pollution control assessment undertaken by Evans & Peck raises a number of serious concerns.

We note that on page 3 the applicant states "The works which have been approved to date (under Liverpool Council approved Earthworks Development Application 1417/05) involved the excavation of approximately 40,000m^3 of spoil from the southern portion of the site in order to reinstate the original natural ground levels." We are concerned that this 40,000m^3 (i.e. 60,000 plus tonnes) will contain significant amounts of construction and demolition waste and possibly other industrial and hazardous waste materials which may be entirely unsuitable for use on the northern end of the site as proposed by Moorebank Recyclers. We note that the proponent proposes that "the excavated material from the southern end of the site will be used to construct a series of perimeter mounds and to fill the operational areas of the site, designated as Area 1 on Figure 1."

Our Flood Expert Mr Mark Tooker of NPC Consultants has also made the following comments in relation to the Proposed Site Filling claimed to be approved by Council previously (DA 1417/05).

"The use of a one dimensional (1D) flood model to assess the impacts of significant filling in a complex flood area is technically inappropriate as it would be technically unable to accurately determine impacts on flood levels and velocities on surrounding properties.

In addition to this, there is no assessment of the impact on flood velocities on adjacent properties especially around the 8m high mound. While it is claimed that excavation at the southern end of the site will balance the fill volume, this will not mitigate the impacts on adjoining properties of the 8m mound at the northern end of the site.

The flood impacts of this extensive filling needs to be assessed with a 2D flood model so the potential impacts can be accurately assessed. This is accepted practice by the Council and the industry and to not model it in this way is highly irregular. The assessment of such a large project should not rely upon outdated methods and substandard inappropriate flood models."

4. **Waste Issues**

As the spoil material is clearly waste and may well contain hazardous materials, the EPA will be required to license the northern portion of the site as a landfill activity. In addition, any approval to utilise this material in this manner will need to incorporate stringent conditions relating to the classification and assessment of the waste material that is being exhumed as spoil from the southern portion of the site. It may well be that this material will need to be transported off the site to an appropriately licensed landfill to deal with this material. The point which we wish to highlight is that this spoil is waste material which has the potential to be severely contaminated due to the activities formerly carried out on the site owned by the proponent, which was an industrial landfill operated by the TNT Group.

We suggest that the construction of the bund wall and the raising of the land for the platform should only be undertaken with material that was certified as virgin excavated natural material (VENM) as defined by the EPA.

5. **Operating Hours**

We note that the proponent still seeks to obtain approval for operations from Monday to Saturday 7:00 AM to 6:00 PM with the operation of the crushers being restricted to 7:00 AM to 5:30 PM. Standard industry operating hours imposed by the EPA on other recycling facilities and quarries require operations on Saturdays to be from 8:00 AM to 1:00 PM only.

Given that the hours of operation was one of the principal issues raised by numerous submissions this demonstrates that the proponent will not accommodate the interests of adjoining residences and neighbours. Accordingly, there is no willingness by the proponent to submit a Preferred Project Report that had bona fide intentions of minimising the environmental impact of the proposed development.

6. **Other Matters**

At page 2-53 of the Submissions Preferred Project Report and Revised Statements of Commitments, the proponent states at paragraph 2.6.2: "There is no evidence presented which would lead to a conclusion that the Benedict Sand and Gravel operations will cease within the next 18 months."

This statement is deliberately misleading. Benedict (the owner of the Tanlane land) has indicated that it is our intention to cease operations there within the next 18 months. The land is zoned residential and we are currently dealing with major development companies to develop a residential precinct on the R3 zoned Tanlane land. Benedict has spent millions of dollars in legal fees and court cost to secure an easement to facilitate access for this residential precinct. No residential development is possible until this access is secured. The hearing to determine the costs of this easement is scheduled for 11 and 12 November 2013. Moorebank Recyclers have been misleading in suggesting that there has been no attempt by Benedict to undertake residential development when Moorebank Recyclers have embarked on court action since 2008 to oppose the access to allow this development to occur.

6. **Traffic Movements**

In respect of traffic movements we note that the proponent contends that the site will be operational for 292 days per annum. We believe that this is an excessively optimistic view and that this figure has been used to spread the proposed vehicle movements over the longest period of time possible. Accordingly the traffic studies, with particular reference to the Impact on Intersection Performance, should be re-done with a more realistic assumption of the number of working days which specifically takes into account public holidays, Christmas shutdown, and other operational interruptions.

7. **Visual Amenity**

We note that the report states on page 2-75 that: "It is proposed once the Marina Function Centre development has been approved and the construction levels obtained by way of a construction certificate, that the visual impact would be reassessed and, if required, the northern bund would be raised by way of an amendment pursuant to Section 75W." We note that the marina is currently being considered by the JRPPand that the visual impacts of the proposed development on the marina precinct are well known by the proponent. Accordingly, the visual impact statement needs to be re-done immediately in order to assess the impact on this development.

Yours sincerely

Ernest Dupere
Director

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Moorebank Noise

Moorebank Recyclers Pty Ltd | Moorebank Recyclig Facility Noise

Prepared for Moorebank Joint Venture | 11 November 2013

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Moorebank Noise

Final

Report J13116RP1 | Prepared for Moorebank Joint Venture | 11 November 2013

Approved by	**Najah Ishac**
Position	Director
Signature	
Date	11/11/13

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at or under the times and conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

Document Control

Version	Date	Prepared by	Reviewed by
V1	11/11/13	N.Ishac	D.Weston

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Appendices

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1 Introduction

1.1 Overview

EMGA Mitchell McLennan Pty Limited (EMM) has been commissioned by Moorebank Joint Venture to review noise emission from the proposed material recycling facility, that is, the Moorebank Recycling project by Moorebank Recyclers Pty Ltd (Moorebank).

The Moorebank Joint Venture (our client) has interests in land adjoining to the north of the proposed recycling facility, which is proposed for a marina and passive recreation areas, as well as land further north which is zoned for residential development and passive recreation areas (Tanlane). These areas along with existing residences of Georges Fair to the west of Brickmakers Drive and an existing residence north of the Tanlane land are the focus of our assessment of potential noise impact from the proposed Moorebank Recycling project.

The noise impact assessment of the proposed Moorebank Recycling project has been carried out with reference to the following guidelines and policies:

- *The NSW Industrial Noise Policy* (INP, EPA 2000); and
- *The Road Noise Policy* (RNP, EPA 2011).

The INP applies to the proposed recycling facility sources, including the trucking movements on the access road and ramps at the proposed bridge crossing to Brickmakers Drive. Outside of these areas, the trucking noise is assessable against the RNP (eg once the trucks are on Brickmakers Drive and other public roads).

Upon initial review it was evident that the proposed truck access road and corresponding on and off ramps from the proposed bridge crossing to Brickmakers Drive are the most relevant with respect to potential for noise impacts.

1.2 Reference material

In completing our study we have reviewed and sourced input from several documents provided to us by our client. These include the following documents:

- Traffic report for Construction and Operation of a Materials Recycling Facility on Lot 6 DP 1065574 Newbridge Road, Moorebank (Lyle Marshall & Associates Pty Ltd dated November 2012)
- Moorebank Recycling Facility Noise Impact Assessment (Wilkinson Murray Pty Ltd dated November 2012)
- Moorebank Recycling Facility Noise Impact Assessment (Wilkinson Murray Pty Ltd dated August 2013)
- Liverpool Council Local Environmental Plan (LEP) 2008 map
- Materials Recycling Facility Preferred Project Report dated 15 August 2013 (Nexus Environmental Planning Pty Ltd
- Various plans and drawings showing the proposed bridge crossing to Brickmakers Drive, proposed marina facility and surrounding lot boundaries etc.

- Moorebank Recyclers Pty Ltd -V- Liverpool City Council - L&E Court Proceedings No. 30141 of 2013 - Materials Recycling Facility at Newbridge Road, Moorebank - Response to Cooper Affidavit (Renzo Tonin 14 May 2013)

The above reference documents provide important input material we need to carry out our investigations and assessment. Of particular relevance are the site and plant layout, sound emission data, recent background noise monitoring data and mitigation measures described in the Wilkinson Murray report and truck movement data in the traffic report.

In conducting our noise modelling of site emissions and trucking movements along the proposed access road and bridge, we attempted to maintain as much consistency with methods and assumptions put forward by Wilkinson Murray and Renzo Tonin to minimise disagreements and debate. To that end, we concur with most elements of the methods and assumptions presented by Renzo Tonin, with exception of the final results, outcomes and conclusions.

1.3 Project description

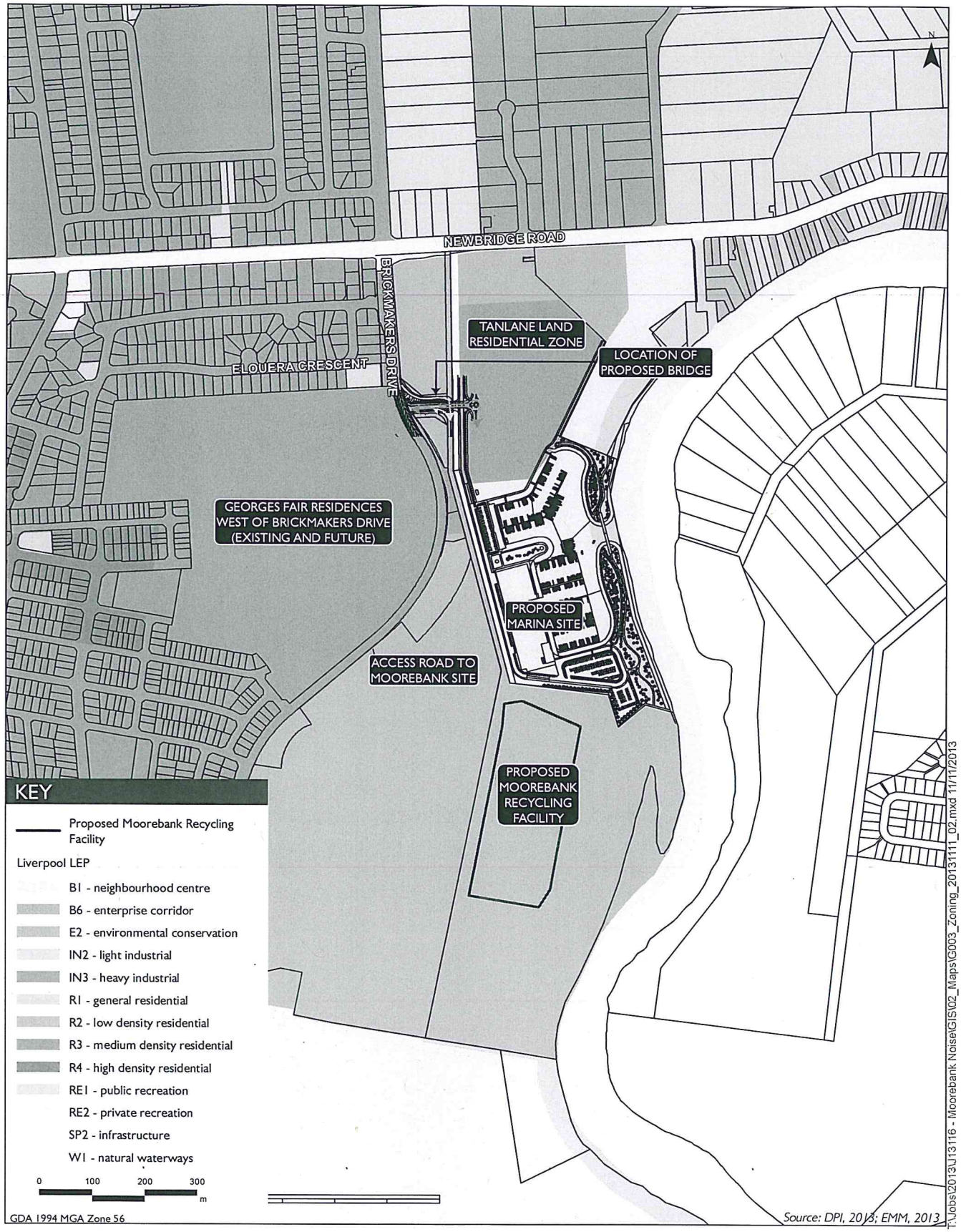
Figure 1.1 provides an overview of the site location, truck access road and ramps, and background noise monitoring locations as presented by others. In addition, noise impact assessment locations as identified by others and ourselves are shown. Figure 1.2 is also provided and shows the Liverpool Council Local Environmental Plan (LEP, 2008) zoning for reference.

Features of the area include Brickmakers Drive which runs generally north south, linking Newbridge Road to the north with Nuwarra Road to the south. The Moorebank site is located to the east of Brickmakers Drive, with the truck access road running between the site and Brickmakers Drive as shown in Figure 1.1.

EMM has been involved with various studies in the past including monitoring of works for Boral at the former brick works, the demolition of the brickworks, assessment of road traffic along Brickmakers Drive during its design and during development of the Georges Fair residential area. We are therefore intimately familiar with the area having visited these properties, including the proposed bridge crossing area to Brickmakers Drive.

Proposed Moorebank recycling facility, access road, background noise monitoring, assessment locations and surrounding properties

Figure 1.1



EMM

LEP Zoning

Figure 1.2

The pertinent points relating to the proposed Moorebank recycling facility for our study include the following:

- operating hours of 7am to 6pm Monday to Saturday; and
- truck movements of 324 per day and 38.5 in a busy hour as per the traffic report.

1.4 Noise sensitive receptors

Our study includes noise contours overlayed on a base map showing the surrounding land uses and hence depicts locations of noise sensitive receptors potentially impacted by the proposed recycling facility. The areas of most interest include:

- existing residence north of the Tanlane land;
- Tanlane land residential zone;
- Georges Fair residences west of Brickmakers Drive (existing and future);
- Elouera Crescent residences west of Brickmakers Drive;
- marina recreational area to the north; and
- passive recreation areas to the north and east of the site.

2 Existing noise environment

The area is characterised by local traffic on Brickmakers Drive, more distant traffic on Newbridge Road and otherwise the residential areas nearby are considered typical of suburban Sydney.

The existing noise environment has been defined and quantified by others including Wilkinson Murray and Renzo Tonin. We have reviewed the methods used by both to derive representative background noise levels used in setting noise criteria, and compared these methods against the INP, which is the authority on background noise level and criteria derivation. We found the following:

- Representative rating background noise levels (RBL) for locations considered most relevant to this study as measured or otherwise determined are:
  - 28 Elouera Cr, Moorebank - 42 dB(A) daytime, 40 dB(A) evening and 35 dB(A) night time (Wilkinson Murray May 2013 data)
  - 28 Elouera Cr, Moorebank - 43 (Renzo Tonin). It should be stated that the data presented does not satisfy the INP's minimum seven day requirement and only six daytime samples are used to derive the RBL. In such situations it is prudent to adopt the minimum ABL, which in this case would be 41.5dB(A) ignoring Sunday when the site is not proposed to operate. This is consistent with the Wilkinson Murray finding above of 42dB(A).
  - 41 Elouera Cr, Moorebank - 44 dB(A) daytime weekdays, 42 dB(A) daytime for Saturdays (Renzo Tonin). It should be stated that the data presented does not satisfy the INP's minimum seven day requirement and only five daytime samples are used to derive the RBL. Notwithstanding, the five samples presented are consistent (for weekdays) and the final RBL is therefore considered representative.
  - Bushview Lane Georges Fair - 47 dB(A) daytime weekdays, 45 dB(A) daytime for Saturdays (from Wilkinson Murray / Renzo Tonin and Renzo Tonin respectively)
  - Bradbury Street Georges Fair - 36 dB(A) daytime weekdays, 34 dB(A) daytime for Saturdays (from Wilkinson Murray and Renzo Tonin respectively)
  - Martin St Milperra - 43 dB(A) daytime (Wilkinson Murray).

The two studies (by Wilkinson Murray and Renzo Tonin) include an adjustment of the above RBL values to establish representative values at locations closer to Brickmakers Drive and the Tanlane property. The Wilkinson Murray method includes an adjustment for future traffic associated with increases along Brickmakers Drive. This approach was not supported by Renzo Tonin, stating that background levels are set by distant traffic and not local traffic conditions. We agree that such an adjustment to RBLs is not valid.

However, Renzo Tonin made an adjustment to measured RBLs taken at Elouera Crescent and estimated higher values for the George's Fair receptors further south from monitoring locations. This is said to have been based on additional attended measurements at GF_01 (the Georges Fair location) and we assume by correlating with simultaneous readings at Elouera Crescent (correlation details were not provided). This approach is valid, however we note that the monitoring location GF_01 as shown in photographs in the Renzo Tonin report is fronting and relatively close and exposed directly to Brickmakers Drive traffic. This location may be representative of dwellings fronting Brickmakers Drive, but is not considered suitable for

dwellings further back nor is it considered representative for the Tanlane residential zone as suggested by Renzo Tonin. The future dwellings for Tanlane will be considerably further from Brickmakers Drive.

The only way forward with RBLs is to adopt those derived from long term unattended monitoring without adjustments, as listed above, for Georges Fair and Tanlane land. This approach is only marginally different to those put forward by Wilkinson Murray and Renzo Tonin (in part), but is logical, reasonable and representative for the reasons described above. It is not normally or in this situation responsible to do otherwise. This is because monitoring data is only a snapshot in time that provides a window into a select period in the year, which we know changes from week to week and month to month, and therefore we must be cautious not to inflate background noise data, which in turn leads to inflated criteria.

3 Criteria

3.1 Industrial Noise Policy

The noise emission from any industrial source associated with the proposed Moorebank Recyclers development, such as on-site plant and equipment, processing plant and truck movements on the private access road, should be controlled to avoid impact upon the acoustic amenity of nearby properties.

The EPA oversees the Industrial Noise Policy (INP) which provides a framework and process for deriving noise criteria. The INP criteria for industrial noise sources have two (2) components:

1. Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and

2. Maintaining noise level amenity for particular land uses for residents and sensitive receivers in other land uses.

This approach was adopted by both Wilkinson Murray and Renzo Tonin.

3.1.1 Assessing intrusiveness

For assessing intrusiveness, the background noise generally needs to be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than 5 dB(A) above the measured RBL, over any 15 minute period.

3.1.2 Assessing amenity

The amenity assessment is based on noise criteria specific to land use and corresponding sensitivity to noise. The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. The criteria relate only to other continuous industrial-type noise and do not include road, rail or community noise. If the existing (measured) industrial-type noise level approaches the criterion value, then the Policy sets maximum noise emission levels from new sources with the objective of ensuring that the cumulative levels do not significantly exceed the criterion. The INP classifies the noise environment of the subject area as "Suburban".

3.1.3 INP project specific noise levels (PSNLs)

The resulting project specific noise level (PSNL) criteria for the proposed recycling facility are therefore as follows:

- Residences in the vicinity of 41 Elouera Crescent, Georges Fair and Tanlane residential
  - Intrusive criteria ($L_{eq,15min}$) Daytime - 49 dB(A) weekdays and 47 dB(A) Saturdays
  - Amenity criteria ($L_{eq,11hour}$) Daytime - 55 dB(A)
- Residences in the vicinity of 28 Elouera Crescent:
  - Intrusive criteria ($L_{eq,15min}$) Daytime - 47 dB(A)
  - Amenity criteria ($L_{eq,11hour}$) Daytime - 55 dB(A)

- Residences in the vicinity of Bushview Lane Georges Fair:
  - Intrusive criteria ($L_{eq,15min}$) Daytime - 52 dB(A) weekdays and 50 dB(A) Saturdays
  - Amenity criteria ($L_{eq,11hour}$) Daytime - 55 dB(A)
- Residences in the vicinity of Bradbury Street Georges Fair:
  - Intrusive criteria ($L_{eq,15min}$) Daytime - 41 dB(A) weekdays and 39 dB(A) Saturdays
  - Amenity criteria ($L_{eq,11hour}$) Daytime - 55 dB(A)
- Passive recreation (foreshore area of the proposed marina (walking tracks etc.))
  - 50 dB(A) $L_{eq,period}$ when in use
- Active recreation (golf course to the south, the proposed marina (defined in Council's zoning as recreation use))
  - 55 dB(A) $L_{eq,period}$ when in use

The key differences in the criteria above to those presented by Wilkinson Murray and Renzo Tonin are they are marginally lower for residential land and 10 dB lower for the marina due to varying definitions of its use. Liverpool Council's LEP 2008 zone RE1 and RE2 are public and private recreation respectively. The proposed marina site is within RE2 (private recreation), while the foreshore strip is public recreation. The definition of a commercial receptor in the INP is that of a business zone in an LEP, which is not the case here.

3.2 Road Noise Policy

The principle guidance to assess the impact of road traffic noise on noise sensitive receptors is in the NSW EPA's *Road Noise Policy* (RNP, 2011). Table 3.1 presents the road noise assessment criteria for residential land uses, reproduced from Table 3 of the RNP.

Table 3.1 Road traffic noise assessment criteria for residential land uses

Road Category	Type of project/development	Assessment criteria – dB(A)	
		Day (07:00-22:00)	Night (22:00 – 07:00)
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments.	$L_{eq,15hr}$ 60 (external)	$L_{eq,9hr}$ 55 (external)
Local Roads	Existing residences affected by additional traffic on existing local roads generated by land use developments.	$L_{eq,1hr}$ 55 (external)	$L_{eq,1hr}$ 50 (external)

Additionally, the RNP states where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2 dB.

3.2.1 Relative increase criteria

In addition to meeting the assessment criteria, any significant increase in total traffic noise at receptors must be considered. Receptors experiencing increases in total traffic noise levels above those presented in Table 3.2 should be considered for mitigation.

Table 3.2 Relative increase criteria for residential land uses

Road Category	Type of project/development	Total traffic noise level increase - dB(A)	
		Day (07.00 am to 10.00 pm)	Night (10.00 pm to 07.00 am)
Freeway/arterial/sub-arterial roads and transitways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road.	Existing traffic $L_{eq(15\text{-}hr)}$+12 dB (external)	Existing traffic $L_{eq(9\text{-}hr)}$+ 12 dB (external)

The issue of road traffic noise on public roads (eg Brickmakers Drive) is considered to have been adequately addressed in previous studies, most recently in the Renzo Tonin affidavit. EMM completed a study previously relating to Brickmakers Drive during its design process (excluding the trucks subject of the proposed recycling facility) and consider Renzo Tonin's report to be satisfactory. Hence no further analysis is included regarding trucks on public roads, except that it is clear that having an additional 324 truck movements on the northern section of Brickmakers Drive can only mean an increase in traffic related noise to residences in the vicinity. This increase is depicted in the Renzo Tonin report as being not more than 2 dB as an average across the daytime 15 hour period. This may be the case, however having an additional 324 daily movements and associated maximum noise level events will only serve to exacerbate the annoyance of local residents near Brickmakers Drive.

4 Noise modelling

4.1 Meteorological effects on received noise levels

The INP provides procedures for identifying and combining prevailing meteorological conditions at a site (referred to as a 'feature' of the area) and assessing the noise levels against the relevant criteria. In the absence of comprehensive data, the INP provides default weather conditions to be used to assess impact. This includes adoption of a 3 m/s wind from source to receiver.

Data obtained from the Bureau of Meteorology's website indicates prominent wind directions include westerly, south westerly and north westerly in the mornings and easterlies and south easterlies in the afternoons. This is based on 9am and 3pm observations between 1968 and 2010. The Wilkinson Murray study adopts a 3m/s wind speed for the directions of all receivers to capture a worst case scenario, and we have maintained this approach.

4.2 Modelling

This section presents the method and base parameters used to model noise emission from the site, including the effect of prevailing meteorological conditions on received noise levels.

Noise predictions were carried out using the ISO9613 algorithm incorporated into Brüel and Kjær Predictor software. 'Predictor' calculates total noise levels at receptors from the concurrent operation of multiple noise sources. The model considers factors such as the lateral and vertical location of plant, source-to-receptor distances, ground effects, atmospheric absorption, topography and applicable meteorological conditions.

The Wilkinson Murray and Renzo Tonin report notes the use of ISO9613.

The emission factors for the on-site plant proposed for the recycling facility was obtained from the Wilkinson Murray reports, as was the levels from trucks using the access road and bridge crossing. The bunding around the recycling plant as shown in the site plans within the Wilkinson Murray reports was also digitised into our model and therefore we consider these aspects consistent. No detail is provided in relation to these elements in the Renzo Tonin study and therefore we are not able to comment on any differences here.

However, the critical element in all the modelling is the access road and bridge crossing ramps. The Wilkinson Murray study deals with this by modelling the road as a 'line' source, while the Renzo Tonin report does not specify any details. We have adopted the line source method in our model with $L_{eq,15min}$ sound power emission values as per the Wilkinson Murray report of 78dB(A)/m for 10 truck movements on the main north south section of the access road. However, the inbound and outbound ramps on the proposed bridge crossing are better represented using point sources based on measured data for similar operations, rather than the line source method adopted by Wilkinson Murray. The Renzo Tonin report suggests a similar approach although no details are provided. In adopting a point source approach, we maintained some consistency with the Wilkinson Murray report by using their emission factors of:

- 75dBA/m for 5 truck movements on the down ramp section of the bridge crossing; and
- 81dBA/m for 5 truck movements on the up ramp section of the bridge crossing.

The modelling included a barrier for the access road and ramps as per Renzo Tonin's report.

4.3 Results

The results of our noise modelling is shown in Table 4.1 and depicted graphically in Figure 4.1. The results show:

- Noise levels are predicted to exceed criteria at proposed Georges Fair residences adjacent Brickmakers Drive by up to 9 dB (location GF_01). The barrier versus no barrier result is unchanged as this receiver as it is almost directly opposite the bridge crossing and hence the barrier does not provide any shielding to this property from the closest trucking operations on the ramps. Our results are higher than those presented by both Wilkinson Murray and Renzo Tonin, which cannot be explained;

- Noise levels are predicted to exceed criteria at existing Elouera Crescent residences;

- Noise levels are predicted to exceed criteria at future Tanlane residences by up to 9 dB (location T_14) with no access road barrier. This Tanlane location is potentially the closest future receiver to the access road and bridge crossing. The noise contours (Figure A in Appendix A) shows that the criteria (49 dB(A)) is predicted to be exceeded across approximately 50% of the Tanlane land, which is a significant impact. Discussions around the feasibility of a road barrier or tunnel is provided below. Our predictions are 6 dB higher than Renzo Tonin's barrier scenario.

- Noise levels are predicted to exceed criteria at existing Bradbury Street residences by 3 dB, without a barrier and by 2 dB with a barrier.

- Noise levels are predicted to exceed criteria at future passive recreation areas (foreshore area) of the proposed marina.

There is a significant discussion around adoption of road side noise barriers or even a tunnel to achieve compliance with noise criteria. One consideration of this is cost. Typical road side barrier cost estimates we have been provided on other projects suggest a minimum cost of approximately $2000 per lineal metre of barrier. For the current project, this would total $4M for both sides of the access road and ramps. We cannot hazard a guess at the cost of a tunnel as suggested required by Renzo Tonin to achieve criteria. In our opinion a barrier or tunnel option do not constitute reasonable and feasible noise mitigation and should not be considered further.

Table 4.1 Predicted noise levels (EMM and others) vs criteria

Receiver	No Access Road Barrier		Access Road Barrier		Renzo (Rd Barrier)	Wilko (No Rd Barrier)		Criteria
	Calm	Wind	Calm	Wind				
					Adverse	Calm	Adverse	Day
GF01	58	58	58	58	43	-	-	49
28 Elouera	46	48	45	48		-	-	47
T-01	48	49	43	45	36	-	-	49
T-08	50	51	45	47	39	-	-	49
T-09	53	54	49	50	41	-	-	49
T-14	58	58	49	49	43	-	-	49
T-19	56	57	47	48	43	-	-	49
5R	49	51	45	47		52	53	49
4K	56	57	46	47		53	54	49
4M	50	52	46	48		48	51	49
4N	56	57	58	58		53	54	49
Bradbury	39	42	38	41		30	34	39
Bushview	43	45	41	44		-	-	50
Existing	38	40	36	39		-	-	49
Recreational areas								
Marina passive Rec	49	51	48	49		-	-	50
Marina 5I	54	55	49	50		55	56	55
6	45	48	44	47		46	50	55
7 (Golf)	43	46	42	45		42	46	55

Notes: *1.The wind scenarios are for 3m/s winds.*

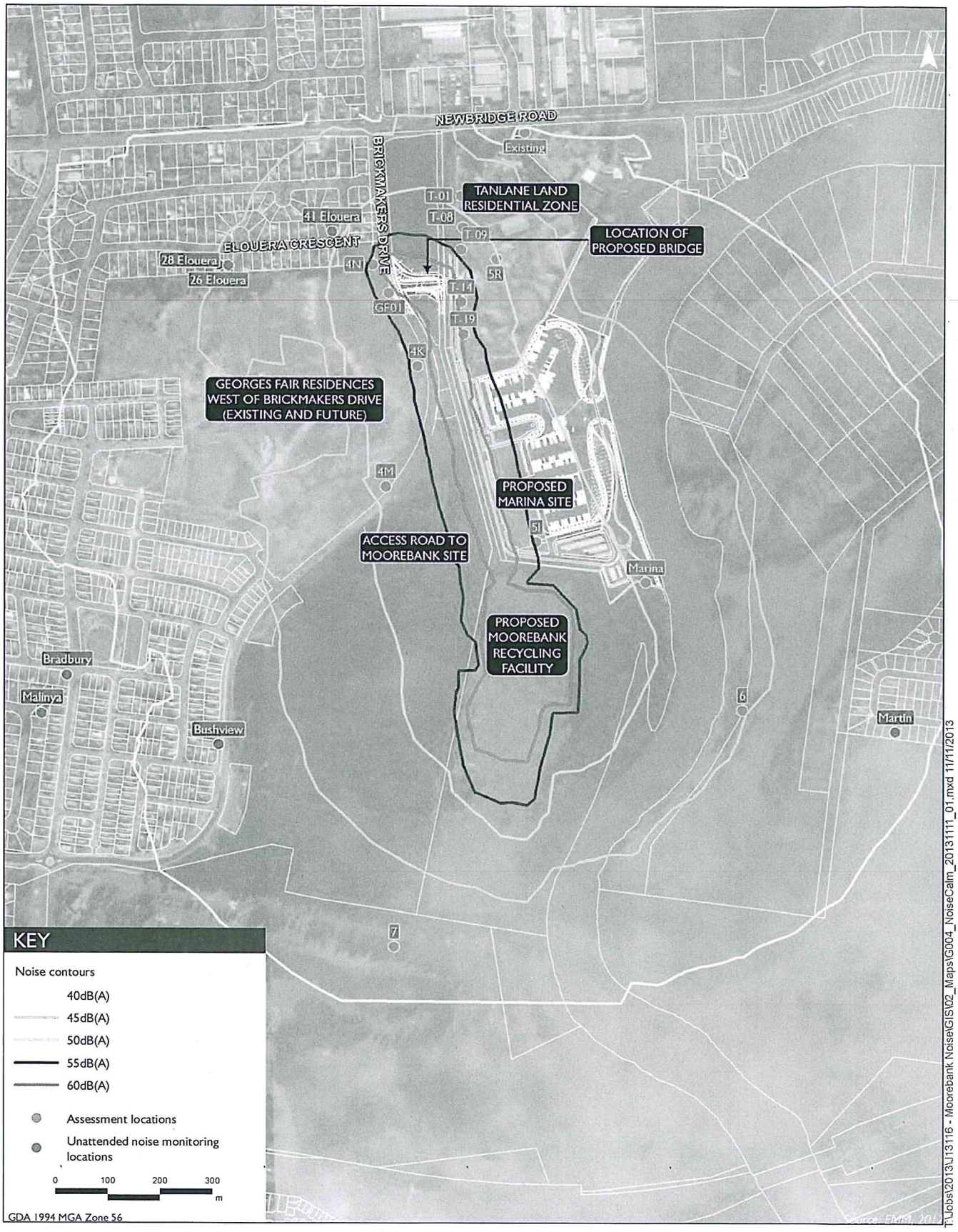
2. Renzo = Affidavit by Renzo Tonin May 2013; Wilko = Wilkinson Murray August 2013

5 Conclusion

EMM has completed a review and assessment of the proposed Moorebank Recycling Facility and conclude that truck movements along the proposed site access road and bridge crossing ramps cannot be reasonably and feasibly mitigated to achieve noise criteria. Of most significance is the exceedance of criteria across approximately 50% of the residentially zoned Tanlane land.

Appendix A

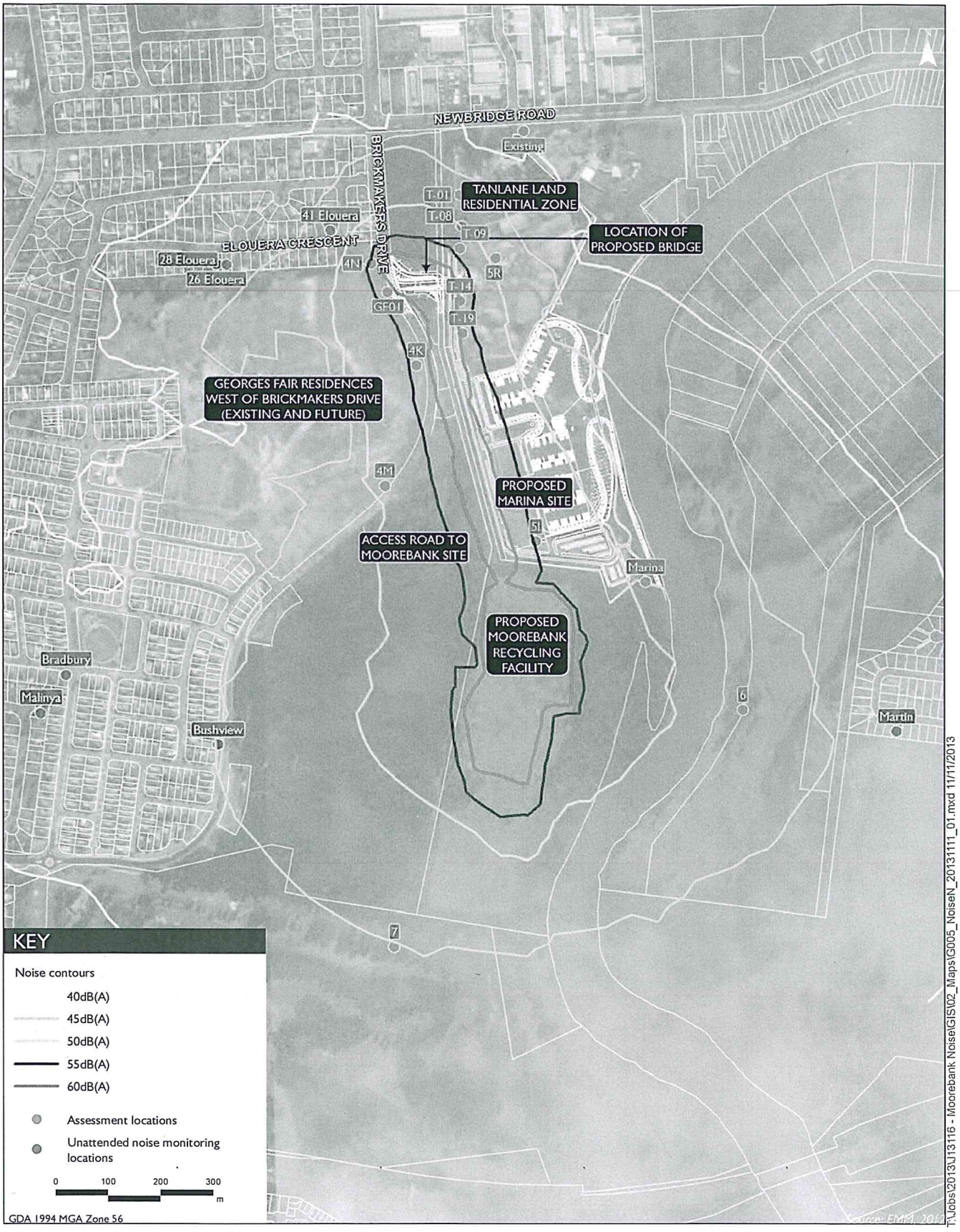
Noise contours



EMM

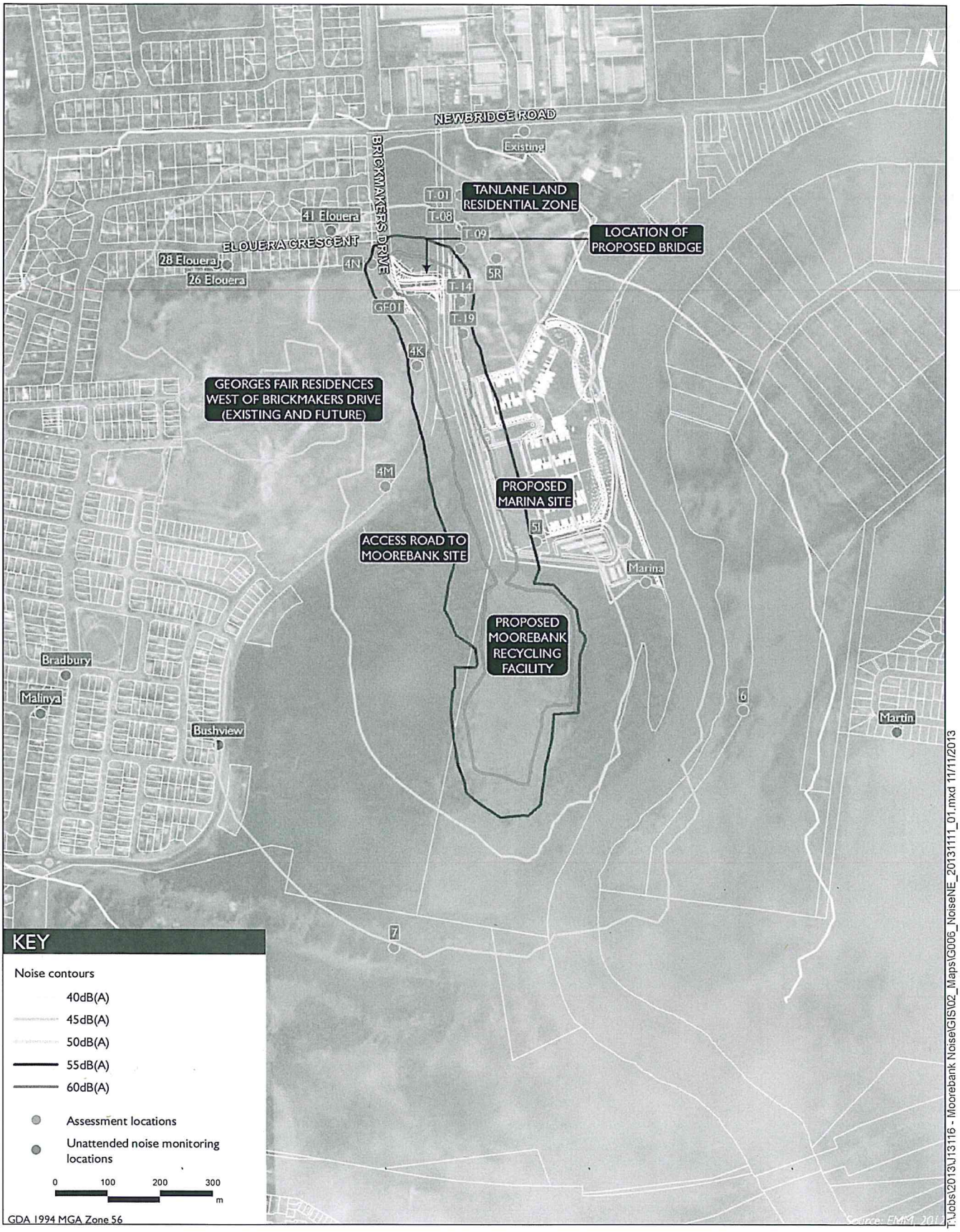
Predicted L_{eq}, 15min noise levels, dB(A) - calm conditions

Figure A



Predicted L_{eq}, 15min noise levels, dB(A) - northerly winds

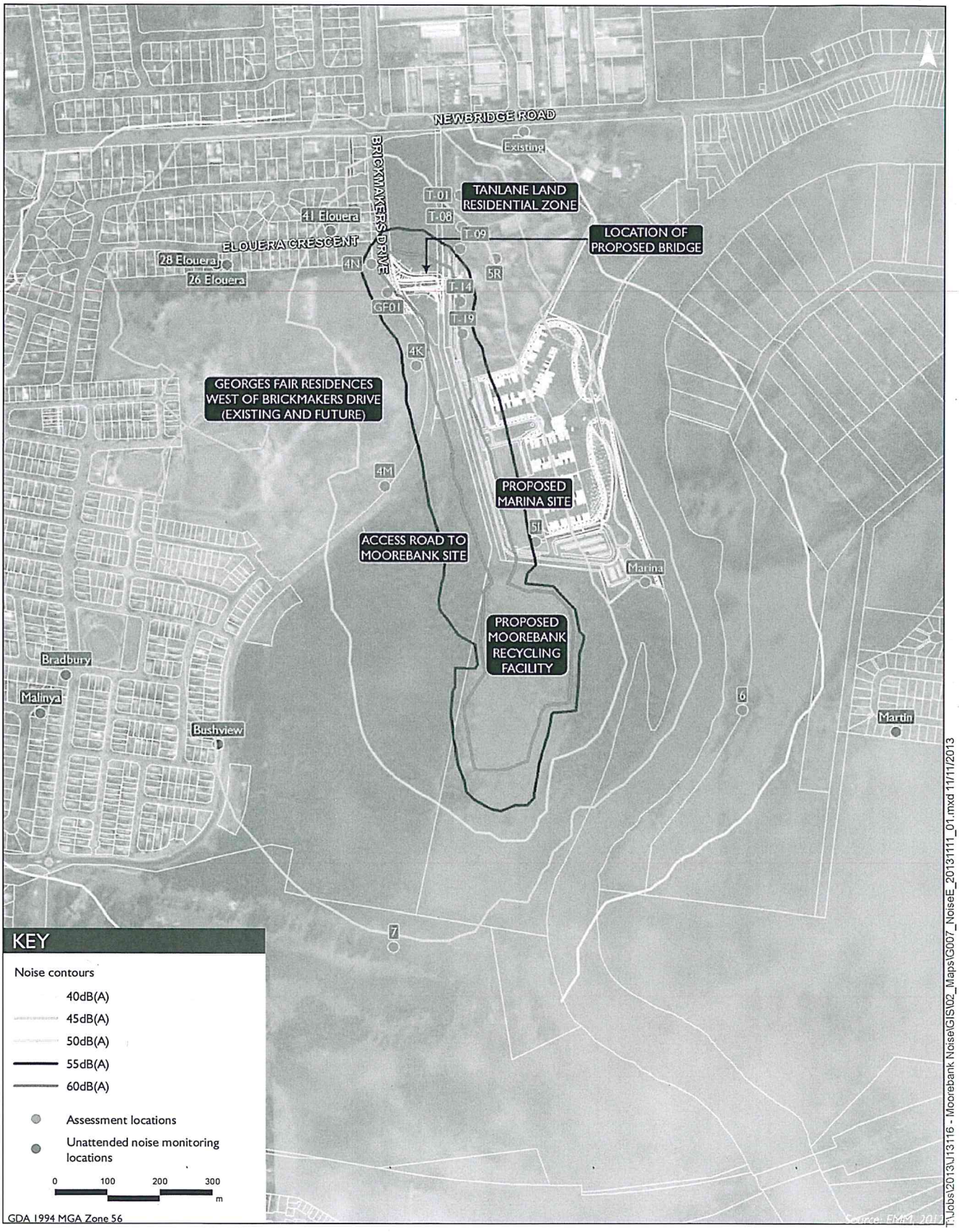
Figure B



EMM

Predicted L_{eq}, 15min noise levels, dB(A) - north easterly winds

Figure C



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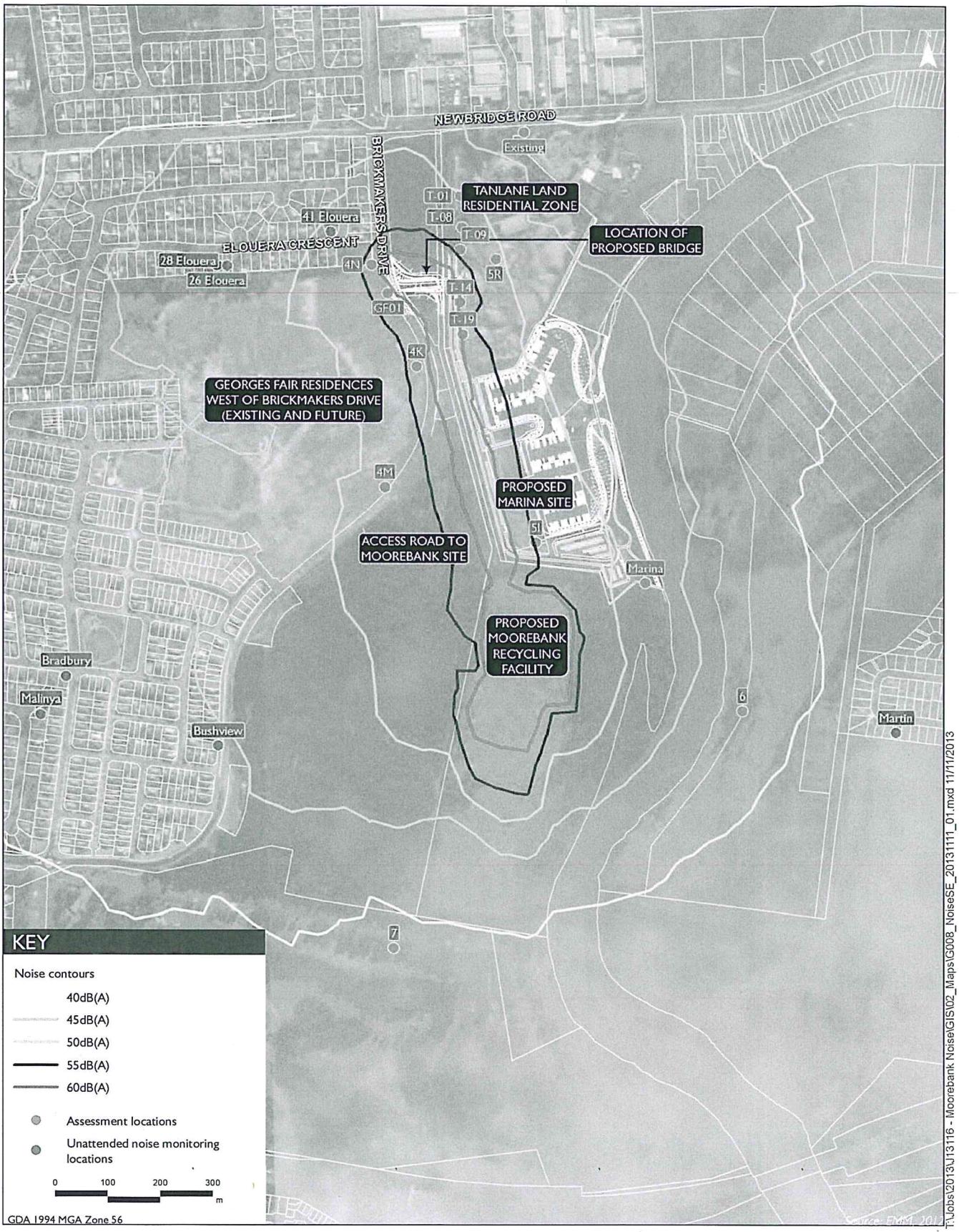
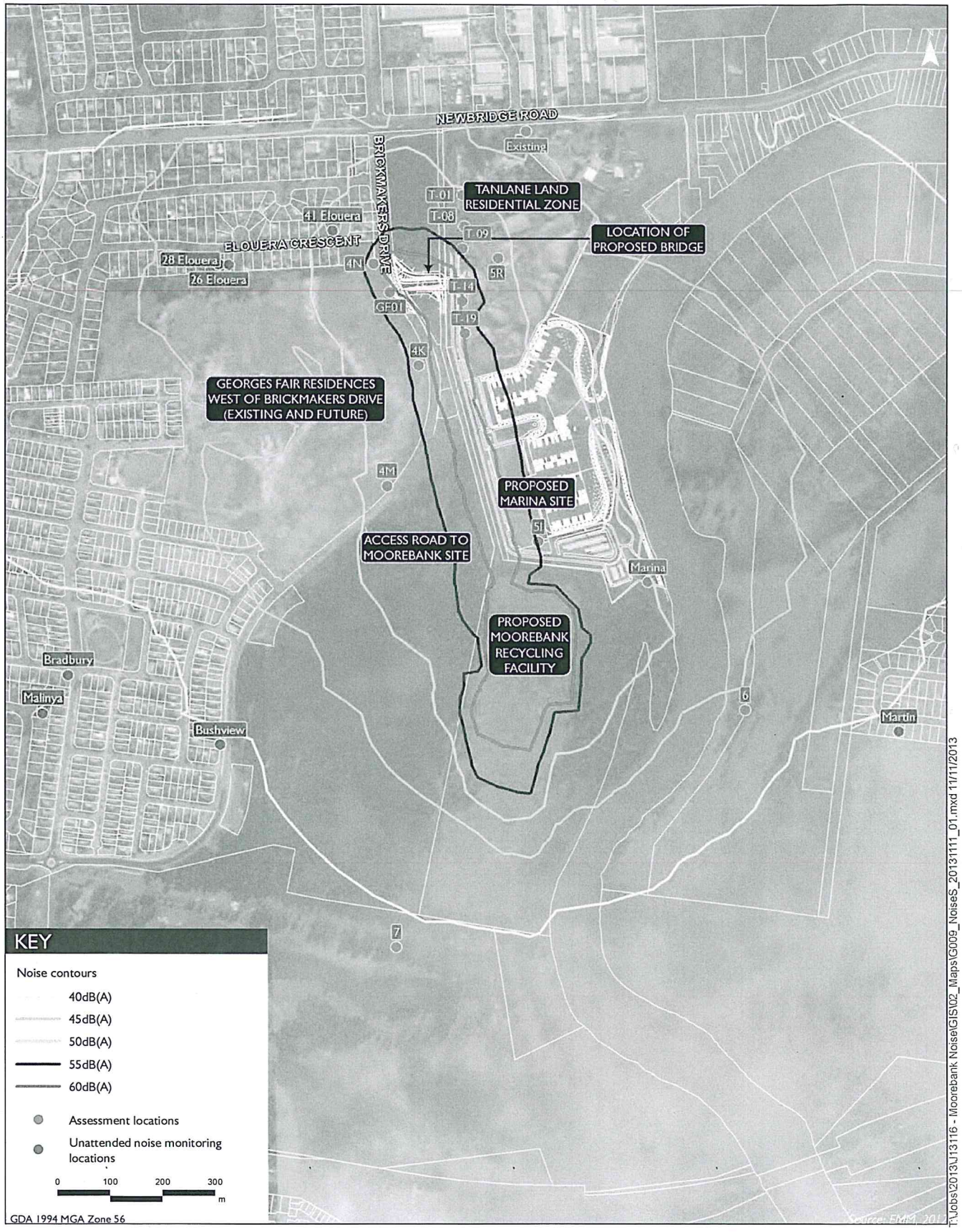
EMM
EMGA Mitchell McLennan

Predicted L_{eq}, 15min noise levels, dB(A) - easterly winds
Figure D



Predicted L_{eq}, 15min noise levels, dB(A) - south easterly winds

Figure E



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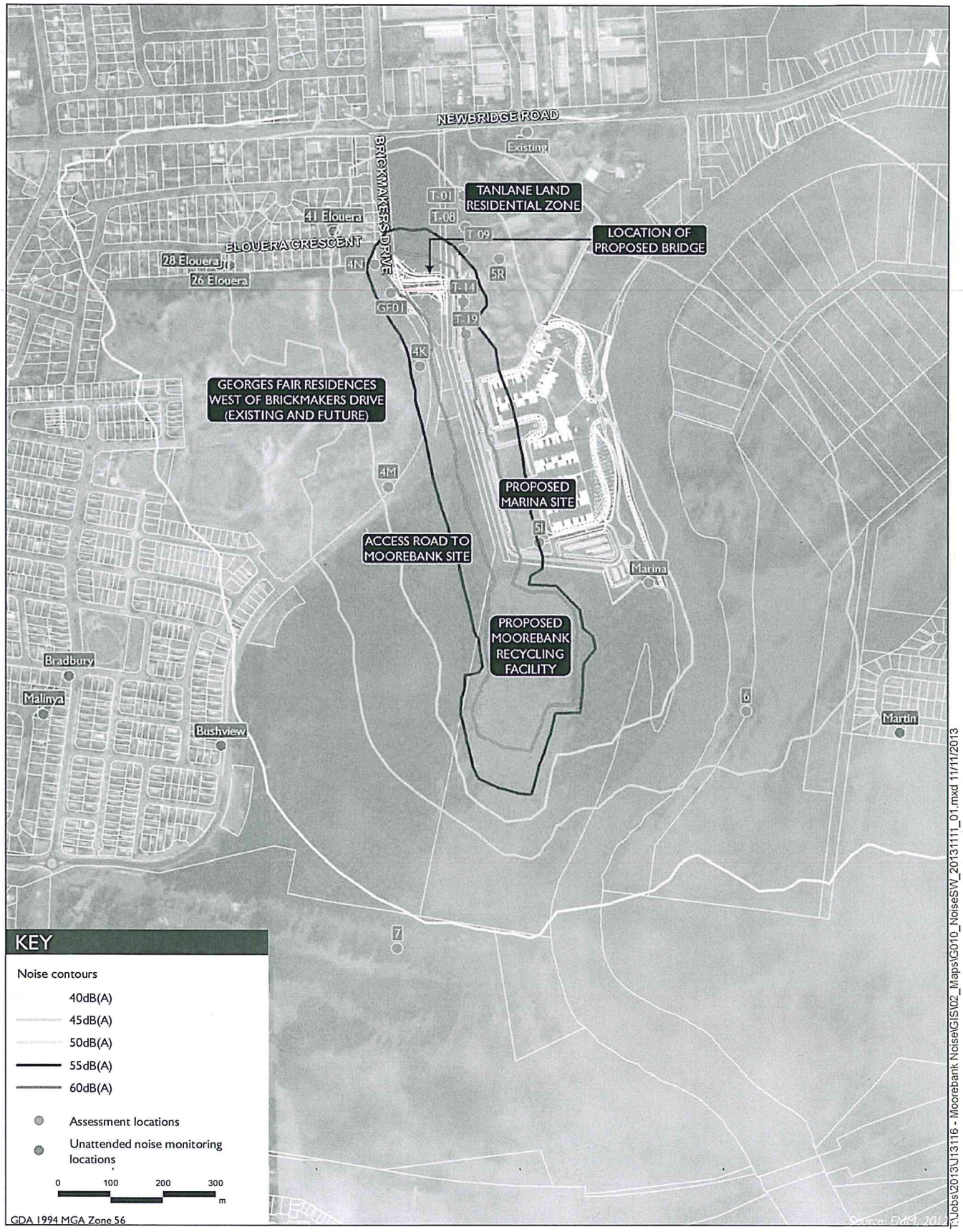
Predicted L_{eq}, 15min noise levels, dB(A) - southerly winds

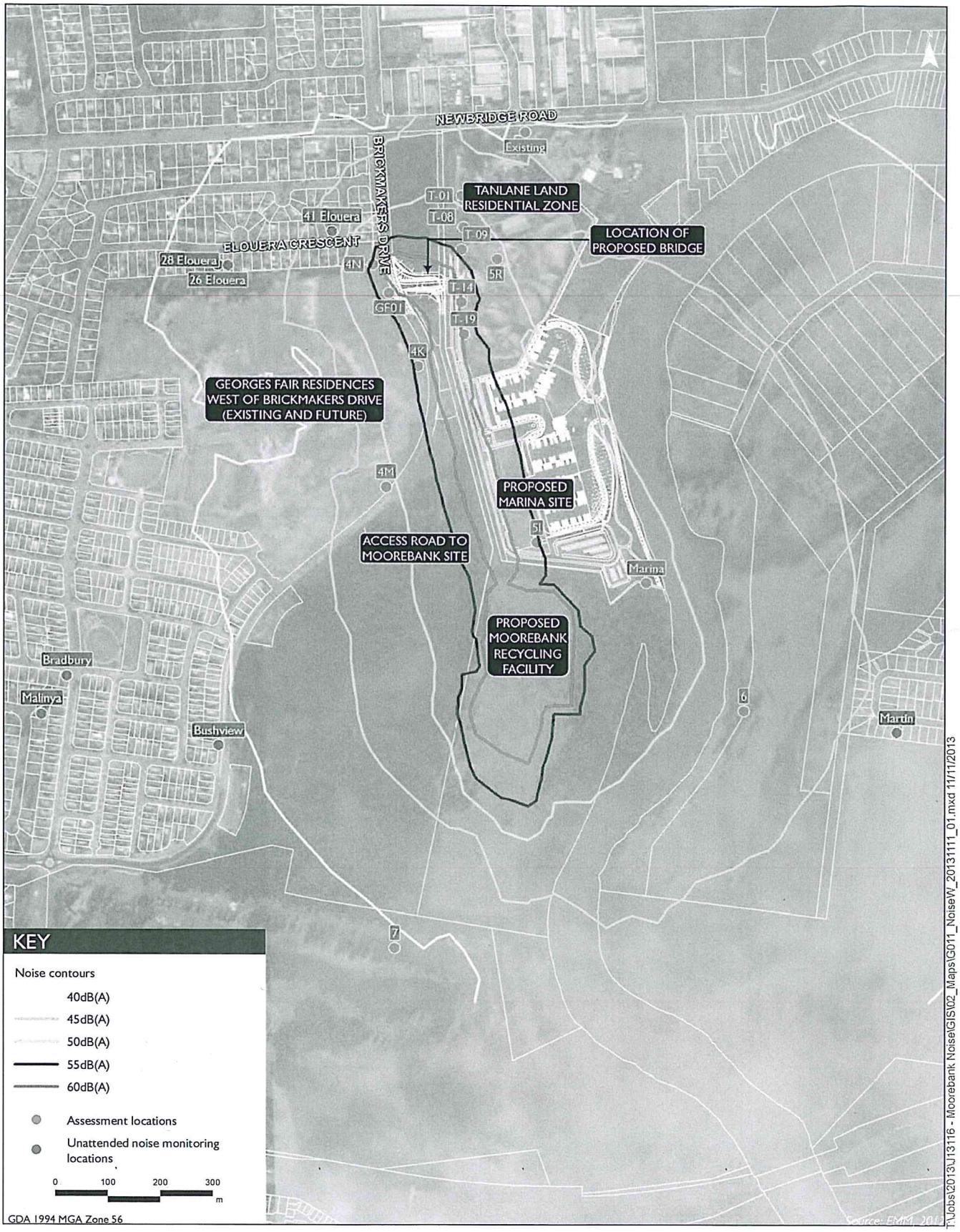
Figure F



EMM

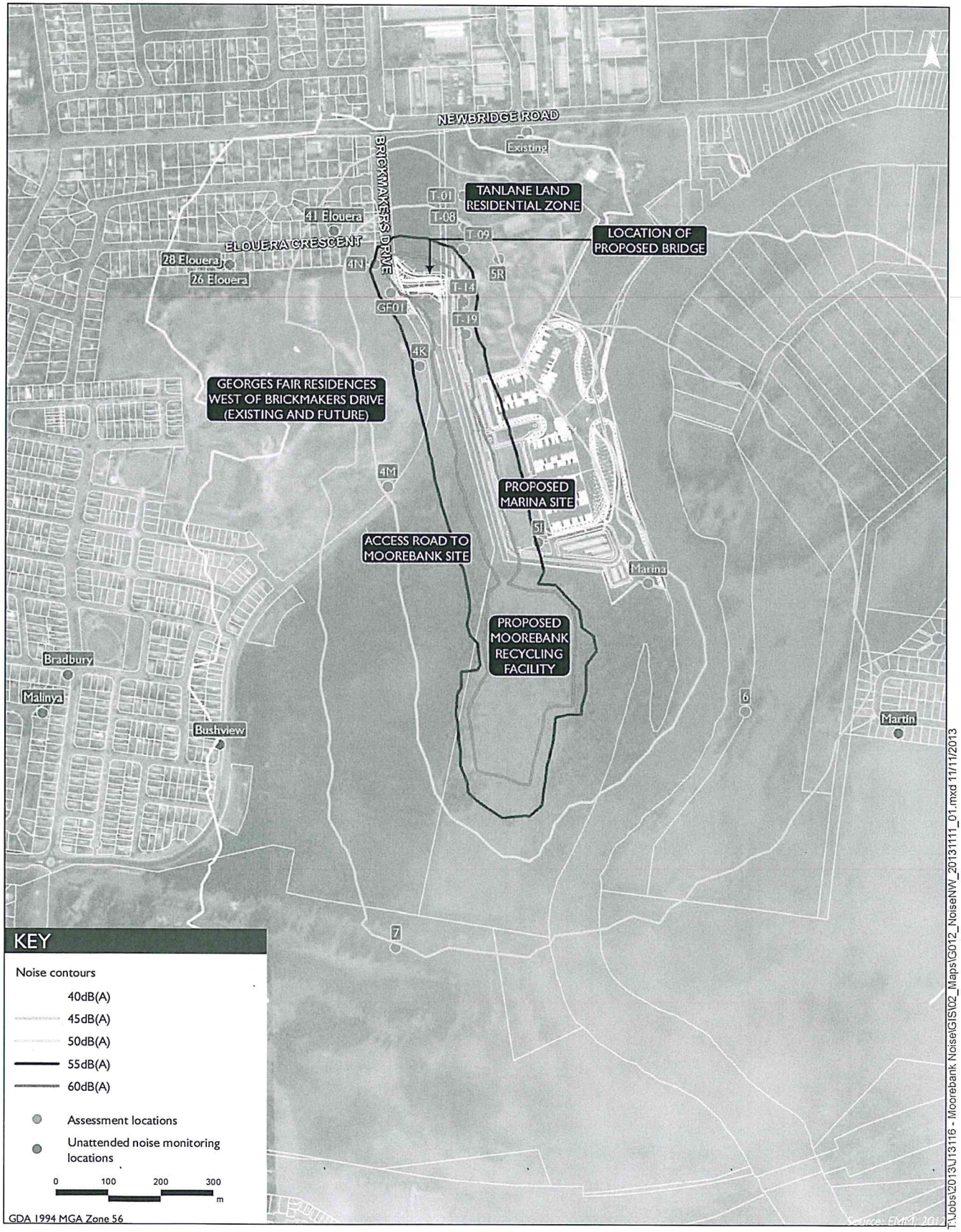
Predicted L_{eq}, 15min noise levels, dB(A) - south westerly winds

Figure G



Predicted L_{eq}, 15min noise levels, dB(A) - westerly winds

Figure H



EMM

Predicted L_{eq}, 15min noise levels, dB(A) - north westerly winds

Figure 1