# Appendix H
# Provisional EMPs

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Moorebank Intermodal Company

# Moorebank Intermodal Terminal Project

# Noise and Vibration Provisional Environmental Management Framework

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PARSONS BRINCKERHOFF

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## Author, Reviewer and Approver details

| | | | |
|---|---|---|---|
| Prepared by: | Emma Lichkus | Date: 02/07/2014 | Signature:  |
| Reviewed by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |
| Approved by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |

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Parsons Brinckerhoff Australia Pty Limited

*ABN 80 078 004 798*

Level 27 Ernst & Young Centre
680 George Street, Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
Email: sydney@pb.com.au
www.pbworld.com


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# 1. Environmental Management framework

The Moorebank IMT Project would be developed by the private sector under the direction of the Moorebank Intermodal Company (MIC) Limited, a Government-Business Enterprise. The future developer and operator of the Project has not yet been selected. As such, a proposed overall environmental management framework has been outlined as part of the Environmental Impact Statement (EIS) (refer to Chapter 28 - Environmental management framework), which would guide the development of a future detailed framework.

Figure 1.1 outlines the overall environmental management framework for the Project. The environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004. It is anticipated that MIC and the developer and operator for the Project would have established environmental management systems covering their respective business objectives, policies, activities and associated environmental aspects and impacts.

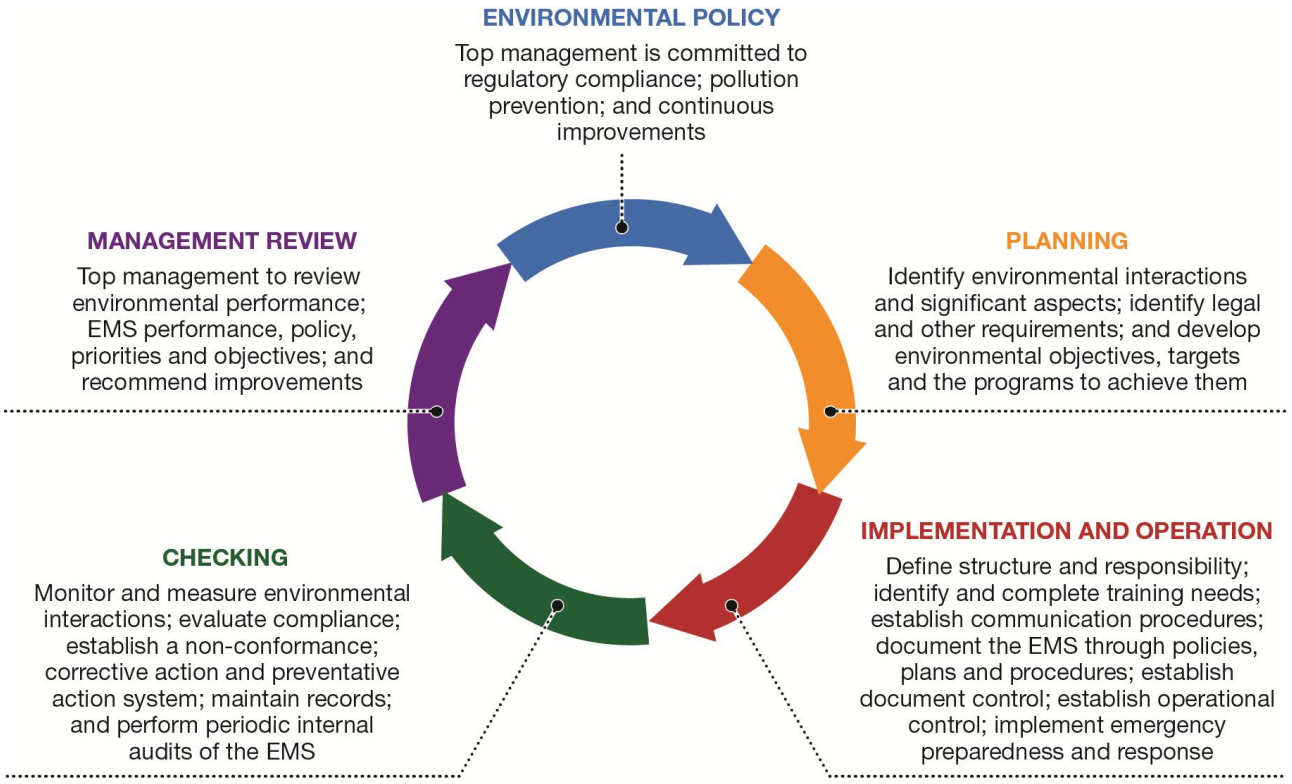


**Figure 1.1 Overall environmental management framework for the Project**

Approval of the Project is being sought for:

- construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and
- Stage 1 development consent as State significant development (SSD) from the NSW Department of Planning & Environment (NSW DP&E) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the concept proposal described in the EIS (including final approval for Early Works).

Subject to approval of the Stage 1 SSD, the Project will be subject to further development approval under the EP&A Act (Stage 2 SSD development approvals).

It is anticipated that the developer and operator for the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities, for example:

- Design Management Plan (DMP) (incorporating environment design criteria);
- Construction Environmental Management Plan(s) (CEMP); and
- Operational Environmental Management Plan(s) (OEMP).

This document outlines the Provisional Environmental Management Framework (PEMF) which will guide the development of the above management plans.

The project specific detail to be addressed by each of the above listed management plans would be dictated by the requirements of the following key project documentation:

- The Project's EIS (including this PEMF);
- Approval issued under the EPBC Act;
- Stage 1 and Stage 2 SSD approvals issued under the NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project; and
- Other permits and/or licences required during the course of the Project.

## 1.1 Provisional Environmental Management Framework

As part of the Project's EIS, a series of PEMF has been prepared. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. The PEMF would be further developed during detailed design and the Stage 2 SSD approval process.

The PEMFs combined with the Project Approvals, contractual arrangements and other permits and/or licences required during the course of the Project provide guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s).

# 2. The Project site and study area

The Moorebank IMT Project is proposed to be situated on land located approximately 30 kilometres (km) south-west of the Sydney Central Business District (CBD) and 4 km south of the Liverpool CBD in the Liverpool Local Government Area (LGA) (refer Figure 2.1).

The residential suburbs of Casula, Wattle Grove and North Glenfield are the closest communities to the Project site and include residential receptors that are likely to have lines of sight to the Project site. In these communities, receivers and land uses that are potentially sensitive to noise and vibration include residences, education institutions, places of worship, child care facilities, aged care facilities and places of recreation.

Figure 2.1 shows the location and type of the nearest noise sensitive receivers considered for the purpose of assessing the noise and vibration impacts of the Project. Locations were selected based on observations during site visits and to represent those receptors with a potential line of sight to any of the rail access option indicative layouts.

The Project site is located at an approximate ground level height of 15 metres (m) above Australian height datum (AHD) and immediately to the east of the Georges River and floodplain. There is steep relief on either side of the floodplain, such that the main IMT site and the surrounding suburbs are generally at a similar residual ground level with adjacent residential receptors in Casula, Wattle Grove and Glenfield. The receptors in Casula are approximately 10 m to 30 m above the residual level of the main IMT site. At Wattle Grove and Glenfield, the residential receptors are approximately 2 m to 5 m above the residual level of the main IMT site. The extent of line of sight to the rail access connections would be dependent on the selected design (i.e. the northern, central or southern rail access option) and the relative height above ground level of the IMEX and interstate track, particularly for the bridge crossing the Georges River and floodplain.

To quantify and characterise the existing daytime (7 am to 6 pm), evening (6 pm to 10 pm) and night-time (10 pm to 7 am) noise environments in the vicinity of the Project, both short-term attended and long-term unattended ambient noise monitoring surveys were undertaken in the Wattle Grove, North Glenfield and Casula suburbs during November 2010, August 2011 and October 2011. A continuous noise monitoring survey has also been running since July 2012. A total of 20 months of data from this continuous survey was used to determine the existing noise environment within the communities surrounding the Project site. Noise monitoring locations are shown in Figure 2.1.

Figure 2.1 provides a summary of the rating background noise levels (RBLs) for the daytime, evening and night-time periods at those monitoring locations that best represent the surrounding residential communities. These levels were based on the daily unattended ambient noise monitoring. The RBL is the median of the $L_{A90}$ noise levels in each measurement period, as referenced from the NSW Environment Protection Authority's (EPA's) (2000) *Industrial Noise Policy* (INP). The $L_{A90}$ noise level is the A-weighted sound pressure level exceeded for 90% of the measurement time.

Figure 2.1 also shows the long-term measured $L_{Aeq}$ ambient noise levels at those monitoring locations that best represent the surrounding residential communities. $L_{Aeq}$ noise levels are the constant sound pressure levels that exhibit the equivalent acoustic energy of a fluctuating noise level (the energy-averaged sound level).

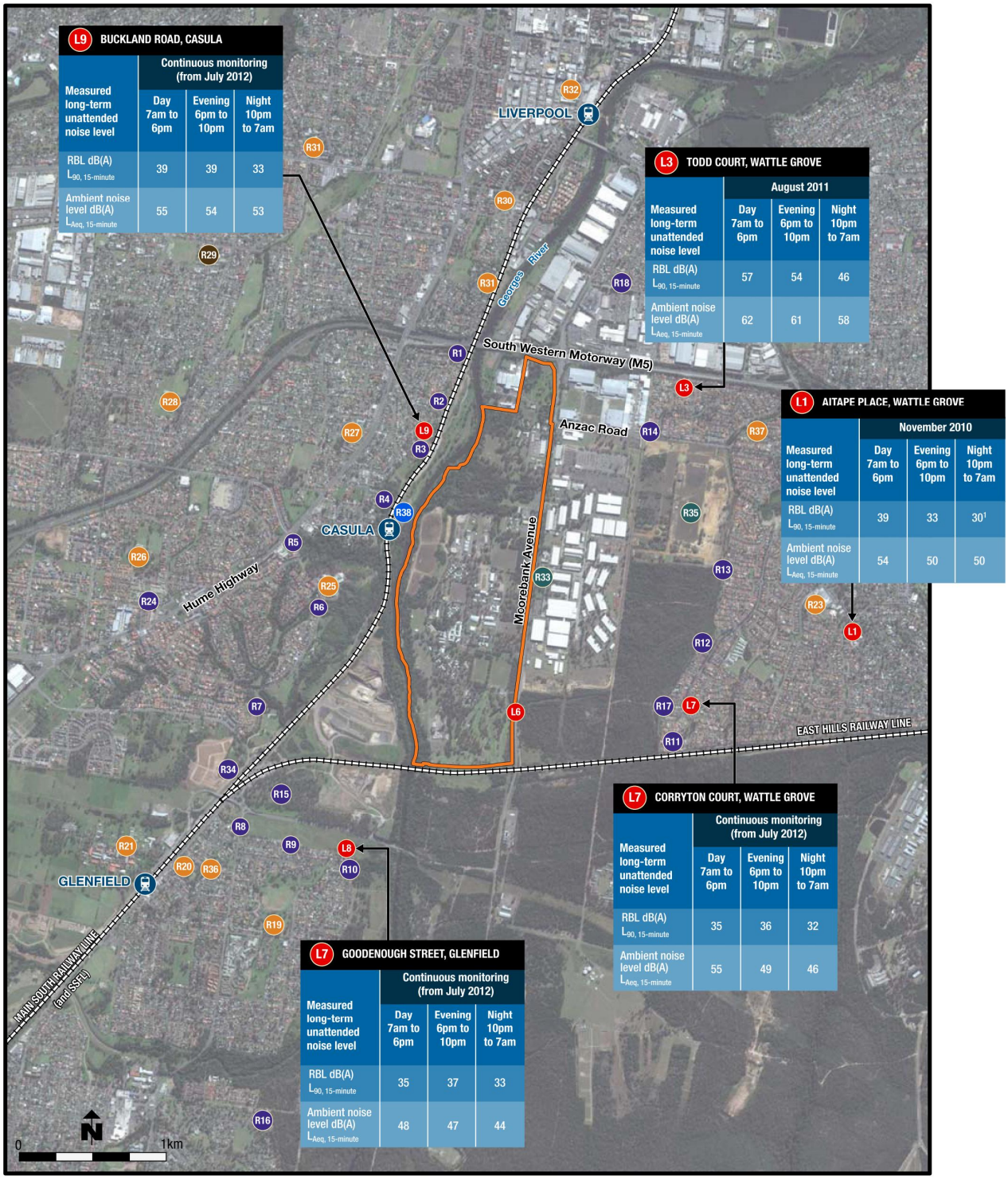


**Figure 2.1 Potentially affected receivers, noise monitoring locations and measured background noise levels**

# 3. Purpose and scope

The purpose of this PEMF is to provide a high level overview as to how the noise and vibration impacts during design, construction and operational phases of the Project will be minimised.

This PEMF combined with the Project Approval, contractual arrangements and other permits and/or approvals required during the course of Project provides guidance with respect to the development of Project specific management plans, such as, DMPs, CEMP(s) and OEMP(s). It is anticipated that the future developer and operator of the Project would be required to develop these plans.

As part of the approval process for the Project, it is necessary to show that the Proponent has taken, and will take, all practical steps to properly manage the noise and vibration risks associated with the Project. This is achieved by the following:

- Identification of activities that may lead to noise/vibration impacts and associated impacts.
- Establishment of objectives, targets and indicators for the management of noise/vibration impacts.
- Establishment of management approaches as well as monitoring, reporting, auditing and review regimes.

A detailed Noise and Vibration Assessment was undertaken (Volume 3 of the EIS) and Chapter 12 – *Noise and vibration* of the EIS provides a summary of the potential impacts of the Project on the existing noise and vibration environment within and surrounding the Project site.

# 4. Activities that may lead to noise and vibration impacts

The construction and subsequent operation of the Project will have noise and vibration impacts.

A range of management and mitigation measures have been identified to assist the Project in complying with the established noise and vibration goals/criteria. The effectiveness of these management and mitigation measures will be assessed/confirmed through further detailed analysis dung the detailed design phase.

A continuous noise monitoring survey has also been running since July 2012. A total of 20 months of data from this continuous survey was used to determine the existing noise environment within the communities surrounding the Project site including Wattle Grove, Casula and North Glenfield. Results of the monitoring are provided on the Project website <http://www.micl.com.au>.

The noise loggers will provide continuous measurement of ambient noise levels 24 hours per day to develop a long-term noise profile for the day-time, evening and night-time periods in the communities surrounding the Project. The measurement data is to be analysed to determine the influence of existing noise sources upon the noise environments, the temporal and seasonal changes to the ambient noise levels and the long-term quantification of background noise levels.

The ambient noise monitoring surveys within Casula, Wattle Grove and Glenfield would be continued throughout the construction and operation of the Project.

The noise monitoring program will also monitor any changes to the ambient noise environment from other developments in the area.

## 4.1 Potential impacts

The potential environmental impacts associated with the Project include the following construction and operation impacts:

### 4.1.1 Construction impacts

#### 4.1.1.1 Noise

During construction, noise levels at the assessed receivers were predicted to mostly comply with the adopted construction noise management levels (NMLs), which are based on the *Interim Construction Noise Guideline* (DECC 2009). In particular, the majority of daytime construction works are predicted to comply with the NMLs at all receptors and would be expected to be undertaken without the requirement for noise mitigation.

At Casula, Wattle Grove and Glenfield, noise levels during piling and rail access construction works are predicted to temporarily exceed the NMLs and therefore trigger the need for reasonable and feasible noise mitigation measures.

#### 4.1.1.2 Vibration

Based on the closest distances of 40 m to 450 m between receptors and proposed construction works, any potential ground vibration during construction is expected to comply with the ground vibration assessment criteria for human comfort and cosmetic damage.

## 4.1.2 Operational impacts

### 4.1.2.1 Noise without mitigation

At Full Build of the Project in approximately 2030, without any noise mitigation, noise levels from operations at the main IMT site were predicted to exceed the noise assessment criteria at the nearest residential receivers in Casula, Wattle Grove and North Glenfield under certain conditions for all three layout options. Due to the proximity of residential receptors to the western main IMT site boundary, Casula residents were predicted to be the most affected. Noise levels at all non-residential receptors were predicted to comply with the amenity noise criteria for all option layouts.

For operation of the rail access connection to the SSFL at Full Build of the Project in approximately 2030, noise levels at the nearest residential receivers in Casula were predicted to exceed the amenity noise criteria under the northern rail access option, but comply with the criteria for the central and southern rail access options. Again, noise levels at all non-residential receptors were predicted to comply with the amenity noise criteria for all option layout options.

Based on these results, and subject to further assessment during detailed design, the potential noise reduction requirements for worst case noise levels predicted during neutral meteorological conditions are identified in Chapter 12 – *Noise and vibration.* During the early morning and night-time of the winter months, potential temperature inversion conditions may enhance the propagation of noise and, compared to neutral meteorological conditions, require additional mitigation of noise levels by 1 to 3 dBA.

Operational events at the Project site during the night-time and early morning, such as containers being manoeuvred heavily and the shunting of rail freight, are predicted to comply with sleep disturbance objectives in the relevant OEH guidelines. However, in relation to train movements on the rail access connection, predicted noise levels for the northern rail access connection option of up to 83 dBA $L_{Amax}$ at Lakewood Crescent and 84 dBA $L_{Amax}$ at Buckland Road in Casula are above the adopted 80 dBA $L_{Amax}$ sleep disturbance objective. Therefore, it is proposed that a detailed assessment of sleep disturbance impacts be undertaken during detailed design for the northern rail access option, if this option is selected.

During Project Phases B and C, there is potential for construction activities to overlap with operations at certain times. If receptors experience noise from both construction and operation at a similar noise level, the cumulative noise level is likely to be no more than 1 to 3 dBA above the dominant noise level contribution from either construction or operation.

Any potential ground vibration from operations on the Project site and the rail access connection are predicted to comply with the relevant vibration criteria for human comfort and cosmetic structural damage.

Recognising the predicted noise criteria exceedances, a range of operational noise mitigation measures are proposed to be implemented for the Project. Where the proposed measures are implemented in full, the potential impacts presented in the EIS can be mitigated to achieve compliance with the relevant guidelines. This would be confirmed through further analysis during detailed design, with priority being given to the containment of noise emissions at source, followed by ‘at-boundary’ measures such as embankments and noise walls. Should the assessment criteria not be achieved at all receptors, where the Project has reduced noise levels to be as low as reasonably practicable, the relevant guidelines (the *NSW Industrial Noise Policy*) note that achievable noise limits can be negotiated with regulators and the community.

#### 4.1.2.2 Vibration

The IMT site is located at least 450 m from the nearest receptors. At this distance, any potential ground vibration generated from the IMT operations would not be perceptible and would comply with the human comfort (disturbance) and cosmetic structural damage criteria detailed in section 12.3.1 of Chapter 12 – *Noise and vibration* of the EIS.

The operation of rail freight accessing the SSFL on the rail access connection has a greater potential for ground vibration impacts, and was therefore the focus of the assessment.

The lowest threshold of perceptible vibration for most people is approximately 0.14 millimetres per second root mean square This equates to an $L_{Vmax}$ of 103 dB (where $L_{Vmax}$ is the maximum vibration level occurring during a train passby event). For rail freight travelling at 60 kilometres per hour (which is the maximum design speed for the rail access connection), the 103 dB vibration level was predicted to be achieved at distances of 30 m or greater from the track. Based on the indicative layouts for the rail access options, the rail access connections would be at least 30 to 100 m from the nearest residences. As such, any perceptible ground vibration levels are expected to comply with both the vibration criteria for human comfort and the less conservative criteria for cosmetic structural damage.

# 5. Objectives, targets and indicators

The objectives, targets and indicators for the management of noise and vibration impacts are shown in Table 5.1. The management controls implemented help achieve these objectives/targets described in the following section.

**Table 5.1 Objectives, targets and indicators for the management of noise and vibration impacts**

| Objectives | Targets | Indicators |
|---|---|---|
| During the detailed design phase, ensure that the proposed construction and operational noise and vibration management/mitigation measures have been incorporated into the design. | Detailed design incorporates nominated construction and operation mitigation/management measures that enable the proposed NMLs to be achieved.<br>Predictive noise and vibration modelling confirms that construction and operation mitigation/management measures incorporated into the detailed design will enable the proposed NMLs to be achieved. | Instances whereby nominated management/mitigation measure have not been incorporated into the detailed design.<br>Instances whereby the proposed NMLs will not be achieved. |
| Establish and maintain awareness of the importance of ensuring that noise and vibration impacts associated with the Project are minimised. | All Project and workforce personnel to complete an environmental induction, which will include information on the importance of minimising noise and vibration impacts. | Number and percentage of Project and workforce personnel that have attended required environmental induction prior to commencing work on the Project site. |
| Avoid the exceedance of construction phase noise goals/criteria. | Zero incidents of noise goals/criteria being exceeded during construction phase. | Number of incident reports relating to exceedances of the noise goals/criteria during the construction phase. |
| Avoid the exceedance of construction phase vibration goals/criteria. | Zero incidents of vibration goals/criteria being exceeded during construction phase. | Number of incident reports relating to exceedances of the vibration goals/criteria during the construction phase. |
| Avoid the exceedance of operation phase noise goals/criteria. | Zero incidents of noise goals/criteria being exceeded during operation phase. | Number of incident reports relating to exceedances of the noise goals/criteria during the operation phase. |
| Avoid the exceedance of operation phase vibration goals/criteria | Zero incidents of vibration goals/criteria being exceeded during operation phase. | Number of incident reports relating to exceedances of the vibration/criteria during the operation phase. |

# 6. Management approach

As discussed in section 1, it is anticipated that the developer and operator of the project would be required to develop a number of project specific management plans to address design, construction and operational activities. This includes a DMP (incorporating environment design criteria); a CEMP; and an OEMP.

The noise and vibration component of the above listed project specific management plans would align with the high level requirements as detailed in this PEMF as well as the project specific requirements.

The following sections provide a summary of the management control measures to be implemented during design, construction and operation in order to mitigate the risks associated with potential noise and vibration impacts.

## 6.1 Management controls – detailed design phase

During the detailed design phase, works would be undertaken to meet the objectives as detailed in Section 5 of this PEMF.

The following controls measures were identified as part of the EIS and would be implemented during the detailed design phase of the project:

- To achieve the noise reductions in Table 12.25 in Chapter 12 – *Noise and vibration*, mitigation treatments would need to reduce noise from all dominant noise sources. The Project would implement reasonable and feasible noise mitigation to control potential noise levels. In the event that the Project does not meet the assessment criteria at receptors, if the Project has reduced noise levels to be as low as practicable, the NSW *Industrial Noise Policy* (INP) (EPA 2000b) notes that:
  - achievable noise limits can be negotiated with regulators and the community; and
  - the Project specific noise levels outlined in Chapter 12 – *Noise and vibration* (in 5V – 5AE) should not automatically be interpreted as conditions for approval without consideration of other factors (environmental, social and economic) consistent with the objectives of the EP&A Act. In this regard, where appropriate, the INP notes that noise limits can be set above the Project specific noise levels.
- Operational plant and equipment would be selected with the lowest practicable noise emissions.
- Mechanical components on fixed and mobile equipment, such as motors, gearboxes and exhausts, would include enclosures and acoustic insulation (lagging) to limit noise emissions. The appropriate design of acoustic enclosures and acoustic insulation can reduce source noise levels of individual plant and equipment by 10 dB(A) or more.
- Where feasible, motors and mechanical noise-generating components of the RMGs would be located near to ground level rather than the top of the gantry.
- Where feasible, and where it would produce a lower noise emission, electric motors and vehicles would be operated instead of diesel powered equipment.

- The following measures would be incorporated into the design and operation of the freight trains on the rail access connection for the northern rail access option, and the rail track on the main IMT site to control potential operational noise:
  - Where required, the track form design would include feasible and reasonable measures to mitigate noise, including rail dampers, rail pad stiffness and the rail fastening systems. Increasing the rail support stiffness can reduce direct noise, but may result in an increase in structure-radiated noise. The design would have to address these two sources to provide effective noise control.
  - The track on the rail access connection would be designed to minimise acute changes in vertical alignment that could reduce the requirement for locomotives to operate at high throttle on the ascent or under heavy braking on the descent. The rail lines would also comprise continuously welded track to remove joints.
  - The rail access connection bridge would be designed as a concrete or composite/concrete structure to minimise potential reradiated noise from vibrating sections of the elevated track. Detailed noise analysis would be undertaken to identify both airborne and re-radiated noise contributions, to effectively mitigate total noise emissions.
- To further control potential rail noise from wheel squeal the following measures are proposed:
  - The turn radius of curved track sections would be greater than 500 m to reduce tight turns in the alignment.
  - Track greasing systems should be investigated on curved sections of track to lubricate and reduce friction at the wheel-rail interface.
  - The track maintenance system would include measures such as grinding to remove rail roughness, treatment of roughness on the wheels of locomotives and wagons, and adjustment of bogie-suspension tracking and brake system set up.
- Where feasible all rail tracks would be designed to maximise the separation distance between rail lines and the nearest residences.
- Noise walls or noise barriers would be installed within the main IMT site to impede the line of sight between noise sources and the nearest receptors. Where a noise wall or barrier fully impedes the line of sight to all dominant noise sources, a reduction in received noise level of 10 dB(A) or more can be achieved.

  In regard to noise walls or barriers:
  - Noise walls/barriers would need to be solid structures, typically constructed of concrete or similar material.
  - Additional absorptive material could be applied to the internal facades of the noise walls/barriers to reduce reflected noise from the wall/barriers.
  - TEU containers could be used as noise barriers where they are stacked, to eliminate gaps or openings to effectively impede the direct line of sight to nearest receptors. This is likely to require an operational management procedure to ensure the container areas adjacent to the residential communities are maintained so that the containers are at the maximum practicable height at all times (typically up to five TEUs).
  - To provide effective noise control the noise walls/barriers would need to achieve a transmission loss of at least 10 dB(A) more than the insertion loss.
  - For the northern rail access option, noise walls/barriers would be investigated for the rail tracks on the rail access connection between the SSFL and the main IMT site boundary. Due to the elevated location of residences in Casula, the noise wall/barrier on the viaduct of the rail access connection may require a cantilevered design to increase the mitigation of noise from locomotives.
  - On-site noise walls/barriers would be constructed at the earliest opportunity in the Project development to provide noise attenuation during all construction and operation phases.

  - Subject to further consideration of environmental, social and economic impacts, earth mounding could be considered as an alternative to, or in conjunction with, noise walls/barriers to attenuate the propagation of noise between the site and nearest affected receptors. Where earth mounding can fully impede the line of sight to dominant noise sources, reductions in ground level noise sources of 6 dB(A) LAeq or greater may be achievable. For each rail access option, it is proposed that earth mounding be considered on the main IMT site, at the western extent of the IMEX and interstate rail lines.

- Where feasible, all on-site buildings and structures would be designed and constructed to impede noise from ground level operation of heavy vehicles, side picks and ITVs.
- The noise and vibration measures described above would be subject to further consideration during detailed design – at which point, the predicted noise impacts and the likely effectiveness of the measures (or equivalent alternative measures) would be further investigated. This further investigation would include consideration of potential environmental, social and economic impacts of the measures.

  It is also proposed that the following points be considered in the further assessment of potential impacts and design of mitigation measures:

  - Assessment of potential noise emissions from any concrete batching plant and implementation of any required noise mitigation, would be undertaken by the appointed construction contractor upon confirmation of the design and operation of the concrete batching plant.
  - During the detailed design of the Project the specification of operating plant and machinery for the Project would be confirmed. This would include the provision of one-third octave band noise emission data from equipment vendors to facilitate a detailed assessment of annoyance characteristics in accordance with the NSW Industrial Noise Policy (INP) (EPA 2000b).
  - To verify the predicted noise levels and recommended noise mitigation in the noise and vibration assessment, the predictive assessment of potential noise levels would be revised for the detailed design of the construction and operation of the selected rail access option. This would include assessment of potential cumulative noise impacts from simultaneous construction and operation once the detailed development phasing is confirmed. It should also include detailed assessment of sleep disturbance impacts from the northern rail access option, if this option is selected. Where deemed necessary, mitigation measures may be required to reduce and control maximum noise events from sources such as locomotive exhausts and wagon bunching.
  - The ARTC is completing a post commissioning monitoring survey to determine the current rail noise levels from the SSFL. The outcomes of this survey were not available to MIC at the time of this EIS. The detailed noise assessment to be prepared during detailed design would, where feasible, adopt the ARTC noise monitoring survey to determine any potential contribution of the Project to the total rail noise from the SSFL, and any requirements for reasonable and feasible noise mitigation.
  - The specific vibration propagation characteristics can be highly variable depending on the ground conditions at a given location. As such it is recommended that ground vibration impacts be reviewed during the detailed design, particularly where Project rail track would pass within 50 m of residences.

- The appropriateness of the noise and vibration management and mitigation measures are to be further investigated as part of the further Stage 2 SSD approval process. These measures, or their replacement measures, are to be implemented through the CNVMP prior to and during all noise-generating construction works for each of the Project phases.

## 6.2 Management controls – construction phase

The management controls to be implemented during the construction phase of the Project are as follows:

- A construction noise and vibration management plan (CNVMP) would be included in the CEMP to document mechanisms for demonstrating compliance with the Project approvals and commitments made in this EIS.
- Where reasonable and feasible, standard construction working hours should be restricted to 7 am and 6 pm (Monday to Friday) and 8 am and 1 pm on Saturdays.
- No works would be undertaken on Sundays or public holidays, unless they are necessary to minimise impacts on the local community, maintaining health and safety on-site, and/or where site conditions (such as rail closedown works) expressly require construction outside these times.
- Night works would be programmed to minimise the number of consecutive nights work affecting the same receptors.
- Works may be permitted outside of the standard daytime construction hours where:
  - requested by the NSW Police, RMS and other authorities, such as when delivery of materials/equipment to site requires temporary road closures;
  - required to maintain health and safety, avoid injury or loss of life, or prevent environmental damage;
  - they would not be audible at the nearest receivers; and/or
  - works are required to be undertaken during rail possessions to maintain the operational service of adjacent rail corridors.

  Potentially affected residents and relevant authorities would be notified in advance of works performed outside of standard daytime construction hours.
- During site inductions and toolbox talks, all site workers (including subcontractors and temporary workforce) are to be made aware of the hours of construction and how to apply practical, feasible and reasonable measures to minimise noise and vibration when undertaking construction activities (including when driving vehicles).
- Quieter and less vibration-emitting construction methods would be applied where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles would minimise noise and vibration impacts.
- The construction site would be arranged to minimise noise impacts by locating potentially noisy activities away from the nearest receivers wherever possible.
- Where possible, equipment that emit directional noise would be oriented away from sensitive receptors.
- Reversing of vehicles and mobile equipment would be minimised so as to prevent nuisance caused by reversing alarms.
- Where work is proposed in the vicinity of residences, potentially affected residents would be advised, at least two weeks prior to the commencement of works, of the potential noise and vibration levels and the proposed management measures to control environmental impacts.
- Whenever possible, loading and unloading areas would be located away from the nearest residences.
- Broadband reversing alarms would be used instead of tonal reversing alarms, in particular outside standard working hours (such as during night-time rail possession works). Sub-contractors would also be notified of this requirement and where possible (particularly for night works) this would be included as a contractual requirement.
- Equipment that is used intermittently would be shut down when not in use.

- All engine covers would be kept closed while equipment is operating.
- Where possible, trucks associated with the work would not be left standing with their engines operating in streets adjacent to or/within residential areas.
- Traffic speeds would be signposted and all drivers would be expected to comply, and to implement responsible driving practices to minimise unnecessary acceleration and braking events. Traffic movements should be scheduled to minimise continuous traffic flows (convoys).
- The site manager (as appropriate) should provide a community liaison phone number and permanent site contact so that any noise and/or vibration related complaints can be received and addressed in a timely manner. Consultation and cooperation between the site and neighbours of the site would assist in limiting uncertainty, misconceptions and adverse reactions to noise and vibration.
- Attended noise and ground vibration measurements would be undertaken at monthly intervals and upon receipt of adverse comment/complaints during the construction program, to confirm that noise and vibration levels at adjacent communities and receptors are consistent with the predictions in this assessment and any approval and/or licence conditions.
- If noise generating construction works are undertaken outside the standard daytime construction hours and/or measured construction noise levels at nearest residences are greater than 75 dB(A) $L_{Aeq}$, the following additional noise mitigation measures would be considered:
  - Localised acoustic screens, comprising a solid structure such as plywood fencing with an absorptive acoustic to surround noise generating construction plant or work locations. To be effective for ground level noise, the screens would be lined with acoustic absorptive material, be at least 2 m in height and installed within 5 m of the noise source.
  - Dominant noise-generating mechanical plant would be fitted with feasible noise mitigation controls such as exhaust mufflers and engine shrouds.
  - Respite periods of one hour are recommended for every continuous three hour period of work; alternatively daytime works would be scheduled between 9 am and 12 pm, and from 2 pm to 5 pm.
  - Where practical, noisy construction work would be undertaken during the less sensitive 6 pm to 10 pm evening period.
- Depending on the specific construction works undertaken, construction noise mitigation may need to be implemented where:
  - Piling works for all rail access connection options: Piling works are undertaken within approximately 600 m of residences in Casula and within approximately 800 m of residences in Glenfield.
  - Rail access connection works for all rail access options: Daytime construction works undertaken within 450 m from nearest receptors in Casula and up to 1,400 m residences where rail construction is required outside of the standard daytime hours, such as during rail possession.

## 6.3 Management controls – operational phase

During the operation phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following control measures were identified as part of the EIS and would be implemented during the operation phase of the Project:

- Before to the start of each phase of operations, an operational noise and vibration management plan (ONVMP) would be developed and implemented. The ONVMPs would detail the staged operation of the Project, the potential off-site operational noise levels as determined during the detailed design process, and all measures to manage and mitigation operational noise and vibration.

- As a minimum, the ONVMP would include:
  - the operational noise criteria/limits as defined by the relevant Project approvals and Environmental Protection Licence;
  - identification of all surrounding receptors and land use that would be potentially sensitive to noise and vibration;
  - identification of all noise and vibration generating operations and the timing of these operations;
  - the location and specification of any on-site and off-site noise mitigation, including the requirement for future mitigation as part of the staged operation;
  - detailed measures for managing operational noise, including checklist and auditing procedures to ensure measures are implemented before the start of noise generating activity;
  - procedures for the monitoring and reporting of operational noise and vibration;
  - procedures for consultation with the community regarding operational noise and vibration; and
  - complaint handling procedures.
- Where feasible and practical to do so, consideration would be given to:
  - undertaking locomotive maintenance during the daytime and evening periods of 7 am to 10 pm;
  - operating heavy vehicles to limit the requirement for reversing and audible reversing alarms, such as the use of one-way systems for on-site roads; and
  - appropriate commitment either contractual or operational that rail operators accessing the site would be required to undertake regular maintenance of all rail freight to address wheel flat spots and locomotive exhausts.

## 6.4 Monitoring

Within each of the Project specific management plans, the developer and operator would need to detail what monitoring would be undertaken to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the EPBC Act and EP&A Act;
- Contractual requirements established between MIC and the developer and operator;
- Other permits and/or licences required during the course of the Project; and
- Objectives, targets and indicators as presented in this PEMF.

### 6.4.1 Baseline monitoring

The ambient noise monitoring surveys within Casula, Wattle Grove and Glenfield would be continued throughout the construction and operation of the Project (with annual reporting of noise results up to 2 years beyond the completion of Full Build). The noise surveys would quantify any potential noise from the Project and identify any trends/changes in the ambient noise environment during the progressive development.

In the event of any noise or vibration related complaint or adverse comment from the community, noise and ground vibration levels would be measured at the potentially affected premises, where feasible to do so. In accordance with procedures in the CNVMP and ONVMP, the measured noise and/or vibration levels would then be assessed to ascertain if remedial action is required.

### 6.4.2 Construction noise monitoring

During construction, airborne noise levels would be measured on an as-required basis during standard hours of work (Monday to Friday 7 am to 6 pm, Saturdays 8 am to 1 pm) and any works undertaken outside the standard hours of work. The purpose of the noise monitoring is to determine the noise levels from the construction works at noise sensitive receivers to support the management and mitigation of noise emissions.

The following requirements would be followed during noise monitoring:

- Measurements would be undertaken during satisfactory conditions of nil precipitation and/or where the wind speed does not exceed 5 metres per second.
- Unless monitoring locations are pre-determined, the sound level meter would be located 3 to 5 metres away from walls, buildings and other reflecting surfaces where feasible.
- Noise monitoring would be undertaken at the most affected point on or within the property boundary or at the most affected point within 30 metres of the property.
- Noise monitoring would always be conducted when activities on-site are typical of normal works.
- Monitoring would not be undertaken during respite periods for noisy works or where the measurements are likely to be influenced by noisy short term 'one off' activities that are not usually performed on-site.

### 6.4.3 Operational noise monitoring

Monitoring of noise during operations is to occur within 3 months of the commencement of each stage of operation of the Project and on an as-required basis in response to adverse comment or complaint regarding noise. The noise monitoring would determine noise levels from the Project to confirm the noise emission performance of the Project at noise sensitive receivers within the communities of Casula, North Glenfield and Wattle Grove.

All noise monitoring is to be consistent with the guidelines provided in the NSW Industrial Noise Policy 1999 and must include attended (observed measurements) and unattended (noise logging) at locations representative of the noise sensitive receivers as identified in the Project's EIS. The measurements must target operations that have the potential to cause offensive noise including noise emissions from industrial, road and rail transportation sources during the day, evening and night-time periods.

The following requirements would be followed during noise monitoring:

- Measurements would be undertaken during satisfactory conditions of nil precipitation and/or where the wind speed does not exceed 5 metres per second.
- Unless monitoring locations are pre-determined, the sound levels meter would be located 3 to 5 metres away from walls, buildings and other reflecting surfaces where feasible.
- Noise monitoring would be undertaken at the most affected point on or within the property boundary or at the most affected point within 30 metres of the property.
- Measurements within 1 metre of the dwelling facade would be taken to confirm maximum ($L_{Amax}$) noise levels.
- Noise monitoring would always be conducted when activities on-site are typical of normal operation.
- Monitoring would not be undertaken during periods of minimal noise generating operation or where the measurements are likely to be influenced by noisy short term 'one off' activities that are not usually performed on-site.
- The data to be used to determine meteorological conditions shall be that recorded by either the Australian Bureau of Meteorology or a weather station located on the Project site.

### 6.4.4 General requirements for all noise monitoring

The ambient noise environment is influenced by other sources of noise. To determine the influence of Project specific noise at a receiver, it is important to record a measurement of the construction/operational noise alone and not influenced by existing background noise. Where the background noise is significant and cannot be eliminated from the readings, a correction for background is needed to estimate the noise generated by the Project alone. In this case, the background noise level would be measured at a location representative of the receiver environment and where the noise from the construction/operational activities and from other industrial or transportation sources is not a dominant influence to the readings.

All acoustic instrumentation employed would be designed to comply with the requirements of Australian Standard AS 1259.2 2000 'Sound Level Meters' and carry current NATA or manufacturers calibration certificates. Instrument calibration would be checked before and after each monitoring event, with the variation in calibration levels not exceeding +/- 1 dBA.

### 6.4.5 Noise monitoring parameters

All noise monitoring during construction and operation of the Project will, as a minimum, measure noise levels to quantify the $L_{Aeq}$, $L_{Amax}$, $L_{A1}$, $L_{A10}$ and $L_{A90}$ noise metrics. To provide a representative measurement of the noise, monitoring events would ideally be undertaken for a continuous 15 minute period or, for events of a shorter duration, the full duration of the event under investigation. The determination of operational noise levels for the day, evening and night-time periods would be applied to the noise levels from a period of continuous noise monitoring of 1 to 2 weeks in duration.

### 6.4.6 Monitoring of ground vibration

Ground vibration will be measured, as required, to determine potential perceptible (disturbance) and/or cosmetic (structural damage) impacts at receivers sensitive to vibration from construction and the operation of the Project.

The performance requirements for the measurement instrumentation would meet the specifications set out in British Standard BS 7482 *'Instrumentation for the Measurement of Vibration Exposure of Human Beings'* Parts 1 and 3 and British Standard BS 6472 2008 *'Guide to Evaluation of Human Exposure to Vibration in Buildings'* Part 1.

Typically, vibration monitoring will require transducers, piezoelectric accelerometers and geophones, signal-conditions equipment and a data recording and analysis system. The mounting of vibration transducers to vibrating structures or the ground substrate should, where feasible, comply with Australian Standard AS 2275-2004 *'Mechanical Vibration and Shock-Mechanical Mounting of Accelerometers'* and guidance from the NSW Office of Environment and Heritage, which recommends:

- Mountings would be as stiff and light as possible.
- Brackets would be avoided transducers would be mounted by means of studs or quick-setting, high modulus resin. The transducers can be secured to the structure of the building by expansion bolts or rigid type adhesive.
- Measurement on floors with soft coverings is to be avoided.
- Where the measurement surface consists of rock, asphalt or concrete, the transducers would be fastened to the surface with a bolt or with epoxy or other quick setting, rigid cement.
- Where soil conditions permit, the transducer can be fixed to a stiff steel or aluminium 'star-stake', Projecting only a few millimetres above the ground surface. Where the transducer is to be buried, it must be at a depth of at least three times the main dimension of the transducer and well tamped to avoid coupling distortion.

### 6.4.7 Vibration monitoring parameters

Ground vibration monitoring is to measure the Peak Particle Velocity (PPV) in the X, Y and Z axis of vibration. In consideration of the Department of Environment and Conservation's *Assessing Vibration: a technical guideline*, the measured levels are to be applied to calculate/estimate Vibration Dose Values to assess potential disturbance impacts.

### 6.4.8 Trigger vales for noise and vibration

The trigger values for noise and ground vibration from construction and operation will be the noise and vibration assessment criteria detailed in the Noise and Vibration Assessment Technical Paper prepared for the Moorebank IMT EIS. The trigger criteria have been established in accordance with the guidelines and policies outlined below.

- NSW Department of Environment, Conservation and Climate Change *Interim Construction Noise Management Guideline*, 2009.
- NSW Environment Protection Authority *Industrial Noise Policy*, 2000 (and on-line application notes).
- NSW Environment Protection Authority *Rail Infrastructure Noise Guideline*, 2013.
- NSW Department of Environment, Climate Change and Water *NSW Road Noise Policy*, 2011.
- NSW Department of Environment and Conservation Assessing Vibration: A Technical Guideline, 2006.

All noise and vibration criteria will be confirmed as part of the Project Approval process and relevant environment protection licensing.

## 6.5 Management response to incidents and non-compliances

Within each of the Project specific management plans, the private sector developer would need to detail how incidents and non-compliances will be managed. It is envisaged that in doing so the private sector developer will draw upon its corporate Environmental Management System and address the specific requirements of the Project Approval.

Incidents may include (but are not limited to) the following:

- Required noise and vibration goals/criteria not achieved.
- Project and workforce personnel have not attended Project environmental inductions.
- Failure to meet identified objectives and targets.
- Near misses.
- Non-compliances.
- Complaints from surrounding receivers.

Incidents including non-compliances and near misses would trigger internal (and external as required) notifications, reporting, investigation, close out and associated corrective and preventative actions to ensure compliance as well as continual improvement.

### 6.5.1 Response actions

Where noise and vibration levels are measured above the Project specific criteria, they would be investigated and, where required, feasible and reasonable mitigation measures would be implemented to reduce impacts and achieve the objective of compliance with all Project specific noise and vibration criteria.

Where a non-conformance is identified the following measures would be implemented where appropriate:

- Current noise and vibration management and mitigation practices would be reviewed and additional feasible, reasonable and practical measures would be investigated to reduce and control potential noise and vibration levels from construction and/or operational activities.
- The measured operational noise levels would be included in the ongoing detailed design of the staged development of the Project to ensure adequate mitigation is provided for the new and additional operations.
- All complaints relating to noise and vibration during construction and operation would be reported and actioned in accordance with the Project's complaint handling procedures.

## 6.6 Reporting, auditing and review

Within each of the Project specific management plans, the operator and developer would need to detail what reporting, auditing and review processes would be implemented to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed.
- Project approvals issued under the EPBC Act and EP&A Act.
- Contractual requirements established between MIC and the developer and operator for the Project.
- Other permits and/or licences required during the course of the Project.
- Objectives, targets and indicators as presented in this PEMF.
- The Project specific management plans themselves (e.g. DMP, CEMP(s) and OEMP) and their associated monitoring programs.

### 6.6.1 Detailed design phase

Design reviews will be undertaken and documented to ensure the environmental design requirements/criteria associated with mitigating potential noise and vibration impacts during construction and operation have been taken into account and complied with.

### 6.6.2 Construction phase

The reporting requirements applicable for the construction phase will be in accordance with the Project's CEMP and its associated construction noise and vibration management plan as well as the requirements specified in Project Approval/conditions of approval, permits and licences as applicable to the Project.

Regular environmental audits would be undertaken to assess compliance with the CEMP, its associated construction noise and vibration management plan as well as the requirements specified in the Project Approval/conditions of approval, permits and licences as applicable to the Project. An annual environmental performance review and compliance report would be prepared during the construction phase of the Project.

### 6.6.3 Operational phase

The reporting requirements applicable for the operational phase will be in accordance with the Project's OEMP and its associated operational noise and vibration management plan as well as the requirements specified in the Project approval/conditions of approval, permits and licences as applicable to the Project.

Regular environmental audits would be undertaken to assess compliance with the OEMP, its associated noise and vibration management plans as well as the requirements specified in the Project Approval/conditions of approval, permits and licences as applicable to the Project. An annual environmental performance review and compliance report would be prepared during the operational phase of the Project.

### 6.6.4 Independent environmental audit

Throughout the life of the Project (construction and operational phases) the proponent would commission an independent environmental audit of the Project on an annual basis. The audit should:

- be conducted by a suitably qualified, experienced and independent team of experts and where necessary the team would be endorsed by the relevant Commonwealth and State government agencies;
- be led by a suitably qualified auditor and include experts in and field as directed by the relevant Commonwealth and State government agencies;
- be conducted in accordance with the guidance provided in ISO 19011:2002 (or as updated) – *Guidelines for Quality and/or Environmental Management Systems Auditing;*
- include consultation with relevant government agencies;
- assess the environmental performance of the Project and whether it is complying with the requirements of the Project Approval and any relevant licences and permits (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned Project related approvals, permits and licences;
- recommend measures and actions to improve the environmental performance of the Project, and/or any strategy, plan or program required under the Project Approval, permits and licences; and
- be included in the relevant annual environmental management report (AEMR).

The proponent would make copies of each independent environment audit available for public inspection on request and if requested be submitted to the Commonwealth and State based agencies.

### 6.6.5 Pre-construction compliance report

Four (4) weeks prior to the commencement of construction activities, the proponent would prepare a Pre-Construction Compliance Report. The Pre-Construction Compliance Report should:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed prior to construction have been complied with;
- include the date when each relevant condition of approval was complied with, including dates of submission and any required report and/or approval dates; and
- detail any approvals or licences required to be issued by government departments or agencies before construction commences.

### 6.6.6 Pre-operation compliance report

Four (4) weeks prior to the commencement of operations, the proponent would prepare a Pre-Operation Compliance Report. The Pre-Operation Compliance Report should:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed before operations commence were complied with
- include the date when each relevant condition of approval was complied with, including dates of submission of any required reports and/or approval dates
- detail any approvals or licences issued by government departments for the Project's operation.

### 6.6.7 Annual environmental management review

Throughout the life of the Project (construction and operational phases) the proponent would prepare an AEMR. The AEMR would review the performance of the Project against the CEMP and OEMP. The AEMR would include, but not necessarily be limited to:

- details of compliance with the various conditions of approval (i.e. Commonwealth and State approval conditions);
- copy of the complaints register for the preceding 12 months (exclusive of personal details), and details of how these complaints were addressed and resolved;
- identification of any circumstances in which the environmental impacts and performance of the Project during the year have not been generally consistent with the environmental impacts and performance predicted in the relevant Project documentation (e.g. EIS, Project Approval conditions as well as any licences and permits), with details of additional mitigation measures applied to the Project to address recurrence of these circumstances;
- results of all environmental monitoring required by the conditions of approval (i.e. Commonwealth and State approval conditions) as well as relevant licences and permits, including interpretation and discussion by a suitably qualified person;
- a list of all occasions in the preceding 12 month period when environmental goals/objectives/impact assessment criteria for the Project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure; and
- copies of the relevant independent environmental audit report, pre-construction compliance report and pre-operation compliance report.

## 6.7 Community consultation and liaison

A Community Engagement Plan (CEP) would be prepared and implemented by the developer and operator of the Project. This will outline the consultation and notification processes during the pre-construction, construction and operation phases. The CEP would be prepared to ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;
- accurate and accessible information is made available; and
- a timely response is given to issues and concerns raised by stakeholders and the community.

## 6.8 Supporting documentation

The purpose of the PEMF is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. Other PEMFs prepared as part of the Project's EIS include:

- Traffic, transport and access;
- Air quality;
- Light spill;
- Biodiversity;
- Hazards and risks;
- Aboriginal heritage:
- European heritage;
- Water quality and stormwater management; and
- Soils and contamination.

# 7. Applicable legislation, standards and guidelines

The legislative instruments, standards and guidelines specifically related to the management of potential noise and vibration impacts include the following:

- Australian Standard AS 1259.2 2000 *'Sound Level Meters';*
- Australian Standard AS 2275-2004 *'Mechanical Vibration and Shock-Mechanical Mounting of Accelerometers'*;
- British Standard BS 7482 *'Instrumentation for the Measurement of Vibration Exposure of Human Beings'* Parts 1 and 3;
- British Standard BS 6472 2008 *'Guide to Evaluation of Human Exposure to Vibrations in Buildings'* Part 1;
- EPBC Act;
- EP&A Act;
- *Interim Construction Noise Guideline* (DECCC, 2009);
- ISO 19011:2002 (or as updated) – Guidelines for Quality and/or Environmental Management Systems Auditing;
- *NSW Industrial Noise Policy* (EPA 2000);
- *Assessing Vibration: A Technical Guideline* (DECC 2006);
- *NSW Road Noise Policy* (DECCW 2011);
- *Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects* (DECC 2007); and
- *Rail Infrastructure Noise Guideline* (NSW EPA 2013).

Moorebank Intermodal Company

# Moorebank Intermodal Terminal Project

## Traffic, Transport and Access Provisional Environmental Management Framework

2 July 2014

PARSONS BRINCKERHOFF

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## Author, Reviewer and Approver details

| | | | |
|---|---|---|---|
| Prepared by: | Emma Lichkus | Date: | Signature:  |
| Reviewed by: | Paul Greenhalgh | Date: | Signature:  |
| Approved by: | Paul Greenhalgh | Date: | Signature:  |

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Parsons Brinckerhoff Australia Pty Limited

*ABN 80 078 004 798*

Level 27 Ernst & Young Centre
680 George Street, Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
Email: sydney@pb.com.au
www.pbworld.com


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# 1. Environmental Management framework

The Moorebank IMT Project would be developed by the private sector under the direction of the Moorebank Intermodal Company (MIC) Limited, a Government Business Enterprise. The future developer and operator of the Project has not yet been selected. As such, a proposed overall environmental management framework has been outlined as part of the Environmental Impact Statement (EIS) (refer to Chapter 28 - *Environmental management framework*), which would guide the development of a future detailed framework.

Figure 1.1 outlines the overall environmental management framework for the Project. The environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004. It is anticipated that MIC and the developer and operator of the Project would have established environmental management systems covering their respective business objectives, policies, activities and associated environmental aspects and impacts.

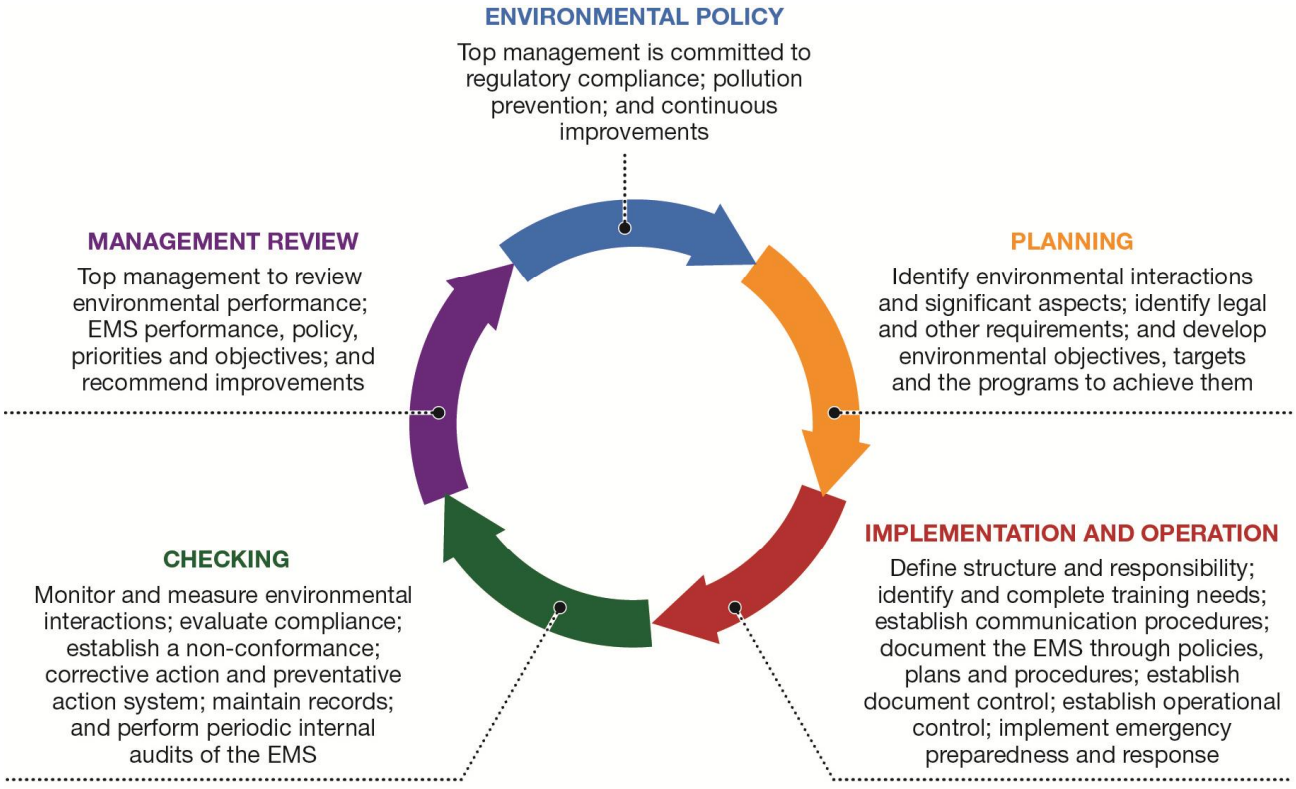


**Figure 1.1 Overall environmental management framework for the Project**

Approval of the Project is being sought for:

- construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Stage 1 development consent as State significant development (SSD) from the NSW Department of Planning & Environment (NSW DP&E) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the concept proposal described in the EIS (including final approval for Early Works).

Subject to approval of the Stage 1 SSD, the Project will be subject to further development approval under the EP&A Act (Stage 2 SSD development approvals).

It is anticipated that the developer and operator of the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities, for example:

- Design Management Plan (DMP) (incorporating environment design criteria).
- Construction Environmental Management Plan(s) (CEMP).
- Operational Environmental Management Plan(s) (OEMP).

This document outlines the Provisional Environmental Management Framework (PEMF) which will guide the development of the above management plans.

The project specific detail to be addressed by each of the above listed management plans would be dictated by the requirements of the following key project documentation:

- The Project's EIS (including this PEMF);
- Project Approval issued under the EPBC Act;
- Stage 1 and Stage 2 SSD approvals issued under the NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator of the Project; and
- Other permits and/or licences required during the course of the project.

### 1.1.1 Provisional Environmental Management Framework

As part of the Project's EIS, a series of PEMFs has been prepared. The purpose of the PEMF is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. The PEMF would be further developed during detailed design and the Stage 2 SSD approval process.

The PEMF combined with the Project approvals, contractual arrangements and other permits and/or licences required during the course of the Project provide guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s).

# 2. The Project site and study area

The Project is situated in the Sydney suburb of Moorebank; NSW located approximately 35 km south west from the centre of Sydney and approximately 2 km south of Liverpool CBD. The Project site is located in an urban setting, comprising mainly residential, industrial and commercial land uses and is bounded by Moorebank Avenue to the east, the East Hills Railway Line to the south, the Georges River to the west and the ABB (a power and automation technology manufacturer) and the M5 Motorway to the north. The M5 Motorway provides access to other Sydney motorways, with the M7 Motorway interchange approximately 5 km by road west of the proposed site.

The Southern Sydney Freight Line (SSFL) is currently being duplicated on the western side of the Georges River along the South Line/Bankstown Line and would be used to service the terminal.

The Project site is currently occupied by the School of Military Engineering (SME) and other minor Department of Defence (Defence) units. The existing road network surrounding the Project site primarily comprises local roads, owned and operated by the Liverpool City Council (LCC), and private roads, owned and maintained by Defence. The LCC local roads include Moorebank Avenue (between the M5 Motorway and Anzac Road), Anzac Road, Bapaume Road and Cambridge Avenue, each of which has a speed limit of 60 kilometres per hour (km/h). Defence roads include Moorebank Avenue south of Anzac Road, and roads within the Project site, some of which connect to Moorebank Avenue.

The Project site is located in close proximity to a number of major roads, including the Hume Highway (a National Road) and the M5 Motorway (a State Road). The section of the M5 Motorway over the Georges River between Moorebank Avenue and the Hume Highway is a recognised bottleneck within the motorway network, due in part to the short distance available for vehicles joining and leaving the motorway at this location. This effect could potentially be complicated by the planned widening of the M5 Motorway, by Roads and Maritime Services (RMS) immediately east and west of Moorebank Avenue.

# 3. Purpose and scope

The purpose of this PEMF is to provide a high level overview as to how the traffic, transport and access impacts during design, construction and operational phases of the Project will be minimised.

This PEMF combined with the Project approvals, contractual arrangements and other permits and/or approvals required during the course of Project provides guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s). It is anticipated that the future developer and operator of the Project would be required to develop these plans.

As part of the approval process for the Project, it is necessary to show that the Proponent has taken, and will take, all practical steps to properly manage the traffic, transport and access risks associated with the Project. This is achieved by the following:

- Identification of activities that may lead to traffic, transport and access impacts.
- Establishment of objectives, targets and indicators for the management of traffic, transport and access impacts.
- Establishment of management approaches as well as monitoring, reporting, auditing and review regimes.

A detailed Traffic, Transport and Accessibility Impact Assessment was undertaken (Volume 3 of the EIS) and Chapter 11 - *Traffic, transport and access* of the EIS provides a summary of the existing transportation network surrounding the Project as well as potential traffic, transport and access impacts resulting from construction and operation of the Project.

# 4. Activities that may lead to traffic, transport and access impacts

The construction and operation of the Project will have traffic, transport and access impacts.

A range of management and mitigation measures have been identified to minimise these impacts. The effectiveness of these management and mitigation measures will be assessed/confirmed through further analysis during the detailed design phase.

The potential environmental impacts associated with the Project include the following construction and operation impacts.

## 4.1 Construction impacts

Construction vehicle traffic is expected to be greatest during the main earthworks and civil construction in Phase A (in approximately 2016) due to an increase in vehicle movements and the physical disruption to the road network required to increase the capacity of Moorebank Avenue. Construction access to the main IMT site would be via Moorebank Avenue (north of the East Hills Railway Line) and the M5 Motorway. Increased traffic volumes from construction activities would temporarily increase congestion at existing intersections along Moorebank Avenue. However once Moorebank Avenue is upgraded as part of the Project in Phase A, SIDRA intersection modelling has confirmed that the upgraded intersections would operate better than the existing road network. Some partial and full road closures may be required during construction (most likely at night). In regard to construction impacts on the M5 Motorway, the impact of the Project construction traffic on the operation of the M5 Motorway is expected to be negligible.

For the construction of the rail access connection from the SSFL to the Project site, it is likely that a proportion of construction traffic (around 25 heavy vehicles a day) would need to access the bridge construction area through Casula on the western bank of the Georges River. Construction of the rail access connection to the operating SSFL would cause some temporary disruption to the operation of this freight corridor.

An assessment of the most appropriate haulage route for site access west of the Georges River would be undertaken during the development of the detailed design in consultation with LCC, and may incorporate haulage routes used for the SSFL construction (where appropriate).

## 4.2 Operational impacts

A strategic traffic network model was developed to assess the impact of the Project on the distribution of intermodal-related traffic within the Sydney region. During operation, the Project would save on road based freight trips. By transferring freight movements to the Project site by rail for distribution, the regional network would experience reductions of approximately 65,000 truck vehicle kilometres travelled (VKT) a day and 1,850 truck vehicle hours travelled a day. This is also expected to contribute to reducing heavy vehicle-related crashes.

The majority of the traffic generated by the Project operations is likely to have already been on the Sydney strategic highway network anyway. Some additional heavy and light vehicle trips would be generated by the Project, primarily along Moorebank Avenue, the M5 Motorway and local road intersections in the vicinity of the Project site. Increase in traffic as a result of the Project could intensify any existing congestion along the M5 Motorway during peak hours; however, given the Project would contribute less than 3% of the traffic volume, this impact is predicted to be negligible.

In 2030, at the highest forecast levels of activity on-site, the Project operational traffic is not predicted to have a significant impact on most of the intersections in the vicinity of Moorebank. Any increase in congestion at these intersections is expected to be offset by the significant wider network benefits, especially around Port Botany the result from the diversion of container traffic from the roads in this area. There would be no need for heavy vehicle parking on Moorebank Avenue associated with the Project.

# 5. Objectives, targets and indicators

The objectives, targets and indicators for the management of traffic, transport and access impacts are shown in Table 5.1. The management controls implemented help achieve these objectives/targets described in the following section.

**Table 5.1 Objectives, targets and indicators for the management of traffic, transport and access impacts**

| Objectives | Targets | Indicators |
|---|---|---|
| During the detailed design phase, ensure that the proposed traffic, transport and access control measures (for construction and operation) have been incorporated into the design. | Detailed design incorporates the control measures for construction and operation as identified in the EIS and this PEMF. | Instances whereby nominated control measures have not been incorporated into the detailed design. |
| Establish and maintain awareness of the importance of ensuring impacts associated traffic, transport and access associated with the Project are minimised. | All Project and workforce personnel to complete an environmental induction, which will include information on the importance of minimising traffic, transport and access impacts. | Number and percentage of Project and workforce personnel that have attended required environmental induction prior to commencing work on the Project site. |
| The implementation of Traffic Management Plan(s) and associated Traffic Control Plan(s) during construction with no environmental or safety incidents. | Zero environmental and safety incidents associated with traffic, transport and access during construction. | Number of incidents (environmental and safety) relating to traffic, transport and access during the construction phase(s) of the Project. |
| The implementation of Traffic Management Plan(s) and associated Traffic Control Plan(s) during operation with no environmental or safety incidents. | Zero environmental and safety incidents associated with traffic, transport and access during operation. | Number of incidents (environmental and safety) relating to traffic, transport and access during the operational phase(s) of the Project. |

# 6. Management approach

As discussed in section 1, it is anticipated that the private sector developer would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. This includes a DMP (incorporating environment design criteria); a CEMP; and an OEMP.

The traffic and transport component of the above listed project specific management plans would align with the high level requirements as detailed in this PEMF as well as the project specific requirements.

The following sections provide a summary of the management control measures to be implemented during design, construction and operation in order to mitigate the risks associated with potential traffic and transport impacts.

## 6.1 Management controls – detailed design phase

During the detailed design phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following controls measures were identified as part of the EIS and would be implemented during the detailed design phase of the Project:

- The Project team would continue to liaise with Australian Rail Track Corporation (ARTC), Transport for NSW (TfNSW) and other stakeholders on the rail freight network regarding the capacity of the network beyond the Southern Sydney Freight Line (SSFL) (including for interstate rail transport). Further analysis would be undertaken to determine likely demand distribution and capacity across the rail freight network.
- Install a variable message signage system within the Project site to direct heavy vehicles and facilitate safe and efficient access and navigation.
- Install a permanent variable message system on Moorebank Avenue to manage traffic movement to and from the various areas of the Moorebank IMT.
- Use the most southern access off Moorebank Avenue (Access 5) as the main back-up access route for heavy vehicles, for the central and southern rail access options, if the main truck access becomes blocked.
- Consider the provision of pedestrian and cyclist connections from Moorebank Avenue into the Project site for the warehouse developments and Moorebank IMT site.
- Provide staff storage and shower areas to promote cycling, jogging and walking as mode of transport.
- Negotiate with bus operators for the provision of additional bus stops and increased bus services between the Project site and nearby public transport interchange hubs to reduce the volume of light vehicles generated by staff. Facilitate discussions with Transdev and Transport for NSW for future bus services for the Moorebank IMT site.
- Undertake further detailed design and staging of the Project rail link construction works to ensure:
  - connection with the SSFL is designed to minimise construction impacts on SSFL operations;
  - connection with the SSFL would allow trains to leave and enter the SSFL at a maximum design speed of 45 kilometres per hour (km/h);
  - trains entering and leaving the Project site have an appropriate staging area (i.e. arrival and departure roads) to enable smooth interface and minimum disruption to other operations on the SSFL;

- the Project's internal train control system and signalling integrates with the SSFL system; and
- Undertake consultation with the ARTC and appropriate rail operators throughout the detailed design and construction of the proposed rail link to the SSFL to minimise disturbance to SSFL operations.

## 6.2 Management controls – Early Works and construction phase

During the construction phase(s), works would be undertaken to meet the objectives as detailed in section 5 of this PEMF.

The following control measures would be implemented during the construction phase(s) of the Project:

- Modify access locations in response to the development of the Moorebank Avenue upgrade. During this stage numerous access locations may be required for the transportation of spoil and material.
- Minimise heavy vehicle movements through Casula residential roads by using the Project site east of the Georges River as a construction area for the Georges River rail bridge where possible.
- Minimise construction vehicle movements during peak periods to minimise impacts to Moorebank Avenue and other local roads. In particular, Moorebank Avenue south of the East Hills Railway Line would not be used by construction heavy vehicles.
- Ensure access to neighbouring properties is maintained, including the ABB site.
- Develop a communications plan to provide information regarding traffic impacts and road upgrades to the relevant authorities, bus operators and the local community. Ensure the communications plan includes a contact list with appropriate chains of command.
- Implement Traffic Control Plans (TCPs) to inform drivers of the construction activities and locations of heavy vehicle access locations.
- Obtain Road Occupancy Licences (ROLs) as necessary, including for the upgrade of Moorebank Avenue.
- Develop an emergency response plan for the upgrade of Moorebank Avenue during Project Phase A. During this phase, emergency vehicles using Moorebank Avenue as a transport route would need to be considered, as well as emergency access to adjoining properties.
- During the Early Works development phase, traffic on Moorebank Avenue would be monitored during peak periods to ensure that queuing at intersections does not impact on other road users.

### 6.2.1 Construction traffic management plan

Effective traffic management plans must form part of the overall CEMP and OEMP to be implemented for the Project. It is anticipated that these plans would be developed further during the detailed design and would include the results and findings of any further assessment. However, the following general measures would be included in the construction traffic management plan:

- Minimise heavy vehicle movements through Casula residential roads by using the Project site east of the Georges River as a construction area for the Georges River rail bridge where possible.
- Minimise construction vehicle movements during peak periods, where possible, to minimise impacts to Moorebank Avenue and other local roads. In particular Moorebank Avenue south of the East Hills Railway Line would not be utilised by construction heavy vehicles.
- Ensure access to neighbouring properties is maintained, including the ABB site.

- Develop a communications plan to provide information regarding traffic impacts and road upgrades to the relevant authorities, bus operators and the local community. Ensure the communications plan includes a contact list with appropriate chains of command.
- Implement Traffic Control Plans to inform drivers of the construction activities and locations of heavy vehicle access locations.
- Obtain Road Occupancy Licences as necessary, including for the upgrade of Moorebank Avenue.
- Develop an emergency response plan for the upgrade of Moorebank Avenue during Project Phase A. During this stage, emergency vehicles using Moorebank Avenue as a transport route would need to be considered, as well as emergency access to adjoining properties.

## 6.3 Management controls – operational phase

During the operation phase, traffic management plans would be implemented as part of the OEMP.

## 6.4 Monitoring

It is anticipated that the developer and operator of the Project would be required to develop a number of Project specific management plans to address design activities, construction activities and operational activities. These plans would include a DMP, CEMP(s) and an OEMP.

Within each of the Project specific management plans, the private sector developer would need to detail what monitoring would be undertaken to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed.
- Project approvals issued under the EPBC Act and EP&A Act.
- Contractual requirements established between MIC and the developer and operator of the Project.
- Other permits and/or licences required during the course of the Project.
- Objectives, targets and indicators as presented in this PEMF.
- Specifically, it is anticipated that, during Early Works, traffic on Moorebank Avenue would be monitored during peak periods to ensure that queuing at intersections does not impact on other road users.
- No operational monitoring is considered necessary; after the construction of Moorebank Avenue, the proposed intersections would operate at a better LoS than the existing intersections, and would be capable of handling the estimated demand. Also, the truck movements associated with the IMT would be controlled by a scheduling system. This system would provide truck arrival and departure data to facilitate monitoring during operation.

### 6.4.1 Traffic congestion monitoring

The traffic assessment undertaken as part of the EIS and its associated results are based on strategic modelling that has been developed using the existing traffic volumes. There is some uncertainty around the predicted traffic volumes for the construction and operation period of the Moorebank IMT development. As such, monitoring of future traffic volumes and patterns would be undertaken to better determine the actual traffic volumes within the study area.

The following traffic monitoring (i.e. traffic counts) would be conducted to monitor the traffic flow on Moorebank Avenue as well as the key access intersections to and from the Project site:

- Tube count surveys during the construction period every six (6) weeks.

- Tube count surveys and intersections surveys once traffic volumes have stabilised post-construction. These surveys would be undertaken every six (6) months over a period of two (2) years of facility operations so as to determine the actual traffic volumes generated by containers, warehouses or the SIMTA site.

If the actual traffic volumes (i.e. surveyed data during construction and operation) are higher than the predicted volumes, additional analysis would be undertaken to ascertain if traffic congestion has deteriorated significantly more than predicted. If required, mitigation measures may include limiting truck movements at certain times of the day.

In addition, the performance of traffic signal controlled intersections affected by the Project would be monitored. The actual performance of these signal controlled intersections would be compared to that expected to determine if there was any detrimental performance impact. If required, mitigation measures may include adjusting the signal phasing and cycle time of the traffic signals.

## 6.5 Management response to incidents and non-compliances

Within each of the Project specific management plans, the private sector developer would need to detail how incidents and non-compliances will be managed. It is envisaged that in doing so the private sector developer will draw upon its corporate Environmental Management System and address the specific requirements of the Project approval.

Incidents may include (but are not limited to) the following:

- Failure to meet identified objectives and targets.
- Project and workforce personnel have not attended Project environmental inductions.
- Near misses.
- Non-compliances.

Incidents including non-compliances and near misses would trigger internal (and external as required) notifications, reporting, investigation, close out and associated corrective and preventative actions to ensure compliance as well as continual improvement.

## 6.6 Reporting, auditing and review

Within each of the Project specific management plans, the private sector developer would need to detail what reporting, auditing and review processes would be implemented to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the EPBC Act and EP&A Act;
- Contractual requirements established between MIC and the developer and operator of the Project;
- Other permits and/or licences required during the course of the Project;
- Objectives, targets and indicators as presented in this PEMF; and
- The Project specific management plans themselves (e.g. DMP, CEMP(s) and OEMP and their associated monitoring programs.

### 6.6.1 Independent environmental audit

Throughout the life of the Project (construction and operational phases) the proponent would commission an independent environmental audit of the Project on an annual basis. The audit would:

- be conducted by a suitably qualified, experienced and independent team of experts and where necessary the team would be endorsed by the relevant Commonwealth and State government agencies;
- be led by a suitably qualified auditor and include experts in and field as directed by the relevant Commonwealth and State government agencies;
- be conducted in accordance with the guidance provided in ISO 19011:2002 (or as updated) – *Guidelines for Quality and/or Environmental Management Systems Auditing;*
- include consultation with relevant government agencies;
- assess the environmental performance of the Project and assess whether it is complying with the requirements of the Project approvals and any relevant licences and permits (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned Project related approvals, permits and licences;
- recommend measures and actions to improve the environmental performance of the Project, and/or any strategy, plan or program required under the Project approval, permits and licences; and
- be included in the relevant annual environmental management report (AEMR).

The proponent would make copies of each independent environment audit available for public inspection on request and if requested be submitted to the Commonwealth and State based agencies.

### 6.6.2 Pre-construction compliance report

Four (4) weeks prior to the commencement of construction activities, the proponent would prepare a Pre-Construction Compliance Report. The Pre-Construction Compliance Report would:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed prior to construction have been complied with;
- the date when each relevant condition of approval was complied with, including dates of submission and any required report and/or approval dates; and
- detail any approvals or licences required to be issued by government departments or agencies before construction commences.

### 6.6.3 Annual environmental management review

Throughout the life of the Project (construction and operational phases) the proponent would prepare an AEMR. The AEMR would review the performance of the Project against the CEMP and OEMP. The AEMR would include, but not necessarily be limited to:

- details of compliance with the various conditions of approval (i.e. Commonwealth and State approval conditions)
- a copy of the complaints register for the preceding 12 months (exclusive of personal details), and details of how these complaints were addressed and resolved

- identification of any circumstances in which the environmental impacts and performance of the Project during the year have not been generally consistent with the environmental impacts and performance predicted in the relevant Project documentation (e.g. EIS, Project Approval conditions as well as any licences and permits), with details of additional mitigation measures applied to the Project to address recurrence of these circumstances
- results of all environmental monitoring required by the conditions of approval (i.e. Commonwealth and State approval conditions) as well as relevant licences and permits, including interpretation and discussion by a suitably qualified person
- a list of all occasions in the preceding 12 month period when environmental goals/objectives/impact assessment criteria for the Project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure
- copies of the relevant independent environmental audit report, pre-construction compliance report and pre-operation compliance report.

## 6.7 Community consultation and liaison

A Community Engagement Plan (CEP) will be prepared and implemented by the future developer and operator of the Project. This will outline the consultation and notification processes during the pre-construction, construction and operation phases. The CEP would be prepared to ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;
- accurate and accessible information is made available; and
- a timely response is given to issues and concerns raised by stakeholders and the community.

## 6.8 Supporting documentation

This PEMF is one of a suite of plans which form part of the Project's EIS. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. Other PEMFs prepared as part of the Project's EIS include:

- Noise and vibration;
- Air quality;
- Light spill;
- Biodiversity;
- Hazards and risks;
- European heritage;
- Water quality and stormwater management;
- Soils and contamination; and
- Air quality.

# 7. Applicable legislation, standards and guidelines

The legislative instruments, standards and guidelines specifically related to the management of potential traffic, transport and access impacts include the following:

- EPBC Act.
- NSW EP&A Act.
- ISO 19011:2002 (or as updated) – Guidelines for Quality and/or Environmental Management Systems Auditing.
- RMS 2005 *Accident Reduction Guide Version 1.1.*

Moorebank Intermodal Company

# Moorebank Intermodal Terminal Project

## Aboriginal Heritage Provisional Environmental Management Framework

2 July 2014

PARSONS BRINCKERHOFF

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| | | | |
|---|---|---|---|
| Prepared by: | Emma Lichkus | Date: 02/07/2014 | Signature:  |
| Reviewed by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |
| Approved by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |

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*ABN 80 078 004 798*

Level 27 Ernst & Young Centre
680 George Street, Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
Email: sydney@pb.com.au
www.pbworld.com


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# 1. Environmental Management framework

The Moorebank IMT Project would be developed by the private sector under the direction of the Moorebank Intermodal Company (MIC) Limited, a Government-Business Enterprise. The future developer and operator of the Project has not yet been selected. As such, a proposed overall environmental management framework has been outlined as part of the Environmental Impact Statement (EIS) (refer to Chapter 28 - *Environmental management framework*), which would guide the development of a future detailed framework.

Figure 1.1 outlines the overall environmental management framework for the Project. The environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004. It is anticipated that MIC and the future developer and operator of the Project would have established environmental management systems covering their respective business objectives, policies, activities and associated environmental aspects and impacts.

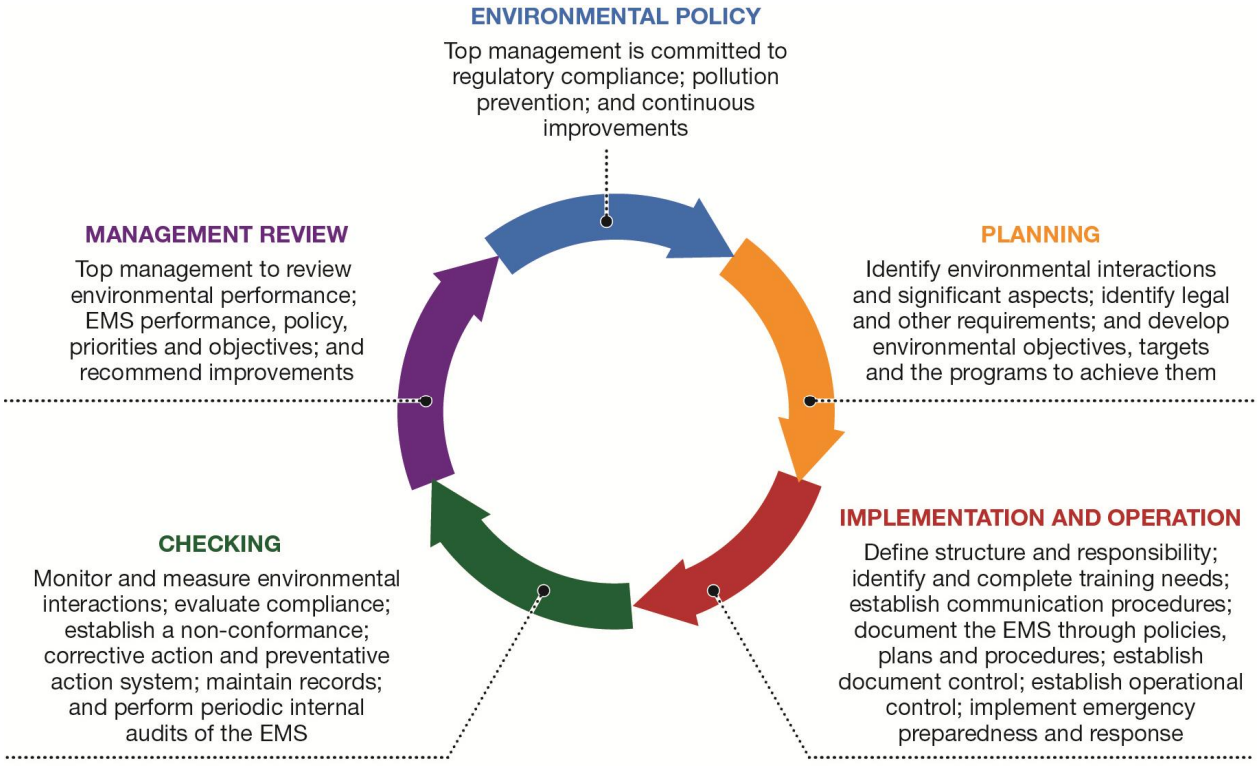


**Figure 1.1 Overall environmental management framework for the Project**

Approval of the Project is being sought for:

- construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Stage 1 development consent as State significant development (SSD) from the NSW Department of Planning & Environment (NSW DP&E) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the concept proposal described in the EIS (including final approval for Early Works).

Subject to approval of the Stage 1 SSD, the Project will be subject to further development approval under the EP&A Act (Stage 2 SSD development approvals).

It is anticipated that the future developer and operator of the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities, for example:

- Design Management Plan (DMP) (incorporating environment design criteria).
- Construction Environmental Management Plan(s) (CEMP).
- Operational Environmental Management Plan(s) (OEMP).

This document outlines the Provisional Environmental Management Framework (PEMF) which will guide the development of the above management plans.

The project specific detail to be addressed by each of the above listed management plans would be dictated by the requirements of the following key project documentation:

- The Project's EIS (including this PEMF);
- Project Approval issued under the EPBC Act;
- Stage 1 and Stage 2 SSD approvals issued under the NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator of the Project; and

Other permits and/or licences required during the course of the project.

## 1.1 Provisional Environmental Management Framework

As part of the Project's EIS, a series of PEMFs has been prepared. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised.

The PEMFs combined with the Project approvals, contractual arrangements and other permits and/or licences required during the course of the Project provide guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s).

# 2. The Project site and study area

The Moorebank IMT Project is proposed to be situated on land located approximately 30 kilometres (km) south-west of the Sydney Central Business District (CBD) and 4 km south of the Liverpool CBD in the Liverpool Local Government Area (LGA) (refer Figure 2.1).

The Project site comprises:

- the main IMT site (which is the land to the east of the Georges River, is currently occupied by Defence; and
- the rail connection (including the Georges River) from the main IMT site to the SSFL, including the three rail access options (northern, central and southern) as proposed within the Project concept.

These are described below.

## 2.1 Main IMT site

Field surveys undertaken on the main IMT site for the purposes of this EIS have indicated there are localised areas of Aboriginal archaeological sensitivity. The majority of Aboriginal sites identified within the main IMT site are surface scatters of artefacts and areas of archaeological deposit. Of interest, three scarred trees of possible Aboriginal origin were identified, as well as three PADs and three archaeologically sensitive landform types. These are mapped in Chapter 20 – *Aboriginal heritage* in the EIS. The remainder of the main IMT site has been extensively developed for Defence purposes, and a large proportion of the site is either of low or no sensitivity.

## 2.2 Rail access options

One PAD was identified to the west of Georges River, on land affected by the northern rail access option. This PAD is located on an archaeologically sensitive landform as shown in Figure 20.3 in Chapter 20 – *Aboriginal heritage* in the EIS.

No surface evidence of Aboriginal occupation was found on land that would be affected by the central and the southern rail access options; however, areas of potentially intact deposits were identified along the banks of the Georges River that may contain archaeological evidence.

# 3. Purpose and scope

The purpose of this PEMF is to provide a high level overview as to how the impacts on Aboriginal heritage values during design, construction and operational phases of the Project will be minimised.

This PEMF combined with the Project approvals, contractual arrangements and other permits and/or approvals required during the course of Project provides guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s). It is anticipated that the preferred developer and operator of the Project would be required to develop these plans.

As part of the approval process for the Project, it is necessary to show that the proponent has taken, and will take, all practical steps to properly manage the potential impacts to Aboriginal heritage items associated with the Project. This is achieved by the following:

- Identification of activities that may lead to Aboriginal heritage impacts.
- Establishment of objectives, targets and indicators for the management of Aboriginal heritage impacts.
- Establishment of management approaches as well as monitoring, reporting, auditing and review regimes.

A detailed Aboriginal Heritage Impact Assessment was undertaken (Volume 5 of the EIS). Chapter 20 - *Aboriginal heritage*) of the EIS provides a summary of the existing Aboriginal heritage values surrounding the Project as well as potential Aboriginal heritage impacts resulting from construction and operation of the Project.

# 4. Activities that may lead to impacts to Aboriginal heritage values

The construction and operation of the Project may impact Aboriginal heritage values on the Project site.

A range of management and mitigation measures have been identified to minimise these impacts. The effectiveness of these management and mitigation measures will be assessed through further detailed analysis during the detailed design phase.

During construction and full operation of the Project, there would be impacts on Aboriginal sites within and adjacent to the proposed construction footprint. Table 4.1 summarises the nature and extent of potential impacts on recorded Aboriginal sites that would result from the three Moorebank IMT concept designs (northern, central and southern rail option layouts). The figures in Chapter 20 – *Aboriginal heritage* identify the location of the Aboriginal heritage sites.

**Table 4.1 Impacts to recorded sites**

| Site number | Rail access option | Location | Degree of harm | Consequence of harm |
|---|---|---|---|---|
| Georges River corridor and terraces | Northern | Partly within construction footprint on western bank | Partially impacted | Potential destruction of part of site |
| | Central | Partly within construction footprint on eastern and western banks | Partially impacted | Potential destruction of part of site |
| | Southern | Partly within construction footprint on eastern and western banks | Partially impacted | Potential destruction of part of site |
| MA1 | Northern | Partly within construction footprint | Partially impacted | Potential destruction of part of site |
| | Central | Partly within construction footprint | Partially impacted | Potential destruction of part of site |
| | Southern | Within conservation zone | Not impacted | Nil |
| MA2 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |

| Site number | Rail access option | Location | Degree of harm | Consequence of harm |
|---|---|---|---|---|
| MA3 | Northern | Within conservation zone | Not impacted | Nil |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within conservation zone | Not impacted | Nil |
| MA4 | Northern | Within conservation zone | Not impacted | Nil |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| MA5 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| MA6 | Northern | Within conservation zone | Not impacted | Nil |
| | Central | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| MA7 | Northern | Within conservation zone | Not impacted | Nil |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| MA8 | Northern | Within conservation zone | Not impacted | Nil |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within conservation zone | Not impacted | Nil |
| MA9 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |

| Site number | Rail access option | Location | Degree of harm | Consequence of harm |
|---|---|---|---|---|
| MA10 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site (deposit is likely to extend north and south beyond the construction footprint) |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site (deposit is likely to extend north and south beyond the construction footprint) |
| MA11 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within conservation zone | Not impacted | Nil |
| MA12 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within conservation zone | Not impacted | Nil |
| MA13 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within conservation zone | Not impacted | Nil |
| MRSA2 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Central | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| | Southern | Within construction footprint | Directly impacted | Potential destruction of whole or part of site |
| MAPAD2 | Northern | Within construction footprint | Directly impacted | Potential destruction of whole or part of the site |
| | Central | Within conservation zone | Not impacted | Nil |
| | Southern | Within conservation zone | Not impacted | Nil |

# 5. Objectives, targets and indicators

The objectives, targets and indicators for the management of Aboriginal heritage impacts are shown in Table 5.1. The management controls implemented help achieve these objectives/targets described in the following section.

**Table 5.1 Objectives, targets and indicators for the management of Aboriginal heritage impacts**

| Objectives | Targets | Indicators |
|---|---|---|
| During the detailed design phase, ensure that the proposed control measures (for detailed design) are implemented and/or incorporated into the design. | Detailed design phase control measures have been implemented and/or incorporated into the design. | Instances whereby nominated control measures have not been implemented and/or incorporated into the design. |
| During the detailed design phase, ensure that the proposed Aboriginal heritage control measures (for construction and operation) have been incorporated into the design. | Detailed design incorporates the control measures for construction and operation as identified in the EIS and this PEMF. | Instances whereby nominated control measures have not been incorporated into the detailed design. |
| Establish and maintain awareness of the importance of ensuring that impacts to Aboriginal heritage values associated with the Project are minimised. | All Project and workforce personnel to complete an environmental induction, which will include information on the importance of protecting and minimising Aboriginal heritage values within the Project Site. | Number and percentage of Project and workforce personnel that have attended required environmental induction prior to commencing work on the Project site. |
| During construction phases, Aboriginal heritage values are protected and unexpected finds are managed in accordance with legal requirements. | Zero incidents where areas or items of Aboriginal heritage are damaged without prior approval.<br>Zero incidents where protected Aboriginal heritage items or areas are damaged.<br>Unexpected finds are appropriately managed. | Incidents involving Aboriginal heritage items and/or areas.<br>Instances associated with unexpected finds. |
| During operation, Aboriginal heritage values are protected and unexpected finds are managed in accordance with legal requirements. | Zero incidents where areas or items of Aboriginal heritage are damaged without prior approval.<br>Zero incidents where protected Aboriginal heritage items or areas are damaged.<br>Unexpected finds are appropriately managed. | Incidents involving Aboriginal heritage items and/or areas.<br>Instances associated with unexpected finds. |

# 6. Management approach

As discussed in section 1 of this PEMP, it is anticipated that the private sector developer would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. This includes a DMP (incorporating environment design criteria); a CEMP; and an OEMP.

The Aboriginal heritage component of the above listed project specific management plans would align with the high level requirements as detailed in this PEMF as well as the project specific requirements.

The following sections provide a summary of the management control measures to be implemented during design, construction and operation in order to mitigate the risks associated with potential Aboriginal heritage impacts.

## 6.1 Management controls – detailed design and Early Works phase

Whilst the majority of the impacts to Aboriginal heritage items would occur in Project development Phases A – C, it is important that analysis and salvage is undertaken prior to construction. Therefore, the following mitigation measures would be considered and implemented during the detailed design and Early Works development phases of the Project:

- Where practicable, options would be explored to conserve moderate to high significance sites in situ.
- An Aboriginal heritage interpretation strategy for the Project would be developed in close consultation with the registered Aboriginal parties. The strategy may consider combining both European and Aboriginal interpretation within the Project site.
- If the northern rail access option is selected, then the mitigation measures outlined in the Northern Powerhouse Land Aboriginal archaeology assessment (NOHC 2014a addendum report) should be implemented and consideration given to potential historical heritage implications. This includes further data gathering to fill the knowledge gaps regarding MAPAD2 and would involve:
  - desktop study (of geotechnical borehole data and levels);
  - drilling to recover undisturbed sediment core (for assessment and dating and as an archive sequence); and
  - subsurface bulk sample retrieval (using augered mud bucket) to assess preservation conditions and artefact presence/absence at depth.
- Information recovered from future investigations at MAPAD2 would be incorporated into an Aboriginal heritage interpretation strategy for the Project as a whole, developed in close consultation with the registered Aboriginal parties.
- If the central rail access option is selected, a program of Aboriginal subsurface archaeological investigation should be undertaken. The testing program would need to assess the upper metre of deposits as well as deposits at depth.
- If the southern rail access option is selected, a combined geotechnical and archaeological assessment should be undertaken to assess the nature of any deposit and the need for further archaeological investigation and/or salvage.

- Options for avoidance of impacts at sites MA6 and MA7 would be explored during the detailed design phase. If impacts cannot be avoided, consultation would be undertaken with Registered Aboriginal Parties regarding options for specialist investigations (e.g. a suitably qualified specialist in eucalypts of the Sydney region and dendrochronology may be engaged to formally assess the age of the trees and their scars) and culturally appropriate mitigation strategies.
- An archaeological salvage excavation program would be implemented to conserve archaeological deposits of moderate to high archaeological/scientific significance located within the construction footprint (items recorded at MA5 and MA9).

  Consideration would be given to conserving both sites in situ, within open space reserves, or as an extension of the proposed conservation zone.
- A surface salvage program would be carried out to conserve surface artefacts located within the construction footprint (items recorded at MA1, MA2, MA3 and MA4). Salvage of surface artefacts would be undertaken prior to any impacts in these areas.
- Consultation would be ongoing with the registered Aboriginal parties throughout the life of the Project and would include:
  - consultation on the future care and management of recovered Aboriginal objects;
  - methodologies for any future investigations; and
  - finalisation of management and mitigation strategies subject to detailed design.

## 6.2 Management controls – construction phase

During the construction phase(s), works would be undertaken to meet the objectives as detailed in section 5 of this PEMF.

The following control measures were identified as part of the EIS and would be implemented during the construction phase(s) of the Project:

- The Unanticipated Discoveries Protocol described in Appendix 9 of Technical Paper 12 – *Aboriginal Heritage Impact Assessment* in Volume 6 would be followed in the event that historical items or relics or suspected burials are encountered during construction works.

## 6.3 Management controls – operational and ongoing

During the operation phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF.

- Consultation would be ongoing with the registered Aboriginal parties throughout the life of the Project and would include:
  - consultation on the future care and management of recovered Aboriginal objects;
  - methodologies for any future investigations; and
  - finalisation of management and mitigation strategies subject to detailed design.

## 6.4 Monitoring

The developer and operator of the Project would be required to develop a number of Project specific management plans Within each of the Project specific management plans, the private sector developer would need to detail what monitoring would be undertaken to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the EPBC Act and EP&A Act;
- Contractual requirements established between MIC and the developer and operator of the Project;
- Other permits and/or licences required during the course of the Project; and
- Objectives, targets and indicators as presented in this PEMF.

## 6.5 Management response to incidents and non-compliances

Within each of the Project specific management plans, the private sector developer would need to detail how incidents and non-compliances will be managed. It is envisaged that in doing so the private sector developer will draw upon its corporate Environmental Management System and address the specific requirements of the Project approval.

Incidents may include (but are not limited to) the following:

- Failure to meet identified objectives and targets.
- Project and workforce personnel have not attended Project environmental inductions.
- Required approvals/permits are not in place prior to the disturbance of Aboriginal heritage values.
- Unexpected finds.
- Near misses.
- Non-compliances.

Incidents including non-compliances and near misses would trigger internal (and external as required) notifications, reporting, investigation, close out and associated corrective and preventative actions to ensure compliance as well as continual improvement.

## 6.6 Reporting, auditing and review

Within each of the Project specific management plans, the private sector developer would need to detail what reporting, auditing and review processes would be implemented to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the EPBC Act and EP&A Act;
- Contractual requirements established between MIC and the developer and operator of the Project;
- Other permits and/or licences required during the course of the Project;
- Objectives, targets and indicators as presented in this PEMF; and
- The Project specific management plans themselves (e.g. DMP, CEMP(s) and OEMP and their associated monitoring programs.

### 6.6.1 Independent environmental audit

Throughout the life of the Project (construction and operational phases) the proponent would commission an independent environmental audit of the Project on an annual basis. The audit would:

- be conducted by a suitably qualified, experienced and independent team of experts and where necessary the team would be endorsed by the relevant government agencies (e.g. Commonwealth and State);
- be led by a suitably qualified auditor and include experts in and field as directed by the relevant government agencies (e.g. Commonwealth and State);
- be conducted in accordance with the guidance provided in ISO 19011:2002 (or as updated) – *Guidelines for Quality and/or Environmental Management Systems Auditing;*
- include consultation with relevant government agencies;
- assess the environmental performance of the Project and assess whether it is complying with the requirements of the Project approvals and any relevant licences and permits (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned Project related approvals, permits and licences;
- recommend measures and actions to improve the environmental performance of the Project, and/or any strategy, plan or program required under the Project approvals, permits and licences; and
- be included in the relevant annual environmental management report (AEMR).

The proponent would make copies of each independent environment audit available for public inspection on request and if requested be submitted to the Commonwealth and State based agencies.

### 6.6.2 Pre-construction compliance report

Four (4) weeks prior to the commencement of construction activities, the proponent would prepare a Pre-Construction Compliance Report. The Pre-Construction Compliance Report would:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed prior to construction have been complied with;
- include the date when each relevant condition of approval was complied with, including dates of submission and any required report and/or approval dates; and
- detail any approvals or licences required to be issued by government departments or agencies before construction commences.

### 6.6.3 Pre-operation compliance report

Four (4) weeks prior to the commencement of operations, the proponent would prepare a Pre-Operation Compliance Report. The Pre-Operation Compliance Report would:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed before operations commence have been complied with;
- include the date when each relevant condition of approval was complied with, including dates of submission of any required reports and/or approval dates; and
- detail any approvals or licences issued by government departments for the Project's operation.

### 6.6.4 Annual environmental management review

Throughout the life of the Project (construction and operational phases) the proponent would prepare an AEMR. The AEMR would review the performance of the Project against the CEMP and OEMP. The AEMR would include, but not necessarily be limited to:

- details of compliance with the various conditions of approval (i.e. Commonwealth and State approval conditions);
- copy of the complaints register for the preceding 12 months (exclusive of personal details), and details of how these complaints were addressed and resolved;
- identification of any circumstances in which the environmental impacts and performance of the Project during the year have not been generally consistent with the environmental impacts and performance predicted in the relevant Project documentation (e.g. EIS, Project approval conditions as well as any licences and permits), with details of additional mitigation measures applied to the Project to address recurrence of these circumstances;
- results of all environmental monitoring required by the conditions of approval (i.e. Commonwealth and State approval conditions) as well as relevant licences and permits, including interpretation and discussion by a suitably qualified person;
- a list of all occasions in the preceding 12 month period when environmental goals/objectives/impact assessment criteria for the Project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure; and
- copies of the relevant independent environmental audit report, pre-construction compliance report and pre-operation compliance report.

## 6.7 Community consultation and liaison

A Community Engagement Plan (CEP) will be prepared and implemented by the developer and operator for the Project. This will outline the consultation and notification processes during the pre-construction, construction and operation phases. The CEP would be prepared to ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;
- accurate and accessible information is made available; and
- a timely response is given to issues and concerns raised by stakeholders and the community.

## 6.8 Supporting documentation

This PEMF is one of a suite of plans which form part of the Project's EIS. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. Other PEMFs prepared as part of the Project's EIS include:

- Noise and vibration;
- Traffic, transport and access;
- Light spill;
- Biodiversity;
- Hazards and risks;

- European heritage;
- Water quality and stormwater management;
- Soils and contamination; and
- Air quality.

# 7. Applicable legislation, standards and guidelines

The legislative instruments, standards and guidelines specifically related to the management of potential Aboriginal heritage impacts include the following:

- EPBC Act;
- EP&A Act;
- NSW *Heritage Act 1977;*
- NSW *National Parks and Wildlife Act 1974;*
- Aboriginal cultural heritage consultation requirements for proponents (NSW DECCW 2010);
- ISO 19011:2002 (or as updated) – Guidelines for Quality and/or Environmental Management Systems Auditing; and
- Roads and Maritime Services *Accident Reduction Guide Version 1.1*.

Moorebank Intermodal Company

# Moorebank Intermodal Terminal Project

# Air Quality Provisional Environmental Management Framework

2 July 2014

PARSONS BRINCKERHOFF

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| | | | |
|---|---|---|---|
| Prepared by: | Emma Lichkus | Date: 02/07/2014 | Signature:  |
| Reviewed by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |
| Approved by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |

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*ABN 80 078 004 798*

Level 27 Ernst & Young Centre
680 George Street, Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
Email: sydney@pb.com.au
www.pbworld.com


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# 1. Environmental Management framework

The Moorebank IMT Project would be developed by the private sector under the direction of the Moorebank Intermodal Company (MIC) Limited, a Government Business Enterprise. The future developer and operator for the Project has not yet been selected. As such, a proposed overall environmental management framework has been outlined as part of the Environmental Impact Statement (EIS) (refer to Chapter 28 - *Environmental Management framework*), which would guide the development of a future detailed framework.

Figure 1.1 outlines the overall environmental management framework for the Project. The environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004. It is anticipated that MIC and the developer and operator for the Project would have established environmental management systems covering their respective business objectives, policies, activities and associated environmental aspects and impacts.

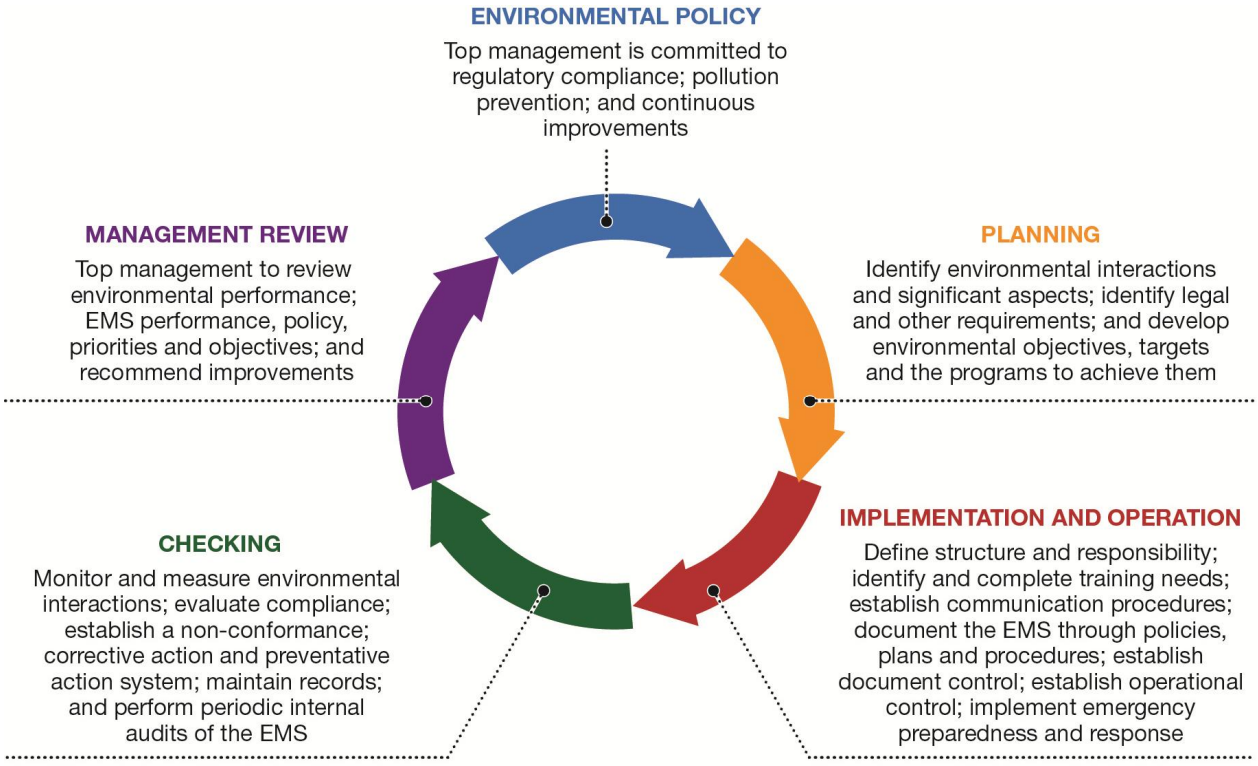


**Figure 1.1 Overall environmental management framework for the Project**

Approval of the Project is being sought for:

- construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Stage 1 development consent as State significant development (SSD) from the NSW Department of Planning & Environment (NSW DP&E) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the concept proposal described in the EIS (including final approval for Early Works).

Subject to approval of the Stage 1 SSD, the Project will be subject to further development approval under the EP&A Act (Stage 2 SSD development approvals).

It is anticipated that the developer and operator for the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities, for example:

- Design Management Plan (DMP) (incorporating environment design criteria).
- Construction Environmental Management Plan(s) (CEMP).
- Operational Environmental Management Plan(s) (OEMP).

This document outlines the Provisional Environmental Management Framework (PEMF) which will guide the development of the above management plans.

The project specific detail to be addressed by each of the above listed management plans would be dictated by the requirements of the following key project documentation:

- The Project's EIS (including this PEMF);
- Project Approval issued under the EPBC Act;
- Stage 1 and Stage 2 SSD approvals issued under the NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project; and
- Other permits and/or licences required during the course of the project.

## 1.1 Provisional Environmental Management Frameworks

As part of the Project's EIS, a series of PEMFs have been prepared. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised.

The PEMFs combined with the Project approvals, contractual arrangements and other permits and/or licences required during the course of the Project provide guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s).

# 2. The Project site and study area

The Project site is located on primarily flat land immediately east of the Georges River. On the other side of the Georges River, elevations increase to 40–50 m, approximately 20 m higher than at the Project site.

Geographic characteristics can influence local air drainage flows. For example, the presence of the Blue Mountains (to the west of the Project site), can result in plume entrapment, poor dispersion of airborne pollutants and the potential to cause greater off-site impacts, due to the downward motion of cold air form a high point. As these local air drainage flows often occur at night, this would result in temperature inversion (a thin layer of the atmosphere where the normal decrease in temperature with height switches to a temperature increase with height). This allows for the trapping of pollutants below the inversion until it breaks down (typically around mid-morning).

For local air quality impacts, 38 potentially sensitive receivers and four boundary locations (selected monitoring locations north, south, east and west of the Project boundary), refer to Figure 2.1. These include but are not limited to residential properties, schools, and aged care facilities near the Project site. The closest sensitive receiver is the Defence National Storage and Distribution Centre (DNSDC) facility (Receiver 33) located adjacent to the eastern boundary of the Project site. As part of the Defence Logistics Transformation Program, the DNSDC facility will move to a new location (referred to as Receiver 35) approximately 1.5 km to the north-east of the Project site (West Wattle Grove) under the Defence Logistics Transformation Project, which is due to be completed by the end of 2014.

A number of industrial and non-industrial sources close to the Project site have the potential to influence the local airshed. These include, but are not limited to:

- existing industries to the east and north-east of the Project site (including Greenhills Industrial Estate and Moorebank Business Park);
- the existing Glenfield Landfill to the south-west;
- traffic emissions from the existing road network, including the M5 Motorway directly bordering the northern boundary of the Project site;
- emissions from diesel locomotives on the SSFL to the west of the Project boundary (and a small number of diesel XPT trains on Main South Line);
- diesel locomotive emissions from the East Hills Rail Line to the south of the Project site boundary (NB: Diesel trains are infrequent on this line but do occur occasionally when diesel trains such as XPT-type locomotives are diverted from Main South Line); and
- emissions from aircraft at Bankstown Airport to the north-east and the military airfield at Holsworthy.

These sources are likely to give rise to emissions of particulate matter (TSPs, $PM_{10}$ and $PM_{2.5}$), $NO_2$, $SO_2$, CO, trace levels of VOCs, heavy metals and odour.

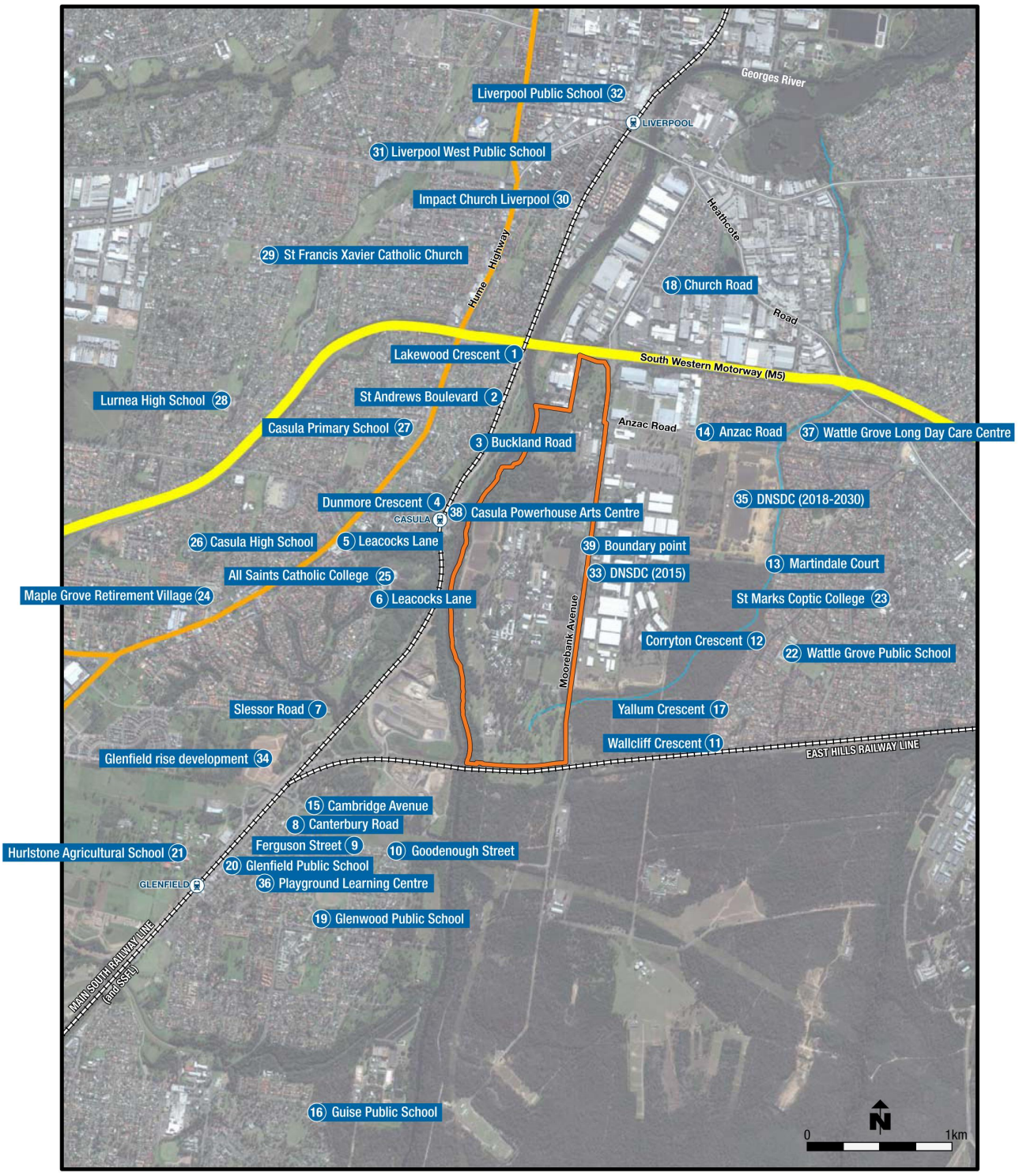


**Figure 2.1 Nearest assessed receivers to the Project Site**

# 3. Purpose and scope

The purpose of this PEMF is to provide a high level overview as to how air quality impacts will be minimised during design, construction and operational phases of the Project.

This PEMF combined with the Project approval, contractual arrangements and other permits and/or approvals required during the course of Project provides guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s). It is anticipated that the developer and operator for the Project would be required to develop these plans.

As part of the approval process for the Project, it is necessary to show that the Proponent has taken, and will take, all practical steps to properly manage the air quality risks associated with the Project. This is achieved by the following:

- Identification of activities that may lead to air quality impacts.
- Establishment of objectives, targets and indicators for the management of air quality impacts.
- Establishment of management approaches as well as monitoring, reporting, auditing and review regimes.

Detailed Local and Regional Air Quality Impact Assessments were undertaken for the Project (Volume 5 of the EIS) and Chapter 17 – *Local air quality* and Chapter 18 – *Regional air quality* of the EIS provides a summary of the potential impacts of the Project on existing air quality within and surrounding the Project site, as well as for the wider Sydney region.

# 4. Activities that may lead to air quality impacts

The construction and operation of the Project will have impacts on air quality. This section provides an overview of the impacts detailed in Section 17.3 (in Chapter 17 – *Local air quality*) of the EIS.

A range of management and mitigation measures have been identified to minimise these impacts (refer to sections 5 and 6 of this PEMF). The effectiveness of these management and mitigation measures will be assessed/confirmed through further analysis during detailed design.

## 4.1 Construction impacts

During construction, the main potential air quality related impacts would be associated with the generation of dust and emissions from the movement of on-site machinery, bulk earthworks, material storage and associated vehicular traffic.

### 4.1.1 Dust emissions

Dust or particulate matter emissions would be generated by various construction activities. These activities include:

- vehicle movements on paved and unpaved roads;
- heavy earthwork operations such as excavation and earthmoving activities;
- erosion of stockpiles and freshly exposed areas on-site;
- handling, transfer and storage of materials; and
- re-contouring of land and soil exposure for reseeding.

Larger particles (TSP) would likely settle out closer to the emission source due to their larger mass. The deposition of these particles can cause nuisance within the surrounding area.

Finer particles ($PM_{10}$ and $PM_{2.5}$) would likely remain in entrainment for longer than larger particles and therefore are spread greater distances. The fine nature of these particles has the potential to impact on people's respiratory systems if not adequately controlled.

The short-term nature of the construction activities and the proposed implementation of detailed control measures (refer to section 5 and 6 of this PEMF) would enable particulate matter emissions to be effectively managed.

### 4.1.2 Vehicle emissions

During construction, emissions are likely to be associated with the combustion of diesel fuel and petrol. The operation of on-site machinery during construction and general site operations would generate CO, $CO_2$, $NO_X$, $SO_2$, particulate matter ($PM_{10}$ and $PM_{2.5}$) and trace amounts of non-combustible hydrocarbons. Emission rates and impact potential would depend on the number and power output of the combustion engines, the quality of the fuel and the condition of the combustion engines.

### 4.1.3 Odour emissions

Part of the excavation works includes the removal of potentially contaminated soils from within the construction footprint. As a result of the contaminated soils being exposed to the ambient air environment, there is potential for some odorous emissions to be released. Slight odours may be detectable at the Project site close to the emission source(s) during construction. The intensity of perceived odour impacts can vary significantly between people, as reactions to odour are highly subjective. However, on-site surveys of the soils detected few volatile contaminants and odorous compounds (Parsons Brinckerhoff 2014b) such that odorous emissions are not expected to be an issue during excavation works.

## 4.2 During operation

### 4.2.1 Emissions from diesel locomotives and switch engines

A significant source of air emissions during the operation of the Project would be generated from diesel freight train locomotives travelling to and from the import/export (IMEX) and interstate terminals and the switch engines used to move the wagons within the working tracks.

Locomotive emissions would result from the combustion of diesel fuel and petroleum. Pollutants would include particulate matter fractions (TSP, $PM_{10}$ and $PM_{2.5}$), CO, $CO_2$, $NO_x$, $SO_2$ and trace levels of non-combustible VOCs, non-methane hydrocarbons (NMHCs) and PAHs.

Fugitive particulate matter emissions from the use of freight trains are mainly caused by wheel/brake action on rail lines and entrainment of surface particles in the rail corridor. (Note: Emissions from open sources such as this are termed ‘fugitive’ as they are not discharged to the atmosphere in a confined flow stream).

### 4.2.2 Emissions from on-site mobile equipment

On-site mobile emissions were modelled from emission sources, including forklifts, side picks and in-terminal vehicles (ITVs). This equipment would be used to transport the TEUs to the warehousing facilities and container storage facilities. Forklifts would be limited to the warehouses and would not be required until Project Phase B when the warehousing facilities become operational. The side picks and ITVs would operate throughout the Project site.

All forklifts, side picks and ITVs would be powered by liquefied natural gas (LNG). Emissions from LNG equipment would primarily consist of $NO_x$, $PM_{2.5}$, CO and trace levels of non-combustible hydrocarbons such as VOCs.

### 4.2.3 Over-the road vehicle (OTV), diesel and petrol vehicle emissions

Emissions are anticipated to arise from the combustion of diesel and petrol fuel from delivery trucks and heavy goods vehicles and employee and visitor cars entering and leaving the Project site. Combustion exhausts from the OTVs are expected to be a significant contributor of emissions to the local airshed and have been included in the predictive air dispersion modelling described in section 17.3.2, along with emissions from passenger vehicles which comprise a minor source.

Emissions from the OTVs and passenger vehicles are expected to include NOx, $PM_{10}$, $PM_{2.5}$, $SO_2$ and CO. In addition, low levels of VOCs, NMHCs and PAHs are also anticipated.

### 4.2.4 Miscellaneous emissions

Minor fugitive emissions are expected from fuels and chemicals stored on-site (e.g. LNG, diesel, lubricant oils and cleaning chemicals). Refrigeration facilities may be required throughout the operation of the Project and thus, refrigeration emissions may be released as part of the Project's operation. Transportation refrigeration units (TRUs) are used to maintain climate control for containers and railcars carrying perishable cargo. A study into air emission sources commonly associated with centres for the transport and movement of goods, such as intermodal facilities and maintenance yards, showed that TRUs were responsible for only a small amount of $PM_{10}$ emissions from the operation of intermodal facilities. The study also found that the proportion of $NO_X$ emissions resulting from TRUs was significantly less for $PM_{10}$ (Douglass, Heiken, Rubenstein, 2010). Thus the air quality emissions resulting from Project-related refrigeration activities are unlikely to contribute significantly to the overall air emissions from the Project. However, at this stage of the development specific refrigeration requirements of the Project are unknown. This would need to be further investigated at the detailed design stage.

Some minor localised odour emissions may be generated as part of the Project's general operation or proposed on-site packaged sewage treatment plant. The expected odour impacts on-site and offsite would be negligible, based on the setting of the Project site, the likely ambient air quality characteristics and transient nature of odorous emissions.

# 5. Objectives, targets and indicators

The objectives, targets and indicators for the management of air quality impacts are shown in Table 5.1. The management controls implemented help achieve these objectives/targets described in the following section.

**Table 5.1 Objectives, targets and indicators for the management of air quality impacts**

| Objectives | Targets | Indicators |
|---|---|---|
| During the detailed design phase, ensure that the proposed air quality control measures (for construction and operation) have been incorporated into the Project's design. | Detailed design incorporates the control measures for construction and operation as identified in the EIS and this PEMF, to ensure emissions remain within acceptable levels as specified in relevant regulations or guidelines.<br>Predictive air quality modelling confirms that construction and operation mitigation/management measures incorporated into the detailed design will enable regulatory requirements to be achieved. | Instances whereby nominated control measures have not been incorporated into the detailed design.<br>Instances whereby relevant regulatory requirements are anticipated not to be achieved. |
| Establish and maintain awareness of the importance of ensuring that air quality impacts associated with the Project are avoided, where possible, or minimised. | All Project and workforce personnel to complete an environmental induction, which will include information on the importance of minimising air quality impacts. | Number and percentage of Project and workforce personnel that have attended required environmental induction prior to commencing work on the Project site. |
| Avoid the exceedance of air quality goals/criteria during construction. | Zero incidents of air quality goals/criteria being exceeded during construction phase. | Number of incident reports relating to exceedances of air quality goals/criteria during the construction phase. |
| Avoid the exceedance of air quality goals/criteria during operation. | Zero incidents of air quality goals/criteria being exceeded during operation phase. | Number of incident reports relating to exceedances of air quality goals/criteria during the operations phase. |

# 6. Management approach

As discussed in section 1, it is anticipated that the private sector developer would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. This includes a DMP (incorporating environment design criteria); a CEMP; and an OEMP.

The air quality component of the above listed project specific management plans would align with the high level requirements as detailed in this PEMF as well as the project specific requirements.

The following sections provide a summary of the management control measures to be implemented during design, construction and operation in order to mitigate the risks associated with potential air quality impacts.

## 6.1 Management controls

### 6.1.1 Management controls – detailed design phase

During the detailed design phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following control measures were identified as part of the EIS and would be implemented during the detailed design phase of the Project:

- During detailed design the following measures would be further investigated:
  - refrigerated on-site containers would be electrically powered;
  - use of hybrid only cars (electric/Liquefied natural gas (LNG)/Compressed natural gas (CNG), Liquefied petroleum gas (LPG)) on-site;
  - considering requiring that older diesel trucks be installed with the latest emission reduction technology would be considered (e.g. retrofitting of particle filters, installation of catalytic convertors or replacement with newer less polluting diesel engines to ensure emissions requirements conform to the Australian Design Rule ADR80/03);
  - all on-road trucks would comply with the Euro 5 emission standards;
  - all new off-road construction equipment to meet, at minimum, the US EPA Tier 3 emission standards for non-road diesel engines (US EPA Tier 4 emission standard equipment would be adopted where available);
  - use of hybrid locomotives or cleaner fuels for locomotives would be considered (e.g. locomotives powered by batteries with a small diesel engine for recharging the batteries and for additional power (as currently used on the Burlington Northern Santa Fe railway, California, USA)); and
  - use of fuel cells, LNG and electric powered locomotives would be considered.
- The following proposals would be considered as part of an effective and integrated strategic management plan:
  - investigation of the feasibility of increasing the fraction of container traffic that moves by rail:
  - implementation of terminal appointment systems and appropriate time slots for Project site access for truck and rail deliveries to avoid unnecessary on-site air emissions during peak periods;
  - minimisation of the potential for fluctuating demand forecasts for equipment among carriers, railways and the terminal through effective communication;

  - utilisation of the latest information technologies such as Intelligent Transportation Systems (ITS) applied to transportation operations which can result in improved transportation efficiency and a reduced environmental impact; and
  - consideration of the use of a virtual container yard to assist with incorporating on-site operational efficiencies to ensure air emissions are minimised.
- The following measures would be further investigated at detailed design stage:
  - All chemicals and fuels would be stored in sealed containers as per appropriate regulations and guidelines.
  - The on-site storage of fuel would be kept to a minimum to minimise vapour emission levels.
  - Unloading of fuels (diesel or liquefied natural gas) would be vented via return hoses that recirculate vapours from delivery to receiver.
  - Tanks would be fitted with a conservation vent (to prevent air inflow and vapour escape until a pre-set vacuum or pressure develops).
  - Strategies would be put in place to reduce the usage of chemical and fuels in additional to using alternative fuel technologies as recommended in the NSW *Action for Air* (DECCW 2009). Particular focus would be on those products with the potential to release high levels of air toxics.
- Odour emissions would be controlled through the implementation of Best Management Practice (BMP). The following mitigation measures and safeguards are recommended for the operational works:
  - providing covering for inlet works;
  - extraction of inlet works foul air gases to a soil bed filter for treatment; and
  - contingencies in place for potential loss of aeration (backup generator for power supply and storage of lime for dosing to the process units in the event that anaerobic conditions occur).

### 6.1.2 Management controls – Early Works and construction phases

During the preconstruction and construction phases, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following control measures were identified as part of the EIS and would be implemented during the preconstruction and construction phases of the Project:

- A Dust Management Plan (DMP) would be prepared as part of the CEMP.
- Dust minimisation measures would be developed and implemented prior to commencement of construction. The *NSW Coal Mining Benchmarking Study: Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (OEH 2011a) would be referenced for measures for dust management.
- Methods for management of emissions would be incorporated into Project inductions, training and pre-start talks.
- Activities with the potential to cause significant emissions, such as material delivery and load out and bulk earthworks, would be identified in the CEMP. Work practices which minimise emissions during these activities would be investigated and applied where reasonable and feasible.
- A mechanism for raising and responding to complaints would be put in place for the duration of the construction phase.
- Vehicle movements would be limited to designated entries and exits, haulage routes and parking areas. Project site exits would be fitted with hardstand material, rumble grids or other appropriate measures to limit the amount of material transported off-site (where required).
- Work site compounds and exposed areas would be screened to assist in capturing airborne particles and reduce potential entrainment of particles from areas susceptible to wind erosion.

- Dust would be visually monitored during construction and, the following measures would be implemented:
  - Apply water (or alternative measures) to exposed surfaces that are causing dust generation. Surfaces may include any stockpiles, hardstand areas and other exposed surfaces (for example recently graded areas are those areas recently scraped). Regular watering would ensure that the soil is moist to achieve 50% control of dust emissions from scrapers, graders and dozers.
  - Appropriately cover loads on trucks transporting material to and from the construction site. Securely fix tailgates of road transport trucks prior to loading and immediately after unloading.
  - Prevent, where possible, or remove, mud and dirt being tracked onto sealed road.
  - Apply water at a rate of >2 litres (L) per square metre per hour ($L/m^2/hr$) to internal unsealed access roadways and work areas. Application rates would be related to atmospheric conditions (e.g. prolonged dry periods) and the intensity of construction operations. Paved roads would be regularly swept and watered when necessary.
- Dust generating activities (particularly clearing and excavating) would be avoided or minimised during dry and windy conditions.
- Project site speed limits of 20 kilometres per hour (km/hr) would be imposed on all construction vehicles at the Project site.
- Graders would be limited to a speed of 8 km/hr to reduce potential dust emissions.
- Material stockpiles would not exceed an area of 1 ha and would be regularly watered to achieve 50% control of potential dust emissions.
- Exposed areas and stockpiles would be limited in area and duration. For example, vegetation stripping or grading would be staged where possible, unconsolidated stockpiles would be covered, or hydro mulch or other revegetation applicant applied to stockpiles or surfaces left standing for extended periods.
- Revegetation or rehabilitation activities would proceed once construction activities are completed within a disturbed area.
- Construction plant and equipment would be well maintained and regularly serviced so that vehicular emissions remain within relevant air quality guidelines and standards.
- Excavation works in potentially contaminated soils would be managed to ensure that they are completed during optimal dispersive conditions to minimise odorous emissions.
- Emissions from trucks would be regulated in accordance with the requirements prescribed in the National Environmental Protection Measure (NEPM) (Diesel Vehicle Emissions) (NEPC 2001).
- All construction vehicles would be tuned to not release excessive level of smoke from the exhaust and would be compliant with NSW Office of Environment and Heritage (OEH) Smokey Vehicles Program under the *Protection of the Environment and Operations Act 1997* (NSW)(POEO Act) and POEO Regulations (NSW) (2010).
- All on-road trucks are to comply with the Euro 5 emission standards.
- All new off-road construction equipment would be required to meet, at minimum, the US Environmental Protection Agency (EPA) Tier 3 emission standards for non-road diesel engines.
- Establishment of Action Response Levels (ARLs) for use with real-time dust management. These aid in the assessment of impact potential, and establish an early warning system during adverse trends, reducing complaint potential and non-compliance issues. An ARL trigger would be a defined measurement of elevated dust levels for a prolonged period
- It is also proposed that ambient air quality monitoring is undertaken as part of the Project's construction phase right through to operation. This would include, but would not be limited to:

- on-site monthly dust deposition monitoring would be undertaken during construction to measure dust fallout from the Project at boundary points and selected sensitive receiver locations. This would include comparison of concentrations with the air quality criteria.
- Continuation of the existing Project monitoring (that records continuous measurements of NOx, $PM_{10}$ and weather data) after operations commence to ensure that the ambient air quality criteria are met. The existing station may need relocation based on site construction works and regulator recommendations.
- The existing on-site meteorological monitoring station location would be reviewed to ensure compliance with relevant Australian Standard documentation.

### 6.1.3 Management controls – operational phase

Operations of the Project would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following control measures were identified as part of the EIS and would be implemented during the operations phase of the Project:

- Pre-operation:
  - An air quality management plan (AQMP) would be prepared for the operation of the Project.
  - Investigate the possibility of reducing locomotives idling times on-site.
- Operation:
  - Manage Project site traffic to ensure trucks do not queue along public roads adjacent to the Project site. This can be achieved through the implementation and enforcement of an idling limit for trucks on-site and at the troubled truck parking area (e.g.1 hour).
  - Optimise the use of trucks capable of transporting multiple TEUs simultaneously to achieve maximum efficiency on-site and reduce air emissions.
  - Emissions from any exhaust stacks would be regulated in accordance with the provisions of the NSW *Protection of the Environment and Operations Act* 1997 (POEO Act).
  - Periodic stack monitoring would be undertaken to demonstrate compliance with in-stack limits.
  - Vehicles would be tuned to not release excessive levels of smoke from the exhaust and to be compliant with OEH's Smokey Vehicles Program under the POEO Act and POEO Regulations.
  - A documented testing program by relevant enforcement agencies would be implemented at regular intervals.
  - A regular and documented maintenance and inspection program would be implemented for all equipment that enters the Project site.
  - On-site good housekeeping and raw material handling practices would be controlled through agreed protocols.
  - Emissions from trucks would be regulated by the NEPM (Diesel Vehicle Emissions) (NEPC 2001).
  - Emissions from locomotives would follow international standards, such as those provided for under United States legislation '*Final Rule: Control of Emissions of Air Pollution from Locomotives and Marine Compression-Ignition Engines Less Than 30 litres per Cylinder'* (US EPA 2012) and would meet the Tier 2+ or above emission standard for all new locomotives entering the Project site (No emission standards are available under the NSW or Federal legislative framework for locomotives).

  - Emissions from shunting engines would follow international standards, such as those provided for under United States legislation '*Final Rule: Control of Emissions of Air Pollution from Locomotives and Marine Compression-Ignition Engines Less Than 30 litres per Cylinder*' (US EPA 2012) and would meet the Tier 2+ or above emission standard. Older locomotives would up graded to meet Tier 1 or Tier 2+ emission standards where reasonable and feasible. (No emission standards are available under the NSW or Federal legislative framework for shunting engines).
- It is also proposed that ambient air quality monitoring is undertaken as part of the Project's construction phase right through to operation. This would include, but would not be limited to:
  - On-site monthly dust deposition monitoring would be undertaken during construction to measure dust fallout from the Project at boundary points and selected sensitive receiver locations. This would include comparison of concentrations with the air quality criteria.
  - Continuation of the existing Project monitoring (that records continuous measurements of NOx, $PM_{10}$ and weather data) after operations commence to ensure that the ambient air quality criteria are met. The existing station may need relocation based on site construction works and regulator recommendations.
  - The existing on-site meteorological monitoring station location would be reviewed to ensure compliance with relevant Australian Standard documentation.

### 6.1.4 Monitoring

Within each of the Project specific management plans, the private sector developer would need to detail what monitoring would be undertaken to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the EPBC Act and EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project;
- Other permits and/or licences required during the course of the Project; and
- Objectives, targets and indicators as presented in this PEMF.

The Project's EIS has identified the following air quality monitoring requirements:

- On-site monthly dust deposition monitoring would be undertaken during construction to measure dust fallout from the Project at boundary points and selected sensitive receiver locations. This would include comparison of concentrations with the air quality criteria.
- The existing Project monitoring (that records continuous measurements of $NO_x$, $PM_{10}$ and weather data) would continue after operations commence to ensure that the ambient air quality criteria are met.

## 6.2 Management response to incidents and non-compliances

Within each of the Project specific management plans, the private sector developer would need to detail how incidents and non-compliances will be managed. It is envisaged that in doing so the private sector developer will draw upon its corporate Environmental Management System and address the specific requirements of the Project approval.

Incidents may include (but are not limited to) the following:

- Relevant air quality goals/criteria not achieved.

- Project and workforce personnel have not attended Project environmental inductions.
- Failure to meet identified objectives and targets.
- Non-compliances.
- Complaints from surrounding receivers.

Incidents, such as non-compliances, would trigger internal (and external as required) notifications, reporting, investigation, close out and associated corrective and preventative actions to ensure compliance as well as continual improvement.

## 6.3 Reporting, auditing and review

Within each of the Project specific management plans, the private sector developer would need to detail what reporting, auditing and review processes would be implemented to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed.
- Project approvals issued under the EPBC Act and EP&A Act.
- Contractual requirements established between MIC and the developer and operator for the Project.
- Other permits and/or licences required during the course of the Project.
- Objectives, targets and indicators as presented in this PEMF.
- The Project specific management plans themselves (e.g. DMP, CEMP(s) and OEMP) and their associated monitoring programs.

### 6.3.1 Detailed Design phase

Design reviews will be undertaken and documented to ensure the environmental design requirements/criteria associated with mitigating potential air quality impacts during construction and operation have been incorporated into the design and/or complied with.

### 6.3.2 Construction phase

Any reporting requirements applicable to the construction phase will be in accordance with the Project's CEMP, relevant subordinate management plans (e.g. the Dust Management Plan), and the requirements specified in Project Approval/ conditions of approval, permits and licences as applicable to the Project.

Monthly environmental reports would be prepared during the construction phase of the Project. Regular environmental audits would also be undertaken to assess compliance with the CEMP, relevant subordinate management plans (e.g. the Dust Management Plan), and the requirements specified in the Project Approval/conditions of approval, permits and licences as applicable to the Project.

An annual environmental performance review and compliance report would be prepared during the construction phase of the Project.

### 6.3.3 Operational phase

The reporting requirements applicable for the operational phase will be in accordance with the Project's OEMP, relevant subordinate management plans (e.g. the (AQMP)), and the requirements specified in the Project approval/conditions of approval, permits and licences as applicable to the Project.

Monthly environmental reports would be prepared during the operational phase of the Project. Regular environmental audits would be undertaken to assess compliance with the OEMP, relevant subordinate management plans (e.g. the AQMP), and the requirements specified in the Project Approvals/conditions of approval, permits and licences as applicable to the Project.

An annual environmental performance review and compliance report would be prepared during the operational phase of the Project.

### 6.3.4 Independent environmental audit

Throughout the life of the Project (construction and operational phases) the proponent would commission an independent environmental audit of the Project on an annual basis. The audit would:

- be conducted by a suitably qualified, experienced and independent team of experts and where necessary the team would be endorsed by the relevant government agencies (e.g. Commonwealth and State);
- be led by a suitably qualified auditor and include experts in and field as directed by the relevant Commonwealth and State government agencies;
- be conducted in accordance with the guidance provided in ISO 19011:2002 (or as updated) – *Guidelines for Quality and/or Environmental Management Systems Auditing;*
- include consultation with relevant government agencies;
- assess the environmental performance of the Project and assess whether it is complying with the requirements of the Project approvals and any relevant licences and permits (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned Project related approvals, permits and licences;
- recommend measures and actions to improve the environmental performance of the Project, and/or any strategy, plan or program required under the Project approvals, permits and licences; and
- be included in the relevant annual environmental management report (AEMR).

The proponent would make copies of each independent environment audit available for public inspection on request and if requested be submitted to the Commonwealth and State based agencies.

### 6.3.5 Pre-construction compliance report

Four (4) weeks prior to the commencement of construction activities, the proponent would prepare a Pre-Construction Compliance Report. The Pre-Construction Compliance Report would:

- detail how the relevant conditions of Commonwealth and State approval have been complied with prior to construction;
- include the date when each relevant condition of approval was complied with, including dates of submission and any required report and/or approval dates; and
- detail any approvals or licences required to be issued by government departments or agencies before construction commences.

### 6.3.6 Pre-operation compliance report

Four (4) weeks prior to the commencement of operations, the proponent would prepare a Pre-Operation Compliance Report. The Pre-Operation Compliance Report would:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed before operations commence have been complied with;
- include the date when each relevant condition of approval was complied with, including dates of submission of any required reports and/or approval dates; and
- detail any approvals or licences issued by government departments for the Project's operation.

### 6.3.7 Annual environmental management review

Throughout the life of the Project (construction and operational phases) the proponent would prepare an Annual Environmental Management Review (AEMR). The AEMR would review the performance of the Project against the CEMP and OEMP. The AEMR would include, but not necessarily be limited to:

- details of compliance with the various conditions of approval (i.e. Commonwealth and State approval conditions);
- copy of the complaints register for the preceding 12 months (exclusive of personal details), and details of how these complaints were addressed and resolved;
- identification of any circumstances in which the environmental impacts and performance of the Project during the year have not been generally consistent with the environmental impacts and performance predicted in the relevant Project documentation (e.g. environmental impact statement, Project Approval conditions as well as any licences and permits), with details of additional mitigation measures applied to the Project to address recurrence of these circumstances;
- results of all environmental monitoring required by the conditions of approval (i.e. Commonwealth and State approval conditions) as well as relevant licences and permits, including interpretation and discussion by a suitably qualified person;
- a list of all occasions in the preceding 12 month period when environmental goals/objectives/impact assessment criteria for the Project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure; and
- copies of the relevant independent environmental audit report, pre-construction compliance report and pre-operation compliance report.

## 6.4 Community consultation and liaison

A Community Engagement Plan (CEP) will be prepared and implemented by the developer and operator for the Project. This will outline the consultation and notification processes during the pre-construction, construction and operation phases. The CEP would be prepared to ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;
- accurate and accessible information is made available; and
- a timely response is given to issues and concerns raised by stakeholders and the community.

## 6.5 Supporting documentation

This PEMF is one of a suite of frameworks which form part of the Project's EIS. The purpose of the PEMF are to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. Other PEMFs prepared as part of the Project's EIS include:

- Noise and vibration;
- Light spill;
- Traffic and transport;
- Biodiversity;
- Hazards and risk;
- Water quality;
- Aboriginal heritage;
- European heritage; and
- Soils and contamination.

# 7. Applicable legislation, standards and guidelines

The legislative instruments, standards and guidelines specifically related to the management of potential local air quality impacts include the following:

- EPBC Act;
- EP&A Act;
- Commonwealth *National Environment Protection Council Act 1994* (NEPC Act);
- NSW Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW Department of Environment and Conservation (DEC) 2005);
- Commonwealth National Environmental Protection (Ambient Air Quality) Measure (NEPM 1998, 2003);
- Commonwealth National Environmental Protection (Air Toxics) Measure (NEPM 2011); and
- ISO 19011:2002 (or as updated) – Guidelines for Quality and/or Environmental Management Systems Auditing.

Moorebank Intermodal Company

# Moorebank Intermodal Terminal Project

# European Heritage Provisional Environmental Framework

2 July 2014

PARSONS BRINCKERHOFF

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| | | | |
|---|---|---|---|
| Prepared by: | Emma Lichkus | Date: 02/07/2014 | Signature:  |
| Reviewed by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |
| Approved by: | Paul Greenhalgh | Date: 02/07/2014 | Signature:  |

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*ABN 80 078 004 798*

Level 27 Ernst & Young Centre
680 George Street, Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
Email: sydney@pb.com.au
www.pbworld.com


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# 1. Environmental Management framework

The Moorebank IMT Project would be developed by the private sector under the direction of the Moorebank Intermodal Company (MIC) Limited, a Government Business Enterprise. The future developer and operator for the Project has not yet been selected. As such, a proposed overall environmental management framework has been outlined as part of the Environmental Impact Statement (EIS) (refer to Chapter 28 - *Environmental management framework*), which would guide the development of a future detailed framework.

Figure 1.1 outlines the overall environmental management framework for the Project. The environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004. It is anticipated that MIC and the developer and operator for the Project would have established environmental management systems covering their respective business objectives, policies, activities and associated environmental aspects and impacts.

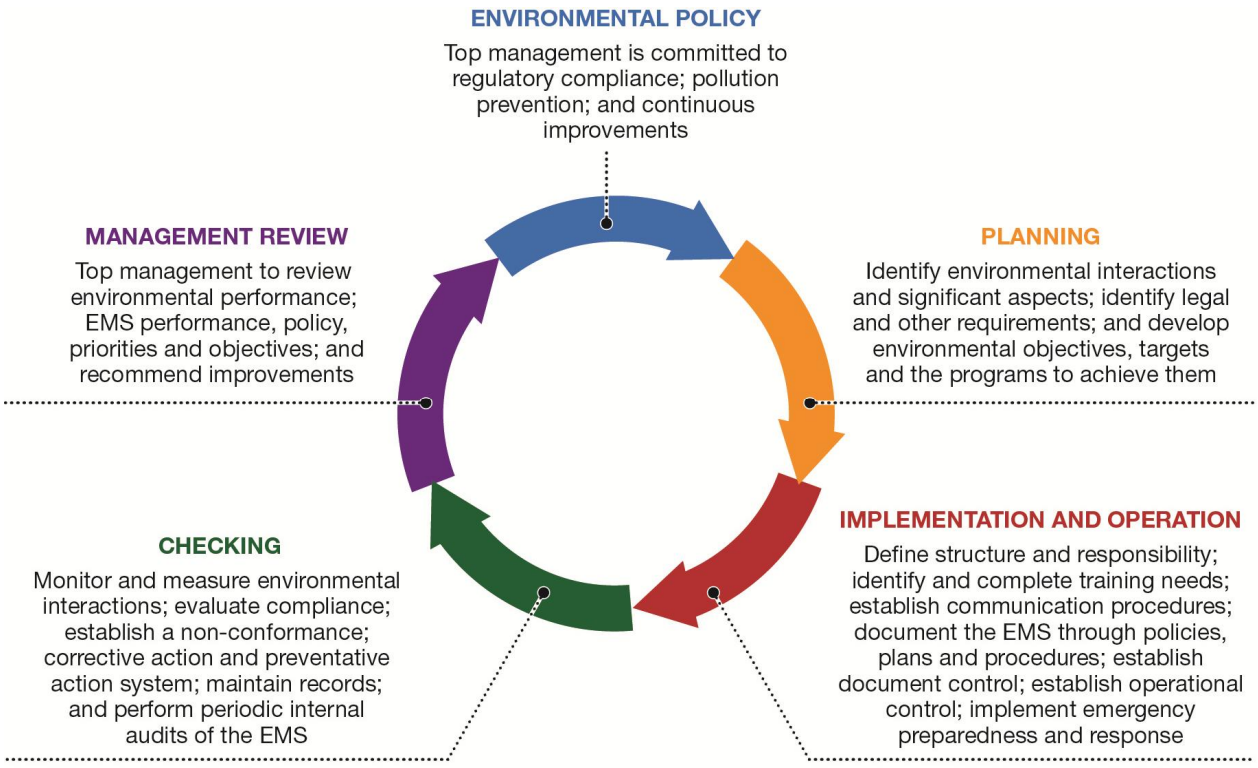


**Figure 1.1 Overall environmental management framework for the Project**

Approval of the Project is being sought for:

- construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Stage 1 development consent as State significant development (SSD) from the NSW Department of Planning & Environment (NSW DP&E) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the concept proposal described in the EIS (including final approval for Early Works).

Subject to approval of the Stage 1 SSD, the Project will be subject to further development approval under the EP&A Act (Stage 2 SSD development approvals).

It is anticipated that the developer and operator for the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities, for example:

- Design Management Plan (DMP) (incorporating environment design criteria).
- Construction Environmental Management Plan(s) (CEMP).
- Operational Environmental Management Plan(s) (OEMP).

This document outlines the Provisional Environmental Management Framework (PEMF) which will guide the development of the above management plans.

The project specific detail to be addressed by each of the above listed management plans would be dictated by the requirements of the following key project documentation:

- The Project's EIS (including this PEMF);
- Project Approval issued under the EPBC Act;
- Stage 1 and Stage 2 SSD approvals issued under the NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project; and

Other permits and/or licences required during the course of the project.

## 1.1 Provisional Environmental Management Framework

As part of the Project's EIS, a series of PEMFs has been prepared. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised.

The PEMFs combined with the Project approvals, contractual arrangements and other permits and/or licences required during the course of the Project provide guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s).

# 2. The Project site and study area

The Moorebank IMT Project is proposed to be situated on land located approximately 30 kilometres (km) south-west of the Sydney Central Business District (CBD) and 4 km south of the Liverpool CBD in the Liverpool Local Government Area (LGA) (refer Figure 2.1).

The Project site comprises:

- the main IMT site (which is the land to the east of the Georges River, is currently occupied by Defence; and
- the rail connection (including the Georges River) from the main IMT site to the SSFL, including the three rail access options (northern, central and southern) as proposed within the Project concept.

These are described below.

## 2.1 Main IMT site

In regard to European heritage values, the main IMT site includes memorial sites dedicated to military personnel who have served in the RAE Corps. The School of Military Engineering (SME)is also referred to as the Australian Army Engineers Group, and includes the Royal Australian Engineers (RAE) Memorial Chapel, RAE Monument, Major General Sir Clive Steele Memorial Gates, and Cullen Universal Steel Trust (CUST) Hut. It is identified as a local heritage item in Schedule 5 of the *Liverpool Local Environmental Plan 2008*. A number of these individual items also meet the criteria for Commonwealth and State significance (refer Table 21.7 in Chapter 21 – *European heritage* of the EIS).

Prior to development of the Project, some items of heritage significance are proposed to be relocated in part or in full to Holsworthy Barracks as part of Defence's Moorebank Unit's Relocation (MUR) Project. These include parts of the RAE Chapel and fittings, parts of the RAE Museum sandstone wall, the RAE Museum Collections, and various other memorials. The relocation of these items would have a dual impact on the historical context of the items relocated and on the residual Moorebank cultural landscape.

Following completion of the MUR Project, the residual Moorebank cultural landscape would be fragmented, with a loss of historical and social connection. While many of the intangible heritage values (e.g. associations with the memorials, chapel and museum) would be transferred to the new SME site at Holsworthy, there would be residual heritage values associated with the broader landscape setting, as well as more tangible elements of the landscape such as the archaeological deposits, the CUST Hut, the Royal Australian Air Force STRARCH Hangar, the dog cemetery and the commemorative garden.

Three potential archaeological deposits (PADs) also lie within the proposed construction footprint on the main IMT site. These are mapped in Chapter 21 – *European heritage* of the EIS.

## 2.2 Rail access options

There are no items of heritage significance that meet local, State or Commonwealth heritage listing thresholds to the west of the Georges River, on land that would be impacted by any of the three rail access options.

# 3. Purpose and scope

The purpose of this PEMF is to provide a high level overview as to how the European heritage impacts during design, construction and operational phases of the Project will be minimised.

This PEMF combined with the Project approvals, contractual arrangements and other permits and/or approvals required during the course of Project provides guidance with respect to the development of Project specific management plans, such as, DMP, CEMP(s) and OEMP(s). It is anticipated that the developer and operator for the Project would be required to develop and maintain these plans.

As part of the approval process for the Project, it is necessary to show that the Proponent has taken, and will take, all practical steps to properly manage the potential impacts to European heritage items associated with the Project. This is achieved by the following:

- Identification of activities that may lead to European heritage impacts.
- Establishment of objectives, targets and indicators for the management European heritage impacts.
- Establishment of management approaches as well as monitoring, reporting, auditing and review regimes.

A detailed European Heritage Impact Assessment was undertaken (Volume 6 of the EIS) and Chapter 21 - *European heritage* of the EIS provides a summary of the existing European heritage values surrounding the Project as well as potential European heritage impacts resulting from construction and operation of the Project.

# 4. Activities that may lead to impacts to European heritage values

The construction and operation of the Project will impact European heritage values on the Project site.

A range of management and mitigation measures have been identified to minimise these impacts. The effectiveness of these management and mitigation measures will be assessed through further detailed analysis during the detailed design phase.

## 4.1 Direct impacts

The identified heritage items that would be directly impacted by the Project's construction footprint are summarised below.

- MH3 & MH4;
- MHPAD1;
- MHPAD2;
- MHPAD3;
- MAPAD2 (Unit 1);
- MAPAD2 (Unit 2);
- CUST Hut;
- Building 99;
- Dog cemetery (MH1);
- RAE Chapel;
- RAAF STRARCH Hangar;
- RAE Museum and Australian Army Museum of Military Engineering Collections;
- Commemorative Gardens (MH6);
- RAE Museum Sandstone Wall;
- Commanding Officers (COs) Walk; and
- Other memorials.

These items would have to be removed either through relocation or demolition of the site during the preconstruction and construction phase of the Project.

The impacts of the Project need to be considered in the context of already identified impacts from the MUR Project. As noted earlier, the MUR Project has identified several heritage items that would be relocated from the SME before construction of the Moorebank IMT Project. These include parts of the RAE Chapel and fittings, parts of the RAE Museum sandstone wall, the RAE Museum Collections and various other memorials. The relocation of the items as part of the MUR will have a dual impact on the historical context of the items remaining and the residual Moorebank Cultural Landscape.

The residual Moorebank Cultural Landscape will be a fragmented one, with an added loss of historical and social connection through the cessation of occupation and use. While many of the intangible values (e.g. associations with the memorials, Chapel and Museum) would be transferred to the new SME site at Holsworthy, there would be residual values associated with the broader landscape setting, as well as more tangible elements of the landscape such as the archaeological deposits, the CUST Hut, the Transport Compound Workshop (B99), the RAAF STRARCH Hangar, the dog cemetery and the commemorative garden. These items display many of the heritage values which are characteristic of the entire Moorebank Cultural Landscape.

## 4.2 Indirect impacts

There are five items adjacent to the Project site that are listed on the LCC LEP (Section 4.5.3):

- Kitchener House;
- Glenfield Farm;
- the former Casula Power Station, located on the western side of the Georges River;
- Railway viaduct, Main South Railway Line, located adjacent to Woodbrook Road, Casula; and
- Railway viaduct, Main South Railway Line, located approximately 200 m south of the former Casula Power Station.

The potential impacts of the Project on each of these items relate to the erection of buildings or structures within sightlines, and alteration of the setting of the place. Impacts may include:

- visual impact from the increase in scale, height and bulk of structures within the site; and
- noise and vibration associated with demolition, construction and operation of the Project.

# 5. Objectives, targets and indicators

The objectives, targets and indicators for the management of European heritage impacts are shown in Table 5.1. The management controls implemented help achieve these objectives/targets described in the following section.

**Table 5.1 Objectives, targets and indicators for the management of European heritage impacts**

| Objectives | Targets | Indicators |
|---|---|---|
| During the detailed design phase, ensure that the proposed control measures (for detailed design and pre-construction are implemented and/or incorporated into the design. | Detailed design and pre-construction control measures have been implemented and/or incorporated into the design. | Instances whereby nominated control measures have not been implemented and/or incorporated into the design. |
| During the detailed design phase, ensure that the proposed European heritage control measures (for construction and operation) have been incorporated into the design. | Detailed design incorporates the control measures for construction and operation as identified in the EIS and this PEMF. | Instances whereby nominated control measures have not been incorporated into the detailed design. |
| Establish and maintain awareness of the importance of ensuring that impacts to European heritage values associated with the Project are minimised. | All Project and workforce personnel to complete an environmental induction, which will include information on the importance of protecting and minimising impacts to European heritage values within the Project Site. | Number and percentage of Project and workforce personnel that have attended required environmental induction prior to commencing work on the Project site. |
| During construction phases, European heritage values are protected and unexpected finds are managed in accordance with legal requirements. | Zero incidents where areas or items of European heritage are damaged without prior approval.<br>Zero incidents where protected European heritage items or areas are damaged.<br>Unexpected finds are appropriately managed. | Incidents involving European heritage items and/or areas.<br>Instances associated with unexpected finds. |
| During operation, European heritage values are protected and unexpected finds are managed in accordance with legal requirements. | Zero incidents where areas or items of European heritage are damaged without prior approval.<br>Zero incidents where protected European heritage items or areas are damaged.<br>Unexpected finds are appropriately managed. | Incidents involving European heritage items and/or areas.<br>Instances associated with unexpected finds. |

# 6. Management approach

As discussed in section 1, it is anticipated that the private sector developer would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. This includes a DMP (incorporating environment design criteria); a CEMP; and an OEMP.

The European heritage component of the above listed project specific management plans would align with the high level requirements as detailed in this PEMF as well as the project specific requirements.

The following sections provide a summary of the management control measures to be implemented during design, construction and operation in order to mitigate the risks associated with potential European heritage impacts.

## 6.1 Management controls – detailed design phase

During the detailed design phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following controls measures were identified as part of the EIS and would be implemented during the detailed design phase of the Project:

- Road names within the SME would be retained through their transfer to roads created at the new SME complex.
- Continued commemoration of significant events and individuals would be considered through the naming of buildings, streets and the rail bridge proposed for construction as part of the Project.
- Where practicable options exist for avoiding impacts on one or more identified heritage items, preference would be given to conserving items of Commonwealth or State significance.
- If the central rail access option proceeds, Heritage item Railway viaduct, *Main Southern Railway Line* (item 11) would be noted on all plans and maps during construction and all care taken to avoid this item.
- If the southern rail access option proceeds, heritage item Railway viaduct, *Main Southern Railway Line* (item 12) would be noted on all plans and maps during construction and all care taken to avoid this item.
- Further consideration would be given to options for the retention and/or relocation and adaptive reuse of the CUST Hut and the RAAF STRARCH Hangar to mitigate impacts on heritage values associated with these structures and their broader cultural landscape context.

  Options considered for mitigation in order of preference are:

  - Relocation (either off-site or on-site) and conserve/adaptive reuse – this would be investigated further as part of the detailed design and Project approval process.
  - Interpretive commemoration utilising materials/elements from the building - this may be required but would be determined by the findings from investigations in option 1 above.
  - Demolition may be required but would be determined by the findings from investigations in option 1 above.

  The first preference would be to retain and adaptively reuse these items on the redeveloped Project site (within the precinct but outside the secure area, as part of the administrative facilities or similar). If this is not feasible or practicable, the second preference would be for relocation to another appropriate location, potentially with adaptive reuse.

## 6.2 Management controls – Early Works phase

During the Early Works phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following controls measures were identified as part of the EIS and would be implemented during the detailed design phase of the Project:

- Where avoidance of impacts on heritage items is not practicable, mitigation works inclusive or archival recordings, salvage of archaeological deposits, relocation of significant element of the built environment and/or adaptive reuse would be undertaken.
- The European heritage interpretation strategy would be developed in close consultation with local historical societies, former and current staff and military personnel. The strategy could consider combining both European and Aboriginal interpretation within the Project site.
- Archival recording of all items of Commonwealth, State and local significance would be required prior to any impact. This would include recording of salient physical aspects of the Moorebank Cultural Landscape.
- No impacts would occur within the potential archaeological deposits (PAD) boundaries of MHPAD1 and MHPAD2 without prior archaeological salvage, as these sites contain archaeological deposits, inclusive of in situ building remains, that are assessed to be of local significance in the context of the history of military housing and training at Moorebank.
- In addition to archival recording of the Transport Compound Workshop (B99), consideration would be given during the detailed design stage to the in-situ conservation or adaptive reuse of this structure within the Project site. This would assist with mitigation of heritage impacts on the structure itself and the Moorebank Cultural Landscape as a whole.
- In addition to archival recording, the Dog Cemetery (MH1) would be repositioned and the individual graves reinterred. This would be carried out in accordance with the wishes of the SME's Explosive Detection Dogs unit and respecting the social value of the site.
- In addition to archival recording, consideration would be given during detailed design to the in situ conservation of the Commemorative Garden (MH6). If in situ conservation is not possible, the plaques and planting should be relocated to an alternate location on public display within the Project.
- The unanticipated discoveries protocol (detailed in Appendix 7 of Technical Paper 11 – *European Heritage Impact Assessment* in Volume 6) would be followed in the event that historical items or relics or suspected burials are encountered during excavation works.
- The unanticipated discoveries protocol (detailed in Appendix 7 of Technical Paper 11 – *European Heritage Impact Assessment* in Volume 6) would be followed in the event that historical maritime items or relics are encountered during bridge works within the Georges River.
- Further consideration would be given to options for the retention and/or relocation and adaptive reuse of the CUST Hut and the RAAF STRARCH Hangar to mitigate impacts on heritage values associated with these structures and their broader cultural landscape context.

  Options considered for mitigation in order of preference are:

  - Relocation (either off-site or on-site) and conserve/adaptive reuse – this would be investigated further as part of the detailed design and Project approval process.
  - Interpretive commemoration utilising materials/elements from the building - this may be required but would be determined by the findings from investigations in option 1 above.
  - Demolition may be required but would be determined by the findings from investigations in option 1 above.

The first preference would be to retain and adaptively reuse these items on the redeveloped Project site (within the precinct but outside the secure area, as part of the administrative facilities or similar). If this is not feasible or practicable, the second preference would be for relocation to another appropriate location, potentially with adaptive reuse.

## 6.3 Management controls – construction phase

During the construction phase(s), works would be undertaken to meet the objectives as detailed in section 5 of this PEMF.

The following control measures were identified as part of the EIS and would be implemented during the construction phase(s) of the Project:

- If the central rail access option proceeds, Heritage item Railway viaduct, *Main Southern Railway Line* (item 11) would be noted on all plans and maps during construction and all care taken to avoid this item.
- If the southern rail access option proceeds, heritage item Railway viaduct, *Main Southern Railway Line* (item 12) would be noted on all plans and maps during construction and all care taken to avoid this item.
- The unanticipated discoveries protocol (detailed in Appendix 7 of Technical Paper 11 – *European Heritage Impact Assessment* in Volume 6) would be followed in the event that historical items or relics or suspected burials are encountered during excavation works.
- The unanticipated discoveries protocol (detailed in Appendix 7 of Technical Paper 11 – *European Heritage Impact Assessment* in Volume 6) would be followed in the event that historical maritime items or relics are encountered during bridge works within the Georges River.

## 6.4 Management controls – operational and ongoing

During the operation phase, works would be undertaken to meet the objectives as detailed in Section 5 of this PEMF.

## 6.5 Monitoring

Within each of the Project specific management plans, the private sector developer would need to detail what monitoring would be undertaken to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the Commonwealth EPBC Act and NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project;
- Other permits and/or licences required during the course of the Project; and
- Objectives, targets and indicators as presented in this PEMF.

## 6.6 Management response to incidents and non-compliances

Within each of the Project specific management plans, the private sector developer would need to detail how incidents and non-compliances will be managed. It is envisaged that in doing so the private sector developer will draw upon its corporate Environmental Management System and address the specific requirements of the Project approvals.

Incidents may include (but are not limited to) the following:

- Failure to meet identified objectives and targets.
- Project and workforce personnel have not attended Project environmental inductions.
- Required approvals/permits not in place prior to the disturbance of European heritage values.
- Unexpected finds.
- Near misses.
- Non-compliances.

Incidents including non-compliances and near misses would trigger internal (and external as required) notifications, reporting, investigation, close out and associated corrective and preventative actions to ensure compliance as well as continual improvement.

## 6.7 Reporting, auditing and review

Within each of the Project specific management plans, the private sector developer would need to detail what reporting, auditing and review processes would be implemented to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed;
- Project approvals issued under the Commonwealth EPBC Act and NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project;
- Other permits and/or licences required during the course of the Project;
- Objectives, targets and indicators as presented in this PEMF; and
- The Project specific management plans themselves (e.g. DMP, CEMP(s) and OEMP and their associated monitoring programs.

### 6.7.1 Independent environmental audit

Throughout the life of the Project (construction and operational phases) the proponent would commission an independent environmental audit of the Project on an annual basis. The audit would:

- Be conducted by a suitably qualified, experienced and independent team of experts and where necessary the team would be endorsed by the relevant Commonwealth and State government agencies;
- be led by a suitably qualified auditor and include experts in and field as directed by the relevant Commonwealth and State government agencies;

- be conducted in accordance with the guidance provided in ISO 19011:2002 (or as updated) – *Guidelines for Quality and/or Environmental Management Systems Auditing;*
- include consultation with relevant government agencies;
- assess the environmental performance of the Project and assess whether it is complying with the requirements of the Project approvals and any relevant licences and permits (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned Project related approvals, permits and licences;
- recommend measures and actions to improve the environmental performance of the Project, and/or any strategy, plan or program required under the Project approvals, permits and licences; and
- be included in the relevant annual environmental management report (AEMR).

The proponent would make copies of each independent environment audit available for public inspection on request and if requested be submitted to the Commonwealth and State based agencies.

### 6.7.2 Pre-construction compliance report

Four (4) weeks prior to the commencement of construction activities, the proponent would prepare a Pre-Construction Compliance Report. The Pre-Construction Compliance Report would:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed prior to construction have been complied with;
- include the date when each relevant condition of approval was complied with, including dates of submission and any required report and/or approval dates; and
- detail any approvals or licences required to be issued by government departments or agencies before construction commences.

### 6.7.3 Pre-operation compliance report

Four (4) weeks prior to the commencement of operations, the proponent would prepare a Pre-Operation Compliance Report. The Pre-Operation Compliance Report would:

- detail how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed before operations commence have been complied with;
- include the date when each relevant condition of approval was complied with, including dates of submission of any required reports and/or approval dates; and
- detail any approvals or licences issued by government departments for the Project's operation.

### 6.7.4 Annual environmental management review

Throughout the life of the Project (construction and operational phases) the proponent would prepare an AEMR. The AEMR would review the performance of the Project against the CEMP and OEMP. The AEMR would include, but not necessarily be limited to:

- details of compliance with the various conditions of approval (i.e. Commonwealth and State approval conditions);
- copy of the complaints register for the preceding 12 months (exclusive of personal details), and details of how these complaints were addressed and resolved;

- identification of any circumstances in which the environmental impacts and performance of the Project during the year have not been generally consistent with the environmental impacts and performance predicted in the relevant Project documentation (e.g. EIS, Project approval conditions as well as any licences and permits), with details of additional mitigation measures applied to the Project to address recurrence of these circumstances;
- results of all environmental monitoring required by the conditions of approval (i.e. Commonwealth and State approval conditions) as well as relevant licences and permits, including interpretation and discussion by a suitably qualified person;
- a list of all occasions in the preceding 12-month period when environmental goals/objectives/impact assessment criteria for the Project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure; and
- copies of the relevant independent environmental audit report, pre-construction compliance report and pre-operation compliance report.

## 6.8 Community consultation and liaison

A Community Engagement Plan (CEP) will be prepared and implemented by the developer and operator of the Project. This will outline the consultation and notification processes during the pre-construction, construction and operation phases. The CEP would be prepared to ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;
- accurate and accessible information is made available; and
- a timely response is given to issues and concerns raised by stakeholders and the community.

## 6.9 Supporting documentation

This PEMF is one of a suite of plans which form part of the Project's EIS. The purpose of this PEMF is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. Other PEMFs prepared as part of the Project's EIS include:

- Noise and vibration;
- Traffic and transport;
- Light spill;
- Biodiversity;
- Hazards and risk;
- Water quality;
- Aboriginal heritage;
- Soils and contamination; and
- Air quality.

# 7. Applicable legislation, standards and guidelines

The legislative instruments, standards and guidelines specifically related to the management of potential European heritage impacts include the following:

- EPBC Act;
- EP&A Act;
- NSW *Heritage Act 1977;*
- Commonwealth Heritage Register;
- ISO 19011:2002 (or as updated) – Guidelines for Quality and/or Environmental Management Systems Auditing;
- NSW State Heritage Register; and
- Liverpool City Council Local Environmental Plan.

Moorebank Intermodal Company

# Moorebank Intermodal Terminal Project

# Biodiversity Provisional Environmental Management Framework

3 July 2014

PARSONS BRINCKERHOFF

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| | | | |
|---|---|---|---|
| Prepared by: | Emma Lichkus | Date: 03/07/2014 | Signature:  |
| Reviewed by: | Paul Greenhalgh | Date: 03/07/2014 | Signature:  |
| Approved by: | Paul Greenhalgh | Date: 03/07/2014 | Signature:  |

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*ABN 80 078 004 798*

Level 27 Ernst & Young Centre
680 George Street, Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
Email: sydney@pb.com.au
www.pbworld.com


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# 1. Environmental management framework

The Moorebank IMT Project would be developed by the private sector under the direction of the Moorebank Intermodal Company (MIC) Limited, a Government Business Enterprise. The future developer and operator for the Project has not yet been selected. As such, a proposed overall environmental management framework has been outlined as part of the Environmental Impact Statement (EIS) (refer to Chapter 28 - *Environmental management framework*), which would guide the development of a future detailed framework.

Figure 1.1 outlines the overall environmental management framework for the Project. The environmental management framework would include an overarching Environmental Management System (EMS) that complies with AS/NZS ISO 14001:2004. It is anticipated that MIC and the developer and operator for the Project would have established environmental management systems covering their respective business objectives, policies, activities and associated environmental aspects and impacts.

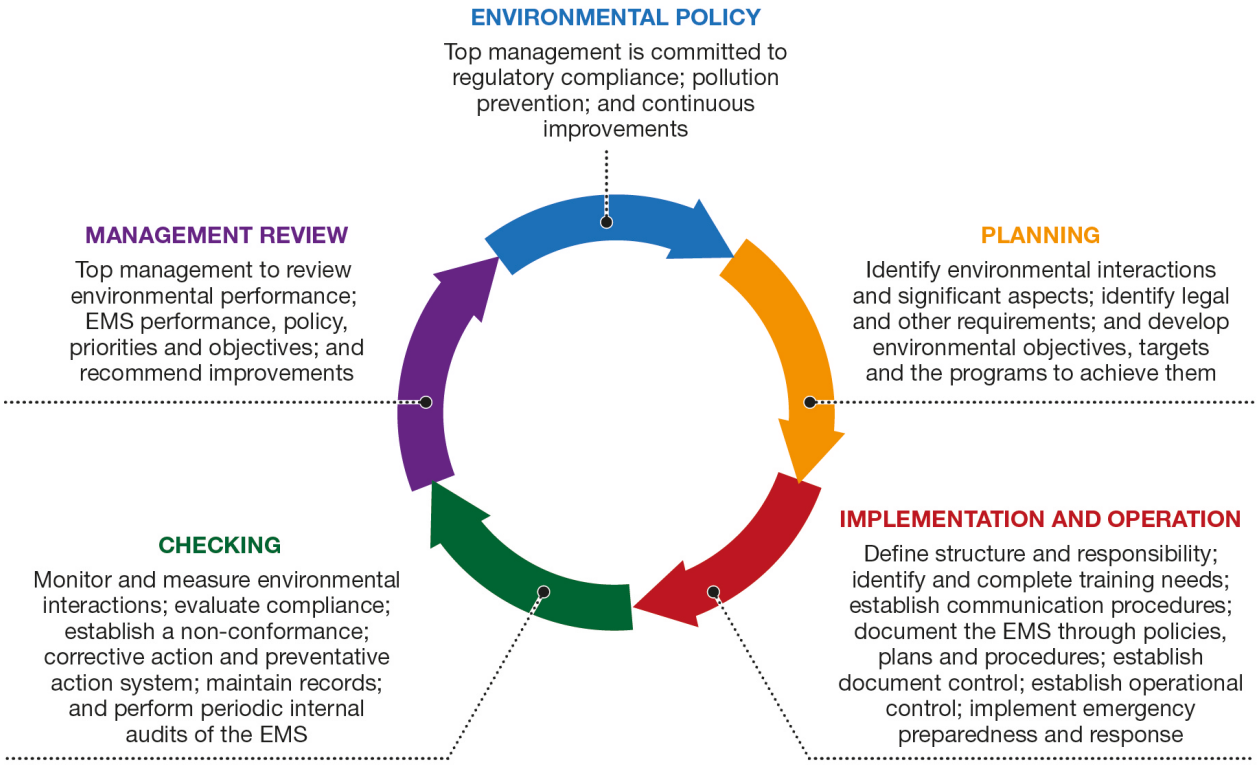


**Figure 1.1 Overall environmental management framework for the Project**

Approval of the Project is being sought for:

- construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and
- Stage 1 development consent as State significant development (SSD) from the NSW Department of Planning & Environment (NSW DP&E) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the concept proposal described in the EIS (including final approval for Early Works).

Subject to approval of the Stage 1 SSD, the Project will be subject to further development approval under the EP&A Act (Stage 2 SSD development approvals).

It is anticipated that the developer and operator for the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities, for example:

- Design Management Plan (DMP) (incorporating environment design criteria);
- Construction Environmental Management Plan(s) (CEMP); and
- Operational Environmental Management Plan(s) (OEMP).

This document outlines the Provisional Environmental Management Framework (PEMF) which will guide the development of the above management plans.

The project specific detail to be addressed by each of the above listed management plans would be dictated by the requirements of the following key project documentation:

- The Project's EIS (including this PEMF);
- Project Approval issued under the EPBC Act;
- Stage 1 and Stage 2 SSD approvals issued under the NSW EP&A Act;
- Contractual requirements established between MIC and the developer and operator for the Project; and
- Other permits and/or licences required during the course of the project.

## 1.1 Provisional Environmental Management Framework

As part of the Project's EIS, a series of PEMFs have been prepared. The purpose of the PEMFs is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised.

The PEMFs combined with the Project approvals, contractual arrangements and other permits and/or licences required during the course of the project provide guidance with respect to the development of project specific management plans, such as, DMPs, CEMPs and OEMPs.

# 2. The Project site and study area

The Moorebank IMT Project is proposed to be situated on land located approximately 30 kilometres (km) south-west of the Sydney Central Business District (CBD) and 4 km south of the Liverpool CBD in the Liverpool Local Government Area (LGA) (refer Figure 2.1).

The Project site comprises:

- the main IMT site (which is the land to the east of the Georges River, is currently occupied by Defence; and
- the rail connection (including the Georges River) from the main IMT site to the SSFL, including the three rail access options (northern, central and southern) as proposed within the Project concept.

These are described below.

## 2.1 Main IMT site

The main IMT site and the surrounding landscape are part of the Cumberland Plain Woodland of western Sydney. The Cumberland Plain Woodland has undergone extensive clearing, grazing and disturbance for agricultural, urban and industrial development, particularly in the 20$^{th}$ century. The vegetation on the Project site has been largely cleared and replaced with roads, buildings, playing fields and exotic grassland. Small stands of introduced and native trees are scattered throughout the Project site.

Four native vegetation communities have been recorded on the main IMT site, as described by Tozer (2003): Castlereagh Swamp Woodland, Castlereagh Scribbly Gum Woodland, Riparian Forest and Alluvial Woodland. The latter two communities are both listed as River-Flat Eucalypt forest under the NSW *Threatened Species Conservation Act 1995* (TSC Act). While all four communities form part of threat-listed ecological communities under the TSC Act, none of these communities correspond with a threat-listed community as listed under the EPBC Act.

Two threat-listed species of plant, *Persoonia nutans* (listed as endangered under the EPBC Act and TSC Act) and *Grevillea parviflora subsp. parviflora* (listed as vulnerable under the EPBC Act and TSC Act), have been recorded on the main IMT site. Six additional threat-listed plant species have a moderate likelihood of occurrence within the main IMT site and the land affected by the three rail access options, based on their preferred habitats and known distribution; however, targeted searches undertaken for this Project have not detected these species.

Faunal surveys detected the Grey-headed Flying-fox (listed as Vulnerable under the EPBC Act and TSC Act) flying over the main IMT site. An earlier fauna study (Lesry 2003) recorded the presence of two threat-listed microbat species in the Project site: the Large-footed Myotis and the Eastern Bent-wing Bat.

Aquatic biodiversity in the lower freshwater reaches of the Georges River is modified as a result of habitat degradation caused by changes in water flow volumes and velocities (including weirs upstream and downstream), increased nutrients and chemical pollutants, and the introduction of exotic species. The native species that exist here generally comprise disturbance tolerant species. Within the IMT site itself, some disturbed aquatic habitat exists, including Anzac Creek, which is identified as Class 3 (Minimal Fish Habitat) in accordance with Fairfull and Witheridge (2003). Onsite detention basins provide some foraging and breeding habitat for native frogs, reptiles and water birds.

Ten migratory species have been predicted to occur within the locality of the IMT site, but were not recorded during the surveys. Based on previous studies, the Regent Honeyeater (listed as Critically Endangered under the EPBC Act) has the potential to occur within the Project site, along with other migratory species of bird, as described in further detail in Chapter 13 – *Biodiversity.*

## 2.2 Rail access options

The vegetation communities affected by each of the three rail access options consist of open grassy woodland of the shale-derived soils of the Cumberland Plain in the west, and shrubby riparian woodland of the alluvial plains adjoining the Georges River riparian corridor in the east (refer Figure 13.2 in Chapter 13 – *Biodiversity*). There are no Threatened flora species present or with potential habitat within the rail access options.

A summary of the specific ecological characteristics relevant to each of the rail access options is provided in Table 13.2 in Chapter 13 – *Biodiversity*. The main difference between the existing ecological environments of the rail access options is the extent of vegetation, habitat and riparian zone associated with the Georges River.

# 3. Purpose and scope

The purpose of this PEMF is to provide a high level overview as to how the biodiversity impacts during design, construction and operational phases of the Project will be minimised.

This PEMF combined with the Project approvals, contractual arrangements and other permits and/or approvals required during the course of project provides guidance with respect to the development of project specific management plans, such as, DMP, CEMP and OEMP. It is anticipated that the developer and operator for the Project would be required to develop these plans.

As part of the approval process for the Project, it is necessary to show that the Proponent has taken, and will take, all practical steps to properly manage the biodiversity risks associated with the Project. This is achieved by the following:

- Identification of activities that may lead to biodiversity impacts.
- Establishment of objectives, targets and indicators for the management of biodiversity impacts.
- Establishment of management approaches as well as monitoring, reporting, auditing and review regimes.

A detailed Ecological Impact Assessment was undertaken (Volume3 of the EIS) and Chapter 13 – *Biodiversity* of the EIS provides a summary of the potential impacts of the Project on existing biodiversity within and surrounding the Project site.

# 4. Activities that may lead to biodiversity impacts

Given the location and nature of the Project and its context with regard to existing road and rail infrastructure, there is limited scope for using alternative locations to entirely avoid impacts on biodiversity. Multi-criteria analyses (MCA) were carried out and considered the reduction of impacts on areas of high ecological value, which resulted in the proposed retention (as a conservation zone) of substantial areas of vegetation along the Georges River. Other areas of vegetation outside the riparian corridor would also be retained.

The vegetation clearing and associated impacts on biodiversity is likely to follow a phased approach (Early Works, Project Phase A, Project Phase B, Project Phase C) as discussed in Chapter 8 – *Project development phasing and construction* of the EIS. The phasing of the Project will affect the timing of the implementation of mitigation measures; however allowing for the establishment of offsets prior to the occurrence of these impacts.

## 4.1 Potential impacts

The potential environmental impacts associated with construction of the project include the following direct and indirect impacts:

### 4.1.1 Construction direct impacts

- Vegetation clearing and habitat loss.
- Direct mortality (flora and fauna).
- Disturbance of aquatic habitat.
- Disturbance of groundwater dependent ecosystems.

### 4.1.2 Construction indirect impacts

- Fragmentation and loss of connectivity.
- Noise impacts on fauna.
- Light impacts on fauna.
- Turbidity impacts.
- Dust pollution.
- Introduction and spread of weeds.
- Increased edge effects.
- Changes to fire regimes.

The potential environmental impacts associated with the operation of the project include the following direct and indirect impacts:

### 4.1.3 Operational direct impacts

- Direct mortality (fauna).

### 4.1.4 Operational indirect impacts

- Noise impacts on fauna.
- Light impacts on fauna.
- Dust pollution.
- Changes to fire regimes.

As part of the EIS, impact assessments for threatened species, populations and ecological communities have been conducted and mitigation measures proposed to mitigate impacts. It be noted that based on these assessments and the mitigation measures proposed (including an offsets strategy detailed in Technical Paper 3 - *Ecological Impact Assessment*), no threatened species population or ecological community is likely to be significantly impacted by the Project.

# 5. Objectives, targets and indicators

The objectives, targets and indicators for the management of biodiversity impacts are shown in Table 5.1. The management controls implemented help achieve these objectives/targets described in the following section.

**Table 5.1 Objectives, targets and indicators for the management of biodiversity impacts**

| Objectives | Targets | Indicators |
|---|---|---|
| During the detailed design phase, ensure that the nominated vegetation retention areas are maintained. | No reduction in the area of native vegetation proposed to be retained. | Area of nominated vegetation retention to be cleared as a result of the Project's detailed design. |
| During the detailed design phase, minimise the extent of vegetation clearance required during construction. | Area of vegetation clearance required following completion of detailed design does not significantly exceed the area identified during the EIS. | Area of vegetation clearance required during construction. |
| During the detailed design phase, assess opportunities for increase habitat connectivity. | Opportunities for increased habitat connectivity within the Project site have been identified during detailed design. | Opportunities identified during detailed design have been confirmed as part of the project's construction and operational phases. |
| Establish and maintain awareness of the importance of protecting the biodiversity values associated with the Project site. | All project and workforce personnel to complete an environmental induction, which will include information on the biodiversity values associated with the Project site and their accountabilities and responsibilities associated with minimising biodiversity impacts. | Number and percentage of project and workforce personnel that have attended required environmental induction prior to commencing work on the Project site. |
| Avoid disturbance to flora and fauna located outside the approved clearing footprint during the construction phase of the project. | Zero incidents of unauthorised disturbance or clearing. | Area impact by disturbance/clearing outside the approved clearing footprint. |
| Avoid injury or death of fauna resulting from construction activities (including vegetation clearing and drainage of any on-site waterbodies). | Zero incidents of injury or death to fauna resulting from construction activities (including vegetation clearing and drainage of any on-site waterbodies). | Number of incident reports relating to the injury or death of fauna resulting from construction activities (including vegetation clearing and drainage of any on-site waterbodies). |
| Prevent the spread of weeds within nominated vegetation retention areas including riparian vegetation associated with the Georges River. | Noxious and environmental weeds do not spread within the Project site and their presence within vegetation retention areas including riparian vegetation is reduced. | Presence of noxious and environmental weeds is reduced within the Project site. |
| Proposed offset strategy and riparian restoration plan are commenced at earliest opportunity to enable the realisation of their associated environmental benefits. | The implementation of the proposed offset strategy and riparian restoration plan at the earliest stage of the project possible | Progress reporting as to the implementation status of offset strategy and riparian restoration plan as well as identifiable environmental improvements |
| Avoid disturbance to flora and fauna resulting from operational activities. | Zero incidents of unauthorised disturbance of vegetation retention area including riparian vegetation associated with the Georges River | Number of instances relating to unauthorised flora/fauna disturbance during operational activities. |
| Avoid injury or death of fauna resulting from operational activities. | Zero incidents of injury or death to fauna resulting from operational activities. | Number of incident reports relating to the injury or death of fauna resulting from operational activities. |

# 6. Management approach

As discussed in section 1 of this PEMF, it is anticipated that the private sector developer would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. This includes a DMP (incorporating environment design criteria); a CEMP; and an OEMP.

The biodiversity component of the above listed project specific management plans would align with the high level requirements as detailed in this PEMF as well as the project specific requirements.

The following sections provide a summary of the management control measures to be implemented during design, construction and operation in order to mitigate the risks associated with potential biodiversity impacts.

## 6.1 Management controls – detailed design phase

During the detailed design phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF.

The following controls measures were identified as part of the EIS and would be implemented during the detailed design phase of the project:

- The design of site fencing and any overhead powerlines would consider the potential for collision by birds and bats and minimise this risk where practicable.
- The potential for translocation of threatened plant species as individuals or as part of a soil translocation process would be considered during the detailed development of the CEMP.
- Consideration would be given to fitting roost boxes to the bridge over the Georges River to provide roost sites for the Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) which may utilise such structures. Provision of roost boxes under bridges has been identified as priority action for the recovery of the Large-footed Myotis.
- A bridge/viaduct would be used for the railway crossing of the Georges River. This may allow connectivity of terrestrial habitat along the river banks underneath the bridge.
- Options for maintaining habitat connectivity would be investigated at the detailed design phase of the Project, including establishing native vegetation and placing habitat elements such as rock piles and large woody debris under the bridge to provide cover for fauna.
- The detailed design process for the bridge over the Georges River would consider disturbance to aquatic habitat and fish passage conditions. The design would as a minimum adhere to the fish friendly passage guidelines (Fairfull & Witheridge 2003) for waterway crossings.
- Opportunities for planting of detention basins with native aquatic emergent plants and fringing trees would be explored in the detailed design of the Project and, if practicable, implemented so that they would provide similar habitat in the medium term to that lost through the removal of existing basins.
- The Biosecurity division of the Commonwealth Department of Agriculture would be consulted regarding the detailed design of the Project and its operation, to ensure that all legal requirements and appropriate management measures related to biosecurity are implemented to minimise the risk of the introduction of pest species.
- During detailed design, the Project would implement appropriate design and landscape/vegetation management measures to reduce the bushfire risk and threat to biodiversity.

- The detailed design process would consider the potential groundwater impacts to ground-dependent ecosystems and in most cases would be mitigated at the design phase.

## 6.2 Management controls – Early works and construction phase

During the construction phase(s), works would be undertaken to meet the objectives as detailed in section 5 of this PEMF.

The following control measures were identified as part of the EIS and would be implemented prior to and during the construction phase(s) of the project:

- Following detailed design and prior to construction, detailed flora and fauna mitigation measures would be developed and presented as part of the CEMP. These detailed measures would incorporate the measures listed below.
- Vegetation clearing would be restricted to the construction footprint and sensitive areas would be clearly identified during the construction process as exclusion zones.
- The exclusion zones would be marked on maps, which would be provided to contractors, and would be marked on the ground using high visibility fencing (such as barrier mesh).
- A trained ecologist would accompany clearing crews in order to ensure disturbance is minimised and to assist in relocating any native fauna to adjacent habitat.
- A staged habitat removal process would be developed and would include the identification and marking of all habitat trees in the area.
- Where feasible, clearing of hollow-bearing trees would be undertaken in March–April when most microbats are likely to be active (not in torpor) but are unlikely to be breeding or caring for young, and when threatened hollow-dependent birds in the locality are also unlikely to be breeding.
- Pre-clearing surveys would be conducted 12 to 48 hours before vegetation clearing to search for native wildlife (e.g. reptiles, frogs, Cumberland Land Snail) that can be captured and relocated to the retained riparian vegetation of the Georges River Corridor.
- Vegetation would be cleared from a 10 m radius around habitat trees to encourage animals roosting in hollows to leave the tree. A minimum 48 hour waiting period would allow animals to leave.
- After the waiting period, standing habitat trees would be shaken (where safe and practicable) under the supervision of an ecologist to encourage animals roosting in hollows to leave the trees, which would then be felled, commencing with the most distant trees from secure habitat.
- Felled habitat trees would either be immediately moved to the edge of retained vegetation, or left on the ground for a further 24 hours before being removed from the construction area, at the discretion of the supervising ecologist.
- All contractors would have the contact numbers of wildlife rescue groups and would be instructed to coordinate with these groups in relation to any animal injured or orphaned during clearing.
- Relocation of animals to adjacent retained habitat would be undertaken by an ecologist during the supervision of vegetation removal.
- An ecologist would supervise the drainage of any waterbodies on the Project site and would relocate native fish (e.g. eels), tortoises and frogs to the edge of the Georges River and/or the existing pond at the northern end of the IMT Site.
- Important habitat elements (e.g. large woody debris) would be moved from the construction area to locations within the Project site which would not be cleared during the Project or to stockpiles for later use in vegetation/habitat restoration.

- Winter-flowering trees would be preferentially planted in landscaped areas of the Project site to provide a winter foraging resource for migratory and nomadic nectar-feeding birds and the Grey-headed Flying-fox.
- Erosion and sediment control measures such as silt-fencing and hay bales would be used to minimise sedimentation of streams and resultant impacts on aquatic habitats and water quality.
- The CEMP would include detailed measures for minimising the risk of introducing weeds and pathogens.
- Measures to manage undesirable animal species include:
  - Monitoring of undesirable animal species. Monitor the site for the presence of introduced and undesirable animal species as part of fauna monitoring;
  - Co-operate with government bodies, interest groups and adjacent landowners in regional pest management programs including the NSW Department of Primary Industries, the Office of Environment and Heritage (OEH), and the Invasive Animal Cooperative Research Centre interest groups (e.g. Australasian Pest Bird Network and local landowners);
  - Manage the use of nest boxes by undesirable species by removing the eggs and/or young of introduced animals (e.g. Black Rat and Common Myna) found utilising nest boxes under appropriate permit conditions.;
  - Remove any insect colonies (bees, wasps, termites, ants found in nest boxes); and
  - Modify or move nest boxes to discourage use by undesirable species.
- The Project would also include a long-term program of weed removal and riparian vegetation restoration in the Georges River corridor, which would include monitoring landscaped areas for the presence of noxious and environmental weeds. A preliminary weed management strategy is provided in Appendix E of Technical Paper 3 - Ecological Impact Assessment in Volume 3, setting out the principles for the management of the riparian zone.
- The Biodiversity Offsets Strategy detailed in Appendix F of Technical Paper 3 – Ecological Impact Assessment in Volume 3 would be implemented for the Project.

## 6.3 Management controls – operational phase

During the operation phase, works would be undertaken to meet the objectives as detailed in section 5 of this PEMF. The following control measures were identified as part of the EIS and would be implemented during the operation phase of the project:

- A riparian restoration plan for the Georges River riparian zone and Casula offset area would be implemented. The objectives of the plan include:
  - restoration and revegetation of the riparian zone of the site to be consistent with, and complementary to, areas of remnant indigenous vegetation within the Georges River Corridor (approximately 16.7 ha of land to be revegetated);
  - long-term eradication and suppression of the most detrimental weed species on the site including vine and woody weeds (approximately 20.0 ha of land to undergo a weed control program);
  - consolidation and widening of the existing vegetation corridor of Georges River where feasible; and
  - improved habitat values for native animals and plants, particularly threatened species.
- The Biodiversity Offsets Strategy detailed in Appendix F of Technical Paper 3 – Ecological Impact Assessment in Volume 3 would be implemented for the Project.
- The management plan for the Georges River riparian corridor (refer to Appendix E of Technical Paper 3 - Ecological Impact Assessment in Volume 3) would be implemented and would include a monitoring program designed to detect operational impacts.

- Measures to manage undesirable animal species include:
  - Monitoring of undesirable animal species. Monitor the site for the presence of introduced and undesirable animal species as part of fauna monitoring;
  - Co-operate with government bodies, interest groups and adjacent landowners in regional pest management programs including the NSW Department of Primary Industries, the OEH, and the Invasive Animal Cooperative Research Centre interest groups (e.g. Australasian Pest Bird Network and local landowners);
  - Manage the use of nest boxes by undesirable species by removing the eggs and/or young of introduced animals (e.g. Black Rat and Common Myna) found utilising nest boxes under appropriate permit conditions;
  - Remove any insect colonies (bees, wasps, termites, ants found in nest boxes); and
  - Modify or move nest boxes to discourage use by undesirable species.
- The Project would also include a long-term program of weed removal and riparian vegetation restoration in the Georges River corridor, which would include monitoring landscaped areas for the presence of noxious and environmental weeds. A preliminary weed management strategy is provided in Appendix E of Technical Paper 3 - Ecological Impact Assessment in Volume 3, setting out the principles for the management of the riparian zone.
- The management of the conservation lands along the Georges River would include management of fire regimes to promote biodiversity conservation.

## 6.4 Monitoring

It is anticipated that the developer and operator for the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. These plans would include a DMP, CEMP and an OEMP.

Within each of the project specific management plans, the private sector developer would need to detail what monitoring would be undertaken to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed.
- Project approvals issued under the EPBC Act and EP&A Act.
- Contractual requirements established between MIC and the developer and operator for the Project.
- Other permits and/or licences required during the course of the project.
- Objectives, targets and indicators as presented in this PEMF.

### 6.4.1 Baseline monitoring

The Project's EIS has identified the following biodiversity monitoring requirements:

- Georges River riparian corridor monitoring – A monitoring program (as part of the management plan for the Georges River riparian corridor) would be designed to detect operational impacts and a procedure for reporting to inform any modification to the operation of the Project site that may be necessary to minimise the identified impacts.
- Weed monitoring – The Project would also include a long-term program of weed removal and riparian vegetation restoration in the Georges River corridor, which would include monitoring of the landscaped areas of the facility for the presence of noxious and environmental weeds.

Baseline monitoring would be undertaken prior to the commencement of construction works and would include the following monitoring requirements.

#### 6.4.1.1 Georges River riparian corridor monitoring

Monitoring of the Georges River riparian corridor would be undertaken in accordance with the Management Plan for Restoration of the Riparian Zone of the Georges River at the Moorebank IMT site, provided in Appendix E of the Ecological Impact Assessment (Volume 3). The Management Plan outlines the management and restoration strategies for this area as well as the detailed planning, monitoring and performance indicators as well as adaptive management measures.

In accordance with the Management Plan, baseline monitoring of the current condition would be needed and would include:

- cover and diversity of weed species
- cover and diversity of native canopy, shrub and groundcover plants
- diversity and abundance of sedentary native bird species
- extent of erosion.

#### 6.4.1.2 Weed monitoring

A preliminary weed management strategy is provided in Appendix E of the Ecological Impact Assessment, (Volume 3) report, which sets out the principles for the management and monitoring of the riparian zone.

Baseline monitoring of location and extent of weed invasion within the Project site and weed species present would be undertaken to allow evaluation of the progress and effectiveness of weed control measures. This would involve general monitoring of terrestrial weeds, focusing on areas that have recently been burnt, riparian zones and areas adjacent to the proposed footprint. This monitoring would be repeated during and following construction in order to assess the introduction levels of weeds.

Annual reports summarising the progress of weed control works would be provided by the organisation engaged to carry out the weed management strategy. These are to include but not be limited to information regarding species targeted, photographic monitoring (before and after treatments), areas treated, herbicide concentrations used, techniques used and time spent on each task.

## 6.4.2 Monitoring of biodiversity impacts

Table 6.1 outlines the parameters for monitoring impacts to biodiversity, the response triggers and management actions.

**Table 6.1 Parameters, objectives, targets and management action responses for biodiversity management**

| Parameter | Objective | Targets | Response trigger | Management action |
|---|---|---|---|---|
| Native vegetation extent | During the detailed design phase, ensure that the nominated vegetation retention areas are maintained. | No reduction in the area of native vegetation proposed to be retained. | No clearing beyond the proposed footprint. | Review design, revise impact assessment if necessary. |
| Environmental protection through induction | Establish and maintain awareness of the importance of protecting the biodiversity values associated with the Project site. | All project and workforce personnel to have completed an environmental induction, which will include information on the biodiversity values associated with the Project site and their accountabilities and responsibilities associated with minimising biodiversity impacts. | Any staff on-site that have not completed the required environmental induction(s). | Staff member to stop work until induction successfully completed. |
| Disturbance to flora and fauna outside approved footprint | Avoid disturbance to flora and fauna located outside the approved clearing footprint. | Zero incidents of unauthorised disturbance or clearing. | Clearing or disturbance beyond the proposed footprint. | Report incident to environmental site manager.<br>Check that vegetation clearing boundaries and environmental protection zones are adequately delineated.<br>Review environmental inductions issued for construction plans, drawings and work instructions. |
| Fauna injury or death | Avoid injury or death of fauna (including vegetation clearing and drainage of any on-site waterbodies). | Zero incidents of injury or death to fauna resulting from construction activities (including vegetation clearing and drainage of any on-site waterbodies). | Any injury or death of fauna. | Report incident to environmental site manager.<br>Review mitigation measures and revise if appropriate. Where appropriate, update environmental inductions. |
| Weeds | Prevent the spread of weeds within nominated vegetation retention areas including riparian vegetation associated with the Georges River. | Noxious and environmental weeds do not spread within the Project Site and their presence within vegetation retention areas including riparian vegetation is reduced. | Weed extent increased.<br>New location of weed invasion identified.<br>New species of weed identified on-site. | Report incident to environmental site manager.<br>Undertake adaptive weed management as outlined in weed management plan. |

During the construction and operation phases of the Project, regular inspections would be undertaken to assess whether or not biodiversity impacts are in accordance with that permitted. The inspections would focus on the following key items:

- Are vegetation clearing boundaries and environmental protection zones adequately delineated?
- Have pre-clearing surveys and fauna relocation / rescue operations been implemented?
- Has vegetation been cleared in accordance with best practice or as specified in the relevant Project Approval?
- Has access to environmentally sensitive areas been restricted?
- Have the appropriate number and types of nest boxes been installed?
- Have hollow-bearing limbs, woody debris and bush rocks identified for relocation been moved to fauna translocation sites or other recipient sites?
- Have identified bat roosts been relocated, or have artificial bat roosts been installed in fauna translocation sites or other recipient sites?

## 6.5 Management response to incidents and non-compliances

As previously noted, it is anticipated that the developer and operator for the Project would be required to develop a number of project specific management plans to address design activities, construction activities and operational activities. These plans would include a DMP, CEMP and an OEMP.

Within each of the project specific management plans, the private sector developer would need to detail how incidents and non-compliances will be managed. It is envisaged that in doing so the private sector developer will draw upon its corporate Environmental Management System and address the specific requirements of the Project Approval.

Incidents may include (but are not limited to) the following:

- Nominated vegetation areas not maintained (all stages of project).
- Project and workforce personnel have not attended project environmental inductions.
- Unauthorised clearing of vegetation (flora).
- Unauthorised disturbance of animals including injury and death.
- Failure to meet identified objectives and targets.
- Near misses.
- Non-compliances.

Incidents including non-compliances and near misses would trigger internal (and external as required) notifications, reporting, investigation, close out and associated corrective and preventative actions to ensure compliance as well as continual improvement.

## 6.6 Reporting, auditing and review

Within each of the project specific management plans, the private sector developer would need to detail what reporting, auditing and review processes would be implemented to ensure compliance with the following:

- The Project's EIS, with respect to the commitments made as well as the management and mitigation measures proposed.
- Project approvals issued under the EPBC Act and NSW EP&A Act.
- Contractual requirements established between MIC and the developer and operator for the Project.
- Other permits and/or licences required during the course of the project.
- Objectives, targets and indicators as presented in this PEMF.
- The project specific management plans themselves (e.g. DMP, CEMP and OEMP) and their associated monitoring programs.

### 6.6.1 Independent environmental audit

Throughout the life of the Project (construction and operational phases) the proponent would commission an independent environmental audit of the Project on an annual basis. The audit:

- be conducted by a suitably qualified, experienced and independent team of experts and where necessary the team would be endorsed by the relevant government agencies (e.g. Commonwealth and State);
- be led by a suitably qualified auditor and include experts in and field as directed by the relevant government agencies (e.g. Commonwealth and State);
- be conducted in accordance with the guidance provided in ISO 19011:2002 (or as updated) – *Guidelines for Quality and/or Environmental Management Systems Auditing;*
- include consultation with relevant government agencies;
- assess the environmental performance of the Project and whether it is complying with the requirements of the Project Approval and any relevant licences and permits (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned Project related approvals, permits and licences;
- recommend measures and actions to improve the environmental performance of the Project, and/or any strategy, plan or program required under the Project Approval, permits and licences; and
- be included in the relevant annual environmental management report (AEMR).

The proponent would make copies of each independent environment audit available for public inspection on request and if requested be submitted to the Commonwealth and State based agencies.

### 6.6.2 Pre-construction compliance report

Four (4) weeks prior to the commencement of construction activities, the proponent would prepare a Pre-Construction Compliance Report. The Pre-Construction Compliance Report details:

- how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed prior to construction have been complied with;
- the date when each relevant condition of approval was complied with, including dates of submission and any required report and/or approval dates; and

- any approvals or licences required to be issued by government departments or agencies before construction commences.

### 6.6.3 Pre-operation compliance report

Four (4) weeks prior to the commencement of operations, the proponent would prepare a Pre-Operation Compliance Report. The Pre-Operation Compliance Report detail:

- how the relevant conditions of approval (i.e. Commonwealth and State approval conditions) required to be addressed before operations commence have been complied with;
- the date when each relevant condition of approval was complied with, including dates of submission of any required reports and/or approval dates; and
- any approvals or licences issued by government departments for the Project's operation.

### 6.6.4 Annual environmental management review

Throughout the life of the Project (construction and operational phases) the proponent would prepare an AEMR. The AEMR review the performance of the project against the CEMP and OEMP. The AEMR includes, but not necessarily be limited to:

- details of compliance with the various conditions of approval (i.e. Commonwealth and State approval conditions);
- a copy of the complaints register for the preceding 12months (exclusive of personal details), and details of how these complaints were addressed and resolved;
- identification of any circumstances in which the environmental impacts and performance of the Project during the year have not been generally consistent with the environmental impacts and performance predicted in the relevant Project documentation (e.g. environmental impact statement, Project Approval conditions as well as any licences and permits), with details of additional mitigation measures applied to the Project to address recurrence of these circumstances;
- results of all environmental monitoring required by the conditions of approval (i.e. Commonwealth and State approval conditions) as well as relevant licences and permits, including interpretation and discussion by a suitably qualified person;
- a list of all occasions in the preceding 12 month period when environmental goals/objectives/impact assessment criteria for the Project have not been achieved, indicating the reason for failure to meet the criteria and the action taken to prevent recurrence of that type of failure; and
- copies of the relevant independent environmental audit report, pre-construction compliance report and pre-operation compliance report.

## 6.7 Community consultation and liaison

A Community Engagement Plan (CEP) will be prepared and implemented by the developer and operator for the Project. This will outline the consultation and notification processes during the pre-construction, construction and operation phases. The CEP would be prepared to ensure that:

- the community and stakeholders have a high level of awareness of all processes and activities associated with the Project;
- accurate and accessible information is made available; and
- a timely response is given to issues and concerns raised by stakeholders and the community.

## 6.8 Supporting documentation

This PEMF is one of a suite of plans which form part of the Project's EIS. The purpose of the PEMF is to provide a high level overview as to how the environmental impacts during design, construction and operational phases of the Project will be minimised. Other PEMFs prepared as part of the Project's EIS include:

- Noise and vibration;
- Traffic;
- Light spill;
- Hazards and risk;
- Water quality;
- Aboriginal heritage;
- European heritage;
- Soils and contamination; and
- Air quality.

# 7. Applicable legislation, standards and guidelines

The legislative instruments, standards and guidelines specifically related to the management of potential biodiversity impacts include the following:

- EPBC Act;
- EP&A Act;
- TSC Act;
- NSW *Noxious Weeds Act 1993;*
- NSW *National Parks and Wildlife Act 1974;*
- NSW *Pesticides Act 1999;*
- *NSW principles for the use of biodiversity offsets in NSW* (NSW Department of Environment and Climate Change 2008);
- *EPBC Act – Environmental Offsets Strategy* (Department of Sustainability, Environment, Water, Population and Communities 2012);
- ISO 19011:2002 (or as updated) – Guidelines for Quality and/or Environmental Management Systems Auditing;
- The Australian Weeds Strategy; and
- NSW Weeds Strategy.