

# Appendix D – Environmental Risk Assessment and Mitigation Measures

The following section provides recommendation for mitigation measures in response to potential impacts identified in **Section 6** of the EIS.

Following the implementation of appropriate mitigation measures as recommended, it is determined that the proposal will not result in any significant adverse impacts on the surrounding environment. The following table illustrates how the matters raised within the SEARs will be addressed.

The table has directly related mitigation measures responding to each impact also based upon the range of technical and specialist consultant reports appended to the EIS.

**N.B. ‘O’ – Operational; ‘C’ – Construction**

SEARS	Potential Impact	Stage of Project	Approach
Ground and Water Conditions	Soil resources and related infrastructure, riparian lands on and near the site and including soil erosion, saline intrusion, Acid Sulfate soils	C	<p>To ensure groundwater values are protected, the following mitigation measures are recommended:</p> <ul style="list-style-type: none"> <li>Construction Environmental Management Plan (<b>CEMP</b>) addressing groundwater protection, spill response, sediment control and hazardous materials management.</li> <li>Bunded and compliant storage of fuels, oils and chemicals, with designated refuelling areas.</li> <li>Site personnel training in safe chemical handling and emergency spill response.</li> <li>WSUD treatments to support infiltration where appropriate, including deep soil zones, permeable surfaces and vegetated drainage.</li> <li>Implementation of the Acid Sulfate Soil Management Plan (<b>ASSMP</b>) approved under the Stage 2-4 Bulk Earthworks DA to manage any unexpected ASS risks.</li> <li>These measures ensure that both construction and operation can proceed without adverse impacts to groundwater quality, recharge or flow characteristics.</li> </ul>

Construction Waste Management Plan	Waste and pollution of the site and surrounding community as a result of construction.	C	<p>Training/Site Inductions</p> <p>All staff employed during the demolition and construction stages of the development must undertake site-specific induction training regarding the procedures for waste management. Employees of the head contractor will undertake a specific induction outlining their duties and how they are to enforce the waste management procedures.</p> <p>Induction training will include the following at a minimum:</p> <ul style="list-style-type: none"> <li>▪ Legal obligations;</li> <li>▪ Emergency response procedures on site;</li> <li>▪ Waste storage locations and separation of waste;</li> <li>▪ Litter management in transit and on site;</li> <li>▪ The implications of poor waste management practices;</li> <li>▪ Correct use of general-purpose spill kits;</li> <li>▪ Responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).</li> </ul> <p>Materials Selection and Ordering</p> <ul style="list-style-type: none"> <li>▪ Selection of all materials will be undertaken by architectural designers;</li> <li>▪ Prefabrication of materials off-site where possible;</li> <li>▪ Materials requirements are to be accurately calculated to minimise waste from over-ordering;</li> <li>▪ Materials ordering process is to aim at minimisation of materials packaging;</li> <li>▪ Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented.</li> </ul> <p>Waste Avoidance Opportunities</p> <ul style="list-style-type: none"> <li>▪ Limiting unnecessary excavation;</li> <li>▪ Selection of construction materials taking into consideration to their long lifespan and potential for reuse;</li> <li>▪ Ordering materials to size and ordering pre-cut and prefabricated materials;</li> <li>▪ Reuse of formwork;</li> <li>▪ Planned work staging;</li> <li>▪ Use of naturally ventilating buildings to reduce ductwork;</li> </ul>
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- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk and requesting cardboard or metal drums rather than plastics;
  - Requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
  - Reduction of PVC use;
  - Use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
  - Use of fittings and furnishings that have been recycled or incorporate recycled materials;
  - Use of building materials, fittings and furnishings with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

#### Site Procedures

- Excavated materials will be used onsite where practical;
- Green waste will be mulched and reused in landscaping either onsite or offsite;
- Concrete, tiles and bricks will be reused or recycled offsite;
- Steel will be recycled offsite; all other metals will be recycled where economically viable;
- Framing timber will be reused on-site or recycled off-site;
- Windows, doors and joinery will be recycled off-site where possible;
- Plumbing, fittings and joinery will be recycled off-site where possible;
- Plasterboard will be re-used in landscaping on-site or returned to the supplier for recycling where possible;
- All used crates will be stored for reuse unless damaged;
- All glass that can be economically recycling will be;
- All solid waste timber, brick, concrete, rock, plasterboard and other materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site;
- Beverage container recycling will be provided on-site for employee use;
- All waste and recycling will be disposed of via council approved systems.

			<p><b>General Requirements</b></p> <ul style="list-style-type: none"> <li>▪ All waste management facilities onsite should:</li> <li>▪ Be conveniently located to enable easy access for on-site movement and collection;</li> <li>▪ Be incorporated with other loading/unloading facilities;</li> <li>▪ Have sufficient space for the quantity of waste generated and careful source separation of recyclable materials;</li> <li>▪ Have sufficient space to contain any on-site treatment facilities, such as compaction equipment;</li> <li>▪ Have adequate weather protection and, where required, be enclosed or undercover;</li> <li>▪ Be secure and lockable;</li> <li>▪ Be well-ventilated and drained to the sewer;</li> <li>▪ Be clearly sign-marked to ensure appropriate use.</li> </ul> <p><b>Waste and Recycling Receptacles</b></p> <p>A sufficient quantity of skip bins should be provided for the separate storage of each type of C&amp;D material generated on site. This will assist in maximising source separation and resource recovery, while reducing the costs and quantity of materials disposed of at landfill.</p> <p>The size of the receptacles should be appropriate to the nature of waste generated and the available storage area.</p>
<p>Construction Noise and Vibration</p>	<p>Construction noise affecting surrounding residents and community.</p>	<p>O, C</p>	<p><b>General noise management measures</b></p> <p>The following general noise management measures are recommended for all receiver locations:</p> <ul style="list-style-type: none"> <li>▪ Regularly inspect and maintain equipment to ensure it is in good working order.</li> <li>▪ Provide special attention to any use and maintenance of 'noise control' or 'silencing' kits fitted to machines to ensure they perform as intended.</li> <li>▪ Avoid any unnecessary noise when carrying out manual operations and when operating plant.</li> <li>▪ Simultaneous operations of noisy plant within discernible range of a sensitive receiver is to be limited / avoided where possible.</li> <li>▪ The offset distance between noisy plant and adjacent sensitive receivers is to be maximised where practical.</li> <li>▪ Where practical, plant and equipment that are used intermittently are to have throttle setting reduced or shut down when not in use. Any plant and equipment that will not be used for extended periods of time are to be switched off.</li> </ul>

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- Truck engines should be turned off as opposed to idling, if feasible. Also, non-tonal reversing beacons should be considered for the on-site vehicles.
  - In addition to the noise mitigation measures outlined above, a management procedure will need to be put in place to deal with noise complaints that may arise from construction activities. Each complaint will need to be investigated, and appropriate noise amelioration measures put in place to mitigate further occurrences, where the noise in question is in excess of allowable limits.
  - Good relations with people living and working in the vicinity of the Corrimal Coke Works site should be established at the beginning of a project and be maintained throughout the project, as this is of paramount importance. Keeping people informed of progress and taking complaints seriously and dealing with them expeditiously is critical. The person selected to liaise with the community must be adequately trained and experienced in such matters.

#### **Specific noise management measures**

Other potential mitigation measures include:

- Neighbour notification
    - Community consultation procedures and site point-of-contact must be established.
    - Notify surrounding residential areas (at a minimum, NCAs 1 to 6) of the estimated dates, locations during each day and typical duration of noisy activities so a given receiver will have an understanding of the duration of works that is in closest proximity to them.
    - If feasible and reasonable, the use of noisy plant could alternatively be restricted to certain times of the day with periods of respite in between (to be negotiated with surrounding noise sensitive receivers). For example, noisy activities such as saw cutting / hammering (using an excavator) could be limited to weekdays when the surrounding residents are likely to not be at home. It is also noted however that respite periods can have the effect of increasing the overall duration of the construction works, and the community may prefer to have the works completed as quickly as possible.
  - All employees, contractors and subcontractors are to receive site induction, toolbox talks and ongoing training so that the above noise management measures are implemented accordingly.
  - Content within toolbox talks should include the location of nearest noise sensitive receivers, relevant project specific and standard noise / vibration mitigation measures, permissible hours of work, truck route and truck loading restrictions and employee parking areas.
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### Vibration Mitigation Measures

The following vibration mitigation measures are recommended to minimise vibration impacts from Stage 2-4 civil works.

A management procedure is to be implemented to deal with vibration complaints. Consultation with occupants and property owners is recommended and should be aimed at providing a communication path directly to the contractor. Each complaint is to be investigated and where vibration levels are established as exceeding the set limits, appropriate amelioration measures shall be put in place to mitigate future occurrences.

- Carry out vibration testing of actual equipment on site prior to the civil works to determine acceptable buffer distances to sensitive receivers. Where subdivision work activities are within the acceptable buffer distances determined from site testing, additional vibration monitoring is to be undertaken which signals to the contractor (by way of buzzer, flashing lights, etc.) when vibration levels approach / exceed the recommended limits. Further details of the monitoring procedures are set out in Section 6.3.1.
  - Where vibration is found to be excessive, management measures must be implemented to ensure vibration compliance is achieved. Management measures may include:
    - Using smaller equipment or modifying the construction methodology (eg. using a rock saw preferentially to a hydraulic hammer, using a lower roller vibration setting, etc.) where feasible;
    - Establishment of safe buffer zones; and
    - Time restrictions to the operation of vibration intensive plant to address human comfort.
    - Notification by letter drop should be carried out for the nearest surrounding residential properties in NCAs 3, 4 and 6 to address potential community concerns that perceived vibration may cause damage to property. Notification is to be provided to these receivers prior to the commencement of civil works.
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