

Appendix B7: Waste and Energy Management Sub- Plan

NEWCASTLE INNER CITY BYPASS – RANKIN PARK TO
JESMOND (STAGE 4 – MAIN WORKS)

ACKNOWLEDGMENT OF COUNTRY

Fulton Hogan acknowledges the Awabakal People as the Traditional Owners of the land we are working on, and pay our respect to their Elders past, present and emerging.

We recognise their deep connection to Country and value the contribution to caring for, and managing the land and water.

We are committed to pursuing genuine and lasting partnerships with Traditional Owners to understand their culture and connections to Country in the way we plan for and carry out the delivery of the Works.



Artwork by Luke Penrith, from Fulton Hogan's Reconciliation Action Plan.

Luke Penrith is a modern contemporary Aboriginal Artist living in Brungle NSW, Wiradjuri Country. His ancestry is connected through the Wiradjuri, Wotjobaluk, the Yuin and the Gumbaynggirr Nation.

Document control

This is an e-copy of the Plan and it interfaces with the other associated plans, which together describe the proposed overall project management system for the project.

The latest revision of this plan is available on the Fulton Hogan server. If any unsigned hard copies of this document are printed, they are valid only on the day of printing.

The revision number is included at the bottom of each page. When revisions occur, the entire document will be issued with the revision number updated accordingly for each owner of a controlled copy.

Attachments/Appendices to this plan are revised independently of this plan.

Revision history

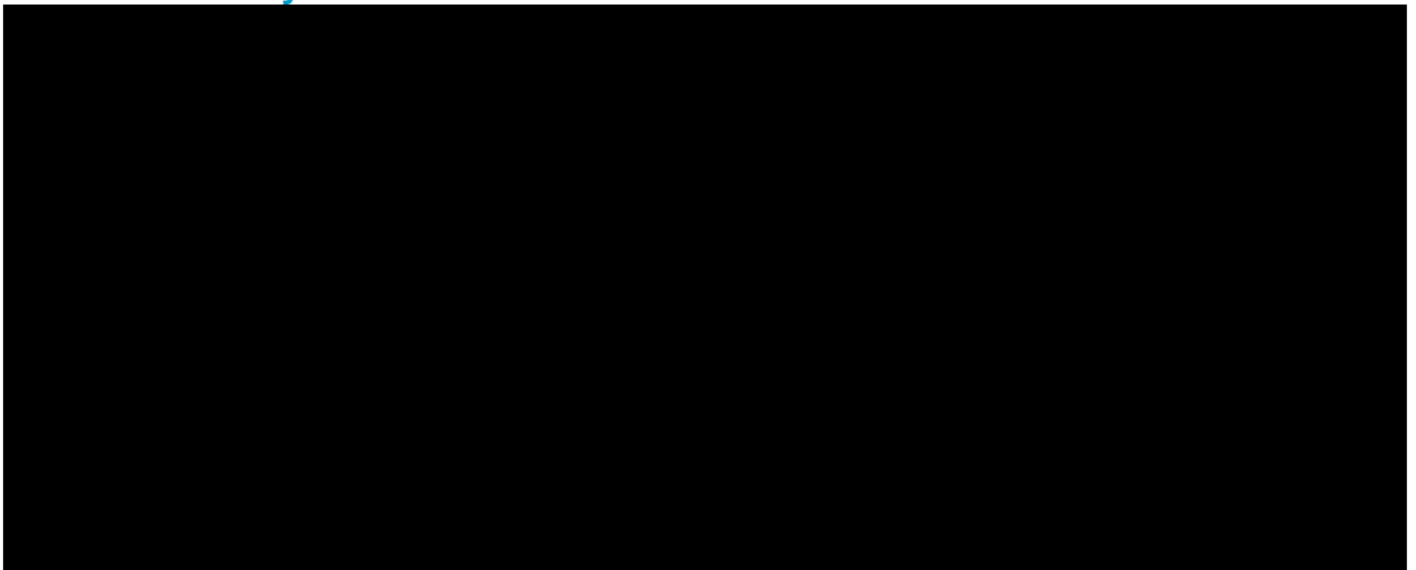


Table of contents

| | |
|--|-----------|
| 1. Introduction | 1 |
| 1.1. Purpose | 1 |
| 1.2. Background | 1 |
| 1.3. Structure of WEMP | 1 |
| 1.4. Consultation for preparation of the WEMP | 1 |
| 2. Objectives, targets and environmental performance outcomes | 2 |
| 2.1. Objectives | 2 |
| 2.2. Targets | 2 |
| 2.3. Environmental performance outcomes | 2 |
| 3. Legal and other requirements | 3 |
| 3.1. Legislation | 3 |
| 3.2. Guidelines and standards | 3 |
| 3.3. Conditions of approval | 3 |
| 3.4. Revised environmental management measures | 6 |
| 4. Existing Environment | 9 |
| 4.1. Construction waste streams and energy use | 9 |
| 5. Environmental aspects and impacts | 9 |
| 6. Waste management | 10 |
| 6.1. Waste management hierarchy | 10 |
| 6.1.1. Reduce or avoid waste | 10 |
| 6.1.2. Reuse and recycle waste | 10 |
| 6.1.3. Handling and storage of waste | 11 |
| 6.1.4. Disposal of waste | 11 |
| 6.2. Waste classification | 11 |
| 6.3. Waste exemptions | 12 |
| 6.4. Classification of potential waste streams from the project | 12 |
| 7. Environmental mitigation measures | 24 |
| 8. Compliance management | 28 |
| 8.1. Roles and responsibilities | 28 |
| 8.2. Training | 28 |
| 8.3. Complaints | 28 |
| 8.4. Inspections and monitoring | 28 |
| 8.5. Auditing | 29 |
| 8.6. Reporting | 29 |

8.7. Non-conformances 29

9. Review and improvement of WEMP 29

List of tables

Table 1: Environmental performance outcomes relevant to waste and energy management2

Table 2: Conditions of approval relevant to WEMP4

Table 3: Revised environmental management measures relevant to WEMP7

Table 4: Potential waste streams and resource use management strategy13

Table 5: Waste and energy mitigation measures24

Table 6: Monitoring and inspection28

List of figures

Figure 1: The waste hierarchy 10

Appendices

- Appendix A: Potential waste facilities
- Appendix B: Waste register (example)

Glossary/ Abbreviations

| Term/ abbreviation | Definition |
|-----------------------|---|
| CCS | Community Communication Strategy |
| CEMP | Construction Environmental Management Plan |
| CoA | Condition of Approval |
| Construction | Has the same meaning as the definition of the term in the Project Approval |
| Construction Boundary | Has the same meaning as the definition of the term in the Project Approval: The area physically affected by works described in documents listed in Condition A1. |
| D&C | Design and Construct |
| Department/ DPHI | NSW Department of Planning, Housing, and Infrastructure (formerly known as Department of Planning and Environment (DPE)) |
| EIS | Environmental Impact Statement |
| EMS | Environmental Management System |
| EPA | NSW Environment Protection Authority |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979</i> |
| EPL | Environment Protection Licence |
| ER | Environmental Representative for the SSI |
| ESCP | Primary Erosion and Sediment Control Plan |
| EWMS | Environmental Work Method Statement |
| FFMP | Flora and Fauna Management Sub-Plan |
| HP | Hold Point: a point in the construction or verification process beyond which work may not proceed without receiving authorisation from the appropriate party. |
| Material harm | Has the same meaning as the definition of the term in the Project Approval: Is harm that: (a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or (b) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) |
| Minister, the | NSW Minister for Planning |
| NA | Not applicable |
| Non-compliance | Has the same meaning as the definition of the term in the Project Approval: An occurrence, set of circumstances or development that is a breach of the Project Approval. This includes a failure to comply with the processes included within this CEMP. |
| Non-conformance | Failure to conform to the requirements of project or Fulton Hogan system documentation. |
| OEMP | Operational Environmental Management Plan |
| OEMS | Operational Environmental Management System |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Term/ abbreviation | Definition |
|-------------------------|--|
| Planning Secretary, the | Planning Secretary of the DPHI (or nominee, whether nominated before or after the date on which the Project Approval was granted. |
| POEO Act | <i>Protection of the Environment Operations Act 1997 (NSW)</i> |
| Project, the | Newcastle Inner City Bypass Rankin Park to Jesmond |
| Project Approval, the | The Minister's approval for the SSI. |
| PV | Project Verifier |
| Relevant Council(s) | Has the same meaning as the definition of the term in the Project Approval: Lake Macquarie City Council and City of Newcastle, as relevant. |
| REMM | Revised Environmental Management Measure |
| RMS | Roads and Maritime Services (now TfNSW) |
| RP2J | Rankin Park to Jesmond |
| SPIR | Submissions and Preferred Infrastructure Report |
| SSI | State Significant Infrastructure, as generally described in Schedule 1 of the Project Approval, the carrying out of which is approved under the terms of the Project Approval. |
| SWMP | Soil and Water Management Sub-Plan |
| SWTC | TfNSW Scope of Works and Technical Criteria |
| TfNSW | Transport for NSW |
| UDLP | Urban Design and Landscape Plan |
| WEMP | Waste and Energy Management Sub-Plan |
| Work(s) | Has the same meaning as the definition of the term in the Project Approval: All physical activities to construct or facilitate the construction of the SSI, including environmental management measures and utility works. however, does not include work that informs or enables the detailed design of the SSI and generates noise that is no more than 5 dB(A) above the rating background level (RBL) at any residence |

1. Introduction

1.1. Purpose

This Waste and Energy Management Sub-Plan (WEMP) describes how Fulton Hogan will minimise the amount of waste for disposal and manage energy use during construction of the Newcastle Inner City Bypass Rankin Park to Jesmond (RP2J) Project (the project) to reduce environmental harm and climate change impacts caused by greenhouse gas emissions.

This WEMP has been prepared to detail how Fulton Hogan will comply with the project approval, and implement and achieve relevant performance outcomes, commitments and mitigation measures specified in the EIS as amended by the SPIR and subsequent Modification 1 Submissions Report (also known as 'Revised Environmental Management Measures' (REMMs)) during construction of the project. Additionally, this WEMP has been prepared to address the requirements of the Scope of Works and Technical Criteria (SWTC) Appendix 4 Additional Environmental Requirements and TfNSW Specification D&C G36 Environmental Protection (G36).

The WEMP will be updated as required upon receipt of the Environment Protection Licence (EPL) for the project.

For the avoidance of doubt, the CEMP (including this WEMP) relates to the construction phase only. Detailed design environmental requirements will be addressed as part of the detailed design phase, separate to the CEMP approvals process. Detailed design is generally completed about six months after CEMP approval. In addition, operational environmental requirements will be met during the operational phase (upon the completion of construction) and addressed in the Operational Environmental Management Plan (OEMP) or Environmental Management System (EMS) as agreed with the Planning Secretary in accordance with CoA D3.

1.2. Background

Chapter 18 of the EIS assessed the extent and magnitude of potential impacts of construction and operation of the project on waste management in terms of waste generation and resource use.

The EIS identified the various waste streams that would be generated during the construction of the project based on desktop assessment, including but not limited to excavation wastes, timber and green wastes, demolition wastes, redundant existing pavement, waste from vehicle/ plant equipment maintenance and wastewater from amenities. It also identified opportunities to avoid, reduce and recycle waste.

Chapter 20 of the EIS assessed the extent and magnitude of potential impacts of construction and operation of the project provides to climate change risk in terms of climate change and greenhouse gases emissions.

A review of the construction waste impacts was carried out as part of the SPIR and Modification 1 Submissions Report and it was concluded that the potential impacts are consistent with those outlined in the EIS.

1.3. Structure of WEMP

This WEMP is part of Fulton Hogan's environmental management framework for the project and is supported by other documents, including the Waste Register and relevant Environmental Work Method Statements. The review and document control processes for this WEMP are described in Chapters 11 and 12 respectively of the CEMP.

1.4. Consultation for preparation of the WEMP

In accordance with the project approval, no consultation is required with public authorities during the preparation of this WEMP.

Ongoing consultation will be undertaken during detailed design and construction of the project as required by the project approval. This will be subject to a separate consultation process to that required for preparation of this WEMP and undertaken in accordance with the Community Communication Strategy (CCS) approved by the Planning Secretary under CoA B3.

2. Objectives, targets and environmental performance outcomes

2.1. Objectives

The key objective of the WEMP is to ensure that waste for disposal and energy use are minimised. To achieve this objective, Fulton Hogan will undertake the following:

- Ensure measures are identified and implemented to minimise waste, manage waste and conserve energy throughout the construction of the project
- Ensure the preferred waste management hierarchy of avoidance, minimisation, reuse, recycling and finally disposal is followed
- Ensure appropriate measures are implemented to address and comply with all relevant legal and other requirements as described in Chapter 3 of this WEMP, including the CoA and REMMs outlined in Table 2 and Table 3 respectively.

2.2. Targets

The following targets have been established for the management of waste and energy consumption during the project:

- Avoid the unnecessary production of waste where practical to do so
- Dispose of waste materials in accordance with legislative requirements
- Minimise / reduce the quantities of resources to be used
- Minimise / reduce energy consumption
- Achieve the waste re-use/ recycling targets nominated in Table 4.

2.3. Environmental performance outcomes

The construction-related environmental performance outcomes relevant to this WEMP are listed in Table 1. A cross reference is also included to indicate where the environmental performance outcome is addressed in this WEMP in terms of how it will be implemented and achieved.

Table 1: Environmental performance outcomes relevant to waste and energy management

| Key issue | Environmental performance outcome | How implemented and achieved |
|-----------|--|---|
| Waste | Suitable spoil will be recycled and reused | Section 6.1 Section 6.1.2 Section 6.4 Chapter 7 mitigation measure ID WEMM1, WEMM13. |
| | Waste will be disposed of at appropriately licensed facilities | Section 6.1.4 Section 6.4 |
| Energy | Avoidance of unnecessary resource consumption | Section 6.1 Chapter 7 mitigation measure ID WEMM21-WEMM26. |

3. Legal and other requirements

3.1. Legislation

Legislation relevant to waste and resources management includes:

- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (General) Regulation 2009
- Protection of the Environment Operations (Waste) Regulation 2005
- Waste Avoidance and Resource Recovery Act 2001 (WARR Act)
- Contaminated Land Management Act 1997
- National Greenhouse and Energy Reporting Act 2007
- Environmentally Hazardous Chemicals Act 1985
- Energy Efficiency Opportunities Act 2006 (EEO Act).

Relevant provisions of the above legislation are explained in the Register of legal and other requirements included in Appendix A1 of the CEMP.

3.2. Guidelines and standards

The main guidelines, standards and policy documents relevant to this WEMP include:

- Waste Avoidance and Resource Recovery Strategy 2007 (DECC, 2007)
- Waste Reduction and Purchasing Policy (RTA, 2009)
- Waste Classification Guidelines (EPA, 2014),
- Best Practice Waste Reduction Guidelines for the Construction and Demolition Industry - tools for Practice (Natural Heritage Trust, 2000).
- Resource Efficiency Policy (State of NSW and Office of Environment and Heritage, 2014)
- NSW Government Resource Efficiency Policy (GREP);
- Environmental Sustainability Strategy 2019-2023 (TfNSW)
- Technical Guide “Management of road construction and maintenance wastes” (TfNSW)
- Technical Direction ETD 2015/020 “Legal offsite disposal of Roads and Maritime Services waste” (TfNSW).
- Environment Fact Sheets (TfNSW).

3.3. Conditions of approval

The CoA relevant to this WEMP are listed in Table 2. A cross reference is also included to indicate where the condition is addressed in this WEMP or other project management documents.

Table 2: Conditions of approval relevant to WEMP

| CoA No. | Condition requirements | Document reference | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|------------------------|--|-----|-----------------------|--|-----|---------------------|--|-----|-----------------|------------------------------------|-----|-------------|--|-----|----------------|--|-----|------------------------------|--|-----|------------------|------------------|-------------|
| PART C - CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | <p>The following CEMP Sub-plans must be prepared in consultation with the relevant public authorities identified for each CEMP Sub-plan:</p> <p>Table 3: CEMP Sub-plan and relevant public authorities</p> <table> <tr> <th></th><th>Required CEMP Sub-plan</th><th>Relevant public authorities to be consulted for each CEMP Sub-plan</th></tr> <tr> <td>(a)</td><td>Traffic and transport</td><td>Relevant council and Health Administration Corporation</td></tr> <tr> <td>(b)</td><td>Noise and vibration</td><td>Relevant council and Health Administration Corporation</td></tr> <tr> <td>(c)</td><td>Flora and Fauna</td><td>DPI Fisheries and Relevant council</td></tr> <tr> <td>(d)</td><td>Air quality</td><td>Relevant council and Health Administration Corporation</td></tr> <tr> <td>(e)</td><td>Soil and water</td><td>Relevant council, DPI Fisheries and DPE Water,</td></tr> <tr> <td>(f)</td><td>Aboriginal cultural heritage</td><td>Heritage NSW and Registered Aboriginal Parties</td></tr> <tr> <td>(g)</td><td>Flood management</td><td>Relevant council</td></tr> </table> | | Required CEMP Sub-plan | Relevant public authorities to be consulted for each CEMP Sub-plan | (a) | Traffic and transport | Relevant council and Health Administration Corporation | (b) | Noise and vibration | Relevant council and Health Administration Corporation | (c) | Flora and Fauna | DPI Fisheries and Relevant council | (d) | Air quality | Relevant council and Health Administration Corporation | (e) | Soil and water | Relevant council, DPI Fisheries and DPE Water, | (f) | Aboriginal cultural heritage | Heritage NSW and Registered Aboriginal Parties | (g) | Flood management | Relevant council | Section 1.4 |
| | Required CEMP Sub-plan | Relevant public authorities to be consulted for each CEMP Sub-plan | | | | | | | | | | | | | | | | | | | | | | | | |
| (a) | Traffic and transport | Relevant council and Health Administration Corporation | | | | | | | | | | | | | | | | | | | | | | | | |
| (b) | Noise and vibration | Relevant council and Health Administration Corporation | | | | | | | | | | | | | | | | | | | | | | | | |
| (c) | Flora and Fauna | DPI Fisheries and Relevant council | | | | | | | | | | | | | | | | | | | | | | | | |
| (d) | Air quality | Relevant council and Health Administration Corporation | | | | | | | | | | | | | | | | | | | | | | | | |
| (e) | Soil and water | Relevant council, DPI Fisheries and DPE Water, | | | | | | | | | | | | | | | | | | | | | | | | |
| (f) | Aboriginal cultural heritage | Heritage NSW and Registered Aboriginal Parties | | | | | | | | | | | | | | | | | | | | | | | | |
| (g) | Flood management | Relevant council | | | | | | | | | | | | | | | | | | | | | | | | |
| C5 | The CEMP Sub-plans must state how: | | | | | | | | | | | | | | | | | | | | | | | | | |
| (a) | the environmental performance outcomes identified in the documents listed in Condition A1 and terms of this approval will be achieved; | Section 2.3 | | | | | | | | | | | | | | | | | | | | | | | | |
| (b) | the mitigation measures identified in the documents listed in Condition A1 and terms of this approval will be implemented; | Through the implementation of this WEMP (in particular refer to Section 3.4). | | | | | | | | | | | | | | | | | | | | | | | | |
| (c) | the relevant terms of this approval will be complied with; and | Through the implementation of this WEMP (in particular refer to Part E Waste CoA cross references below). | | | | | | | | | | | | | | | | | | | | | | | | |
| (d) | issues requiring management during construction, as identified through ongoing environmental risk analysis, will be managed. | Chapter 5, second paragraph Chapter 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| C6 | The CEMP Sub-plans must be developed in consultation with the relevant public authorities specified in Table 3 . Details of all information requested by an authority to be included in a CEMP Sub-plan as a result of consultation, including copies of all correspondence from those authorities, must be provided with the relevant CEMP Sub-Plan . | Section 1.4 | | | | | | | | | | | | | | | | | | | | | | | | |
| C7 | Any of the CEMP Sub-plans may be submitted along with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction for approval by the Planning Secretary. | CEMP (main section) Section 1.4 | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| CoA No. | Condition requirements | Document reference |
|-----------------------|---|--|
| C8 | Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Planning Secretary, or as otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans , as approved by the Planning Secretary, including any minor amendments approved by the ER must be implemented for the duration of construction. Where construction of the SSI is staged, construction of a stage must not commence until the CEMP and sub-plans for that stage have been approved by the Planning Secretary. | CEMP (main section) Section 1.4 |
| PART E - WASTE | | |
| E81 | Waste generated during works and operation of the SSI must be dealt with in accordance with the following priorities: | Waste generation during operation will be addressed in the OEMP or EMS as required under CoA D3 as detailed in Section 1.1 last paragraph. |
| | (a) waste generation must be avoided and where avoidance is not reasonably practicable, waste generation must be reduced; | Section 6.1 Section 6.1.1 Chapter 7 mitigation measure ID WEMM1, WEMM4, WEMM5. |
| | (b) where avoiding or reducing waste is not possible, waste must be re-used, recycled, or recovered; and | Section 6.1 Section 6.1.2 Section 6.4 Chapter 7 mitigation measure ID WEMM6 – WEMM18. |
| | (c) where re-using, recycling or recovering waste is not possible, waste must be treated or disposed of. | Section 6.1 Section 6.1.4 Section 6.3 Section 6.4 Appendix B |
| E82 | The importation of waste and the storage, treatment, processing, reprocessing or disposal of such waste must comply with the conditions of the EPL for the SSI, or a Resource Recovery Exemption or Order issued under the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> , as the case may be. | Section 6.1 Section 6.1.4 Section 6.3 Section 6.4 Appendix B |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| CoA No. | Condition requirements | Document reference |
|---------|---|--|
| E83 | Waste generated by all activities associated with works and operation of the SSI must only be: | Section 1.1 - operational environmental requirements will be addressed in the OEMP or EMS as agreed with the Planning Secretary in accordance with CoA D3. |
| | (a) exported to a EPA licensed facility for the storage, treatment, processing, reprocessing or disposal, or to any other place that can lawfully accept such waste, or | Section 6.1 Section 6.1.4 Section 6.4 Appendix B |
| | (b) reused in accordance with a Resource Recovery Exemption or Order issued under the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> . | Section 6.1 Section 6.1.2 Section 6.3 Section 6.4 Appendix B |
| E84 | All waste must be classified in accordance with the EPA's <i>Waste Classification Guidelines</i> , with appropriate records and disposal dockets retained for audit purposes. | Section 6.2 Section 6.3 Section 6.4 |

3.4. Revised environmental management measures

Relevant construction-related REMMs from the Modification 1 Submissions Report are listed in Table 3. A cross reference is also included to indicate where the measure is addressed in this WEMP or other project management documents.

Table 3: Revised environmental management measures relevant to WEMP

| ID No. | Revised environmental management measure | Document reference |
|--|--|--|
| Resource use and waste management | | |
| Construction waste | | |
| RW01 | A resource and waste management plan will be prepared to identify the hierarchy for sourcing and the use of resources and waste management. The plan will adopt the resource management hierarchy principles of the <i>Waste Avoidance and Resource Recovery Act 2001</i> , Roads and Maritime Services waste management procedures and Environmental Management System. The plan will include, but not be limited to: | This WEMP Section 6.1 |
| | <ul style="list-style-type: none"> Identification of the waste stream that will be generated during construction | Section 6.4 |
| | <ul style="list-style-type: none"> A waste register detailing types of waste collected, amounts, date, time, transportation method and details of disposal | Appendix B |
| | <ul style="list-style-type: none"> A resource management strategy detailing beneficial reuse options for surplus and/or unsuitable material | Section 6.1 Section 6.4 |
| | <ul style="list-style-type: none"> A strategy to minimise waste in packaging | Section 6.1.1 Section 6.4 Chapter 7 mitigation measure ID WEMM5. |
| | <ul style="list-style-type: none"> Consideration of procurement strategies to minimise unnecessary consumption of materials. | Chapter 7 mitigation measure ID WEMM1, WEMM4, WEMM5. |
| Surplus excavation material | | |
| RW02 | Surplus material that is not able to be used on-site as part of the project would be reused or disposed of in the following order of priority: | Section 6.1 |
| | <ul style="list-style-type: none"> Transfer to other nearby Roads and Maritime projects for immediate use | Section 6.3 |
| | <ul style="list-style-type: none"> Transfer to an approved Roads and Maritime temporary stockpile site for future use during projects or routine maintenance | Section 6.3 |
| | <ul style="list-style-type: none"> Transfer to a Roads and Maritime approved site for reuse on concurrent private/local government project (with appropriate approvals as required) | Section 6.3 |
| | <ul style="list-style-type: none"> Disposal at an approved materials recycling or licensed waste disposal facility | Section 6.1.4 |
| | <ul style="list-style-type: none"> As otherwise provided for by the relevant legislation and regulation. | Chapter 6 Section 3.1 |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| ID No. | Revised environmental management measure | Document reference |
|--|--|---|
| Existing waste | | |
| RW03 | Pre-existing waste will be dealt with in accordance with the POEO Act and <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (EPA 2014) and either recycled or disposed of at an appropriately licensed facility at the start of construction. | Section 6.1 Section 6.1.2 Section 6.1.4 |
| Operational waste | | |
| RW04 | All operational waste will be managed in accordance with the Roads and Maritime waste management procedures and Environmental Management System | Waste generation during operation will be addressed in the OEMP or EMS as required under CoA D3 as detailed in Section 1.1, last paragraph. |
| Greenhouse gas and climate change | | |
| Climate change | | |
| GH01 | The detailed design of the project will take into consideration the potential effect of climate change, including designing drainage to accommodate increased rainfall and severe weather events. | Detailed Design |
| Greenhouse gas emissions | | |
| GH02 | Vegetation removal will be minimised where practicable. | FFMP Chapter 6 mitigation measure ID FFMM1, FFMM2, FFMM7, FFMM10. |
| GH03 | The use of alternative fuels and power sources for construction plant and equipment will be investigated and implemented, where appropriate. | Chapter 7 mitigation measure ID WEMM21. |
| GH04 | Recycled materials will be incorporated in the design of pavement and structures where possible. | Detailed Design Chapter 7 mitigation measure ID WEMM17. |
| GH05 | The energy efficiency and related carbon emissions will be considered in the selection of vehicle and plant equipment. | Chapter 7 mitigation measure ID WEMM21, WEMM26. |

4. Existing Environment

This Chapter provides a brief summary of the various construction activities, potential waste streams and sources of energy use during construction of the project as identified in the EIS.

Further information on the existing environment, is provided in the EIS Chapter 18 (Resource use and waste management) and Chapter 20 (Greenhouse gas and climate change).

4.1. Construction waste streams and energy use

Construction of the project will generate a number of potential waste streams, including (EIS, p571):

- Excavation wastes
- Timber and green wastes
- Demolition wastes
- Construction wastes including waste generated from:
 - Redundant existing pavement
 - Chemical/spill clean-up or remediation
 - Remediation of contaminated material
 - Sediment/sludge from sedimentation basin desilting
 - Waste water from tannin affected water, contaminated runoff from concrete bridge decks, water captured in excavations and sedimentation basin de-watering
- Packaging materials
- Waste produced from the maintenance of construction vehicles and plant, which might include oils, fluids, fuels, tyres
- Sewage and general waste from office and construction compounds
- Miscellaneous wastes.

The following sources of construction related energy use/ consumption (fuel and electricity) have been identified:

- Fuel use for mobile and stationary plant and equipment
- Fuel use for employee/construction personnel commuting
- Fuel use for transport/ delivery of plant and equipment to site
- Electricity use at site compounds.

5. Environmental aspects and impacts

The key construction activities and the associated potential sources of waste and energy consumption are identified through a risk management approach. The consequence and likelihood of each activity's impact on the environment has been assessed to prioritise its significance. The results of this risk assessment are included in Appendix A3 of the CEMP.

Ongoing environmental risk analysis will be undertaken during construction through regular inspections, monitoring and auditing as described in Chapter 8. This will ensure that issues requiring management (including cumulative impacts) are appropriately managed.

6. Waste management

6.1. Waste management hierarchy

The *Waste Avoidance and Resource Recovery Act 2001* ensures that resource management options including for spoil, are considered against a hierarchy of:

- Avoidance of unnecessary resource consumption
- Resource recovery (including reuse, recycling, reprocessing, and energy recovery), and
- Disposal.

Refer to Figure 1 for the waste hierarchy provided by the EPA in the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21, 2014*.

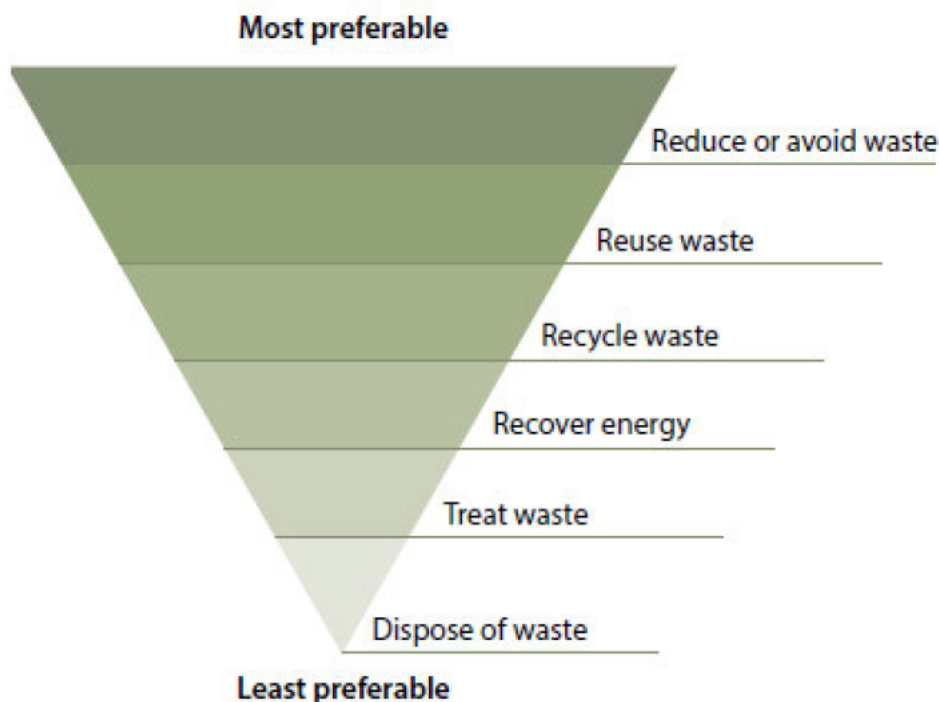


Figure 1: The waste hierarchy

The approach to the steps in the waste hierarchy most relevant to the project is briefly described below.

6.1.1. Reduce or avoid waste

Reducing or avoiding the generation of waste is of primary importance to the project. The following approach will be adopted:

- Consider construction options that have a higher waste reduction capacity than alternatives.
- Order material/ goods with minimal packaging or request suppliers to remove packaging from site.
- Accurately estimate materials required to minimise wastage of product.
- When possible material generated onsite will be reused.

6.1.2. Reuse and recycle waste

Waste separation and segregation will be promoted on site to facilitate reuse and recycling as a priority of the waste management program as follows:

- Segregate waste onsite – waste materials, including spoil and demolition waste, will be separated onsite into dedicated bins/ areas for either reuse onsite or collection by a waste contractor and transported to offsite

facilities. Locations of segregated bins will be determined onsite subject to safety assessment, including pedestrian and heavy vehicle considerations.

- Separate waste offsite – wastes will be deposited into one bin where space is not available for placement of multiple bins, and the waste will be sorted offsite by a waste contractor. Location of bin will be determined onsite subject to safety assessment, including pedestrian and heavy vehicle considerations.
- Where feasible and reasonable, secondary waste material will be used in construction. Refer to Table 4 for details on waste types that may be reused on site, and
- Implement measures for reducing demand on water resources as described in Chapter 6 of the SWMP mitigation measure ID SWMM24, SWMM41 and SWMM42.

6.1.3. Handling and storage of waste

Where waste is required to be handled and stored onsite prior to onsite reuse or offsite recycling/ disposal, the following measures will apply:

- Spoil and mulch will be stockpiled onsite in allocated areas, where appropriate, and mitigation measures for dust control and surface water management will be implemented in accordance with the AQMP and the SWMP.
- Topsoil will be stockpiled in allocated areas and protected from degradation and erosion so that it retains its productivity and can be beneficially reused on the project site. Mitigation measures for dust control and surface water management will be implemented in accordance with the AQMP and the SWMP respectively.
- Liquid wastes will be stored in appropriate containers in bunded areas until transported offsite. Bunded areas will have the capacity to hold 110% of the liquid waste volume for bulk storage or 120% of the volume of the largest container for smaller packaged storage
- Hazardous waste will be managed by the appropriately qualified and licensed contractors, in accordance with the requirements of the *Environmentally Hazardous Chemicals Act 1985* and the EPA waste disposal guidelines, and
- All other recyclable or non-recyclable wastes will be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations onsite and subcontractors commissioned to regularly remove / empty the bins to approved disposal or recycling facilities.
- The importation of waste and the storage, treatment, processing, reprocessing or disposal of such waste must comply with the conditions of the EPL for the project, or a Resource Recovery Exemption or Order issued under the *Protection of the Environment Operations (Waste) Regulation 2014*, as the case may be (CoA E82).

6.1.4. Disposal of waste

Waste disposal will be in accordance with the *Protection of the Environment Operations Act 1997*, EPL for the project and the *Waste Avoidance and Resource Recovery Act 2001*. Wastes unable to be reused or recycled will be disposed of offsite to an appropriately licensed waste facility following classification (refer to Section 6.2). Appendix A outlines the waste facilities in the vicinity of the project that may be utilised during construction. Details of waste types, volumes and destinations will be recorded in the Waste register provided in Appendix B.

6.2. Waste classification

Where waste cannot be avoided, reused or recycled it will be classified and appropriate disposal will then occur. The classification of waste will be undertaken in accordance with the *NSW EPA Waste Classification Guidelines Part 1: Classifying Waste* (2014). This document identifies six classes of waste: Special, Liquid, Hazardous, Restricted Solid, General Solid (putrescible) and General Solid (non-putrescible), and describes a six step process to classifying waste.

The general classification principles are as follows:

- If a special waste is mixed with another waste, the waste must be managed to meet the requirements of both the special wastes and the other class of waste.
- If asbestos waste is mixed with any other class of waste, all of the waste must be classified as asbestos waste.
- If liquid waste is mixed with hazardous or solid waste and retains the defined characteristics of liquid waste, it remains liquid waste.

- Two or more classes of waste must not be mixed in order to reduce the concentration of chemical contaminants. Dilution is not an acceptable waste management option.
- Where practicable, it is desirable to separate a mixture of wastes before classifying them.

6.3. Waste exemptions

Clause 51 of the *Protection of the Environment Operations (Waste) Regulation 2005* enables the EPA to grant exemptions to the licensing and payment of levies for the land application or use of waste.

The EPA has issued general resource recovery orders (orders) and general resource recovery exemptions (exemptions) for a range of commonly recovered, high volume and well characterised waste materials that allow their use as fill or fertiliser at unlicensed, offsite facilities. These are general gazette orders and exemptions that do not require approval but, all conditions of an order and exemption must be met for the reuse of the resource recovery waste to be lawful. A full list of the current general orders and exemptions is available on the [EPA website](#). If the resource recovery waste intended for reuse does not appear in this list, an application can be made to the EPA for a specific order and exemption to be granted.

Orders and exemptions may be used for the following materials during construction of the project:

- Excavated natural material
- Excavated public road material
- Mulch
- Reclaimed asphalt pavement
- Recovered aggregate
- Slag (blast furnace)
- Stormwater
- Treated drilling mud.

6.4. Classification of potential waste streams from the project

The construction activities and types of wastes that may be generated during construction are outlined in Table 4. This table also identifies preferred reuse, recycling and disposal methods for each waste stream.

Waste classification was determined based on the six step process provided in the *EPA Waste Classification Guidelines Part 1: Classifying Waste* (2014). For additional information on the six steps, refer to Section 6.2 of this WEMP.

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



Table 4: Potential waste streams and resource use management strategy

| Aspect | Waste Type | Waste Classification | Approx. Volume/Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|--|--|---|---|--|------------------------|--|
| Geotechnical investigations and surveys, including potholing | Drilling mud (that has been dewatered) | Subject to chemical assessment (if material is to be taken offsite) | 46 m ³ | <p>Reuse onsite – Reincorporate drilling mud into the works.</p> <p>Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014).</p> <p>Reuse offsite – Apply treated drilling mud to land at unlicensed premises where there is full compliance with the treated drilling mud order and exemption.</p> <p>Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014).</p> | 90% | <p>In order for an exemption to apply, all the conditions of the exemption must be met. These conditions include, but are not limited to, sampling and testing requirements, chemical thresholds, use restrictions and record keeping requirements.</p> <p>The 'Approved Notice under Section 143' form must be completed where material is taken offsite to unlicensed premises in accordance with Section 143(3A) of the POEO Act and G40 Clause 4.11.4. A Hold Point under G40 Clause 4.11 applies.</p> <p>In the event that disposal offsite is required, this will occur at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014)</p> |
| | Drilling fluid (vegetable based) | Liquid waste (pre-classified by the EPA) | 36,600 L (600L /drill hole x 61 holes) | Recycling onsite – recycle back into drill hole. | 100% | In the event that disposal offsite is required, this will occur at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|-------------------------------------|----------------------------|--|---------------------------------------|---|------------------------|---|
| Demolition, including of structures | Concrete, bricks, ceramics | General solid waste (non-putrescible) (pre-classified by the EPA) | 500 m ³ | Reuse onsite - If suitable, crush and use as backfill/ road base. Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) Reuse offsite – Apply concrete to land at unlicensed premises where there is full compliance with the recovered aggregate order and exemption. | 100% | In order for an exemption to apply, all the conditions of the exemption must be met. These conditions include, but are not limited to, sampling and testing requirements, chemical thresholds, use restrictions and record keeping requirements. The 'Approved Notice under Section 143' form must be completed where material is taken offsite to unlicensed premises in accordance with Section 143(3A) of the POEO Act and G40 Clause 4.11.4. A Hold Point under G40 Clause 4.11 applies. |
| | Asphalt | General solid waste (non-putrescible) (pre-classified by the EPA) | 6,500 tonnes | Reuse onsite - If suitable, use as backfill/ road base or for access roads. Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). Reuse offsite – Apply asphalt to land for road making activities, building, landscaping and construction works at an unlicensed premises where there is full compliance with the recovered aggregate order and exemption. Disposal offsite – disposal at an appropriately licensed waste facility in accordance with the premises' | 100% | As above. In addition, coal tar asphalt must be disposed of to a licensed landfill and is not to be re-used for any purpose, including reincorporation as fill in subsurface road layers (TfNSW Environment Technical Direction ETD 2015/021 "Coal tar asphalt handling and disposal") Under no circumstances should asphalt containing coal tar be re-used to manufacture new asphalt (TfNSW Environment Technical Direction ETD 2015/021 "Coal tar asphalt handling and disposal") |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|--------|--------------|---|---------------------------------------|---|------------------------|----------|
| | | | | Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) | | |
| | Waste metal | General solid waste (non-putrescible) (pre-classified by the EPA) | 50 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Glass | General solid waste (non-putrescible) (pre-classified by the EPA) | 2 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Timber | General solid waste (non-putrescible) (pre-classified as 'building and demolition waste' by the EPA) | 5 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Plasterboard | General solid waste (non-putrescible) (pre-classified by the EPA) | 0 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection | 100% | Nil. |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|-----------------------|--|--|---------------------------------------|---|------------------------|--|
| | | | | Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | | |
| | Asbestos | Special waste (Asbestos) (pre-classified by the EPA) | 1 tonne | Disposal offsite – disposal at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) | 0% | Asbestos waste will be handled in accordance with the Fulton Hogan Work Health Safety Management Plan. If asbestos waste is encountered, SafeWork NSW licensed asbestos removalists will be engaged to handle, manage and remove the waste. Note - Only bonded asbestos may be received at some premises. There may also be limits on the quantity of asbestos that can be stored on some premises at any time. |
| Clearing and grubbing | Green waste - native weed-free vegetation (branches, loppings, tree trunks, tree stumps) | General solid waste (non-putrescible) (pre-classified by the EPA as 'garden waste') | 11 ha | Reuse onsite – Reuse mature tree trunks/ coarse woody debris/ felled habitat trees and root balls. Refer to the FFMP for further details. Alternatively, mulch and stockpile for use onsite during landscape planting and in conjunction with soil erosion and sediment control measures. | 100% | Follow the Weed management plan in the FFMP. |
| | Topsoil | Subject to chemical assessment (if material is to be taken offsite) | 64,000 m ³ | Reuse onsite - stockpile onsite to retain productivity for later reuse in landscaping, ensuring topsoil is weed-free. Reuse offsite – Apply topsoil to land at unlicensed premises where there is full compliance with the excavated natural material order and exemption. | 100% | In order for an exemption to apply, all the conditions of the exemption must be met. These conditions include, but are not limited to, sampling and testing requirements, chemical thresholds, use restrictions and record keeping requirements. |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|------------|-----------------------------|---|---------------------------------------|---|------------------------|--|
| | | | | Disposal offsite – disposal at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) | | The 'Approved Notice under Section 143' form must be completed where material is taken offsite to unlicensed premises in accordance with Section 143(3A) of the POEO Act and G40 Clause 4.11.4. A Hold Point under G40 Clause 4.11 applies. If reuse is not feasible disposal offsite will occur at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence. |
| | Green waste - weeds | General solid waste (non-putrescible) | Unknown at this stage | Isolate weeds and either: encapsulate by deep burying onsite; leave weeds to decompose; manage noxious weeds in accordance with Department of Primary Industries requirements and relevant legislation; or dispose of weeds offsite at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence as directed by the Environment Manager/ EC. | 0% | Nil. |
| Earthworks | Excess uncontaminated spoil | Subject to chemical assessment (if material is to be taken offsite) | 159,000 m ³ | Reuse onsite – Reuse material unsuitable for construction in alternative ground/foundation treatments, or use it to construct embankments, or to flatten road side batters for example. Reuse offsite – Apply material to land as engineering fill or for use in earthworks at an unlicensed premises where there is full compliance with the | 100% | In order for an exemption to apply, all the conditions of the exemption must be met. These conditions include, but are not limited to, sampling and testing requirements, chemical thresholds, use restrictions and record keeping requirements. The 'Approved Notice under Section 143' form must be completed where material is taken offsite to unlicensed premises in accordance with Section |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|--------|--------------------------|--------------------------------|---------------------------------------|--|------------------------|---|
| | | | | excavated natural material order and exemption. Disposal offsite – disposal at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) | | 143(3A) of the POEO Act and G40 Clause 4.11.4. A Hold Point under G40 Clause 4.11 applies. If reuse is not feasible disposal offsite will occur at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence. |
| | Contaminated spoil/ soil | Subject to chemical assessment | 10 m ³ | Reuse onsite – Reuse onsite following relevant soil testing and remediation as required. Reuse may include deep burial and blending onsite. Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the DECCW <i>Waste Classification Guidelines</i> (EPA, 2014). | 90% | For soil remediation using landfarming, refer to the NSW EPA Guidelines: ' <i>Best Practice Note: Landfarming</i> ' (April 2014). Refer to SWMP Appendix D Unexpected contaminated land and asbestos finds procedure as needed. |
| | Acid sulfate soils | Subject to chemical assessment | 0 m ³ | Reuse onsite – Manage and reuse on site where possible in accordance with the <i>Waste Classification Guidelines: Part 4: Acid sulfate soils</i> (EPA, 2014). Undertake soil testing as required prior to reuse. Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Refer to SWMP Appendix B Acid sulfate soil management procedure. Refer to SWMP Appendix D Unexpected contaminated land and asbestos finds procedure as needed. |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|------------------------------|--|---|---------------------------------------|---|------------------------|---|
| | Virgin excavated natural material (VENM) | General solid waste (non-putrescible) (pre-classified as by the EPA) | 1,000 m ³ | Reuse onsite – Balance cut and fill earthworks, where possible, to optimise reuse on the project. Reuse offsite – Apply material to land at an unlicensed premises. | 100% | The 'Approved Notice under Section 143' form must be completed where material is taken offsite to unlicensed premises in accordance with Section 143(3A) of the POEO Act and G40 Clause 4.11.4. A Hold Point under G40 Clause 4.11 applies. |
| Road and bridge construction | Steel (e.g. reinforcing) | General solid waste (non-putrescible) | 35 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Conduits and pipes | General solid waste (non-putrescible) | 7.5 tonnes | Reuse onsite - Crush and reuse onsite as backfill or road base where compliant with contract specifications. Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 90% | Nil. |
| | Timber (e.g. formwork, fencing) | General solid waste (non-putrescible) | 75 m ³ | Reuse onsite - If suitable. Resource recovery offsite - Reuse, recycling, reprocessing or energy | 90% | Nil. |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|--------|---|---|---------------------------------------|---|------------------------|---|
| | | (pre-classified as 'building and demolition waste' by the EPA) | | recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | | |
| | Packaging materials, including pallets, wood, plastic, cardboard and metals | General solid waste (non-putrescible) | 65 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Concrete | Subject to chemical assessment (if material is to be taken offsite) | 1,500 m ³ | <p>Reuse onsite – Crush and reuse onsite as backfill or road base where compliant with contract specifications.</p> <p>Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014).</p> <p>Reuse offsite – Apply concrete to land for road making activities, building, landscaping and construction works at an unlicensed premises where there is full compliance with the recovered aggregate order and exemption.</p> <p>Disposal offsite – disposal at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and</p> | 100% | <p>In order for an exemption to apply, all the conditions of the exemption must be met. These conditions include, but are not limited to, sampling and testing requirements, chemical thresholds, use restrictions and record keeping requirements.</p> <p>The 'Approved Notice under Section 143' form must be completed where material is taken offsite to unlicensed premises in accordance with Section 143(3A) of the POEO Act and G40 Clause 4.11.4. A Hold Point under G40 Clause 4.11 applies.</p> <p>If reuse is not feasible disposal offsite will occur at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence.</p> |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|--|---|--|--|--|------------------------|----------|
| | | | | the <i>Waste Classification Guidelines</i> (EPA, 2014) | | |
| Erosion and sediment control maintenance | Geotextile | General solid waste (non-putrescible) | 1 tonne Avoid use of geotextile where practicable | Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014) | 0% | Nil. |
| | Sediment/ sludge collected from sediment basins/ bottom of trench or tank (e.g. once they reach capacity) | General solid waste (non-putrescible) | 25 m ³ | Reuse onsite - Mix with existing spoil and reuse onsite. Disposal offsite - Place in a shallow pit lined with heavy duty plastic sheeting to dry out (evaporation pit). Once the sludge has dried out sufficiently to allow it to be spaded this waste can be disposed offsite. | 90% | Nil. |
| | Sediment fence and sandbags | General solid waste (non-putrescible) | 75 tonnes | Reuse onsite where possible based on condition, or dispose offsite at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 10% | Nil. |
| Site compounds/ equipment maintenance | Tyres | Special waste (pre-classified by the EPA) | 10 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|------------------------------------|---|--|---------------------------------------|---|------------------------|----------|
| | Drained oil filters, rags and oil-absorbent materials (i.e. spill kit materials) that only contain non-volatile petroleum hydrocarbons and do not contain free liquids. | General solid waste (non-putrescible) (pre-classified by the EPA) | 2 tonnes | Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 0% | Nil. |
| | Containers, previously containing dangerous goods, from which residues have been removed by washing or vacuuming | General solid waste (non-putrescible) (pre-classified by the EPA) | 1 tonne | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Waste oil | Liquid waste (pre-classified by the EPA) | 1,500 L | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| Site compound and office operation | Food waste | General solid waste (putrescible) | 368 tonnes | Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment | 0% | Nil. |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| Aspect | Waste Type | Waste Classification | Approx. Volume/ Quantity ¹ | Proposed environmental management reuse/ recycling/ disposal strategy | Reuse / Recycle Target | Comments |
|--------|--|--|---------------------------------------|---|------------------------|----------|
| | | (pre-classified by the EPA) | | Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | | |
| | Waste water and sewage from amenities | General solid waste (putrescible) (pre-classified by the EPA) | 351,000 L | Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 0% | Nil. |
| | Rubbish, paper, cardboard and plastic, glass, aluminium cans | General solid waste (non-putrescible) | 168 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Electrical waste | General solid waste (non-putrescible) | 0.2 tonnes | Resource recovery offsite - Reuse, recycling, reprocessing or energy recovery at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 100% | Nil. |
| | Unwanted/excess liquid chemicals | Liquid waste | 200 L | Disposal offsite - at an appropriately licensed waste facility in accordance with the premises' Environment Protection Licence and the <i>Waste Classification Guidelines</i> (EPA, 2014). | 0% | Nil. |

7. Environmental mitigation measures

Specific mitigation measures to address waste and resources impacts during pre-construction (PC) and construction (C) are outlined in Table 5.

Table 5: Waste and energy mitigation measures

| ID | Mitigation measure | Timing | | Responsibility |
|------------------------------------|--|-----------------|----------------|--|
| | | PC ¹ | C ² | |
| GENERAL | | | | |
| WEMM1 | Adopt and promote the waste hierarchy (reduce or avoid waste, reuse waste, recycle waste, recover energy, treat waste, dispose of waste). | ✓ | ✓ | Environmental Manager Procurement Manager |
| WEMM2 | Keep site free of litter and maintain good housekeeping. | | ✓ | Foreman |
| WEMM3 | Do not cause, permit or allow waste generated outside the project to be received at the project for storage, treatment, processing, reprocessing, or disposal on the project, except as expressly permitted by an environment protection licence (EPL) under the <i>Protection of the Environment Operations Act 1997</i> (POEO Act), if such a licence is required in relation to that waste. | | ✓ | Foreman |
| REDUCE OR AVOID | | | | |
| WEMM4 | Calculate precise estimates prior to placing orders. Record the totals of materials brought onto site. | ✓ | ✓ | Project Engineers |
| WEMM5 | Implement, where possible, agreements with suppliers to return excess construction materials or packaging for future reuse. When available bulk or minimal packaging options will be used when purchasing materials. | ✓ | ✓ | Contracts Manager |
| RESOURCE RECOVERY (REUSE, RECYCLE) | | | | |
| WEMM6 | Establish a list of preferred suppliers for waste management services (e.g. waste oil recyclers, metal recyclers, etc.). | ✓ | ✓ | Contracts Manager Environmental Manager |
| WEMM7 | Include in waste contractor subcontract agreements requirements to comply with statutory requirements, report quantities, types, dates and destination of material removed from site. | ✓ | ✓ | Contracts Manager |
| WEMM8 | Classify all wastes generated on the site during construction in accordance with the EPA <i>Waste</i> | | ✓ | Site/ Project Engineers |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| ID | Mitigation measure | Timing | | Responsibility |
|--------|---|-----------------|----------------|---|
| | | PC ¹ | C ² | |
| | <i>Classification Guidelines</i> (2014) prior to transporting waste off site. | | | |
| WEMM9 | Obtain and provide receipts/dockets for waste removed from site to the Environmental Coordinator. | | ✓ | Foreman |
| WEMM10 | Record all waste removed from site in the Waste Register. | | ✓ | Environmental Coordinator |
| WEMM11 | Provide appropriate facilities to ensure that materials for recycling are separated from materials that are to be disposed of as wastes. Ensure facilities are labelled for the various waste streams to ensure easy recognition and to also prevent cross contamination of waste streams. | | ✓ | Project Manager |
| WEMM12 | Collect and store waste oil in suitable containers and store in a bunded area until collected for recycling. Ensure permanent bunded storage areas are covered. | | ✓ | Superintendent |
| WEMM13 | Reuse excavated spoil generated onsite where possible, considering the following options: <ul style="list-style-type: none"> Construction of embankments Flattening of road batters Alternative ground/ foundation treatments | | ✓ | Foreman |
| WEMM14 | Reuse waste material generated onsite where possible, including topsoil and mulch. For example, keep topsoil that is not contaminated by noxious weeds in stockpiles for later spreading on fill batters and other areas. | | ✓ | Foreman |
| WEMM15 | Prior to transporting waste to a premises other than an EPA-licensed waste management facility, ensure the premises can lawfully accept the waste; obtain a copy of the completed and signed 'Approved Notice under Section 143' form from the landholder to confirm this; and ensure the Hold Point under G40 Clause 4.11 has been released. | | ✓ | Foreman Environmental Coordinator |
| WEMM16 | Provide paper and cardboard recycling bins/boxes in all site offices. All paper waste to be sent to recycling facility. Encourage all staff to separate paper waste. | | ✓ | Receptionist Environmental Coordinator |
| WEMM17 | Use recycled products in construction to reduce demand on resources, where the use of the material is cost and performance competitive and TfNSW' specifications allow it. This may include the use of fly ash and slag within concrete mixes; re-use of existing pavement; recycled steel; guideposts and/ or signage. | | ✓ | Project / Site Engineer |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| ID | Mitigation measure | Timing | | Responsibility |
|--|--|-----------------|----------------|---|
| | | PC ¹ | C ² | |
| WEMM18 | Set printers at the site office to default to double sided and black and white printing. Encourage all staff to minimise paper use through use of electronic media, re-use of paper etc. Refill or return printer cartridges for recycling. | | ✓ | Receptionist |
| DISPOSAL | | | | |
| WEMM19 | Store construction wastes which cannot be recycled in clearly labelled waste bins/ skips onsite. The skips will be collected by a licensed waste contractor on a regular basis and transported to a licensed landfill. | | ✓ | Superintendent |
| WEMM20 | Ensure portable toilets are emptied regularly to prevent overflows and effluent is disposed of in accordance with the EPA <i>Waste Classification Guidelines</i> (2014). Connect toilets at the site compound to the sewerage network where feasible. | | ✓ | Superintendent |
| | WEMM6-WEMM10 above also apply. | | | |
| ENERGY USE/ CONSUMPTION (FUEL, OIL AND POWER) | | | | |
| WEMM21 | Use alternative fuels and energy efficient plant, equipment and vehicles where feasible and reasonable to reduce greenhouse gas emissions, through consultation with subcontractors and suppliers. | ✓ | ✓ | Procurement Manager |
| WEMM22 | Service/ maintain all plant and vehicles, including trucks entering and leaving the site, and construction equipment in accordance with the manufacturer's specification to comply with all relevant legislation and to ensure it is operating efficiently | | ✓ | Procurement Manager Foreman |
| WEMM23 | Procure locally produced goods and services where feasible and cost effective to reduce transport fuel emissions. Where possible, ensure materials are delivered as full loads. | ✓ | ✓ | Procurement Manager |
| WEMM24 | Consider the procurement of renewable energy technologies (e.g. solar photovoltaic, wind power) for power generation onsite | ✓ | ✓ | Procurement Manager Project Manager |
| WEMM25 | Turn machinery, vehicles, air conditioning and lights off when not in use. | | ✓ | Subcontractors Foreman Office staff |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| ID | Mitigation measure | Timing | | Responsibility |
|--------|---|-----------------|----------------|--|
| | | PC ¹ | C ² | |
| WEMM26 | Ensure construction equipment, plant and vehicles are appropriately sized for the task. | ✓ | ✓ | Procurement Manager Project Manager |

¹ PC means pre-construction; ² C means construction

8. Compliance management

8.1. Roles and responsibilities

Fulton Hogan's Project Team organisational structure and overall roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 5 of this WEMP.

8.2. Training

All employees, subcontractors and utility staff working on site will undergo site induction and toolbox training relating to waste and energy use management issues, including:

- waste/ recycling storage requirements
- waste disposal responsibilities
- energy efficient best practices
- waste classification prior to waste leaving site
- waste records required

Further details regarding staff induction and training are outlined in Chapter 5 of the CEMP.

8.3. Complaints

Complaints will be recorded and addressed in accordance with Section 6.2.3 of the CEMP and the Community Communication Strategy (CCS).

8.4. Inspections and monitoring

Regular inspections and monitoring specific to waste and energy use will be undertaken during construction in accordance with Table 6. General requirements and responsibilities in relation to inspections and monitoring are documented in Sections 8.1 and 8.2 of the CEMP respectively.

Table 6: Monitoring and inspection

| Monitoring details | Record | Responsibility | Frequency |
|--|---|---|---|
| Track waste taken offsite to a licensed premises | Waste Register | Environmental Manager | When waste taken offsite. Waste Register to be updated regularly. |
| | Waste receipts/ dockets | Foreman | When waste taken offsite to a waste facility. |
| | Transportation dockets | Foreman | When EPA 'trackable' waste taken offsite. |
| Track waste taken offsite to an unlicensed premises (e.g. VENM, ENM) | 'Approved Notice under Section 143' form completed. | Environmental Manager/ Project Engineer | Prior to transporting waste offsite to an unlicensed premises. |
| | Release of Hold Point under G40 Clause 4.11. | | |

| Monitoring details | Record | Responsibility | Frequency |
|--|------------------------------------|-----------------------|---|
| | Waste Register | Environmental Manager | When waste taken offsite. Waste Register to be updated regularly. |
| Inspections for litter; materials management; unauthorised disposal of construction waste (illegal dumping); contamination of waste streams; adequacy of capacity of waste receptacles; indications of inefficient plant operation (as part of weekly environmental inspection). | Environmental Inspection Checklist | Environmental Manager | Weekly |

8.5. Auditing

Auditing (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this WEMP, TfNSW specifications and other relevant approvals, permits and licences. Auditing requirements are detailed in Section 8.4 of the CEMP.

8.6. Reporting

A Waste Avoidance and Resource Recovery Report will be submitted to TfNSW once a year containing information relating to wastes generated or recycled in accordance with Annexure G36/F, at the following dates:

- within one month from 1 July of the current calendar year, for the previous 12 months of the contract period, or part thereof if the contract commenced after 1 July of the previous calendar year
- at Date of Final Completion, for the final reporting period.

General reporting requirements and responsibilities are documented in Chapter 9 of the CEMP.

8.7. Non-conformances

Non-conformances will be dealt with and documented in accordance with Chapter 10 of the CEMP.

9. Review and improvement of WEMP

The WEMP will be reviewed to ensure compliance with legislative requirements and its suitability and effectiveness for the project.

The review may be in the form of:

- A formal management review
- An audit, and/or
- An inclusion as a separate item at a site meeting.

The Environmental Manager may review and update the WEMP more regularly where:

- Significant changes in construction activities occur
- Where targets are not being achieved, or
- In response to audits and non-conformance reports.

Any minor changes to the WEMP will be approved by the ER and the remainder approved by the Planning Secretary in accordance with CoA C8. For additional information about the document review process, refer to Section 1.6 of the CEMP.

Appendix A: Potential waste facilities

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



Table A1: Potential waste facilities

| EPL holder name | Premises | Scheduled activity | EPL No. | Waste type as per licence | Contact |
|------------------------------|--|--|---------|--|-----------|
| Benedict Recycling Pty Ltd | 1A McIntosh Drive Mayfield West NSW 2304 | Resource recovery Waste storage | 20771 | General solid waste (non-putrescible) | 4960 9977 |
| Boral Recycling Pty Limited | 1/24 Egret Street Kooragang NSW 2304 | Resource recovery Waste storage – other types of waste | 11968 | General solid waste (non-putrescible) | 4920 1030 |
| Cleanaway Operations Pty Ltd | 47 Raven Street Kooragang NSW 2304 | Contaminated soil treatment Waste processing (non-thermal treatment) Waste storage | 6124 | Refer directly to licence | 4908 9500 |
| Newcastle City Council | 141 Minmi Rd Wallsend NSW 2287 | Resource recovery Waste disposal (application to land) Waste storage | 5897 | Hazardous Wastes Liquid Waste Restricted solid waste General solid waste (non-putrescible) General solid waste (putrescible) Asbestos waste | 4985 6600 |
| Onesteel Recycling Pty Ltd | 14 Sparke Street Hexham NSW 2322 | Metallurgical activities Waste storage | 5345 | Hazardous Wastes Scrap metal Liquid Waste | 4961 9700 |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| EPL holder name | Premises | Scheduled activity | EPL No. | Waste type as per licence | Contact |
|-------------------------------------|---|---|---------|--|-----------|
| SCE Resources Pty Ltd | 151 Ingall Street Mayfield NSW 2304 | Resource recovery Waste storage – other types of waste | 12764 | Asphalt waste (including asphalt resulting from road construction and waterproofing works) Basic Oxygen Steel Slag Building and demolition waste Cement Fibre Board Cured concrete waste from a batch plant Electric Arc Furnace Slag Electric Arc Ladle Slag Glass Granulated Blast Furnace Slag Power Station Bottom Ash Power Station Fly Ash Rail Ballast Sand Virgin excavated natural material Soils Wood waste | 4276 5888 |
| Veolia Recycling & Recovery Pty Ltd | Units 2 and 4, 122 Woodstock Street Mayfield North NSW 2304 | Resource recovery Waste storage – other types of waste | 20881 | General solid waste (non-putrescible) | 4934 8899 |

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



| EPL holder name | Premises | Scheduled activity | EPL No. | Waste type as per licence | Contact |
|---|---|--|---------|---|----------|
| Veolia Raymond Terrace Resource Recovery Park | 330 New Line Road Raymond Terrace NSW 2324 | Extractive activities Waste disposal (application to land) Waste processing (non- thermal treatment) | 7628 | General solid waste (non-putrescible) Asbestos waste | 13 13 35 |

Appendix B: Waste register (example)

Appendix B7: Waste and Energy Management Sub-Plan

Newcastle Inner City Bypass Rankin Park to Jesmond (Stage 4 – Main Works)



Table B1: Water register (example)



Waste Register

Newcastle Inner City Bypass Rankin Park to
Jesmond (Stage 4 – Main Works)

Notes

1. In accordance with the EPA 'Waste Classification Guidelines' (2014) which can be accessed at: <http://www.epa.nsw.gov.au/resources/wasteregulation/140796-classify-waste.pdf>
2. Where a facility has a weighbridge installed, records of all waste entering the facility should be based on the quantities (in tonnes) recorded by the weighbridge.
3. Reuse occurs when a material is used again for the same or similar use with no reprocessing. Reusing a product more than once in its original form reduces the waste generated and the energy consumed, which would have been required to be recycled.
Recycling involves processing waste into a similar non waste product consuming less energy than production from raw materials. Recycling spares the environment from further degradation, saves landfill space and saves resources that were used to originally make the material. eg. mulching cleared vegetation for reuse in landscaping.

| DATE | WASTE DESCRIPTION (choose one of the 23 materials from the drop down list on each row) | WASTE CLASSIFICATION ¹ (choose one of the 6 materials from the drop down list on each row) | TOTAL QUANTITY ² | UNITS (e.g. tonnes) | INTENDED END USE ³ (choose one of the 3 options from the drop down list on each row) | RECEIVAL FACILITY | TRANSPORTED BY | DOCKET OR INVOICE NUMBER | WASTE TRANSPORT VEHICLE NUMBER | REFERENCE IN ENVIRONMENTAL SAMPLING REGISTER (eg. if monitoring carried out to demonstrate compliance with Resource Recovery Exemption OR to classify waste) | TRANSPORTER NAME AND WASTE TRANSPORT LICENCE NUMBER (If applicable) |
|------|---|--|--------------------------------|---------------------------|---|----------------------|-------------------|-----------------------------------|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |