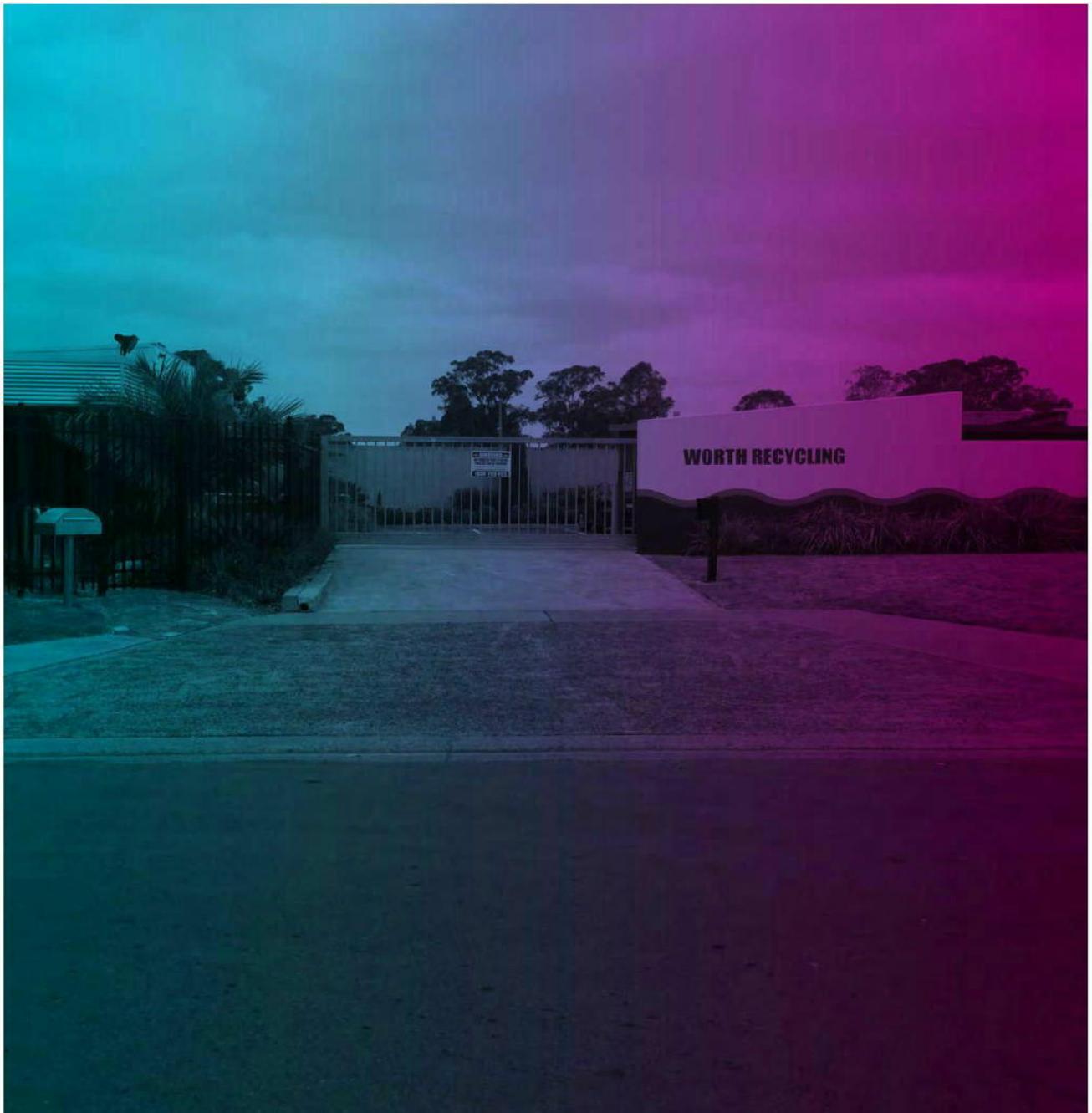


# St Marys Waste Management Facility Expansion

## Environmental Impact Statement



# St Marys Waste Management Facility Expansion

## Environmental Impact Statement

### Prepared for

Worth Recycling Pty Ltd

### Prepared by

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### Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	09-Apr-2013	Draft for Client Review	Ruth Baker Associate Director – Environment	
B	01-May-2013	Draft for Client Review	Caitlin Bennett – Principal Environmental Planner	
C	17-May-2013	Final for Issue	Caitlin Bennett Principal Environmental Planner	

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## Declaration under Schedule 2, Part 3 of the Environmental Planning and Assessment Regulation 2000.

### Author of the Environmental Impact Statement

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Qualifications: Bachelor of Science (Environmental Biology), Masters of Urban and Regional Planning

### Name and Address of the responsible person:

As above

### Address of the land to which this EIS applies:

The land to which this Environmental Impact Statement (EIS) applies is located at 42-46 Charles Street, St Marys on Lot 300 DP 1143213 within the Penrith local government area as detailed in Section 1.

### Description of the Infrastructure to which this EIS applies:

This EIS examines Worth's proposal to relocate its solid waste operations from its South Windsor Facility and expand its processing capacity at St Marys. The proposed Development would involve modifications to existing buildings and facilities to support the treatment the additional waste streams, as well as the construction of some additional storage bunkers, bunding, drainage infrastructure and a water treatment plant.

### Assessment of the Environmental Impact of the Infrastructure:

An assessment of the environmental impact of the infrastructure is contained in this Environmental Impact Statement.

### Declaration:

Pursuant to Clause 6(f), Part 3, Schedule 2 of the Environmental Planning and Assessment Regulation 2000, I declare that this Environmental Impact Statement:

- a. Has been prepared in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* and the *Environmental Planning and Assessment Regulation 2000*;
- b. Contains all available information that is relevant to the environmental assessment of the development to which this environmental impact statement relates; and
- c. Contains information that is neither false nor misleading.



Caitlin Bennett

17 May 2013

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## Table of Contents

Executive Summary	vii
Project Terms	11
1.0 Introduction	15
1.1 Project Background	15
1.2 Project Location	15
1.3 The Site and Surrounds	15
1.4 Environmental Impact Statement Process and Approach	23
1.4.1 Director-General's Assessment Requirements	23
1.4.2 Purpose and structure of this report	23
2.0 Project Need and Justification	25
2.1 Need and Justification	25
2.2 Objectives of the Proposed Development	26
3.0 Project Alternatives	27
3.1 The 'Do Nothing' Alternative	27
3.2 Expansion of the Existing Facility	27
3.3 Modifying St Marys Facility	27
4.0 Project Description	29
4.1 Proposed Development	29
4.1.1 Overview	29
4.1.2 Restricted soils, hazardous soils, greases and refinery sludges – immobilisation	29
4.1.3 Drill muds – chemical immobilisation/centrifuging	37
4.1.4 Stormwater and canal dredgings – settling, segregation and immobilisation	37
4.1.5 Oil filters – crushing/segregation	37
4.1.6 Construction and demolition waste – sorting and segregation	38
4.1.7 Packaged Waste – sorting, re-packaging or immobilisation	38
4.2 Supporting Operations and Plant	38
4.3 Operation	39
4.3.1 Operational Vehicle and Equipment Movements	39
4.3.2 Operational Hours	40
4.3.3 Operational Workforce	40
4.3.4 Environmental Management and Monitoring	41
4.4 Construction	41
4.4.1 Construction Activities and Materials	41
4.4.2 Construction Plant and Equipment	42
4.4.3 Construction Traffic	43
4.4.4 Construction Hours and Duration	43
4.4.5 Construction Workforce	43
5.0 Statutory Planning Considerations	45
5.1 Permissibility	45
5.2 Consent Authority	45
5.3 Designated Development	46
5.4 Integrated Development	46
5.5 Proposed Modification	46
5.6 State Legislation	47
5.6.1 Protection of the Environment Operations Act 1997	47
5.6.2 Waste Avoidance and Resource Recovery Act 2001	47
5.7 Environmental Planning Instruments	47
5.7.1 State Environmental Planning Policy No 33 – Hazardous and Offensive Development	47
5.7.2 State Environmental Planning Policy No 55 – Remediation of Land	48
5.7.3 State Environmental Planning Policy (Infrastructure) 2007	48
5.7.4 Penrith Local Environment Plan 2010	48
5.8 Other Environmental Planning Instruments	48
5.8.1 Draft North-West Subregional Strategy	48

	5.8.2	Penrith Development Control Plan 2010	49
5.9		Commonwealth Legislation	56
	5.9.1	Environment Protection and Biodiversity Conservation Act 1999	56
6.0		Consultation	59
	6.1	Director-General's Requirements	59
	6.2	Stakeholder Engagement	60
	6.2.1	Environment Protection Authority	60
	6.2.2	Penrith City Council	61
	6.2.3	Roads and Maritime Services	61
	6.2.4	Sydney Water	61
	6.3	Community Consultation	61
7.0		Issues Prioritisation	63
	7.1	Introduction	63
	7.2	Risk Matrix	63
	7.3	Risk Assessment	64
8.0		Key Environmental Issues	65
	8.1	Air Quality	65
	8.1.1	Introduction	65
	8.1.2	Existing Environment	65
	8.1.3	Potential Impacts	75
	8.1.4	Mitigation Measures	79
	8.2	Noise and Vibration	81
	8.2.1	Introduction	81
	8.2.2	Existing Environment	81
	8.2.3	Potential Impacts	86
	8.2.4	Mitigation Measures	101
	8.3	Traffic and Transport	103
	8.3.1	Introduction	103
	8.3.2	Existing Environment	103
	8.3.3	Potential Impacts	108
	8.3.4	Mitigation Measures	114
9.0		Other Environmental Issues	115
	9.1	Surface Water	115
	9.1.1	Introduction	115
	9.1.2	Existing Environment	115
	9.1.3	Potential Impacts	119
	9.1.4	Surface Water Management Strategy	120
	9.1.5	Mitigation Measures	121
	9.2	Hazard and Risk	122
	9.2.1	Introduction	122
	9.2.2	Existing Environment	122
	9.2.3	Potential Impacts	122
	9.2.4	Mitigation Measures	124
	9.3	Soils and Geology	125
	9.3.1	Introduction	125
	9.3.2	Existing Environment	125
	9.3.3	Potential Impacts	126
	9.3.4	Mitigation Measures	127
	9.4	Ecology	128
	9.4.1	Introduction	128
	9.4.2	Existing Environment	128
	9.4.3	Potential Impacts	130
	9.4.4	Mitigation Measures	131
	9.5	Landscape Character and Visual Amenity	132
	9.5.1	Introduction	132
	9.5.2	Existing Environment	132
	9.5.3	Potential Impacts	138
	9.5.4	Mitigation Measures	140

9.6	Socio-economic	141
	9.6.1 Introduction	141
	9.6.2 Existing Environment	141
	9.6.3 Potential Impacts	142
	9.6.4 Mitigation Measures	144
9.7	Heritage	145
	9.7.1 Introduction	145
	9.7.2 Existing Environment	145
	9.7.3 Potential Impacts	147
	9.7.4 Mitigation Measures	148
9.8	Greenhouse Gas	149
	9.8.1 Introduction	149
	9.8.2 Existing Environment	149
	9.8.3 Potential Impacts	150
	9.8.4 Summary	152
	9.8.5 Mitigation Measures	153
10.0	Summary of Mitigation Measures	155
	10.1 Mitigation Measures	155
	10.2 Residual Risk Analysis	160
11.0	Justification and Conclusion	163
	11.1 Introduction	163
	11.2 Justification	163
	11.2.1 Summary of Strategic and Development Justification	163
	11.2.2 Environmental, Social and Economic Impacts	164
	11.2.3 Ecologically Sustainable Development	164
	11.3 Conclusion	167
12.0	References	169
Appendix A	Director-General's Requirements	A
Appendix B	Site Plans	B
Appendix C	Operational Environmental Management Plan	C
Appendix D	Air Quality Impact Assessment	D
Appendix E	Noise and Vibration Impact Assessment	E
Appendix F	Traffic and Transport Impact Assessment	F
Appendix G	SEPP 33 Risk Screening	G
Appendix H	Ecology Desktop Searches	H
Appendix I	Greenhouse Gas Assessment	I

**List of Plates**

Plate 9-1	Industrial property on Dunheved Circuit, just south of Links Road	134
Plate 9-2	Industrial property on Dunheved Circuit, along the southern boundary of the Dunheved Industrial Precinct	134
Plate 9-3	Storage Tanks within industrial property along Charles Street, within the Dunheved Industrial Precinct	135
Plate 9-4	Storage Tanks within industrial property along the eastern boundary of the Dunheved Industrial Precinct, Dunheved Circuit	135
Plate 9-5	Entrance to industrial property along Charles Street within the Dunheved Industrial Precinct	136
Plate 9-6	Entrance to industrial property along Charles Street within the Dunheved Industrial Precinct	136
Plate 9-7	Heavy vehicle entrance point to the Site on Charles Street	137
Plate 9-8	Light vehicle entrance point to the Site on Dunheved Circuit	138

**List of Figures**

Figure 1-1	Regional Context	17
Figure 1-2	Local Context	19
Figure 1-3	Existing Site Layout	21
Figure 4-1	Proposed Site Layout	33
Figure 4-2	The immobilisation Process	35
Figure 8-1	Air Quality Sensitive Receiver Locations	67
Figure 8-2	Annual and Seasonal Wind Rose for St Marys for 2011 generated by CALMET	71
Figure 8-3	Predicted Odour Concentrations (99th percentile) at St Marys Facility (OU)	77
Figure 8-4	Noise Sensitive Receiver Locations	83
Figure 8-5	Construction Noise Assessment Noise Modelling Results	89
Figure 8-6	Traffic Movements along the Regional Road Network	105
Figure 8-7	Vehicle Movements within Dunheved Industrial Precinct	111
Figure 9-1	St Marys Treatment Facility Stormwater Detention Areas (Worth, 2012)	117
Figure 9-2	SEPP 33 Application – Class PG II & III Flammable Liquids Boundary Distance Requirements	124

## List of Tables

Table 4-1	Proposed waste streams (including treatment method and annual capacity)	29
Table 4-2	Proposed capacity of Dangerous Goods to support operations	39
Table 5-1	DCP 2010 requirements under D4 Industrial Development	50
Table 5-2	Protected Matters Search Tool results within 10 kilometres of the Site	57
Table 6-1	DGRs for the Proposed Development	59
Table 6-2	Issues raised during consultation with the EPA	60
Table 7-1	Consequence and Likelihood Risk Matrix Definitions	63
Table 7-2	Risk rating matrix	63
Table 7-3	Risk assessment (pre-mitigation)	64
Table 8-1	EPA Impact Assessment Criteria – Complex Odours	73
Table 8-2	NSW EPA Air Quality Impact Assessment Criteria (DEC 2005)	74
Table 8-3	Predicted Maximum 1-Hour Ground Level Odour Concentrations (99 <sup>th</sup> percentile)	76
Table 8-4	Sensitive Receiver Locations	82
Table 8-5	Logger results – existing background ( $L_{A90}$ ) and ambient noise levels ( $L_{Aeq}$ )	85
Table 8-6	Continuous equivalent noise levels ( $L_{Aeq}$ ) in octave frequency bands	86
Table 8-7	Construction Noise Sources	87
Table 8-8	Construction Noise Results	88
Table 8-9	Recommended safe working distances for vibration intensive plant	91
Table 8-10	Recommended $L_{Aeq}$ noise levels from industrial noise sources	92
Table 8-11	Summary of environmental noise criteria for residential sensitive receivers	93
Table 8-12	Sound power levels for major equipment	94
Table 8-13	Calculated sound power levels for shed openings	94
Table 8-14	Car park activities sound power levels	95
Table 8-15	Operational Noise Results – Night Time	96
Table 8-16	Operational Noise Results – Evening	97
Table 8-17	Operational Noise Results – Day Time	98
Table 8-18	Road traffic noise assessment criteria for residential land uses	99
Table 8-19	Background road traffic noise levels during years of operation	100
Table 8-20	Existing weekday traffic – Forrester Road   Links Road   Ropes Crossing Boulevard	107
Table 8-21	Existing weekend traffic – Forrester Road   Links Road   Ropes Crossing Boulevard	107
Table 8-22	Forrester Road   Links Road   Ropes Crossing Boulevard roundabout throughput - Construction	109
Table 8-23	Forrester Road   Links Road   Ropes Crossing Boulevard roundabout throughput – Full operations	113
Table 8-24	Forrester Road   Links Road   Ropes Crossing Boulevard roundabout throughput – Full operations	113
Table 9-1	Proposed Type and Quantity of DG Stored at the Worth Recycling Facility vs. SEPP 33 Threshold Levels	123
Table 9-2	Atlas of NSW Wildlife search results within one kilometre of the Site	128
Table 9-3	Matters of NES likely to occur within one kilometre of the Site	129
Table 9-4	Distance of local landscape features from the proposed Development	133
Table 9-5	Potential Impact of additional infrastructure on landscape character and visual amenity	139
Table 9-6	Overview of the history of the Site	146
Table 9-7	Historic Heritage Register Search Results	147
Table 9-8	Indigenous archaeological sites within one kilometre of the Site	147
Table 9-9	GHG Assessment Boundary – Construction phase	151
Table 9-10	Construction phase of the proposed Development GHG emissions	151
Table 9-11	GHG Assessment Boundary – Operational phase	152
Table 9-12	Operational phase of the proposed Development GHG emissions (annual)	152
Table 10-1	Summary of Mitigation Measures	155
Table 10-2	Residual Risk Profile for the Proposed Development	161
Table 11-1	Application of Ecologically Sustainable Development to the proposed Development	166

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## Executive Summary

This Environmental Impact Statement (EIS) has been prepared on behalf of Worth Recycling Pty Ltd (Worth) in support of an application for the construction and operation of a waste recycling facility at St Marys. This EIS has been prepared in accordance with the relevant provisions under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This EIS describes the proposed Development, presents an assessment of all key environmental issues, and considers the areas directly and/or indirectly affected by construction and operation of the proposed Development.

### The Proposed Development

The proposed Development is located on a 1.5 hectare (ha) site previously operated as a materials (metal) recycling facility within the Dunheved Industrial Precinct, St Marys. Located in the Penrith Local Government Area, the proposed Development would involve limited construction activity, as the majority of facilities and structures already exist on the Site. Construction works would largely comprise modifications to existing buildings to accommodate Site operations, as well as the installation of additional facilities to support the treatment of additional waste streams, including a water treatment plant, storage infrastructure (additive/reagent hoppers, bunkers and storage tanks) and operational control facilities including a control room and laboratory.

Operation of the proposed Development would involve the sorting, processing, treatment, curing and temporary storage of approximately 77,400 tonnes per annum of contaminated soils, restricted soils, greases, oil filters drill muds, stormwater and canal dredging materials. Combined with a reduced processing capacity of 22,000 tonnes of acid sulfate soils (ASS) per annum from the currently approved 30,000 tonnes, the proposed Development would enable 99,400 tonnes of various waste streams to be treated per annum.

A reduction to the ASS throughput from the approved 30,000 tonnes per annum to 22,000 tonnes per annum under Section 96(1A) of the EP&A Act is also being concurrently sought as part of this proposed Development.

### Strategic Need

National waste production continues to grow annually, and Worth's South Windsor Facility is one of only two NSW Environment Protection Authority (EPA) accredited solid waste immobilisation facilities in NSW. The existing South Windsor Facility is not large enough to accommodate the future demand for immobilisation and stabilisation services in NSW in the immediate or longer term, and the option to expand the South Windsor Facility is not currently feasible. The proposed Development of the St Marys Facility would expand the capacity of this waste processing service in NSW.

### Statutory Planning Considerations

The St Marys Facility is located on land zoned as *IN1 – General Industrial* under the provisions of the *Penrith Local Environmental Plan 2010* (Penrith LEP), which prescribes the proposed Development as being an innominate prohibited use. However, Clause 121 of the *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) identifies that development for the purposes of waste or resource management facilities, such as the proposed Development, is permissible with consent if it is located in a prescribed zone, including *IN1 – General Industrial*. As the ISEPP prevails to the extent of an inconsistency with the Penrith LEP, and the proposed Development would be defined as a waste or resource management facility and is located in a prescribed zone, the proposed Development would be permissible with development consent.

Under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), the proposed Development meets the definition of contaminated soil treatment works and as a waste management facility or work. The proposed Development is therefore considered to be designated development, requiring an EIS to be prepared, which is to accompany the Development Application for the proposed Development. Additionally, the proposed Development would require an Environmental Protection Licence from the EPA, and is therefore defined as integrated development under section 91 of the EP&A Act.

In accordance with Section 8(c) of Schedule 4A of the EP&A Act, the Sydney West Joint Regional Panel would exercise the functions of the consent authority for the proposed Development.

As Penrith City Council was the consent authority for the approved ASS treatment facility at the Site, Council is the consent authority for the proposed modification under Section 96(1A) of the EP&A Act.

### **Consultation**

In preparing this EIS, the Director-General's Environmental Assessment Requirements (DGRs) issued by the Department of Planning and Infrastructure (DP&I) for the proposed Development on 12 February 2013 have been addressed as required.

During the preparation of the EIS for the proposed Development, Worth consulted with relevant Government stakeholders, namely the EPA, Penrith City Council, and local businesses. Consultation focussed on key environmental issues associated with the proposed Development, and provided opportunity for relevant agencies and neighbouring businesses to raise concerns that they may have in relation to the proposed Development.

### **Assessment of Potential Environmental Impacts**

#### *Construction*

There is the potential for the proposed Development to impact on the natural and socio-economic environment during construction. Such construction impacts would include:

- Dust generation from earthworks, stockpiles and general construction activities, affecting the Dunheved industrial precinct;
- Temporary small increase in heavy and light vehicle movements (approximately 3.5 percent of existing traffic), which would at times coincide with peak hour traffic movements, particularly at the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout (worst-case scenario);
- Human discomfort to occupants of neighbouring properties within Dunheved industrial precinct from the vibration associated with the use of the 13 tonne excavator with a hydraulic rock breaking hammer;
- Temporary impacts on visual amenity from the presence of construction plant and equipment; and
- Movement and exposure of soils and construction material, subsequently increasing the potential for mobilisation.

The assessment concluded that with the implementation of proposed mitigation measures, construction impacts would be temporary in nature and unlikely to result in long term impacts to the environment.

#### *Operation*

There is the potential for the operation of the proposed Development to impact on the natural and socio-economic environment including:

- Dust generation from the tracking of dirt onto hardstand areas;
- Treatment and storage of waste products would not generate odours under typical conditions that would not emanate outside of the Site boundary;
- An additional 21 round-trip heavy vehicle and 20 round-trip light vehicle movements per day, with only a small proportion during AM and PM peak hour periods;
- Exceedance of the EPA's Industrial Noise Policy criteria for night-time operations from the use of excavators on-site during this period;
- Installation of 12 metre hoppers within the Site; and
- Altering the quality of the water discharged from the Site.

The assessment concluded that with the implementation of proposed mitigation measures, operational impacts would be unlikely to result in long term impacts to the environment.

### **Residual Risk**

The residual risk analysis undertaken for the proposed Development indicates that the proposed Development presents an overall very low to low risk in relation to the identified environmental issues, provided that the proposed mitigation, management and monitoring measures are implemented.

### **Project Justification**

The expansion of the St Marys Facility aligns with national and state waste management objectives and would reduce the environmental risk of waste directly, through the stabilisation of contaminated soils, restricted soils, greases and acid sulfate soils.

The proposed Development increases the capacity for commercial and industrial waste treatment, while also improving the management of hazardous waste in the Sydney metropolitan region and across NSW. The proposed Development aligns with the *National Waste Policy; Less Waste, More Resources* (COAG) as the St Marys Facility would reduce the amount of hazardous materials being disposed of at landfill, and provide facilities to handle and dispose of hazardous substances in an environmentally sustainable manner.

Undertaking the proposed Development in the manner outlined in this EIS is considered justified when considering its compatibility with the existing land use, the potential biophysical and socio-economic impacts and the proposed Development's conformance with the principles of ecologically sustainable development.

Provided the mitigation measures outlined in this EIS are implemented, it is unlikely that significant, adverse impacts would occur within the St Marys Facility or within the surrounding environment. The beneficial impacts of the proposed Development outweigh the potential impacts, including:

- Increased capacity for immobilisation and stabilisation of contaminated soils, restricted soils, packaged waste, refinery sludges, and greases within the Sydney metropolitan region and wider NSW;
- The generation of an additional eight permanent full time positions and the transfer of seven positions from the South Windsor Facility; and
- Improved environmental controls over the management of process water, surface water and Site drainage.

### **Conclusion**

The proposed Development proposes would expand Worth's St Marys Facility to enable the expansion of a waste recycling facility with the ability to process and treat contaminated soils, restricted soils, refinery sludge, packaged waste, and greases in addition to the treatment of acid sulfate soils. The proposed Development would also sort construction and demolition waste.

This EIS has demonstrated that with the implementation of proposed mitigation measures, the proposed Development is unlikely to have significant or long term adverse impacts on the environment.

This EIS satisfies statutory requirements regarding the Development Application (DA) for the proposed expansion of the St Marys Facility. The findings of the environmental impact assessment presented in this EIS and accompanying technical studies confirms that the proposed St Marys waste recycling facility has a strong justification to proceed and is considered suitable for approval under Part 4 of the EP&A Act.

It is also recommended that approval be granted to the proposed modification under Section 96(1A) of the EP&A Act.

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## Project Terms

Term/acronym	Explanation
The Applicant	Worth Recycling Pty Ltd
ABL	Assessment Background Level
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ASS	Acid Sulfate Soils
BOD	Biochemical Oxygen Demand - The amount of oxygen dissolved in water necessary for microorganisms to decompose the organic matter in the water.
BoM	Bureau of Meteorology
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CHL/NHL	Commonwealth Heritage List/National Heritage List
COAG	Council of Australian Governments
C&I	Commercial and industrial
C&D	Construction and demolition
DA	Development Application
(The) proposed Development	The proposed expansion of an waste management facility at St Marys
DG	Dangerous Goods
DCP 2010	<i>Perth Development Control Plan 2010</i>
DGRs	Director General's Requirements
DP&I	Department of Planning and Infrastructure
ECRTN	Environmental Criteria for Road Traffic Noise
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
ESCP	Erosion and Sediment Control Plan
(The) facility	The existing waste management facility
FTE	Full time equivalent
GHG	Greenhouse Gas
ICNG	Interim Construction Noise Guidelines
ISEPP	<i>State Environmental Planning Policy (Infrastructure) 2007</i>
INP	Industrial Noise Policy

Term/acronym	Explanation
LEP	Local Environmental Plan
LGA	Local government area
(the) Metropolitan Plan	The Metropolitan Plan for Sydney 2036
NES	Matters of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage
OEMP	Operational Environmental Management Plan
OU	Odour Unit
PAD	Potential Archaeological Deposit
PCC	Penrith City Council
Penrith LEP	<i>Penrith Local Environmental Plan 2010</i>
PG	Packing Group
POEO Act	<i>Protection of the Environment Operations Act 1999</i>
RBL	Rating Background Level
RNE	Register of the National Estate
RNP	Road Noise Policy
RL	Reduced Level
RMS	Roads and Maritime Service
SCEW	Standing Committee on the Environment and Water
SEPP	State Environmental Planning Policy
SEPP 33	<i>State Environmental Planning Policy 33 – Hazardous and Offensive Development</i>
SEPP 55	<i>State Environmental Planning Policy No. 55 – Remediation of Land</i>
SEWPaC	Sustainability, Environment, Water, Population and Communities
Site	The area within the boundary of the existing St Marys Waste Management Facility
SHI	State Heritage Inventory
SHR	State Heritage List
SRD SEPP	<i>State Environmental Planning Policy (State and Regional Development) 2011</i>
SWMP	Soil and Water Management Plan
TMP	Traffic Management Plan
tpa	Tonnes per annum
TSC Act	<i>Threatened Species Conservation Act 1995</i>
TSS	Total Suspended Solids - A measure of the suspended solids in wastewater, effluent, or water bodies, determined by tests for total suspended non-filterable solids.
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
WARR Strategy	<i>Waste Avoidance and Resource Recovery Strategy 2007</i>
Water conductivity	A measure of the ability of water to pass an electrical current.

Term/acronym	Explanation
WM Act	<i>Water Management Act 2000</i>
WMP	Waste Management Plan
Worth	Worth Recycling Pty Ltd

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## 1.0 Introduction

### 1.1 Project Background

Worth Recycling Pty Ltd (herein Worth) currently owns a waste management facility at St Marys (the St Marys Facility), approximately 43 kilometres from the Sydney CBD, and 7.5 kilometres from Penrith town centre. The facility currently has approval to accept up to 30,000 tonnes of acid sulfate soils (ASS) per year.

Worth is now seeking to relocate its solid waste operations from its South Windsor Facility and expand its processing capacity at St Marys (the proposed Development) to enable around 77,400 tonnes of contaminated soils, restricted soils, packaged wastes, greases, oil filters drill muds, stormwater and canal dredging materials to be processed and treated per year, in addition to 22,000 tonnes per annum of ASS. The proposed Development would include modifications to existing buildings and facilities to support the treatment the additional waste streams. A reduction to the ASS throughput from the approved 30,000 tonnes per annum to 22,000 tonnes per annum is also being concurrently sought as part of this proposed Development.

This Environmental Impact Statement (EIS) has been prepared in accordance with the relevant provisions under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Director General's Assessment Requirements (DGRs) were issued on 12 February 2013 and are presented in Section 6.1. This EIS describes the project, and presents an assessment of all key environmental issues as determined by the DGRs. The assessment considers the area directly or indirectly affected by construction and operation of the proposed Development.

### 1.2 Project Location

The St Marys Facility is a 1.5 ha site within the Dunheved industrial precinct in the Penrith Local Government Area. The St Marys Facility is located 43 kilometres from the Sydney CBD and approximately 7.5 kilometres from Penrith town centre at 42-46 Charles Street, on Lot 300 DP 1143213 (the Site) (refer to Figure 1-1 and Figure 1-2)

### 1.3 The Site and Surrounds

Prior to Worth's purchase of the Site in mid-2012, it was previously operated as a materials (metal) recycling facility under approved development consent DA08/0805. Under this approval, two warehouses (referred to as Area 1, Area 2, Area 3 and Area 4), a workshop, wash down bay, two weighbridges, two access points (Charles Street and Dunheved Circuit), two offices, staff amenities and car parking facilities were constructed. At the time of the Site being purchased by Worth, the facility was not operational.

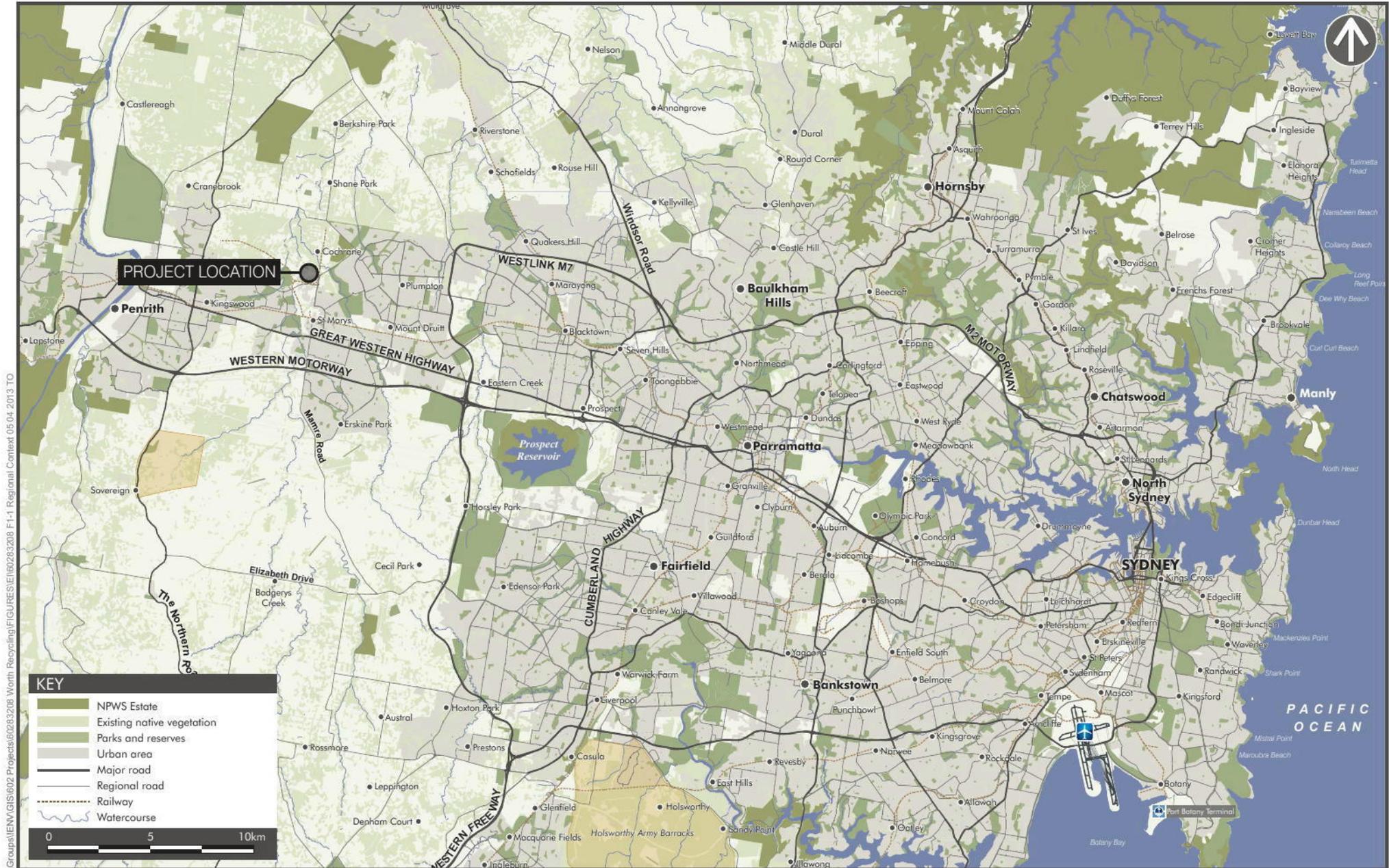
On 21 August 2012, Worth submitted DA12/0780 for the change of use of the Site from a materials recycling facility to a waste management facility for ASS. Development consent for DA12/0780 was granted on 30 October 2012 by Penrith City Council. Worth is currently liaising with Environment Protection Authority (EPA) concerning the issue of an Environment Protection License (EPL) for the facility, as approved. ASS treatment is expected to commence in June 2013.

Several residential areas are located within one to two kilometres of the industrial precinct, including Ropes Crossing, North St Marys, St Marys, Werrington and Werrington County. Adjacent to the industrial estate are the Dunheved Golf Course (west of Links Road) and the St Marys Leagues Stadium (east of Forrester Road). There is no visibility of the Site from residential areas.

Two creeks are located either side of the industrial estate; Ropes Creek and South Creek. Ropes Creek flows in a north westerly direction to join the northern flowing South Creek, which then flows into the Hawkesbury River at Windsor (Blacktown City Council, 2013).

**Existing businesses within the Dunheved Industrial Precinct include:**

- Linfox (transport and logistics);
- ARC (steel industry);
- Jasco (stationery products);
- Corinthian Doors (timber door manufacturer);
- R & G Fencing (metal fencing manufacturing);
- Australian Waste Oil Refineries (oil recycling services);
- Jaybro Civil and Safety Products (safety and environmental products); and
- Ronstin (paint manufacturers and wholesalers).



G:\projects\ENV\GIS\602 Projects\60283208 Worth Recycling\FIGURES\E1\60283208 FI-1 Regional Context 05-04-2013 TO



FIGURE 1-1

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## 1.4 Environmental Impact Statement Process and Approach

### 1.4.1 Director-General's Assessment Requirements

The proposed Development is permissible with development consent and is classified as designated development under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (the EP&A Regulation). As such, the proposed Development is subject to Part 4 of the EP&A Act and requires the preparation of an EIS.

In accordance with the EP&A Act, DGRs were requested from the Department of Planning and Infrastructure (DP&I). This request was supported by a scoping study. The scoping study provided a description of the proposed expansion of the waste management facility at St Marys and outlined the potential environmental issues that are considered in the more detail in this EIS.

DGRs for the proposed Development were issued on 12 February 2013, and are discussed in more detail in Section 6.1 and included as Appendix A.

### 1.4.2 Purpose and structure of this report

This EIS has been prepared by AECOM, on behalf of Worth, in accordance with Part 4 of the EP&A Act and the DGRs issued by the Director-General in accordance with Schedule 2 of the EP&A Regulation. Where there is a specific DGR relevant to the chapter or issue, the DGR is provided at the start of the chapter.

The purpose of this EIS is to provide a description of the nature of activities proposed as part of the proposed Development and to assess the key potential impacts of these activities on the natural, built and social environments. It has been prepared to satisfy Schedule 2 of the EP&A Regulation, the DGRs and Section 79C of the EP&A Act.

Specialist technical reports have been prepared to address the key environmental issues relating to the proposed Development, being air quality, traffic and noise and vibration. As part of the preparation of the EIS, a greenhouse gas assessment was undertaken, as well as a risk screening in accordance with the requirements of *State Environmental Planning Policy No.33 – Hazardous and Offensive Development*. These technical reports are presented as appendices to this EIS and summarised in corresponding chapters of this document. It is therefore important that the EIS is read in conjunction with the technical assessments.

This EIS is structured as follows:

- **Chapter 1 Introduction** – provides an overview of the proposed Development, the Site and surrounding context, the statutory environmental planning process and the structure of this document;
- **Chapter 2 Project Need and Justification** – describes the strategic need for the proposed Development and context of the waste Immobilisation market in which the project would be developed;
- **Chapter 3 Alternatives** – provides details on the alternatives considered for the proposed Development;
- **Chapter 4 Project Description** – provides a detailed description of the proposed activities and works associated with the proposed Development;
- **Chapter 5 Statutory Planning** – describes the legislative and policy context of the proposed Development, including the approvals required;
- **Chapter 6 Consultation** – provides a discussion of the formal procedures proposed and/or undertaken with the community, stakeholders and relevant authorities as part of the environmental impact assessment process;
- **Chapter 7 Issues Prioritisation** – provides a summary of the key issues to be addressed in the environmental assessment and how these issues were prioritised in order of significance to the proposed Development and surrounding environment;
- **Chapter 8 Key Environmental Issues** – provides an assessment of the key environmental issues being air quality, noise and vibration and traffic and transport;
- **Chapter 9 Other Environmental Issues** – provides an assessment of the non-key environmental issues being surface water, hazard and risk, soils, ecology, landscape character and visual amenity, socio-economic impacts and heritage;
- **Chapter 10 Summary of Mitigation Measures** – provides a summary of all mitigation measures to be implemented during construction and/or development of the proposed Development; and
- **Chapter 11 Justification and Conclusion** – addresses the justification for the proposed Development and provides conclusions regarding the potential residual environmental issues remaining after mitigation of risks.

## 2.0 Project Need and Justification

### 2.1 Need and Justification

Nationally, waste generation across all waste streams is growing at an average of 4.3 percent per year, driven by population growth and increasing per capita consumption (DECCW, 2010). Between 2008 and 2009 in NSW, 58 percent of waste was recycled and 42 percent went to landfill. The commercial and industrial waste stream, from which Worth receives most of its waste (with a portion also being sourced from the construction and demolition waste stream), comprised 37.4 percent of the total disposed waste in NSW (DECCW, 2010). Further, hazardous/special wastes (mainly contaminated soil) comprised the largest volume within the construction and industrial waste stream in Sydney in 2008 at 13.9 percent or 309,570 tonnes (DECCW, 2009).

The need to improve management of hazardous waste across Australia is reflected in the *National Waste Policy; Less waste, more resources*, which was developed by the Council of Australian Governments (COAG) Standing Committee on the Environment and Water (SCEW) in 2009. Strategy 12 of the *National Waste Policy* states the following (with aims specific to the St Marys Facility highlighted in bold):

*To ensure that our international obligations are met, **hazardous materials entering the waste stream are reduced**; transboundary movement of hazardous waste is effectively, efficiently and legally undertaken within Australia and complies with international requirements; product stewardship is adopted to provide for the impacts of a product with potentially hazardous materials being responsibly managed during and at the end-of-life; and **facilities are available to handle and dispose of hazardous substances that become waste, in an environmentally sound manner.***

Similarly, the NSW Waste Avoidance and Resource Recovery Strategy (DECCW, 2007) aims, in order of priority, to:

- minimise waste;
- maximise resource recovery from waste streams, and
- minimise the environmental impacts of the waste stream.

The need to immobilise and stabilise contaminated waste and dispose of this in an environmentally sound manner is a vital step to minimise the environmental impacts of contaminated materials. Stabilising contaminated material reduces the risk of leaching at levels of concern which occurs when waste is disposed directly into landfill, which otherwise has the potential to cause contamination of surface water, groundwater and soil. In turn, leachate leakages cause long-term and irreversible environmental and social consequences. For this reason, the *National Waste Policy* aims at ensuring that potentially hazardous content of wastes is reduced, and that waste recovery, handling and disposal are consistent, safe and accountable.

The expansion of the St Marys Facility aligns with national and state waste management objectives and would reduce the environmental risk of waste directly, through the stabilisation of contaminated soils, restricted soils, greases and ASS. Furthermore, the facility would provide the opportunity to divert waste from landfill through the recycling of 'cake' by-product from drill muds to be sent to brick manufacturing plants, the recovery of metals for recycling, and recovery of construction and demolition material for re-use. These measures would assist towards satisfying the NSW Government's objectives of waste avoidance, recovery and recycling as provided in the *Waste Avoidance and Resource Recovery Act 2001* and the *NSW Waste Avoidance and Resource Recovery Strategy 2007* (DECC, 2007).

With the South Windsor Facility being the only EPA-accredited solid waste immobilisation facility currently in the Sydney area, and one of only two in NSW, the need for expanded capacity of this processing service in the context of demand is evident. To respond to future demand, Worth has identified the need to provide additional capacity. Options to expand its operations in NSW have been investigated and are outlined further in Section 3.2.

## 2.2 Objectives of the Proposed Development

The objectives of the proposed Development would be to:

- Satisfy market demand for environmentally sound management of contaminated solid waste through immobilisation and stabilisation treatments prior to disposal;
- Enable Worth to grow within the NSW waste management sector by providing additional solid waste capacity at St Marys, and as a result, enable growth at its South Windsor Facility;
- Assist the NSW and Australian governments in improving waste management, as per the aims of the *National Waste Policy: Less waste, more resources* (COAG SCEW, 2011); and
- Provide a facility that is able to process and immobilise large volumes of contaminated material in response to emergency environmental incidents involving contaminated soils or water.

## 3.0 Project Alternatives

### 3.1 The 'Do Nothing' Alternative

Worth has operated a waste treatment facility at South Windsor (the South Windsor Facility) for more than 25 years. The licensed facility comprises three operations: solids waste treatment, a water treatment plant and oil treatment plant. This facility receives and processes oily sludges, slop oils, waste oily waters and wastewater emulsions, with a capacity of the plant being 350,000 litres per week.

If the proposed Development was not to go ahead, it would be difficult for the South Windsor Facility to expand and continue operating its three treatment streams within its current configuration. As a result, the business would not be able to support growth in the demand for waste immobilisation and stabilisation services.

Without the development, there would remain limited capacity within Sydney to respond to large environmental incidents. Environmental risk may result, with a lack of facilities able to process a growing waste stream of industrial and hazardous waste, and a larger volume of waste forced to landfill prior to immobilisation.

Therefore, if Worth were not to expand their current operations in the context of growing market demand, the result would be a loss of capacity for waste immobilisation services in NSW. It is therefore not feasible for Worth Recycling to choose the 'do nothing' alternative.

### 3.2 Expansion of the Existing Facility

Over the last 10 years, the South Windsor Facility has seen rapid growth. Continued growth has meant that the South Windsor Facility:

- Is not large enough to accommodate all three existing treatment operations at current volumes, and options to expand further are not feasible; and
- would not be able to accommodate future demand in the immediate and long-term.

Worth has previously purchased neighbouring properties to accommodate this growth, though space restrictions are still currently limiting physical expansion of the operations at this Site. The purchase of additional space did not improve the traffic management or environmental health and safety qualities of this Site.

With expansion, the difficulties concerning traffic circulation and the associated environmental health and safety hazards for workers would remain, given the established infrastructure. For this reason, Worth decided to investigate options to relocate a number of treatment operations at the South Windsor Facility in order to release some space at this Site. In turn, the South Windsor Facility would be able to house an improved liquid waste treatment facility with room for natural growth in this waste management sector.

### 3.3 Modifying St Marys Facility

In choosing an alternative Site to relocate the solid waste treatment operations currently at South Windsor, Worth looked at several land options. A Greenfield site in McGraths Hill was considered but required the need for substantial construction and capital investment to establish the required infrastructure.

In contrast, the St Marys Facility offered an opportunity for Worth to modify a site that was previously established and that was suitable for the intended uses. Advantageous features of the site included its location within a pre-established industrial precinct, the layout (specifically, a good separation of maintenance facilities and the car park from operational areas), sufficient space to cater for the additional waste streams, and surrounding streets offering adequate traffic flow and volume.

For this reason, the St Marys Facility was deemed the most appropriate option to accommodate the solid waste treatment operations and to subsequently alleviate pressure at the South Windsor Facility. In this way, the expansion of the St Marys Facility would provide a platform for future growth of waste immobilisation operations as required by the demands of the market.

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## 4.0 Project Description

The EIS must consider waste management, including:

- The measures that would be implemented to ensure that the project is consistent with the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2007* and other relevant NSW Government Policy;
- Identification of the quantity and type of waste that would be accepted, handled, stored, processed or disposed of at the facility; and
- A description of how this waste would be stored and handled on site, and transported to and from the site.

### 4.1 Proposed Development

#### 4.1.1 Overview

Worth is proposing to expand its current operations at St Marys to enable the relocation of its solid waste operations from the South Windsor Facility to the Site at St Marys, and to cater for future growth. The proposed Development would enable the non-thermal treatment and processing of an additional 77,400 tonnes per annum to that currently received at the South Windsor Facility, comprising various waste streams as detailed in Table 4-1. Figure 4-1 illustrates the indicative layout of the proposed Development. Site plans are provided in Appendix B.

Worth is also seeking to reduce the treatment capacity of ASS at the Site, as approved, from 30,000 tonnes to 22,000 tonnes per annum by way of modification to the existing approval.

Table 4-1 Proposed waste streams (including treatment method and annual capacity)

Waste Stream	Treatment Method	Annual Capacity (approximate)
Drill muds	Chemical/centrifugal	47,000 tonnes
Restricted soils	Segregation/immobilisation	2,400 tonnes
Hazardous soils	Immobilisation	12,000 tonnes
Stormwater and canal dredgings	Settling/segregation/immobilisation	6,000 tonnes
Greases (and drum storage)	Immobilisation	1,000 tonnes
Oil Filters	Crushing/segregating	1,500 tonnes
Refinery sludges	Immobilisation	4,800 tonnes
Packaged waste	Sorting/segregation/immobilisation	300 tonnes
Construction / demolition waste	Sorting/segregation	2,400 tonnes

Details regarding each of the waste streams and treatment methods are briefly discussed in Section 4.1.2 to Section 4.1.7. At this stage, waste streams to be treated at the St Marys Facility would be sourced mostly from within NSW. However, it is possible that following the establishment of the facility, waste may also be received from interstate.

#### 4.1.2 Restricted soils, hazardous soils, greases and refinery sludges – immobilisation

Restricted soils, hazardous soils, greases, refinery sludges would undergo immobilisation using a chemical fixation and solidification process. Examples of the type of wastes to be treated include hydrocarbon impacted soils, hydrocarbon sludges, tar-based residues and lead contaminated soils.

The immobilisation process is largely automated to improve the quality of the mixing and to increase the success rate of the blends. This process is illustrated in Figure 4-1 and can be broadly described as follows:

### Site Delivery, Categorisation and Testing

The waste is delivered to the Site as a solid or in a slurry form. The waste would be tested off-site prior to delivery (for example, at the point of origin), or tested on-site at the time of delivery to the St Marys Facility:

- If the waste has been tested off-site prior to delivery, it would be stored at the St Marys Facility within a specified bunker in preparation for processing.
- If the waste is tested on-site at the time of delivery to the St Marys Facility, the waste stream would be stored within a separate specified bunker until the appropriate treatment method is determined. The type of testing to be undertaken at the Site would typically be a "go/no go" or confirmation testing for quality assurance purposes. In the event that the waste has not been classified appropriately (due to insufficient or inadequate sampling or testing) prior to delivery to the Site, then confirmation testing would be undertaken at this time.
- If the waste delivered to the Site is not covered by a General Immobilisation Approval or the Specific Immobilisation Approvals (SIA) issued by the EPA to Worth for the Site under clause 50 of the *Protection of the Environment Operations (Waste) Regulation 2005*, then the waste would be stored in a specified bunker until the EPA has issued the necessary SIA.

### Storage and Treatment

Storage of the waste material received at the Site would depend on the consistency of the waste (for example, a soil versus a slurry), as follows:

- If the waste is soil, it is transferred directly to the pug mill using a front end loader or excavator.
- If the waste is a slurry, the water content would typically be high, which may potentially prevent or inhibit the addition of reagents during treatment of the waste, and may also impact upon the effectiveness of the curing stage of the immobilisation process. Waste received as a slurry would therefore be stored in an immobilisation pit within Area 1 of the St Marys Facility to facilitate the removal of any excess water. The waste stream would then be transferred from the immobilisation pit to the pug mill (refer to Figure 4-2) using a front end loader or excavator.

Reagents, which would be either one or a combination of cement, lime or fly ash, would be added to the waste stream within the pug mill to immobilise the contaminant contained within the soil or sludge. The pug mill would mechanically mix or agitate the waste stream with the reagent to transform the waste to a more stable and homogenous form. The chemical and physical properties of the waste stream would determine the type and quantity of reagents or additives required to treat and immobilise the contaminant. However, it is envisioned that the reagents or additives to be used would largely consist of cement, lime, fly ash or a combination of the three. Cement, lime and fly ash would be stored at the St Marys Facility in three hoppers, 12 metres in height, immediately south of Area 1.

Once the mixing is completed, the 'trap door' of the pug mill would open, and the treated waste stream would be transferred via an enclosed screw (conveyor) to a bunker located within Area 1 for curing.

### **Curing and Disposal**

The time taken for treated waste material to cure would depend on the nature of the original contaminant, and can range from 12 hours to seven days. During this time, a small amount of leaching from the treated waste may occur. Any contaminated leachate would be captured in closed catch drains, stored and transferred by road back to the South Windsor Facility for processing.

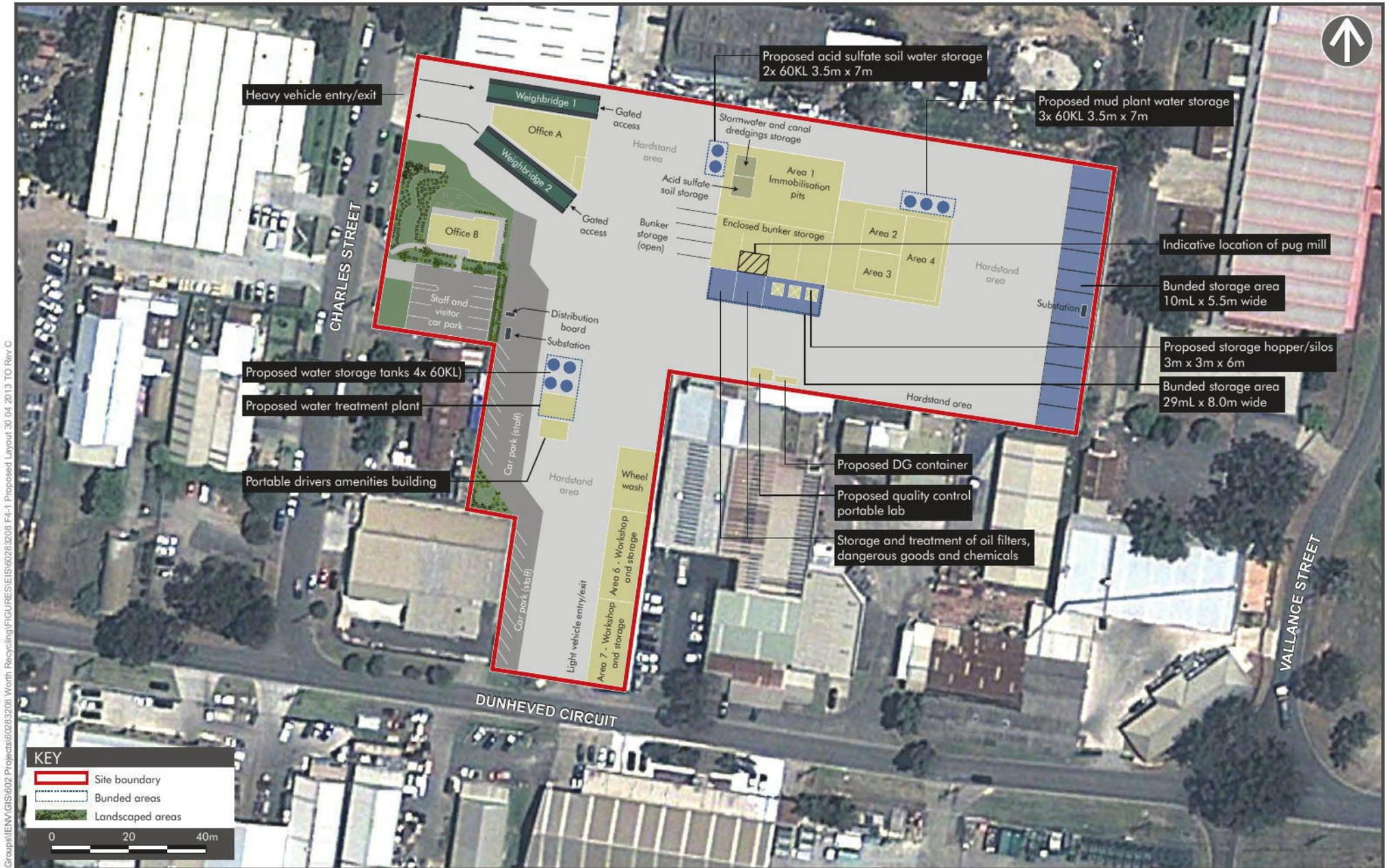
Prior to the disposal of any treated waste, Worth would test the processed waste material to ensure it satisfies EPA criteria, and to classify the processed waste in accordance with EPA guidelines. Testing would typically include the following:

- Chemical and physical analysis of the waste to be disposed of;
- Undertaking a Toxicity Characteristics Leaching Procedure test, where necessary, to determine the leachable concentration and class of waste in accordance with EPA Waste Classification Guidelines; and
- Measurements of unconfined compressive strength.

Following testing and verification of the classification of the waste that is to be disposed of, the treated waste would be stored within a specified external or internal bunker until licensed removal can be arranged. Sampling of wastes at the St Marys Facility at all stages of the process would be undertaken in accordance with EPA requirements, with the analysis undertaken by a lab certified by the National Association of Testing Authorities.

The addition of water during the immobilisation process is generally only required to assist with the chemical reaction of cement with waste. This generally only produces small volumes of waste water, which would be captured, stored and, if required, transported to the South Windsor Facility for processing.

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**KEY**

- Site boundary
- Bundled areas
- Landscaped areas

0      20      40m

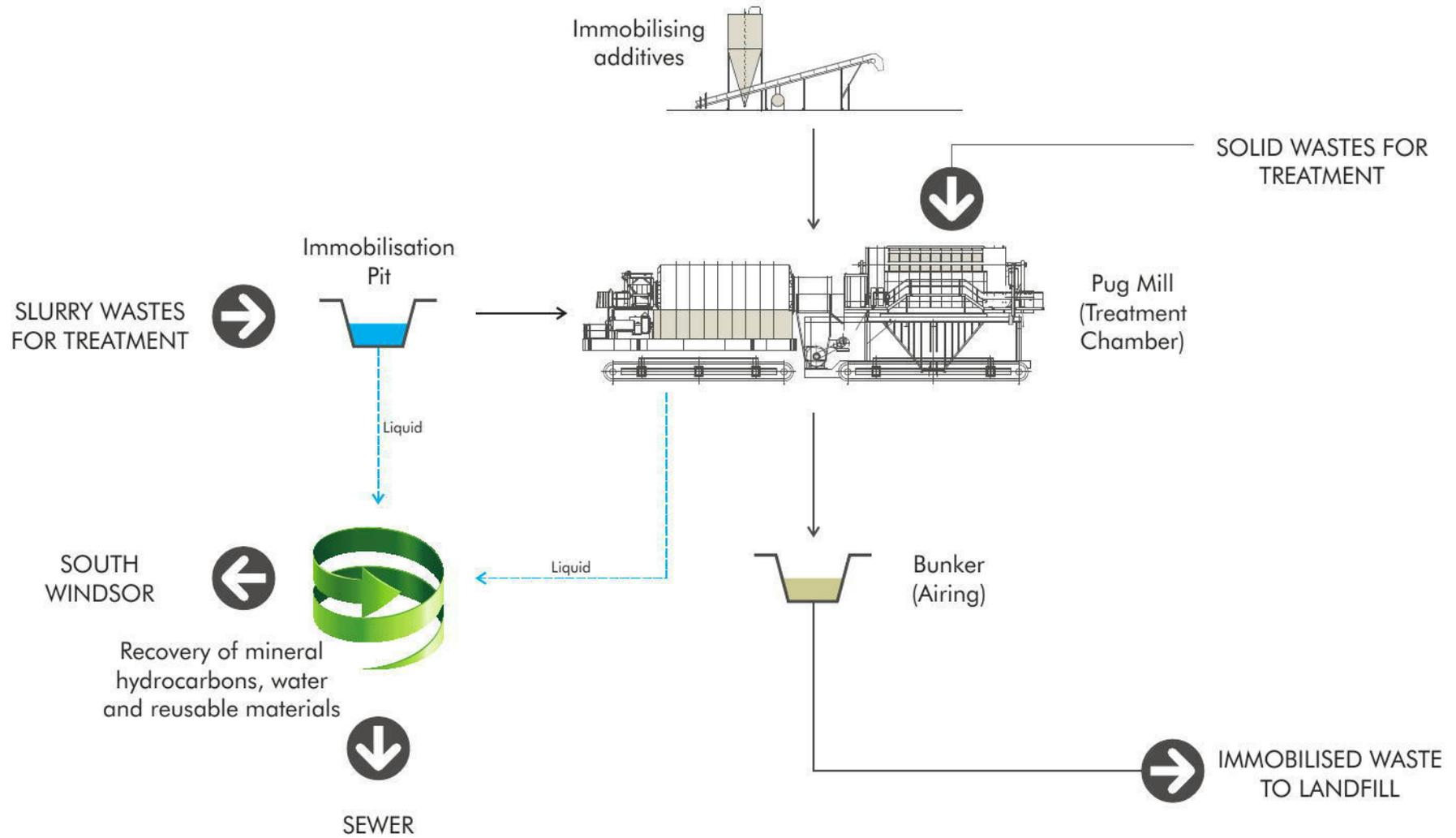


**PROPOSED SITE LAYOUT**  
 Environmental Impact Statement  
 Worth Recycling Facility

FIGURE 4-1

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#### 4.1.3 Drill muds – chemical immobilisation/centrifuging

Around 47,000 tonnes of drill muds would be accepted at the proposed Development for treatment. Drill muds are generated during drilling operations such as horizontal directional drilling, potholing and non-destructive digging. Drill muds consist of a mixture of naturally occurring rock and soil (for example, sandstone, shale and clay), as well as drilling fluid generated during the drilling operations. Drill muds that contain low levels of contaminants (for example, heavy metals and Total Petroleum Hydrocarbons (TPH)) are covered by the EPA's general exemption under clause 51 and clause 51A of the *Protection of the Environment Operations (Waste) Regulation 2005*.

Drill muds accepted at the proposed Development would be treated via a chemical and centrifuge method in Areas 2, 3 and 4 of the St Marys Facility (Figure 4-1). The drill mud plant would consist of a decanter, hydro cyclones and shaker screens, pumps and two waste water storage tanks. The process is largely automated and involves the following steps:

- Drill muds would arrive at the Site via tanker, where they would be tested for quality assurance and verification. The drill muds would then pass through a large grill located above the designated treatment pit to remove any large rocks and/or materials, and then be discharged into one of two proposed pit structures (approximately three metres (depth) by eight metres (wide) by eight metres (length)) located in Area 3;
- The drill mud would then be transferred from the pit structure to the mud separator (hydro cyclones and shaker screens) via a conveyor, where the majority of the liquid of the drill mud would be removed.
- The liquid removed from this process would be dosed with flocculants and coagulants and be processed through a decanter to remove any remaining solids. The liquid would be collected and stored in three bunded 60 KL storage tanks immediately north of Area 2. This liquid would then be transferred to the Site's water treatment plant (refer to Figure 4-1 and Section 4.2), or transported to the South Windsor Facility for treatment. If the liquid is treated on-site, the treated water would be discharged to the local sewer, in accordance with a registered trade waste agreement with Sydney Water.
- The resulting solid component of the drill mud (referred to as 'cake') would then be transferred to the mud bunker in Area 4 (Figure 4-1) for storage using a front end loader. The 'cake' would then be transferred off Site by third parties to external sites for beneficial reuse such as brick manufacturing.

#### 4.1.4 Stormwater and canal dredgings – settling, segregation and immobilisation

Stormwater and canal dredgings would be treated within Area 1 (Figure 4-1) of the Site using settling, segregating and, if needed, immobilisation methods. Stormwater treated at the Site would typically contain sediment, water and refuse materials (for example, plastic bottles and aluminium cans). Canal dredgings may contain other organic materials, such as mangrove roots, and water which would typically be more saline than stormwater.

Stormwater and canal dredgings would be received at the Site in a similar fashion to drill muds (by tanker), and would pass through a grill above the storage/settlement pit (Figure 4-1) to remove any large solid materials and contaminants. Following the settlement of the soil in the pit, refuse would be skimmed off the top of the water surface for collection and disposal off-site. The water component of this waste stream would then be pumped out of the pit and transferred to the Site's proposed water treatment plant, as the water remaining would generally be low in contaminant levels. Prior to off-site disposal or discharge to the local sewer, treated water would be tested to ensure that it meets water discharge quality requirements.

The soil component of this waste stream would be removed from the pit using an excavator and placed in a storage bunker. Should testing confirm that the soil component requires treatment, it would undergo immobilisation, as described in Section 4.1.2. Should the soil not contain any contaminants, it would be classified as either general or restricted solid waste and disposed of at landfill.

#### 4.1.5 Oil filters – crushing/segregation

Worthington currently stores oil filters at its South Windsor Facility and then passes them on to a third party for crushing. It is proposed that the St Marys Facility would include facilities for the crushing of oil filters using a hydraulic machine situated either within or immediately south of the Area 1 building. This would be undertaken within the bunded external storage area located immediately south of the Area 1 building. The enclosed bunker would be sealed and bunded to manage any spills. Crushed oil filters would be stored in a skip bin and taken off site for recycling.

#### **4.1.6 Construction and demolition waste – sorting and segregation**

A small amount of construction and demolition waste, such as building rubble, timber, glass, bricks and similar materials would be accepted at the Site for sorting and segregation of waste and recyclable materials. This would not include any form of crushing.

The sorting and segregation of construction and demolition waste would occur within Area 1, with waste separated by its classification (for example, restricted waste or general waste) or recovery potential in accordance with EPA guidelines. Waste and any materials identified for recovery or recycling would be stored within banded external bunkers located along the eastern boundary of the Site (Figure 4-1).

It is not intended for the proposed Development to accept or sort asbestos within this waste stream. It is anticipated that screening for asbestos contaminated material would be screened from the waste stream prior to delivery of the Site. However, should asbestos be unintentionally delivered to the Site, Worth would isolate this material and arrange for the waste to be removed by a suitably qualified contractor. Procedures for the identification, isolation and removal of asbestos contaminated material would be detailed within the updated Operational Environmental Management Plan and the Environmental, health and Safety System (refer to Section 4.3.4).

#### **4.1.7 Packaged Waste – sorting, re-packaging or immobilisation**

Around 300 tonnes of packaged waste would be received at the Site, which would be bulked (i.e. grouped) or blended for classification and disposal off-site, or alternatively, immobilised through the process as described in Section 4.1.2. Packaged wastes would be stored within the enclosed external storage area located immediately south of the Area 1 building. Packaged waste can include packaged materials (such as paints, household chemicals, silicone or aerosols), and are typically generated as a waste stream due to quality control issues during manufacture, or damage to the packaged goods which makes the product no longer viable for sale. The form of the packaged waste being accepted at the St Marys Facility would vary, depending on the waste type. However, these would typically arrive at the Site shrink wrapped and packaged on pallets. Packaged wastes consisting of food or drink would be accepted at the Site.

Packaged wastes can, on occasion, be classified as dangerous goods but would not be received in quantities above thresholds outlined in SEPP33 (refer to Section 9.2).

Upon acceptance at the Site, the packaged waste would be classified and the disposal or treatment method would be identified. This procedure may include sorting, bulking or consolidating of the waste to allow the appropriate classification under the EPA guidelines.

## **4.2 Supporting Operations and Plant**

### **Drum Storage**

Drums (approximately 205 litres in capacity), which have been delivered to the Site to transport grease and oil filters for processing, would be stored within the storage bunker area in the southern enclosed section of Area 1 as part of the proposed Development, and would be either compressed or crushed using a hydraulic machine. The hydraulic machine would be situated either within or immediately south of the Area 1 building and would include a containment tray and tap to capture any remaining liquid runoff.

The drum storage area has the potential to hold up to 240 drums (empty or containing grease and oil filters), and would be stored in a covered bunker area. Crushed drums would be stored at within a separate storage bunker, and would be transported off site to a suitably licensed third party facility for recycling.

### **Water Treatment Plant**

The Site water treatment plant would treat certain liquids removed from drill muds, stormwater and canal dredgings to remove remnant total suspended solids prior to discharge to the sewer. Runoff captured by pits and catch drains within banded areas of the Site, or other waste water generated through the immobilisation process that contains a high level of contaminants, would be collected and transferred off-site to the South Windsor Facility for a higher grade of treatment.

Following treatment of liquid at the water treatment plant, water to be discharged would be tested to ensure it meets quality standards prior to its disposal via the local sewer. A trade waste agreement would need to be entered into with Sydney Water prior to the discharge of the treated water from the Site to the sewer. This is discussed further in Section 9.1.

The water treatment plant would be located immediately north of the approved portable drivers amenities building (Figure 4-1), and would have a footprint of around 20 square metres. It would be supported by four 60KL storage tanks, which would be situated north of the water treatment plant.

### Laboratory

A portable laboratory / control room (3 metres by 6 metres) would be constructed to support the testing of waste prior to and following treatment. The laboratory is located to the south of Area 1, along the southern boundary of the Site (Figure 4-1).

### Workshop and Storage Shed

Area 6 and Area 7 would be used to provide supporting services to the proposed Development, for example; general storage and vehicle maintenance activities (Figure 4-1).

### Operational Hub

Office A and Office B are currently occupied under an interim occupation certificate, and are presently used by the sales department of Worth and for site management.

As part of the proposed Development, Worth intends to consolidate its operational activities within Office B. This would contain support administration and management services for its NSW operations, including the management of the Worth transport fleet. The sales department of Worth is currently operating at the Site and would remain as part of this consolidation.

Office A would continue to be the reception for the Site, and would also provide meeting room facilities.

### Dangerous Goods Store

A dangerous goods store along the Site boundary south of Area 1 is proposed. The store would consist of compartmentalised bunded storage areas within a shipping container, and would store chemicals required for operational activities, such as the maintenance and cleaning of the proposed water treatment plant. The type and amount of dangerous goods to be stored at the Site are detailed in Table 4-2.

Table 4-2 Proposed capacity of Dangerous Goods to support operations

Dangerous Goods	DG Class & PG*	Treatment Process	Description of Purpose	Volume (Litres) / Mass (tonnes)	
Hydrochloric Acid	8 – II	Water Treatment	Adjust pH of water down	1,000 L / 1.25 t	Total Class 8 = 6.3 t
Sodium hydroxide	8 – II	Water Treatment	Adjust pH of water up	3,000 L / 3.75 t	
Sodium hypochlorite	8 – II	Water Treatment	Destruction of micro-organisms	1,000 L / 1 t	
Nitric Acid	8 – II	Cleaning	Chem-clean of membranes	200L / 0.3 t	

## 4.3 Operation

### 4.3.1 Operational Vehicle and Equipment Movements

#### External

It is anticipated that the proposed Development would generate around four heavy vehicle movements and five light vehicles movements on average per hour during peak periods.

Heavy vehicle movements would be associated with the removal of treated waste and support services provided at South Windsor (namely wastewater treatment). To manage traffic movements, heavy vehicles would arrive at the Site from the south via Dunheved Circuit and Charles Street. Heavy vehicles exiting the site would turn right out onto Charles Street and travel north, joining Links Road to return to Forrester Road (Figure 8-7).

Heavy vehicles delivering waste to the Site would enter via Weighbridge 1. Before entering the operational areas of the Site, the driver would provide details of the delivery (including the nature of the waste) at the gated security checkpoint using an intercom and security cameras. Following verification of the waste, staff would direct the driver to the appropriate delivery point, with signage at the gate providing additional directional support.

Heavy vehicles would generally enter and exit the Site in a clockwise direction, and exit via the gated Weighbridge two. Weighbridge two would also record the weight of the heavy vehicle and have the ability to count axle loads. Information obtained at the entry and exit gates would be entered into the software program RAMSPRO, which is maintained by Worth, to track waste delivered to the Site and transported off-site.

To restrict the number of vehicles travelling along Charles Street as a result of the proposal, light vehicle movements, comprising employees and couriers travelling to and from the Site would not travel along Charles Street. Alternatively, light vehicles would travel either in a clockwise or anti-clockwise direction along Links Road and Forrester Road, and would access the Site via an alternate light vehicle entrance point on Dunheved Circuit (Figure 8-7). Nineteen staff parking spaces are provided along the south-eastern boundary of the Site (Figure 4-1).

A visitor and staff car park is also provided in car park adjacent to Office B (Figure 4-1), which is gated with an intercom access. This arrangement would not change as a result of the proposed Development.

#### **Internal Operational Movements**

In addition to heavy vehicle described above, the proposed Development would also use the following mobile plant/vehicles:

- Forklifts;
- Front end loader;
- Excavator; and
- Street sweeper (consisting of a modified skid steer loader).

The indicative internal traffic flow within the Site is discussed in Section 8.3.

#### **4.3.2 Operational Hours**

The proposed standard hours of operation of the Development would be:

- 5 am to 10 pm Monday to Friday; and
- 8 am to 1 pm on Saturdays.

To provide operational flexibility, Worth is seeking approval for 24 hour operations to provide the St Marys Facility the capability to respond to major peak processing and treatment periods. Approval for 24-hour operations would allow the site to process waste streams and to receive project deliveries or deliveries from regional areas/interstate at the Site outside of the abovementioned standard hours of operation, when deemed necessary. For example, extended hours of operation would enable Worth to respond to processing and treatment demands from major construction activities in the Sydney metropolitan area.

#### **4.3.3 Operational Workforce**

The proposed Development, once fully operational, would generate approximately 15 full time equivalent positions in addition to the 15 existing full time positions associated with the current site operations at St Marys. The 15 additional full time positions is inclusive of seven full time positions being transferred from the South Windsor Facility. In total, it is expected that up to approximately 30 staff will be present on-site.

#### 4.3.4 Environmental Management and Monitoring

The proposed Development would be managed in accordance with the following plans and systems:

- A Quality System, which outlines the broader responsibilities for staff at the Site and systems to comply with regulatory, statutory and customer requirements, as well as systems to ensure quality control of processes at the Site and a framework for continual improvement;
- An Environment, Health and Safety System, with individual plans relating to each individual waste treatment process;
- An Operational Environmental Management Plan (OEMP).
- An Emergency Plan, which would document systems and procedures to deal with all types of incidents (e.g. spills, explosions and fires) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment; and
- A Pollution Incident Response Management Plan (Section 10.0).

These plans and systems specific to the Site would be updated prior to the commencement of operations of the proposed Development to account for the additional waste streams. The OEMP for the facility, as approved, is located in Appendix C. This includes a Waste Management Plan.

### 4.4 Construction

#### 4.4.1 Construction Activities and Materials

The proposed Development would involve limited construction activity, as the majority of facilities and structures already exist on the Site.

There is the potential that construction of the proposed Development would need to be staged to accommodate concurrent acid sulfate soil treatment operations, which have been approved under development consent DA12/0780. Detailed construction staging requirements would be determined during the detailed design phase of the proposed Development.

Construction activities are anticipated to be limited to the following activities:

##### Area One

- Civil works would involve construction of bunding and drainage for storage bunkers;
- Construction of a storage pit in Area 1, requiring the removal of concrete and excavation of soil, as well as concrete pour to form the pit;
- The external bays located along the southern side of Area 1 would be bunded and enclosed using concrete and foundations with steel enforcements;
- Construction of roofing over external bunkers to the west of the Area 1 building. Roofing would consist of canvas material (water-resistant) which would be mounted on a retractable frame;
- Building cladding would be constructed with roller doors for the drum/oil filter storage area;
- Installation of exterior materials, including a concrete panel at the base of the Area 1 building, including metal wall cladding and a metal roof; and
- Installation of three reagent/additive storage hoppers, of three metres by three metres, with a height of up to 12 metres, immediately south of Area 1.

**Areas 2, 3 and 4**

- Installation of exterior materials, including a concrete panel at the base of building, with Colorbond metal wall cladding above;
- Construction of treatment pits in Area 2 and Area 3, requiring the removal of concrete and excavation of soil, as well as concrete pour to form the pits;
- Construction of a catch drain along the southern extent of Area 3;
- Installation of drill mud treatment plant in Area 2, 3 and 4, which would require minor excavation; and
- Installation of three 60kL tanks at a height of seven metres, immediately north of Area 2. The tanks would be delivered and installed with necessary foundations.

**External bunkers (Eastern site boundary):**

- New external bunkers approximately 6 metres deep would be constructed along the eastern boundary, and would comprise 250-300mm thick concrete lining and foundations, with steel reinforcements; and
- For bunkers that would contain waste other than construction and demolition waste, roofing would also be constructed. Roofing would be comprised of canvas material (curtain/synthetic, water-resistant) and would be mounted on a retractable frame.

**Water Treatment Plant**

- The water treatment plant would be containerised plant, with necessary electricity connections provided. Four 60kL storage tanks would also be installed immediately north of the water treatment plant. No excavation would be required for the installation of pipework to transfer water to the treatment plant, as this pipework would remain above ground.

**Dangerous Goods Store**

- Provision for a dangerous goods store along the Site boundary south of Area 1. The store would consist of compartmentalised banded storage areas within a shipping container. No service connections would be required for this structure.

**4.4.2 Construction Plant and Equipment**

The described construction activities would require the use of the following indicative types of plant and equipment:

- At least one crane of at least 100 tonnes and one small franna crane;
- A hydraulic concrete rock breaking hammer;
- Angle grinders;
- Excavators and other earth moving equipment;
- Scissor lifts and mobile cranes;
- Miscellaneous electrical hand tools;
- Concrete pumps and delivery trucks; and
- A portable compressor.

#### 4.4.3 Construction Traffic

Traffic movements associated with the construction of the proposed Development would comprise both heavy and light vehicles. Construction traffic would be generated by the following sources:

- Light vehicle movements would be generated mainly by construction crews travelling to and from the Site.
- Heavy vehicle movements would be generated by the delivery / removal of:
  - Construction plant and equipment, including:
    - One crane of at least 100 tonnes and one small franna crane;
    - Excavators and other earth moving equipment;
    - Scissor lifts and mobile cranes; and
    - Concrete pumps and delivery trucks;
  - General construction supplies and equipment; and
  - Waste from demolition, excavation, and/or other construction activities.

#### 4.4.4 Construction Hours and Duration

Construction would be undertaken during the following standard construction hours:

- 7am to 6pm Monday to Friday; and
- 8am to 1pm on Saturdays.

Construction may be undertaken in stages to reflect market demands. If all elements are constructed simultaneously, construction would occur over six months, including two months for civil works, three months for construction works and one month for commissioning of the proposed Development. Should concurrent operation and construction activity be required, an Environment, Health and Safety plan for construction activity would be implemented to manage any conflicts.

#### 4.4.5 Construction Workforce

The construction workforce required for the proposed Development has been estimated at around 15 full time positions. Confirmation of the construction workforce and any staging of these personnel in accordance with construction staging would be undertaken during the detailed design phase of the proposed Development.

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## 5.0 Statutory Planning Considerations

The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to:

- *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*;
- *State Environmental Planning Policy (Infrastructure) 2007*;
- *Draft South West Subregional Strategy\**
- *Penrith Local Environmental Plan 2010*; and
- Relevant development control plans and section 94 plans.

\* It is noted that North West Subregional Strategy is the relevant strategy for the Site.

### 5.1 Permissibility

The Site is zoned *IN1 – General Industrial* under the *Penrith Local Environmental Plan 2010* (Penrith LEP). The proposed Development is an innominate prohibited use in that zone under the provisions of Penrith LEP.

However, clause 121 of the *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) identifies that development for the purposes of waste or resource management facilities is permissible with consent if located in a prescribed zone (which includes *IN1 – General Industrial*).

A waste or resource management facility for the purposes of clause 121 of the ISEPP is defined as meaning a resource recovery facility or a waste disposal facility. A resource recovery facility or waste disposal facility are defined in clause 120 of the ISEPP as follows:

- **resource recovery facility** means a facility for the recovery of resources from waste, including such works or activities as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from waste gases and water treatment, but not including re-manufacture of material or goods or disposal of the material by landfill or incineration.
- **waste disposal facility** means a facility for the disposal of waste by landfill, incineration or other means, including associated works or activities such as recycling, resource recovery and other resource management activities, energy generation from waste gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal.

In the event of any inconsistency between the Penrith LEP and the ISEPP, the ISEPP prevails to the extent of an inconsistency. Consequently, as the proposed Development would be defined as a waste or resource management facility and is located in a prescribed zone, the proposed Development would be permissible with development consent.

### 5.2 Consent Authority

The proposed Development is not classified as State Significant Development as it does not exceed the threshold criteria for a waste and resource management facility under Clause 23 of Schedule 1 of the *State Environmental Planning Policy (Stage and Regional Development) 2011* (SRD SEPP), being 'Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste' or 'Development for the purposes of hazardous waste facilities that transfer, store or dispose of solid or liquid waste classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste'.

As the proposed Development would be classified as a waste management facility or work under Clause 32 of Schedule 3 of the EP&A Regulation (Section 5.3), the Sydney West Joint Regional Planning Panel (JRPP) would therefore exercise the functions of the consent authority on behalf of Penrith City Council for the proposed Development by virtue of Clause 8(c) of Schedule 4A of the EP&A Act. As the proposed Development is located in the Penrith LGA, the DA would be lodged with Penrith City Council for processing and assessment prior to determination by the JRPP.

Penrith City Council would be the consent authority for and would determine the Section 96(1A) modification (Section 5.5), as it was the consent authority for the DA for the approved ASS treatment facility.

### 5.3 Designated Development

Section 77A (1) of the EP&A Act provides that development may be declared designated development by an Environmental Planning Instrument or the *Environmental Planning and Assessment Regulation 2000* (the Regulation). Under clause 4 of the EP&A Act, development listed in Part 1 of Schedule 3 of the Regulation is designated development unless it is declared not to be by a provision in Part 2 of that Schedule.

Under Schedule 3 of the Regulation, the proposed Development falls within the category of contaminated soil treatment works as the facility would comprise contaminated soil treatment works that would *'treat more than 1,000 cubic metres per year of contaminated soil not originating from the site on which the development is located'*. The proposed development is therefore categorised as designated development and requires the preparation of an EIS as it falls within the categories of development described in Schedule 3 of the Regulation.

The proposed Development would also be classified as a *'waste management facilities or works'* under Schedule 3 of the Regulation as it would *'sort, consolidate or temporarily store waste at transfer stations or materials recycling facilities to transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse and handle substances classified in the Australian Dangerous Goods Code.....'*

As the proposed Development is considered to be Designated Development, an EIS is required and has been prepared to accompany the DA for the proposed Development.

### 5.4 Integrated Development

Section 91 of the EP&A Act defines what integrated development approvals would be required for proposed developments.

The proposed Development would be defined as integrated development as it would require an Environment Protection Licence (if approved) from the EPA (refer to Section 5.6.1). At the time of writing this EIS, Worth was liaising with the EPA concerning the issue of an EPL for the approved DA for ASS treatment at the Site.

No other integrated approvals would be required, including the *Water Management Act 2000*.

### 5.5 Proposed Modification

As described in Section 4, Worth is concurrently seeking a modification to the DA12/0780 to reduce the approved treatment throughput of the Site from 30,000 tonnes to 22,000 tonnes per annum. This follows a review of the predicted demand for ASS treatment.

As the proposed decrease in approved treatment throughput would reduce the impact of the facility, the proposed modification is considered to be of minimal environmental impact and substantially the same development (as approved). As such, a modification under Section 96(1A) of the EPA&A Act is sought concurrent to the DA for the proposed expansion. The operational activities associated with ASS treatment at the Site, and therefore the scope of this modification, has been considered in this EIS alongside the proposed additional waste streams.

As the Site would support both ASS treatment and the proposed Development, Worth is seeking consistency between any modified approval and approval for the proposed Development. This would minimise conflicts between any approval instruments and maximise efficiencies for compliance management.

## 5.6 State Legislation

### 5.6.1 Protection of the Environment Operations Act 1997

The primary objective of the POEO Act is to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development.

Due to the fact that it is defined as a Scheduled Activity under Schedule 1 of the POEO Act, the proposed Development would require an Environment Protection Licence (if approved) from the EPA. Its definition as a Scheduled Activity has been determined by its inclusion in the following categories:

- Contaminated soils treatment, as the proposed development has the capacity to treat more than 1,000 cubic metres per year of contaminated soils received from off-site;
- Waste processing (non-thermal), as the proposed development would include non-thermal treatment of hazardous and other waste; meaning the receiving of hazardous waste and restricted solid waste, with more than 200kg of waste on site at any time; and
- Waste storage, as there would be more than five tonnes of hazardous waste, restricted solid waste, liquid waste, clinical or related waste or asbestos waste is stored on the premises at any time.

### 5.6.2 Waste Avoidance and Resource Recovery Act 2001

One of the primary objectives of the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) is to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis. The NSW 2007 *Waste Avoidance and Resource Recovery Strategy* (the Waste Strategy) provides an essential framework for achieving the objectives of the WARR Act and outlines waste avoidance and resource recovery goals and targets in four key result areas:

- Preventing and avoiding waste;
- Increasing recovery and use of secondary materials;
- Reducing toxicity in products and materials; and
- Reducing litter and illegal dumping.

Operation of the proposed Development would contribute to the achievement of key objectives within these focus areas, as it would remove and facilitate the treatment of problem wastes and contribute to the integrated delivery of waste management services across the State.

## 5.7 Environmental Planning Instruments

### 5.7.1 State Environmental Planning Policy No 33 – Hazardous and Offensive Development

The following Environmental Planning Instruments (other than the Penrith LEP) apply to the Site and have been considered in the preparation of the EIS:

- *State Environmental Planning Policy No 33 – Hazardous and Offensive Development.*
- *State Environmental Planning Policy No 55 – Remediation of Land.*
- *State Environmental Planning Policy (Infrastructure) 2007.*

The *Sydney Regional Environmental Plan (SREP) No. 30 – St Marys* and the *St Marys Environmental Planning Strategy 2000* establish the planning and design principles to guide the development of the former Australian Defence Industries munitions manufacturing site north of St Marys. The area to which SREP 30 applies is located north of Links Road, and neighbours the industrial estate in which the proposed Development is located. As the Site is outside the boundary of the SREP 30, the provisions have not been considered in the EIS, except for the purposes of the heritage assessment in Section 9.7 of this EIS.

### 5.7.2 State Environmental Planning Policy No 55 – Remediation of Land

*State Environmental Planning Policy No 55 – Remediation of Land* (SEPP 55) provides a state-wide planning approach for the remediation of contaminated land. Clause 7 of SEPP 55 requires a consent authority to consider whether the land is contaminated and whether it is suitable (or can be made suitable) for the proposed development.

The proposed development is for an existing developed Site. There is no known contamination on the Site according to a search of the EPA databases - the '*Contaminated Land: Record of Notices*' and the '*List of NSW Contaminated Sites Reported to the EPA*'. Furthermore, a contaminated Site investigation was previously undertaken by WSP Environment Pty Ltd which did not identify any areas of contamination which would require further assessment. This has been discussed further in Section 9.3.

### 5.7.3 State Environmental Planning Policy (Infrastructure) 2007

Clause 104 and Schedule 3 of the ISEPP identify certain development that requires a consent authority to consult with the Roads and Maritime Services (RMS). This includes any landfills, recycling facilities or waste transfer stations of any size or capacity on a site that has access to any road. It is noted that recycling facilities is not defined by the ISEPP.

### 5.7.4 Penrith Local Environment Plan 2010

The Site is zoned *IN1 – General Industrial* under the Penrith LEP.

The objectives of zone zoned *IN1 – General Industrial* are:

- To provide a wide range of industrial and warehouse land uses;
- To encourage employment opportunities;
- To minimise any adverse effect of industry on other land uses;
- To support and protect industrial land for industrial uses;
- To promote development that makes efficient use of industrial land; and
- To permit facilities that serve the daily recreation and convenience needs of persons working in industrial areas.

The proposed Development would be considered generally consistent with these objectives. The operation of the proposed Development as a waste processing facility would provide employment opportunities, is consistent with its zoning on industrial land, makes efficient use of the existing industrial lot, and would not be expected to adversely affect surrounding industries. Despite its consistency with zoning objectives for zone *IN1 – General Industrial*, the proposed Development is an innominate prohibited use in this zone under the provisions of the Penrith LEP as described earlier in section 5.1 of this EIS.

The Penrith LEP also contains provisions relating to specific development standards, such as those for subdivision lot size, height of buildings, and floor space ratio. The only relevant standard that applies to the proposed Development is that for the height of buildings, which stipulates that the height of a building is not to exceed the maximum height shown for the land on the Height of Buildings Map. In the case of the site of the proposed Development, the maximum height is 12 metres. All new structures would be below this building height, including the proposed tanks and hoppers which would be up to 12 metres in height.

## 5.8 Other Environmental Planning Instruments

### 5.8.1 Draft North-West Subregional Strategy

The Draft North-West Subregional Strategy (Department of Planning, 2007) is a key planning document for implementation of the Sydney Metropolitan Strategy for 2036 at a regional level. One of the key directions of the Draft North-West Subregional Strategy is to protect and enhance Strategic Employment Lands, being land zoned for industrial or similar purposes in environmental planning instruments. There are 4,486 hectares of developed employment lands in the north-west subregion, making it the largest contributor of employment lands in the Sydney Region, including 242 hectares of this land located in St Marys. The Dunheved Industrial Precinct is one of the oldest industrial precincts in the Penrith LGA (Department of Planning, 2007).

Table 5 of the Draft North-West Subregional Strategy notes that the Dunheved Industrial Precinct is to be retained for industrial purposes, namely light and heavy manufacturing. The proposed Development would be situated on land within the Dunheved Industrial Precinct, within an existing facility. Its operation would ensure continued use of existing key employment lands, and would therefore be consistent with the Draft North-West Subregional Strategy.

Another key direction of the Draft North-West Subregional Strategy is the location of more jobs in Western Sydney, with the subregion having an employment target of 130,000 additional jobs. Construction of the proposed Development would require the engagement of contractors, and operation would include the generation of 15 full time positions, including the transfer of seven positions from the existing South Windsor Facility. The proposed Development can also be considered consistent with regards to employment targets for the north-west subregion.

### 5.8.2 Penrith Development Control Plan 2010

The *Penrith Development Control Plan 2010* (DCP 2010) applies to all land zoned under the Penrith LEP, including the IN1 General Industrial zone in which the subject site is located. The DCP 2010 supplements the provisions contained within the Penrith LEP by providing detailed guidelines for development. This includes controls that apply to site planning, vegetation management, landscape design, transport, access and parking and subdivision, as well as specific controls for rural and industrial land uses.

Although there are no specific requirements for waste facilities, there are requirements for development in industrial areas. The main industrial areas in Penrith are broken down into eleven precincts. The proposed Development is located with Precinct 1: Dunheved/St Marys (north of Christie Street). The assessment of the proposed Development against the general objectives under D4 (Industrial Development) of DCP 2010 are considered Table 5-1.

The assessment found that the proposed Development would be considered to be generally consistent with the requirements of DCP 2010. In summary, the following is noted:

- Additional structures would be within the maximum building height limit, with the majority of new structures positioned adjacent to existing structures and within the existing roof line. New structures would be obscured to varying degrees from the street by existing or approved structures. However, the proposed Development would involve alterations to existing buildings and the erection of industrial plant (such as hoppers). These are consistent with the visual catchment of the industrial area, with the potential impacts provided in Section 9.5.
- Two additional structures (a proposed laboratory and dangerous goods store) would be positioned close to the western boundary. The DCP 2010 does not specify any side setbacks with shared boundaries. However, it is noted that a concrete wall of around 2.9 metres in height is present along this side boundary, which would screen the new structures.
- Car parking requirements for warehouses or distribution centres is calculated by gross floor area (GFA) or employees, whichever is the greater. At maximum capacity, the proposed Development would have 30 employees. With a GFA of around 2,668m<sup>2</sup> (with the industrial standard at one space per 100m<sup>2</sup> GFA), the DCP would require 25-26 spaces, versus 15 spaces based on the number of employees. However, given the anticipated shift times for evening operational staff (being 2pm to 10pm), the existing 29 spaces (which includes one disabled parking space) is considered to be adequate for the purposes of the total development.
- The existing lighting of the Site complies with *Australian Standard AS4282-1997: Control of the obtrusive effects of lighting*. It is not anticipated that additional lighting would be required as a result of the proposed Development; however, any additional lighting would be installed in accordance with AS4282-1997.
- The layout of the proposed Development would enable circulation of heavy vehicles as well as the separation of staff car parking and visitor areas with operational areas. A traffic impact assessment has been undertaken for the proposed Development and is included in Section 8.3 of this EIS.
- Surface water and waste water management would be managed, as per the detail provided in Section 9.1.

Table 5-1 DCP 2010 requirements under D4 Industrial Development

Requirement	Consideration
<b>General objectives</b>	
Promote industrial development which can operate in a functional, safe and environmentally friendly manner	Ongoing environmental and safety objectives would be managed through the implementation of site-specific operational management plans.
Minimise conflict between industrial land uses and adjacent sensitive land uses	The proposed Development is consistent with its zoning on industrial land and would not be expected to adversely affect surrounding industries. No adjacent sensitive land uses have been identified. Impacts to surrounding land uses have been considered further in the socio-economic impact assessment as part of the EIS (refer to Section 9.6).
Ensure that development of land to which this chapter applies will not significantly affect the function, efficiency and safety of all classified roads and other major roads	Traffic volumes associated with operation of the proposed Development are not anticipated to adversely affect the existing and future service and safety level of the road, as the road currently services similar industrial facilities in an industrial land use zone. Further detail on impacts to traffic and access is provided in Section 8.3.
Promote development of a visually attractive form, design and scale, where urban elements, streetscape and built forms are integrated with the existing environment	The proposed Development would not involve the construction of any additional buildings, with the exception of the laboratory and dangerous good store which would comprise a temporary one-storey building or container respectively. These structures would be obscured by existing structures on the street frontage. However, the proposed Development would involve alterations and extensions to existing buildings and the erection of industrial plant (such as hoppers). These are consistent with the visual catchment of the industrial area, with the potential impacts provided in Section 9.5.
Retain existing vegetation and promote the integration of significant landscaped areas into the site design to minimise the impacts of built form and hardstand areas	The proposed Development does not propose to increase the extent of existing hardstand areas. Existing landscaping would be retained.
Manage traffic impacts and access issues for larger vehicles and loading facilities	The proposed Development is not expected to generate operational traffic volumes that would cause significant traffic and access issues. Further detail on impacts to traffic and access is provided in Section 8.3.
Address visual impacts and safety requirements of large external storage areas	Hazards and risks, and impacts to visual amenity resulting from the proposed Development are considered in Sections 9.2 and Section 9.5.
Promote employment generation that has considered access to public transport and supporting services for improved amenity	The proposed Development, once fully operational, would generate approximately 15 full time equivalent positions in addition to the 15 existing full time positions associated with the current site operations at St Marys. The 15 additional full time positions is inclusive of seven full time positions being transferred from the South Windsor Facility
<b>Building height</b>	
Encourage building forms that respond to the topography of the site and the relative position of the site to other allotments within, and to, the street	The proposed Development would not involve the construction of any additional buildings, with the exception of the laboratory which would comprise of a temporary, unobtrusive one-storey building, and a

Requirement	Consideration
	dangerous goods store. The proposed laboratory would not be a permanent feature of the site, and would be obscured from view by existing structures on the street frontage. The proposed Development would also involve modifications to existing buildings and the erection of industrial plant. Neither the proposed laboratory, plant nor the proposed modifications to existing buildings would conflict with the objectives relating to building height within the DCP 2010 (being 12 metres).
Ensure a scale of building which complements the existing environment in which the site is located addressing visibility from key public spaces and the scale and context of the existing and desired streetscape	The proposed Development would not involve the construction of any permanent additional buildings, with the exception of the laboratory which would comprise of a temporary, unobtrusive one-storey building, and a dangerous goods store. The proposed Development would involve modifications to existing buildings and the erection of industrial plant. Proposed plant (such as hoppers) would be within the building line, and additional structures may be visible from outside the Site, however these features would be in keeping with the scale and context of the predominantly industrial nature of the surrounding area, and it is not anticipated that they would be visible from key public spaces.
<b>Building setbacks and landscape</b>	
Enhance the visual quality of industrial development through appropriate setbacks, building and landscape design, particularly when viewed from public areas	The proposed Development would not involve the construction of any additional buildings, with the exception of the laboratory which would comprise of a temporary, one-storey building and a dangerous goods store. These structures would be obscured from view by existing structures on the street frontage. Proposed modifications to existing buildings and addition of the laboratory, dangerous goods store and plant would not result in changes to existing street frontage setbacks or landscaping and would not conflict with the objectives relating to Building Setbacks and Landscape within the DCP 2010.
<ul style="list-style-type: none"> <li>- Ensure new development retains existing trees or significant stands of vegetation in the overall site layout</li> <li>- Provide functional areas of planting that enhance the presentation of a building</li> </ul>	Landscaping on the Site is consistent with the relevant requirements, and no changes to existing landscaping are proposed as part of the Development.
Screen undesirable views and minimise the visual impact of hard surface areas	No construction of new hardstand areas or expansion of existing hardstand areas is proposed as part of the proposed Development. In addition, there would be no significant impact to visual amenity as a result of existing hardstand areas, as the majority of the Site is, and will continue to be screened from view by the existing perimeter wall.
Create industrial precincts with their own intrinsic and unique landscape characteristics, which enhance the existing and/or natural landscape and character of an area	No significant alterations to the existing Site, with the exception of the addition of the laboratory, dangerous goods store and plant, are proposed. Proposed alterations are believed to be in keeping with the existing landscape and character of the surrounding area.

Requirement	Consideration
<p>Setbacks for industrial development are to be in accordance with the standards specified in Table D4.1 (9 metres)</p>	<p>Street frontage setbacks are currently consistent with the relevant standards, and no changes to existing setbacks, or addition of structures along street frontages, are proposed as part of the Development. There do not appear to be provisions relating to side setbacks for boundaries within the DCP 2010. As such, it is believed that the position of the proposed laboratory will not contravene the requirements for Building Setbacks and Landscape.</p>
<p>In Precincts 1 and 2, 8 and 10 variations to the required setbacks will be considered on merit, taking account of site areas and street frontage widths, access to the site, availability of on-site parking and access areas, landscaping provision and the setbacks of adjoining development</p>	<p>Street frontage setbacks are currently consistent with the relevant standards, and no changes to existing setbacks, or addition of structures along street frontages, are proposed as part of the proposed Development. As such, no variations to setback requirements are anticipated.</p>
<p>The visual impact of large expanses of wall should be reduced in scale by architectural treatment as well as by dense grove planting or other landscape design solutions</p>	<p>No changes to the existing perimeter wall are proposed.</p>
<p>Where an industrial development contains large expanses of hardstand or paved areas, the applicant must demonstrate how the development application reduces the 'heat effect' and visual impact of these large expanses</p>	<p>No construction of new hardstand areas or expansion of existing hardstand areas is proposed as part of the proposed Development.</p>
<b>Building design</b>	
<p>The majority of the controls contained within this section apply primarily to existing structures on the Site. For the purpose of identifying statutory considerations of relevance to the proposed Development, those outlined below are the controls considered relevant to additional structures only.</p>	
<ul style="list-style-type: none"> <li>- Encourage a high standard of architectural design, utilising quality materials and finishes appropriate for the locality</li> <li>- Ensure that development is undertaken in a sustainable manner, demonstrating this through the application of the Building Sustainability Index (BASIX), Green Star and/or Australian Buildings Greenhouse Ratings (now part of the National Australian Built Environment Rating System NABERS) certification systems, where appropriate.</li> <li>- Encourage innovation in building design and the use of materials</li> <li>- Encourage articulated and varied frontages to minimise perceived bulk and scale</li> </ul>	<p>The proposed Development would not involve the construction of any additional buildings, with the exception of the laboratory and dangerous goods store which would comprise of a temporary, one-storey demountable. The proposed laboratory would not be a permanent feature of the Site, and would be obscured from view by existing structures on the street frontage. The proposed Development would also involve modifications to existing buildings and the erection of industrial plant. Proposed additions and modifications to existing buildings are largely considered to comply with the objectives relating to Building Design within the DCP 2010.</p>
<p>Ensure that new development can integrate into the existing urban fabric to contribute to the creation of a visually cohesive urban environment</p>	<p>Proposed additions and modifications to existing buildings would not compromise the Site's visual integration into the surrounding industrial environment, and are believed to be in keeping with the character of the area. Proposed plant (such as hoppers) adjacent to buildings would be below the current building line. Some additional structures (such as the water treatment plant storage tanks) may be visible from outside the Site, however these features would be in keeping with the scale and context of the predominantly industrial nature of the surrounding area,</p>

Requirement	Consideration
<p>Non-residential developments including mixed use developments, with a construction cost of \$1 million or more are to demonstrate a commitment to achieving no less than 4 stars under Green Star or 4.5 stars under the Australian Building Greenhouse Rating system (now part of the National Australian Built Environment Rating System (NABERS)).</p>	<p>The capital cost of the proposed Development is not anticipated to be \$1 million. However, the Proposed Development only proposes minor additions and alterations to the existing structures at the Site to facilitate that additional capacity.</p>
<p>Particular care should be taken in regard to:</p> <ul style="list-style-type: none"> <li>- Designing roof elements; and</li> <li>- Locating plant and mechanical equipment including exhausts, so as to screen them from a public place</li> </ul>	<p>Proposed plant (such as hoppers) may extend above the building line and may be visible from outside the site, however these features would be in keeping with the scale and context of the predominantly industrial nature of the surrounding area, and it is not anticipated that they would be visible from key public spaces.</p>
<p>Architectural features, consistent with the overall design of the building, may be used to:</p> <ul style="list-style-type: none"> <li>- Highlight entrances to buildings; and</li> <li>- Accentuate pedestrian areas and provide improved climatic amenity, particularly for buildings that will experience high volumes of pedestrian movements, using techniques such as verandas and awnings.</li> </ul>	<p>The proposed Development would not involve the construction of any additional buildings, with the exception of the laboratory and dangerous goods store which would comprise temporary, one-storey demountables. The proposed laboratory and dangerous goods store would not be permanent features of the Site, and are not expected to involve any architectural features of note. Extensions or additions to existing buildings would be in keeping with the existing building form.</p>
<p>The development must incorporate a variety of external finishes in terms of both colour and type of material used. The external finishes (walls, roof, awnings etc.) of the development are to be:</p> <ul style="list-style-type: none"> <li>- Made from durable high quality, low maintenance, non-reflective materials;</li> <li>- Compatible with the overall design and form of the development;</li> <li>- Selected for all built forms to ensure the entire development presents a homogenous form;</li> <li>- Considered in associated with the proposed plantings and landscape treatment;</li> <li>- Considered for their ability to provide visual relief in large wall surfaces and elevations; and</li> <li>- Selected to ensure the development complements the surrounding environment while reducing the temptation to vandalism and graffiti.</li> </ul>	<p>Proposed additions and modifications to existing buildings would take into consideration the practical and aesthetic implications of various external finishes, and as such the proposed Development is not expected to contravene any of the requirements relating to external finishes as stipulated within the DCP 2010.</p>
<p>All loading areas should be located towards the rear of allotments. Where possible, loading areas should be screened from the view of main road frontages through physical and/or vegetation screening</p>	<p>No significant changes to the position of existing loading areas are proposed. Most views of loading areas are obstructed by existing structures, and potential view lines from street frontages are minimal.</p>
<b>Storage of materials and chemicals</b>	
<p>Ensure that external storage of goods does not detract from the visual amenity of industrial areas, streetscapes or adjoining residential areas</p>	<p>There would be no significant impact to the visual amenity of the surrounding industrial area, as storage areas within the facility are mostly screened from view by existing structures and the existing perimeter wall. The Site is not visible from any nearby residential areas. Further detail on impacts to visual amenity resulting from the proposed Development is provided in Section 9.5.</p>
<p>Ensure that the storage and use of chemicals that are potentially hazardous to humans occurs in a safe and</p>	<p>Safety concerns relating to the storage and use of chemicals during construction and operation of the</p>

Requirement	Consideration
responsible manner and minimises the risk of accidental injury or loss of life	proposed Development would be addressed through implementation of site-specific hazard and safety management plans.
Ensure that the storage and use of potentially polluting substances occurs in an environmentally responsible manner, and will not have any detrimental impact on the environmental quality of the surrounding area	Environmental concerns relating to the use of potentially polluting substances during construction and operation of the proposed Development would be addressed through implementation of site-specific operational environmental management plans.
For sites with multiple frontages, either to roads or to the main western railway line, the location and orientation of external storage areas shall minimise visual impact from all potential view points	Although the Site has two road frontages, there would be no significant impact to the visual amenity of the surrounding industrial area, as most views of storage areas are obstructed by existing structures and the existing perimeter wall, and potential view lines from street frontages are minimal. Further detail on impacts to visual amenity resulting from the proposed Development is provided in Section 9.5.
Rain water tanks are not to be visually intrusive from the main street frontage or other public areas	No additional rain water tanks are proposed. There would be no significant impact to the visual amenity of the streetscape or public areas as a result of the waste water storage tanks, as they are screened from view by existing structures and the existing perimeter wall. Further detail on impacts to visual amenity resulting from the proposed Development is provided in Section 9.5.
<p>If the development involves the storage of chemicals on the site, a Chemical Use and Storage Report may be required. A chemical use and storage report will not be required when:</p> <ol style="list-style-type: none"> <li>i. The use of chemicals is for routine cleaning and the chemicals to be used are of household or hospital grade</li> <li>ii. The total quantity of chemicals to be routinely used or stored on site does not exceed 100L</li> <li>iii. The chemicals to be used or stored are not of sufficient acidity, alkalinity or strength to cause significant harm on skin contact, or to the environment if a spill were to occur</li> <li>iv. The application outlines the methods proposed to be used to minimise the potential for spills</li> </ol>	The EIS accompanying the DA for the proposed Development outlines methods proposed to be used to minimise the potential for spills. As such, a Chemical Use and Storage Report would not be required.
Accessing and servicing the site	
Ensure the safe and efficient movement into and out of an industrial development without adversely affecting the existing and future service and safety levels of the road	No changes to the Site's existing vehicle entry and exit systems are proposed as part of the proposed Development. Traffic volumes associated with operation of the proposed Development are not anticipated to adversely affect the existing and future service and safety level of the road, as the road currently services similar industrial facilities in an industrial land use zone. Further detail on impacts to traffic and access is provided in Section 8.3.
Ensure industrial development provides sufficient parking on-site to accommodate all parking demands generated by the development while ensuring safe and efficient movement of vehicles within the site	Existing on-site parking is provided (refer to Figure 4-1). The proposed Development would not involve any modifications to the existing car parks.

Requirement	Consideration
Encourage the development of a parking layout that enhances the function and appearance of the industrial development	No modifications to the existing parking layout are proposed as part of the proposed Development
Ensure that cyclist and pedestrian needs are adequately and safely accommodated in all industrial areas	This requirement is not relevant to the proposed Development.
<p>Industrial development shall, where appropriate, be design to:</p> <ol style="list-style-type: none"> <li>i. Allow all vehicles to enter and leave the site in a forward direction</li> <li>ii. Accommodate heavy vehicle parking and manoeuvring areas</li> <li>iii. Avoid conflict with staff, customer and visitor vehicular and cycle movements</li> <li>iv. Ensure satisfactory and safe operation with the adjacent road system</li> </ol>	The existing Site layout facilitates the achievements of all listed components of this requirement. As such, no associated adjustments the Site layout are proposed as part of the proposed Development. It should be noted that the separation of Site accesses minimises conflict between staff parking areas (light vehicles) operational areas of the facility (heavy vehicles).
<p>In general, turning circles will be required to be provided to accommodate the largest type of truck which could reasonably be expected to service the site. All developments must be designed and operated so that a standard truck may complete a 3-point or semi-circular turn on the site without interfering with parked vehicles, buildings, landscaping or outdoor storage and work areas.</p>	The existing Site layout provides adequate turning circles for the largest type of truck that would be expected to service the site during operation of the proposed Development, and also allows for circulation around Areas 1, 2, 3, and 4. As such, no adjustments to turning circles within the site layout are proposed as part of the proposed Development.
<p>Adequate space is to be provided within the site for the loading, unloading and fuelling (if applicable) of vehicles. These areas shall be screened from the road</p>	The existing Site layout provides adequate space for loading and unloading during operation of the proposed Development. As such, no adjustments to turning circles within the site layout are proposed as part of the proposed Development. Most views of loading areas are obstructed by existing structures, and potential view lines from street frontages are minimal.
<p>Car parks, aisles and manoeuvring areas shall be designed with function and safety in mind, and have minimum dimensions conforming with the Australian Standards 2890 Parking Facilities. The relevant parts of this standard are AS2890.1 Off-Street Parking, AS2890.2 Commercial Vehicle Facilities, and AS2890.3 Bicycle Parking Facilities. In addition, the following elements should be considered:</p> <p>Where the nature of the industrial development will attract clients/visitors to the site, the following elements shall be included in the car park design:</p> <ul style="list-style-type: none"> <li>- Where the nature of the industrial development will attract clients/visitors to the site, the following elements shall be included in the car park design: <ul style="list-style-type: none"> <li>• The internal (vehicular) circulation network is to be free of disruption to circulating traffic and ensure pedestrian safety;</li> <li>• The car park should, where possible, be designed with wheel stop kerbs only, rather than a barrier kerb between parking areas and pedestrian pathways; and</li> <li>• The movement of pedestrians throughout the car park is clearly delineated by all users</li> </ul> </li> </ul>	The existing Site layout, which would remain largely unadjusted upon completion of the proposed Development, allows for circulation around Areas 1, 2, 3, and 4. Bollards provide separation between car parking areas and operational areas to minimise conflicts.

Requirement	Consideration
of the car park and minimises conflict with vehicles.	
Where parking spaces are to be provided for people with disabilities, these spaces are to be: <ul style="list-style-type: none"> <li>- Suitably located near entrances to the building, lifts and access ramps (if required)</li> <li>- Provided in accordance with AS1428.1 Design for Access and Mobility</li> <li>- Supplemented by the installation of appropriate tactile pavement treatments where required</li> </ul>	A disabled parking space is provided within close proximity to the entrance of Office B (refer to Figure 4-1). This parking space is compliant with all relevant standards.
<b>Lighting</b>	
Encourage the installation of external lighting which does not detract from the appearance of the development or amenity of the locality	The existing lighting of the Site complies with AS4282-1997. It is not anticipated that additional lighting would be required as a result of the proposed Development, however, any additional lighting would be installed in accordance with that Australian Standard
Illuminate parts of the site for security reasons and to provide increased safety in accordance with the principles of Crime Prevention through Environmental Design (CPTED)	
Minimise energy waste by providing the correct lighting orientation and minimising overspill lighting	

It should also be noted that section D4 Industrial Development of the DCP 2010 provides the following scenarios through which applicants can demonstrate additional commitment to the principles of the DCP 2010:

- a) Improved sustainability outcomes including vegetation management and landscape, water management, land management and waste management in accordance with the DCP 2010;
- b) Increased landscape setbacks, landscape areas, street tree planting, green roofs and improved streetscape outcomes;
- c) High quality building design that is visually attractive, innovative, integrated into the landscape design, takes into account the visual catchment, and is articulated to reduce building scale and bulk;
- d) No impacts on sensitive adjacent land uses through careful site planning, building design and landscape treatment; and
- e) Conservation and adaptive reuse of industrial buildings listed as heritage items in Schedule 5 Environmental heritage of the Penrith LEP, such as the World War II ammunition factory buildings in Precincts 1 and 2 (Dunheved and St Marys).

The majority of the commitments outlined in this section of the DCP 2010 are not applicable to the proposed Development. However, the proposed Development could be considered to contribute to sustainability outcomes through inclusion of features such as the Water Treatment Plant, and by its inherent function as a waste treatment and recycling facility. In addition, the proposed Development could be considered to comply with commitment (c) as it is not expected to impact upon any adjacent sensitive land uses.

## 5.9 Commonwealth Legislation

### 5.9.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities for actions that may have a significant impact on matters of National Environmental Significance (NES). Approval from the Commonwealth Minister is in addition to any approvals under NSW legislation.

The EPBC Act also provides for the identification, conservation and protection of places of national heritage significance and provides for the management of Commonwealth heritage places. The Act also establishes the Australian Heritage Council.

The EPBC Act lists eight matters of NES that must be addressed when assessing the environmental impacts of a proposal. These matters are:

- World heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory species;
- Nuclear actions (including uranium mining);
- Commonwealth marine areas; and
- Great Barrier Reef Marine Park.

Other matters protected under the EPBC Act include the protection of the environment where proposed activities are located on Commonwealth land.

The EPBC Protected Matters Search Tool was used to identify matters of NES within 10 kilometre of the Site. The results of this search are presented in Table 5-2.

The proposed Development would not impact on any matters of NES. The Site is predominantly hardstand and the only vegetation remaining at the Site consists of a landscaped garden with negligible potential for threatened species or habitat. Potential off-site impacts to nationally significant ecological and heritage matters are discussed in Sections 9.4 and 9.7 respectively. Although the search revealed that one threatened ecological community (Cumberland Plain Shale Woodlands and Shale- Gravel Transition Forest) is likely to occur within 10 km of the Site, this community is not found on the Site itself or in the immediate vicinity of the Site. As such, there would be no impact on this community as a result of the proposed Development.

**Table 5-2 Protected Matters Search Tool results within 10 kilometres of the Site**

Matter of NES	Presence
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Listed Threatened Ecological Communities	1
Listed Threatened Species	30
Listed Migratory species	14

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## 6.0 Consultation

During the preparation of the EIS, you should/must consult with the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult surrounding landowners and occupiers that are likely to be impacted by the proposal.

Details of the consultations carried out and issues raised must be included in the EIS

### 6.1 Director-General's Requirements

An EIS Scoping Report was prepared and submitted to the DP&I on behalf of Worth in early 2013 (AECOM, 2013). The purpose of the EIS Scoping Report was to provide the DP&I with an overview of the proposed Development so that the DP&I could formulate appropriate Director-General's Environmental Assessment Requirements (DGRs) for the proposed Development.

The DP&I subsequently issued the DGRs for this EIS on 12 February 2013. These DGRs are provided in Table 6-1 and Appendix A. Cross references to relevant sections of this EIS where issues are addressed are also included in Table 6-1.

Table 6-1 DGRs for the Proposed Development

Issue	Description	Location in the EIS
Waste Management	The measures that would be implemented to ensure that the project is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2007 and other relevant NSW Government Policy	Section 11.2.1
	Identification of the quantity and type of waste that would be accepted, handled, stored, processed or disposed of at the facility	Section 4.1.1
	A description of how this waste would be stored and handled on site, and transported to and from the site	Section 4.1
Soil and Water	Consideration of any contaminated soil (including acid sulfate soils) and water on-site, in accordance with relevant guidelines	Section 9.1 and Section 9.3
	Identification of any licensing requirements or other approvals under the <i>Water Act 1912</i> and/or <i>Water Management Act 2000</i>	Section 9.1.1
	An assessment of potential impacts on the quality and quantity of existing surface and groundwater resources and any potential impacts from flooding	Section 0 and Section 9.3.3
	A detailed description of the proposed water management system (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts	Section 9.1
	Details of leachate collection and management	Section 9.1
Air quality	Including odour, dust and greenhouse gas emissions in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors	Section 8.1 and Appendix D
Noise	Including construction, operation and traffic noise in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors	Section 8.2 and Appendix E
Traffic and Transport	An assessment of potential traffic impacts on the capacity, efficiency and safety of the road network	Section 8.3 and Appendix F
	A description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area	Section 8.3 and Appendix F

Issue	Description	Location in the EIS
Hazards and Risk	Including a preliminary risk screening undertaken in accordance with the <i>State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)</i> and <i>Applying SEPP 33 (DoP, 2011)</i> , and if necessary, a Preliminary Hazard Analysis (PHA)	Section 9.2 and Appendix G
Heritage	Including Aboriginal Cultural Heritage	Section 9.7
Environmental Planning Instruments	The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to: <ul style="list-style-type: none"> <li>- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development;</li> <li>- State Environmental Planning Policy (Infrastructure) 2007;</li> <li>- Draft South West Subregional Strategy*</li> <li>- Penrith Local Environmental Plan 2010; and</li> <li>- Relevant development control plans and section 94 plans.</li> </ul> <p>* It is noted that North West Subregional Strategy is the relevant strategy for the Site.</p>	Section 5.0
Consultation	During the preparation of the EIS, you should/must consult with the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultations carried out and issues raised must be included in the EIS	Section 6.0

## 6.2 Stakeholder Engagement

### 6.2.1 Environment Protection Authority

During the preparation of this EIS, representatives from Worth and AECOM met with the air quality branch of the EPA on 30 January 2013, and with the EPA more generally on the 23 March 2013. Points of discussion and issues raised during these meetings, as well as where these issues are detailed in Table 6-2 and have been considered during the preparation of this EIS.

Table 6-2 Issues raised during consultation with the EPA

Description of Issue Raised	Location in EIS
Methodology and approach to the air quality impact assessment for both construction and operation	Appendix D
Potential for waste to be transported to the site to be tested prior to its arrival and its use as a screening test for potential odour issues and subsequent management	Section 4.1
Consolidation of the site's existing licencing for the treatment of acid sulfate soils with the proposed Development's licensing requirements	Section 5.3
Proposed site fire management	Section 9.2
Quality Assurance/Quality Control (QA/QC) for the separation of wastes at the facility	Section 4.1
Assurance program for the management of asbestos waste if received at the facility	Section 4.1.6
The need for a new Specific Immobilisation Approval (SIA) for the facility at St Marys	Section 4.1.2
Incorporating the requirements of WorkCover in the construction and operation of the facility	Section 9.2.4
The need for adequate management of surface water at the facility	Section 0
The consideration of hazards and risks as part of the EIS	Section 9.2 and Appendix G

### **6.2.2 Penrith City Council**

Penrith City Council was provided with a copy of the EIS Scoping Document for the proposed Development, as well as a copy of the DGRs for review and comment. On 20 March 2013, Penrith City Council advised that there was no need for a meeting to discuss the proposed Development, and no issues were raised.

### **6.2.3 Roads and Maritime Services**

Roads and Maritime Services (RMS) was contacted during the preparation of the Traffic Impact Assessment to obtain relevant traffic and crash data. Given the scale of the proposed Development, and as advised by DP&I, consultation was undertaken with Penrith City Council Traffic Department in relation to the scope of the Traffic Impact Assessment, including land use considerations, road network development in the vicinity of the Site, forecast increases in traffic, road network performance and potential safety issues to consider in the assessment. No specific issues were raised during this consultation.

### **6.2.4 Sydney Water**

Consultation is ongoing with Sydney Water in relation to drainage of stormwater and discharge of treated wastewater to sewer. In March 2013, Sydney Water granted permission for Worth to discharge water to the sewer from the interceptor located in the centre of the site near the existing wheel wash.

## **6.3 Community Consultation**

Consultation with relevant businesses in the vicinity of the Site was undertaken by Worth in April 2013.

Six consultees were interviewed, of which two were aware of the proposed Development and four were not aware of the proposal. Of the two that were aware of the proposal, one consultee raised odour as an issue.

Of the four consultees that were unaware of the project, two did not raise any issues or concerns regarding the proposal. The remaining two consultees raised 'odour and noise' and 'odour and traffic' as issues.

These issues have been discussed in Section 8.1 (concerning odour), Section 8.2 (concerning noise) and Section 8.3 (concerning traffic).

There were no requests from consultees for further information to be provided by Worth in relation to the proposed Development. Worth will provide additional information to surrounding businesses should owners request information relating to the proposed Development.

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## 7.0 Issues Prioritisation

### 7.1 Introduction

This chapter builds on the preliminary risk assessment undertaken for the proposed Development as part of the EIS Scoping Report and identifies and ranks potential environmental issues associated with the construction and operation of the proposed Development in terms of their relevance and importance to the assessment of the potential impacts of the proposed Development.

### 7.2 Risk Matrix

The risk matrix used in the preliminary assessment as detailed in Table 7-2 was used to evaluate the potential environmental issues associated with the proposed Development. Additional information that has been received regarding the key environmental and social issues following the submission of the EIS Scoping Report, including consultation with regulatory authorities and neighbouring property owners has been considered.

The application of the risk matrix to the proposed Development enabled potential environmental issues to be ranked in terms of their relevance and importance to the assessment of the potential impacts of the proposed Development. The results of the risk matrix application are reflected in the level of assessment of each of the key issues within this EIS. Definitions of each of the levels of consequence and likelihood that were used in the risk matrix are provided in Table 7-1. Potential impacts are ranked according to the risk rating matrix (refer to Table 7-2) as being High, Medium, Low or Very Low risk to the environment.

Table 7-1 Consequence and Likelihood Risk Matrix Definitions

Potential Consequences	Likelihood of adverse impact
1) Broad scale environmental impact	A. Almost certain
2) Regional environmental impact	B. Likely
3) Local environmental impact	C. Possible
4) Minor environmental impact	D. Unlikely
5) Insignificant environmental impact	E. Rare

Table 7-2 Risk rating matrix

	Likelihood of adverse impact					
		A	B	C	D	E
Potential Consequence	1	High	High	Medium	Low	Very Low
	2	High	High	Medium	Low	Very Low
	3	Medium	Medium	Medium	Low	Very Low
	4	Low	Low	Low	Low	Very Low
	5	Very Low				

### 7.3 Risk Assessment

The rating and prioritisation of potential environmental and social impacts associated with the proposed Development is provided in Table 7-3.

This rating allows the prioritisation of issues for assessment and does not initially consider the application of mitigation measures to manage environmental effects. Appropriate and proven mitigation measures would be implemented to minimise and manage potential impacts associated with each environmental aspect considered in this risk assessment. An assessment of potential impacts associated with each environmental aspect considered in the risk assessment, and proposed mitigation measures to reduce the potential impacts, are presented in Section 8.0 and Section 9.0 of this EIS, respectively, and are summarised in Section 10.0.

Table 7-3 Risk assessment (pre-mitigation)

Environmental Aspect	Potential Environmental Issue	Consequence	Likelihood	Rating
Air Quality	Generation of odours and particulates as a result of contaminated soils and other processes on Site.	Medium (3)	Medium (C)	Medium
	Generation of fugitive emissions associated with operation of machinery and transport vehicles.	Low (4)	Low (D)	Low
Traffic and access	Traffic impacts on Charles Street and local road network due to truck movements required for the proposed Development.	Medium (3)	Medium (C)	Medium
Noise	Noise impacts on nearby sensitive receivers through the use of equipment and machinery and transport vehicles.	Medium (3)	Medium (C)	Medium
	Noise during evening and night-time periods, including road traffic noise.	Medium (3)	Medium (C)	Medium
Surface water	Runoff from Site containing pollutants.	Medium (3)	Low (D)	Low
	Accidental spills and pollution of local waterways.	Medium (3)	Low (D)	Low
Risk and Hazards	Potential impacts on neighbouring land uses, depending on the final volumes and types of hazardous material stored on-site.	Medium (3)	Low (D)	Low
Soils	Minor excavation works would be required, and existing Site is covered in hardstand	Very Low (5)	Very Low (E)	Very Low
Visual amenity	No change to current Site footprint or use. Some additional plant, with hoppers likely to protrude above building line.	Low (4)	Very Low (E)	Very Low
Socio-economic effects	Employment generating opportunity.	Very Low (5)	Very Low (E)	Very Low
Heritage	No change to existing footprint.	Very Low (5)	Very Low (E)	Very Low
Ecology	No change to existing footprint.	Very Low (5)	Very Low (E)	Very Low

## 8.0 Key Environmental Issues

### 8.1 Air Quality

The EIS must address air quality, including odour, dust and greenhouse gas emissions in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors

#### 8.1.1 Introduction

An air quality impact assessment (AQIA) was undertaken in order to assess potential effects of the proposed Development on local air quality. The AQIA has been appended to this EIS (Appendix D), and is summarised in the following section.

The purpose of the AQIA was to address the DGRs relating to assessment of air quality impacts resulting from the proposed Development. The DGRs state that air quality, including odour and dust, were to be considered in accordance with relevant EPA guidelines and that the assessment must consider any potential impacts on nearby private receptors.

Based on the outcomes of subsequent meetings held with the EPA, it was advised that odour impacts should be the key focus of the AQIA and that potential dust impacts were not considered a key issue due to the high moisture content of waste materials handled on Site. As such, a quantitative assessment of odour impacts and qualitative assessment of dust impacts have been undertaken. Assessment of odour impacts for the proposed Development utilised the TAPM, and CALMET meteorological processor and the CALPUFF dispersion model.

The AQIA was based on a conventional approach following the procedures outlined in the NSW EPA's *Approved Methods for the Modelling and Assessment of Pollutants in NSW* (DEC 2005).

#### 8.1.2 Existing Environment

##### Land Use and Sensitive Receivers

The Site is located within the Dunheved Industrial Precinct and is surrounded by a number of industry types including steel, paint, timber, fencing, paint and stationary manufacture and waste recycling services.

Neighbouring premises within the industrial estate include:

- Linfox (transport and logistics);
- ARC (steel industry);
- Jasco (stationery products);
- Corinthian Doors (timber door manufacturer);
- R & G Fencing (metal fencing manufacturing);
- Australian Waste Oil Refineries (oil recycling services);
- Jaybro Civil and Safety Products (safety and environmental products); and
- Ronstin (paint manufacturers and wholesalers).

Several residential areas are located within two kilometres of the Dunheved Industrial Precinct, including Ropes Crossing, North St Marys, St Marys, Werrington and Werrington County. Adjacent to the industrial estate are the Dunheved Golf Course (west of Links Road) and the St Marys Leagues Stadium (east of Forrester Road). The nearest sensitive residential receivers are located east of Forrester Road approximately 865 metres south east of the Site and due to their distance from the Site, are unlikely to be affected by odour and dust emissions from the site. The Site is not visible from residential areas.

Due to the limited sensitive residential receptors within close proximity to the Site, sensitive receptors included in this assessment have been limited to properties adjacent to the site boundary within the industrial estate. The locations of adjacent industrial buildings identified as sensitive receptors in the air quality assessment are shown in Figure 8-1.

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**AIR QUALITY - SENSITIVE RECEIVERS**  
 Environmental Impact Statement  
 Worth Recycling Facility

FIGURE 8-1

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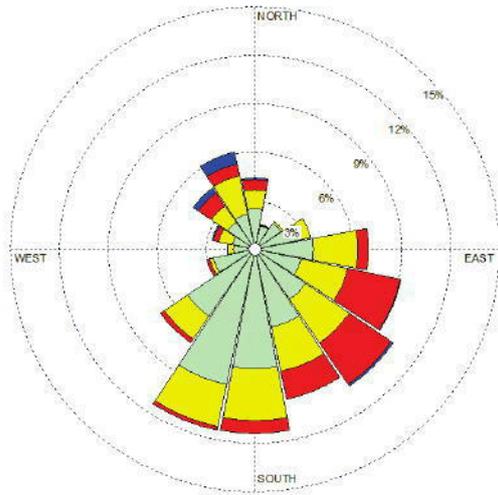
### **Dispersion Meteorology**

Wind speed and direction are important variables in dispersion modelling, as they dictate the direction and distance air pollutant plumes travel. In the absence of suitable local meteorological data, the CSIRO *The Air Pollution Model* (TAPM) and the CALMET meteorological processors were used to simulate the complex metrological patterns that exist within the study area, accounting for the effects of local topography and changes in land surface characteristics.

Annual and seasonal wind roses for 2011 generated from the CALMET data are presented in Figure 8-2. It can be seen from Figure 8-2 that, on an annual basis, the dominant wind direction is from the south, away from the nearest residential sensitive receivers located southeast of the Site. A similar trend is observed during each season. The average wind speed from the CALMET data was found to be 1.9 m/s, which represents a light wind speed. Seasonally, the average wind speed is similar for all seasons with the exception of summer which is slightly higher at 2.1 m/s.

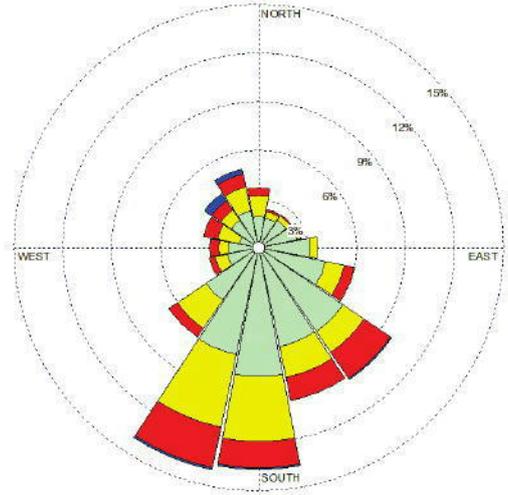
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Summer (2011) St Marys



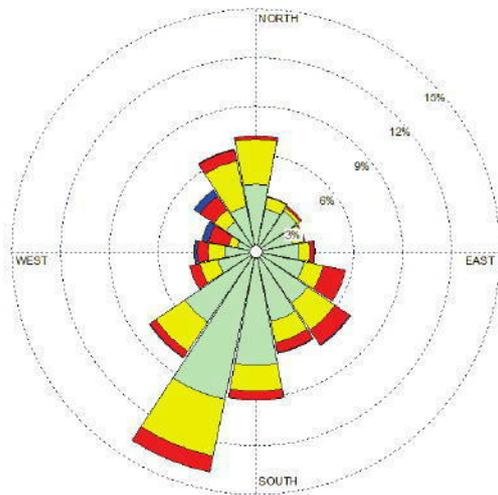
Calms: 4.9%

Autumn (2011) St Marys



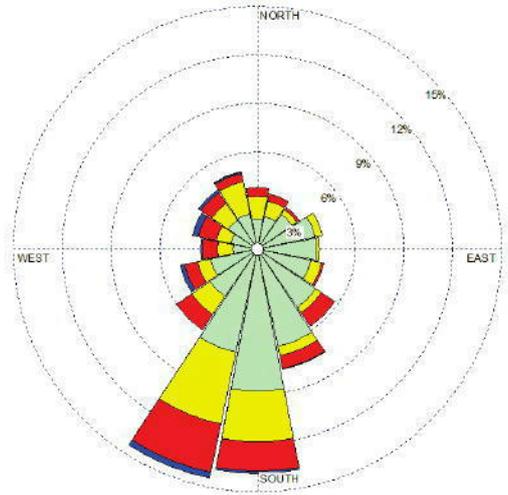
Calms: 7.1%

Spring (2011) St Marys



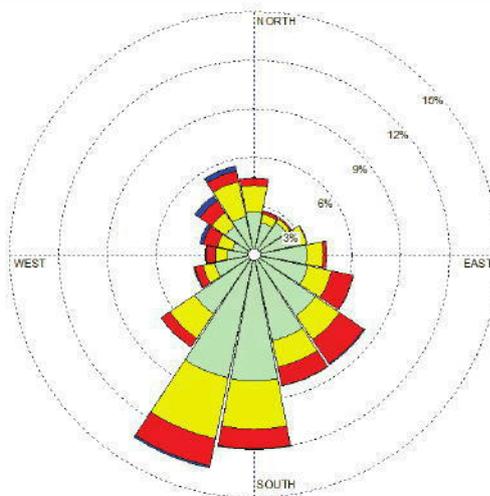
Calms: 8.3%

Winter (2011) St Marys

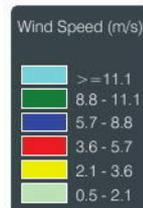
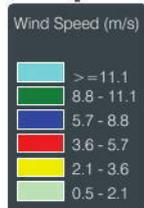
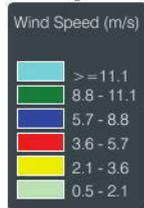


Calms: 6.9%

Annual (2011) St Marys



Calms: 6.8%



I:\Groups\ENV\GIS\602 Projects\60283208 Worth Recycling\FIGURES\ES\60283208 F8-2 Annual Seasonal Wind Rose 22\_04\_2013.T0



ANNUAL SEASONAL WIND ROSE FOR ST MARYS  
Environmental Impact Statement  
Worth Recycling Facility

Data Source: Calmet

FIGURE 8-2

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### Assessment Criteria

The main pollutants of interest for a waste processing facility, such as that proposed for St Marys, are odour and dust (particulates). Assessment criteria for both are discussed below.

#### Odour

The perception of odour is highly individual and varies between individuals based on their sensitivity, the acuteness of their sense of smell, and their prior history with different odours. Odour characteristics also affect people's perception of it; some odours are pleasant, while others are offensive. Offensive odours can adversely affect people's quality of life, and exposure can result in stress and other physical symptoms.

The odour threshold is the theoretical minimum concentration of a chemical that produces an olfactory response, which, in practice, is used to indicate whether an odour is detectable. The odour threshold defines 1 odour unit (1 OU) for each chemical. The threshold relates to odour detection and does not consider the recognition of an odour's character.

The EPA's impact assessment criteria for complex mixtures of odours (DEC, 2005) were designed to take into account the ranges of individual sensitivity to odours based on a statistical approach according to the size of the surrounding population. As population density increases, the proportion of sensitive individuals is also likely to increase; as such, areas with larger populations require more stringent criteria. The criteria are shown in Table 8-1.

Table 8-1 EPA Impact Assessment Criteria – Complex Odours

Population	Criteria (OU)*
Urban ( $\geq$ ~2000) and/or schools and hospitals	2
~ 500	3
~ 125	4
~ 30	5
~ 10	6
Single residence ( $\leq$ ~2)	7
*99th percentile nose response time	

The proposed Development Site is located within an industrial precinct, with the nearest sensitive residential receivers located approximately 865 metres south east of the Site. Due to the limited proximity of urban residential land use surrounding the Site, an odour assessment criterion of 3 OU has been adopted for this assessment to satisfy the EPA's concerns regarding odour impacts to industrial properties adjacent to the property boundary.

#### Dust

Of particular relevance to the proposed Development are criteria for particulate matter. As such, the following pollutants were assessed as part of the AQIA:

- Particulate matter with equivalent aerodynamic diameter  $\leq$  10 microns ( $PM_{10}$ );
- Particulate matter with equivalent aerodynamic diameter  $\leq$  2.5 microns ( $PM_{2.5}$ );
- Total suspended particulates; and
- Deposited dust.

Particles within the  $PM_{10}$  and  $PM_{2.5}$  fractions generally enter the body via inhalation. Once in the lungs, particles can have a direct physical effect and/or be absorbed into the blood. Total suspended particulates may also be deposited in the mouth, throat or nose and can be ingested. Airborne particulate matter can be generated by vehicles from direct emissions from the burning of fuels (especially diesel powered vehicles) and from wear of tyres or vehicle-generated air turbulence on roadways. Particles may also be generated from earthworks, wind erosion, and construction activities.

PM<sub>10</sub> particles are easily entrained into the air by wind or disturbances. Airborne particulate matter may also react with other substances in the atmosphere, reduce visibility, increase the possibility of precipitation, fog and clouds and reduce solar radiation. Additionally, particulate matter may cause similar respiratory impacts in animals as to humans.

Table 8-2 summarises the NSW EPA impact assessment criteria for the pollutants included in the assessment. In general, these criteria relate to the total burden of air pollutants in the air and not just the air pollutants from project-specific sources. Therefore, some consideration of background levels needs to be made when using these criteria to assess impacts.

**Table 8-2 NSW EPA Air Quality Impact Assessment Criteria (DEC 2005)**

Pollutant	Averaging Period	Criteria
Particulate matter (PM <sub>10</sub> )	Maximum 24-hour average	50 µg/m <sup>3</sup>
	Annual average	30 µg/m <sup>3</sup>
Particulate matter (PM <sub>2.5</sub> )*	Maximum 24-hour average	25 µg/m <sup>3</sup>
	Annual average	8 µg/m <sup>3</sup>
Total suspended particulate (TSP)	Annual average	90 µg/m <sup>3</sup>
µg/m <sup>3</sup> = micrograms per cubic metre		
*National Environment Protection Measures (NEPM) Advisory reporting standards only		

The NSW EPA's criteria for TSP and deposited dust were set to protect against nuisance impacts, while the PM<sub>10</sub> criteria were set to protect against adverse health effects. There is an increasing body of evidence to suggest that criteria for finer particulate matter (for example, PM<sub>2.5</sub>) may be more important for protecting against adverse health impacts; at this stage, however, the NSW EPA has not set criteria for PM<sub>2.5</sub> that are applied on a project-specific basis, and the criteria specified above represent the NEPM advisory reporting standards.

### Existing Air Quality

#### *Odour*

No existing odour complaint data for the Site was available; however, the local air quality in the vicinity of the Site is expected to be typical of that experienced in any industrialised area. Of particular note are other manufacturing and waste businesses such as Nepean Rubber and Plastics, paint manufacturing, and waste storage located within the Dunheved Industrial Precinct, as well as the St Marys sewage treatment plant located approximately 780 metres to the north of the site.

#### *Dust*

The EPA operates a number of air quality monitoring stations in northwest Sydney. The closest monitoring station to the proposed Development is located at St Marys (6km south of the site). This station records hourly PM<sub>10</sub> concentrations using a Tapered Element Oscillating Microbalance (TEOM). The maximum 24-hour concentration measured at St Marys in 2012 (the most recent year for which data are available) was 34 µg/m<sup>3</sup> which is below the EPA 24-hour maximum criterion of 50 µg/m<sup>3</sup> (EPA, 2013). The annual average PM<sub>10</sub> concentration was recorded at 14 µg/m<sup>3</sup> for 2012 which is under the EPA annual average criterion of 30 µg/m<sup>3</sup> (EPA, 2013).

No measurements of local PM<sub>2.5</sub> and TSP ambient air quality concentrations were available. In the absence of existing annual TSP concentration data, the annual PM<sub>10</sub> concentration can be assumed to be 40 percent of the annual TSP concentration; this is a conservative approach as per data reported by the NSW Minerals Council (2000). This equates to an annual TSP concentration of 35 µg/m<sup>3</sup>, which is below the NSW EPA criterion of 90 µg/m<sup>3</sup>.

### 8.1.3 Potential Impacts

#### Potential Emission Sources

##### *Odour*

During operation, the treatment and storage of waste products would largely be undertaken in partially enclosed areas (namely Area 1, 2, 3 and 4) limiting potential odour impacts offsite including at surrounding industrial properties.

Waste streams which have the potential to generate odorous emissions would include:

- Soils (including those classified as hazardous, restricted and general waste and ASS);
- Refinery sludge;
- Grease oil;
- Drill muds,
- Stormwater and canal dredgings; and
- Oil filters.

The type and quality of the above waste streams on-site are likely to vary, which would alter odour impacts on-site at any given time. Some odour emissions are also anticipated to be temporary in nature. For example oil filters (as currently treated at the South Windsor Facility) pose only a short term odour impact, as oil filters which are crushed at the Site are stored within a skip bin and taken off-site for recycling. Also ASS, which has the potential to emit hydrogen sulphide, would only cause temporary odour impacts, prior to being neutralised. Furthermore the type of odour would be largely dependent on the nature of the contaminants contained in the waste materials received.

Odour emission monitoring was conducted by AECOM at the Worth Recycling South Windsor Facility during March 2013. Odour emissions at the South Windsor Facility are anticipated to be representative of the odour emissions from solid and liquid wastes to be treated and stored at the St Marys site. Monitoring was conducted at six locations, which were chosen in order to encompass the potential odour sources at the St Marys Facility, and to provide data which would assist in the preparation of the air quality assessment. Based on the odour sampling undertaken at the South Windsor Facility, the largest contributing waste stream to odour emissions on-site would be grease oil solids and liquids.

There are no potential sources of odour anticipated during the construction phase of the proposed Development.

##### *Dust*

The principal air pollutant likely to be associated with the construction of the proposed Development would be dust generated through excavation activities for the drainage systems and treatment pits, and potentially dust generated by vehicles tracking mud onto adjoining streets when exiting the site. During operation, potential sources of dust emissions would largely arise through tracking of dirt onto the hardstand areas and subsequent disturbance by heavy and/or light vehicle movements within the site.

#### Assessment Results

##### *Odour Impacts*

Results of the odour modelling are shown in Table 8-3 and Figure 8-3. The following points should be noted when reviewing the results:

- Modelling of area sources does not account for the enclosed nature of each source within warehouses which would largely contain odour emissions on-site. Thus modelled odour concentrations are likely to over-predict offsite odour impacts.
- The model scenario assumes the Facility is operating with average odour emissions for each individual source obtained from sample data collected during March 2013 at the South Windsor Waste Management Facility.

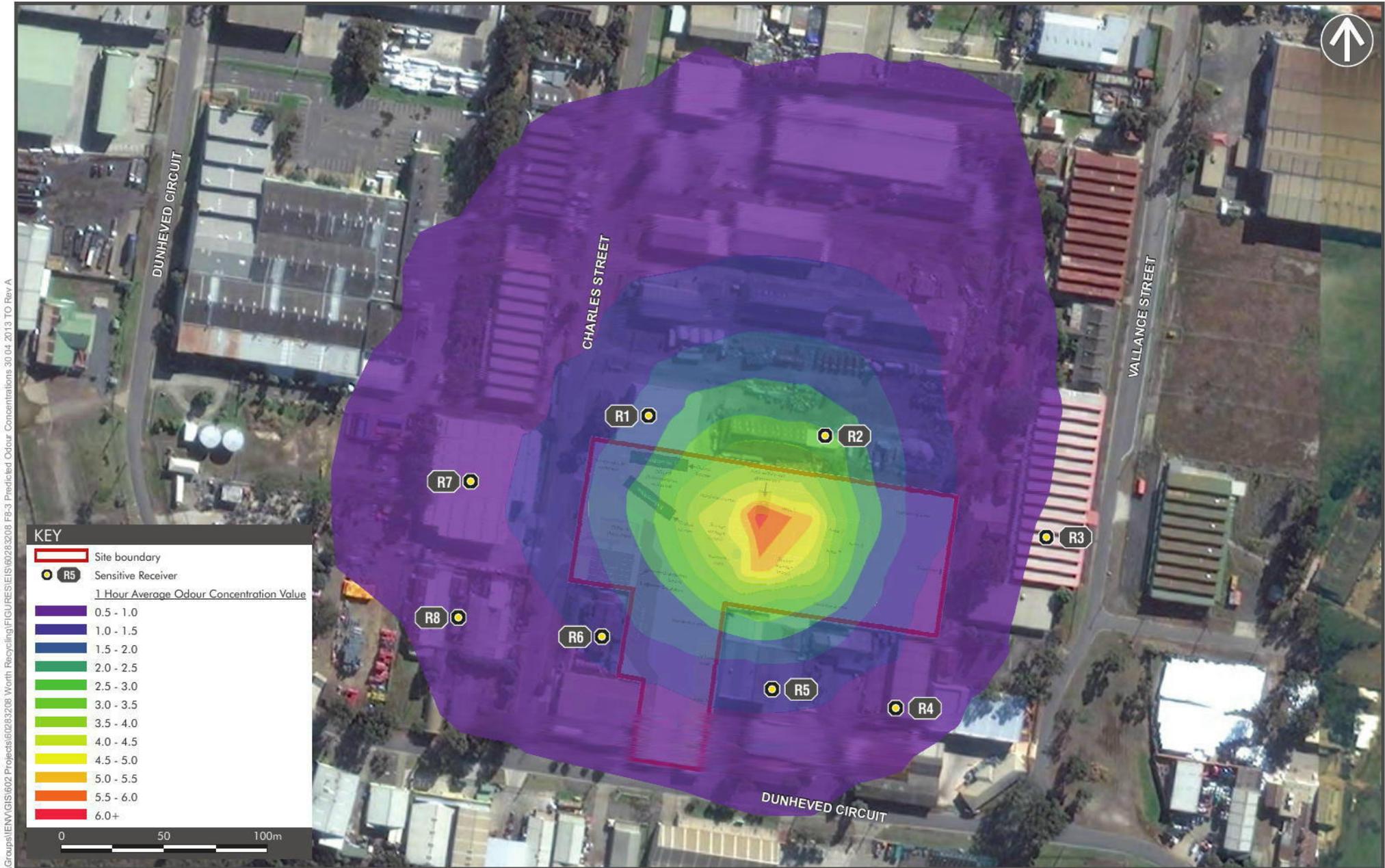
Results of the modelling indicate that the maximum 1-hour (99th percentile) 3 OU criterion contour extends outside the site boundary for the proposed expansion scenario. A contour plot for the predicted maximum 1-hour (99th percentile) odour concentration for the proposed scenario is presented in Figure 8-3. The plume is orientated in a northerly direction, dictated by the dominant southerly winds as described in Section 8.1.2.

Table 8-3 shows the model predictions at the nearest sensitive receptors (nearby industrial buildings). It can be seen that all sensitive receptor locations (refer to Figure 8-1) are predicted to experience odour levels below the 3 OU criterion. The model predictions show that sensitive receivers to the north would experience the highest odour concentrations with a concentration of 1.6 and 2.6 OU (99th percentile) predicted at sensitive receptors 1 and 2 respectively.

Given the partially enclosed nature of the odour emission sources and predicted concentrations at nearby sensitive receptors, the modelling suggests that the operation of the proposed Development is unlikely to cause adverse odour impacts beyond the Site boundary. There are no potential sources of odour anticipated during the construction phase.

**Table 8-3 Predicted Maximum 1-Hour Ground Level Odour Concentrations (99<sup>th</sup> percentile)**

Sensitive Receptor	Maximum 1-hour Odour Concentration (99 <sup>th</sup> Percentile) (OU)
1	1.6
2	2.6
3	0.5
4	0.7
5	1.2
6	1.1
7	0.6
8	0.8
<b>Criterion</b>	<b>3.0</b>



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### *Dust Impacts*

#### **Construction**

During construction there is the potential for particulate matter emissions to be generated from earthworks. Fugitive dust sources present during construction of the proposed Development would include earthmoving activities from the excavation and construction of pits for waste storage, construction of a catch drain, cleared groundcover and topsoil and stockpiling of spoil and construction materials.

Dust emissions from soil piles would depend on a number of factors including the moisture content and soil texture. Particulate matter emissions from general construction activities depend on-site characteristics, the moisture content of the disturbed soil and the particular type of activities being carried out.

The impact of fugitive dust sources are generally related to the quantity and drift potential of the dust particles. Larger particles generally settle near the source, whereas finer particles (PM<sub>10</sub> particles) can be dispersed over greater distances. The closest residential receivers lie approximately 865 metres south east of the Site and thus dust impacts from construction are unlikely to affect nearby residences. However, there is potential for construction dust from the proposed Development to impact the local air quality of the Dunheved Industrial Precinct. Continuous management of dust generated on-site during the construction phase through the use of standard dust mitigation techniques, as well as use of the existing on-site sweeper and truck wash facility, would minimise the spread of construction dust generated.

#### **Operation**

Potential dust impacts during operational activities on-site would largely arise from the tracking of dirt onto hardstand areas and subsequent disturbance by heavy and/or light vehicle movements within the Site. Waste streams onsite including drill muds and soil would be maintained with some level of moisture, minimising potential dust impacts. Waste streams would also be stored within the building or within external bunkers south and west of Area 1 and along the eastern boundary of the Site. The external bunkers would be provided with canvas roofing mounted on a retractable frame to mitigate against potential dust impacts. The existing truck wash near Area 6 would continue to be used to remove dust and dirt from vehicles prior to their leaving the Site.

In light of the high moisture content of waste materials handled on-site, and the majority of the treatment operations at the Site being undertaken undercover in partially enclosed areas, potential operational dust impacts were not considered to be a key issue for the proposed Development. With the implementation of suitable mitigation measures as described in Section 8.1.4, no impacts on local air quality due to dust emissions during the operational phase are anticipated.

#### **8.1.4 Mitigation Measures**

##### **Odour**

Taking into account both the relatively enclosed nature of the odour emission sources and the modelling results, it is not expected that the proposed Development, operating under typical conditions would have a significant impact beyond the immediate location of the odour sources. As such no odour mitigation measures would be required.

In the event that frequent increases in odour at adjoining industrial premises is observed, Worth would investigate the introduction of feasible and reasonable odour controls, which due to the variable nature of the Site feedstock, would be determined on a case by case basis.

Assessment of odour impacts at the St Marys site has been limited to the odour emission sources currently present under standard operating conditions at Worth's South Windsor Facility. Conservatively, the currently present waste streams at the South Windsor Facility have been assumed to occupy all pit and bunker waste holding sites at the Site. It should be noted however, that the South Windsor Facility at the time of testing was not treating refinery sludge which could be considered an additional odour source to be held with the available waste holding sites within the existing warehouse.

**Dust**

Appropriate dust management measures would be implemented throughout the duration of the construction phase and would include:

- Continued use of the street sweeper during construction activities at the Site;
- Watering of exposed soils when necessary;
- Water sprays for dust-generating excavation activities;
- Covering of trucks removing spoil; and
- Avoidance or minimisation of dust-generating activities, wherever practical, during high wind conditions.

Potential dust impacts resulting from operation of the proposed Development were not considered a key issue due to the high moisture content of waste materials handled onsite and the majority of the treatment operations at the site being undertaken undercover in partially enclosed areas. The Site does, and would continue to, mitigate dust by using a street sweeper during operation to minimise the spread of construction dust generated. Other proposed operational mitigation measures include:

- Ensure soils maintain a suitable moisture content pre and post treatment to minimise dust impacts, and water exposed soils where necessary;
- Dust-generating activities undertaken outside the warehouse would be avoided or minimised, wherever practical, during high wind conditions.

The following EPL conditions would be adhered to throughout construction and operation of the proposed Development:

- Onsite activities would not create visible dust emissions at the Site boundary; and
- Dust mitigation infrastructure, such as sprinklers, hoses and/or street sweepers shall be installed, maintained and operated within the Site to effectively suppress dust emissions.

## 8.2 Noise and Vibration

The EIS must consider Noise, including construction, operation and traffic noise in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors.

### 8.2.1 Introduction

As part of the preparation of this EIS, and in accordance with the DGRs for the proposed Development, a Noise and Vibration Impact Assessment (NVIA) has been undertaken by AECOM, which includes the following:

- The establishment of maximum noise limits applicable to construction and operation of the proposed Development, as well as for expected traffic generation;
- An assessment of noise from predicted construction and operational traffic generated from the proposed Development against the existing traffic flow;
- The provision of noise model for the proposed Development Site;
- An assessment of the likely noise and vibration impact from construction activities on nearby sensitive receivers; and
- An assessment of the likely noise impact from operational activities from operational activities on nearby sensitive receivers.

The NVIA was prepared in accordance with the following guidelines and policies:

- *Interim Construction Noise Guidelines* (ICNG) (Department of Environmental, Climate Change and Water (DECCW, 2009);
- *Road Noise Policy* (RNP) (DECCW, 2011);
- *Industrial Noise Policy* (INP) (EPA, 2000); and
- *Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation (DEC), 2009).

The NVIA is provided in Appendix E, and summarised in Section 8.2.2 to Section 8.2.4.

### 8.2.2 Existing Environment

#### 8.2.2.1 Sensitive receivers

The Site is located within the Dunheved Industrial Precinct and is surrounded by industrial land uses. Residential areas are located within the suburbs of Werrington, Werrington County, North St Marys, Ropes Crossing and Tregear, with the nearest residential receiver is located 865 metres south-east of the proposed Development at 199 Forrester Road, North St Marys. Other land uses in proximity to the Site include the Dunheved Golf Course, commercial premises (St Marys League Club and McDonalds) and a school (Chiefly College).

The sensitive receivers located within 1.5 kilometres of the Site, for the purposes of this EIS, have been divided into noise catchment areas, which include the industrial, residential, and commercial sensitive receivers, as well as the active recreational area (golf course) and the school, detailed in Table 8-4.

Sensitive receivers within these noise catchment areas, as illustrated in Figure 8-4 have been chosen for assessment as they represent the highest noise affected receivers within their classified noise catchment area. As such, compliance at these selected receivers would demonstrate compliance at other sensitive receivers within the noise catchment area.

Table 8-4 Sensitive Receiver Locations

Category of Sensitive Receiver	Description
Industrial Receivers	<p>Industrial receivers are located within two areas; the Dunheved Industrial Precinct within which the proposed Development is located and the industrial area immediately south of the precinct and west of Forrester Road. The industrial receivers most affected by the proposed Development are described as receivers I1 to I5 on Figure 8-4, and include:</p> <ul style="list-style-type: none"> <li>- 40A Charles Street (I1);</li> <li>- 40B Charles Street (I2);</li> <li>- 48 Charles Street (I3);</li> <li>- 50 Charles Street (I4); and</li> <li>- 101-104 Dunheved Street (I5).</li> </ul>
Residential Receivers	<p>Sensitive residential receivers are located within the suburbs of Werrington, Werrington County, North St Marys, Ropes Crossing and Tregear. The nearest residential receiver is located 865 metres south-east of the proposed Development at 199 Forrester Road, North St Marys (receiver R1 on Figure 8-4). The residential receivers most affected by the proposed Development, described as receivers R1 to R5 on Figure 8-4 are:</p> <ul style="list-style-type: none"> <li>- 199 Forrester Road (R1);</li> <li>- 11 Townsend Crescent (R2);</li> <li>- Residents in the southern portion of Ropes Crossing (R3);</li> <li>- 189 Boronia Road (R4); and</li> <li>- Residents in the western portion of Tregear (R5).</li> </ul>
Active Recreational Area	<p>Dunheved Golf Course is located 600 metres west of the proposed Development. The potentially most affected locations of the golf course would include the golf house, nearby tee-off points and greens, indicated as GF1 to GF5 on Figure 8-4.</p>
Commercial Facilities	<p>The nearest commercial facilities are St Marys League Club and McDonalds noted as receivers C1 and C2 on Figure 8-4. These facilities are located on the eastern side of Forrester Road at the intersection with Boronia Road, approximately 800m south-east of the proposed Development.</p>
School	<p>Chiefly College (marked as S1 on Figure 8-4) is located 1.15 kilometres south-east of the proposed Development.</p>



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**NOISE - SENSITIVE RECEIVERS**  
 Environmental Impact Statement  
 Worth Recycling Facility

FIGURE 8-4

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### 8.2.2.2 Existing Noise Environment

To gain an appreciation of the existing noise environment, continuous and attended noise monitoring was undertaken. This is discussed further below.

#### *Continuous Noise Monitoring*

Continuous noise monitoring was undertaken using a noise logger between 12 March 2013 and 20 March 2013, to determine the existing background noise levels or rating background level (RBL) at sensitive residential receivers. The RBL is representative of the lowest background sound level for any residential sensitive receiver considered within the NVIA. The RBL, representing day, evening and night time assessment periods is the average of the individual assessment background levels (ABL) determined over the entire monitoring duration. ABLs are established by determining the lowest tenth-percentile ( $L_{A90}$ ) of the noise data acquired over each period of interest.

The noise logger was positioned on the front yard of 144 Ayrell Street, St Marys. This location was selected taking into consideration the nearest residential receiver locations (Figure 8-4), which were expected to be the most affected. In addition, this location was chosen as it was not adjacent to Forrester Road, therefore avoiding traffic noise contributions to the background noise environment and resulting in more conservative criteria for noise criteria.

The logger results for the monitoring period and the RBLs are detailed in Table 8-5 below.

**Table 8-5** Logger results – existing background ( $L_{A90}$ ) and ambient noise levels ( $L_{Aeq}$ )

Measurement Date	$L_{A90}$ Background noise Levels, dB(A)			$L_{Aeq}$ , Ambient Noise Levels, dB(A)		
	Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>	Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>
Wed 13, March	40	38	33	63	53	50
Thurs 14, March	41	36	33	58	53	49
Fri 15, March	40	36	31	55	54	51
Sat 16, March	39	36	N/A <sup>4</sup>	55	52	N/A <sup>4</sup>
Sun 17, March	41	38	34	55	52	48
Mon 18, March	39	N/A <sup>4</sup>	N/A <sup>4</sup>	57	N/A <sup>4</sup>	N/A <sup>4</sup>
Tues 19, March	38	N/A <sup>4</sup>	N/A <sup>4</sup>	56	N/A <sup>4</sup>	N/A <sup>4</sup>
<b>RBL/Log Average</b>	<b>40</b>	<b>36</b>	<b>33</b>	<b>58</b>	<b>53</b>	<b>49</b>

Notes:

- 1) Day is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sunday and Public Holidays
- 2) Evening is defined as 6:00pm to 10:00pm, Monday to Sunday Public Holidays
- 3) Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays and Public Holidays
- 4) Measurement affected by adverse weather conditions

#### *Attended Noise Monitoring*

Ambient noise characteristics of sensitive residential receivers were determined through attended noise monitoring, undertaken at 15 minute intervals between 7pm and 8pm on 19 March 2013 (classified as the evening time period in the INP). This was undertaken in conjunction with the continuous noise monitoring to determine RBLs for the assessment. The monitoring period was considered representative given the reduced traffic noise contributions relative to the proposed operational activities.

The continuous equivalent noise levels (dB) were recorded across a range of spectra, varying from an octave band centre frequency of 31.5 Hz to 8000Hz. The spectra recorded were then used throughout the remainder of the NVIA as representative of the background noise at sensitive receivers.

The acoustic environment was predominantly comprised of road noise from vehicles travelling along adjacent local roads and also from Forrester Road. Table 8-6 presents spectra recorded during the attended measurement.

Table 8-6 Continuous equivalent noise levels ( $L_{Aeq}$ ) in octave frequency bands

Time period	$L_{eq}$ , continuous equivalent noise levels, dB									Overall $L_{Aeq}$ , dB(A)
	Octave Band Centre Frequency, Hz									
	31.5	63	125	250	500	1000	2000	4000	8000	
Evening	53	57	53	50	45	47	41	36	31	50

### 8.2.3 Potential Impacts

#### 8.2.3.1 Construction Noise

##### Assessment Criteria

The ICNG was used as a basis for establishing construction noise management levels (NMLs) for the proposed Development. NMLs must be set for the standard working hours, defined by the ICNG as 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays and incorporated into a construction noise management plan to be prepared prior to the commencement of construction.

The ICNG recommends that a quantitative assessment is carried out for all 'major construction projects that are typically subject to an EIA process'. A quantitative assessment, based on a likely 'worst case' construction scenario has therefore been carried out for the proposed Development. Predicted noise levels at nearby noise sensitive receivers have been determined in accordance with the provisions of Section 4.5 of the ICNG, and an NML for the construction of the proposed Development has been determined using the guidance provided in the ICNG for setting and applying NMLs as detailed in Table 3 of Appendix E.

As such, the applicable NML levels for this assessment are as follows for the relevant sensitive receivers during standard working hours:

- Residential premises – 50 dB(A);
- Schools – 45dB(A) (internal noise level);
- Active recreational areas – 65dB(A)
- Industrial premises – 75dB (A).

##### Construction Noise Assessment Methodology

The assessment of construction noise associated with the proposed Development has been undertaken based on a list provided by Worth, detailing the works that are planned to take place during the construction phase (Appendix F of Appendix E).

SoundPLAN 7.0 was used to model construction scenarios for the proposed Development under neutral weather conditions. The following assumptions were applied when modelling the construction scenario:

- Two work packages were modelled:
  - A general works package, which includes all sources except for the hydraulic rock breaker; and
  - Excavator with a rock breaking hammer
- The construction works were assumed to occur within discrete areas of the Site, and a conservative assumption was made that general construction works would take place across the majority of the Site (refer to Figure 4-1).
- All buildings within the construction works footprint (Figure 4-1) have been removed, providing a conservative assessment as it would be expected that the existing buildings would provide some level of noise attenuation during construction.
- The existing concrete perimeter fence would remain in place and would not change in height throughout the construction works; and
- All noise sources (i.e. all construction activities) would occur simultaneously. Although this is unlikely, it provides a more conservative prediction of noise levels during construction.

Results of the construction noise assessment are provided in Section 8.2.3 of this EIS.

### Construction Noise Sources

Construction of the proposed Development would require the use of a range of plant and equipment which would generate a range of noise sources. Table 8-7 details these noise sources, including the estimated quantity, sound power levels and representative source heights.

Table 8-7 Construction Noise Sources

Plant and Equipment (Noise Source)	Quantity	Representative Source Height, m	Unit SWL, dB	Total SWL, dB
100t Crane	1	3	100	100
20t Franna Crane	1	3	93	93
13t Excavator with rock breaking hammer	1	0.5	112	112
Angle Grinders	2	3	108	111
20t Excavators	2	3	99	102
Scissor Lifts	2	3	100	103
Mobile Cranes	2	3	104	107
Hand Tools (Electrical/Mechanical)	3	3	94	99
Concrete Pumps and delivery trucks	1	3	106	106
Portable Compressor	3	0.5	109	114

### Assessment Results

The result of the noise modelling at each sensitive receiver illustrated in Figure 8-5 is presented in Table 8-8 below. Figure 8-5 illustrates the 50 dB (A) and 75 dB (A) noise contours, which are the residential and industrial noise management levels respectively. Figure 8-5 demonstrates that the NML is not exceeded for sensitive receivers in the vicinity of the proposed Development, with the 50dB (A) noise contour (which represents the most stringent NML for any assessed sensitive receiver) contained within the Dunheved industrial precinct, where only industrial receivers are located. It is therefore considered that construction noise as a result of the proposed Development would comply with respective noise criteria at all receivers.

Table 8-8 Construction Noise Results

ID	Location	Receiver Type	NML, $L_{Aeq}$ 15min, dB(A)	Predicted Noise Level, $L_{Aeq}$ 15min, dB(A)	Compliance (Y/N)
<b>Standard Working Hours</b>					
R1	199 Forrester Rd	Residential	50	36	Y
R2	11 Townsend Cres	Residential	50	35	Y
R3	Eastern Residents	Residential	50	33	Y
R4	189 Boronia Rd	Residential	50	37	Y
R5	South West Residents	Residential	50	34	Y
S1	Chifley College	School classroom	45	35 <sup>1</sup> (25)	Y
C1	McDonalds, St Marys	Commercial	70	39	Y
C2	Leagues Club	Commercial	70	40	Y
GF1	Golf House	Active recreation	65	42	Y
GF2	Golf Course	Active recreation	65	42	Y
GF3	Golf Course	Active recreation	65	41	Y
GF5	Golf Course	Active recreation	65	40	Y
GF4	Golf Course	Active recreation	65	41	Y
I1	40A Charles St	Industrial	75	63	Y
I3	48 Charles St	Industrial	75	65	Y
I2	40B Charles St	Industrial	75	53	Y
I4	101-104 Dunheved Ct	Industrial	75	54	Y
I5	50 Charles St	Industrial	75	46	Y

**Note:**

- 1) The predicted noise level is an external noise level. The predicted internal noise level has been provided in brackets using the common assumption that an external façade with an open window typically provides 10 dB (A) attenuation.

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### 8.2.3.2 Construction Vibration

#### Assessment Criteria

The EPA's *Assessing vibration: A Technical Guideline* has been designed to be used in evaluating and assessing the effects of vibration emissions from industry, transportation and machinery. The guideline is used in assessments of vibration impacts caused by the construction and operation of new developments.

Vibration criteria are set primarily according to whether the particular activities of interest are continuous in nature or intermittent, whether they occur during the daytime or night-time, and the type of receiver to be assessed e.g. commercial or residential. The effects of vibration in buildings can be divided into three main categories:

- Those in which the occupants or users of the building are inconvenienced or possibly disturbed, i.e. human disturbance or discomfort;
- Those in which the integrity of the building or the structure itself may be prejudiced; and
- Those where the building contents may be affected.

Therefore, vibration levels at sensitive receiver locations must be controlled so as to prevent discomfort and regenerated noise, and in some extreme cases, structural damage.

The EPA's publication *Assessing vibration: A Technical Guideline* recommends safe working distances to minimise disturbance to occupants of nearby buildings and is based on *British Standard BS 6472 'Evaluation of human exposure to vibration in buildings'*. Safe working distances for vibration inducing equipment are listed in Table 8-9.

**Table 8-9 Recommended safe working distances for vibration intensive plant**

Plant	Rating/Description	Safe Working Distance	
		Cosmetic Damage	Human Response
Vibratory Roller	< 50 kN (Typically 1-2T)	5 m	15-20 m
	< 100 kN (Typically 2-4T)	6 m	20 m
	< 200 kN (Typically 4-6T)	12 m	40 m
	< 300 kN (Typically 7-13T)	15 m	100 m
	> 300 kN (Typically 13-18T)	20 m	100 m
Small Hydraulic Hammer	(300 kg – 5-12T excavator)	2 m	7 m
Medium Hydraulic Hammer	(900 kg – 12-18T excavator)	7 m	23 m
Large Hydraulic Hammer	(1,600 kg – 18-34T excavator)	22 m	73 m
Vibratory Pile Driver	Sheet piles	2–20 m	20 m
Pile Boring	≤ 800 mm	2 m	N/A
Jackhammer	Handheld	1 m nominal	Avoid contact with structure

### Assessment Results

The construction of the proposed Development would require the use of a range of construction plant and equipment, as detailed in Table (Table 8-12). This includes a 13 tonne excavator with a hydraulic rock breaking hammer. Due to the vibration intensive nature of the rock breaker, the safe working distance from this equipment for cosmetic damage is seven metres and 23 metres for human response.

The use of vibratory intensive equipment, namely a 13 tonne excavator with a hydraulic rock breaking hammer has the potential to cause human discomfort to occupants of neighbouring properties; specifically 48 Charles Street, approximately 12 metres from the proposed construction works. Mitigation measures to avoid or control the effects of vibration from the construction activities have been provided in Section 8.2.4.2.

### 8.2.3.3 Operational Noise

#### Operational Noise Criteria

The INP provides guidance and recommendations on the assessment of noise impacts from industrial and commercial facilities throughout all defined day, evening and night periods. The assessment procedure for industrial noise sources has two components that must be satisfied; intrusiveness criteria and amenity criteria.

#### Intrusiveness criteria

The INP states that the noise from any single source should not intrude greatly above the prevailing background noise level. The industrial noises are generally considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source ( $L_{Aeq}$ ), measured over a 15 minute period, does not exceed the background noise level measured in absence of the source by more than 5 dB. Adjustments are to be applied to the level of noise produced if the noise at the receiver contains annoying characteristics such as tonality or impulsiveness.

#### Amenity criteria

To limit continuing increases in noise levels, the maximum ambient noise level resulting from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the INP. That is, the ambient  $L_{Aeq}$  noise level should not exceed the level appropriate for the particular locality and land use.

The amenity criteria as defined in the INP are shown in Table 8-10, for residential sensitive receivers in suburban areas, and for other various types of receivers.

Table 8-10 Recommended  $L_{Aeq}$  noise levels from industrial noise sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended $L_{Aeq}$ Noise Level, dB(A)	
			Acceptable	Recommended Maximum
Residence	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
Active recreation area (e.g. school playground, golf course)	All	When in use	55	60
School classroom - internal	All	Noisiest 1-hour period when in use	35	40
Commercial premises	All	When in use	65	70
Industrial premises	All	When in use	70	75

The residential sensitive receivers in this study are defined as 'Suburban' for the purposes of this noise assessment. A summary of the applicable intrusive and amenity criteria for nearby residential receivers for the proposed Development is given in Table 8-11. These criteria must be applied at the most affected boundary; if this is more than 30 metres from the residence, the criteria would be applied at the most-affected point within 30 metres of the residence. Residences within this assessment are classified as being located in a suburban area. The background noise level measured at 144 Ayrell St was used to form the criteria for all residential receivers within this assessment. This criteria is considered to be conservative, as this location is likely to have a low background noise level in comparison to other surrounding residences.

Active recreational areas should be assessed at the most-affected point within 50 metres of the area boundary. School classrooms should be assessed as internal noise levels. The outdoor to indoor noise reduction is generally accepted as being 10 dB (A) with windows open, and 20 dB (A) with windows closed.

Table 8-11 Summary of environmental noise criteria for residential sensitive receivers

Period	RBL ( $L_{A90}$ )	Intrusive Criterion RBL + 5	Ambient ( $L_{Aeq}$ )	Amenity Criteria	Final Environmental Criteria
Day	40	45	58	48	45
Evening	36	41	53	43	41
Night	33	38	49	39	38

#### *Operational Noise Assessment Methodology*

The operational noise levels associated with the proposed Development were predicted using an implementation of the CONCAWE algorithms in the SoundPLAN 7.0 noise propagation software.

The noise model takes into account significant noise source sound level emissions and locations, screen effects, receiver locations, ground topography, general plant Site layout, plant and equipment sound power and pressure levels measured on-site, noise attenuation due to geometrical spreading, air absorption, ground absorption and the effects of the prevailing weather conditions.

All residential sensitive receivers were modelled at a height of 1.5 metres above ground level. Noise predictions were carried out at sensitive receivers identified in Figure 8-4.

Worst case weather conditions have been assessed using weather data measured at the EPA Weather Station at St Marys over three months of winter in 2012. In accordance with the INP guidelines, wind has been assessed as there is a 30 percent greater occurrence of wind speeds less than 3 m/s, source to receiver.

#### Modelled Sources and Processes

The proposed Development would largely be operational between 5am and 10pm Monday to Friday and 8am to 1pm on Saturdays. These periods of operation are defined by the INP as daytime, evening and night.

The various types of wastes received at the St Marys facility are generally treated via one of three processes, designated below as processes a) to c). Four other general operational processes form part of the site's routine and intermittent operations, designated as processes d) to g). These noise generating processes are identified below:

- a) Drills muds and stormwater and canal dredging
- b) Restricted and hazardous soils and greases refinery sludges
- c) Construction demolition waste
- d) Waste removal from Site
- e) Workshop activities
- f) Wheel washing activities
- g) Oil filter and drum storage

Provided in Appendix E are the significant noise activities within each process. Equipment locations, activity locations and vehicle movements around the Site that were included in the noise model are also shown in Appendix E.

In order to provide a conservative assessment, the model assumed that all noise sources (i.e. all operational activities) would occur simultaneously. Although this is unlikely, it provides a more conservative prediction of noise levels during operation of the proposed Development.

#### Modelled Plant and Equipment

Attended measurements were conducted by AECOM personnel at Worth's South Windsor Facility on the 12 March 2013. A series of sound pressure measurements were made to enable calculations of equipment and process sound power levels.

For activities that were not occurring on the day, sound power levels were determined from published data by the UK Department for Environment, Food and Rural Affairs (DEFRA) "Update of noise database for prediction of noise on construction and open sites" noise database. The sound power levels used in the noise model are shown in Table 8-12.

Table 8-12 Sound power levels for major equipment

Equipment/Activity	Sound Power Level, $L_{Aeq}$ dB(A)
<b>Measured</b>	
Truck moving	94
Shaker	97
Decanter and pumps	86
Jet washing	105
Auger and mixer	95
Excavator emptying/sorting cans	101
Broadband reversing beeper	109
<b>Externally Sourced</b>	
Front end loader transporting material	124
Excavator scooping into designated storage areas	118
Angle grinder grinding steel	108

As further input for calculating noise levels, Worth Recycling provided AECOM with the frequencies and durations of each activity or movement that is considered within this assessment. Using these parameters, the sound power levels of the equipment were normalised against the assessment period of 15 minutes (900 seconds).

Roller door openings for Area 1 (entry and exit) and Area 2 were included in the noise model as area sources, and the activities/equipment within the respective areas are shown in Table 8-13. The sources were taken to be positioned at the centre of the spaces, with the resulting sound power levels also presented in Table 8-13.

Table 8-13 Calculated sound power levels for shed openings

Opening	Equipment/Activities Contained	Sound Power Level, $L_{Aeq(15\text{ min})}$ dB(A)
Area 1 – Entry	- Broadband reversing beeper	111
Area 1 - Exit	- Excavator scooping into designated storage areas	109
	- Auger and mixer	
Area 2	- Decanter and pumps	99
	- Shaker	

The waste water treatment plant (Figure 4-1) has not been included into the model, as sound data has not yet been attained from the manufacturer nor was the equipment active at the South Windsor facility for attended measurements to occur. In the absence of the sound power spectrum, AECOM has provided the maximum overall sound power level which the selected waste water treatment plant may operate concurrently with all other proposed plant without altering the predicted noise levels at the assessed sensitive receivers. This is discussed further in Section 8.2.4.

#### Car Park Noise Emissions

A simple calculation was performed to assess the potential noise impacts from car parking activities at the Site on nearby sensitive receivers. The noise criteria which these noisy car park activities are assessed against are identical to those applied for the aforementioned site operations.

The sound power levels used for the activities are shown in Table 8-14. These levels have been sourced from AECOM's sound power database. Level spectrums have been provided in Appendix E of Appendix E. A cumulative assessment was then undertaken in conjunction with the outcomes of the operational noise model.

Table 8-14 Car park activities sound power levels

Activity	Time weighting reduction, dB(A)	Sound Power Level, dB(A)	Resultant Sound Power Level, dB(A), $L_{Aeq, 15min}$
Door/boot slam	3	84	81
People talking	-	79	79
Car accelerating	-	93	93

#### *Assessment Results*

Based on the assumptions and modelling parameters of the operational noise assessment, the operational noise levels associated with the proposed Development were predicted at the receiver locations indicated in Section 8.2.2.1 and Figure 8-4 under neutral and worst case weather conditions. The noise modelling results have been shown against the night time criteria, which has the more stringent of the assessable periods, as well as the evening and day time periods in Table 8-15, Table 8-16 and Table 8-17 respectively. However, it should be noted that standard operating hours for the proposed Development would typically be within the day and evening periods.

Noise contour plots for these scenarios are presented in Appendix E.

Table 8-15 Operational Noise Results – Night Time

ID	Location	Type	Criteria, L <sub>Aeq</sub> (15min), dB(A)	Predicted Noise Level L <sub>Aeq,15min</sub> , dB(A)		Exceedance, dB(A)			
				Neutral wind	Worst case weather (3 m/s wind)	Neutral weather	Worst case weather (3 m/s wind)		
<b>Night Period</b>									
I1	40A Charles St	Industrial	70	68	67	-	-		
I2	40B Charles St	Industrial	70	55	55	-	-		
I3	48 Charles St	Industrial	70	64	63	-	-		
I4	101-104 Dunheved Ct	Industrial	70	49	49	-	-		
I5	50 Charles St	Industrial	70	48	46	-	-		
C1	McDonalds, St Marys	Commercial	65	37	41	-	-		
C2	Leagues Club	Commercial	65	40	44	-	-		
S1	Chifley College	School classroom - internal	Out of School Hours						
R1	199 Forrester Rd	Residential	38	36	41		3		
R2	11 Townsend Cres	Residential	38	35	40		2		
R3	Eastern Residents	Residential	38	33	38	-	-		
R4	189 Boronia Rd	Residential	38	36	41		3		
R5	South West Residents	Residential	38	32	25	-	-		
GF1	Golf House	Active recreation	55	42	35	-	-		
GF2	Golf Course	Active recreation	55	41	34	-	-		
GF3	Golf Course	Active recreation	55	40	33	-	-		
GF4	Golf Course	Active recreation	55	40	32	-	-		
GF5	Golf Course	Active recreation	55	40	33	-	-		

Note:

The predicted noise level is an external noise level. The predicted internal noise level has been provided in brackets using the common assumption that an external façade with an open window typically provides 10 dB (A) attenuation.

Table 8-16 Operational Noise Results – Evening

ID	Location	Type	Criteria, L <sub>Aeq</sub> (15min), dB(A)	Predicted Noise Level L <sub>Aeq,15min</sub> , dB(A)		Exceedance, dB(A)			
				Neutral wind	Worst case weather (3 m/s wind)	Neutral weather	Worst case weather (3 m/s wind)		
<b>Evening Period</b>									
I1	40A Charles St	Industrial	70	68	67	-	-		
I2	40B Charles St	Industrial	70	55	55	-	-		
I3	48 Charles St	Industrial	70	64	63	-	-		
I4	101-104 Dunheved Ct	Industrial	70	49	49	-	-		
I5	50 Charles St	Industrial	70	48	46	-	-		
C1	McDonalds, St Marys	Commercial	65	37	41	-	-		
C2	Leagues Club	Commercial	65	40	44	-	-		
S1	Chifley College	School classroom - internal	Out of School Hours						
R1	199 Forrester Rd	Residential	41	36	41	-	-		
R2	11 Townsend Cres	Residential	41	35	40	-	-		
R3	Eastern Residents	Residential	41	33	38	-	-		
R4	189 Boronia Rd	Residential	41	36	41	-	-		
R5	South West Residents	Residential	41	32	25	-	-		
GF1	Golf House	Active recreation	55	42	35	-	-		
GF2	Golf Course	Active recreation	55	41	34	-	-		
GF3	Golf Course	Active recreation	55	41	33	-	-		
GF4	Golf Course	Active recreation	55	40	32	-	-		
GF5	Golf Course	Active recreation	55	40	33	-	-		

Note:

The predicted noise level is an external noise level. The predicted internal noise level has been provided in brackets using the common assumption that an external façade with an open window typically provides 10 dB (A) attenuation.

Table 8-17 Operational Noise Results – Day Time

ID	Location	Type	Criteria, L <sub>Aeq</sub> (15min), dB(A)	Predicted Noise Level L <sub>Aeq,15min</sub> , dB(A)		Exceedance, dB(A)	
				Neutral wind	Worst case weather (3 m/s wind)	Neutral weather	Worst case weather (3 m/s wind)
<b>Day Period</b>							
I1	40A Charles St	Industrial	70	68	67	-	-
I2	40B Charles St	Industrial	70	55	55	-	-
I3	48 Charles St	Industrial	70	64	63	-	-
I4	101-104 Dunheved Ct	Industrial	70	49	49	-	-
I5	50 Charles St	Industrial	70	48	46	-	-
C1	McDonalds, St Marys	Commercial	65	37	41	-	-
C2	Leagues Club	Commercial	65	40	44	-	-
S1	Chifley College	School classroom - internal	35	33 <sup>1</sup> (23)	38 <sup>1</sup> (28)	-	-
R1	199 Forrester Rd	Residential	45	36	41	-	-
R2	11 Townsend Cres	Residential	45	33	40	-	-
R3	Eastern Residents	Residential	45	33	38	-	-
R4	189 Boronia Rd	Residential	45	36	41	-	-
R5	South West Residents	Residential	45	32	25	-	-
GF1	Golf House	Active recreation	55	42	35	-	-
GF2	Golf Course	Active recreation	55	41	34	-	-
GF3	Golf Course	Active recreation	55	41	33	-	-
GF4	Golf Course	Active recreation	55	40	32	-	-
GF5	Golf Course	Active recreation	55	40	33	-	-

Note:

The predicted noise level is an external noise level. The predicted internal noise level has been provided in brackets using the common assumption that an external façade with an open window typically provides 10 dB (A) attenuation.

Exceedances are predicted to occur at three residential receivers; R1, R4 and R2 to the east of the St Marys facility during the night time. No exceedances are predicted to occur during the day and evening times.

Inspection of the computational noise model indicates that the night time exceedances are due to the use of excavators. The excavator scooping material into the designated storage areas has the second highest sound power level of any equipment or activity within Table 8-12. This non-compliance is discussed in Section 8.2.4.

**8.2.3.4 Road Traffic Noise (Construction and Operation)**

*Assessment Criteria*

The RNP outlines the assessment method to be used to assess the noise arising from traffic generated by the proposed development. The RNP guidelines are applicable for traffic movements generated as a result of the additional traffic generated during the operational phase of the Development. Criteria for various receivers are included in the RNP; however, industrial receivers do not require assessment in accordance with the RNP.

The main road providing access to the industrial zone where the proposed development is located is Links Rd. This road is classified as a local road. Movements along Links Rd will only affect industrial receivers and hence traffic flows on this road were not included in this road noise assessment. The main road, Forrester Rd which connects to Links Rd is an arterial road and will be the focal point of the road noise assessment within this report.

The relevant road traffic noise assessment criteria have been shown below in Table 8-18.

Table 8-18 Road traffic noise assessment criteria for residential land uses

Road Category	Type of project/land use	Assessment Criteria – dB(A)	
		Day (7 a.m.-10 p.m.)	Night (10 p.m. – 7 a.m.)
Arterial road	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments	LAeq(15 hour) 60 (external)	LAeq(9 hour) 55 (external)

Where the road noise level is found to be above the RNP criteria the relative increase criteria shall be applied. The relative increase criteria are applied as follows:

*“Where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria. A secondary objective is to protect against excessive decreases in amenity as the result of the project by applying the relative increase criteria. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.*

...

*For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding ‘no build option’.”*

Therefore the criteria for the road noise assessment is that, at a minimum, traffic arising from the proposed development should not lead to an increase in existing noise levels of more than 2 dB(A).

The EPA’s Interim Construction Noise Guideline (ICNG) does not provide direct reference to an appropriate criterion to assess the noise arising from construction traffic on public roads.

Given the relative short duration of most construction activities and taking into consideration the recently released EPA’s Road Noise Policy (RNP) which provides guidance when assessing relative increases in criteria, namely:

‘In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person’.

Thus, the criterion applied to traffic movements on public roads generated during the construction phase of the project is an increase in existing road traffic noise of no more than 2 dB(A).

### Road Traffic Noise Assessment Methodology

An assessment of road traffic noise based on existing and predicted traffic flows as a result of the proposed Development was undertaken for both construction and operational phases. The traffic flows considered within this assessment were light and heavy vehicles including staff vehicle movements, waste delivery trucks and construction vehicles. The roads subject to assessment included Forrester Road at locations north and south of Links Road. Light and heavy vehicle traffic flows have been predicted from 2013, when construction of the proposed Development is anticipated to commence, through to 2015 when the proposed Development is expected to be fully operational. Separate traffic flows were predicted for weekday and weekend periods.

Road traffic noise generated from increased traffic flows along Forrester Road as a result of the proposed Development has the potential to impact on residential and commercial receivers. Given all receivers on Links Road are industrial receivers and the RNP does not require impacts to be assessed for industrial receivers, Links Road was not included in the assessment of road traffic noise.

### Assessment Results – Construction Traffic Noise

The assessment of construction traffic noise predicted that during the construction period, a peak  $L_{Aeq, 1hour}$  increase of 1.3 dB (A) would occur. This peak is expected to occur along the northern section of Forrester Road.

It has therefore been predicted that noise resulting from construction traffic would not add to the current road traffic noise by more than 2 dB and the Development would therefore comply with the 2 dB relative increase criteria during the construction phase. The full results tables for the construction phase have also been provided in Appendix G of Appendix E.

### Assessment Results – Operational Traffic Noise

By using predicted background traffic flows, traffic noise without the addition of traffic generated from the development has been calculated. These predicted background traffic noise levels have been shown in Table 8-19. The predicted background road traffic noise levels exceed their respective assessment criteria and thus the relative increase criteria will apply.

Table 8-19 Background road traffic noise levels during years of operation

Stage	2015 Facility Fully Operational			
	Day		Night	
	Weekday	Weekend	Weekday	Weekend
Forrester Rd – South of Links	70.2	66.0	64.6	59.9
Forrester Rd – North of Links	67.8	65.1	62.1	58.5

Site operations would typically be between 5am and 10pm Monday to Friday, and 8am and 1pm on Saturdays, during which time, heavy vehicles would regularly travel to the Site to deliver various waste types. There would also be periods where trucks would remove treated waste from the Site, and a minor flow of traffic departing the Site to retrieve waste.

The potential increase in road traffic noise during operation of the proposed Development as a result of forecasted traffic increases was calculated as a logarithmic percentage above the existing traffic flow. It was determined that traffic increases related to the operation of the proposed Development at the St Marys Facility would not increase the  $L_{Aeq}$  noise level of any one hour period by more than 2 dB, in compliance with the RNP. Noise is expected to increase by less than 1 dB (A) in the most affected hour, from its predicted flow from the St Marys Facility. The full result tables are provided in Appendix E.

## **8.2.4 Mitigation Measures**

### **8.2.4.1 Construction Noise**

As it is predicted that construction activities associated with the proposed Development would lead to exceedances of the NMLs at sensitive receivers, no mitigation or management measures are proposed.

### **8.2.4.2 Construction Vibration**

Construction of the proposed Development would require the use of a 13 tonne excavator with a hydraulic rock breaking hammer. The utilisation of this plant has the potential to trigger human response for occupants within 48 Charles Street, situated 12 metres from the designated work area. To mitigate the effects of vibration of this plant on neighbouring occupants, the following mitigation measures will be implemented where practical:

- Source Controls, including:
  - a) Use of less vibration intensive plant and equipment where reasonable and feasible to do so. For example, a smaller hydraulic hammer attached to an excavator with tonnage less than 12 tonne, which would have a safe working distance for cosmetic damage and human response that is less than the distance between the nearest neighbour (48 Charles Street) and the designated work area; and
  - b) The provision of respite periods.
- Management controls, including:
  - a) Informing neighbouring property owners prior to the commencement of vibratory construction works;
  - b) Maintenance of a complaints register and the provision of prompt responses to any complaints received;
  - c) Site planning and layout; and
  - d) Training of all site staff, including contractors, site managers and temporary equipment operators.
- Implementation of path controls; namely avoiding vibration intensive works in a concentrated area and work over a large area to reduce maximum vibration dose values

### **8.2.4.3 Operational Noise**

Operation of the proposed Development would result in non-compliance with the noise limits presented in the INP at up to three residential receivers during night time periods (Section Table 8-15), requiring the implementation of noise control measures. It is noted that this would only occur during adverse weather conditions.

The dominant noise source causing exceedances of the noise criteria is the use of excavators to scoop material into the designated storage areas within the proposed Development Site, and for the sorting of oil drums and construction waste. To address the exceedances, the excavator would not be used to handle oil drums and construction waste between 10pm and 7am Monday to Saturday, and between 10pm and 8am on Sundays and public holidays. The removal of this noise source would reduce the predicted noise levels to achieve the night time criteria at the sensitive receivers during adverse weather conditions.

Further, to ensure the criteria is met at all sensitive receivers, the waste water treatment plant is to have an overall sound power level of no greater than 104 dB(A). This sound power level was determined through distance loss and the assumption that the noise source is positioned at a height that is lower than the barrier between the treatment plant location and the sensitive receiver locations (with no noise shielding due to buildings factored into the calculation). If in the event that the selected plant cannot meet this sound power level, then noise attenuation of the plant itself would be considered.

Reasonable and feasible mitigation and management measures would also be considered to minimise unnecessary excessive noise, including:

- Maximise the offset distance between noisy plant items and nearby noise sensitive receivers where reasonable and feasible to do so;
- Avoid simultaneous operation of noisy plant close together and adjacent to sensitive receivers where practicable;
- Position noisy equipment away from sensitive receivers where possible;
- Locate noisy plant away from potentially noise affected neighbours or behind barriers, such as sheds or walls;
- **Maintenance work on equipment and plant with the potential to generate noise impacts would be carried out within daytime hours, where possible;**
- Where practicable, consecutive works within the same locality would be minimised;
- Plant and equipment would be switched off when not in use;
- Examine, and implement where feasible and reasonable, alternative work practices which generate less noise – for example, the use of electric equipment instead of diesel or petrol powered equipment;
- Maintain and operate equipment in an efficient manner, in accordance with manufacturer's specifications, to reduce the potential for adverse noise and vibration impacts;
- Ensure plant is regularly maintained, equipment that becomes noisy would be repaired or replaced as soon as practicably possible;
- The work Site would be arranged to minimise the use of movement alarms on vehicles, equipment and mobile plant.
- In the case that high impact noise activities or activities likely to generate noise with intermittent, impulsive, tonal or low-frequency characteristics are required, affected sensitive receivers would be appropriately notified, and respite periods would be implemented where necessary;
- Proactive driver/operator training and operational procedures would be implemented to minimise the use of reversing alarms (taking into account WorkCover and occupational health and safety requirements).

#### **8.2.4.4 Road Traffic Noise**

**Given the predicted level of road traffic noise generated by the proposed Development during construction and operation, no mitigation or management measures are proposed.**

## 8.3 Traffic and Transport

The EIS must consider traffic and transport, including:

- An assessment of potential traffic impacts on the capacity, efficiency and safety of the road network; and
- A description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area.

### 8.3.1 Introduction

In accordance with the DGRs for the proposed Development, a quantitative assessment of potential traffic impacts on the capacity, efficiency and safety of the road network has been undertaken (refer to Appendix F). Particular consideration has been given to access arrangements, heavy vehicle routes, and heavy vehicle movements. In addition, measures to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area are described. The findings of the traffic and transport impact assessment are summarised in this chapter.

### 8.3.2 Existing Environment

#### External Road Network

The St Marys Facility is generally well connected to the Sydney Metropolitan Region (and beyond) via major arterial roads and motorways. All vehicles travel to and from the Site via Forrester Road, with access to Dunheved Industrial Precinct provided via a roundabout with Links Road. Across the wider road network, onward connections are provided by arterial routes including the Great Western Highway, the M4 Motorway, Westlink M7 Motorway, and The Northern Road (refer to Figure 8-6).

Westbus / CDC bus services 759 and 780 provide public transport connections along Forrester Road to the north and south of Links Road. There are no formal bicycle provisions on Forrester Road in the vicinity of Dunheved Industrial Precinct. Dedicated footpaths are provided on Forrester Road south of Links Road; there are no formal pedestrian facilities on Forrester Road between Links Road and Lingayen Avenue (approximately 500m south of Palmyra Avenue).

#### Dunheved Industrial Precinct Road Network and Site Access

The road network within the Dunheved Industrial Precinct, which includes Links Road, Dunheved Circuit, and Charles Street, is designed for and currently used by a high proportion of heavy vehicles. The posted speed limit within the precinct is generally 60km/h, and there are no public transport services or formal bicycle or pedestrian facilities. On-street parking is heavily utilised along Charles Street; this appears to be associated with staff and operational traffic generated by other industrial developments on Charles Street.

The Site is currently configured to accommodate heavy vehicle access, egress, and internal movements. Heavy vehicles currently enter and exit the Site via a gated access with Charles Street, which connects to Dunheved Circuit and Links Road and on to the external road network. Light vehicles enter and exit the Site via a separate entrance on Dunheved Circuit. This provides separation of heavy vehicles and light vehicles associated with the operation of the Site (Figure 4-1). The Site also has an additional gated light vehicle entry point to the Site via Charles Street, which provides access to Car Park 1 for staff and visitors.

Twenty staff parking spaces are provided in Car Park 2 and Car Park 3, with around 9 additional spaces provided in Car Park 1. The Site currently employs around 15 full-time staff, which creates a requirement under the *Pennith City Council Development Control Plan 2010*. Specifically *Part C10 – Transport, Access and Parking* requires 'Warehouses or distribution centres' to provide 1 space per 100m<sup>2</sup> of gross floor area (GFA). The existing site has a GFA of 2,557m<sup>2</sup>, which creates a requirement to provide around 25-26 parking spaces. The existing 29 spaces therefore provide suitable parking for staff and visitors, based on current activities and requirements.

#### Existing Site Traffic

Full operations have yet to commence at the Site, at the time of writing this EIS. However, the following discussion is based on the anticipated traffic generation at the Site as well as current heavy vehicle generation at the South Windsor facility (which processes liquid and solid wastes).

The Site currently operates 6 days a week (6am–6pm Monday to Friday, and 8am–2pm Saturdays). Existing operations employ around 15 full-time staff, all of whom are assumed to travel to and from the site by car, with arrival and departure times dependent on shift patterns. In addition courier activities have been assumed to generate approximately five light vehicle arrivals / departures per day.

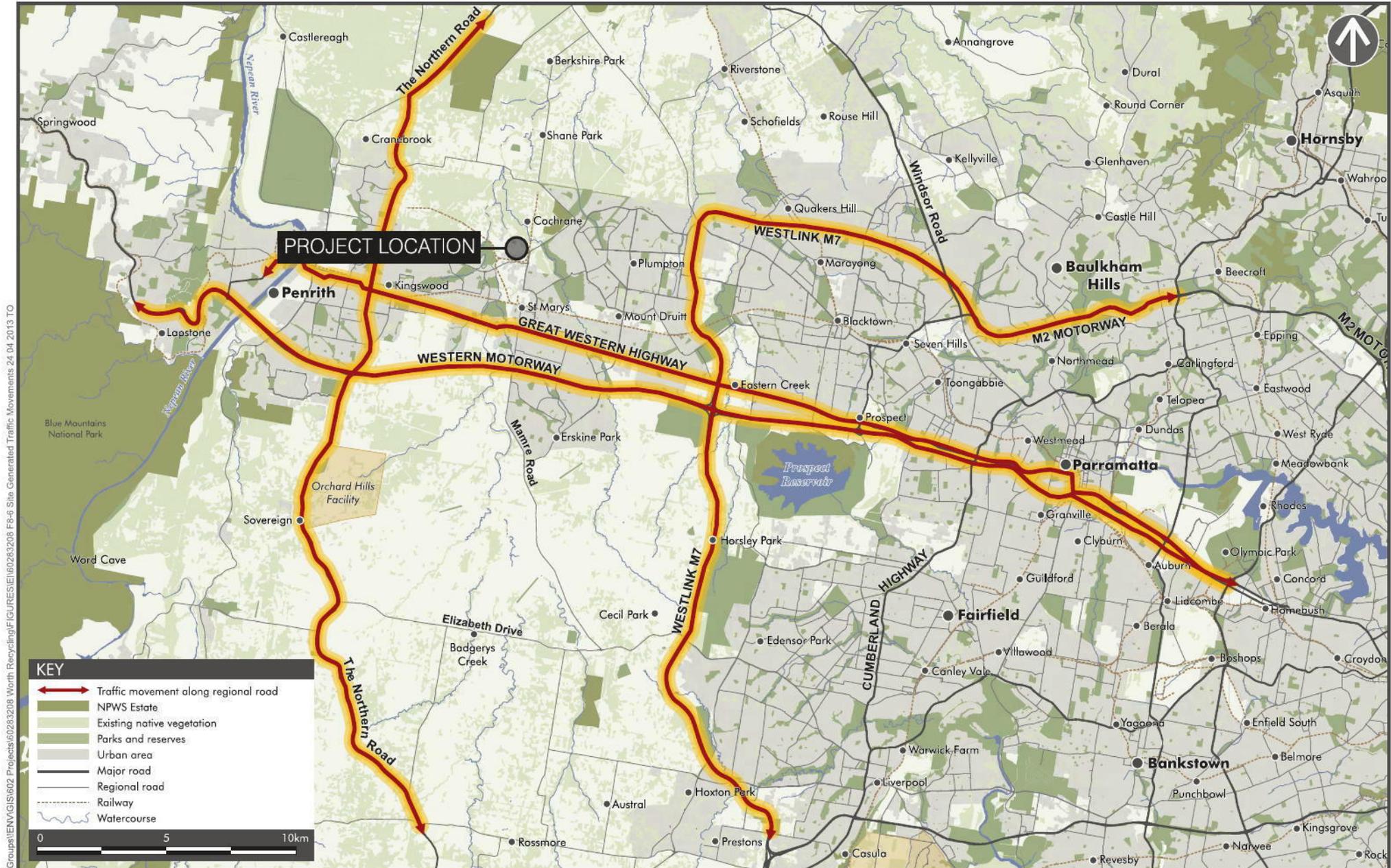
Solid waste is typically transported to and from the Site using heavy rigid trucks. Any waste arriving at the Site that contains some water component (e.g. sludges, muds etc.) is transported using tankers. Between 1 January and 11 March 2013 at the South Windsor facility, daily heavy vehicle arrival and departure data recorded an average of around 200 weighed and unweighed heavy vehicle transactions per week.

In summary, once the proposed Development is fully operational, total vehicle movements on a typical weekday are estimated as:

- 35-40 waste vehicles (heavy vehicles);
- 15 staff vehicles (light vehicles);
- 5 courier vehicles (light vehicles); and
- A total of **70-80 heavy vehicle movements** and around **40 light vehicle movements**, based on the above

Around 70-80 percent of all vehicles associated with the Site are expected to travel to/from the south via Forrester Road. This route is most heavily utilised as it provides the most convenient access to the wider arterial network, via the Great Western Highway and M4 motorway.

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**SITE GENERATED TRAFFIC MOVEMENTS ALONG THE REGIONAL ROAD NETWORK**  
 Environmental Impact Statement  
 Worth Recycling Facility

FIGURE 8-6

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### Existing Traffic Volumes

All traffic travelling to and from the St Marys Facility use Forrester Road. Recent survey data for Forrester Road, Links Road and Ropes Crossing Boulevard was collected for the purpose of developing an assessment of current conditions within the vicinity of the Site. A summary of existing weekday and weekend traffic for these roads is shown in Table 8-20 and Table 8-21, respectively.

**Table 8-20 Existing weekday traffic – Forrester Road | Links Road | Ropes Crossing Boulevard**

Location	2013 Weekday traffic			
	Daily traffic (All vehicles, 2-way)	% Heavy vehicles	AM peak hour traffic (All vehicles, 2-way)	PM peak hour traffic (All vehicles, 2-way)
Forrester Road, south of Links Road	25,840	11.3%	1,920 (7-8AM)	2,170 (3-4PM)
Forrester Road, north of Links Road	16,650	8.2%	1,220 (8-9AM)	1,440 (4-5PM)
Links Road, west of Forrester Road	8,430	17.4%	660 (7-8AM)	740 (3-4PM)

Source: (Based on) Austraffic Traffic Survey Data (2013); Penrith City Council Traffic Survey Data (2011-2012)

**Table 8-21 Existing weekend traffic – Forrester Road | Links Road | Ropes Crossing Boulevard**

Location	2013 Weekend traffic			
	Daily traffic (All vehicles, 2-way)	% Heavy vehicles	AM peak hour traffic (All vehicles, 2-way)	PM peak hour traffic (All vehicles, 2-way)
Forrester Road, south of Links Road	13,300	4.6%	1,090 (11AM-12PM)	1,070 (12PM-1PM)
Forrester Road, north of Links Road	11,500	3.3%	910 (11AM-12PM)	920 (12PM-1PM)
Links Road, west of Forrester Road	1,950	12.3%	190 (11AM-12PM)	160 (12PM-1PM)

Source: (Based on) Austraffic Traffic Survey Data (2013); Penrith City Council Traffic Survey Data (2011-2012)

Key features of existing traffic volumes on the external road network are as follows:

- Recent long-term traffic growth on key routes within the Dunheved Industrial Precinct has been one percent to 2.5 percent per annum according to historic RMS Annual Average Daily Traffic data.
- Weekday traffic on Forrester Road and Links Road peaks between:
  - 7am – 9am, in typical AM peak conditions.
  - 3pm – 5pm in typical PM peak conditions.
- Traffic on Forrester Road is significantly higher south of Links Road than north of Links Road, with the majority of traffic travelling to and from the Dunheved Industrial Precinct following a route to/from south of the precinct.

Traffic surveys undertaken in March 2013 noted that during the busiest AM and PM weekday peak periods, the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout operated with little delay and minimal congestion. The performance and safety of this roundabout is aided by the provision of the continuous southbound traffic lane on Forrester Road, which separates this major through traffic movement from other traffic entering and exiting the roundabout.

### Crash History

Analysis of recent crash history for Forrester Road between Palmyra Avenue to the north and Glossop Street to the south was undertaken using recently available RMS data (2006 to 2011). The crash history for this section of Forrester Road shows:

- A total of 76 reported accidents.
- 1 (~1 percent) fatal crash (NSW average ~1 percent<sup>1</sup>).
- 33 (43 percent) injury crashes (NSW average 46 percent).
- 42 (55 percent) non-injury crashes (NSW average 53 percent).

The above crash record indicates that the crash history (severity) for Forrester Road is slightly better than the NSW average, with a lower proportion of injury crashes and higher proportion of non-injury crashes. Crash records also indicate that 29 percent of crashes involved a truck of some description, which is consistent with the NSW average. The generation of truck movements is a key impact associated with the majority of developments within Dunheved Industrial Precinct.

In summary, historic crash data for Forrester Road does not indicate any negative road safety trends associated with traffic generated by developments within the Dunheved Industrial Precinct; this includes traffic generated by existing operations at the St Marys Facility. The crash history for this road is generally consistent with NSW averages.

### 8.3.3 Potential Impacts

#### Construction

Traffic movements associated with the construction of the proposed Development would comprise both heavy and light vehicles, although impacts from construction activities are expected to be minimal given the current condition and function of the site.

Construction duration is estimated to include two months for civil works, three months for construction and one month for commissioning; all of which would take place during standard construction hours. Although it is likely that construction would be staged to minimise impacts (and due to future market demand), it is assumed that construction would occur simultaneously for all proposed components.

Construction traffic would be generated by the following sources:

- Light vehicle movements would be generated mainly by construction crews travelling to and from the Site.
- Heavy vehicle movements would be generated by the delivery / removal of:
  - Construction plant and equipment:
    - One crane of at least 100 tonnes and 1 small franna crane;
    - Excavators and other earth moving equipment;
    - Scissor lifts and mobile cranes; and
    - Concrete pumps and delivery trucks;
  - General construction supplies and equipment; and
  - Removal of waste from demolition, excavation, and/or other construction activities.

In a 'worst-case' scenario, peak construction traffic generation would coincide with existing weekday traffic peaks. The main conflict point would be located where construction traffic adds to / conflicts with traffic on Forrester Road, specifically at the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout. As noted in Section 8.3.2, the morning and afternoon traffic peaks at this roundabout are between 7am to 8am and 3pm to 4pm, respectively.

Existing and 'worst-case' construction traffic throughput at the Forrester Road | Links Road | Ropes Crossing Boulevard intersection during peak hours is shown in Table 8-22.

<sup>1</sup> NSW averages taken from *Road Traffic Crashes in New South Wales, TINSW / RMS 2011*

Table 8-22 Forrester Road | Links Road | Ropes Crossing Boulevard roundabout throughput - Construction

Time period	2013 Weekday traffic			
	Light / Heavy	Existing traffic (All vehicle movements)	Construction traffic (All vehicle movements)	Construction traffic (% existing traffic)
AM peak hour (7-8AM)	Light	1,850	8	0.4%
	Heavy	260	8	3.1%
PM peak hour (3-4PM)	Light	2,160	8	0.4%
	Heavy	230	8	3.5%

Although it is anticipated that construction of the proposed Development would increase both light and heavy traffic travelling to and from the Site, Table 8-22 indicates this increase is relatively small (less than 3.5 percent of existing traffic). Given the existing high level of performance of the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout, construction activities would not be expected to have any noticeable effect on road network performance or safety at this (or any other) location.

Given that existing pedestrian and cycling activity in the area is extremely limited, construction activities would not be expected to have any noticeable effect on pedestrian or bicycle safety or amenity.

In addition it is anticipated that there would be ample parking space within the site for construction vehicles based on existing provisions (see Section 8.3.2); additional parking requirements would not be expected to impact on the local road network.

## Operation

### Traffic Generation

As a result of the proposed development, traffic movements to and from the Site would include additional heavy vehicles associated with the delivery and subsequent removal of treated waste, plus any movements associated with support services provided at the existing South Windsor Facility (namely waste water treatment).

The proposed capacity of the expanded facility would be 99,400 tonnes per year, operating primarily between 5am and 10pm Monday to Friday, and 8am to 1pm on Saturdays. To provide flexibility to Worth to respond to major peak periods, it is proposed that 24 hour operations would occasionally be undertaken to process waste streams and to receive project deliveries or deliveries from regional areas/interstate.

The proposed capacity of the expanded facility would be 99,400 tonnes per year, which is expected to equate to movement of an average of 317 tonnes per day. Assuming an average vehicle payload of 15 tonnes, this would result in 21 heavy vehicles travelling to and from the site per day (42 vehicle movements per day). This average was adopted for the purpose of the quantitative assessment. However it is acknowledged that the Site may generate between one truck per hour to up to 10 trucks per hour, and the effects of this have been qualitatively considered. No change to the composition of heavy vehicles (for example longer or heavier vehicles) is expected as a result of the development.

It has been assumed that the 15 additional staff associated with the proposed Development would travel to and from the Site alone by car, with arrivals and departures based on anticipated shift patterns provided by Worth. In addition, courier activity has been assumed to generate around one light vehicle per hour between 9am-5pm, on average. Based on these assumptions, the expanded facility would be expected to generate an additional 23 light vehicle arrivals and departures from the Site over the course of a typical day, on top of the existing 40 light vehicle movements.

The Site would employ a total of approximately 30 full-time staff following full development of the Site, and the GFA would be expanded to 2,668m<sup>2</sup>. The site currently provides around 29 car spaces, which would provide sufficient parking for staff and visitors of a 'Warehouse or distribution centre', based on proposed activities and requirements at full development in accordance with requirements of the *Fenrth City Council Development Control Plan 2010, Part C10 – Transport, Access and Parking*. The proposed Development is therefore expected to continue to provide sufficient parking for staff and visitors based on proposed activities and requirements at full development.

In summary, the proposed Development, once fully operational would be expected to generate around 40-45 heavy vehicle movements and a similar volume of light vehicle movements per day during peak operations. During a typical weekday, three light vehicle and four heavy vehicle movements would be expected in the AM peak (7am -8am). In the PM peak (3pm-4pm), five light vehicle and four heavy vehicle movements are anticipated.

#### *Site Access and Traffic Distribution*

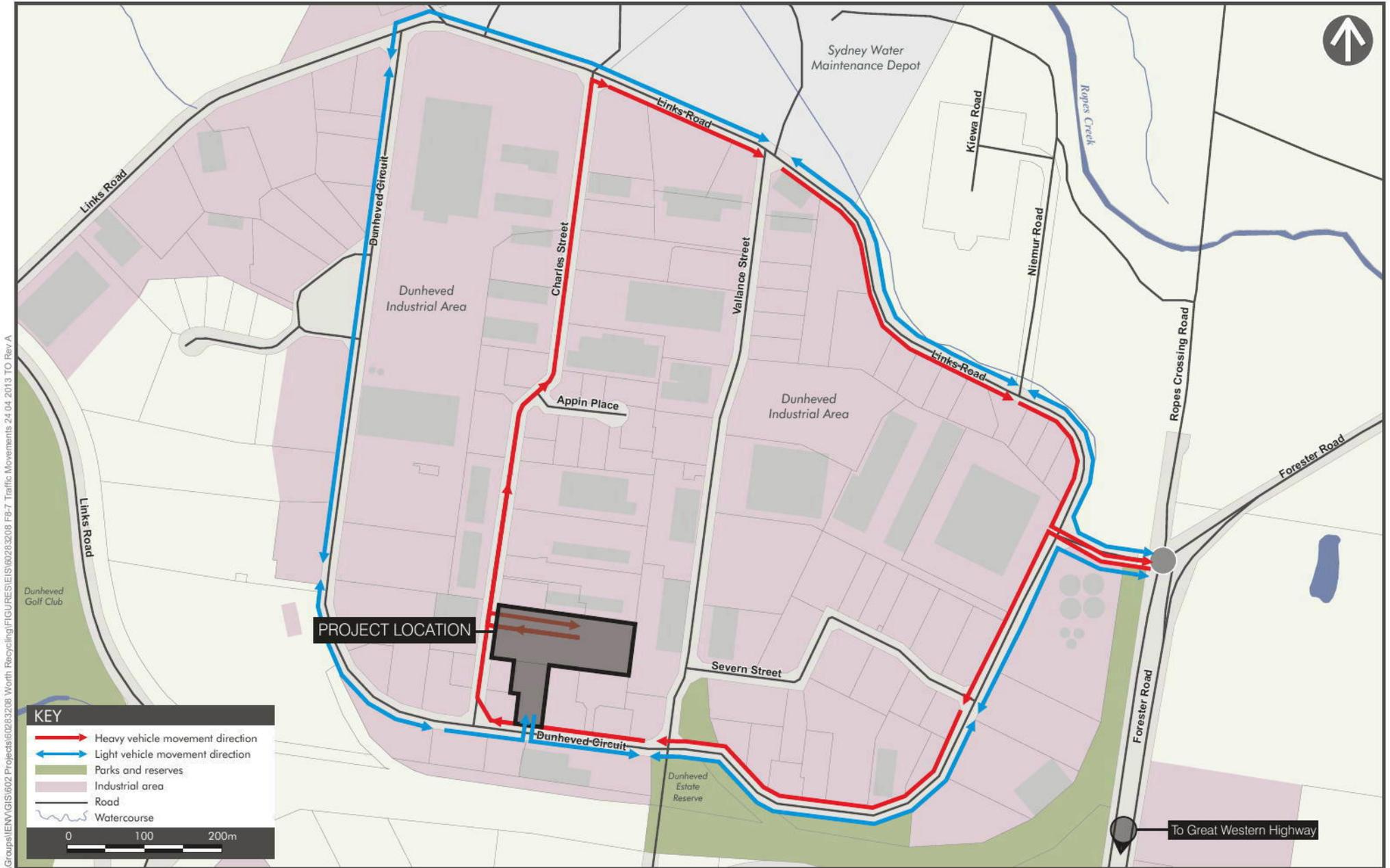
Across the wider road network, traffic is expected to follow similar patterns and routes to existing traffic travelling to and from the Site. The majority – around 70-80 percent based on existing conditions - of both heavy and light vehicles generated by the development would be expected to continue to approach and leave Dunheved Industrial Precinct via Forrester Road to the south of Links Road, which provides onward connections to the Great Western Highway and M4 motorway.

To manage traffic movements within Dunheved Industrial Precinct, it is proposed that heavy vehicles would maintain the existing arrival arrangement and enter the Site from the south via Dunheved Circuit and Charles Street. Heavy vehicles exiting the site would turn right out onto Charles Street and travel north, joining Links Road to return to Forrester Road (Figure 8-7). This circulating arrangement (shown in Figure 8-7) would minimise conflicts caused by turning and opposing vehicle movements on Charles Street and Dunheved Circuit.

Within the Site, access arrangements would not change as a result of the proposed Development. Heavy vehicles delivering waste would enter via Weighbridge 1 and following security verification, staff would direct the driver to the delivery point, with signage at the gate providing additional directional support. Heavy vehicles would generally circulate the Site in a clockwise direction, and exit via the gated Weighbridge 2. Both weighbridges would record the weight of the heavy vehicle at the point of entry and exit, and have the ability to count axle loads.

In light of the proposed continued use of existing access arrangements and traffic routes, and the recommended implementation of the circulating arrangement described above, access to the proposed Development during operation is not expected to significantly impact upon the capacity and efficiency of the local road network.

To restrict the number of vehicles travelling along Charles Street as a result of the proposal, light vehicle movements, comprising employees and couriers travelling to and from the Site would not travel along Charles Street. Alternatively, light vehicles would travel either in a clockwise or anti-clockwise direction along Links Road and Forrester Road, and would access the Site via an alternate light vehicle entrance point on Dunheved Circuit (Figure 8-7). Nineteen staff parking spaces are provided along the south-eastern boundary of the Site (Figure 4-1).



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### Road Network Impacts and Performance

It is assumed that the proposed Development would be fully operational by 2015. Forecast background and additional operational traffic as a result of the proposed Development at the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout during peak hours is shown in Table 8-23. Forecast background traffic has assumed an annual growth rate of around two percent per annum, consistent with historic growth in the area.

Table 8-23 Forrester Road | Links Road | Ropes Crossing Boulevard roundabout throughput – Full operations

Time period	2015 Weekday traffic			
	Light / Heavy	Background traffic (All vehicle movements)	Operational traffic (All vehicle movements)	Operational traffic (% background traffic)
AM peak hour (7-8AM)	Light	1,928	3	0.2%
	Heavy	271	4	1.5%
PM peak hour (3-4PM)	Light	2,246	5	0.2%
	Heavy	235	4	1.7%

As for construction, operation of the proposed Development would increase both light and heavy traffic travelling to and from the Site. Table 8-23 indicates the small level of this increase (less than 1.7 percent) when compared to existing background traffic in the vicinity of Dunheved Industrial Precinct. Traffic generated by the operation of the proposed Development would not be expected to significantly change traffic patterns, behaviours or heavy vehicle types travelling to and from the site.

To quantify the impacts of this increase in traffic, SIDRA intersection modelling was been undertaken based on the existing roundabout configuration. Traffic volumes used to assess the performance with and without ('do nothing') the proposed Development during weekday AM and PM peaks are shown in Table 8-24.

The results of this assessment indicate that the relatively small level of additional traffic generated by the proposed Development would have no noticeable effect on the efficient operation, or reduce the significant spare capacity of the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout, which is the main potential conflict point in the vicinity of the Site.

Table 8-24 Forrester Road | Links Road | Ropes Crossing Boulevard roundabout throughput – Full operations

Scenario	Vehicle movements	Level of Service	Degree of saturation (v/c)	Average delay (seconds)	Max queue length (m)
<b>2015 Weekday AM peak (7-8AM)</b>					
Do nothing	2,221	A	0.50	9.7	31
With development	2,228	A	0.50	9.7	31
<b>2015 Weekday PM peak (3-4PM)</b>					
Do nothing	2,503	A	0.66	11.8	53
With development	2,512	A	0.67	11.9	54

Within Dunheved Industrial Precinct, the road network generally consists of wide, industrial-standard roads which are frequented by heavy vehicles. At present, traffic volumes on this road network are relatively low, resulting in a large amount of spare capacity. The small increase in traffic as a result of the proposed Development would have little effect on the capacity or efficiency of this road network in the vicinity of the Site.

On the external road network, Forrester Road operates efficiently with little congestion in the vicinity of Dunheved Industrial Precinct. Again, the increase in traffic would have little effect on its capacity or efficiency. On the wider arterial road network (for example the Great Western Highway or M4 Motorway) the traffic generated by the development would be negligible when compared to background traffic and have no meaningful effect on performance.

Given that existing pedestrian and cycling activity in the area is extremely limited, operations would not be expected to have any noticeable effect on pedestrian or bicycle safety or amenity.

In summary, operational traffic impacts would be limited to a relatively small amount of additional traffic. As a result, the existing high level of performance of the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout and surrounding road network would not be affected, and operations would not be expected to have any noticeable effect on road network performance or safety at this (or any other) location.

#### **8.3.4 Mitigation Measures**

##### **Construction**

Construction activity impacts are expected to be limited to only a small increase in existing traffic travelling to and from the Site. As a result, no specific mitigation measures are proposed to maintain or improve the safety, capacity or efficiency of the road network at the Site or in the surrounding area.

Construction activities would generally be contained within the Site. However, if and when necessary, a construction traffic management plan (CTMP) would be prepared. This would include guidelines, general requirements and procedures to be used when construction activities would have a potential impact on existing traffic arrangements. It would ensure that delays and disruptions are kept to a minimum, and proactively identify and respond to any changes in road safety resulting from construction works.

##### **Operation**

The operational assessment indicates that the existing road network would operate safely and efficiently in the future with or without the proposed development. As a result, no physical mitigation measures or upgrades are required to maintain or improve the safety, capacity or efficiency of the road network and access points at the Site or in the surrounding area following construction.

However, to improve the safety and efficiency of the road network in Dunheved Industrial Precinct, a circulating arrangement for heavy vehicles using Charles Street, Links Road and Dunheved Circuit would be adopted as described in Section 8.3.3 and shown in Figure 8-7.

In the case that other mitigation measures or upgrades are subsequently deemed necessary as part of the proposed Development, these would be undertaken in accordance with RMS and Council standards, requirements and guidelines.

No infrastructure upgrades are proposed to mitigate the specific impacts of this development. However, it is acknowledged that strategic planning has previously identified two key modifications to the existing road network which would directly affect traffic and transport operations and movements at Dunheved Industrial Precinct:

- The provision of a second direct road connection (in addition to Links Road) between Christie Road and the precinct.
- The upgrade (including signalisation and bus priority provision) of the Forrester Road | Links Road | Ropes Crossing Boulevard roundabout.

It is understood that these upgrades are part of longer-term planning strategies for the development of Dunheved Industrial Precinct and its surroundings. The purpose of these upgrades would be to accommodate traffic generated by major developments and land use changes including the various precincts within the St Marys Release Area, namely: Western Precinct; Central Precinct; Eastern Precinct; Ropes Creek Precinct, and; North and South Dunheved Precincts.

The timing of these upgrades would likely be triggered by the staged development of these precincts (and other major developments) in the future. These upgrades are not expected to create or worsen any adverse impacts associated with the proposed Development, or create a need for any major additional mitigation measures.

## 9.0 Other Environmental Issues

### 9.1 Surface Water

The EIS must consider soil and water, including:

- Consideration of any contaminated soil (including acid sulfate soils) and water on-site, in accordance with relevant guidelines;
  - Identification of any licensing requirements or other approvals under the Water Act 1912 and/or Water Management Act 2000;
  - An assessment of potential impacts on the quality and quantity of existing surface and groundwater resources and any potential impacts from flooding;
  - A detailed description of the proposed water management system (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts; and
- Details of leachate collection and management.

#### 9.1.1 Introduction

This chapter provides an assessment of surface water in accordance with the DGR's for the proposed Development. As part of this assessment, consideration has been given to impacts on local waterways from both construction and operational phase of the proposed Development. Additionally, water licensing requirements, water contamination and general surface water management has been considered. Where required, mitigation measures have been recommended for the management of surface water for the proposed Development.

#### 9.1.2 Existing Environment

The existing stormwater system for the proposed Development site was originally established by the previous landowner for the purposes of operating a metals recycling facility. The site is comprised of fully sealed hardstand, with a runoff sheet which flows into an onsite stormwater management system, capable of storing 120m<sup>3</sup> of water.

Stormwater management within the Site is based on a partial detention system which reduces the peak flow of runoff across the site during a rainfall event. Runoff pools within the site's hardstand area (Figure 9-1) and discharges, under gravity, to the drainage system in the local road network on Charles Street and Dunheved Circuit. The general stormwater runoff arrangements are as follows:

- Stormwater runoff from the northern portion of the site drains to the northern boundary and into the council stormwater management system via an existing Humeceptor. The Humeceptor device provides for the capture and retention of stormwater to remove oils and grease, hydrocarbons, other petroleum products and suspended solids prior to discharge. Worth is currently negotiating with Penrith City Council and the adjacent landowner to establish an easement along the northern boundary of the proposed Development site for the discharge of surface water runoff into the local council stormwater management system;
- Stormwater runoff from the southern-most part of the site, near Area 6 drains to the eastern boundary of the site and into the. or transfer from the site; and
- Water from the wash down bay is discharged in accordance with an existing agreement with Sydney Water to discharge to the sewer.

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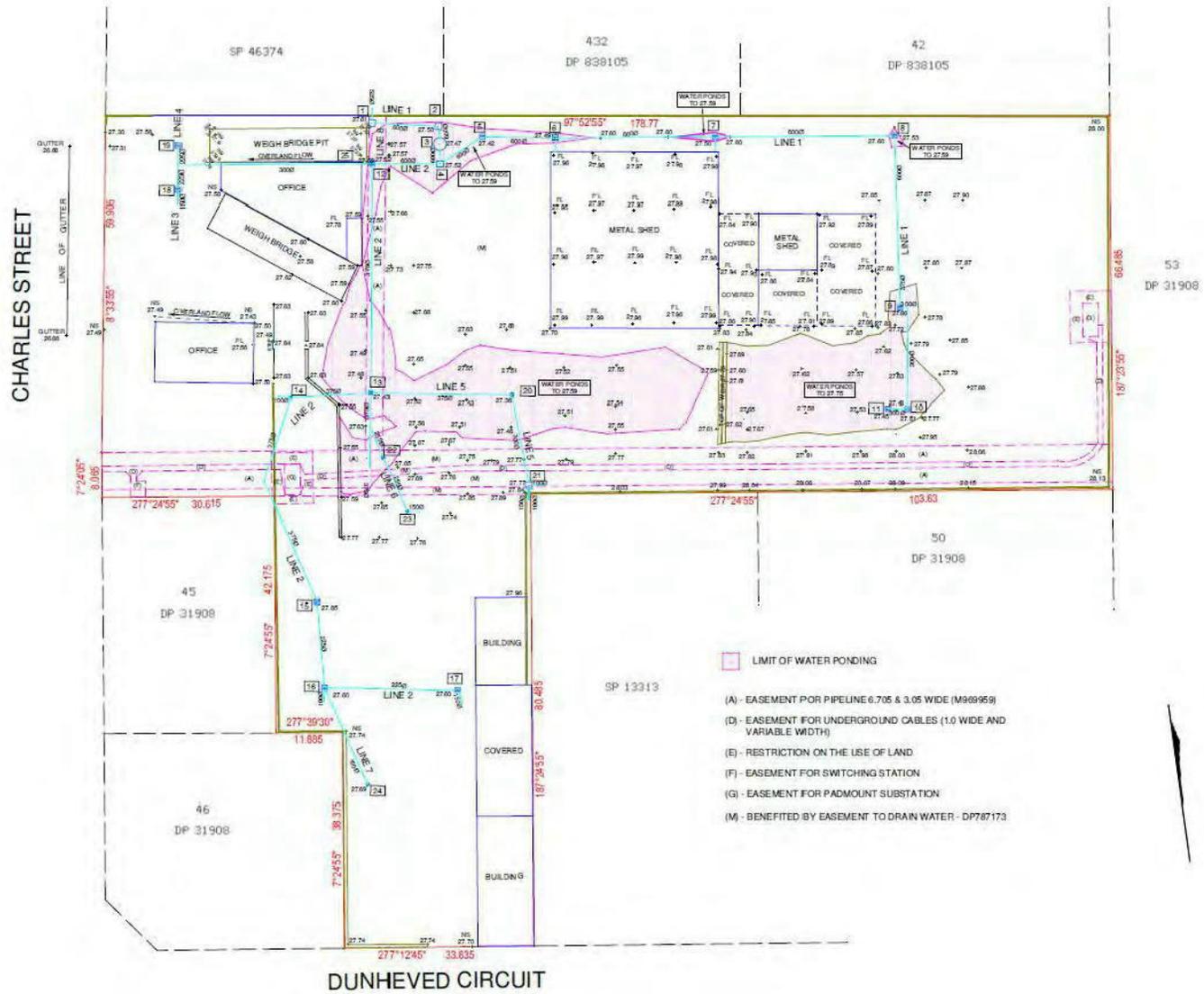


Figure 9-1 St Marys Treatment Facility Stormwater Detention Areas (Worth, 2012)

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### 9.1.3 Potential Impacts

#### Construction

During construction, earthworks and general construction activities would result in the disturbance and exposure of sediments. Activities to be undertaken during construction that have the potential to disturb sediments and generate spoil and construction waste include:

- Construction of foundations for liquid storage tanks and bunkers;
- Civil works associated with the construction of bunding and drainage for the storage bunkers;
- Concrete removal and soil excavation for the construction of treatment pits in Area 4; and
- Construction of catch drains associated with the bunded areas.

Mobilisation of sediments in runoff can increase turbidity and sediment loads in the Site stormwater management system and result in reduced water quality of runoff from the Site. Sediment laden water also has the ability to block stormwater drainage structures and result in localised flooding.

#### Operation

The proposed Development would increase the current operations at the St Marys facility to enable the non-thermal treatment of an additional 77,400 tonnes per annum of waste, which includes the receipt, storage and treatment of several additional waste streams, as detailed in Table 4-1. The operation of the proposed Development is not anticipated to generate additional runoff during a rainfall event as the facilities are within the footprint of the existing industrial facility and the area of impervious surface would not increase as a result of the development.

The nature of the additional waste streams poses a risk to the quality of the stormwater that is discharged from the Site, and could potentially affect the receiving environment if the surface water management at the Site is not managed appropriately. In particular, the following activities pose a risk to the quality of stormwater if not managed in an appropriate manner:

- the introduction of restricted or contaminated waste;
- the generation of leachate from the immobilisation process and other waste waters;
- the storage of packaged waste and other chemicals and associated potential for spills;
- the storage of materials in open bunkers; and
- the handling and storage of greases and oils.

The activities at the site would be managed in accordance with a surface water management strategy for the Site (refer to Section 9.1.4) to ensure that risks of surface water contamination are minimised.

#### Water Licensing Requirements

The proposed Development is situated on land that forms part of the Greater Metropolitan Region Unregulated River Water Sources Water Sharing Plan, and as such, the *Water Management Act 2000* (WM Act) applies to the proposed Development. The proposed Development would not require a water use approval; water management works approval or an activity approval under sections 89, 90 and 91 of the WM Act respectively.

#### 9.1.4 Surface Water Management Strategy

A surface water management strategy has been presented to demonstrate the appropriate management and separation of 'dirty' or potentially contaminated surface water flows from 'clean' operational areas. The following objectives and principles form the basis of the surface water and waste water management strategy:

- Installation of an on-site treatment plant to manage low-contaminant waste water to primarily cater for waste water generated by the treatment of drill muds, stormwater and canal dredgings
- Support from the South Windsor Facility to treat other waste waters containing contaminants above permitted discharge levels. This would consist of waste water collected by catch drains, such as leachate from the immobilisation process;
- Installation of catch drains at operational areas, which would be temporarily stored on site and collected for treatment offsite;
- Covering of bunker storage areas, for example, the storage areas for greases, oil filters and packaged waste would be enclosed, whereas other external bunkers would be fitted with retractable cloth covers;
- Regular sweeping of hardstand areas and use of the vehicle wash down bay; and
- Provision of bunded areas, where required, in accordance with EPA requirements.

The proposed Development would include the construction of bunds around areas that would contain solid waste materials or other substances that have the potential to contaminate stormwater runoff, including:

- Storage bunkers along the eastern boundary of the Site;
- The space immediately south of Area 1, inclusive of the three storage hoppers and the storage and treatment area for oil filters, greases, and packaged wastes;
- The acid sulfate soils water storage tank areas immediately adjacent to Area 1 in the north east;
- Water storage tanks and water treatment plant in the south of the Site;
- The drill muds water storage tanks immediately north of Area 2 and Area 4; and
- The dangerous goods storage area to the south of the enclosed treatment areas on the site boundary.

The bunds enclosing these areas would be capable of withholding at least 110 percent of the largest storage container within a bunded area, or 35 percent of the total product in areas with small containers such as drums. The storage bunkers along the eastern boundary of the site would also be fitted with retractable cloth covers and the dangerous goods storage area would be enclosed and compartmentalised to allow for the segregation of different types of dangerous goods within the building.

The Site would consequently be segregated into bunded areas containing materials with the potential to contaminate the surface water within the proposed Development Site, and areas that would not be exposed to contaminated materials and considered 'clean'. Runoff from within the mud plant area would be captured and pumped to the proposed Development Site's water treatment plant. Once treated, this water would either be discharged to the local sewage system if it meets the minimum water quality standards, or alternatively, it would be stored in the adjacent tanks and transported to the South Windsor facility for treatment and disposal. All potentially contaminated runoff and leachate within other bunded areas would be trapped in catch drains, stored in the tanks and transported to the South Windsor facility for treatment and disposal. Consultation with Sydney Water would continue in order to determine discharge requirements and limits upon selection of the water treatment plant at the Site.

By segregating areas which could contain potentially contaminated water during operation through the implementation of catch drains and bunding of sensitive areas, the remainder of the site hardstand can be considered clean. This, in addition to the Site being an existing industrial facility negates the requirement for a first-flush water treatment system throughout the clean hardstand areas within the proposed Development Site.

### 9.1.5 Mitigation Measures

The following measures would be implemented to minimise the potential for impacts to water quality:

- Good housekeeping and maintenance activities would be implemented across the Site during construction and operation to ensure that the areas outside of bunded areas are kept clean and tidy to reduce the potential for contamination of surface water runoff;
- The bunding at the Site would be designed, constructed and maintained to align with the conditions specified in the following guidelines:
  - *Storing and Handling Liquids: Environmental Protection, Participants Manual* (DECC, 2007); and
  - *Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management Part B – Review of Best Practice and Regulation* (DEC, 2005).
- The tank bunds would be inspected regularly to ensure that they remain in a suitable condition;
- All vehicles exiting the Site would pass through the wheel wash;
- Acid sulfate soils that would be stored at the site are surrounded by diversion drains which direct any water that may have potentially been in contact with this material to a separate bunded tank on-site. This water, which may potentially contain leachate from acid sulfate soils material stockpiles, would be transported off-site via road tanker for treatment at Worth's South Windsor Facility;
- The treatment of acid sulfate soils with lime would be undertaken in covered areas within Area 1 to limit the exposure of the stormwater to ASS;
- The treatment and curing of immobilised waste would be undertaken in covered areas within Area 1 to limit the exposure of leachate to stormwater, with leachate collected for treatment at the South Windsor Facility; and
- Personnel and contractors working and/or visiting the St Marys Facility would be inducted to the Site. This induction would include a section outlining the segregation of clean and dirty areas, as well as general housekeeping practices that must be implemented.

With the implementation of the mitigation measures and the stormwater management strategy developed for the site, impacts to surface water quality and flooding as a result of the proposed Development are unlikely.

## 9.2 Hazard and Risk

The EIS must consider hazard and risk, including a preliminary risk screening undertaken in accordance with the *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)* and *Applying SEPP 33 (DoP, 2011)*, and if necessary, a Preliminary Hazard Analysis (PHA).

### 9.2.1 Introduction

Operation of the proposed Development would involve storage and handling of a number of Dangerous Goods (DGs) listed under the Australian Dangerous Goods Code (Federal Office of Road Safety, 2007). In accordance with the Director General's Requirements (DGRs), a preliminary hazard and risk review has been undertaken with the purpose of determining whether:

- State Environmental Planning Policy No.33, Hazardous and Offensive Developments (SEPP 33) applies to the operation of the proposed Development; and whether
- Preparation of a Preliminary Hazard Analysis (PHA) would be required to support the Development Application.

This review followed the approach recommended within *Applying SEPP 33 – Hazardous and Offensive Development Guideline* (DP&I, 2011). The findings are summarised in this chapter and the SEPP 33 Risk Screening is provided in full in Appendix G .

### 9.2.2 Existing Environment

The St Marys Site is not yet operational and therefore there are currently no chemicals or DGs stored at the Site.

Existing fire fighting equipment on the Site has recently been refurbished in accordance with the existing ASS approval and to meet the requirements set out by Penrith City Council.

### 9.2.3 Potential Impacts

#### Proposed Storage of Dangerous Goods

The proposed Development would receive, treat and process various waste streams (refer to Section 4.1), a number of which may be classified as DGs under the Australian Dangerous Goods Code (ADG). In addition, chemicals may be used for the on-site treatment of process water.

The type and maximum quantity of DGs that would be stored and handled at the Site are listed in Table 9-1. Materials used for chemical treatment or mixing do not meet the DG criteria.

DGs proposed for storage at the Site would be located in two main areas; water treatment chemicals would be held in the water treatment plant area, and waste streams received by the facility that are classified as DGs would be held in a dedicated DG storage area located at least 5m from the boundary wall of the Site.

#### SEPP 33 Application

*Applying SEPP 33 – Hazardous and Offensive Development Guideline* (DP&I, 2011) provides maximum permissible threshold levels of DGs that may be stored at a facility before SEPP 33 would be deemed to apply.

Using the general screening threshold quantities as provided by the guideline, maximum threshold levels for those DGs are presented in Table 9-1. Comparison of maximum threshold levels against the quantities specified in Table 9-1 reveals that none of the quantities of materials stored at the proposed Development would exceed the maximum permissible threshold levels. As such, SEPP 33 does not apply to the proposed Development.

Table 9-1 Proposed Type and Quantity of DG Stored at the Worth Recycling Facility vs. SEPP 33 Threshold Levels

Dangerous Goods	DG Class & PG*	Treatment Process	Description of Purpose	Volume (Litres) / Mass (tonnes)	SEPP 33 Threshold (tonnes) <sup>#</sup>	
Hydrochloric Acid	8 – II	Water Treatment	Adjust pH of water down	1,000 L / 1.25 t	25 t	
Sodium hydroxide	8 – II	Water Treatment	Adjust pH of water up	3,000 L / 3.75 t		
Sodium hypochlorite	8 – II	Water Treatment	Destruction of micro-organisms	1,000 L / 1 t		
Nitric Acid	8 – II	Cleaning	Chem-clean of membranes	200L / 0.3 t		
Packaged Waste – paint, etc. (flammable)	3	Disposal offsite	Collected for disposal offsite	11,100 L / 10 t	at boundary	5 t
					5m from boundary	20 t

\* Goods assumed to be Packaging Group (PG) II

# Threshold levels listed in Table 3 of *Applying SEPP 33 – Hazardous and Offensive Development Guideline* (DP&I, 2011)

#### **Corrosive Substances**

The SEPP33 threshold level for corrosive substances (Class 8 PG II) is 25,000 kg/L or 25 tonnes for Packaging Group (PG) II materials. It is noted that PG II materials were selected for the purpose of the review, as the threshold quantities for these materials are less than PG III substances and therefore facilitate a more conservative assessment result. It is noted that none of the corrosive substances listed for water treatment use in Table 9-1 would be PG I, as water treatment chemicals are not produced in the PG I category.

The proposed Development would hold a maximum of 6.3 tonnes of corrosive substances. As a result, the 25 tonne threshold (Class 8 PG II) would not be exceeded and SEPP 33 is not deemed to apply to the storage of corrosive substances at the Site.

#### **Flammable Liquids**

The application of SEPP 33 for the storage of flammable liquids is based on the quantity stored and the distance of separation of these materials from the Site boundary. As the quantity of flammable liquids increases, it is necessary to provide greater separation from the site boundary. Figure 9-2 presents the graph provided within *Applying SEPP 33 – Hazardous and Offensive Development Guideline* (DP&I, 2011) for the purpose of calculating the required separation from the site boundary based on stored quantities.

The storage area for flammable liquids at the proposed Development would be located a minimum of 5m from the boundary of the Site. At this distance, the maximum permissible quantity of flammable liquids (Class 3 PG II and III) is 20 tonnes or 22,000 L. As the facility would only store a maximum of 11,100 L or 10 tonnes, SEPP 33 is not deemed to apply to on-site storage of flammable liquids.

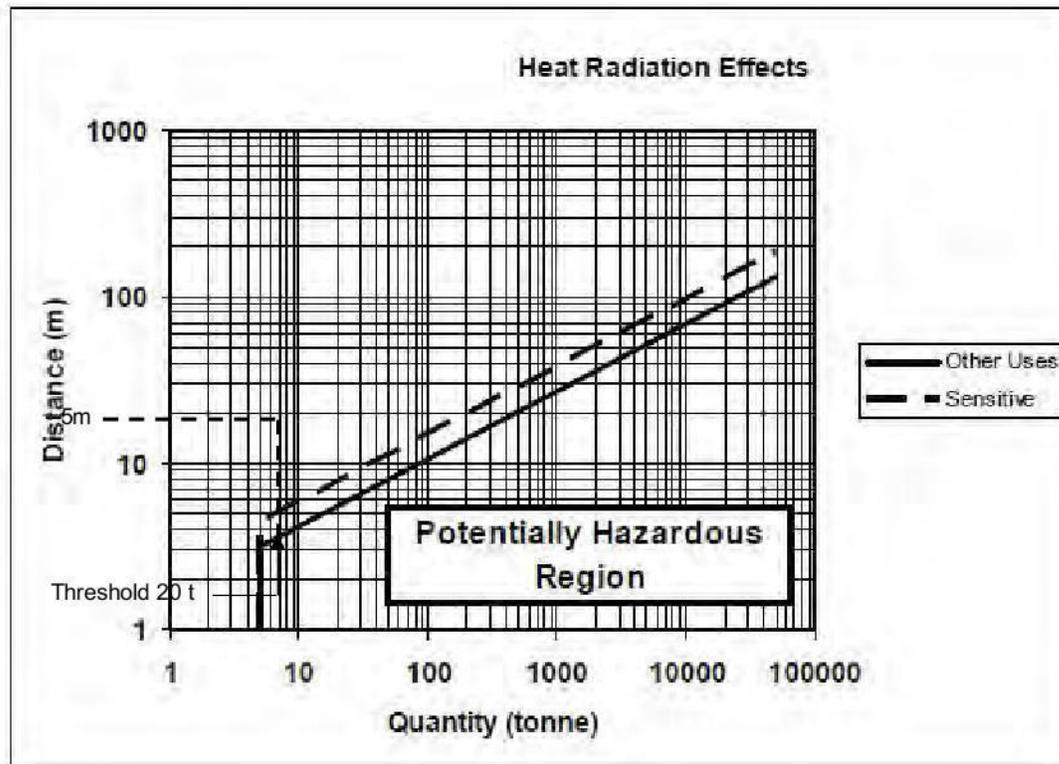


Figure 9-2 SEPP 33 Application – Class PG II & III Flammable Liquids Boundary Distance Requirements

Based on the findings of the preliminary hazard and risk review, it is concluded that SEPP 33 does not apply to the proposed Development.

#### 9.2.4 Mitigation Measures

The review of the hazards and risks associated the proposed Development identified the need for fire fighting foam (FFF) to be available in the vicinity of the packaged waste storage area. Worth therefore proposes to install a FFF branch to an existing hydrant located nearest to the packaged waste store.

No additional mitigation measures pertaining to hazard and risk are proposed.

Notwithstanding the above assessment, it is noted that the proposed Development must comply with the requirements of the *NSW Work Health and Safety Regulation 2011*, under the *Work Health and Safety Act 2011*. Whilst the storage facilities associated with the proposed Development will comply with the requirements of the Regulation, appropriate documentation will be prepared and available on-site to meet the full requirements of Section 7 of the Regulation.

## 9.3 Soils and Geology

The EIS must consider any contaminated soil (including acid sulfate soils) and water on site in accordance with relevant guidelines.

### 9.3.1 Introduction

A brief assessment of potential impacts to soils and geology is presented in this section, focusing on the risks that may be presented during construction. In accordance with the Director General's Requirements, contaminated soil (including acid sulfate soils) has also been considered with reference to relevant guidelines. Mitigation and management measures to minimise potential impact to soils and geology are also recommended.

### 9.3.2 Existing Environment

#### *Topography*

The 1:25,000 Riverstone Topographic Map shows the Site has a local relief of 20 metres Australian Height Datum (AHD), and is generally flat. The area surrounding the Site slopes west toward South Creek.

#### *Soils*

Review of the 1:100,000 Soil Landscape Series for the Penrith area shows the site is situated on the Berkshire Park soil landscape (Bannerman and Hazelton, 1990). These soils are characterised by weak orange heavy clays and clayey sand. Soils of this classification possess a high wind erosion hazard, gully, sheet and rill erosion on dissected areas and waterlogging, impermeable subsoils and low fertility.

Soils are not exposed at the site due to the ground being entirely covered by concrete hardstand.

#### *Geology*

Review of the 1:100,000 Geological Series for the Penrith area shows that the Site is situated on Cainozoic Londonderry Clay, the composition of which includes clay and consolidated sand. Beneath the Londonderry Clay is Bringelly Shale of the Wianamatta group, comprising shale, claystone, laminate, sandstone, rare coal and tuff.

#### *Contamination*

##### *Database Searches*

A search of the EPA Contaminated Land Record of Notices and the List of NSW Contaminated Sites reported to the EPA identified that there are no known areas of contamination on the Site.

##### *Phase 1 Contamination Assessment*

A Phase 1 Contamination Assessment was conducted in November 2011 by WSP Environmental Pty Ltd, which was completed in connection to the sale of the Site to Worth. The investigation did not identify any areas of contamination at the time the audit was conducted. Further, Worth has advised that soil contamination was not encountered during recent excavation activities associated with the construction of the ASS pit on-site under the recent Development Application approval by Penrith City Council.

The Phase 1 Assessment concluded that the Site has a low risk of contamination given the condition of the buildings, housekeeping, presence of the hardstand and the low potential for offsite mitigation due to the presence of underlying clays. However, it did note the following:

- Evidence of hydrocarbon leaks/spillages and/or metal residues have been identified in a number of areas;
- The potential for historic and recent Site activities (scrap metal storage, processing and recycling) has been identified as a potential contaminant source owing to the unknown suitability of management and mitigation measures in place during these activities and the absence of a complete hardstand cover prior to approximately 2008;
- Former presence and demolition of buildings of an unknown type, suggesting a potential for asbestos in fill underlying the concrete hardstand;
- Historic site activities indicate a potential for underground or above ground fuel tanks (in addition to those observed during the contamination assessment); and
- Imported fill material that may have been used during the development of the site in the early to mid-1940s. Waste materials generated from site operations may have been used for filling.

Potentially contaminated media at the Site include fill material, natural soils or groundwater. Potential contaminants of concern based on past and present land use include:

- Heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, mercury, zinc, aluminium, barium, tin, manganese) from storage processing and recycling of scrap metal.
- Asbestos from potential former up-filling of the Site, former buildings and structure and stripping of materials containing asbestos.
- Petroleum hydrocarbons including BTEX (benzene, toluene, ethylbenzene, and xylenes), Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons from fuel storage, lubricants and cutting oils.
- Polychlorinated Biphenyl oils at decommissioned/redundant electrical equipment and transformers.
- Degreasing solvents (e.g. trichloroethylene and methyl ethyl ketone) from Site operations.
- Acids, sulfates and sulphides from potential lead-acid car battery recovery.
- Ash materials (including Polycyclic Aromatic Hydrocarbons) potentially in fill.

The Phase 1 assessment considered the Site suitable for on-going industrial land use owing to the presence of widespread hardstand limiting exposure to potential underlying impacted soil. It did note that if the Site were to undergo a change in land use (that is, other than industrial) a Phase 2 Contamination Assessment would be required.

#### *Acid Sulfate Soils*

The Australian Soil Resource Information System (ASRIS) demonstrates that the area has an extremely low probability/very low confidence of Acid Sulfate Soils (ASS).

#### *Groundwater*

The presence of groundwater at the Site was investigated by WSP Environmental (WSP, 2011). The groundwater table at the Site is expected to occur at approximately 6 m below ground level in the Bringelly Shale. There is the potential for shallow perched water within the Londonderry Clay, but the clay would not be expected to yield appreciable quantities of groundwater and is unlikely to represent an aquifer. The clay likely forms an aquitard or aquaclude above the Bringelly Shale (WSP Environmental, 2011).

There is likely to be little or no groundwater flow through the main rock matrix of the Bringelly Shale, with groundwater restricted to interconnected linear fractures. Any groundwater flow is likely to be towards the west and South Creek (WSP Environmental, 2011). A groundwater bore search (NSW Natural Resources Atlas, April 2013) identified 5 groundwater monitoring bores located approximately 900m northwest of the site. No abstraction wells are located within 1km of the Site.

### **9.3.3 Potential Impacts**

The potential impacts on soils as a result of the proposed Development would be limited to construction activities, given the presence and extent of the hardstand area. Construction activities that would expose and disturb soil would involve excavation conducted for drainage infrastructure, plant footings (where needed) and pit construction for the bunkers.

Potential impacts resulting from excavation may include exposure of contaminated soils, if present at the Site. Risks relating to contaminated soil include direct contact with the material for construction workers, as the area would not be accessible to the public during construction. As outlined in Section 9.3.2, the risk of contamination is low and as the Site is not changing in land use (that is, it would remain as an industrial land use), a Phase 2 Contamination Assessment is not proposed. Furthermore, the Phase 1 assessment did not identify any areas of contamination which would require further assessment. As such, contaminated soils are not expected to be encountered during excavation activities associated with construction of the proposed Development. In line with the mitigation measures recommended in Section 9.3.4, soils would be characterised prior to mobilisation in order to ensure that appropriate management and disposal pathways are implemented.

Impacts as a result of erosion are considered to be low given the limited extent of disturbance to the concrete hardstand areas. There may be a need to temporarily stockpile excavated soil (for example, from the proposed pit structures), which could present a temporary risk to the quality of surface water discharges from the site. However, any potential impacts would be readily mitigated and/or managed through the implementation of sediment controls and good construction Site management practices.

Operational activities are not expected to impact on soils due to all soils on Site being contained by concrete hardstand areas. The suggested waste water management measures, as detailed in Section 9.1.5, would further reduce the potential for any impacts on soil as a result of the proposed Development.

During operation there is the potential for spills and leaks of chemicals from the Dangerous Goods and chemical storage areas to impact on soils and groundwater quality. With the installation and maintenance of appropriate bunding and the implementation of emergency spill response procedures, if required, the risk of impacting soils and groundwater is low.

Without appropriate management, there is the potential for impacts to soils and groundwater as a result of leaching of contaminants from the waste materials into the soils from pits and storage areas. However, given that the groundwater table is approximately six metres below ground level and the maximum depth of the proposed pits is three metres, there is limited potential for encountering large quantities of groundwater. Notwithstanding the limited potential for impacts to soils and groundwater, storage areas would be covered with impervious hardstand and proposed pits would be lined with concrete to protect the surrounding soil and groundwater from contamination. The concrete lining will also prevent the incursion of any groundwater, should it be present, into the pits.

#### **9.3.4 Mitigation Measures**

The following measures are to be implemented during construction:

- Prior to the commencement of construction that would result in disturbance of the underlying soil, in situ soil testing would be undertaken within these areas to determine if contamination is present and to characterise any spoil that would be generated by the disturbance. If contamination is found to be present, the soil would be removed to an appropriately licenced facility for treatment and/or disposal;
- Appropriate controls would be provided to manage exposed soil surfaces and stockpiles to prevent sediment discharge into stormwater drains and adjacent streets;
- Stockpile and storage locations would be clearly identified. Erosion and sediment controls would be provided around stockpiles where appropriate;
- Dust suppression, for example regular sweeping and wetting of exposed surfaces and stockpiles, would be conducted where there is a risk of increased dust outside of acceptable levels, to ensure compliance with the air quality provision of the POEO Act; and
- Washing soils, residue or dust off construction traffic vehicles prior to their leaving the Site.

Mitigation and management measures as detailed in Section 9.1.5 would also minimise the potential for impacts on soils during operation. As such, no additional measures are proposed.

## 9.4 Ecology

There are no specific DGRs relating to Ecology

### 9.4.1 Introduction

This section of the EIS provides an assessment of Impacts of the proposed Development on the local and regional ecology. Ecological impacts have been assessed through a desktop assessment of existing documents and searches of relevant databases, namely the EPBC Protected Matters Search Tool, and the NSW BioNet Atlas of wildlife.

### 9.4.2 Existing Environment

The Site is comprised entirely of hardstand in an industrial precinct with no flora or potential fauna habitat present on the property. There is a small amount of planted trees and shrubs along the local roads, including Charles Street and Dunheved Circuit, with the closest planting being adjacent to the entrance of the Site, and others along these streets being within 10 to 50 metres of the Site. Prior to the purchase of the Site by Worth, the Site was cleared of vegetation for the construction and operation of the materials recycling facility.

The methodology used to undertake the ecological impact assessment comprised a desktop investigation and analysis. Databases and maps searched included the EPBC Act Protected Matters Search Tool and the BioNet Atlas of NSW Wildlife. Searches were conducted for a ten kilometre area surrounding the Site. However, the impact area was reduced to a one kilometre search, as works on the Site would be discrete and unlikely to result in ecological impacts beyond the streets immediately surrounding the Site.

The closest stands of vegetation, other than street plantings or isolated trees, are located approximately 540 metres north east of the Site in land subject to *Sydney Regional Environmental Plan No 30 (St Marys)* and within areas zoned as Regional Park. Other groups of vegetation include riparian vegetation along Ropes Creek and South Creek, located approximately 850 metres to the west of the Site and approximately 840 metres north-west of the Site respectively. To the north-west is a large area of cleared grassland. This land is to be subdivided for the establishment of the Jordan Springs residential development.

The BioNet Atlas of NSW Wildlife is the database of the Office of Environment and Heritage (OEH) which contains records of flora and fauna, known and predicted vegetation communities, endangered population and key threatening processes listed under the *Threatened Species Conservation Act 1995 (TSC Act)*. A search of the Atlas identified a number of threatened species and endangered ecological communities (EEC) located within ten kilometres of the Site. Those found within one kilometre of the Site are listed in Table 9-2. A full list of threatened species and endangered ecological communities found within 10 kilometres of the Site is located in Appendix H.

Table 9-2 Atlas of NSW Wildlife search results within one kilometre of the Site

Scientific Name	Common Name	Quantity	Approximate location in relation to Site
<i>Eucalyptus tereticornis</i>	Forest Red Gum	1	400m SSW
<i>Grevillea juniperina</i>	Juniper-leaved Grevillea	~100	540m NE
<i>Mendolium corneovirens</i>	Cumberland Plain Land Snail	2	600m ESE 800m ESE
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	1	600m ESE
<i>Litoria aurea</i>	Green and Golden Bell Frog	1	800m ESE
<i>Chenonetta jubata</i>	Australian Wood Duck	1	800m ESE

The Protected Matters Search Tool was also used to identify matters of national environmental significance (matters of NES) or other matters protected by the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* that are likely to occur in the vicinity of the Site (refer to Appendix H). It should be noted that the Site does not possess any existing flora and fauna, or any potential for wildlife habitat. The results of a search of matters of NES within one kilometre of the Site are outlined in Table 9-3 for species, habitat or EECs known to occur or likely to occur within the defined area. A list of those that are known to occur, likely to occur, or may

occur within ten kilometres of the Site is contained in Appendix H. A list of those that may occur within ten kilometres of the Site is contained in Appendix H.

Table 9-3 Matters of NES likely to occur within one kilometre of the Site

Matter of NES	Threatened species/species habitat	Listing under EPBC Act
Listed Threatened Ecological Communities	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered
Listed Threatened Species	<i>Anthochaera Phrygia</i> Regent Honeyeater	Endangered
	<i>Boaurus poiciloptilus</i> Australasian Bittern	Endangered
	<i>Erythrotriorchis radiates</i> Red Goshawk	Vulnerable
	<i>Lathamus discolor</i> Swift Parrot	Endangered
	<i>Rostratula australis</i> Australian Painted Snipe	Vulnerable
	<i>Macquaria australiasica</i> Macquarie Perch	Endangered
	<i>Prototroctes maraena</i> Australian Grayling	Vulnerable
	<i>Heleioporus australiacus</i> Giant Burrowing Frog	Vulnerable
	<i>Litoria aurea</i> Green and Golden Bell Frog	Vulnerable
	<i>Chalinolobus dwyeri</i> Large-eared Pied Bat, Large Pied Bat	Vulnerable
	<i>Dasyurus maculatus maculatus</i> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll	Endangered
	<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	Vulnerable
	<i>Phascolarctos cinereus</i> Koala	Vulnerable
	<i>Potorous tridactylus tridactylus</i> Long-nosed Potoroo	Vulnerable
	<i>Pseudomys novaehollandiae</i> New Holland Mouse	Vulnerable
	<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	Vulnerable
	<i>Allocasuarina glareicola</i>	Endangered
	<i>Pimelea curviflora</i> var. <i>curviflora</i>	Vulnerable
	<i>Prerostylis saxicola</i> Sydney Plains Greenhood	Endangered
	<i>Streblus pendulinus</i> Siah's Backbone, Sia's Backbone, Isaac Wood	Endangered
<i>Pimelea spicata</i>	Endangered	
<i>Hoplocephalus bungaroides</i> Broad-headed Snake	Vulnerable	

Matter of NES	Threatened species/species habitat	Listing under EPBC Act
Listed Migratory Species	<i>Apus pacificus</i> Fork-tailed Swift	Threatened
	<i>Ardea alba</i> Great Egret, White Egret	
	<i>Ardea ibis</i> Cattle Egret	
	<i>Haliaeetus leucogaster</i> White-bellied Sea Eagle	
	<i>Hirundapus caudacutus</i> White-throated Needletail	
	<i>Merops ornatus</i> Rainbow Bee-eater	
	<i>Monarcha melanopsis</i> Black-faced Monarch	
	<i>Myiagra cyanoleuca</i> Satin Flycatcher	
	<i>Rhipidura rufifrons</i> Rufous Fantail	
	<i>Xanthomyza Phrygia</i> Regent Honeyeater	
	<i>Ardea alba</i> Great Egret, White Egret	
	<i>Ardea ibis</i> Cattle Egret	
	<i>Gallinago hardwickii</i> Latham's Snipe, Japanese Snipe	
<i>Rostratula benghalensis (sensu lato)</i> Painted Snipe		

#### 9.4.3 Potential Impacts

The construction and operation of the proposed Development are not likely to have a direct impact on ecology due to the lack of flora and fauna on the Site. No vegetation clearance is necessary during construction or operation. Therefore there is no potential that fauna habitat would be lost or fragmented as a result of the proposed Development.

Vegetation located beyond the Site boundary would also not be impacted. Excavation activities as part of the proposed Development would be limited and as such, any indirect impacts via erosion and sedimentation would be negligible and manageable through erosion and sedimentation measures.

Due to adequate distance from the Site, the endangered ecological community, threatened species or their habitat identified during the database searches outlined in Section 9.4.1 would not be at risk from construction or operational impacts such as increased noise or traffic. The regional park area located approximately 540 metres to the north east of the Site, holds the largest number of flora records, with over 100 Juniper-leaved Grevillea specimens recorded at this location. However, this area is at such a distance from the works that the potential impact on the ecological value of this flora population would be negligible. As evidenced by the Atlas of NSW Wildlife records, all fauna sightings were individual specimens and occurred outside of the industrial zone in which the Site is located. As such, the proposed Development is unlikely to have an impact on the biodiversity values of the area and would not impede the viability of potential habitat or ecological populations in the region.

#### **9.4.4 Mitigation Measures**

Mitigation measures to be implemented during construction and/or operation of the proposed Development include:

- Appropriate controls would be provided to manage exposed soil surfaces and stockpiles to prevent sediment discharge into the adjacent streets.
- Stockpile and storage locations would be clearly identified and erosion and sediment controls would be provided around stockpiles where appropriate.
- Dust suppression would be conducted when there is a risk of increased dust outside of acceptable levels.
- Street trees and plants immediately adjacent to the Site would be fenced with high-visibility material to alert construction vehicle drivers of their location.
- Use of the wheel wash for construction traffic before departing the Site.

## 9.5 Landscape Character and Visual Amenity

There are no specific DGRs relating to Landscape Character and Visual Amenity

### 9.5.1 Introduction

The visual impact of the proposed Development has been assessed through inspections of the surrounding area, topographic map interpretation and photographs of the existing environment. The design of additional infrastructure required for the proposed Development has also been assessed, having regard to a range of sensitive locations, including surrounding residential development and surrounding roads from which the Site is visible.

### 9.5.2 Existing Environment

#### Surrounding Environment

The proposed Development Site is situated within the Dunheved Industrial Precinct, 43km from the Sydney CBD and approximately 7.5 kilometres from Penrith town centre. It is located at 42-46 Charles Street, on Lot 300 DP 1143213 (Figure 1-1). The Dunheved Industrial Precinct and its surrounds are situated on the South Creek floodplain which is generally flat with some gentle rises. While the surrounds are generally flat, the precinct is mostly screened from sensitive receptors by vegetation along the immediate boundary of the precinct, in particular, the Dunheved Golf Course in the south-west, and the Sydney Water Maintenance Depot in the north-east. The riparian vegetation along South Creek and Ropes Creek provides more substantial screening for residential suburbs in the vicinity of the precinct.

Premises within the industrial estate surrounding the Site include:

- Linfox (transport and logistics);
- ARC (steel industry);
- Jasco (stationery products);
- Corinthian Doors (timber door manufacturer);
- R & G Fencing (metal fencing manufacturing);
- Australian Waste Oil Refineries (oil recycling services);
- Jaybro Civil and Safety Products (safety and environmental products); and
- Ronstin (paint manufacturers and wholesalers).

These premises include mostly warehouses and industrial facilities with similar buildings, warehouses and infrastructure to the proposed Development. The surrounding industrial facilities are shown in Plate 9-1 to Plate 9-6.

The proposed Development is in close proximity to several sensitive receivers and recreational areas, including residential suburbs, recreational facilities, parks, reserves and waterways, as detailed in Table 9-4. The nearest sensitive residential receivers are located approximately 865m south east of the Site in the residential suburb North St Marys.

Table 9-4 Distance of local landscape features from the proposed Development

Feature	Distance from the proposed Development	Description of views of the Dunheved Industrial Precinct
Ropes Crossing – residential suburb	1.1km north-east	Limited view of the precinct. Views are screened by Ropes Creek riparian vegetation
Tregear – residential suburb	1.4km east	Limited view of the precinct. Views are screened by Ropes Creek riparian vegetation
North St Marys – residential suburb	865m south	Partial views of industrial premises across Forrester Road. However, these are not part of the Dunheved Industrial Precinct
St Marys – residential suburb	2km south	Partial views of industrial premises through roadside vegetation
Werrington – residential suburb	1.4km south-west	Limited view of the precinct. Views are screened by South Creek riparian vegetation
Werrington County – residential suburb	1.6km west	Limited view of the precinct. Views are screened by the Dunheved Golf Club
Dunheved Golf Course – recreational facility	600m west	Partial views of Dunheved Industrial Precinct through roadside vegetation
Colonial Golf Course and Driving Range – recreational facility	970m south-west	Partial views of Dunheved Industrial Precinct through roadside vegetation and vegetation within the property
St Marys Leagues Stadium – recreational facility	800m east	Partial views of Dunheved Industrial Precinct through roadside vegetation
Ropes Creek – waterway	900m north-west	Limited views of Dunheved Industrial Precinct through riparian vegetation
South Creek – waterway	890m west	Limited views of Dunheved Industrial Precinct through riparian vegetation
Wianamatta National Park	1.5km north	Limited views of Dunheved Industrial Precinct through established vegetation
Dunheved estate reserve	200m south-east	Partial views of Dunheved Industrial Precinct through roadside and parkland vegetation
Tregear Reserve	1.7m east	Limited view of the precinct. Views are screened by Ropes Creek riparian vegetation



Plate 9-1 Industrial property on Dunheved Circuit, just south of Links Road



Plate 9-2 Industrial property on Dunheved Circuit, along the southern boundary of the Dunheved Industrial Precinct



Plate 9-3 Storage Tanks within industrial property along Charles Street, within the Dunheved Industrial Precinct



Plate 9-4 Storage Tanks within industrial property along the eastern boundary of the Dunheved Industrial Precinct, Dunheved Circuit



Plate 9-5 Entrance to industrial property along Charles Street within the Dunheved Industrial Precinct



Plate 9-6 Entrance to industrial property along Charles Street within the Dunheved Industrial Precinct

### Proposed Development Site

Built elements within the boundary of the Site can be largely seen from Charles Street and Dunheved Circuit, mostly as a result of the large entrances to the site to accommodate heavy and light vehicle movements (shown in Plate 9-7 and Plate 9-8). There are no public lookouts or viewing points in the vicinity of the proposed Development.

Prior to Worth's acquisition of the proposed Development Site in mid-2012, the Site was previously operated as a materials recycling facility. The following infrastructure is present on the site, with the tallest structures up to 10 to 12 metres in height:

- Two warehouses (referred to as Areas 1, 2, 3 and 4 as part of the proposed Development);
- A workshop;
- A wash-down bay;
- Two weighbridges;
- Two Site access points (one off Charles Street and one off Dunheved Circuit);
- Two office buildings (referred to as Office A and Office B with respect to the proposed Development);
- An amenities block;
- Heavy and light vehicle parking facilities; and
- Utilities (power and sewer) infrastructure.



Plate 9-7 Heavy vehicle entrance point to the Site on Charles Street



Plate 9-8 Light vehicle entrance point to the Site on Dunheved Circuit

### 9.5.3 Potential Impacts

The proposed Development would largely be accommodated within existing buildings on the Site and would utilise the existing infrastructure as much as practically possible. However, the proposed Development would require the construction and commissioning of the additional buildings and infrastructures (refer Section 4.4 and Figure 4-1). The potential impact of this additional infrastructure is outlined in Table 9-5.

The proposed Development would also include construction and installation of additional treatment plant, storage bunkers, and general modifications within the footprint of existing buildings on the Site; however these would not be visible from external vantage points.

The proposed Development would largely be visually contained within the existing Site, given the presence of existing concrete boundary walls and the position of the Site within an existing industrial facility. Furthermore, the Development will be undertaken within the context of an existing industrial precinct.

Table 9-5 Potential impact of additional infrastructure on landscape character and visual amenity

New Infrastructure	Potential Impact
External bunkers along the eastern Site boundary	Low – the external bunkers would be located against the eastern concrete boundary wall and immediately west of Area 1. They would not be visible outside of the Site boundary
Bunding and drainage around specified areas and infrastructure;	Low – bunding and drainage would be located at the ground level, with bunding no more than 1m in height and would generally not be visible outside of the Site boundary
Retractable roofing over external bunkers	Low – the external bunkers would be located against the concrete boundary wall and immediately west of Area 1. They would be screened by the concrete boundary walls and not be visible outside of the Site boundary
Three reagent/additive storage hoppers immediately south of Area 1	High – the storage hoppers would be 12 metres high and therefore the tallest piece of operational plant within the Site, with existing infrastructure being no more than 10 to 12 metres in height. The hoppers may be slightly visible from outside the Site boundary from Charles Street and Dunheved Circuit, but other sensitive receivers listed in Table 9-4 would be largely screened from the hoppers through existing vegetation. The hoppers would be positioned immediately adjacent to Area 1, and would be within the sight lines of infrastructure already existing at the site, particularly Area 1. The vegetation surrounding the Site would largely screen this plant from sensitive receivers (Table 9-4)
Mud plant water storage	Low – the storage tanks would be 7m high and would be located immediately adjacent to Area 4. They would not be visible from outside the Site boundary.
Water treatment plant	Moderate – the water treatment plant and water storage tanks (four 60KL tanks 7m in height) would be visible from the light vehicle entry/exit point. However, this plant is consistent with plant and infrastructure of surrounding industrial premises.
Dangerous goods store	Low – dangerous goods store would be located against the Site's concrete boundary wall south of Area 1 and would not be visible outside of the Site boundary
Portable laboratory	Low – dangerous goods store would be located against the Site's concrete boundary wall south of Area 1 and would not be visible outside of the Site boundary

### Construction

Activities associated with the construction of the proposed Development would require the use of large plant and equipment for up to six months, including, cranes and scissor lifts, compressors, earth-moving equipment, concrete pumps and delivery vehicles (Section 4.4). The presence of this plant and equipment would generate temporary impacts on visual amenity during the construction phase.

By nature, the industrial precinct experiences heavy vehicle movements and plant deliveries, as well as the use of excavators and cranes across the industrial premises. The plant and equipment required for construction of the proposed Development (Section 4.4) would be generally consistent with plant and vehicles used within other premises in the precinct. The proposed Development Site and the wider industrial precinct has the ability to absorb the visual impact of this construction plant and equipment. In addition, the presence of this construction plant and equipment would be temporary and would not all be present at the Site at the same time.

The nature of construction activities means that there is potential during this period for waste and construction materials to be present. Inappropriate management of such materials can lead to an untidy site, visible from surrounding sensitive receivers. The presence of construction waste and materials would be temporary and would be present for approximately six months. General housekeeping practices within the Site during construction would ensure that the Site remains generally tidy, and no further mitigation would be required.

## **Operation**

The most prominent visible structures that exist on the Site from the previous materials recycling facility are the two warehouses containing Areas 1, 2, 3 and 4. The construction of additional external storage bunkers and water storage tanks immediately adjacent to these areas are not anticipated to alter the character of the Site, or impact on the visual amenity at the surrounding sensitive receiver locations listed in Table 9-4.

The proposed Development includes the installation of three reagent/additive storage hoppers immediately south of Area 1. They would be 12 metres in height, extending above the roofline of some of the existing buildings at the Site by approximately two metres, and would therefore be the most visually prominent feature of the proposed Development. Although the hoppers would be more visually prominent than the infrastructure that currently exists on the Site, the proposed Development is situated within an industrial precinct which has the ability to absorb the visual impact of the hoppers without significantly altering the character of the immediate landscape. In addition, the hoppers would be located within the sight lines of existing Site infrastructure which reduces the impact of their presence at the Site.

The other additional infrastructure to be commissioned at the Site, including the dangerous goods store, laboratory, water treatment plant and external storage bunkers along the eastern boundary would be situated either adjacent to existing industrial buildings, along the concrete boundary walls of the Site or contained within discrete, specified areas. The proposed Development Site has a good visual absorption capacity; the concrete boundary walls of the Site, as well as its location within an industrial precinct, provide a good level of screening from external receivers. The additional infrastructure would not alter the surrounding sensitive landscapes. The proposed Development generally aligns with the objectives and general requirements of the DCP 2010 as they relate to the general requirements for industrial areas. During the detailed design phase of the proposed Development, consideration would be given to reducing impacts to visual amenity, including the choice of materials and colour tones that differ least from existing infrastructure and the surrounding industrial precinct.

### **9.5.4 Mitigation Measures**

#### **Construction**

The construction of the proposed Development would be short term and temporary in nature, and no specific mitigation measures are required with regards to potential impacts to landscape character and visual amenity in the vicinity of the Site.

However, general housekeeping practices would be implemented throughout the construction phase of the proposed Development to ensure that the Site remains generally tidy, and construction materials and waste is managed appropriately.

The quality of existing landscaped areas is not likely to be impacted by the proposed Development. Any landscaped areas impacted during construction would be rehabilitated.

#### **Operation**

Impacts of the operation of the proposed Development are anticipated to be mostly consistent with the existing visual amenity and landscape character of the Site, particularly in the context of its location within an industrial precinct. To retain consistency with the existing Site, and to minimise any impact of the proposed Development on surrounding sensitive receivers, operational infrastructure to be commissioned as part of the proposed Development would be constructed in areas which are screened from such sensitive receivers by the concrete wall boundaries of the Site.

## 9.6 Socio-economic

There are no specific DRs relating to socio-economics

### 9.6.1 Introduction

The socio-economic impacts of the proposed Development have been identified based on a desktop profile of the surrounding community, with identified impacts assessed and evaluated against the likely direct, indirect and cumulative impacts of other developments in the surrounding area.

In accordance with the Director General's Requirements (DGRs) for the proposed Development, social and economic aspects of the environment in the vicinity of the Site have been described to the extent necessary for assessment of environmental impacts. Specific consideration has been given to the following impacts:

- Health implications for nearby residents, pedestrians, workers, school children and the like;
- Likely noise and odour disturbance caused by the operations, including transport operations, on nearby residences;
- Other impacts of trucking movements; and
- Litter and dust control and any nuisance likely to be caused.

### 9.6.2 Existing Environment

#### Land Use

The City of Penrith is located in Sydney's outer western suburbs and encompasses a land area of 407 square kilometres, of which around 80 percent is rural and rural-residential. The rural and rural residential land uses are concentrated in the south and north, with the residential population concentrated in a central band running east west along the major rail and road corridors. Over the last 40 years, Penrith has catered for a significant proportion of Sydney's demand for new housing on the urban fringe. While development has slowed somewhat in recent years, an increase in residential development is expected as several large release areas have been identified for urban development over the next ten to twenty years.

St Marys is located on the eastern side of the Penrith Local Government Area, bordered by South Creek to the west and the M4 Motorway to the south. Its northern section incorporates the industrial suburb of Dunheved. St Marys has a long and rich industrial and agricultural history, and is now the major industrial, commercial and residential centre for the eastern part of the Penrith LGA. The suburb services many rural and urban communities, making it a vital part of the City of Penrith (Penrith City Council, 2012).

#### Population Demographic

The 2011 Census of Population and Housing (Australian Bureau of Statistics (ABS), 2012) recorded a population of 51,949 for the suburb of St Marys (St Marys, NSW Statistical Area Level 3) at the time of the census. This represents an approximate 2.5 percent increase from the previous census in 2006. This rate of population growth is anticipated to increase over the next twenty years with a focus on urban development in land release areas such as the St Marys Release Area, which is located approximately 2km south of the Site. Significant in-fill development opportunities in Penrith and St Marys are also expected to contribute significantly to population growth.

St Marys is predominantly characterised by a young family demographic, with a median age of 33 and children between the ages of 0 to 14 years accounting for 21 per cent of the population (ABS, 2012). This demographic is likely to be dependent on access to employment, education, and community and recreational facilities.

#### Employment

The rate of employment in St Marys is approximately 60 per cent, with the majority of people working in the manufacturing, construction, wholesale trade, retail trade, and transport, postal and warehousing industries. Approximately 4 percent of the population of St Marys are classed as being unemployed.

Worh currently employs 15 full time staff for the current site operations at St Marys.

## **Amenity**

The proposed Development is located within the Dunheved Industrial Precinct. The Precinct is comprised primarily of warehouses and industrial facilities that contain buildings, warehouses and infrastructure similar to that of the proposed Development. The site is located within close proximity to several sensitive receivers and recreational areas, including residential suburbs, recreational facilities, parks, reserves and waterways (refer to Table 9-4). The nearest sensitive residential receivers are located east of Forrester Road approximately 865m south east of the Site. A golf course is located 600 metres west of the Site, and is classified as an active recreational area in accordance with the EPA's Industrial Noise Policy (INP). The potentially most-affected locations at the golf course were considered as receiver locations for the purpose of the noise assessment (Section 9.5), such as the golf house, nearby tee-off points and greens. The nearest commercial facilities are St Marys Leagues Club and McDonalds, located on adjacent corners of Forrester Rd and Boronia St approximately 865 metres from the Development site. The nearest school has been identified as Chiefly College (S1), located 1.15 kilometres south east of the Site.

The acoustic environment within the vicinity of the Site is predominantly composed of road noise from vehicles travelling along adjacent local roads and also from Forrester Road. For the purpose of the noise assessment (Section 8.2), background noise levels were measured at 144 Ayrell St, St Marys and these were used to form the criteria for all residential receivers within the assessment.

No existing odour complaint data for the Site was available; however, the local air quality in the vicinity of the Site is expected to be typical of that experienced in any industrialised area. The closest air quality monitoring station to the proposed Development is located at St Marys (6 kilometres south of the site). This station records hourly PM<sub>10</sub> concentrations using a Tapered Element Oscillating Microbalance (TEOM). The maximum 24-hour concentration measured at St Marys in 2012 (the most recent year for which data are available) was 34 µg/m<sup>3</sup> which is below the EPA 24-hour maximum criterion of 50 µg/m<sup>3</sup> (EPA, 2013). The annual average PM<sub>10</sub> concentration was recorded at 14 µg/m<sup>3</sup> for 2012 which is just under half the EPA annual average criterion of 30 µg/m<sup>3</sup> (EPA, 2013).

Built elements within the boundary of the Site include warehouses, a workshop, a wash-down bay, weighbridges, office buildings, site access points, an amenities block, parking facilities and utilities infrastructure. A number of these elements can be seen from Charles Street and Dunheved Circuit through large site accesses. However, much of the Site is screened by the existing concrete boundary wall, as well as by vegetation and other industrial sites within the surrounding precinct. There are no public lookouts or viewing points within the immediate vicinity, and the nearest sensitive receivers are located approximately 865 metres south of the Site.

## **Traffic and Transport**

The Site is currently configured to accommodate heavy vehicle access (through the Charles Street gated access), egress, and internal movements. Light vehicles enter and exit through a separate access on Dunheved Circuit, providing for separation of heavy and light vehicle movements within the Site. On a typical weekday, the number of existing heavy and light vehicle movements are estimated as 70-80 and 40 respectively. Around 70-80 percent of all vehicles associated with the Site travel to and from the south, as this route provides the most convenient access to the wider arterial network. Within the Dunheved Industrial Precinct, the road network generally consists of wide, industrial-standard roads which are frequented by heavy vehicles. At present traffic volumes on this road are relatively low, resulting in a large amount of spare capacity.

The 2011 census data indicates that private vehicles are the predominant mode of transport used within St Marys for the purpose of travelling to work, followed by trains (ABS, 2012). Existing operations employ 15 full-time staff, all of whom are assumed to travel to and from the Site by car. The existing 29 spaces provide ample parking for staff and visitors, based on current activities and requirements.

### **9.6.3 Potential Impacts**

#### **Construction**

The proposed Development would involve limited construction activity, as the majority of facilities and structures already exist on the Site. As such, impacts to the amenity of the local area during construction are expected to be minor. All construction would be undertaken during standard hours (refer to Section 4.4.3) and may be undertaken in stages spanning approximately six months.

The closest residential receivers are approximately 865 metres south east of the Site and thus dust impacts from construction are unlikely to affect nearby residences. However, there is potential for construction dust from the proposed Development to impact the local air quality of the Dunheved Industrial Precinct. Continuous management of dust generated onsite during the construction phase through use of standard dust mitigation techniques, as well as use of the existing on-site sweeper and truck wash facility, would minimise the spread of construction dust generated. There are no potential sources of odour anticipated during the construction phase.

Although the use of vibratory intensive equipment during construction has the potential to cause human discomfort to occupants of neighbouring properties, the noise and vibration impact assessment (Section 8.2) demonstrated that both construction noise and vibration are expected to comply with all relevant criteria. In addition, it was found that noise caused by construction traffic would not increase road noise levels by more than 2 dB and hence would comply with the Road Noise Policy and Environmental Criteria for Road Traffic Noise.

As discussed in Section 9.5, the use of large plant and equipment such as cranes and concrete pumps during construction would potentially impact on visual amenity. Given the temporary nature of the construction works and the existing industrial landscape and visual context of the Site, construction works associated with the Development are not likely to result in long term impacts to visual amenity.

Although it is anticipated that construction of the proposed Development would increase both light and heavy vehicle traffic travelling to and from the Site, this increase is anticipated to be relatively small and construction activities would not be expected to significantly change traffic volumes, patterns or composition. Given that construction traffic impacts would be limited to a small increase in existing traffic, and the existing high level of performance of the surrounding road network, construction activities would not be expected to have any noticeable effect on road network performance or safety. In addition it is anticipated that there would be ample parking space within the Site for construction vehicles based on existing provisions.

Construction of the proposed Development is expected to generate around 15 locally sourced full-time employment opportunities over the 6 months of construction, through the requirement for services such as excavation, earthmoving and general and specialist construction works. Confirmation of the construction workforce and any staging of these personnel in accordance with construction staging would be undertaken during the detailed design phase of the proposed Development.

### **Operation**

Operation of the proposed Development is not anticipated to result in adverse socio-economic impacts, rather several positive outcomes, including the generation of additional employment opportunities and environmental benefits associated with the immobilisation of contaminants.

Once fully operational, the proposed Development is expected to generate approximately 15 full time equivalent positions, which would include the transfer of seven full time positions from the South Windsor Facility. Taking into account the existing 15 positions at the St Marys Facility, it is expected that a total of approximately 30 staff would present on-site. Operation of the proposed Development is also expected to generate flow-on benefits to the local economy through additional expenditure at locations such as food outlets and petrol stations. Ongoing benefits relating to employment and local economic growth would align with forecasted urban development within the City of Penrith. In addition, the Facility is expected to play a contributing environmental role in providing waste management and contaminant immobilisation services to the growing city of Penrith and NSW more generally.

The proposed Development effectively utilises existing industrial land and is therefore by virtue compatible with the existing land use. Operational impacts to local amenity may occur, however it is expected that such impacts would be minor considering the existing industrial context of the Site. Considering that the Site would continue to be used as a waste facility, the proposed Development is not expected to alter the character of the Site or surrounds, or affect the community values of the area.

Given the partially enclosed nature of the odour emission sources and predicted concentrations at nearby sensitive receptors, the modelling predicts that the operation of the proposed Development is unlikely to cause adverse odour impacts beyond the site boundary. Provided suitable mitigation measures described in Section 8.1.4 are implemented, no impacts on local air quality or amenity due to dust emissions during the operational phase are anticipated.

Noise modelling undertaken as part of the noise assessment (Section 8.2) demonstrated that operational noise exceedances were predicted for three residential receivers using the evening time criteria during the worst-case weather conditions. This exceedance has been addressed through the restriction of the excavator handling oil drums and construction waste during night-time hours. It is anticipated that if these noise control measures are implemented, noise levels associated with operation of the proposed Development will comply with the criteria established within the INP for all periods and weather conditions and impacts on amenity are not anticipated.

The most visually prominent features of the proposed Development are the three proposed reagent/additive storage hoppers (refer to Section 9.5). Although these hoppers would extend above the roofline of the Site's existing buildings, their impact on visual amenity would be reduced by their location within the sight lines of existing infrastructure and by the Site's concrete boundary walls. In addition, the proposed Development is situated within an industrial precinct which has the ability to absorb significant visual features of the site without significantly altering the character of the immediate landscape. As such, impacts of the operation of the proposed Development are anticipated to be mostly consistent with the existing visual amenity and landscape character of the Site.

Operation of the proposed Development is anticipated to result in additional heavy vehicle movements, resulting in a total of around 60-65 movements per day during peak operations. No change to the composition of heavy vehicles (for example the use of longer or heavier vehicles) would be expected. The proposed Development is anticipated to generate a similar volume of light vehicle movements (60-65), and current parking provisions are expected to provide sufficient parking for staff and visitors based on proposed activities and requirements. The overall increase in traffic travelling to and from the site is expected to be small (less than 3.1 percent) when compared to background traffic in the vicinity of Dunheved Industrial Precinct, and is not expected to have a significant effect on the capacity, efficiency or safety of the surrounding road network.

Operation of the existing facility does not currently generate significant nuisance issues relating to littering and loitering, and the proposed Development is not expected to alter current circumstances. Waste generated through operation of the proposed Development would be managed on-site, and employees would receive training relating to appropriate use of on-site waste disposal facilities. With regards to loitering, employees and visitors would have access to sufficient on-site parking and facilities, and the proposed Development would be largely shielded by the existing concrete boundary wall and access gates. As such, the proposed Development is not expected to generate potential for loitering.

#### **9.6.4 Mitigation Measures**

Social and economic impacts of the proposal relate primarily to amenity impacts assessed in other sections of the EIS, including air quality (Section 8.1), traffic (Section 8.3), noise and vibration (Section 8.2), and landscape character and visual amenity (Section 9.5). Impacts to residents and businesses within the surrounding area would therefore be mitigated through the implementation of measures recommended to reduce impacts in these previous sections. No additional measures are proposed.

## 9.7 Heritage

The EIS must consider heritage, including Aboriginal cultural heritage.

### 9.7.1 Introduction

As part of this EIS, a desktop assessment has been undertaken for the proposed Development, including surrounding land up to one kilometre from the site to assess the potential impacts of the proposed Development on European and Aboriginal heritage.

The methodology used to undertake the Indigenous heritage assessment was determined by the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (OEH, 2010). This code sets out the reasonable and practicable steps necessary to:

- Identify whether or not Aboriginal objects are, or are likely to be, present in an area;
- Determine whether or not their activities are likely to harm Aboriginal objects (if present); and
- Determine whether an Aboriginal Heritage Impact Permit is required for the development.

To inform both Indigenous and non-Indigenous assessments, a desktop review was undertaken to characterise the existing environment of the area surrounding the Site including the surrounding environment, natural environment and known archaeological items and sites. For the desktop review of Indigenous cultural heritage values, a search was undertaken using the OEH Aboriginal Heritage Information Management System (AHIMS) database. Searches for non-Indigenous heritage items were also conducted of the Register of the National Estate (RNE) (now a non-statutory list), Commonwealth and National Heritage Lists (CHL/NHL), State Heritage Register (SHR), Heritage Inventory (SHI), Sydney Regional Environmental Plan No.30 (St Marys) and Schedule 2 of Parrith LEP.

### 9.7.2 Existing Environment

As described in Section 1.3 of this EIS, and in the non-Indigenous Heritage section below, the Site has been substantially disturbed as a result of the establishment of the previous materials recycling facility. This involved the earthworks to establish the hardstand across the majority of the Site and the construction of new buildings and services. The recent history of the Site is detailed below.

#### Non-Indigenous Heritage

##### *Site History*

An overview of the site history is outlined in Table 9-6, based on title deed searches and review of historical aerial photographs. From these historical records, it is evident that since at least 1947 the Site has been used for industrial purposes, with metal works and/or recycling present on the Site since at least 1971/1974.

Table 9-6 Overview of the history of the Site

Date	Event	Title Deed
1927-1941		Private grazier landowners
1941		Commonwealth of Australia
1941-1943		Private grazier landowner
1943-1974		Commonwealth of Australia
1947	Site appears to be developed. Surrounding area appears to be partially developed as an industrial area confined within a circular road (still existing).	
1971/1974 – 1982		Affinity Residues Pty Ltd
1978	South-western portion of the Site was almost entirely occupied by two buildings/structures. Surrounding area has been further developed with numerous industrial buildings and structures in place.	
1982-1988		Affinity Metals Pty Ltd
1986	Northern area of the Site is occupied by a square building. East of the building was bare ground with some vegetation cover. Area of hardstand present to the west of the building. A number of structures present to the southwest of the building. Surrounding area appeared relatively unchanged from the situation in 1978.	
1988-2003		Sims Aluminium Pty Ltd (formerly Affinity Metals Pty Ltd)
1994	Majority of the site was occupied by buildings and structures. Building in the north replaced by a building of similar dimensions to current warehouse building. Area to the east of the building appears to be bare ground. The area to the west of the building appears to be hardstand. Surrounding area has been further developed with additional buildings and structures apparent.	
2003-2006		PS Management Ltd
2006-2011		WMR Investments Pty Ltd
2011	Structures in south-west of the Site are no longer present. A new building is located in this area along the south-east boundary. Hardstand now extends to the entire site. Surrounding land use is similar to 1994; however an overall increase in density of infrastructure has occurred.	
2012		Worth Recycling Pty Ltd

### Database Searches

A review of the relevant State and Federal heritage registers and listings was undertaken to determine the non-Indigenous heritage items in the area. Database searches included the Register of the National Estate (RNE), Commonwealth and National Heritage Lists (CHL/NHL), State Heritage Register (SHR), Heritage Inventory (SHI), Sydney Regional Environmental Plan No.30 (St Marys) and Schedule 2 of the Penrith LEP.

Table 9-7 provides a summary of the results of the historic register searches conducted for the Site and surrounds on 6 February 2013.

Table 9-7 Historic Heritage Register Search Results

Listing	Results
Register of the National Estate (RNE)	One item was found in the Penrith LGA listed on the RNE. It is located approximately 4.5 kilometres west of the Site.
National Heritage List (NHL)	No items were found in the Penrith LGA.
Commonwealth Heritage List (CHL)	No items were found in the Penrith LGA.
NSW Heritage Register (NSW HR)	21 items were found in the Penrith LGA listed on the NSW HR. Of these, none were listed on the Site or within a one kilometre radius of the Site.
Sydney Regional Environmental Plan No. 30 (St Marys)	20 items were found within the land covered by SREP 30. Of these, two were within one kilometre of the Site, being Dunheved House at 875 metres from the Site and the Beecroft Butchery at one kilometre from the Site.
Penrith Local Environment Plan 2010 (LEP)	198 items were found in Penrith LGA. Of these, none were listed on the Site or within a one kilometre radius of the Site.
National Trust of Australia (NSW)	No items were found in the Penrith LGA.
World Heritage List (WHL)	No items were found in the Penrith LGA.

### Indigenous Heritage

As per the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*, a search of the AHIMS database was conducted (6 February 2013) for the area within one kilometre of the Site. Table 9-8 summarises the four archaeological sites that were identified within one kilometre or less of the Site.

Table 9-8 Indigenous archaeological sites within one kilometre of the Site

Site Reference	Site Details	Approximate location and distance from Site
45-5-3037	Artefact – potential archaeological deposit	960 metres north of the Site
45-5-3330	Artefact – no details provided	940 metres north west of the Site
45-5-3429	Artefact – no details provided	1 kilometre north west of the Site
45-5-3597	Artefact – no details provided	920 metres north west of the Site

### 9.7.3 Potential Impacts

No European heritage items were located on the Site or within a one kilometre radius of the Site. Therefore the construction or operation of the proposed Development would not impact on any heritage items on the Site or within the broader regional area.

Of those Indigenous heritage sites located within one kilometre of the Site, the closest is at a distance of 920 metres to the northwest of the proposed Development Site, within the northern corner of the Dunheved Golf Course. At such distance, potential impacts to this Site as a result of proposed Development would not occur due to its location outside of the Dunheved Industrial Estate.

Further, the previous disturbance to the Site as result of previous construction activities and the limited excavation required for the Proposed Development, the potential for archaeological items at the Site is considered to be low.

#### **9.7.4 Mitigation Measures**

No mitigation measures are considered necessary for the proposed Development.

If Aboriginal cultural objects are subsequently uncovered during construction or operation, all relevant works would cease immediately in the area to prevent any further impacts to the object(s). A suitably qualified archaeologist and OEH would be contacted to determine the significance of the object(s). The site would be registered in the AHIMS database (managed by OEH) and the management outcome for the site included in the information provided to AHIMS. Some works may not be able to resume until OEH has provided written approval. Further investigation may be required depending on the type of Aboriginal object that is found.

## 9.8 Greenhouse Gas

The EIS must consider air quality, including odour, dust and greenhouse gas emissions in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors.

### 9.8.1 Introduction

In accordance with the DGRs, an assessment of greenhouse gas (GHG) emissions (Appendix I) has been undertaken in accordance with relevant EPA guidelines. The objectives of the GHG assessment were to:

- quantitatively assess the potential Scope 1 and 2 GHG emissions of the construction and operational phases of the proposed Development;
- qualitatively assess the potential impacts of these emissions on the environment; and
- describe the measures which could be implemented to mitigate GHG emissions.

The GHG assessment was conducted according to the general principles outlined in:

- *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)*, WRI and WBCSD (2004); and
- *National Greenhouse Accounts (NGA) Factors*, Australian Department of Climate Change and Energy Efficiency (2012).

### 9.8.2 Existing Environment

#### Climate Change and Greenhouse Gases

Greenhouse gases (GHGs) are emitted into the Earth's atmosphere as a result of natural processes and human activities. Since the industrial revolution there has been an increase in the amount of GHGs emitted which has increased the concentration of GHG emissions in the atmosphere. This has led to an increase in the Earth's average temperature (surface temperature) and has caused Climate Change (or global warming) to occur.

There are numerous GHGs which contribute to the Greenhouse Effect. In order to standardise GHGs, emissions are reported as tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-e).

GHG emissions are categorised into three different scopes (either Scope 1, 2 or 3) in order to delineate between direct emissions from sources that are owned or controlled by a project and indirect emissions that are a consequence of project activities but occur at sources owned or controlled by another entity. A brief description of the three GHG scopes is provided below:

- Scope 1 emissions, also called "direct emissions". These emissions are generated directly by the project, e.g. methane emissions generated as waste decomposes in an anaerobic environment
- Scope 2 emissions, also referred to as "indirect emissions". Scope 2 emissions are generated outside of the project's boundaries to provide energy to the project, e.g. the use of purchased electricity from the grid
- Scope 3 emissions, are all indirect emissions (not included in Scope 2) due to upstream or downstream activities. For example indirect upstream emissions associated with the extraction, production and transport of purchased construction materials.

It should be noted that Scope 3 emissions have not been calculated as part of this GHG assessment since there is very limited opportunity for the proposed Development to influence the quantity of these emissions via mitigation measures.

### Legislative and Policy Context

A number of legislative and policy mechanisms include GHG mitigation considerations and requirements. The following provides a summary of these mechanisms:

- the Clean Energy Plan (*Securing a Clean Energy Future: the Australian Government's climate change plan, 2011*) describes the Australian Government's commitment to reducing GHG emissions and includes targets:
  - Five per cent emission reduction from 2000 levels by 2020, irrespective of commitments made by other countries.
  - 15 per cent or 25 per cent emission reduction from 2000 levels by 2020, if commitments are made by other countries.
  - 80 per cent emission reduction from 2000 levels by 2050.
- the Carbon Price Mechanism (CPM) set out in the *Clean Energy Act 2011* is the central national climate change mitigation instrument which will put a price on Scope 1 GHG emissions and provide a financial incentive for reducing GHG emissions.
- the CPM is underpinned by the *National Greenhouse and Energy Reporting Act, 2007* (NGER). NGER is the national framework for reporting and disseminating information on Scope 1 and Scope 2 GHG emissions, energy use and energy production associated with the activities of Australian corporations.
- the *Energy Efficiency Opportunities Act 2006* (EEO Act) requires users (corporations or corporate groups) of more than 0.5 petajoules of energy per year to assess their energy use, identify cost-effective energy efficiency opportunities, and report publicly on the outcomes.

In addition, GHG emissions reduction is one of the four key objectives of the *National Waste Policy*. The *National Waste Policy* (developed in 2009 and endorsed by the Council of Australian Governments in 2010) sets the direction for Australia's waste management from 2010 to 2020.

#### 9.8.3 Potential Impacts

Scope 1 and 2 GHG emissions would be generated during both construction and operation of the proposed Development.

During the construction phase, electricity and fuel would be consumed, generating emissions, for example through combustion of diesel fuel on-site by construction equipment.

Operation of the proposed Development would also generate GHG emissions, for example through consumption of diesel fuel and electricity that is required to run the facility.

#### Construction

##### Assumptions

For the purpose of the GHG assessment, it has been assumed that during construction, diesel fuel use would be associated with:

- Demolition works (assumed area of 150m<sup>2</sup>);
- Earthworks for bunded storage areas;
- Construction of reinforced concrete bunded storage areas; and
- Installation of storage tanks and other machines required during operation.

It has also been assumed that all construction vehicle/equipment/plant would run on diesel fuel (i.e. no petrol would be used), and that one machine with a standard fuel use rate of 15l/hr would be operational for the total construction period. Construction has been assumed to take place over a six month period and in the worst case for a 66 hour week.

In addition, it has been assumed that a dedicated site office/amenities would not be required during the construction phase, and that existing facilities would be used by construction staff. Hence it is assumed that no material amount of electricity would be consumed during the construction phase.

### GHG Assessment Boundary

The GHG assessment boundary defines the scope of GHG emissions and activities included in the GHG assessment. The GHG emission sources which were included in the assessment boundary for the construction of the proposed Development and the relevant GHG scope are listed in Table 9-9.

**Table 9-9 GHG Assessment Boundary – Construction phase**

Emission Source	Activity	Emission Scope	
		1	2
Diesel fuel used	Operation of construction equipment and site vehicles	✓	

### Assessment Results

The diesel fuel used on-site by construction equipment and Site vehicles would be the only source of direct Scope 1 GHG emissions during the construction phase. The amount of electricity used during the construction phase would be minimal, as the existing facility site offices/amenities would be used by construction staff. As a result, no calculations have been made for Scope 2 emissions during the construction phase.

As shown in Table 9-10, it is estimated that the construction phase of the proposed Development would generate approximately 63 tCO<sub>2</sub>-e of direct Scope 1 GHG emissions.

**Table 9-10 Construction phase of the proposed Development GHG emissions**

Emission Category Emission Source	Quantity	Units	GHG Emissions (tCO <sub>2</sub> -e)	
			Scope 1	Scope 2
Fuel use - construction equipment and site vehicles	23	kL	63	NA

Note: The estimated GHG emissions are based on data provided at the concept design stage of the Development. Hence the GHG emissions results provided are an estimate only, and subject to the accuracy of the estimated construction material / resource quantities and current project design stage and all other project assumptions.

The annual GHG emissions (including emissions and removals from land use and land use change) for NSW were 157.4 million tCO<sub>2</sub>-e in the year 2009 to 2010. As such, the estimated total Scope 1 GHG emissions associated with the construction of the proposed Development (approximately 63 tCO<sub>2</sub>-e) are approximately equivalent to 0.00004 per cent of NSW's annual GHG emissions (in 2009 to 2010).

### Operation

#### Assumptions

For the purpose of the GHG assessment, it has been assumed that during operation, diesel fuel use would be associated with:

- Operation of Site vehicles and operational equipment (e.g. cranes, loaders, dozers, etc.).

It has also been assumed that one machine with a standard fuel use rate of 15L/hr would be operational during the standard operating hours of the facility, and that all operational vehicles/machinery/plant would run on diesel fuel (i.e. no petrol would be used).

Electricity (sourced from the NSW grid) would be used to power operational machinery. Where data on specific machinery is not available, a standard 5.5kW has been assumed. It should be noted that operational machinery has not yet been specified for the proposed Development.

In addition, it has been assumed that additional dedicated site offices/amenities would not be required during the operational phase, and that existing facilities would be used by staff.

### GHG Assessment Boundary

The GHG emission sources which were included in the assessment boundary for the operational phase of the proposed Development and the relevant GHG scope are listed in Table 9-11.

**Table 9-11 GHG Assessment Boundary – Operational phase**

Emission Source	Activity	Emission Scope	
		1	2
Diesel fuel used	Operation of stationary equipment	✓	
	Operation of mobile equipment	✓	
	Operation of site vehicles	✓	
Electricity used	Operation of facility		✓

### Annual Emissions

The use of electricity to power the facility would be the only source of Scope 2 GHG emissions during operation.

It is estimated that annual operation of the proposed Development would generate approximately:

- 1,199 tCO<sub>2</sub>-e of direct Scope 1 GHG emissions; and
- 561 tCO<sub>2</sub>-e of indirect Scope 2 GHG emissions.

The total annual operational (Scope 1 and 2) GHG emissions would amount to approximately 1,761 tCO<sub>2</sub>-e.

Estimated annual GHG emissions associated with operation of the proposed Development are shown in Table 9-12.

**Table 9-12 Operational phase of the proposed Development GHG emissions (annual)**

Emission Category Emission Source	Quantity	Units	Annual GHG Emissions (tCO <sub>2</sub> -e)	
			Scope 1	Scope 2
Electricity use	630,811	kWhr / yr	NA	561
Fuel use - operational equipment & site vehicles	445	kL / yr	1,199	NA
<b>Total</b>			<b>1,761</b>	

Note: The estimated GHG emissions are based on data provided at the concept design stage of the project. Hence the GHG emissions results provided are an estimate only, and subject to the accuracy of the estimated operational project data and all other project assumptions.

Estimated total annual operational (Scope 1 and 2) GHG emissions associated with the proposed Development (around 1,761 tCO<sub>2</sub>-e) are approximately equivalent to 0.001 per cent of NSW's annual GHG emissions (in 2009 to 2010).

Solid waste disposal on land in NSW generated approximately 4.2 million tCO<sub>2</sub>-e in the year 2009 to 2010. The estimated total annual operational (Scope 1 and 2) GHG emissions associated with the proposed Development (approximately 1,761 tCO<sub>2</sub>-e.) are approximately equivalent to 0.04 per cent of NSW's annual (2009 to 2010) waste sector (solid waste disposal on land) GHG emissions.

### 9.8.4 Summary

During the construction phase, electricity and fuel would be consumed. These activities would generate Scope 1 and 2 GHG emissions directly and indirectly. It is estimated that the construction phase of the proposed Development would generate around 63 tCO<sub>2</sub>-e of direct Scope 1 GHG emissions. This is approximately equivalent to 0.00004 per cent of NSW's annual GHG emissions (in 2009 to 2010).

Operation of the proposed Development would also generate GHG emissions, for example through the consumption of diesel fuel and electricity required to run the facility.

It is estimated that annual operation of the proposed Development would generate approximately:

- 1,199 tCO<sub>2</sub>-e of direct Scope 1 GHG emissions; and
- 561 tCO<sub>2</sub>-e of indirect Scope 2 GHG emissions.

The total annual operational (Scope 1 and 2) GHG emissions would amount to around 1,761 tCO<sub>2</sub>-e. This is approximately equivalent to 0.001 per cent of NSW's annual GHG emissions (in 2009 to 2010).

It should be noted that the GHG assessment results provided above are an estimate only, and subject to the accuracy of the estimated construction and operational project data and all other project assumptions.

#### **9.8.5 Mitigation Measures**

To reduce Scope 1 and 2 GHG emissions resulting from the proposed Development during construction and operation, the following options are available:

- minimising the quantity/or emission intensity of fuel used by plant and equipment; and
- minimising the amount/or emission intensity of electricity used.

Furthermore, the following mitigation measures could be implemented during construction and operation to reduce Scope 1 and 2 GHG emissions associated with the proposed Development, where reasonable and feasible:

- use of low GHG intensive alternative fuels (for example biofuels) in equipment and vehicles;
- preferential use/purchase of vehicles with low fuel consumption ratings;
- training of staff in practices to reduce fuel consumption of equipment and vehicles;
- regular maintenance of equipment and vehicles to maximise fuel efficiency; and
- preferential purchase of energy efficient equipment/plant.

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## 10.0 Summary of Mitigation Measures

### 10.1 Mitigation Measures

Recommended construction and operational mitigation measures described throughout this EIS are provided in Table 10-1.

Recommended mitigation measures to be implemented during the construction phase of the proposed Development would be incorporated into a Construction Environmental Management Plan (CEMP), which would cover all construction practices associated with the St Marys Facility. Construction based mitigation measures would also be integrated into any other relevant management and/or response plans for the proposed Development where deemed necessary.

Recommended mitigation measures described in this EIS would be amalgamated into an Operational Environmental Management Plan (OEMP) for the proposed Development. The OEMP for the current operations of the Site (Appendix C) would be updated to include the additional activities associated with the proposed Development, and to minimise potential environmental and social impacts during the continued operations of the St Marys Facility. This would include updating and amending the following sub-plans:

- Air Quality Management Plan;
- Stormwater Management Plan;
- Traffic Management Plan;
- Waste Management Plan; and
- Spill Management Plan.

Additionally, the OEMP would be updated to reflect the operation of the proposed Development, including details around:

- Waste processing management;
- Pollution incident response management; and
- Materials tracking procedures.

The OEMP would also document emergency response procedures, induction and training requirements for Site personnel, auditing and product sampling/testing procedures and protocols, corrective action procedures and as well as OH&S initiatives. Specific environmental management plans associated with the operation of the proposed development would also be detailed in the OEMP.

Table 10-1 Summary of Mitigation Measures

Mitigation Measure Number	Description
<b>Air Quality</b>	
C.01	Continued use of the street sweeper during construction activities at the Site.
C.02	Watering of exposed soils when necessary.
C.03	Water sprays for dust-generating excavation activities.
C.04	Covering of trucks removing spoil.
C.05	Avoidance or minimisation of dust-generating activities, wherever practical, during high wind conditions.
C.06/O.01	Onsite activities would not create visible dust emissions at the Site boundary
C.07/O.02	Dust mitigation infrastructure, such as sprinklers, hoses and/or street sweepers shall be installed, maintained and operated within the Site to effectively suppress dust emissions.
O.03	In the event that frequent increases in odour at adjoining industrial premises is observed, Worth would investigate the introduction of feasible and reasonable odour controls, which due to the variable nature of the Site feedstock, would be determined on a case by case basis.

Mitigation Measure Number	Description
O.04	Continued use of the street sweeper during operational activities at the Site.
O.05	Ensure soils maintain a suitable moisture content pre and post treatment to minimise dust impacts, and water exposed soils where necessary.
O.06	Dust-generating activities undertaken outside the warehouse would be avoided or minimised, wherever practical, during high wind conditions.
<b>Noise and Vibration</b>	
C.08	<p>To mitigate and manage the vibration impacts associated with the use of a 13 tonne excavator with a hydraulic rock breaking hammer, the following would be implemented</p> <ul style="list-style-type: none"> <li>• Source controls, including: <ul style="list-style-type: none"> <li>a) Use of less vibration intensive plant and equipment where reasonable and feasible to do so. For example, a smaller hydraulic hammer attached to an excavator with tonnage less than 12 tonne, which would have a safe working distance for cosmetic damage and human response that is less than the distance between the nearest neighbour (48 Charles Street) and the designated work area; and</li> <li>a) The provision of respite periods.</li> </ul> </li> <li>• Management controls, including: <ul style="list-style-type: none"> <li>a) Informing neighbouring property owners prior to the commencement of vibratory construction works;</li> <li>b) Maintenance of a complaints register and the provision of prompt responses to any complaints received;</li> <li>c) Site planning and layout; and</li> <li>d) Training of all site staff, including contractors, site managers and temporary equipment operators.</li> </ul> </li> <li>• Implementation of path controls; namely avoiding vibration intensive works in a concentrated area and work over a large area to reduce maximum vibration dose values</li> </ul>
O.07	The excavator would not be used to handle oil drums and construction waste between 10pm and 7am Monday to Saturday, and between 10pm and 8am on Sundays and public holidays. The removal of this noise source would reduce the predicted noise levels to achieve the night time criteria at the sensitive receivers during adverse weather conditions.
O.08	The waste water treatment plant is to have an overall sound power level of no greater than 104 dB (A). This sound power level was determined through distance loss and the assumption that the noise source is positioned at a height that is lower than the barrier between the treatment plant location and the sensitive receiver locations (with no noise shielding due to buildings factored into the calculation). If in the event that the selected plant cannot meet this sound power level, then noise attenuation of the plant itself would be considered.
O.09	Maximise the offset distance between noisy plant items and nearby noise sensitive receivers where reasonable and feasible to do so
O.10	Avoid simultaneous operation of noisy plant close together and adjacent to sensitive receivers where practicable
O.11	Position noisy equipment away from sensitive receivers where possible
O.12	Locate noisy plant away from potentially noise affected neighbours or behind barriers, such as sheds or walls
O.13	Maintenance work on equipment and plant with the potential to generate noise impacts would be carried out within daytime hours, where possible
O.14	Where practicable, consecutive works within the same locality would be minimised
O.15	Plant and equipment would be switched off when not in use

Mitigation Measure Number	Description
O.16	Examine, and implement where feasible and reasonable, alternative work practices which generate less noise – for example, the use of electric equipment instead of diesel or petrol powered equipment
O.17	Maintain and operate equipment in an efficient manner, in accordance with manufacturer's specifications, to reduce the potential for adverse noise and vibration impacts
O.18	Ensure plant is regularly maintained, equipment that becomes noisy would be repaired or replaced as soon as practicably possible
O.19	The work Site would be arranged to minimise the use of movement alarms on vehicles, equipment and mobile plant
O.20	In the case that high impact noise activities or activities likely to generate noise with intermittent, impulsive, tonal or low-frequency characteristics are required, affected sensitive receivers would be appropriately notified, and respite periods would be implemented where necessary
O.21	Proactive driver/operator training and operational procedures would be implemented to minimise the use of reversing alarms (taking into account WorkCover and occupational health and safety requirements)
<b>Traffic and Transport</b>	
C.09	If and when necessary, a construction traffic management plan (CTMP) would be prepared. This would include guidelines, general requirements and procedures to be used when construction activities would have a potential impact on existing traffic arrangements. It would ensure that delays and disruptions are kept to a minimum, and proactively identify and respond to any changes in road safety resulting from construction works.
O.22	To improve the safety and efficiency of the road network in Dunheved Industrial Precinct, a circulating arrangement for heavy vehicles using Charles Street, Links Road and Dunheved Circuit would be adopted as described in Section 8.3.3 and shown in Figure 8-7 of this EIS.
O.23	In the case that other mitigation measures or upgrades are subsequently deemed necessary as part of the proposed Development, these would be undertaken in accordance with RMS and Council standards, requirements and guidelines.
<b>Surface Water</b>	
C.10	Good housekeeping and maintenance activities would be implemented across the site during construction and operation to ensure that the areas outside of bunded areas are kept clean and tidy to reduce the potential for contamination of surface water runoff
O.24	The Site would be managed in accordance with the surface water management strategy.
O.25	All vehicles exiting the Site would pass through the wheel wash to adequately remove waste
O.26	The waste water treatment plant would be operational following the issue of a Trade Waste Agreement by Sydney Water. Implementation, and continual improvement when required, of the surface water and waste water management strategy for the St Marys site
O.27	Bunding at the site would be designed, constructed and maintained to align with the conditions specified in the following guidelines: <ul style="list-style-type: none"> <li>• <i>Storing and Handling Liquids: Environmental Protection, Participants Manual</i> (DECC, 2007); and</li> <li>• <i>Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management Part B – Review of Best Practice and Regulation</i> (DEC, 2005).</li> </ul>
O.28	The tank bunds would be inspected regularly to ensure that they remain in a suitable condition
O.29	Acid sulfate soils that would be stored at the site are surrounded by diversion drains which direct any water that may have potentially been in contact with this material to a separate bunded tank on-

Mitigation Measure Number	Description
	site. This water, which may potentially contain leachate from acid sulfate soils material stockpiles, would be transported off-site via road tanker for treatment at Worth's South Windsor Facility.
O.30	The treatment of acid sulfate soils by mixing the materials with lime would continue to be undertaken in covered areas to minimise any exposure of the stormwater to such substances
O.31	Curing of immobilised waste would be undertaken in covered areas within Area 1 to limit the exposure of leachate to stormwater.
O.32	Personnel and contractors working and/or visiting the St Marys facility would be inducted. This induction would include a section outlining the segregation of clean and potentially contaminated areas, as well as general housekeeping practices that must be implemented
<b>Hazard and Risk</b>	
O.33	A fire fighting foam branch would be installed to an existing hydrant located nearest to the packaged waste store.
O.34	The proposed Development must comply with the requirements of the <i>NSW Work Health and Safety Regulation 2011</i> (the Regulation), under the <i>Work Health and Safety Act 2011</i> . Whilst the storage facilities associated with the proposed Development would comply with the requirements of the Regulation, appropriate documentation would be prepared and available on-site to meet the full requirements of Section 7 of the Regulation.
<b>Soils, Geology and Groundwater</b>	
C.11	Prior to the commencement of construction that would result in disturbance of the underlying soil, in situ soil testing would be undertaken within these areas to determine if contamination is present and to characterise any spoil that would be generated by the disturbance. If contamination is found to be present, the soil would be removed to an appropriately licenced facility for treatment and/or disposal
C.12	Appropriate controls would be provided to manage exposed soil surfaces and stockpiles to prevent sediment discharge into stormwater drains and adjacent streets
C.13	Stockpile and storage locations would be clearly identified. Erosion and sediment controls would be provided around stockpiles where appropriate
C.14	Dust suppression, for example regular sweeping and wetting of exposed surfaces and stockpiles, would be conducted where there is a risk of increased dust outside of acceptable levels, to ensure compliance with the air quality provision of the POEO Act
C.15	Washing soils, residue or dust off construction traffic vehicles prior to their leaving the Site
<b>Ecology</b>	
C.16/O.35	Appropriate controls would be provided to manage exposed soil surfaces and stockpiles to prevent sediment discharge into the adjacent streets.
C.17/O.36	Stockpile and storage locations would be clearly identified and erosion and sediment controls would be provided around stockpiles where appropriate.
C.18/O.37	Dust suppression would be conducted when there is a risk of increased dust outside of acceptable levels.
C.19/O.38	Street trees and plants immediately adjacent to the Site would be fenced with high-visibility material to alert construction vehicle drivers of their location.
C.20/O.39	Use of the wheel wash for construction traffic before departing the Site.
<b>Landscape Character and Visual Amenity</b>	
C.21	General housekeeping practices would be implemented throughout the construction phase of the proposed Development to ensure that the Site remains generally tidy, and construction materials and waste is managed appropriately
C.22	During the detailed design phase of the proposed Development, consideration would be given to

Mitigation Measure Number	Description
	reducing impacts to visual amenity, including the choice of materials and colour tones that differ least from existing infrastructure and the surrounding industrial precinct
O.40	Operational infrastructure to be commissioned as part of the proposed Development would be constructed in areas which are screened from such sensitive receivers by the concrete wall boundaries of the Site
<b>Socio-economic</b>	
C.23/O.41	Social and economic impacts of the proposal relate primarily to amenity impacts assessed in other sections of the EIS, including air quality (Section 8.1), traffic (Section 8.3), noise and vibration (Section 8.2), and landscape character and visual amenity (Section 9.5). Impacts to residents and businesses within the surrounding area would therefore be mitigated through the implementation of measures recommended to reduce impacts in these previous sections.
O.42	To retain consistency with the existing Site, and to minimise any impact of the proposed Development on surrounding sensitive receivers, operational infrastructure to be commissioned as part of the proposed Development would be constructed in areas which are screened from such sensitive receivers by the concrete wall boundaries of the Site, where reasonable and feasible to do so.
<b>Heritage</b>	
O.43	If Aboriginal cultural objects are subsequently uncovered during construction, all relevant works would cease immediately in the area to prevent any further impacts to the object(s). A suitably qualified archaeologist and OEH would be contacted to determine the significance of the object(s). The site would be registered in the AHIMS database (managed by OEH) and the management outcome for the site included in the information provided to AHIMS. Some works may not be able to resume until OEH has provided written approval. Further investigation may be required depending on the type of Aboriginal object that is found.
<b>Greenhouse Gas</b>	
C.24/O.44	The quantity/or emission intensity of fuel used by plant and equipment would be minimised where reasonable and feasible
C.25/O.45	The amount/or emission intensity of electricity used would be minimised where reasonable and feasible.
C.26/O.46	Low GHG intensive alternative fuels (for example biofuels) in equipment and vehicles would be used where reasonable and feasible
C.27/O.47	Where reasonable and feasible, preferential use/purchase of vehicles with low fuel consumption ratings would be given during construction and operation
C.28/O.48	Staff would be trained in practices to reduce fuel consumption of equipment and vehicles
C.29/O.49	Equipment and vehicles would be regularly maintained to maximise fuel efficiency
C.30/O.50	Where reasonable and feasible, preferential purchase of energy efficient equipment/plant would be given during construction and operation
<b>Environmental Management and Monitoring</b>	
C.31/O.51	A quality information system would be implemented for the proposed Development, outlining the broader responsibilities for staff at the Site, systems to comply with regulatory, statutory and customer requirements, systems to ensure quality control of processes at the Site and a framework for continual improvement.
C.32/O.52	An Environment, Health and Safety System, with individual plans relating to each individual waste treatment process.
C.33/O.53	An Emergency Plan, which would document systems and procedures to deal with all types of incidents (e.g. spills, explosions and fires) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment
C.34/O.54	A Pollution Incident Response Management Plan would be implemented.

## **10.2 Residual Risk Analysis**

The analysis of residual environmental risks for issues related to the proposed Development is shown in Table 10-2. This analysis indicates the environmental risk profile of the proposed Development based on the assessment of environmental effects and the identification of appropriate mitigation measures.

Table 10-2 Residual Risk Profile for the Proposed Development

Environmental Aspect	Potential Environmental Issue	Initial Risk Rating (No Mitigation Measures)			Residual Risk Rating (Mitigation Measures in Place)
		Consequence	Likelihood	Rating	Residual Risk Rating
Air Quality	Generation of odours and particulates as a result of contaminated soils and other processes on site.	Medium (3)	Medium (C)	Medium	Low
	Generation of fugitive emissions associated with operation of machinery and transport vehicles.	Low (4)	Low (D)	Low	Very Low
Traffic and access	Traffic impacts on Charles Street and local road network due to truck movements required for the proposed Development.	Medium (3)	Medium (C)	Medium	Low
Noise	Noise impacts on nearby sensitive receivers through the use of equipment and machinery and transport vehicles.	Medium (3)	Medium (C)	Medium	Low
	Noise during evening and night-time periods, including road traffic noise.	Medium (3)	Medium (C)	Medium	Low
Surface water	Runoff from site containing pollutants.	Medium (3)	Low (D)	Low	Very Low
	Accidental spills and pollution of local waterways.	Medium (3)	Low (D)	Low	Very Low
Risk and Hazards	Potential impacts on neighbouring land uses, depending on the final volumes and types of hazardous material stored on site.	Medium (3)	Low (D)	Low	Very Low
Soils	Minor excavation works would be required, and existing site is covered in hardstand	Very Low (5)	Very Low (E)	Very Low	Very Low
Visual amenity	No change to current site footprint or use. Some additional plant, with hoppers likely to protrude above building line.	Low (4)	Very Low (E)	Very Low	Very Low
Socio-economic effects	Employment generating opportunity.	Very Low (5)	Very Low (E)	Very Low	Very Low
Heritage	No change to existing footprint.	Very Low (5)	Very Low (E)	Very Low	Very Low
Ecology	No change to existing footprint.	Very Low (5)	Very Low (E)	Very Low	Very Low

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## 11.0 Justification and Conclusion

### 11.1 Introduction

This chapter presents a justification for the proposed Development and a conclusion to the environmental impact assessment. It considers a range of issues including the benefits of the proposed Development, provides a summary of environmental, social and economic impacts, and describes how the proposed Development aligns with the principles of ecologically sustainable development.

### 11.2 Justification

#### 11.2.1 Summary of Strategic and Development Justification

The expansion of the St Marys Facility aligns with national and state waste management objectives and would reduce the environmental risk of waste directly, through the stabilisation of contaminated soils, restricted soils, greases and ASS.

Hazardous and special wastes; mainly contaminated soil, encompassed the largest volume within Sydney's construction and industrial waste stream in 2008, being 13.9 percent (DECCW, 2009). The immobilisation and stabilisation of such contaminated waste and its subsequent disposal in an environmentally sound manner is vital in minimising the environmental impacts of contaminated materials. Waste immobilisation and stabilisation reduces the environmental risk associated with waste, particularly with regards to the irreversible environmental and social impacts associated with leaching of disposed waste on surface water, groundwater and soil at landfills.

Worth's South Windsor Facility is one of only two EPA licensed solid immobilisation waste facilities in NSW, and the only one in the Sydney metropolitan region. In addition to the continued annual growth in waste production nationally, the South Windsor facility is not large enough to accommodate current or future growth and the expansion of the South Windsor facility is not feasible (Section 3.2). This highlights the need for an expanded capacity of this processing service, which the St Marys facility would cater for. The operation of the St Marys facility would enable the following:

- Improvements to the quality of the waste received at the Site, prior to its disposal at landfill;
- The opportunity to divert waste from landfill through the recycling of 'cake' by-product from drill mud to be sent to brick manufacturing plants; and
- The recovery of metals for recycling, and recovery of construction and demolition material for re-use.

These measures would assist towards satisfying the NSW Government's objectives of waste avoidance, recovery and recycling as provided in the *Waste Avoidance and Resource Recovery Act 2001* and the *NSW Waste Avoidance and Resource Recovery Strategy 2007* (DECC, 2007).

Additionally, the proposed Development increases the capacity of commercial and industrial waste treatment, while also improving the management of waste across NSW, and more specifically the Sydney metropolitan region. The proposed Development aligns with the *National Waste Policy; Less Waste, More Resources* (COAG) as the St Marys Facility would reduce the amount of contaminated, restricted or hazardous materials being disposed of at landfill, and provides facilities to handle and dispose of substances that become waste in an environmentally sustainable manner.

### 11.2.2 Environmental, Social and Economic Impacts

Potential environmental, social and economic impacts of the proposed Development have been assessed as part of this EIS. The assessment of the biophysical environment has included individual assessments of:

- Air quality;
- Soils, geology and groundwater;
- Surface water;
- Ecology;
- Greenhouse Gas.
- Noise and vibration;
- Traffic and transport;
- Hazard and risk;
- Landscape Character and Visual Amenity;
- Socio-economic effects, including impacts on employment; and
- Cultural heritage, including Aboriginal and European Heritage.

The implementation of a range of environmental mitigation measures (Section 10.0) would avoid or minimise potential impacts on the surrounding environment, and the proposed Development would therefore not have any significantly adverse environmental impacts. For example, the potential for the quality of stormwater discharged from the site to be detrimentally affected by the operation of the Facility has been reduced by the installation of catch drains and an on-site treatment plant, the covering of bunker storage areas and the provision of bunding.

More specifically, the proposed Development is anticipated to yield improved environmental controls over the management of process water, surface water and site drainage. The proposed Development is therefore justified, considering the potential residual biophysical impacts on the environment are anticipated to be minimal.

When considering the potential residual socio-economic impacts of the proposed Development, the proposed Development is justified. Operation of the proposed Development is not anticipated to result in any adverse socio-economic impacts, rather several positive outcomes; namely the generation of additional employment opportunities, and environmental benefits associated with the immobilisation of contaminants. The proposed Development utilises existing industrial land and would have only minor impacts on local amenity. Suitable mitigation measures, as outlined in Section 10.0 would ensure that socio-economic impacts associated with the proposed Development are minimal.

The alternative of the proposed Development are detailed in Section 3.0 of this EIS. Should the proposed Development not proceed, Worth would not be able to support growth in the demand for waste immobilisation and stabilisation services in the short and long term, and there would remain a limited capacity within Sydney to respond to large environmental incidences, resulting in an increased environmental risk.

### 11.2.3 Ecologically Sustainable Development

The EP&A Act identifies Ecologically Sustainable Development (ESD) as "*the effective integration of economic and environmental considerations in decision-making processes.*" (SEWPaC, 2010). Furthermore, the EPBC Act also identifies the need for the consideration of decision-making processes in environmental impact, namely that "*decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations.*"

One of the objects of the EP&A Act is stated as encouraging ESD (section 5(vii)), defined under the Act as the definition provided for ESD in section 6(2) of the *Protection of the Environment Administration Act 1991*, which encompasses principles of sustainable development that were originally detailed in the *Rio Declaration on Environment and Development (1992)*:

- a) **The precautionary principle** – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
  - i) Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
  - ii) An assessment of the risk-weighted consequences of various options.
- b) **Inter-generational equity** – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- c) **Conservation of biological diversity and ecological integrity** – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.
- d) **Improved valuation, pricing and incentive mechanisms** – namely, that environmental factors should be included in the valuation of assets and services, such as:
  - i) *Polluter pays* – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
  - ii) The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste; and
  - iii) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Clause 7(4) of Schedule 2 of the EP&A Regulation requires that an EIS consider the precautionary principle, as well as the principles of inter-generational equality, conservation of biological diversity and ecological integrity, and the improved valuation, pricing and incentive mechanisms. The consideration of the proposed Development against the requirements of ESD is provided in Table 11-1 below.

The establishment and expansion of the St Marys facility would alleviate pressure at the existing South Windsor facility and would provide a platform for future growth of the waste immobilisation operations as required by the demands of the market (Section 3.3). The decision-making process that was applied to identify the proposed Development as the preferred solution has been conducted in a manner that has integrated both biophysical and socio-economic considerations.

Table 11-1 Application of Ecologically Sustainable Development to the proposed Development

Application to the proposed Development	
<b>Precautionary principle</b>	
If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation	The potential impacts and risks associated with the construction and operation of the proposed Development have been considered in the initial design phase, and will continue to be considered in the detailed design phase of the proposed Development. The implementation of specific mitigation measures as outlined in Section 10.0 would ameliorate potential environmental impacts.
<b>Intergenerational equity</b>	
The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	<p>The proposed Development utilises an existing industrial site, for a purpose similar to its previous use, ultimately ensuring the continued use of site without affecting undisturbed areas. The overall objective of the EIS is to improve hazardous waste management, and provide a facility that is able to process and immobilise large volumes of contaminated material, which would otherwise be disposed of to landfill.</p> <p>The proposed Development aims to minimise the impacts to the local environment by providing mitigation measures which ensure the integrity of the natural and social values of the environment are maintained for future generations.</p>
<b>Conservation of biodiversity and ecological integrity</b>	
Conservation of biological diversity and ecological integrity should be a fundamental consideration	The proposed Development is not anticipated to protect species, their habitats or life cycles. Mitigation measures proposed in Section 9.4.3 would ensure the proposed Development minimised impacts on biological diversity or ecological integrity.
<b>Improved valuation, pricing and incentive mechanisms</b>	
Environmental factors should be included in the valuation of assets and services	<p>The proposed Development provides value to the community in terms of its ability to appropriately treat and dispose of contaminated and hazardous waste materials. Additionally, individual factors relevant to the proposed Development were nevertheless valued according to qualitative, quantitative, economic or non-economic criteria, or a mixture of these criteria, as appropriate. For instance:</p> <ul style="list-style-type: none"> <li>- Air quality was valued by identifying applicable standards and targets that should be met; Noise and vibration, road traffic and landscape and visual amenity were valued according to applicable standards and targets that should be met, as well as according to their qualitative worth in providing human amenity;</li> <li>- The qualitative worth of both Aboriginal and European heritage in the vicinity of the proposed Development was valued (Section 9.7);</li> <li>- The values of terrestrial ecology, particularly threatened species and communities in the vicinity of the proposed Development were considered according to their ecological and biological worth; and</li> <li>- Socio-economic factors relevant to the Project were analysed according to both their qualitative social worth and quantitative economic worth.</li> </ul> <p>Factors considered to be of the greatest value include air quality, noise and vibration and traffic and transport. Worth has committed to mitigation measures as outlined in Section 10.0 to ensure that the proposed Development does not detract from the value of these environmental factors. This EIS has been prepared on the basis of minimising or avoiding impacts on the natural, built and social environments in recognition of the inherent cost of those impacts. In doing so, the cost of impacts associated with the proposed Development have been minimised as far as reasonably practicable</p>

### Summary

Undertaking the proposed Development in the manner outlined in this EIS is considered justified, when considering its compatibility with the existing land use as well as its potential biophysical, social and economic impacts. The proposed Development conforms to the principles of ESD in that:

- The decision making process behind the proposed Development has considered environmental impacts;
- The methodology for undertaking this EIS and the commitments made by Worth to mitigate potential environmental impacts resulting from the proposed Development embody the precautionary principle;
- The proposed Development provides for inter-generational equity by limiting the overall environmental impact of the Site, while improving the management of process water, surface water and site drainage;
- With the proposed mitigation measures in place, the proposed Development would not significantly impact on the biological diversity or ecological integrity of the proposed Development and its surrounds; and
- This EIS has provided for the evaluation of environmental and related factors that are relevant to the proposed Development, and Worth commits to providing appropriate mitigation measures at its own cost.

Worth would commit to ensuring the principles of ESD are followed throughout construction and operation of the proposed Development by implementing the mitigation measures detailed in Section 10.0. Assessment of the proposed Development against these considerations demonstrated that the expansion of Worth's operations at the St Marys Facility is environmentally sustainable and justified.

### 11.3 Conclusion

Worth is proposing to relocate its solid waste operations from its South Windsor Facility and expand its processing capacity at St Marys. Development approval is being sought for the following:

- The processing and treatment of approximately 77,400 tonnes per annum of contaminated soils, restricted soils, packaged waste, greases, oil filters, drill muds, stormwater and canal dredging materials to be processed and treated per year, in addition to ASS (the proposed Development). This would total ; and
- Modifications to existing buildings and facilities to support the treatment of additional waste streams.

A concurrent reduction to the processing capacity for ASS from 30,000 tonnes to 22,000 tonnes by way of a modification under Section 96(1A) of the EP&A Act is also being sought.

The proposed Development is considered justified from both a strategic and ESD perspective, and would provide direct employment of an additional eight employees.

This EIS has considered the potential impacts to the environment as a result of the proposed Development, including consideration of the principles of ESD. Provided the mitigation measures outlined in Section 10.0 are implemented, the proposed Development would operate in accordance with the objects of the EP&A Act. The expansion of the St Marys Facility would provide for additional capacity to immobilise and stabilise contaminated wastes, restricted soils, greases and acid sulfate soils in the Sydney metropolitan region and wider NSW, while aligning with state and national waste management objectives.

This EIS has demonstrated that with the implementation of proposed mitigation measures, the proposed Development is unlikely to have significant or long term adverse impacts on the environment.

The findings of the environmental impact assessment presented in this EIS and accompanying technical studies confirms that the proposed St Marys waste recycling facility has a strong justification to proceed and is considered suitable for approval under Part 4 of the EP&A Act.

It is also recommended that approval be granted to the proposed modification under Section 96(1A) of the EP&A Act.

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## Appendix A

# Director-General's Requirements

## Appendix A Director-General's Requirements



**Mining & Industry Projects**

Contact: Brendan Liew

Phone: 9228 6310

Fax: 9228 6466

Email: [Brendan.liew@planning.nsw.gov.au](mailto:Brendan.liew@planning.nsw.gov.au)

Our ref: 13/02692

Ms Caitlin Bennett  
AECOM Australia Pty Ltd  
PO Box Q410  
Sydney NSW 1230

Dear Ms Caitlin Bennett

**Waste management facility – Sylvania (DGR 701)  
Director-General's Requirements**

I refer to your request for the Director-General's Requirements (DGRs) for the preparation on an Environmental Impact Statement (EIS) for the above development proposal. I have attached a copy of these requirements.

I have attached a copy of these requirements.

In your Form A, you indicated that your proposal could potentially be integrated development and may require an approval and/or license under the *Protection of the Environment Operations Act 1997*. The Department has consulted with the Environment Protection Authority (EPA) and the Office of Environment and Heritage (OEH) on your proposal. Unfortunately, the OEH and EPA were unable to respond in time, and therefore, you are advised to consult with them directly for their requirements for your EIS.

If other integrated approvals are identified before the Development Application (DA) is lodged, you must undertake your own direct consultation with the relevant agencies, and address their requirements in the EIS.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will require an additional approval under the *Commonwealth Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) in Canberra on 6274 1111 or [www.environment.gov.au](http://www.environment.gov.au).

If you have any enquiries about these requirements, please contact Brendan Liew on 9228 6310.

Yours sincerely

Chris Ritchie  
**Manager - Industry**  
**Major Projects Assessment**  
as delegate for the Director-General

12/2/13.

# Director-General's Requirements

Section 78A (8) of the *Environmental Planning and Assessment Act 1979*.

## Designated Development

<b>DGR Number</b>	701
<b>Proposal</b>	Waste management facility, Penrith local government area
<b>Location</b>	42-46 Charles Street, St Marys (Lot 300 DP01143213)
<b>Applicant</b>	Caitlin Bennett
<b>General Requirements</b>	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.
<b>Key Issues</b>	<ul style="list-style-type: none"> <li>• <b>waste management</b> – including:             <ul style="list-style-type: none"> <li>– the measures that would be implemented to ensure that the project is consistent with the aims, objectives, and guidance in the <i>NSW Waste Avoidance and Resource Recovery Strategy 2007</i> and other relevant NSW government policy;</li> <li>– identification of the quantity and type of waste that would be accepted, handled, stored, processed or disposed of at the facility; and</li> <li>– a description of how this waste would be stored and handled on site, and transported to and from the site.</li> </ul> </li> <li>• <b>soil and water</b> - including:             <ul style="list-style-type: none"> <li>– consideration of any contaminated soil (including acid sulphate soils) and water on-site, in accordance with relevant guidelines;</li> <li>– identification of any licensing requirements or other approvals under the <i>Water Act 1912</i> and/or <i>Water Management Act 2000</i>;</li> <li>– an assessment of potential impacts on the quality and quantity of existing surface and groundwater resources and any potential impacts from flooding;</li> <li>– a detailed description of the proposed water management system (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts; and</li> <li>– details of leachate collection and management.</li> </ul> </li> <li>• <b>air quality</b> – including odour, dust and greenhouse gas emissions in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors;</li> <li>• <b>noise</b> – including construction, operation and traffic noise in accordance with relevant EPA guidelines. This assessment must consider any potential impacts on nearby private receptors;</li> <li>• <b>traffic and transport</b> – including:             <ul style="list-style-type: none"> <li>– an assessment of potential traffic impacts on the capacity, efficiency and safety of the road network; and</li> <li>– a description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network in the surrounding area.</li> </ul> </li> <li>• <b>hazards and risk</b> – including a preliminary risk screening undertaken in accordance with <i>State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)</i> and <i>Applying SEPP 33 (DoP, 2011)</i>, and if necessary, a Preliminary Hazard Analysis (PHA); and</li> <li>• <b>heritage</b> – including Aboriginal cultural heritage.</li> </ul>
<b>Environmental Planning Instruments</b>	<p>The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to</p> <ul style="list-style-type: none"> <li>• <i>State Environmental Planning Policy No. 33 – Hazardous and Offensive Development</i>;</li> </ul>

	<ul style="list-style-type: none"> <li>• <i>State Environmental Planning Policy (Infrastructure) 2007;</i></li> <li>• <i>Draft South West Subregional Strategy;</i></li> <li>• <i>Penrith Local Environmental Plan 2010;</i></li> <li>• relevant development control plans and section 94 plans.</li> </ul>
<b>Guidelines</b>	There are no specific guidelines for waste transfer stations or resource recovery facilities. However, Attachment No.1 provides some guidance on the preparation of the EIS.
<b>Consultation</b>	<p>During the preparation of the EIS, you should/must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult surrounding landowners and occupiers that are likely to be impacted by the proposal.</p> <p>Details of the consultations carried out and issues raised must be included in the EIS.</p>

## ATTACHMENT NO. 1

### ADVICE ON THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR WASTE MANAGEMENT

The purpose of this paper is to outline various issues relevant to the preparation and consideration of an EIS for a waste management facility. It is intended to assist the preparation of the EIS. However, it is the applicant's responsibility to identify and address as fully as possible the matters relevant to the specific development proposal in complying with the requirements for EIS preparation (see Attachment No 1).

The matters nominated in this paper are not intended as a comprehensive identification of all issues, which may arise in respect of a waste management facility. Some of the issues nominated may not be relevant to a specific proposal. On the other hand, there may be other issues, not included, that are appropriate for consideration in the EIS.

Information provided should be clear, succinct and objective and where appropriate be supported by maps, plans, diagrams or other descriptive detail. The purpose of the EIS is to enable members of the public, the consent authority (usually the Council) and the Department of Planning to properly understand the environmental consequences of the proposed development.

The particular matters outlined in the following should be included in the EIS.

#### 1. Background information

Sufficient background information should be provided and include:

- objectives of proposal;
- relationship with any regional waste management strategies;
- location of the operations and indication of existing and proposed adjacent developments;
- broad nature and extent of operations proposed;
- land tenure, boundaries, site details in relation to environmental planning instrument zonings and any other land use constraints.

#### 2. Detailed description of proposal

This description should not only describe the proposal at the site but also describe all associated operations such as handling and transport of materials, disposal of wastes and residues, and safety, pollution and environmental controls incorporated into the proposal.

Particular matters to be covered include:

- construction programme and practices;
- plans of operations, reception, segregation and control of incoming waste;
- nature of waste stream including chemical and physical properties, sources and volumes;
- quantities of waste stored and storage arrangements and safeguards of materials, particularly in regard to the storage and disposal of flammable, toxic or hazardous chemicals;
- nature, volume and disposal methods of waste produced by the management facility including fly ash, sludge and the like;
- resources recovery;
- air, odour, noise and vibration emission levels;
- site drainage and contamination controls particularly in regard to leachates, washdown and stormwater run off and contaminated fire water in the event of an emergency;
- plant capacity and major components, types of machinery and equipment to be used;
- stack height and characteristics including dispersion zone requirements;
- expected life of the plant;
- number of persons to be employed;
- hours of operation;
- access arrangements - truck routes and number of truck movements;
- daily operational plan;
- security, fire fighting and counter disaster provisions;
- proposals for landscaping.

### **3. Alternatives**

The EIS should canvass alternatives to the proposed means/strategy of waste management, the proposed site and the proposed methods to undertake the operation.

In particular the EIS should:

- assess strategies which may enable resource recovery, or recycling as an alternative to this proposal or to reduce the scale of this proposal especially in regard to glass, ferrous metal, aluminium, paper, certain plastics and organic material suitable for composting;
- outline the criteria used in selecting the proposed site and justification of that selection, (particularly in terms of safety and pollution issues), including consideration of feasible alternative locations to the proposal and reasons for their rejection as well as the consequences of not undertaking the activity as proposed;
- review the existing performance of the proposed waste management method having regard to overseas experience and technologies as well as local landfill and waste minimising strategies.

### **4. Description of the environment**

This description shall provide details of the environment in the vicinity of the development site and also of aspects of the environment likely to be affected by any facets of the proposal. In this regard, physical, natural, social, archaeological and economic aspects of the environment should be described to the extent necessary for assessment of the environmental impact of the proposed development. Particular attention should focus on existing air quality, ambient noise levels, climatic conditions, amenity and utility provision.

### **5. Analysis of impacts**

The assessment of environmental impact and measures to be taken to reduce the impact should have particular respect to:

- air emission controls, dispersion analysis which indicates ground level emission concentrations under likely atmospheric and weather conditions;
- water pollution controls, surface and groundwater;
- health implications for nearby residents, pedestrians, workers, school children and the like;
- likely noise and odour disturbance caused by the operations, including transport operations, on nearby residences;
- other impacts of trucking movements;
- potential for soil contamination;
- litter and dust control and any nuisance likely to be caused;
- treatment and disposal of residues and leachates;
- litter controls and site maintenance;
- landscaping measures and effects on the visual environment;
- monitoring (especially for emissions and leachates) and site management requirements.

The EIS should clearly specify whether any medical or quarantine wastes, asbestos bearing material and toxic and hazardous wastes are to be received and outline proposals for safe handling of these substances to avoid risk to public health.

In the event that toxic or hazardous substances are to be disposed of, treated or created, either temporarily or permanently, through the process of incineration or waste handling, the EIS should include a preliminary hazard analysis.

### **6. Authorities contacted**

In preparing the EIS, it is suggested that authorities, such as those listed below, should be consulted and their comments taken into account in the EIS.

- The Department of Environment and Climate Change (formerly Environment Protection Authority) in regard to air, water and noise impacts and relevant pollution control legislation requirements;
- The Heritage Office (now part of the Department of Planning) if the proposal is likely to affect any place or building having heritage significance for the State;
- the Department of Environment and Climate Change (formerly National Parks and Wildlife Service) if Aboriginal places or relics are likely to be affected;
- Department of Primary Industries should be contacted if prime agricultural land or areas of significant fish habitat may be affected by the proposal.

- . Department of Water and Energy or The Department of Environment and Climate Change if the proposal may have implications for soil erosion, or will disturb acid sulphate soils, or on water bodies subject to the legislative responsibilities of these agencies.

It is the responsibility of the person preparing the EIS to determine those Departments relevant to the proposed development.

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