Intended for
Hydro Aluminium Kurri Kurri Pty Ltd

Document type
Final Report

Date
December, 2020

KURRI KURRI ALUMINIUM SMELTER DECOMMISSIONING, DEMOLITION AND REMEDIATION
AIR QUALITY MANAGEMENT PLAN

RAMBOLL

Ref	**318000533**
Document ID	**Hydro Kurri Kurri EMP_Appendix D_FINAL_Air Quality Management Plan_20201223**
Revision	**Final Rev 0**
Date	**23/12/2020**
Made by	**C Whitehill**
Checked by	**S Taylor**
Approved by	**F Robinson**
Description	**Ramboll was engaged by Hydro Aluminium Kurri Kurri Pty Ltd to prepare a Remediation Works Environmental Management Plan (RWEMP) to describe how environmental management will be undertaken at the former Hydro Aluminium Kurri Kurri aluminium smelter at Hart Road Loxford, NSW and the surrounding land owned by Hydro. This Air Quality Management Plan (AQMP) forms a component of the RWEMP.**

Ramboll Australia
Level 2, Suite 18
50 Glebe Road
PO Box 435
The Junction
NSW 2291
Australia
T +61 2 4962 5444
www.ramboll.com

CONTENTS

FIGURES

TABLES

APPENDICES

Appendix 1
AQMP Preparation Team Details

Appendix 2
Dust Deposition Monitoring Locations

Appendix 3
Dust Deposition Gauges Monitoring Results

ACRONYMS AND ABBREVIATIONS

AGL	Above ground level
AWS	Automatic Weather Station
AQMP	Air Quality Management Plan
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
CO	Carbon monoxide
DA	Development Application
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environment Protection Licence
Hydro	Hydro Aluminium Kurri Kurri Pty Ltd
IPMP	Integrated Project Management Plan
KPIs	Key Performance Indicators
NOx	Oxides of nitrogen
OEH	Office of Environment and Heritage
PAHs	Polycyclic aromatic hydrocarbons
PM_{10}	Particulate matter less than 10microns in aerodynamic diameter
$PM_{2.5}$	Particulate matter less than 2.5microns in aerodynamic diameter
RWEMP	Remediation Works Environmental Management Plan
SO_2	Sulphur dioxide
SSD	State Significant Development
TSP	Total suspended particulates
VOCs	Volatile organic compounds

GLOSSARY

Council	Cessnock City Council
Department	Department of Planning, Industry and Environment
Hydro	Hydro Aluminium Kurri Kurri Pty Ltd
Hydro Land	The land owned by Hydro Aluminium Kurri Kurri Pty Ltd which includes the Smelter and surrounding land.
Remediation	Remediation of contaminated land and soils at the Smelter and on Hydro Land, including the construction of a Containment Cell as addressed in the State Significant Development application to the Department of Planning, Industry and Environment SSD 6666.
Stage 1 Demolition	Demolition of Smelter buildings addressed in the development application to Cessnock City Council 8/2015/399/1.
Stage 2 Demolition	Demolition of Smelter buildings, three concrete stacks, a water tower, subsurface structures to 1.5m below ground surface and operation of a concrete crushing plant addressed in the development application to Cessnock City Council 8/2018/46/1.
The Smelter	The former Hydro Aluminium Kurri Kurri Pty Ltd aluminium smelter at Hart Road, Loxford.

1. INTRODUCTION

1.1 Background

This Air Quality Management Plan (AQMP) has been prepared by Ramboll Australia Pty Ltd on behalf of Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) to support the Remediation Works Environmental Management Plan (RWEMP) which addresses the decommissioning, demolition and remediation activities at the former Hydro Aluminium Kurri Kurri Smelter (the Smelter) at Hart Road Loxford and the management of the surrounding land owned by Hydro (the Hydro Land).

1.2 Objectives

The objectives of this AQMP are to:

- Establish an air quality monitoring system to assess the air quality impact that activities have on surrounding sensitive receivers.
- Detail the controls to be implemented to minimise dust generation, odour and air contaminants from the Smelter and Hydro Land.
- Provide a mechanism to assess performance against air quality impact assessment criteria.
- Detail requirements for timely and effective management of air quality related community complaints.
- Detail requirements for reporting air quality criteria exceedances.
- Establish the roles and responsibilities of all parties involved in air quality management.
- Establish supervision, monitoring and reporting framework for the AQMP.

1.3 Purpose and Scope

The purpose of the AQMP is to:

- Specify management procedures for air quality related issues and impacts during activities at the Smelter and on the Hydro Land.
- Satisfy the relevant conditions of the development consents for demolition activities (DA 8/2015/399/1 and DA 8/2018/46/1) and remediation (SSD 6666).
- Satisfy the relevant conditions of the Environment Protection Licence (EPL) 1548.

Issues relating to human health (odour, air contaminants, soil and water contaminants) are addressed separately in the Work Health and Safety Management Plan.

1.4 Regulatory Requirements

A list of the development consent conditions related to air quality management and where they are addressed in this document are outlined in **Table 1-1**.

Table 1-1: Project Approval Conditions

No.	Condition	Location in AQMP
SSD 6666		
	Dust Minimisation	
B30	The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.	Section 3.2
B31	The Applicant must ensure that:	N/A
B31(a)	trucks and vehicles entering and leaving the site that are carrying loads of dust generating materials must have their loads covered at all times, except during loading and unloading;	Section 3.2
B31(b)	remediation works are not carried out during adverse metrological conditions;	Section 3.2
B31(c)	any works are carried out progressively on site to minimise exposed surfaces;	Section 3.2
B31(d)	all operations and activities occurring at the remediation works must be carried out in a manner that minimises the emissions of air pollutants from the Development;	Section 3.2
B31(e)	trucks associated with the development do not track dirt onto the public road network.	Section 3.2

No.	Condition	Location in AQMP
	Air Quality Management Plan	
B32	Prior to the commencement of remediation works, the Applicant must prepare an Air Quality Management Plan (AQMP) to the satisfaction of the EPA and the Planning Secretary. The AQMP must form part of the RWEMP required by Condition C2 and be prepared in accordance with Condition C1. The AQMP must:	N/A
B32(a)	be prepared by a suitably qualified and experienced person(s);	Appendix 1
B32(b)	detail all emission sources including odour and particulates from all remediation works;	Section 2.3
B32(c)	describe the control measures that will be implemented for each emission source to minimise the potential risks to adverse air quality in the area, including the nominated measures described in the RAP;	Section 3.2
B32(d)	detail the contingency measures to be implemented to respond to complaints or if dust impacts are identified;	Section 4.5 and Section 4.6
B32(e)	include record keeping, a complaints register and compliance report to identify the control measures that will be implemented for each emission source; and	Section 4.5
B32(f)	show the type and locations of dust monitors with appropriate trigger values and report on the performance of the remediation works in relation to the results from the five dust monitoring stations when compared to the applicable NSW EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA 2017) and National Environment Protection (Ambient Air Quality) Measure (NEPC 2016).	Section 4.1, Appendix 2 and Appendix 3
B31	The Applicant must:	N/A
B31(a)	not commence remediation works until the AQMP required by Condition B30 is approved by the Planning Secretary; and	Noted
B31(b)	implement the most recent version of the AQMP approved by the Planning Secretary for the duration of the remediation works.	Noted
	Management Plan Requirements	
C1	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
C1(a)	detailed baseline data;	Section 2.2
C1(b)	details of:	
C1(b)	the relevant statutory requirements (including any relevant approval, licence or lease conditions);	This table
C1(b)	any relevant limits or performance measures and criteria; and	Section 4.2
C1(b)	the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 3.2
C1(c)	a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 3.2
C1(d)	a program to monitor and report on the:	Section 4.1 and Section 4.3
C1(d)	(i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to paragraph (c) above;	
C1(e)	a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 4.4
C1(f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 4.6
C1(g)	a protocol for managing and reporting any:	Section 4.4

No.	Condition	Location in AQMP
	(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; (iii) failure to comply with statutory requirements; and	and Section 4.5
C1(h)	a protocol for periodic review of the plan.	Section 4.6
	Note: the Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	N/A
DA 8/2015/399/1		
10	Submit to Council an Environmental Management Plan (EMP) for review and written authorisation. The EMP shall contain, but not be limited to, the following specialist plans**:** **Air Quality Management Plan**, Noise and Vibration Management Plan, Waste Management, Soil and Water Management Plan, Demolition Strategy, Traffic Management Plan**,** Stakeholder Engagement and Notification Plan; Work Health and Safety Management Plan; and Heritage Management Measures and shall include, among other things, legislative and regulatory requirements; responsibilities for implementation of the management measures; and the monitoring, recording and improvement for environmental management performance.	This AQMP
14(g)	During demolition, public property (footpaths, roads, reserves, etc) must be clear at all times and must not be obstructed by any demolished material or vehicles. The footpaths and roads must be swept (not hosed) clean of any material, including clay, soil and sand. On the spot fines may be levied by Council against the demolisher and/or owner for failure to comply with this condition. No materials shall be stockpiled on footpaths or road carriageways.	Section 3.2
14(h)	All vehicles leaving the site with demolition materials must be loaded and managed to avoid the spillage of waste in accordance with Clause 70 of the Protection of the Environment Operations Regulation 2014, and vehicles must not track soil and other materials onto public property (footpaths, roads, reserves, etc) and the footpaths must be suitably protected against damage when plant and vehicles access the site.	Table 3-2
14(i)	The burning of any demolished material on site is not permitted, and offenders will be prosecuted.	Table 3-2
DA 8/2018/46/1		
	No specific conditions pertaining to air quality	N/A
EPL 1548		
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Table 3-2
03.2	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.	Table 3-2
O3.3	Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading. Note: Condition O3.3 does not apply solely to transportation of waste tyres or scrap metal in accordance with Clause 70(2) of the Protection of the Environment Operations (Waste) Regulation 2014.	Table 3-2

In addition, the plan aims to comply with the following relevant guidelines:

- *National Environment Protection (Ambient Air Quality) Measure* (NEPC, 2003).
- *AS/NZS 3580.14:2014 Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications.*

2. EXISTING ENVIRONMENT AND POTENTIAL IMPACTS

2.1 Existing Environment

2.1.1 Meteorological

A meteorological tower operated at the Smelter from 1996 to December 2019, providing long term observations of wind speed, temperature, relative humidity and rainfall. A new meteorological station has been established in the south east of the Smelter.

Wind speed and direction data from the Smelter meteorological tower were monitored for the years 2010 to 2014 and for 10 metres and 30 metres AGL. There is reasonable consistency in wind speed and direction across the five years of data at both measurement heights. At 10 metres AGL, each year experiences a dominant south easterly flow, with notable southwest and northwest components. At 30 metres AGL, the dominant wind direction is less defined from the southeast, with more even distribution between the east to southwest. At both measurement levels, the highest wind speeds are most frequently experienced from the west to north quadrant. The average recorded wind speed for all years is in the order of 1.5m/s at 10 metres AGL and 2.7m/s at 30 metres AGL. The frequency of calm conditions (wind speeds less than 0.5 m/s) is higher at 10m AGL than 30 metres AGL.

Monthly mean minimum temperatures are in the range of 4°C to 17°C, with monthly mean maxima of 17°C to 30°C, based on the long-term average record from the Bureau of Meteorology (BoM) Automatic Weather Station (AWS) at Cessnock Airport (Station Number 061242) (the Cessnock Airport AWS) located approximately 12 kilometres to the west of the Smelter site. Peak temperature occurs during summer months with the highest temperatures typically being recorded between November and February. The lowest temperatures are usually experienced between June and August.

Based on historical data recorded since 1968 at Cessnock Airport AWS, the region is characterised by moderate rainfall, with a mean annual rainfall of approximately 730mm, and an annual rainfall range between 460mm and 1,040mm. Rainfall is most pronounced between November and March, with significantly lower rainfall during the colder months of the year. Rainfall data recorded at the Smelter between 2010 and 2014 is comparable with the long-term rainfall recorded at the Cessnock Airport AWS.

2.1.2 Other Land Uses

Land uses in the vicinity of the Smelter include:

- Native vegetation: native ecological communities (with some cleared or disturbed areas) generally surround the Smelter and are within the Hydro owned land. Security fencing separates the Smelter from the vegetation.
- Electricity infrastructure: overhead power lines are located within easements to the north, west, southwest and northwest of the Smelter.
- Recreation: the Kurri Kurri Speedway and the Kurri Kurri Junior Motorcycle Club facility are approximately 500 metres to the east of the Smelter.
- Roads: The key roads in the vicinity of the Smelter are:
  - Hart Road used to access the Smelter and immediately adjacent to the western section of the Smelter.
  - Dickson Road intersects with Hart Road approximately 120 metres south of the Smelter security gate and immediately adjacent to the eastern section of the Smelter.
  - The Hunter Expressway is approximately 380 metres southwest of the Smelter.
- Residential: the Smelter is approximately 600 metres to the north of the nearest sensitive receiver. The next nearest is approximately 750 metres to the southeast. There are approximately 16 rural residences within 1000 metres of the Smelter, of which seven are on Hydro land. Since exhibition of the Environmental Impact Statement (EIS), Hydro has vacated a number of the residences on their land, and commenced a demolition program.
- The nearest residential area to the Smelter is Weston, which is approximately 1800 metres to the southwest.

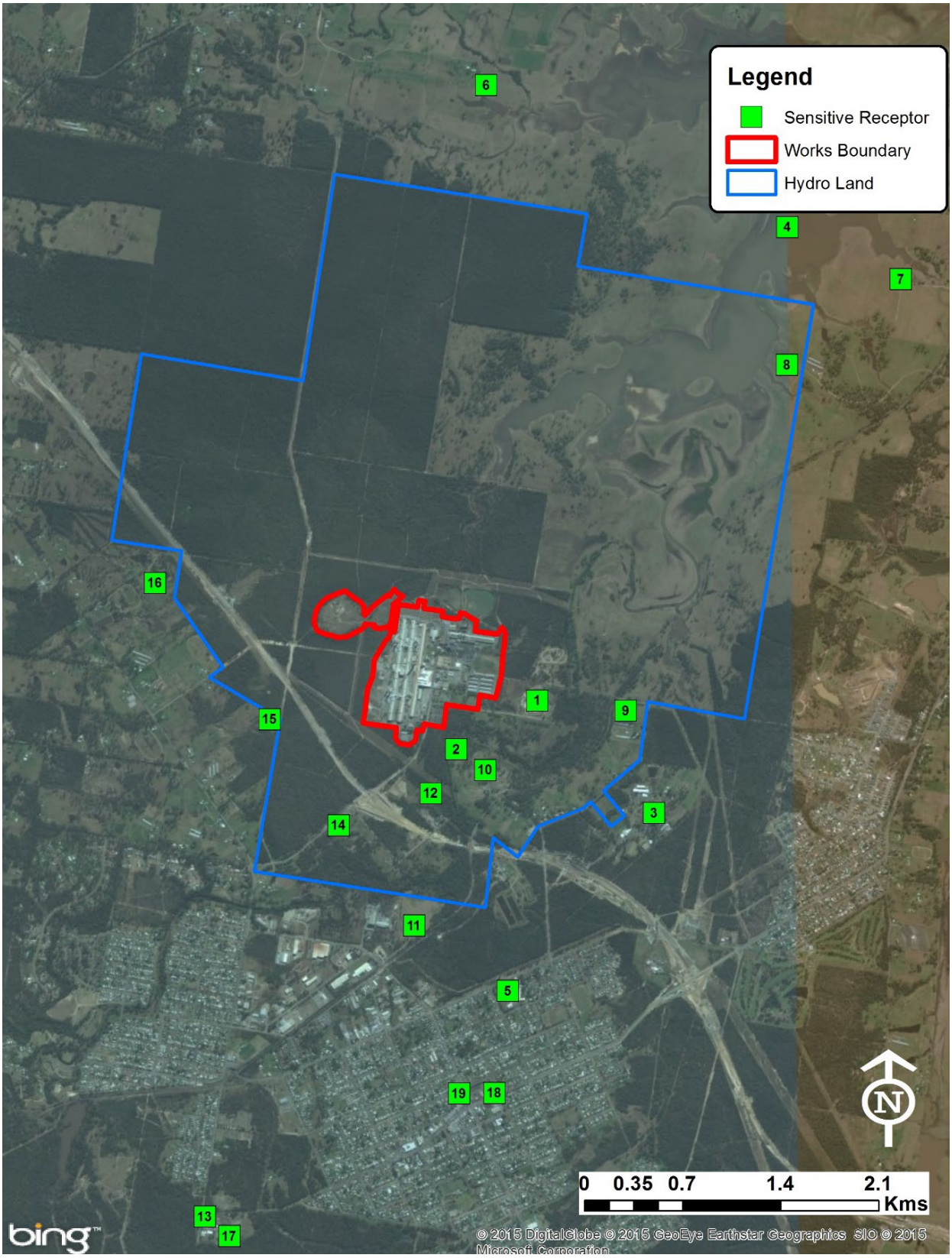
- Education: The Kurri Kurri TAFE is located approximately 1500 metres to the southeast of the Smelter and Kurri Kurri High School is approximately 1900 metres to the southeast of the Smelter.

Details of the surrounding sensitive receptors are listed within **Table 2-1** and shown in **Figure 2-1**.

Table 2-1: Surrounding Sensitive Receiver Locations

ID	Location (m, MGA56)		Distance (km) / Direction from Smelter Site	Name
	Easting	Northing		
R1	358,460	6,370,837	0.31 / E	Kurri Kurri Speedway
R2	357,882	6,370,489	0.27 / ESE	Cricket Pitch (Hydro owned)
R3	359,293	6,370,036	1.4 / SE	Hunter TAFE
R4	360,243	6,374,212	3.54 / NNE	Wentworth Swamp
R5	358,250	6,368,767	1.88 / SSE	Kurri Kurri High School
R6	358,094	6,375,224	3.73 / N	Resident – North
R7	361,051	6,373,839	3.79 / NE	Resident - Northeast
R8	360,241	6,373,230	2.78 / NE	Resident - Northeast (Hydro owned)
R9	359,090	6,370,765	0.92 / ESE	Resident – East
R10	358,089	6,370,343	0.5 / S	Resident – Southeast
R11	357,583	6,369,233	1.29 / S	Resident – South
R12	357,701	6,370,177	0.37 / SSE	Resident - South (Hydro owned)
R13	356,088	6,367,158	3.63 / SSW	Kurri Kurri Hospital
R14	357,043	6,369,948	0.7 / SW	Resident – Southwest (Vacated)
R15	356,552	6,370,704	0.66 / W	Resident - West
R16	355,734	6,371,675	1.63 / WNW	Resident - Northwest
R17	356,265	6,367,019	3.69 / SSW	RFBI Masonic Village Nursing Home
R18	358,155	6,368,039	2.55 / SSE	Kurri Early Childhood Centre
R19	357,903	6,368,035	2.51 / S	Church of Christ

Figure 2-1 Surrounding Sensitive Receiver Locations



2.2 Baseline Particulate Matter Data

In December 2016 Hydro established five dust deposition gauges in the area surrounding the Project Site (prior to commencement of demolition). Monthly results have been, and continue to be, collected for total insoluble material.

Appendix 3 presents a summary of the results of the monthly monitoring from November 2016 to July 2020. Only one round of monitoring (during the February 2020 bushfires) exceed the criteria for dust deposition discussed in **Section 4.2**.

2.3 Potential Impacts

The decommissioning, demolition and remediation activities have the potential to cause dust generation and airborne contaminants. Air quality impacts may result from the following site activities at the Smelter and Hydro Land:

- Removal of accessible hazardous materials and accumulated fines from within structures.
- Delivery and mobilisation of demolition plant and equipment.
- Delivery, establishment and operation of the concrete and refractory crushing plant.
- Establishment of stockpile area and environmental controls.
- Storage of materials within designated stockpile areas.
- Demolition of structures including explosive techniques for the concrete stacks and water tower.
- Excavation and earthworks, including:
  - Earthworks for preparation and construction of the Containment Cell
  - Excavation for removal of contaminated soils within the Smelter and Hydro Land
  - Removing the capping, earthworks and materials removal at the Capped Waste Stockpile
- Transport of material around the site or off-site, including gypsum and contaminated materials
- Vehicles and machinery travelling on unsealed roads or exposed soils
- Odour and/or air contaminant emissions from the remediation of the Capped Waste Stockpile, including asbestos.

3. IMPLEMENTATION

3.1 Roles and Responsibilities

Key personnel responsible for implementation of this AQMP are in **Table 3-1** and consistent with the overall RWEMP.

Table 3-1: Hydro Personnel and Environmental Management Responsibilities

Position	Responsibilities
OVERALL SITE MANAGEMENT	
Managing Director	Make certain that the Hydro Team and contractors are implementing this AQMP. Provide adequate resources and funding for the implementation of this AQMP. Review and approve RWEMP (including this AQMP).
Principal Environmental Consultant	Provide advice on and assistance in implementation, monitoring and auditing of environmental management and performance. Review and modify the AQMP as directed by the Managing Director and/or Project Manager.
Principal Communications Consultant	Manage the mechanisms available for the community to receive information and to make enquiries or complaints about activities
SMELTER DECOMISSIONING AND DEMOLITION ACTIVITIES	
Project Manager	Make certain that any proposed works or changes to existing activities, that may have an impact on the environment or the community (including air quality impacts), have the necessary legislative approval prior to the commencement of works. Make certain that the environmental aspects and issues, associated with proposed works or changes to existing activities, are adequately addressed in the AQMP. Review and approve the AQMP on an annual basis or when changes to activities at the Smelter occur. Facilitate implementation of the AQMP.
Construction Manager	Verify that the work of contractors and Hydro personnel on the Project are undertaken in accordance with this AQMP, relevant environmental management plans, procedures and standards. Provide appropriate training to contractors and Hydro personnel on the Project regarding environment and community requirements and responsibilities. Review and approve the contractors' environmental management documentation prior to commencement of activities and inform contractors of changes to the AQMP.
Contract Administrator	Provide relevant environmental legislative, regulatory and management requirements in tender documentation. Verify that the work of contractors is undertaken in accordance with this AQMP and other relevant environmental procedures and standards.
Workplace Health and Safety (WHS) Manager	Provide Hydro personnel with the necessary tools and training to enable effective implementation of the RWEMP. Implement and maintain an induction package to be provided to all personnel working at the Smelter and Hydro Land, which will include information relevant to the environmental and community management (including air quality management). Undertake a weekly inspection of the Project activities at the Smelter, for the duration of the Project. Maintain a record of personnel induction and training records.

Position	Responsibilities
Demolition Contractor	Comply with the requirements of the AQMP as it applies to Smelter demolition activities. Implement the environmental measures and actions as described in the AQMP through a Demolition EMP and supporting sub-plans and specific procedures that comply with this AQMP. Develop and implement procedures for self-checking environmental management compliance with the Demolition Contractor's procedures and this AQMP. Report potential or actual environmental incidents associated with demolition activities at the Smelter, and assist as required in the investigation, implementation of corrective actions and recording of the incident.
Remediation Contractor	Comply with the requirements of the AQMP as it applies to Smelter and relevant Hydro Land remediation activities. Implement the environmental measures and actions as described in the AQMP through a Remediation EMP and supporting sub-plans and specific procedures that comply with this AQMP. Develop and implement procedures for self-checking management compliance with the Remediation Contractor's procedures and this AQMP. Report potential or actual environmental incidents associated with remediation activities at the Smelter and relevant Hydro Land, and assist as required in the investigation, implementation of corrective actions and recording of the incident.
CARE, MAINTENANCE AND HYDRO LAND MANAGEMENT ACTIVITIES	
Environmental Officer/ Hydro Land Manager	Coordinate and implement the dust monitoring program Verify that the work of contractors and Hydro personnel on Hydro Land are undertaken in accordance with this AQMP and relevant environmental procedures and standards. Undertake a weekly inspection of activities on the Hydro Land that will occur for two weeks or more.
ALL AREAS AND ACTIVITIES	
Contractors	Comply with the requirements of the AQMP as it applies to site environmental management and control. Implement the environmental measures and actions as described in the AQMP through procedures and management plans that comply with this AQMP. Develop and implement procedures for self-checking management compliance with Contractor's procedures and this AQMP.
All Personnel	Implementation of the relevant environmental measures described in this AQMP applicable to their activities.

3.2 Management Measures

Hydro will implement a number of controls to manage air emissions that may be generated from Smelter Site and Hydro Land activities. The dust, odour and air particulate management measures to be implemented are outlined in **Table 3-2**.

Table 3-2 also includes a description of the Key Performance Indicators (KPIs) associated with each of the proposed management measures.

Table 3-2: Air Quality Management Measures

Management Measures	Actions	Timing / Frequency	Responsibility	Further Detail
All personnel will be informed during the site induction of their obligations to minimise potential air quality and dust and the need to take reasonable and practical measures to minimise impacts.	Air quality obligations and management measures to be communicated to personnel during the relevant site induction (Hydro or Contractor's site induction).	Prior to and during activities	WHS Manager Remediation Contractors Demolition Contractors	Section 3.3.2 of the RWEMP (inductions and training) Daracon Integrated Project Management Plan (IPMP) Appendix 1 of Appendix 4 CMA Construction Environmental Management Plan (CEMP) Appendix C
	Personnel are to report to the Project Manager or Environment Officer any activities that are generating, or have the potential to generate, dust or other air emissions that could have an adverse impact on offsite sensitive receivers.	During activities	All personnel	**Section 2.3** (potential air quality impacts) **Figure 2-1** (sensitive receiver locations)
Local residents will be notified in advance of the nature and estimated timeframes for completion of activities and potentially major dust generating activities. Thereafter ongoing notifications and updates on new or changes to activities will be provided in accordance with the Stakeholder Engagement Plan.	Provide local residents with ongoing notification regarding activities and timeframes.	Prior to and during activities A minimum of one week prior to potentially major dust generating activities Quarterly notification of works program	Project Manager Environmental Officer Principal Communications Consultant	Stakeholder Engagement Plan (**Appendix K**)
A 24-hour telephone number is provided as a contact point for any complaints, issues or general enquiries regarding the activities.	Maintain the 24-hour telephone number as a contact point for any complaints, issues or general enquiries in accordance with the Stakeholder Engagement Plan.	Prior to and during activities	Environmental Officer	Stakeholder Engagement Plan (**Appendix K**)
Accumulated fines from within the buildings will be removed where safe, reasonable and feasible to do so prior to building demolition.	Remove accumulated fines from within buildings where: • Safe access is available. • The method does not result in distribution of dusts beyond the building. • It is reasonable and feasible (easily accessible and cost-effective) to do so.	Prior to demolition	Project Manager Demolition Contractor	CMA CEMP Appendix C

Management Measures	Actions	Timing / Frequency	Responsibility	Further Detail
Dust suppression will be used during activities at the Smelter and the Hydro Land.	Watering to be undertaken where practicable during induced demolition of buildings and structures.	Prior to and during demolition	Project Manager Demolition Contractor Environmental Officer	Daracon IPMP Appendix 1 of Appendix 4 CMA CEMP Appendix C
	Watering of demolition areas and unsealed access roads during dusty conditions and if dust is noticed above the wheel height of vehicles.	During demolition As required	Project Manager Demolition Contractors Environmental Officer	
	Watering of the crushing plant during the crushing of concrete and bricks.	During crushing As required	Demolition Contractor Environmental Officer	
	Where possible, vehicles will use existing sealed roads to minimise dust generation.	During activities	Project Manager Remediation Contractors Demolition Contractors Site Services Manager	TMP SAP
	A speed limit of 20 km/hour will be imposed on internal roads.	During activities	Project Manager Remediation Contractors Demolition Contractors	TMP SAP
	Sealed roads at the Smelter will be cleaned of dirt and other deposited material that could generate dust.	As required	Project Manager Remediation Contractors Demolition Contractors	
	Cutting, grinding or sawing equipment will be used with fitted or suitable dust suppression techniques such as water sprays or local extraction where reasonably practical.	During activities	Project Manager Demolition Contractors	
	Provide and maintain an adequate water supply on the site for effective dust/particulate matter suppression/mitigation. Water sources for dust suppression are: • Use of water from the Smelter water management system. • Potable water supply.	Prior to and during activities	Project Manager Remediation Contractors Demolition Contractors	SWMP
	Use enclosed chutes and conveyors and covered skips where possible and appropriate.	During activities	Project Manager Remediation Contractors Demolition Contractors	
	Minimise drop heights from loading or handling equipment and use fine water sprays on equipment during dusty conditions.	During activities	Project Manager Demolition Contractors	Daracon IPMP Appendix 1 of Appendix 4

Management Measures	Actions	Timing / Frequency	Responsibility	Further Detail
	In the event that strong winds are forecast, the activities proposed are to be considered against the predicted wind direction and speed. Where required to avoid impacts on sensitive receivers, activities will be modified or suspended.	During activities	Project Manager Demolition Contractor Environmental Officer	Daracon IPMP Appendix 1 of Appendix 4
	Works will cease in the event that adverse meteorological conditions or extraordinary events lead to conditions that cause unacceptable dust generation**.**	During activities	Project Manager Demolition Contractor Environmental Officer	Daracon IPMP Appendix 1 of Appendix 4
	Where dust is observed moving in the direction of sensitive receivers and could adversely impact the receivers, dust suppression measures must be implemented.	During activities	Project Manager Demolition Contractor Environmental Officer	**Section 4.1.3** (monitoring program) **Figure 2-1** (sensitive receiver locations)
Vehicles will be operated and maintained to minimise exhaust emission impacts.	Where possible vehicles and machinery will be turned off or throttled down when not in use.	During activities	Project Manager Remediation Contractors Demolition Contractors Site Services Manager	Daracon IPMP Appendix 1 of Appendix 4 CMA CEMP Appendix C
	Vehicles and machinery will be maintained in accordance with manufacturer's requirements to maximise operational efficiencies and associated exhaust emissions.	Prior to and during activities As per manufacturers requirements.	Project Manager Remediation Contractors Demolition Contractors Site Services Manager	Daracon IPMP Appendix 1 of Appendix 4 CMA CEMP Appendix C
Vehicles entering and leaving the Smelter and travelling on public roads with potentially dust generating loads will be covered to prevent escape of materials during transport.	All vehicles leaving the Smelter or Hydro Land and travelling on public roads must be loaded and managed to avoid generation of dust.	As required	Remediation Contractors Demolition Contractors Project Manager Site Security/ Smelter Gate	Daracon IPMP Appendix 1 of Appendix 4 CMA CEMP Appendix C
	Any dust, soil or other Smelter-related materials deposited on public roads from Smelter vehicles will be removed as soon as practicable.	As required	Remediation Contractors Demolition Contractors Environmental Officer	CMA CEMP Appendix C
Haul routes will be inspected for integrity and, where required, instigate necessary repairs to the surface as soon as reasonably practicable.	Undertake integrity inspections of haul routes within the Smelter.	Prior to and during activities Monthly	Project Manager Remediation Contractors Demolition Contractors	Section 5.2 of the RWEMP (inspections)

Management Measures	Actions	Timing / Frequency	Responsibility	Further Detail
Transportation, storage and placement of gypsum will be undertaken in a manner which reduces the potential to generate dust.	All vehicles transporting gypsum on public roads will have covered loads.	During remediation activities	Project Manager Remediation Contractor	
	Load levels will not exceed the height of the truck, reducing the material's potential wind and draft exposure.	During remediation activities	Project Manager Remediation Contractor Environmental Officer	CMA CEMP Appendix C
	The gypsum will be unloaded and stored within the specified enclosed shed.	During remediation activities	Project Manager Remediation Contractor Environmental Officer	
	A small daily quantity will be stockpiled at the gypsum application station. Where required due to weather conditions (such as wind) the amount would be reduced and more regularly transported from the stockpile within the shed.	During remediation activities	Remediation Contractor Environmental Officer	
	Capped Waste Stockpile materials (including the placed gypsum) are to be subjected to mist spraying to suppress dust generation if required due to climatic conditions.	During remediation activities	Project Manager Remediation Contractor Environmental Officer	
	Mist spraying facilities are to be available at the Containment Cell if required due to climatic conditions to suppress dust generation.	During remediation activities	Project Manager Remediation Contractor Environmental Officer	
Continued use of dust deposition monitoring locations around the Smelter site.	The five dust deposition monitoring locations will continue to be operated at the locations shown in **Appendix 2**.	Minimum of three months prior to commencement of demolition	Environmental Officer	**Appendix 2**
	Record, interpret and report on air quality data from dust deposition monitoring locations and compare to background (pre-demolition) levels.	Prior to and during demolition Weekly/Monthly	Environmental Officer	**Section 4.3** (reporting)
	Organise routine maintenance of dust deposition monitoring stations.	Prior to and during demolition As required	Environmental Officer	CMA CEMP Appendix C
	In the event that dust deposition monitoring shows an increase in dust levels that exceed EPA criterion, an incident is to be entered into the incident register and the investigation and corrective action procedures of the EMP implemented.	If required	Environmental Officer Principal Environmental Consultant	**Section 4.1.3** (monitoring program) Section 3.5.4 of the RWEMP (incidents) Section 5.4 of the RWEMP (corrective action)

Management Measures	Actions	Timing / Frequency	Responsibility	Further Detail
Carry out regular site inspections to monitor compliance with the AQMP and record inspection results.	Undertake weekly visual inspection of activities to assess effectiveness of air quality control measures.	During activities Weekly	WHS Manager	**Section 4.1.3** (monitoring program)
	Undertake environmental inspections of the Smelter and the Hydro Land to assess compliance with the AQMP.	During activities Monthly	WHS Manager Environmental Officer	Section 5.2 of the RWEMP (inspections)
	Inspection logs will be made available to the Department of Planning and Environment, Cessnock City Council and the EPA upon request	When requested	WHS Manager Environmental Officer	
Details of incidents that cause dust and/or air emissions, and the action taken to resolve the situation, are to be recorded.	Record dust, odour or other air emission generating incidents in the incident register and implement corrective actions in accordance with the EMP.	As required	WHS Manager Environmental Officer Remediation Contractors Demolition Contractors	Section 3.5.4 of the RWEMP (incidents) Section 5.4 of the RWEMP (corrective action)
	Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in a log book.	As required	WHS Manager Environmental Officer Remediation Contractors Demolition Contractors	Section 3.5.4 of the RWEMP (incidents) Section 5.4 of the RWEMP (corrective action)
	Review corrective actions.	Monthly	WHS Manager Environmental Officer	Section 5.4 of the RWEMP (corrective action)
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Register and investigate air quality complaints in accordance with the EMP.	Prior to and during activities	WHS Manager Environmental Officer	Section 3.5.6 of the RWEMP (complaints)

4. MONITORING AND REVIEW

4.1 Monitoring

4.1.1 Meteorological Monitoring

The Hydro meteorological station will capture daily observations of wind speed, temperature, relative humidity and rainfall. The weather station allows for the capture of data that is representative of the area.

The weather station will be maintained and operated in accordance with relevant standards and guidelines including the OEH's *Approved methods for the sampling and analysis of air pollutants in NSW* and AS/NZS 3580.14:2014 *Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications*.

Meteorological forecasts will be regularly monitored to assess the potential winds of speed and direction that could generate dusts that could impact on sensitive receivers. In particular, action is likely to be required where strong winds (greater than 50 km/hr) are predicted from the northwest, northeast, north, west or southwest (in the direction of off-site sensitive receivers). The need to modify activities, implement additional dust control measures, or suspend activities will be reviewed on the basis of the forecast, site conditions and the type and location of activities.

4.1.2 Dust Deposition Monitoring

Monitoring will continue at the five dust deposition monitoring locations established at the locations shown in **Appendix 2**. The monitoring locations were established in December 2016 (six months prior to demolition) in order to establish baseline conditions and implement the monitoring regime provided in **Appendix 1**.

4.1.3 Monitoring Program

The meteorological and air quality monitoring program is outlined in **Table 4-1**.

Table 4-1: Meteorological and Air Quality Monitoring Commitments

Monitoring Details	Frequency	Locations	Parameters	Person/s Responsible
Meteorological monitoring	Continuous	Smelter weather station	Wind speed Temperature Relative humidity Rainfall	Environmental Officer
Review of meteorological forecasts	Daily	Via relevant smart phone apps	Predicted wind speed Predicted temperature Predicted rainfall	WHS Manager Contractor
Dust deposition	Monthly	DDG1, DDG2, DDG3, DDG4 and DDG5	Insoluble solids Ash residue	Environmental Officer
Undertake visual inspection of activities to assess effectiveness of air quality control measures.	Weekly	Work activity areas	Evidence of visible dust blowing off the site in the direction of, and could potentially impact on, residences	Environmental Officer WHS Manager

Further detail regarding air quality monitoring is provided in **Appendix 2**. **Appendix 3** presents a summary of the results of the monthly monitoring at the five dust deposition gauges from November 2016 to July 2020.

4.2 Impact Assessment Criteria

Impact assessment criteria are designed to maintain ambient air quality that allows for the adequate protection of human health and well-being. The air quality assessment criteria applicable to the site are those specified by the NSW Environment Protection Authority (NSW EPA) within the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2005).

With regards to air quality compliance for dust generating activities at the Smelter and Hydro Land, impacts from PM_{10} and total suspended particulate (TSP) matter are considered the most relevant pollutants. The specific goal that will be applicable at surrounding receptors (through the results at the five dust deposition monitoring stations) is an annual incremental impact of deposited dust of $2g/m^2$/month.

4.3 Reporting

All internal and external environmental reporting requirements will be undertaken in accordance with the RWEMP.

Reporting will also be undertaken in accordance with relevant legislation, guideline and notification requirements, as outlined in **Section 1.4**.

4.4 Non-conformances

The need for preventative or corrective action arises from the identification of non-conformance with environmental legal requirements, Hydro environmental requirements or the potential for non-conformances to occur.

Non-conformances will be resolved and recorded in accordance with the RWEMP.

4.5 Complaints

Handling of complaints will be undertaken in accordance with the RWEMP.

Community Complaints are considered environmental incidents and are investigated and documented accordingly. This will include any complaints relating to air quality at the Smelter.

Investigations will be conducted by the Environment Officer, including provision of feedback to the complainant. Corrective actions will be documented and regularly reviewed until completion and signed off.

Correspondence relating to community complaints are filed by the Hydro Construction Manager or Hydro Site Services Manager (as appropriate) through the on-line Hydro Incident Reporting System

4.6 Review and Improvement

Continual improvement of the AQMP will be achieved by the continual evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The Environmental Officer is responsible for ensuring that a regular review of the RWEMP and specialist management plans is undertaken.

Reviews will be recorded in the document control section of this plan.

5. REFERENCES

Bowditch Group (2013). *Hunter Expressway Construction Compliance Report #6 - 16 January 2013 to 15 July 2013*.

Bowditch Group (2014). *Hunter Expressway Construction Compliance Report #6 - 16 July 2013 to 22 March 2014*.

NEPC (2003). *National Environment Protection (Ambient Air Quality) Measure*.

NSW DEC (2005). *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.

NSW OEH (2015). *Air quality monitoring data from Beresfield, Newcastle, Singleton and Wallsend monitoring stations*.

Ramboll Environ (2015). *Statement of Environmental Effects - Demolition of Former Aluminium Smelter Buildings at Kurri Kurri*.

6. LIMITATIONS

Ramboll Australia Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to Hydro Aluminium Pty Ltd dated 20 July 2018 and in accordance with our understanding and interpretation of current regulatory standards.

Site conditions may change over time. This report is based on conditions encountered at the site at the time of the report and Ramboll Australia Pty Ltd disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Ramboll Australia Pty Ltd's professional judgment based on information made available during the course of this assignment and are true and correct to the best of Ramboll Australia Pty Ltd's knowledge as at the date of the assessment.

Ramboll Australia Pty Ltd did not independently verify all of the written or oral information provided to Ramboll Australia Pty Ltd during the course of this investigation. While Ramboll Australia Pty Ltd has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll Australia Pty Ltd was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

6.1 User Reliance

This report has been prepared exclusively for Hydro Aluminium Pty Ltd. It may not be relied upon by any other person or entity without Ramboll Australia Pty Ltd's express written permission.

APPENDIX 1
AQMP PREPARATION TEAM DETAILS

Name	Role in Preparation of AQMP	Qualifications and Years of Experience	Relevant Air Quality Monitoring and Management Experience
Claire Whitehill	Author	B Env Sc (Natural Resource Science) (Hons) 11 years +	More than 11 years of experience in environmental assessment and management plan documentation, and site environmental management
Shaun Taylor	Co-Author/ Review	B App Sc (EAM) (Hons) 22 years+	More than 22 years of experience in environmental assessment, management plan documentation, and compliance auditing

APPENDIX 2
DUST DEPOSITION MONITORING LOCATIONS

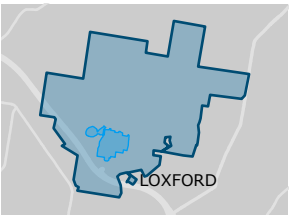
Aerial photography by Nearmap, flown 15.06.2020

Legend

Project site

Dust deposition monitoring location

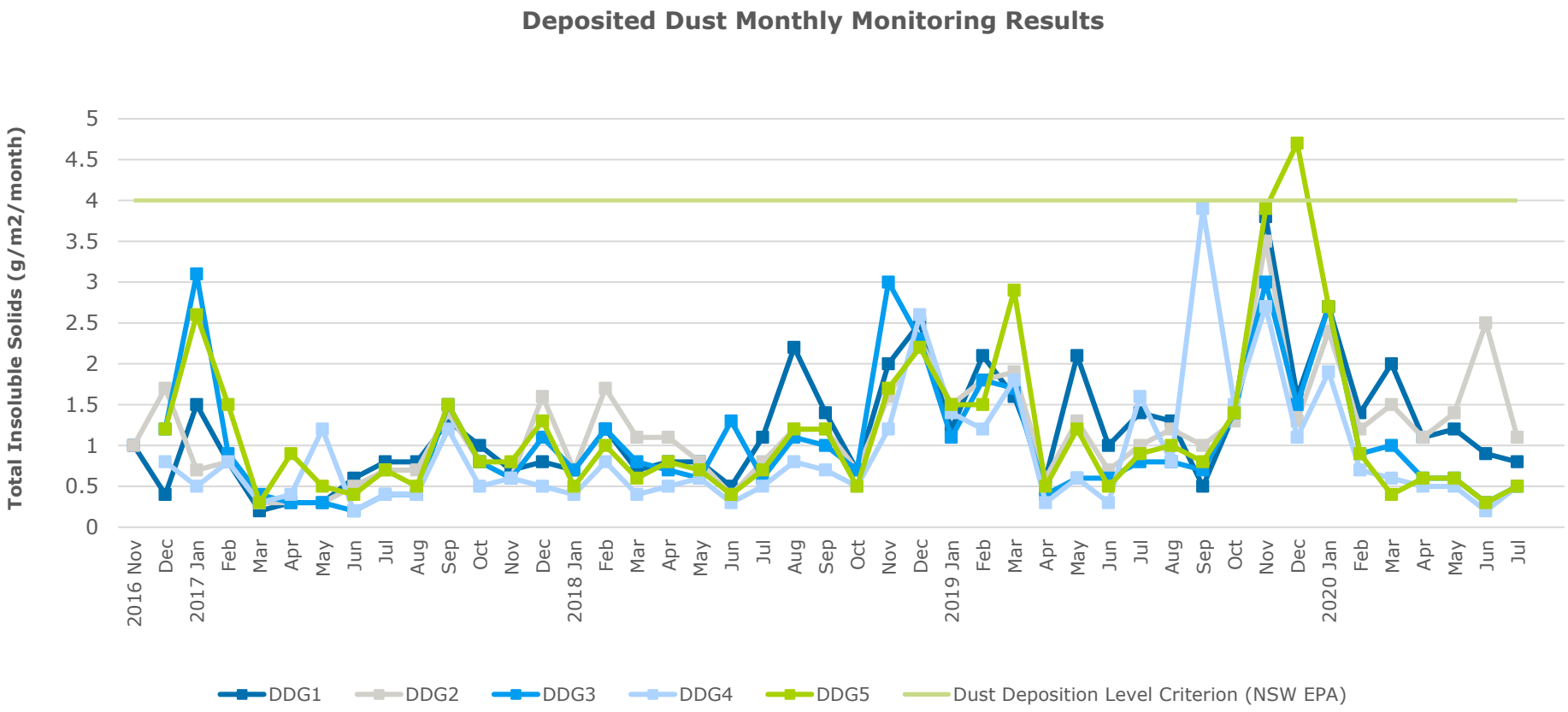
A4
1:9,500



RAMBOLL AUSTRALIA - GIS MAP file : 318000533_GIS_P001_RemediationEMP | F011_AIRMonitoring_V02 | 5/11/2020

Appendix 2 | Dust Deposition Monitoring Locations

APPENDIX 3
DUST DEPOSITION GAUGES MONITORING RESULTS


Deposited Dust Monthly Monitoring Results
Total Insoluble Solids (g/m2/month)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2016 Nov
Dec
2017 Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2018 Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2019 Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2020 Jan
Feb
Mar
Apr
May
Jun
Jul
DDG1
DDG2
DDG3
DDG4
DDG5
Dust Deposition Level Criterion (NSW EPA)