# **Appendices**

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\* A colour version of this Appendix is available on the digital version of this document Attachments 2A, 2B and 4 of this Appendix are only available on the digital version of this document Bowdens Silver Project Report No. 429/24

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# Appendix 1

# Land Titles for Application Area

(Total No. of pages including blank pages = 8)

- Table A1.1Application Area Land Titles
- Figure A1.1 Mine Site Land Titles
- Figure A1.2 Relocated Maloneys Road Land Titles
- Figure A1.3 Water Supply Pipeline Corridor Land Titles and Crown Land



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Table A1.1	
Application Area Land Ti	itles

							Page 1 of 2
Lot	/DP						
		Mir	ne Site - See Fig	jure A1.1 for lar	nd title boundari	es	
Lot	s in Depo	sited Plans					
61/7	55412	76/755412	178/755412	3/755412	42/755412	73/755412	74/755412
107/	755412	102/1124638	2/572701	140/755435	119/755435	127/755435	3/572701
4/57	2701	86/755435	143/755435	132/1050074	1/1171691	1/835810	118/755435
25/755435 26/755435 161/755435 1/814633		1/814633	2/814633	11/810747	122/755435		
121/755435 1/1118167 2/776858 7007/1029353 <sup>**</sup> 7008/1029652 <sup>**</sup> 1/48047 <sup>#</sup>		1/48047#					
Oth	er Land						
A1	Un-name	ed Crown road o	n southern and ea	stern boundaries	of 178/755412 (End	closure Permit	43618)
A2	Un-name 102/1124	ed Crown road o 1638 (Enclosure	n eastern boundar Permit 43618)	y of 107/755412 a	and continuing sout	h along easter	n boundary of
A3	Un-name Permit 43	ed Crown road ru 3618)	unning approximat	ely north-south the	rough 3/755412 and	102/1124638	(Enclosure
A4	Un-name 102/1124 boundary	ed Crown road ru 1638. Road then / of 140/755435.	unning approximat continues south-s . (Part that runs ea	ely west-east alon southwest betweer ast-west is part of l	g southern bounda n eastern boundary Enclosure Permit 43	ry of 74/75541 of 1/1118167 3618)	2 and and western
A5	Un-name running a	ed Crown road o approximately no	n eastern boundar orth-northeast thro	ry of 121/755435, ugh 26/755435, 2	122/755435, 1/8146 5/755435 and 118/7	633, 26/75543 755435	5 and thence
A7	Former C	Crown road on w	estern boundary c	of 7008/1029652 (I	Licence Number LN	l 600680)	
R1	Maloneys	s Road (through	Mine Site)				
		Relocated	Maloneys Road	- See Figure A	1.2 for land title	boundaries	
Lot	s in Depo	sited Plans	-				
102/	/1124638	61/755412	76/755412	178/755412	3/755412	2/755412	18/755412
101/	/1124638	197/755412	7002/1029653**	11/755412			
Oth	er Land						
A8	An unnar	med Crown road	l (subject to an end	closure permit) thr	ough 102/1124638		
R2	A portion	of Wallerawang	g-Gwabegar Railwa	ay north of 7002/1	029653		
R3	Bara-Lue	e Road (Council	road) through 2/75	55412 and 101/11	24638		
R4	Lue Road	d (Council Road	) south of 7002/10	29653			
A9 Lawsons Creek (section forming the southern boundary of 11/755412 and the northern boundary of 197/755412)							
Water Supply Pipeline Corridor* - See Figure A1.3 for land title boundaries							
Lot	s in Depo	sited Plan					
41/7	55412	117/755412	75/755412	115/755412	180/755412	105/755412	194/755412
165/	755412	48/755415 <sup>2**</sup>	7300/1140165**	309/755414	229/755414	268/755414	45/755414
25/7	55414	388/755414	2/577237	1/577237	15/755424	204/755424	1/1169526
220/	40521	136/755424	135/755424	1/1152249	144/755424	1/1228284	164/755442
4/10	08532	3/1008532	2/1008532	1/1216658	165/755442	2/1216304	71/755442
163/	755442	160/755442	158/755442	159/755442	244/755442	1/1216304	202/755442
255/	755442	273/755442 <sup>3</sup>	190/582575	194/755442	216/755442	201/755442	230/755442
214/	755442	215/664444	217/755442	235/755442	7001/10263081**	5/47521	
212/	755442	6/258998	5/258998	32/633148	3/1214133	4/1214133	

#### Table A1.1 (Cont'd) Application Area Land Titles

Page 2 of 2 Water Supply Pipeline Corridor\*- See Figure A1.3 for land title boundaries (Cont'd) Other Land A10 Un-named Crown road running approximately north-south through 3/755412 and 102/1124638 A11 Un-named Crown road running approximately northeast to southwest through 105/755412 A12 Un-named area of Crown land on north western boundary of 165/755412 and along boundary of 6/262777 in the vicinity of Bara-Lue Road A13 Un-named Crown road running north-south on western boundary of 25/755412 A14 Un-named Crown road running east off Bara Rd through 184/755415 A15 Un-named Crown road/road reserve at southeastern boundary of 48/755415 and northeastern boundary of 126/755415 A16 Un-named Crown road/road reserve running adjacent to Hayes Gap Rd on eastern side of 7300//DP1140165 A17 Un-named Council public road on northern boundary of 195/755415 A18 Un-named Crown road running along western boundary of 23/755415 and eastern boundary of 24/755415 A19 Waterway (Pipeclay Creek) at very northern end of 63/755415 and northwest of formed Hayes Gap Rd to the west of 6/755415 A20 Waterway (Pipeclay Creek) that is traversed by formed Hayes Gap Rd at convergence of 408/755414, 6/755415, 2/1192475 and 409/755414 A21 Waterway (Stony Creek) between extreme southeastern boundary of 268/755414 and boundary of 45/755414 A22 Waterway (Cooyal Creek) that runs along northern boundary of 388/755414 and southern boundary of 2/577237 A23 Un-named Crown road running approximately north south through 71/755442 A24 Un-named Crown road running along southern boundary of 190/582575 A25 Un-named Crown road running along northern boundary of 190/582575 and southern boundary of 194/755442 A26 Un-named Crown road running along southern boundary of 215/664444 and northern boundary of 214/755442 A27 Un-named Crown road running approximately southwest to northeast through 235/755442 A28 Un-named Crown road running along southern boundary of 230/755442 and northern boundary of 5/47521 A29 Waterway (Moolarben Ck) between northeastern boundary of 8/626648 and western boundary of 3/1214133. This portion is south of Ulan Road. R5a Bara Lue Road R5b Bara Road R6 Hayes Gap Road R7 Botobolar Road R8 Wollar Road R9 Linburn Lane R10 Moolarben Road R11 Ulan Road (south of Ridge Road) R12 Lagoons Road R13 Ulan Road (north of Main Street) Notes: \* The titles listed relate to the land within the corridor beyond the Mine Site \*\* Crown Land Lot <sup>#</sup> Owned by Mid-Western Regional Council <sup>1</sup> Subject to Aboriginal Land Claim 41007 <sup>2</sup> Subject to Aboriginal Land Claim 43108

<sup>3</sup> Perpetual Lease – P. Libertis

R. W. CORKERY & CO. PTY. LIMITED

BOWDENS SILVER PTY LIMITED

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Appendix 1

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MN Road Maloneys Lot 61 DP755412 Lot 127 Lot 118 DP755435 Lot 76 DP755412 DP755435 Lot 1 DP48047 Bara-Lue I Lot 119 DP755435 Lot 3 Lot 25 DP75543 DP755412 Lot 42 Lot 102 Road DP755412 DP1124638 Lot 178 DP755412 Lot 73 Lot 7007 DP1029353 Lot 26 DP755412 Lot 74 DP755412 Lot 2 DP572701 DP755435 Lot 161 DP755435 Lot 107 Lot 3 DP572701 DP755412 Lot 4 DP572701 Lot 1 DP1118167 Lot 2 ot 102 DP1124638 Lot 140 DP776858 Lot 86 DP755435 DP755435 wittins Creek Lot 1 DP814633 Lot 143 DP755435 Road Lot 2 DP814633 8 Non Lot 132 DP1050074 Lot 122 DP755435 Lawsons Lue Road Pyangle Road Lot 11 DP810747 Lot 121 DP755435 Creek Road a Lot 1 DP8358 Lot DP117169 Lot 7008 Creet DP1029652 Pyangle Lue Lue Road REFERENCE Mine Site Boundary Crown Land (Road Reserve) Former Crown Land Cadastral Boundary Mid West Regional Council **Road Reserve** Watercourse A7 Un-named Crown Road Reference (see detail in Table A1.1) (R1) **Council Road Reference** (see detail in Table A1.1) SCALE 1:40 000 (A4) 0.5 0 0.5 1.0 1.5 2.0 km Figure A1.1 Cadastral Boundary Source: © NSW Department of Finance and Services MINE SITE LAND TITLES Panorama Avenue Bathurst NSW 2795 www.lpi.nsw.gov.au



**ENVIRONMENTAL IMPACT STATEMENT** Appendix 1





Bowdens Silver Project Report No. 429/24

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**ENVIRONMENTAL IMPACT STATEMENT** Appendix 1



#### BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

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# **Appendix 2**

# Secretary's Environmental Assessment Requirements and Matters Identified for Consideration

(Total No. of pages including blank pages = 208)



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Attachment 2A:	Agencies Correspondence (2016) A2-13		
Attachment 2B:	Agencies Supplementary or Updated Correspondence (2019)A2-61		
Attachment 3:	Commonwealth Department of Environment and Energy Assessment Requirements		
Attachment 4:	Agencies Correspondence (2013 to 2015) A2-105		

Note: Attachments 2A, 2B and 4 of this Appendix are only available on the digital version of this document





 Planning Services

 Resource & Energy Assessments

 Contact:
 Philip Nevill

 Tel:
 (02) 8275 1036

 Email:
 philip.nevill@planning.nsw.gov.au

Mr Anthony McClure Bowdens Silver Pty Limited Company PO Box 1115 MUDGEE NSW 2850

Via email: anthonymcclure@silvermines.com.au

Dear Mr McClure

#### Bowdens Silver Project (SSD 5765) Revised Environmental Assessment Requirements

I have attached the revised Planning Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for Bowdens Silver Project.

These requirements have been updated to include the proposed water supply pipeline, reference to the NSW Noise Policy for Industry and Social Impact Assessment Guidelines for State Significant Mining, Petroleum Production and Extractive Industry Development (2017) and to include the Commonwealth's requirements for the assessment of impacts under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The revised requirements are based on the information you have provided to date and have been prepared in consultation with the relevant government agencies. The agencies' previous advice and supplementary/updated advice are attached for your consideration during the preparation of the EIS (see **Attachment 2A and 2B**).

Please note that the Planning Secretary may modify these requirements at any time. If you do not submit a development application (DA) and EIS for the development within 2 years, you must consult further with the Planning Secretary in relation to the preparation of the EIS.

#### **Commonwealth assessment requirements**

A delegate for the Minister of the Environment and Energy has determined the project to be a controlled action under the EPBC Act. The EPBC Act controlling provisions will be assessed in accordance with the *NSW Bilateral Agreement relating to environmental assessment 2015*. As such, I am now providing you with the environmental assessment requirements to ensure that the Commonwealth matters are appropriately addressed in your EIS (see **Attachment 3**).

320 Street Sydney NSW 2000 | GPO Box 39 Sydney NSW 2001 www.planning.nsw.gov.au



#### What you must do

Please contact the Department at least two weeks before you propose to submit your DA and EIS. This will enable the Department to provide lodgement instructions, confirm the applicable fee, determine the required number of copies of the EIS and discuss potential exhibition periods.

It is important for you to recognise that the Department will review the EIS for the project carefully before putting it on public exhibition. If it fails to adequately address these requirements, then you will be required to submit an amended EIS.

The Department also wishes to emphasise the importance of continued effective and genuine community consultation during the preparation of the EIS. This process should provide the community with a clear understanding of the proposal and its potential impacts and include active engagement with the community regarding key issues of concern.

If you wish to discuss the matter further, please contact Philip Nevill on (02) 8275 1036.

Yours sincerely

21/6/19

Steve O'Donoghue Director Resource and Energy Assessments as delegate of the Planning Secretary

Department of Planning & Infrastructure, GPO Box 39, SYDNEY NSW 2001 www.planning.nsw.gov.au

## **Environmental Assessment Requirements**

### **State Significant Development**

Section 4.12(8) of the *Environmental Planning and Assessment Act* 1979 Schedule 2 of the *Environmental Planning and Assessment Regulation* 2000

Application Number	SSD 5765		
Development	<ul> <li>The Bowdens Silver Project, which includes:</li> <li>developing an open cut silver, lead and zinc mine and associated infrastructure, including a water supply pipeline;</li> <li>extracting and processing up to 2 million tonnes of ore a year for up to 17 years;</li> <li>transporting the processed ore from the mine via road; and</li> <li>rehabilitating the site.</li> </ul>		
Location	2.5 km northeast of Lue, in the Mid-Western Regional LGA		
Applicant	Bowdens Silver Pty Limited		
Date of Issue	21 June 2019		
General Requirements	<ul> <li>21 June 2019</li> <li>The Environmental Impact Statement (EIS) for the development must comply with the requirements in Clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.</li> <li>In particular, the EIS must include: <ul> <li>a stand-alone executive summary;</li> <li>a full description of the development, including:</li> <li>the resource to be extracted, demonstrating efficient resource recovery within environmental constraints, and having regard to DRG/DRE's requirements (see Attachment 2A and 2B);</li> <li>the mine layout and scheduling;</li> <li>minerals processing;</li> <li>surface infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process);</li> <li>a waste (overburden, tailings, etc.) management strategy;</li> <li>a requirements (see Attachment 2A and 2B);</li> <li>a rehabilitation strategy, having regard to the EPA's and DPI's requirements (see Attachment 2A and 2B);</li> <li>a rehabilitation strategy, having regard to the EPA's and DPI's requirements (see Attachment 2A and 2B);</li> <li>a rehabilitation strategy, having regard to the EPA's and DPI's requirements (see Attachment 2A and 2B);</li> <li>a rehabilitation strategy, having regard to the EPA's and DPI's requirements (see Attachment 2A and 2B);</li> <li>a the likely interactions between the development and any other existing, approved or proposed mining related development in the vicinity of the site;</li> </ul> </li> <li>a list of any approvals that must be obtained before the development may commence;</li> </ul>		
	<ul> <li>an assessment of the likely impacts of the development on the environment, focusing on the specific issues identified below, including: <ul> <li>a description of the existing environment likely to be affected by the development, using sufficient baseline data;</li> <li>an assessment of the likely impacts of all stages of the development, including any cumulative impacts, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice;</li> <li>a description of the measures that would be implemented to mitigate and/or offset the likely impacts of the development, and an assessment of:</li> </ul> </li> </ul>		

	<ul> <li>whether these measures are consistent with industry best practice, and represent the full range of reasonable and feasible mitigation measures that could be implemented;</li> <li>the likely effectiveness of these measures, including performance measures where relevant; and</li> <li>whether contingency plans would be necessary to manage any residual risks;</li> <li>a description of the measures that would be implemented to monitor and report on the environmental performance of the development if it is approved;</li> <li>a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS;</li> <li>consideration of the development against all relevant environmental planning instruments (including Part 3 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007);</li> <li>a conclusion evaluating the merits of the project as a whole, having regard to the requirements in Section 4.15 of the EIS, certifying that the information contained within the document is neither false nor misleading.</li> <li>While not exhaustive, Attachment 1 contains a list of some of the environmental planning instruments, guidelines, policies, and plans that may be relevant to the environmental assessment of this development.</li> <li>In addition to the matters set out in Schedule 1 of the Environmental Planning and Assessment Regulation 2000, the development application must be accompanied by a signed report from a suitably qualified and experienced person that includes an accurate estimate of the capital investment value (as defined in Clause 3 of the Environmental Planning and Assessment Regulation 2000) of the development, including details of all the assumptions and components from which the capital investment value calculation is derived.</li> </ul>
Specific Issues	<ul> <li>The EIS must address the following specific issues:</li> <li>Land – including:</li> <li>an assessment of the likely impacts of the development on the soils and</li> </ul>
	<ul> <li>land capability of the site and surrounds;</li> <li>an assessment of the likely agricultural impacts of the development, including identification of any strategic agricultural land;</li> <li>an assessment of the likely impact of the development on landforms</li> </ul>
	(topography), including the long term geotechnical stability of any new landforms on site; and
	- an assessment of the compatibility of the development with other land uses in the vicinity of the development in accordance with the requirements of Clause 12 of <i>State Environmental Planning Policy</i> ( <i>Mining, Petroleum Production and Extractive Industries</i> ) 2007, paying particular attention to the agricultural land use in the region;
	• Air Quality- including:
	- an assessment of the likely air quality impacts of the development in
	- an assessment of the likely air quality impacts of the development in accordance with the <i>Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW</i> , having regard to the EPA's requirements (see Attachment 2A and 2B); and
	<ul> <li>an assessment of the likely air quality impacts of the development in accordance with the <i>Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW</i>, having regard to the EPA's requirements (see Attachment 2A and 2B); and</li> <li>an assessment of the likely greenhouse gas impacts of the development;</li> </ul>
	<ul> <li>an assessment of the likely air quality impacts of the development in accordance with the <i>Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW</i>, having regard to the EPA's requirements (see Attachment 2A and 2B); and</li> <li>an assessment of the likely greenhouse gas impacts of the development;</li> <li>Human Health – including:         <ul> <li>a Human Health Risk Assessment addressing how the development's</li> </ul> </li> </ul>
	<ul> <li>an assessment of the likely air quality impacts of the development in accordance with the <i>Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW</i>, having regard to the EPA's requirements (see Attachment 2A and 2B); and</li> <li>an assessment of the likely greenhouse gas impacts of the development;</li> <li>Human Health – including: <ul> <li>a Human Health Risk Assessment addressing how the development's environmental impacts in relation to air quality (including heavy metals) and noise may impact on the health of the local community; and</li> <li>monitoring and management measures to reduce risk to human health;</li> </ul> </li> </ul>
	<ul> <li>an assessment of the likely air quality impacts of the development in accordance with the <i>Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW</i>, having regard to the EPA's requirements (see Attachment 2A and 2B); and</li> <li>an assessment of the likely greenhouse gas impacts of the development;</li> <li>Human Health – including:         <ul> <li>a Human Health Risk Assessment addressing how the development's environmental impacts in relation to air quality (including heavy metals) and noise may impact on the health of the local community; and</li> <li>monitoring and management measures to reduce risk to human health;</li> </ul> </li> <li>Water – including:         <ul> <li>an assessment of the likely impacts of the development on the quantity</li> </ul> </li> </ul>

regard to the EPA's, DPI's and OEH's requirements (see Attachment 2A
and 2B),
- an assessment of the likely impacts of the development on aquifers,
watercourses, npanan iand, water-related intrastructure, and other
water users, including.
<ul> <li>a detailed site water balance, including an assessment of the reliability of water parameter imported to the site and management.</li> </ul>
reliability of water supply imported to the site, and management
of excess water, supported by sensitivity analysis; and
<ul> <li>an assessment of the water quality and management of the</li> </ul>
imported water, including spill/leak management.
Noise and Blasting – including:
- an assessment of the likely operational noise impacts of the
development (including construction noise) under the Noise Policy for
Industry (EPA), and the Voluntary Land Acquisition and Mitigation
Policy, and having regard to the EPA's requirements (see Attachment
2A and 2B);
- if a claim is made for specific construction noise criteria for certain
activities, then this claim must be justified and accompanied by an
assessment of the likely construction noise impacts of these activities
under the Interim Construction Noise Guideline;
- an assessment of the likely road house impacts of the development
under the INSW Road Noise Policy; and
- an assessment of the likely plasting impacts of the development on
people, animals, buildings and intrastructure, and significant hatural
Teatures, naving regard to the relevant ANZECC guidelines;
Biodiversity – including:     approximate of the little kindly are the increase of the above law are to be a second of the
- an assessment of the likely biodiversity impacts of the development, in
accordance with the Framework for Biodiversity Assessment, and howing regard to OEL's requirements (see Attachment OA and OE), and
naving regard to OEH's requirements (see Attachment 2A and 2B), and
- a strategy to onset any residual impacts of the development in
accordance with the NSW Biodiversity Offsets Policy for Major Projects,
Heritage – Including an assessment of the likely Aboriginal and historic
neritage (cultural and archaeological) impacts of the development, naving
Attachment 24 and 20:
Audul III et II. ZA di U. ZD), <b>Transport</b> including on accessment of the Birch transport impacts of the
<ul> <li>transport – including an assessment of the likely transport impacts of the development on the conseint condition potential and efficiency of the local</li> </ul>
and State read network, heaving regard to Mid Mostern Degional Courseilla
and State road network, naving regard to wild-western Regional Council's
A Nicual including an appagement of the likely viewel impacts of the
<ul> <li>visual — including an assessment of the likely visual impacts of the development on private landowners in the visibility of the development and</li> </ul>
key vertage points in the public demain, paying particular attention to the
creation of any new landforms and minimising the lighting impacts of the
development:
<ul> <li>Hazarde including an accomment of the likely ricks to public enfetty paying.</li> </ul>
natticular attention to potential subsidence risks buchfire risks and the
handling and use of any dangerous goods, having regard to the EDA's
requirements (see Attachment 2A and 2B); and
Social & Economic including
- an assessment of the likely social impacts of the development on the local
and regional community generally in accordance with the Social Impact
Assessment Guidelines for State Significant Mining Detroleum
Production and Extractive Industry Development (2017) including the
likely impacts of the development on the local community cumulative
impacts (considering other mining developments in the locality) and
consideration of workforce accommodation; and
an assessment of the likely economic impacts of the dovelopment
- an assessment of the likely economic impacts of the development, paving particular attention to the:
paying particular alterition to the.
<ul> <li>Significance of the development for the State and region; and</li> </ul>
<ul> <li>demand for the provision of local infrastructure and services</li> </ul>
s demand for the provision of local initiast dotate and services.

Consultation	During the preparation of the EIS and subsequent assessment process, you must establish and operate a Community Consultative Committee (CCC) for the development in accordance with the <i>Community Consultative Committee Guidelines: State Significant Projects</i> dated November 2016. You should also consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers, community groups and affected landowners. The EIS must describe the consultation that was carried out, identify the issues raised during this consultation (including by the CCC), and explain how these issues have been addressed in the EIS.
Further	If an EIS for the project is not lodged within 2 years of the issue date of these
consultation after	Environmental Assessment Requirements, the Applicant must consult further
2 years	with the Secretary in relation to the preparation of the EIS.



### ATTACHMENT 1

## Environmental Planning Instruments, Policies, Guidelines & Plans

Land	
	Agfact AC25: Agricultural Land Classification (NSW Agriculture)
	Soil and Landscape Issues in Environmental Impact Assessment (NOW)
	State Environmental Planning Policy No. 55 – Remediation of Land
	Australian and New Zealand Guidelines for the Assessment and Management of
Air Quality	Sonaminated Sites (ANZESS)
	Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (EPA)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA)
	Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)
	Voluntary Land Acquisition and Mitigation Policy (DP&E)
	National Greenhouse Accounts Factors (Commonwealth)
Water	
	Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources
Water Sharing	Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources
Plans	Water Sharing Plan for the Macquarie-Cudgegong Regulated Rivers Water Source
	Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources
	NSW State Groundwater Policy Framework Document (NOW)
	NSW State Groundwater Quality Protection Policy (NOW)
	NSW State Groundwater Quantity Management Policy (NOW)
	NSW Aquifer Interference Policy 2012 (NOW)
Groundwater	Australian Groundwater Modelling Guidelines 2012 (Commonwealth)
	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	Guidelines for the Assessment & Management of Groundwater Contamination (EPA)
	NSW State Rivers and Estuary Policy (NOW)
	NSW Government Water Quality and River Flow Objectives (EPA)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (EPA)
	ANZECC Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)
Surface Water	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA)
	Managing Urban Stormwater: Soils & Construction (Landcom) and associated Volumes 2A to 2E (DECC)
	Managing Urban Stormwater: Treatment Techniques (EPA)
	Managing Urban Stormwater: Source Control (EPA)
	Technical Guidelines: Bunding & Spill Management (EPA)
	A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH)
	NSW Guidelines for Controlled Activities (NOW)
Flooding	Floodplain Development Manual (OEH)

#### BOWDENS SILVER PTY LIMITED

	Floodplain Risk Management Guideline (OEH)
Noise & Blasting	
	NSW Noise Policy for Industry (EPA)
	Interim Construction Noise Guideline (EPA)
	NSW Road Noise Policy (EPA)
	Assessing Vibration: a Technical Guideline (EPA)
	Technical Basis for Guidelines to Minimise Annoyance Due to Blasting
	Overpressure and Ground Vibration (ANZECC)
	Voluntary Land Acquisition and Mitigation Policy (DP&E)
Biodiversity	
	Framework for Biodiversity Assessment (OEH)
	NSW Biodiversity Offsets Policy for Major Projects (OEH)
	Threatened Species Assessment Guidelines (OEH)
	Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (Fisheries NSW)
	NSW State Groundwater Dependent Ecosystem Policy (NOW)
	Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW)
	State Environmental Planning Policy No. 44 – Koala Habitat Protection
	Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI)
Heritage	
	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)
	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH)
	Code of Practice for Archaeological Investigations of Objects in NSW (OEH)
	Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (OEH)
	NSW Heritage Manual (OEH)
	Statements of Heritage Impact (OEH)
	Assessing Significance for Historical Archaeological Sites and 'Relics' (OEH)
	Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH)
Transport	
	Guide to Traffic Generating Developments 2002 (RTA)
	Austroads Guide to Road Design and RMS supplements to road design
	Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
Hazards	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive
	Development
	Hazardous and Offensive Development Application Guidelines – Applying SEPP 33
	Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis
Resource	
	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 (JORC)
Waste	
	Waste Classification Guidelines (EPA)
Rehabilitation	
	Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth)



	Mine Closure and Completion – Leading Practice Sustainable Development		
	Program for the Mining Industry (Commonwealth)		
	Strategic Framework for Mine Closure (ANZMEC-MCA)		
Environmental Pla	nning Instruments - General		
	State Environmental Planning Policy (Mining, Petroleum Production and Extractive		

Industries) 2007

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No. 44 – Koala Habitat Protection State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

Mid-Western Regional Local Environmental Plan 2012



Bowdens Silver Project Report No. 429/24

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### ATTACHMENT 2A

**AGENCIES' CORRESPONDENCE (2016)** 

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Bowdens Silver Project Report No. 429/24

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#### **ENVIRONMENTAL IMPACT STATEMENT** Appendix 2



MID-WESTERN REGIONAL COUNCIL

PO Box 156, MUDGEE NSW 2850 86 Market Street, Mudgee | 109 Herbert Street, Gulgong | 77 Louee Street, Rylstone T 1300 765 002 or 02 6378 2850 | F 02 6378 2815 E council@midwestern.nsw.gov.au

JR | A0420245

12 December 2016

Elle Donnelley NSW Department of Planning & Environment Sent via email: elle.donnelley@planning.nsw.gov.au]

Dear Elle

#### SUBJECT: BOWDENS SILVER PROJECT REVISED SEARS

Thank you for the opportunity to provide input into the revised Secretary's Environment Assessment Requirements (SEARS) for the Bowdens Silver Project.

Mid-Western Regional Council has previously made submissions in relation to the SEARS for this project both in February 2013 and January 2015. A copy of these submissions is attached for your reference.

After reviewing the revised proposal dated November 2016, Council confirms that it does not have any additional matters to raise beyond those already identified in the submissions referred to above. In summary, the key issues to be addressed include:

- 1. **Proximity to Lue Village** the village of Lue with over 100 residences is within 2.5km of the proposed open cut pit. The mitigation and/or management of any impacts relating to issues such as noise, air quality, traffic, local amenity etc. are critical to this community.
- 2. Water as water security is a high priority in this region, it is essential that the project identifies a sustainable water source which does not impact upon town water supplies and/or enforce restrictions on other agricultural users within the catchment area.
- 3. **Roads** the project will require upgrades to local roads (including construction of a new access road and relocation of Maloneys (Bara) Road) prior to construction commencement, and ongoing during the operational phase of the project. It is expected that these upgrades will be at the full cost to the proponent, and that the proponent will make an annual contribution to roads maintenance for the project life cycle based on projected traffic movements.

www.midwestern.nsw.gov.au

R. W. CORKERY & CO. PTY. LIMITED

If you wish to discuss this submission in further detail, please contact 02 6378 2850.

Yours faithfully, лÒ

JULIE ROBERTSON DIRECTOR DEVELOPMENT



#### ENVIRONMENTAL IMPACT STATEMENT Appendix 2

### BOWDENS SILVER PTY LIMITED

Bowdens Silver Project Report No. 429/24

PO BOX 156 MUDGEE NSW 2850

86 Market Street MUDGEE 109 Herbert Street GULGONG 77 Louee Street RYLSTONE

Ph: 1300 765 002 or (02) 6378 2850 Fax: (02) 6378 2815 email: council@midwestern.nsw.gov.au

15 January 2015



A0420245

Mr Kane Winwood NSW Planning & Environment GPO Box 39 SYDNEY NSW 2001

Dear Mr Winwood

#### BOWDENS SILVER PROJECT – REVISED SEARs

I refer to the email dated 15 December 2014 inviting Council to provide comment on the proposed amended Secretary's Environmental Assessment Requirements (SEARs).

Council has reviewed the updated proposal and would like to add the following comments as an addendum to our original submission dated 14 February 2013:

- Council require the applicant to undertake a full assessment of the impacts on air quality
  from dust and particulate matter as a result of the project including monitoring of
  background lead levels to ensure that there are no adverse impacts on the Lue community
  and surrounding area. Council requests that consideration be given to the findings in Port
  Augusta where unexpected high lead levels were found locally and at sites remote from
  the mine site.
- Council reaffirms that it considers that water is a determining issue. To date the applicant has been unable to identify the exact amount of water required, the source of water and the proposed method of reticulation to the mine site. Council remains concerned regarding the potential impact on agricultural users and objects to any scheme that requires the transfer of water licences from below Burrendong Dam. Council requests that the assessment clearly identifies the source of water, amount and proposed reticulation.
- Council reaffirms its requirement that all road upgrades identified in the Preliminary Environmental Assessment be undertaken at full cost to the developer and that all upgrades are required as a condition of approval prior to the commencement of construction on the site. This includes the re-alignment and sealing of Maloneys (Bara) Road from the Lue Road intersection to the mine entrance.



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Council reaffirms that it fully supports the response form the Lue Action Group and requests that their requirements be included in the SEARs. Should you have any queries in relation to this matter please contact Catherine Van Laeren on (02) 6378 2850.

Yours faithfully

der :

CATHERINE VAN LAEREN **DIRECTOR - DEVELOPMENT** 

www.midwestern.nsw.gov.au



BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



(CVL) A0420245

NSW Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2000

Attention: Mr Kane Winwood - Team Leader - Mining Projects

Dear Sir,

#### PRELIMINARY RESPONSE TO DIRECTOR GENERAL'S REQUIREMENT BOWDENS SILVER PROJECT -

Thank you for the opportunity to provide a preliminary response to the Director General's Requirements for the Bowden's Silver Project. Council has reviewed Preliminary Environmental Assessment and Draft DGRs and would request that the following specific issues be included in the DGRs:

• Traffic movements

It is requested that a detailed analysis should be carried out of the impact of all traffic movements (type and frequency) that are anticipated for the whole of the period of the construction and operation of the project – this should include commuter traffic, transport of equipment and the transport of concentration. The analysis should include an assessment of the ability of all roads, intersection, culverts and bridges to cope with the additional traffic and the changing nature of the traffic. Should heavy haulage routes involve haulage through existing towns and villages than the analysis should include the assessment on traffic flow through those towns and villages and potential noise impacts. The study is to provide a detail safety audit and a schedule of works necessary to upgrade the road to ensure that current levels of services are maintained. All roads should be upgraded to comply with Austroad standards in accordance with the standard dictated by traffic volumes including consideration of heavy haulage.

In addition the proponent should address the likely impact and proposed procedures for the transportation of hazardous materials along the proposed haulage routes.

Council would suggest the proponent commence discussions with Council's Engineering Officers are soon as possible regarding all aspects of road works



PO BOX 156 MUDGEE NSW 2850

86 Market Street MUDGEE 109 Herbert Street GULGONG 77 Louee Street RYLSTONE

Ph: 1300 765 002 or (02) 6378 2850 Fax: (02) 6378 2815 email: council@midwestern.nsw.gov.au

14 February 2013

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#### • Road Dilapidation Report

Council requests that an assessment of the condition of the road, that is a dilapidation report, is to take place prior to the commencement of construction and again at the completion of works. Weekly inspections of the roads will also be required, to ensure that any damage to the road is repaired immediately. Council will also be seeking assurances that any road damage that occurs as a result of increased vehicle movements associated with the construction will be funded by the developer and not by Council.

#### • Road Upgrades

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Council requires that all road upgrades required as indentified by the study be undertaken at the full cost to the developer and that all upgrades are required as a condition of approval prior to the commencement of any construction on site.

#### • Road Maintenance

Council requires that a full assessment of all haulage and commuter routes be undertaken to assess the lifecycle maintenance requirement of the routes and undertake a details schedule of works and schedule of costs. All works and costs are to be borne by the proponent.

#### • Realignment of Maloneys Road (Bara) Road

Council requires detailed consultation with Mid-Western Regional Council throughout the design of Maloneys Road including the selection of the new realignment. As this road will become a Mid-Western Council asset Council will require that the roadworks are undertaken by Mid-Western Regional Council at the full cost to the proponent.

#### • Dust

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Council notes that the Draft DGRs will require a quantative assessment of the potential impacts of dust. It is requested that the DGRs include specific reference to variable wind patterns, including seasonal wind patterns and the need for a detailed air dispersal model. Council also requires specific details on the specific dust suppression measures that will be in place during operations and also on the haulage routes.

#### • Noise Impacts.

Council considers that the application of the Industrial Noise Policy is inappropriate in this environment due to the extremely low existing background noise levels. Council stresses that the baseline for the assessment of noise impacts should be less than that allowed by the Industrial Noise Policy having regard to the rural nature of the area. It is considered that having regard to the difficulty to meet acceptable noise levels during nighttime operation and the rural nature of the area that reconsideration should be given to the 24 hour operation of the site.

Council would also require a detailed Traffic Noise Assessment to be carried out on the proposed haulage routes to ascertain the level of impact associated off-site going to be generated as a result of the mining operations.

#### • Complaints Register

Council requires details on how the company proposed to address and monitor all complaints associated with the operations of the mine.

#### Water

Council requests that a moratorium be placed on the sale of high security licenses to the Bowden's Silver Project until detailed assessment of the impact on other water users, such as agricultural users can be modeled and extensive consultation undertaken with existing users. Until such time as it can be demonstrated that the



protection for town water supplies it is consider irresponsible for further high security licenses to be sold that allow the transfer of water allocations within the catchment. It is considered imperative that the modeling, adjustment of the WSP and extensive consultation be undertaken prior to the sale of the water license.

Council considers that potential impact on water security for both agricultural users and town water supply is a determinative issue. It is considered that the cumulative impact of the establishment of mining projects within the catchment and their water demands needs to assessed. In addition, it is imperative that potential adverse impact on water allocations during periods of drought to other industries, agriculture and the town water supply be considered and that the cost of the development include the potential decline of agriculture and growth of other industries due to the restricted access to water. Council considers that it is critical that a diverse economic base be maintain in the region and the potential threat to that diversity should be fully assessed as part of this application.

It is noted that a *Human Health Risk Assessment* is a requirement of the Draft DGRs. Council would request that a particular focus be placed on the assessment on the impacts on dust on drinking water.

• Visual Amenity

It is requested that the DGRs include an assessment of the lighting and light spillage on the rural character of the area and impact on the residential amenity of both the villages and surrounding properties.

Council will also require light shielding modeling carried out as part of the assessment to demonstrate the likely impacts of light onto the neighboring properties and Lue. Mechanisms on how to limit light shielding and the likely impacts it will have will also need to be demonstrated by the proponent.

• Socio Economic Impacts

Council considers that the assumptions regarding available workforce within the supporting information is flawed and fails to take into account the cumulative impact of mining and wind farm projects within the region. Whilst it is acknowledged that some of the construction and operation workforce will be sourced locally it is considered that the majority will need to be imported. Council requests that the DGRs include the requirement for the proponent to identify the likely domicile for 90 % of the construction and operational workforce and undertake a full analysis of the impacts on housing, rental housing, infrastructure, traffic, health and other social impacts and provide realistic measure to mitigate those impacts. The literature review should have regard to the Local Service Assessment Report undertaken by Manidis Roberts on behalf of the DoPI in 2012. A copy is located on Council website at <u>http://www.midwestern.nsw.gov.au/Economic-Development/Publications/</u>. Upon the completion of the demand assessment for temporary accommodation should the project recognise a need for Temporary Workers Accommodation then reference should be made the Mid-Western Regional Comprehensive DCP.

Council is concerned regarding the ongoing viability of the village of Lue and the school. The village of Lue is a successful vibrant community and Council has witnessed the demise of other villages such as Wollar due the impacts of mining. It should be noted that demise of Wollar was not predicted in the EA prepared in support of the mine. Council considers that a full assessment should be made on the potential impacts on Lue with an investigation of student numbers and the potential threat to maintaining those numbers should families leave the village.

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#### Agricultural Impact Analysis

While Council recogonises that the area may not be regarded as prime agricultural lands, Council would like to see the likely off-site impacts on adjoining agricultural lands that are likely to occur as a result of the mine. Council would also like to see what soil resources and land capabilities are likely to be altered.

Environmental Offsets

In identifying proposed environmental offset the proponent should identify the proposed ongoing management program for the offsets including land tenure, Council does not support the conversion of environmental offsets to National Park or transfer to government ownership.

• Voluntary Planning Agreement

To date no discussions have taken place regarding a Voluntary Planning Agreement (VPA) with Mid-Western Regional Council. -Council will be seeking an agreement to compensate for the additional demand on facilities and services provided by the Council. -It should be noted that Council expects that all road upgrades will be required as a condition of approval prior to the commencement of the construction on site rather than included in a VPA.

• Acid Forming Material

Council is concerned regarding the potential for acid forming material left in situ but exposed due to mining activities. Council requests that a complete assessment be undertaken and if necessary that a bond or guarantee be imposed to ensure the ongoing management of the site after the closure of the mine.

#### Fauna and Flora

Council would like to see details on proposed native fish waterway crossings that are likely to be obstructed and altered as a result of the proposal and any critical habitats likely to be affected by the proposal.

• Site Rehabilitation Works post Mine Life

Council would require information on the post mine life rehabilitation plans and proposed uses for the site. As part of this information Council would require quantified information on the lands capabilities post mine life.

#### Lue Action Group

Please find attached a response from the Lue Action Group. Council fully supports the requests included in their response for inclusion in the DGRs.

Council\_supports site specific Director General Requirements with regard to Major Projects.

Should you have any further enquiries in relation to this matter please contact Catherine Van Laeren on 02 6378 2850 during office hours.

Yours faithfully

an

CATHERINE VAN LAEREN GROUP MANAGER – DEVELOPMENT & COMMUNITY SERVICES





OUT16/48752

Ms Elle Donnelley Resource Assessments NSW Department of Planning and Environment GPO Box 39 SYDNEY NSW 2001

Elle.donnelley@planning.nsw.gov.au

Dear Ms Donnelley

#### Bowden Silver Project (SSD 5765) Request for Secretary's Environmental Assessment Requirements

I refer to your email of 29 November 2016 to the Department of Primary Industries (DPI) in respect to the above matter. Comment has been sought from relevant divisions of DPI. Views were also sought from NSW Department of Industry - Lands that are now a division of the broader Department and no longer within NSW DPI. Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au.

DPI has reviewed the request and the previously issued SEARs and provides the following recommendations:

- Specific Issues Land should include the following:
  - A requirement to complete an Agricultural Impact Statement in accordance with the <u>DPI Agricultural Impact Statement Technical Notes</u>.
  - An assessment of the pre mining (baseline) agricultural capability of the land to facilitate rehabilitation to pre-existing agricultural use at the close of the project. This should include monitoring programs to measure the return of land back to pre-existing condition.
- Specific Issues Biodiversity should include a requirement for an aquatic ecological environmental assessment that specifically addresses the impacts on aquatic ecology, loss of Key Fish Habitats, threatened species and proposed offsets. Information to assist the proponent in undertaking this assessment has been included at Attachment A.
- Specific Issues Water should also include the following:
  - Identify water demand, and determine whether an adequate and secure water supply is available for the project.
  - Identify water sources (surface and groundwater), water disposal / discharge methods and water storage structures in the form of a detailed and consolidated water balance.
  - An assessment against the <u>NSW Aguifer Interference Policy (2012)</u> using <u>DPI Water's assessment framework</u>.
  - Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.

NSW Department of Primary Industries Level 11, 323 Castlereagh Street Sydney NSW 2000 Tel: 02 9934 0805 landuse.enquiries@dpi.nsw.gov.au ABN: 72 189 919 072



- References throughout the document to 'NOW' should be amended to DPI Water.
- Attachment 1 Environmental Planning Instruments, Policies, Guidelines & Plans should include the following:
  - o Biodiversity
    - Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (2003)
    - <u>Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)</u>
  - o Land
    - <u>Strategic Regional Landuse Policy (2012)</u>

Yours sincerely

Mitchell Isaacs Director, Planning Policy & Assessment Advice 12 December 2016

DPI appreciates your help to improve our advice to you. Please complete this three minute survey about the advice we have provided to you, here: <a href="https://goo.gl/o8TXWz">https://goo.gl/o8TXWz</a>



#### Attachment A

#### Bowden Silver Project (SSD 5765) Request for Secretary's Environmental Assessment Requirements Detailed comments – DPI Fisheries

#### AQUATIC ECOLOGICAL ASSESSMENT

The aquatic ecological environmental assessment should include the following information;

- A recent aerial photograph (preferably colour), map or GIS of the locality which maps the key fish habitat of the development site, and the waterway classes as defined in Tables 1 and 2 of the Policy & Guidelines document above.
- Aerial extent of the key fish habitat types to be affected either directly or indirectly by the development or activity should be identified and shown on recent aerial photograph map or GIS.
- Description and quantification of aquatic and riparian vegetation should be presented and mapped. This should include an assessment of the extent and condition of riparian vegetation and the extent and condition of freshwater aquatic vegetation and the presence of significant habitat features (e.g. gravel beds, snags, reed beds, etc)
- Quantification of the extent of aquatic and riparian habitat removal or modification which will result from the proposed development, and impacts on fish passage.
- Determination of aquatic biodiversity offsets required (see NSW Biodiversity Offsets Policy for Major Projects, Fact Sheet: Aquatic Biodiversity) at http://www.environment.nsw.gov.au/resources/biodiversity/14817aqoffs.pdf.
- Targeted on-ground surveys for threatened species (see below)
- Detailed maps outlining the proposed realignment of new waterways within the project area.
- Detailed maps outlining compensatory habitats and significant habitat features that will be created to offset the loss of aquatic and riparian habitat.
- Detailed maps that outline and assess the geomorphic stability of the proposed realignments of the new waterways including re-creation of the sinuosity/complexity of the new waterways.
- Details of the location of all waterways crossings and construction designs, such as bridges or culverts, access tracks, gauging stations or water pipelines.
- Details of the location of all waterway realignments, including a detailed rehabilitation plan for the aquatic environment and the adjacent riparian zone, and a timetable for construction of the proposal with details of various phases of construction.
- Aspects of the management of the proposal, both during construction and after completion, which relate to impact minimisation e.g. Environment Management Plans. e.g. Monitoring geomorphic stability of the system and mitigation strategies in place to address any bed lowering, scouring or other impacts that arise as a result of the project. Monitoring of the water quality in receiving waters such as the diverted creeks, particularly during the construction phase, and also during the operational phase.

**End Attachment A** 

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BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



OUT16/48775

Elle Donnelley Planner Resource Assessments Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

Elle.donnelley@planning.nsw.gov.au

Dear Elle

#### Bowdens Silver Project: Request for input into revised SEARs (SSD 5765)

I refer to your email dated 29 November 2016 inviting the Division of Resources & Energy (the Division) to provide comments on the Bowdens Silver Project: Request for input into revised SEARs (SSD 5765).

The Division has reviewed and assessed the adequacy of information in relation to Bowdens Silver Project: Request for input into revised SEARs (SSD 5765) requested by the Department of Planning and Environment (DPE) and requires the following inclusions:

The Environmental Impact Statement (EIS) is to include a brief description of the geological setting of the deposit and specifically provide a description of the geology and mineralisation of the deposit itself.

This description should include detail about the shape, physical dimensions, mineralogy and ore mineral distribution for individual ore bodies/lenses, and in particular, a description of the mineralogy of the ore for all minerals present should be provided, including silver sulphosalts and mineralised sulphides. Appropriate figures and sections showing the distribution of the various styles of mineralisation, such as the upper silver-rich and deeper sulphide-lead-zinc zones should be included.

Supporting information including plans and cross-sections need to show the extent of the mineralised zones to be mined and those located adjacent/beneath planned mining voids from planned activities. Where this may impact on resource sterilisation, utilisation and planned final voids, information such as grade and width/tonnes needs to be included.

The proposed recovery processes and expected recoveries for silver, lead and zinc should also be outlined.

The EIS is to include whole rock, minor and trace element geochemistry of the ore, tailings and waste rock, with commentary on the management of this information in context of the environmental effects of the proposal.

Division of Resources and Energy PO Box 344 Hunter Region Mail Centre NSW 2310 516 High St Maitland NSW 2323 Tel: 02 4931 6666 Fax: 02 4931 6776 www.industry.nsw.gov.au ABN 72 189 919 072


The Division recommends that the standard mining development rehabilitation SEARS be applied to this project (attachment A).

Should you have any enquires regarding this matter please contact Steve Cozens, Senior Project Officer, Royalty & Advisory Services on 9842 8573.

Yours sincerely

Zane West Manager Royalties & Advisory Services

Encl. Attachment A



2

MCV16/XXXX INT16/XXXX



Environmental Sustainability Unit PO Box 344, Maitland NSW 2310 Tel: 4931 6605 Fax: 4931 6790

#### ADVICE RESPONSE

#### Mining Development Rehabilitation Standard SEARs

#### Post-mining land use

(a) Identification and assessment of post-mining land use options;

(b) Identification and justification of the preferred post-mining land use outcome(s), including a discussion of how the final land use(s) are aligned with relevant local and regional strategic land use objectives;

(c) Identification of how the rehabilitation of the project will relate to the rehabilitation strategies of neighbouring mines within the region, with a particular emphasis on the coordination of rehabilitation activities along common boundary areas;

#### Rehabilitation objectives and domains

(d) Inclusion of a set of project rehabilitation objectives and completion criteria that clearly define the outcomes required to achieve the post-mining land use for each domain. Completion criteria should be specific, measurable, achievable, realistic and time-bound. If necessary, objective criteria may be presented as ranges;

#### **Rehabilitation Methodology**

(e) Details regarding the rehabilitation methods for disturbed areas and expected time frames for each stage of the rehabilitation process;

(f) Mine layout and scheduling, including maximising opportunities for progressive final rehabilitation. The final rehabilitation schedule should be mapped against key production milestones (i.e. ROM tonnes) of the mine layout sequence before being translated to indicative timeframes throughout the mine life. The mine plan should maximise opportunities for progressive rehabilitation;

#### **Conceptual Final Landform Design**

(g) Inclusion of a drawing at an appropriate scale identifying key attributes of the final landform, including final landform contours and the location of the proposed final land use(s);

#### **Monitoring and Research**

(h) Outlining the monitoring programs that will be implemented to assess how rehabilitation is trending towards the nominated land use objectives and completion criteria;

(i) Details of the process for triggering intervention and adaptive management measures to address potential adverse results as well as continuously improve rehabilitation practices;

(j) Outlining any proposed rehabilitation research programs and trials, including their objectives. This should include details of how the outcomes of research are considered as part of the ongoing review and improvement of rehabilitation practices;



MCV16/XXXX INT16/XXXX

#### Post-closure maintenance

(k) Description of how post-rehabilitation areas will be actively managed and maintained in accordance with the intended land use(s) in order to demonstrate progress towards meeting the rehabilitation objectives and completion criteria in a timely manner;

#### Barriers or limitations to effective rehabilitation

(I) Identification and description of those aspects of the site or operations that may present barriers or limitations to effective rehabilitation, including:

(i) evaluation of the likely effectiveness of the proposed rehabilitation techniques against the rehabilitation objectives and completion criteria;

(ii) an assessment and life of mine management strategy of the potential for geochemical constraints to rehabilitation (e.g. acid rock drainage, spontaneous combustion etc.), particularly associated with the management of overburden/interburden and reject material;

(iii) the processes that will be implemented throughout the mine life to identify and appropriately manage geochemical risks that may affect the ability to achieve sustainable rehabilitation outcomes;

(iv) a life of mine tailings management strategy, which details measures to be implemented to avoid the exposure of tailings material that may cause environmental risk, as well as promote geotechnical stability of the rehabilitated landform; and

(v) existing and surrounding landforms (showing contours and slopes) and how similar characteristics can be incorporated into the post-mining final landform design. This should include an evaluation of how key geomorphological characteristics evident in stable landforms within the natural landscape can be adapted to the materials and other constraints associated with the site.

(m) Where a void is proposed to remain as part of the final landform, include:

(i) a constraints and opportunities analysis of final void options, including backfilling, to justify that the proposed design is the most feasible and environmentally sustainable option to minimise the sterilisation of land post-mining;

(ii) a preliminary geotechnical assessment to identify the likely long term stability risks associated with the proposed remaining high wall(s) and low wall(s) along with associated measures that will be required to minimise potential risks to public safety; and

(iii) outcomes of the surface and groundwater assessments in relation to the likely final water level in the void. This should include an assessment of the potential for fill and spill along with measures required be implemented to minimise associated impacts to the environment and downstream water users.

(n) Where the mine includes underground workings:

(i) determine (with reference to the groundwater assessment) the likelihood and associated impacts of groundwater accumulating and subsequently discharging (e.g. acid or neutral mine drainage) from the underground workings post cessation of mining; and

(ii) consideration of the likely controls required to either prevent or mitigate against these risks as part of the closure plan for the site.

(o) Consideration of the controls likely to be required to either prevent or mitigate against rehabilitation risks as part of the closure plan for the site;

(p) Where an ecological land use is proposed, demonstrate how the revegetation strategy (e.g. seed mix, habitat features, corridor width etc.) has been developed in consideration of the target vegetation community(s);

(q) Where the intended land use is agriculture, demonstrate that the landscape, vegetation and soil will be returned to a condition capable of supporting this; and

(r) Consider any relevant government policies1.

1 The following government policies should be considered when addressing rehabilitation issues:

Mine Rehabilitation (Leading Practice Sustainable Development Program for the Mining Industry, 2006)

• Mine Closure and Completion (Leading Practice Sustainable Development Program for the Mining Industry, 2006)

FRM-207-2 State Significant Development – ESU Recommended SEARs [Insert Project Name]

Bowdens Silver Project Report No. 429/24

MCV16/XXXX INT16/XXXX

Strategic Framework for Mine Closure (ANZMEC-MCA, 2000)

FRM-207-2 State Significant Development – ESU Recommended SEARs [Insert Project Name]



#### ENVIRONMENTAL IMPACT STATEMENT

Appendix 2

BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



Your reference Our reference Contact

. : EF13/4940 & DOC16/604301-01 : Ms Sheridan Ledger (02) 6332 7608

Mrs Elle Donnelley Resource Assessments Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

13 December 2016

Dear Mrs Donnelley

#### REQUEST FOR SEARS – ENVIRONMENT PROTECTION AUTHORITY BOWDENS SILVER PROJECT (SSD 5765)

I refer to your email of 29 November 2016 requesting the Environment Protection Authority (EPA) provide Secretary's Environmental Assessment Requirements (SEARs) for the proposed "Bowden's Silver Project" (SSD 5765) ("the Project").

The EPA understands that the application will be assessed by the Department of Planning and Environment (DPE) under Part 4 of the *Environmental Planning and Assessment Act 1979* as State Significant Development.

The EPA has considered the details provided regarding the Proposal, including the Preliminary Environmental Assessment (PEA) prepared by RW Corkery & Co, dated November 2016. The EPA considers the Project, if approved, would require licensing by the EPA.

The applicant should address the issues in **Attachments A** to this letter during the preparation of the Environmental Impact Statement (EIS) to adequately assess the environmental impacts of the proposal. In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in **Attachment B** and any relevant industry codes of practice and best practice management guidelines.

The EPA requests that the applicant is provided with the EPA's assessment requirements and guidelines as set out in **Attachments A and B**. The EPA also requests that one (1) hard copy and an electronic copy of the EIS are provided for assessment. These documents should be mailed to the EPA's Central West (Bathurst) office PO Box 1388 BATHURST NSW 2795.

Should you have any enquiries regarding this matter, please contact Ms Sheridan Ledger at the Bathurst office of the EPA on (02) 6332 7608.

Yours sincerely

DARRYL CLIFT Head Central West Unit Environment Protection Authority

> PO Box 1388 Bathurst NSW 2795 Level 2, 203 – 209 Russell Street Bathurst NSW 2795 Tel: (02) 6332 7600 Fax: (02) 6332 7630 ABN 43 692 285 758 www.epa.nsw.gov.au



#### <u>Attachment A</u>

#### Bowden's Silver Project EPA Secretary's Environmental Assessment Requirements

#### Licensing requirements

On the basis of the information submitted, the proposal is a scheduled activity, being "Mining for Minerals" under the *Protection of the Environment Operations Act 1997* (POEO Act) and if approval is granted, proponent will be required to submit a licence application to obtain an environment protection licence (EPL) from the EPA.

As such, the EIS should also address the requirements of Section 45 of the POEO Act determining the extent of each impact and providing sufficient information to enable the EPA to determine appropriate conditions for the licence.

#### Environmental impacts of the project

The EIS must include a comprehensive description of the production processes, all discharges and emissions to the environment, an assessment of likely environmental impacts, particularly in relation to waste storages and include a detailed description of any proposed control measures.

The environmental sensitivity of the site and surrounds should be discussed. Details are required on the location of the proposed development, including the affected environment, to place the Project in its local and regional environmental context including surrounding landuses, land use zonings and most importantly potential sensitive receptors.

The EIS should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

The following environmental impacts of the project need to be assessed, quantified and reported on:

- Water
- Air
- Noise
- Waste, including waste storages
- Construction
- Soils
- Contaminated Land

The EIS should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of these guidelines is at **Attachment B**.

#### Description of proposal and premises

#### The Proposal

The objectives of the Project should be clearly stated and refer to:

the size and type of the operation;

- the nature of the processes and the products, by-products and wastes produced;
- the use or disposal of products;
- the anticipated level of performance in meeting required environmental standards and cleaner production principles;
- the staging and timing of the proposal; and
- the Project's relationship to any other industry or facility.

#### The Premises

The EIS will need to fully identify all of the processes and activities intended for the Project over the life of the development. This will include details of:

- the location of the proposed facility and details of the surrounding environment including the affected environment to place the Project in its local and regional environmental context. This should include surrounding land uses, planning zonings, potential sensitive receptors, catchments and adjoining sensitive areas, surface and sub-surface areas, features of conservation significance and environmental sensitivity (associated maps to be included);
- the proposed layout of the site (associated maps to be included);
- ownership details of any residence and/or land likely to be affected by the Project;
- maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc in the locality that may be affected by the Project;
- all equipment proposed for use at the site;
- chemicals, including fuel, used on the site and proposed methods for their transportation, storage, use and emergency management;
- waste generation and disposal;
- methods to mitigate any expected environmental impacts of the development; and
- site rehabilitation following completion of the Project.

#### Site Layout

The EIS should:

- 1. Provide maps, at an appropriate scale, which clearly identifies the proposed site layout relevant to environmental features such as drainage lines, terrain etc, over the life of the Project.
- 2. Provide maps which show land ownership information, the proposed site layout and impact assessment information at an appropriate scale.

#### Assessment of the environmental impacts of the Project

The potential environmental impacts related to the following environmental issues need to be assessed, quantified and reported on. It should be noted that the following requirements apply to all aspects of the Project, which may include offsite works, including but not necessarily limited to, the relocation of infrastructure eg roads, railway crossings and lines, electricity transmission lines and services, and the establishment of access roads to the Project site.

#### Air Quality

The goal should be to maintain existing rural air quality and protect sensitive receptors, both on and off site from adverse impacts of dust and odour and other relevant air pollutants. Background ambient air levels should be identified to inform the assessment.



Dust is of primary concern with potential emissions from general mining activities, onsite roads, conveyors, transfer points, loading facilities, coal stockpiles, overburden emplacements etc.

The EA should include a detailed air quality impact assessment (AQIA). The AQIA should:

- Assess the risk associated with potential discharges of fugitive and point source emissions for <u>all</u> <u>stages</u> of the Project. Assessment of risk relates to environmental harm, risk to human heath and amenity.
- 2. Justify the level of assessment undertaken on the basis of risk factors, including but not limited to:
  - a. proposal location;
  - b. characteristics of the receiving environment; and
  - c. type and quantity of pollutants emitted.
- Describe the receiving environment in detail. The Project must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to:
  - a. meteorology and climate a minimum of 12 months data obtained from the meteorological station located at the Project site must be provided;
  - b. topography;
  - c. surrounding land-use;
  - d. receptors; and
  - e. ambient air quality.
- 4. Include a detailed description of the Project. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of <u>all emissions</u> must be provided. Include a detailed process diagram/flowchart of the Project specifying all air inputs, air outputs and air discharge points.
- 5. Identification and location of all fixed and mobile sources of dust/air emissions from the development, including rehabilitation, needs to be provided. The location of all emission sources should be clearly marked on a plan for key years of the mine development. The EIS needs to identify all pollutants of concern and estimate emissions by quantity (and size of particles), source(s) and discharge point(s).

Note: emissions can be classed as either:

- a. point (eg emissions from stack or vent), or
- b. fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, crushing/screening, conveyors, storage facilities, plant and yard operation, vehicle movements [dust from road, exhausts, loss from load], land clearing and construction works).
   Fugitive emissions include coal dust emissions and leaks and spills of coal during rail transport to port facilities (as influenced by management methods and procedures employed by the proposal).
- 6. Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2005). http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf.



This assessment should include the following parameters:

- a. dust deposition;
- b. total suspended particles;
- c. PM<sub>10</sub> and PM<sub>2.5</sub> particulate matter.
- 7. Demonstrate the Project's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Clean Air) Regulation 2002.*
- 8. Provide an assessment of the project in terms of the priorities and targets adopted under the NSW State Plan 2010 and its implementation plan Action for Air.
- 9. Detail air emission control techniques/practices that will be employed by the Project.
  - All emission control techniques/practices must be benchmarked against best practice process design and emission control. The Project must be assessed by applying the procedure outlined in in *Coal Mine Particulate Matter Control Best Practice - Site-specific determination guideline* (November 2011). http://www.environment.nsw.gov.au/resources/air/20110813coalmineparticulate.pdf
  - b. Nominated controls must be explicitly linked to calculated emission reductions adopted in the air quality impact assessment emissions inventory, with all assumptions documented and justified.
- 10. Detail emission control techniques/practices that will be employed by the proposal, including the development of real-time monitoring/management procedures, response (adverse weather) trigger levels and predictive meteorological monitoring/modelling for dust management.
- 11. Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.
- 12. Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.

#### Noise and Vibration

Potential impacts on the noise amenity of the surrounding area should be assessed in accordance with the NSW Industrial Noise Policy (INP) and other relevant guidelines mentioned below, accounting for all noise sources associated with the Project. In particular, seasonality assessments are to be undertaken to assess the impact of temperature inversions and wind conditions.

A noise and vibration impact assessment for both construction and operational scenarios should be undertaken as part of the EIS. The assessment should consider the issues outlined below, and identify noise mitigation measures to be implemented to meet project specific noise levels developed for the Project. The EIS will need to assess all feasible and reasonable mitigation measures including an assessment of any residual impacts in accordance with section 8.2.1 of the INP.

The noise assessment must include (but not be limited to) an assessment of the C-weighted noise (low frequency) as well as A-weighted noise.

In relation to noise, the following matters should be addressed (where relevant) as part of the Environmental Assessment.



#### General

- Construction noise associated with the proposed development should be assessed using the Interim Construction Noise Guideline (DECC, 2009). http://www.environment.nsw.gov.au/noise/constructnoise.htm
- Operational noise from all industrial activities (including private haul roads and private railway lines) to be undertaken on the premises must be assessed in accordance with the guidelines contained in the NSW Industrial Noise Policy (EPA, 2000) and Industrial Noise Policy Application Notes. http://www.environment.nsw.gov.au/noise/industrial.htm
- 3. Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the *Assessing Vibration: a technical guideline* (DEC, 2006). <u>http://www.environment.nsw.gov.au/noise/vibrationguide.htm</u>
- 4. If blasting is required for any reasons during the construction or operational stage of the proposed development, blast impacts should be demonstrated to be capable of complying with the guidelines contained in Australian and New Zealand Environment Council Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990). http://www.environment.nsw.gov.au/noise/blasting.htm

#### Road

- Noise on public roads from increased road traffic generated by land use developments should be assessed using the NSW Road Noise Policy (DECCW, 2011). http://www.environment.nsw.gov.au/noise/traffic.htm
- 6. Noise from new or upgraded public roads should be assessed using the *NSW Road Noise Policy* (DECCW, 2011). <u>http://www.environment.nsw.gov.au/noise/traffic.htm</u>

#### Noise Monitoring

Describe the noise monitoring system in detail, including the development and implementation of a monitoring program that:

- uses a combination of predictive meteorological forecasting and real-time noise monitoring, supplemented with attended monitoring measures to evaluate the performance of the mine complex;
- adequately supports the proactive and reactive noise management system on site;
- includes a protocol for determining exceedances of the conditions imposed on the project;
- evaluates and reports on the effectiveness of the noise management system on site;
- provides for the annual validation of the noise model for the mine complex.

The EIS must describe the system that will be implemented to enable the community to access up-to-date information regarding any proposed blasting schedule.



#### Waste

The EIS should identify all wastes to be generated by all aspects of the Project and identify procedures for the handling and management of all wastes produced. The handling of rejects, tailings and overburden material are important aspects which must be assessed in detail.

The EIS should:

- 1. Identify, characterise and classify all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste.
- Demonstrate how waste will be managed in accordance with the waste hierarchy, established under the <u>Waste Avoidance and Resource Recovery Act 2001</u>, which aims to that ensures that resource management options are considered against the following priorities:
  - Avoidance including action to reduce the amount of waste generated by households, industry and all levels of government
  - Resource recovery including reuse, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources
  - Disposal including management of all disposal options in the most environmentally responsible manner.
  - 3. Include a detailed plan for in-situ classification of waste material, including the sampling locations and sampling regime that will be employed to classify the waste, particularly with regards to the identification of contamination hotspots in accordance with the EPA's *Waste Classification Guidelines*.
  - Provide details of the quantity and type of both liquid and non-liquid waste generated, handled, processed or disposed of at the premises. Wastes must be classified according to the Waste Classification Guidelines (DECC 2008).
  - Details of procedures for the assessment, handling, storage, transport and disposal of all hazardous waste used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
  - Identify, characterise and classify all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling. All waste must be classified in accordance with EPA's Waste Classification Guidelines.
  - 7. Provide, where relevant, the methods which will be utilised to ensure compliance with any approved Resource Recovery General Exemption for the offsite disposal of waste either generated onsite and disposed of offsite, or received from offsite and disposed of onsite. Resource Recovery General Exemptions may only be utilised where the waste is land applied for use as fuel of a waste material is a genuine, fit for purpose, reuse of the waste rather than another path to waste disposal.
  - 8. Identify the management and disposal of tailings including actions to prevent potential impacts to groundwater, surface water or any other environmental aspect which may occur as a result of the management technique utilised. The EIS must assess and commit to the implementation of all



feasible and reasonable measures to minimise seeps, leaching, and/or leaks from the tailings storages facilities into the surrounding environment. The EIS must also include details of a monitoring program which will be established to assess leaks and/or seepages from any tailings storage facility, including a leak detection system.

- 9. Assess the potential for acid mine drainage from acid forming materials and identify the management /mitigation measures which will utilised for any PAF material identified.
- 10. Provide details of how waste will be handled and managed onsite to minimise pollution, including:
- a) Stockpile location and management
  - Labelling of stockpiles for identification, ensuring that all waste is clearly identified and stockpiled separately from other types of material (especially the separation of any contaminated and non-contaminated waste).
  - Proposed height limits for all waste to reduce the potential for dust and spontaneous combustion.
  - Procedures for minimising the movement of waste around the site and double handling.
- b) Provide details of waste rock emplacement areas with particular attention to:
  - The quantity of waste rock likely to be generated;
  - Proposed strategies for the handling, reuse/recycling and disposal of waste rock; and
    - Designation of transport routes for the transport of waste rock.

#### Chemicals and Hazardous Materials

The EIS should:

- 1. Provide details of the types and quantity of any chemical substances, including but not necessarily limited to, hydrocarbons (oils and fuels), hazardous or dangerous materials (eg explosives etc) to be used or stored onsite.
- 2. Provide details of procedures for the assessment, handling, storage, transport and disposal of all chemical substances, hazardous or dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
- Outline pollution control measures relating to storage of wastes, materials, possibility of accidental spills (eg. Preparation of contingency plans), appropriate disposal methods and management of contaminated stormwater.

#### <u>Soils</u>

The EIS should include:

1. An assessment of potential impacts on soil and land resources should be undertaken, being guided by *Soil and Landscape Issues in Environmental Impact Assessment* (DLWC 2000). The nature and extent of any significant impacts should be identified. Particular attention should be given to:



- Soil erosion and sediment transport in accordance with *Managing urban stormwater: soils* and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008).
- Urban and regional salinity guidance given in the Local Government Salinity Initiative booklets which includes Site Investigations for Urban Salinity (DLWC, 2002).
- A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- 3. Where required, add any specific assessment requirements relevant to the Project.

#### <u>Water</u>

The environmental outcomes of the Project in relation to water should be:

- There is no pollution of waters (including surface and groundwater); and
- Polluted water (including process/tailings waters, wash down waters, polluted stormwater or sewerage) is captured onsite and collected, treated and beneficially reused, where safe and practical to do so.

The EIS should document the measures that will achieve the above outcomes in the construction, operation and post operations phases of the project. Construction activities <u>will need to demonstrate best</u> practice sediment and erosion control and management in accordance with the reference document *Managing Urban Stormwater: Soils and Construction (NSW Landcom).* 

The EIS should:

- 1. Describe existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the Project.
- 2. Describe any drainage lines, creeks lines etc that will be impacted by the Project.
- 3. Provide a water balance for the including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.
- 4. Describe the Project including position of any intakes and discharges, volumes, water quality and frequency of all water discharges (e.g. surface water discharge to a river/creek, groundwater, irrigation of waste water etc).
- 5. Assess the nature and degree of impact that any proposed discharges may have on the receiving environment. Assessment for discharge to surface waters should be guided by *Using the ANZECC Guidelines and Water Quality Objectives in NSW* (DEC, 2006) using local Water Quality Objectives determined from the *NSW Water Quality and River Flow Objectives* (DEC, 2006). Demonstrate how the Project will be designed and operated to:
  - protect the Water Quality Objectives for receiving waters where they are currently being achieved; and
  - contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.



- 6. Where the proponent intends to undertake the assessment using site-specific water quality trigger values, detail the water quality of a reference site that has been selected based on the site-specific considerations outlined in ANZECC (2000).
- 7. Identify potential impacts on watercourses and the management/mitigation measures that will be implemented where mining activities occur in proximity to or within a watercourse.
- 8. Identify whether any discharge, or the location of the Project, will cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
- 9. If the discharge requires treatment prior to disposal, any treatment measures should be described and the predicted water quality outcomes documented. Include a detailed process diagram/flowchart of the proposal specifying all water inputs, outputs and discharge points
- 10. Demonstrate that all practical options to avoid discharge have been investigated and implemented and outline measures that have been taken to reduce the pollutant load of the discharge so that the environmental impact is minimised where a discharge is necessary.
- 11. Describe how stormwater will be managed both during and after construction including a layout of the proposed stormwater system in accordance with *Managing Urban Stormwater, Soils and Construction Volume 1* (Landcom, 2004) and *Volumes 2A to 2E* (DECC, 2008), The EIS should:
  - Provide the proposed general location of all water management structures. These should be clearly indicated on appropriately scaled maps.
  - Demonstrate how clean, dirty and contaminated water will be managed (separated) on site throughout the life of the Project.
  - Provide detailed water management strategies for all disturbance areas including the management of channel and overland flows into and within the disturbance area.
  - Provide the proposed sizing of all water storage dams, sediment dams and other dams as required and justification for the sizing utilised.
  - Identify contingency measure which may be implemented during extreme rainfall events.
- 12. Where the management of sediment basins requires the use of flocculants, the EIS should include information about the type, toxicity and management of flocculants proposed to treat captured water before discharge.
- 13. Provide detailed water management strategies for all disturbance areas, paying particular attention to the waste rock emplacement areas and potential impacts on groundwater and offsite surface water resources including particular reference to the management of channel and overland flows into and within the disturbance area.
- 14. Determine and detail the tailings management and monitoring strategy and dam design to be implemented, including an assessment of the potential impacts of tailings storage on surface and groundwater resources, contingency plans in the event of a leak or seep, rehabilitation and the long term management and feasibility.
- 15. Provide plans for the proposed relocation/realignment of all creeks and/or drainage lines including design, timelines and completion criteria and sufficient evidence to demonstrate that the proposed plans are achievable, reasonable and feasible in the short and the long term.

- 16. State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (<u>http://www.environment.nsw.gov.au/ieo/index.htm</u>). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values.
- 17. State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality (<u>http://www.mincos.gov.au/publications/australian and new zealand guidelines for fresh and marin e water quality</u>).
- 18. State any locally specific objectives, criteria or targets which have been endorsed by the NSW Government.
- 19. Assess impacts on groundwater and groundwater dependent ecosystems. The assessment should be guided by the principles in *The NSW State Groundwater Policy Framework Document* (DLWC,1997). Assessment and Management of Groundwater Contamination (DEC, 2007) provides guidance on assessing and managing groundwater contamination. Assess impacts against relevant water quality guidelines for:
  - potentially impacted environmental values and beneficial uses using local Water Quality Objectives;
  - contamination, such as investigation levels specified in National Environment Protection Measure Guideline on the Investigation Levels for Soil and Groundwater (EPHC, 1999).
- 20. Provide plans for any proposed relocation/realignment of all creeks and/or drainage lines including design, timelines and completion criteria and sufficient evidence to demonstrate that the proposed plans are achievable/sustainable, reasonable and feasible in the short and the long term.
- 21. Assess any irrigation areas proposed for wastewaters produced in accordance with the EPA Guideline "The Use of Effluent by Irrigation".
- 22. Describe how predicted impacts on surface water, groundwater and aquatic ecosystems will be monitored and assessed over time, including monitoring locations, relevant parameters, and sampling frequency. The EIS should:
  - Include a Trigger Action Response Plan, or similar response management plan, to identify
    appropriate trigger values and criteria and provide appropriate response actions if impacts
    are identified through the monitoring program.
  - Identify the process for identifying any trends in the monitoring data obtained.

Note: Water quality monitoring should be undertaken in accordance with the *Approved Methods* for the Sampling and Analysis of Water Pollutant in NSW (DEC, 2004). Groundwater Sampling and Analysis: Field Guide (Geosciences Australia, 2009) provides guidance on the design of a groundwater sampling program.

#### Monitoring, Assurance and Reporting Programs

- 1. The EIS should include a detailed assessment of any noise, air quality, water quality or waste monitoring required during the construction phase and on-going operation of the facility to prevent or minimise any adverse environmental impacts from the development.
- 2. Appropriate baseline data requirements are to be identified as part of the EIS, to form the basis for baseline and ongoing monitoring of environmental parameters.



- 3. It must be demonstrated that the proposed methods for baseline and subsequent monitoring are scientifically robust and statistically sound.
- 4. The EIS must also identify and describe monitoring programs, compliance assurance programs and reporting requirements and arrangements that will demonstrate the effectiveness of proposed management measures in meeting applicable requirements.
- 5. The EIS must, in addition to outlining proposed programs, clearly identify what is to be monitored and audited and why. This should include identification of monitoring locations, parameters to be monitored, sample analysis methods, the level of reporting proposed. The EIS should also include information on frequency and type of audits proposed to assure compliance with applicable requirements,
- 6. The EIS should demonstrate monitoring and audit programs must be designed appropriately, according to best practice, to provide objective evidence regarding activities associated with the development and have regard to whether these activities are adversely impacting on the environment in the short, medium and/or long term.

#### Cumulative impacts

The EIS should provide an assessment of the cumulative impacts of the project during construction and operation of the proposal with regard to noise, air quality, water quality or waste Assessment of cumulative impacts must consider past, current and future activities in the area surrounding the project, impacts associated with internal components of this project (where relevant – e.g. a project involving construction throughout a precinct or similar), as well as the construction impacts of any projects recently completed.



## Attachment B

#### **Guidance Material**

Title	Web address			
Relevant Legislation				
Contaminated Land Management Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+140+1 997+cd+0+N			
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N			
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1 997+cd+0+N			
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N			
	Licensing			
Guide to Licensing	http://www.epa.nsw.gov.au/licensing/licenceguide.htm			
	Air Issues			
Air Quality				
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf			
POEO (Clean Air) Regulation 2010 http://www.legislation.nsw.gov.au/#/view/regulation/2010/42				
Dust No EPA specific guidance material exists for the control from construction sites. Consideration should be given POEO Act and the Local Government Air Quality Toolkit 2007), accessed via: <u>http://www.epa.nsw.gov.au/air/lgaqt.ht</u>				
Odour - Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006	http://www.epa.nsw.gov.au/air/odour.htm			
	Noise and Vibration			
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/resources/noise/09265cng.pdf			
Industrial Noise Policy and Application Notes	http://www.epa.nsw.gov.au/noise/industrial.htm			
Assessing Vibration: A technical Guideline (DECC, 2006)	http://www.epa.nsw.gov.au/resources/noise/vibrationguide0643.pd f			
SA EPA Environmental Noise Guidelines (SA EPA, 2009)	http://www.epa.sa.gov.au/environmental_info/noise/wind_farms			
Technical Basis for Guidelines to Minimise Annoyance due to Blasting	http://www.epa.nsw.gov.au/resources/noise/ANZECBlasting.pdf			

Title	Web address
Overpressure and Ground Vibration	
NSW Road Noise Policy	http://www.epa.nsw.gov.au/noise/traffic.htm
Waste, Chemical	s and Hazardous Materials and Radiation
Chemical and Fuel Storage	
Bunding and Spill Management	http://www.epa.nsw.gov.au/mao/bundingspill.htm
Storage and Handling of Dangerous Goods – Code of Practice (WorkCover, 2005)	http://www.workcover.nsw.gov.au/formspublications/publications/ Documents/storage-handling-dangerous-goods-1354.pdf
Waste	
Environmental Guidelines: Solid Waste Landfills (EPA 2016)	http://www.epa.nsw.gov.au/resources/waste/solid-waste-landfill- guidelines-160259.pdf
Waste Classification Guidelines	http://www.epa.nsw.gov.au/wasteregulation/classify- guidelines.htm
Resource Recovery Orders and Exemptions	http://www.epa.nsw.gov.au/wasteregulation/orders- exemptions.htm
	Soils
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.legislation.nsw.gov.au/#/view/EPI/1998/520
Contaminated Sites Guidelines	http://www.epa.nsw.gov.au/clm/guidelines.htm
Soils – general	
Soil Publications	http://www.environment.nsw.gov.au/soils/publications.htm
Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008)	Vol 1 - <u>http://www.environment.nsw.gov.au/resources/water/BlueBookVol</u> <u>1.pdf</u> Vol 2 - <u>http://www.environment.nsw.gov.au/stormwater/publications.htm</u>
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
	http://www.environment.gov.au/water/publications/quality/pubs/nw qms-guidelines-4-vol1.pdf
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.mincos.gov.au/publications/australian_and_new_zeala_nd_guidelines_for_fresh_and_marine_water_guality
	http://www.environment.gov.au/water/publications/quality/nwqms- guidelines-4-vol1.html
	http://www.environment.gov.au/water/publications/quality/pubs/nw



Title	Web address
	gms-guidelines-4-vol1.pdf
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve dmethods-water.pdf

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BOWDENS SILVER PTY LIMITED

Bowdens Silver Project Report No. 429/24



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File No: SF16/54269 Ref No: DOC16/604167

Elle Donnelley Planner, Resource Assessments Planning Services GPO BOX 39 SYDNEY NSW 2001

Sent by e-mail to: elle.donnelley@planning.nsw.gov.au

Dear Ms Donnelley

# Request for input into revised Secretary's Environmental Assessment Requirements (SEARs) for Bowden's Silver Project, near Lue, Mid-Western Regional Council LGA (SSD 5765)

Reference is made to your correspondence received on 29 November 2016 seeking input into the revised Secretary's Environmental Assessment Requirements (SEARs) from the Heritage Council of NSW (the Heritage Council) for the above proposal.

A revision of the SEARs is required because the project will not be able to meet the required two year timeframe for submission of the Environmental Impact Assessment and the ownership and project scope has changed from the original application. A review of the documentation associated with the request has been undertaken, in particular the:

 'Preliminary Environmental Assessment for Bowdens Silver Project (State Significant Development No. 5765)' prepared by R.W. Cokery & Co. Pty. Limited dated November 2016 (the Assessment).

The original SEARs issued in February 2015 indicate that a heritage assessment would be required. The Assessment has noted that within the indicative Mine Site, three European heritage features, comprising of two historic mine shafts and hut ruins are extant. However, no further assessment of these heritage items has been provided.

It is further noted that the Assessment has identified sites of Aboriginal archaeological significance based on previous cultural heritage surveys undertaken in 2003 and 2011. The surveys indicated that twenty five Aboriginal heritage sites were identified comprising of seventeen stone artefact scatters and eight isolated finds of stone artefacts. The assessment has indicated that additional investigation will be undertaken with a cultural heritage survey proposed within the area of the proposed access road and project related infrastructure that may be located to the northwest of the proposed open cut pit. The Assessment indicates that a detailed Cultural Heritage assessment of the entire proposed disturbance footprint will be undertaken and an assessment of significance of any identified objects assessed in accordance with the relevant guidelines.

The Heritage Division advises the Department of Planning and Environment that historic and archaeological heritage issues have not been adequately considered in the preparation of the Assessment for this project. Whilst the Assessment has identified the existence of the

Page 1 of 2



abovementioned historic heritage items within the project area, an updated EIS should identify if these potential heritage items are likely to be affected. The following SEARs are recommended to ensure that heritage concerns are adequately addressed prior to project approval:

- The EIS shall include a Heritage Impact Assessment (HIS) prepared in accordance with the guidelines in the NSW Heritage Manual that addresses the significance of, and provides an assessment of the impact on the heritage significance of heritage items on the development site and in the vicinity.
- 2. The EIS shall also a historical archaeological assessment prepared by a suitably qualified historical archaeologist in accordance with the Heritage Division, Office of Environment and Heritage Guidelines 'Assessing Significance for Historical Archaeological Sites and 'Relics' 2009. This assessment should identify what relics, if any, are likely to be present, assess their significance and consider the impacts from the proposal on this potential resource. Where harm is likely to occur, it is recommended that the significance of the relics be considered in determining an appropriate mitigation strategy. In the event that harm cannot be avoided in whole or part, an appropriate Research Design and Excavation Methodology should also be prepared to guide any proposed excavations.

If you have any questions regarding the above matter, please contact Anna Foroozani, Heritage Assessment Officer at the Heritage Division, Office of Environment and Heritage on telephone (02) 9985 6479 or at anna.foroozani@environment.nsw.gov.au.

Yours sincerely

k/MM

Katrina Stankowski Acting Manager, Conservation Heritage Division Office of Environment & Heritage As Delegate of the Heritage Council of NSW 08/12/2016

Helping the community conserve our heritage





Our Ref: DOC16/624453 Your Ref: SSD 5765

> Ms Elle Donnelley Planner Resource Assessments Department of Planning and Environment elle.donelley@planning.nsw.gov.au

Dear Ms Donnelley,

#### Bowdens Silver Project SEARs - SSD 5765

I refer to your e-mail dated 29 November 2016 seeking input into the Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Assessment (EIS) for the Bowdens Silver Project (SSD 5765).

OEH has considered your request and provides SEARs for the proposed development in **Attachments A**, **B** and **C** and guidance material in **Attachment D**.

OEH recommends the EIS needs to appropriately address the following:

- 1. Biodiversity and offsetting
- 2. Aboriginal cultural heritage
- 3. Historic heritage
- 4. Water and soils
- 5. Flooding

OEH notes that there are a number of Endangered Ecological Communities and threatened species potentially affected by the development, and that Aboriginal cultural heritage items may also be present. OEH recommends that the design of the mine avoids areas of native vegetation as much as possible.

Please note that the NSW Biodiversity Offsets Policy for Major Projects www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf is now being implemented. The policy provides a standard method for assessing impacts of major projects on biodiversity and determining offsetting arrangements.

The policy is underpinned by the Framework for Biodiversity Assessment (FBA) http://www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf which contains the assessment methodology that is adopted by the policy to quantify and describe the impact assessment requirements and offset guidance that applies to Major Projects. The FBA must be used by a proponent to assess all biodiversity values on the development site.

> PO Box 2111 Dubbo NSW 2830 Level 1, 48-52 Wingewarra Street Dubbo NSW 2830 Tel: (02) 6883 5330 Fax: (02) 6884 8675 ABN 30 841 387 271 www.environment.nsw.gov.au



If you have any questions regarding this matter further please contact David Geering on 02 6883 5335 or email david.geering@environment.nsw.gov.au.

Yours sincerely,

Itt

STEVEN COX Senior Team Leader Planning North West Region

Date: 13 December 2016

Contact officer: DAVID GEERING 6883 5335

Attachment A - Environmental Assessment Requirements

Attachment B - Species/Populations/Ecological Communities which Require Further Consideration

Attachment C - Critically Endangered Entities Specifically Excluded From Requiring Further Consideration

Attachment D - Guidance Material



## Attachment A – Standard Environmental Assessment Requirements

Bic	odiv	ersitv	
1.	Bi	odiversity impacts related to the proposed Bowdens Silver Project are to be assessed and	
	do	cumented in accordance with the Framework for Biodiversity Assessment, unless otherwise	
	ag	reed by OEH, by a person accredited in accordance with s142B(1)(c) of the Threatened	
	Sp	pecies Conservation Act 1995.	
2.	Im	pacts on the species and ecological communities listed in Attachment B will require further	
	co	nsideration and provision of the information specified in s9.2 of the Framework for Biodiversity	
	As	ssessment.	
Ab 3	orig	inal Cultural Heritage The EIS must identify and describe the Aboriginal cultural beritage values that exist across the	
0.	11	The Ero must rechtly and describe the Abonginal outdata mentage values that exist across the	
	in	ble area that will be areaded by the development and document these in the Elo. This may	
	110	lues should be guided by the Guide to investigating, assessing and reporting on Aboriginal	
		It use should be guided by the Oulde to investigating, assessing and reporting on Aborginal $i$	
4.	vv bo	here Abonginal cultural heritage values are identified, consultation with Abonginal people must	
	DE		
	re	quirements for proponents 2010 (DECCW). The significance of cultural heritage values for	
L	A	poriginal people who have a cultural association with the land must be documented in the EIS.	
5.	Im	pacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS.	
	١r	he EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify	
	ar	y conservation outcomes. Where impacts are unavoidable, the EIS must outline measures	
	proposed to mitigate impacts. Any objects recorded as part of the assessment must be		
	do	ocumented and notified to OEH.	
His	tori	<b>c Heritage</b> The FIS must provide a beritage assessment including but not limited to an assessment of	
0.	im	ine Lis must provide a heritage assessment including but not inmited to an assessment of	
	of	Abariginal baritago valuo, buildings, works, rolios, gardons, landscanos, viows, troos should be	
	0	Aborginal heritage value, buildings, works, relics, gardens, randscapes, views, trees should be	
	as	sessed. Where impacts to State or locally significant heritage items are identified, the	
	as	sessment shall.	
	a.	outline the proposed mitigation and management measures (including measures)	
		significant impacts and an evaluation of the enectiveness of the mitigation measures)	
		generally consistent with the NSVV Heritage Manual (1996),	
	D.	be undertaken by a suitably qualified heritage consultant(s) (hote: where archaeological	
		excavations are proposed the relevant consultant must meet the NSW Heritage Council's	
		Excavation Director criteria),	
	C.	include a statement of heritage impact for all heritage items (including significance	
		assessment),	
	d.	consider impacts including, but not limited to, vibration, demolition, archaeological	
		disturbance, altered historical arrangements and access, landscape and vistas, and	
		architectural noise treatment (as relevant), and	



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	e.	where potential archaeological impacts have been identified develop an appropriate
		archaeological assessment methodology, including research design, to guide physical
		archaeological test excavations (terrestrial and maritime as relevant) and include the results
		of these test excavations.
Wa	iter a	nd Soils
7.	Th	e EIS must map the following features relevant to water and soils including:
	а.	Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).
	b.	Rivers, streams, wetlands, estuaries (as described in Appendix 2 of the Framework for
		Biodiversity Assessment).
	c.	Groundwater.
	d.	Groundwater dependent ecosystems.
	e.	Proposed intake and discharge locations.
8.	Th	e EIS must describe background conditions for any water resource likely to be affected by the
	dev	/elopment, including:
	a.	Existing surface and groundwater.
	b.	Hydrology, including volume, frequency and quality of discharges at proposed intake and
		discharge locations.
	c.	Water Quality Objectives (as endorsed by the NSW Government
		http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that
		represent the community's uses and values for the receiving waters.
	d.	Indicators and trigger values/criteria for the environmental values identified at (c) in
		accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or
		local objectives, criteria or targets endorsed by the NSW Government.
9.	Th	e EIS must assess the impacts of the development on water quality, including:
	a.	The nature and degree of impact on receiving waters for both surface and groundwater,
		demonstrating how the development protects the Water Quality Objectives where they are
		currently being achieved, and contributes towards achievement of the Water Quality
		Objectives over time where they are currently not being achieved. This should include an
		assessment of the mitigating effects of proposed stormwater and wastewater management
		during and after construction.
	b.	Identification of proposed monitoring of water quality.
10.	Th	e EIS must assess the impact of the development on hydrology, including:
	a.	Water balance including quantity, quality and source.
	b.	Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
	c.	Effects to downstream water-dependent fauna and flora including groundwater dependent
		ecosystems.
	d.	Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains
		that affect river system and landscape health such as nutrient flow, aquatic connectivity and
		access to habitat for spawning and refuge (e.g. river benches).
	e.	Changes to environmental water availability, both regulated/licensed and unregulated/rules-
		based sources of such water.



	f.	Mitigating effects of proposed stormwater and wastewater management during and after
		construction on hydrological attributes such as volumes, flow rates, management methods
		and re-use options.
	g.	Identification of proposed monitoring of hydrological attributes.
Flo	odir	ng
11.	Th	e EIS must map the following features relevant to flooding as described in the Floodplain
	De	velopment Manual 2005 (NSW Government 2005) including:
	a.	Flood prone land.
	b.	Flood planning area, the area below the flood planning level.
	C.	Hydraulic categorisation (floodways and flood storage areas).
12.	Th	e EIS must describe flood assessment and modelling undertaken in determining the design
	flo	od levels for events, including a minimum of the 1 in 10 year, 1 in 100 year flood levels and the
	pro	bable maximum flood, or an equivalent extreme event.
13.	Th	e EIS must model the effect of the proposed development (including fill) on the flood behaviour
	un	der the following scenarios:
	a.	Current flood behaviour for a range of design events as identified in 11 above. This includes
		the 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase
		in rainfall intensity of flood producing rainfall events due to climate change.
14.	Мс	odelling in the EIS must consider and document:
	a.	The impact on existing flood behaviour for a full range of flood events including up to the
		probable maximum flood.
	b.	Impacts of the development on flood behaviour resulting in detrimental changes in potential
		flood affection of other developments or land. This may include redirection of flow, flow
		velocities, flood levels, hazards and hydraulic categories.
	C.	Relevant provisions of the NSW Floodplain Development Manual 2005.
15.	Th	e EIS must assess the impacts on the proposed development on flood behaviour, including:
	a.	Whether there will be detrimental increases in the potential flood affectation of other
		properties, assets and infrastructure.
	b.	Consistency with Council floodplain risk management plans.
	C.	Compatibility with the flood hazard of the land.
	d.	Compatibility with the hydraulic functions of flow conveyance in floodways and storage in
		flood storage areas of the land.
	e.	Whether there will be adverse effect to beneficial inundation of the floodplain environment.
	•	on adjacent to or downstream of the site
	f	Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian
		vegetation or a reduction in the stability of river banks or watercourses
	a	Any impacts the development may have upon existing community emergency management
	g.	arrangements for flooding. These matters are to be discussed with the SES and Coupeil
	Ь	Analyzements for hooding. These matters are to be discussed with the SES and Council.
	11.	These metters are to be discussed with the SEC and Course!
1		
	I.	Emergency management, evacuation and access, and contingency measures for the
1		development considering the full range or flood risk (based upon the probable maximum

- flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the SES.
- j. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.



## Attachment B – Species/Populations/Ecological Communities which Require Further Consideration

Table 1

Class	Scientific Name	Common Name	NSW status	Comm. status
Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered



## Attachment C – Critically Endangered Entities Specifically Excluded From Requiring Further Consideration\*

Table 2				
Class	Scientific Name	Common Name	NSW status	Comm. status
Aves	Lathamus discolor	Swift Parrot	Endangered	Critically Endangered
Community	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland	Endangered	Critically Endangered
Flora	Prasophyllum sp. Wybong		Protected	Critically Endangered
Flora	Euphrasia arguta		Critically Endangered	Critically Endangered

\* Further information, as detailed in section 9.2.5.2 of the FBA, is not required for the excluded entities in Table 2. However, assessment of impacts and offset requirements must still be included in the biodiversity assessment report for these entities in accordance with the FBA.



## Attachment D – Guidance Material

Title	Web address			
Relevant Legislation				
Coastal Protection Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+13+19 79+cd+0+N			
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/			
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N			
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+19 94+cd+0+N			
Marine Parks Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+64+19 97+cd+0+N			
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+19 74+cd+0+N			
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1 997+cd+0+N			
Threatened Species Conservation Act 1995	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+101+1 995+cd+0+N			
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N			
Wilderness Act 1987	http://www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+ FIRST+0+N			
	Biodiversity			
NSW Biodiversity Offsets Policy for Major Projects (OEH, 2013)	http://www.environment.nsw.gov.au/resources/biodiversity/14067 2biopolicy.pdf			
Framework for Biodiversity Assessment (OEH, 2013)	http://www.environment.nsw.gov.au/resources/biodiversity/14067 5fba.pdf			
Fisheries NSW policies and guidelines	http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,- guidelines-and-manuals/fish-habitat-conservation			
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchato z.aspx			
Revocation, recategorisation and road adjustment policy (OEH, 2012)	http://www.environment.nsw.gov.au/policies/RevocationOfLandPolicy.htm			
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/parks/policyRevoc ations.pdf			
	<u>Heritage</u>			
The Burra Charter (The Australia ICOMOS charter for places of cultural significance)	http://australia.icomos.org/wp-content/uploads/The-Burra-Charter- 2013-Adopted-31.10.2013.pdf			
Statements of Heritage Impact 2002 (HO & DUAP)	http://www.environment.nsw.gov.au/resources/heritagebranch/heri tage/hmstatementsofhi.pdf			
NSW Heritage Manual (DUAP) (scroll through alphabetical list to 'N')	http://www.environment.nsw.gov.au/Heritage/publications/index.ht m#M-O			



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Title	Web address
Abo	original Cultural Heritage
Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/com mconsultation/09781ACHconsultreq.pdf
Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/107 83FinalArchCoP.pdf
Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)	http://www.environment.nsw.gov.au/resources/cultureheritage/201 10263ACHguide.pdf
Aboriginal Site Recording Form	http://www.environment.nsw.gov.au/resources/parks/SiteCardMain V1_1.pdf
Aboriginal Site Impact Recording Form	http://www.environment.nsw.gov.au/resources/cultureheritage/120 558asirf.pdf
Aboriginal Heritage Information Management System (AHIMS) Registrar	http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm
Care Agreement Application form	http://www.environment.nsw.gov.au/resources/cultureheritage/201 10914TransferObject.pdf
	Water and Soils
Acid Sulphate Soils	
Acid Sulfate Soils Planning Maps via 'The NSW Natural Resource Atlas'	www.nratlas.nsw.gov.au/
Acid Sulfate Soils Manual (Stone et al. 1998)	Manual available for purchase from: http://www.landcom.com.au/whats-new/the-blue-book.aspx Chapters 1 and 2 are on DPI's Guidelines Register at: Chapter 1 Acid Sulfate Soils Planning Guidelines: http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%2 OAcid%20Sulfate%20Soils%20Planning%20Guidelines.pdf Chapter 2 Acid Sulfate Soils Assessment Guidelines: http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%2 OAcid%20Sulfate%20Soils%20Assessment%20Guidelines.pdf
Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004)	http://www.advancedenvironmentalmanagement.com/Reports/Sav annah/Appendix%2015.pdf This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Flooding and Coastal Erosion	
Reforms to coastal erosion management	http://www.environment.nsw.gov.au/coasts/coastalerosionmgmt.ht m
Floodplain development manual	http://www.environment.nsw.gov.au/floodplains/manual.htm
Guidelines for Preparing Coastal Zone Management Plans	Guidelines for Preparing Coastal Zone Management Plans http://www.environment.nsw.gov.au/resources/coasts/130224CZM PGuide.pdf
NSW Climate Impact Profile	NSW Climate Impact Profile
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm



#### BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

Title	Web address
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	www.environment.gov.au/water/publications/quality/australian- and-new-zealand-guidelines-fresh-marine-water-quality-volume-1
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	http://deccnet/water/resources/AWQGuidance7.pdf
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve dmethods-water.pdf





8 December 2016

SF2013/003834; WST13/00010/02

The Manager Resource Assessment Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

#### Attention: Ms Elle Donnelly

Dear Ms Donnelly

#### SSD5765: Bowdens Silver Project Request for updated Secretary's Environmental Assessment Requirements (SEARs)

Thank you for your email on 29 November 2016 seeking revised SEARs from Roads and Maritime Services for the Bowdens Silver Project. Reference is made to Roads and Maritime's previous submission dated 29 January 2013 providing Director General Requirements (now SEARs) for this proposal.

I note the applicant has modified the proposal by reducing the annual ore production rate from 4 million tonnes to 2 million tonnes per annum and increasing the life of the mine from 12 years to 17 years. The proposal will also now include a direct access from Lue Road.

Roads and Maritime's requirements provided in its submission dated 29 January 2013 stand and do not require any changes or amendments.

Please forward a copy of the updated SEARs to Roads and Maritime at the same time they are sent to the applicant. Should you require further information, please contact the undersigned on 02 6861 1681.

Yours faithfully

Andrew McIntyre Manager Land Use Assessment Western

Roads and Maritime Services

51-55 Currajong Street Parkes NSW 2870 | PO Box 334 Parkes NSW 2870 DX 20256 |

www.rms.nsw.gov.au | 13 22 13



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### ATTACHMENT 2B

AGENCIES' SUPPLEMENTARY OR UPDATED CORRESPONDENCE (2019)

## CONTENTS

Department of Industry Lands and Water Division 12 December 2016
Division of Resources and Geoscience 14 May 2019A2-65
nvironment Protection Authority 14 May 2019
Office of Environment and Heritage 14 May 2019A2-84
Road and Maritime Services 7 May 2019A2-92
/lid-Western Regional Council 23 May 2019A2-93
Regional Heritage Operations 10 May 2019A2-95
leritage Division – Office of Environment and Heritage 29 May 2019
leritage Council of New South Wales 8 December 2016A2-98

Attachment 2B is only available on the digital version of this document



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#### ENVIRONMENTAL IMPACT STATEMENT Appendix 2



OUT19/5737

Philip Nevill Environmental Assessment Officer Resource Assessments NSW Department of Planning and Environment

Philip.Nevill@planning.nsw.gov.au

Dear Mr Nevill

# Bowden's Silver Project (SSD 5765) Comment on the Secretary's Environmental Assessment Requirements (SEARs)

I refer to your email of 30 April 2019 to the Department of Industry (DoI) about the above matter.

The following advice for you to consider for inclusion into the SEARs is from relevant branches of Dol Lands & Water and the Department of Primary Industries.

#### Dol -- Water and Natural Resources Access Regulator

- The identification of an adequate and secure water supply for the life of the project. This
  includes confirmation that water can be sourced from an appropriately authorised and reliable
  supply. This is also to include an assessment of the current market depth where water
  entitlement is required to be purchased.
- A detailed and consolidated site water balance.
- Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.
- Proposed surface and groundwater monitoring activities and methodologies.
- Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans (available at https://www.industry.nsw.gov.au/water).

# DPI Agriculture

- We request you include the following in the "Policies Plans and Guidelines" Land Resources section:
  - The NSW Government Guideline for Agricultural Impact Statements (2012) and
  - The Agricultural Impact Statement technical notes (DPI) 2013.

These will assist in the assessment of agriculture in the required agricultural impact statement.

- NSW DPI Agriculture notes the inclusion of the proposed water pipeline from Ulan to the project. We suggest the following requirements:
  - The pipeline route planning and construction should consider the construction impacts on areas of erosion and salinity, including steep lands.

NSW Department of Industry Lands and Water Division Level 49 | 19 Martin Place | Sydney NSW 2000 landuse.enquiries@dpi.nsw.gov.au ABN: 72 189 919 072



- An assessment of agricultural land uses and production values along the pipeline route, along with estimates of loss of land. Agricultural production information can be used to provide relevant agricultural baseline data for rehabilitated land outcomes. This can include information gained as part of the agricultural landholder consultation process to deal with the pipeline construction and its decommissioning if required.
- Any land identified as cropping or special use land (such as viticulture) should have the pipeline depths adjusted to deal with these land uses in consultation with stakeholders so as not to impact on agricultural operations. This may have to consider depths to 1.2 metres.
- A landholder consultation process should be outlined in relation to pipeline access, construction and ongoing maintenance.

# DPI Fisheries

- Waterway Crossings: The design and construction of pipeline crossings across all waterways should be undertaken in accordance with the Department's Policy and *Guidelines for Fish Friendly Waterway Crossings (2004) and Why Do Fish Need to Cross the Road?* The waterway crossings need to ensure that the works are undertaken with minimal impact on the aquatic environment within the immediate vicinity of the proposed works. DPI Fisheries need to be consulted with regards to any temporary measures that will result in blocking fish passage.
- **Riparian Buffer Zones:** DPI Fisheries policy advocates the use of terrestrial buffer zones as per the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)* available on the Department's website at <a href="https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish-habitat-conservation">https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish-habitat-conservation</a> which states that "*NSW DPI will generally require riparian buffer zones to be established and maintained for developments or activities in or adjacent to TYPE 1 or 2 habitats or CLASS 1-3 waterways."*
- Threatened Species, Populations and Ecological Communities Fisheries
   Management Act 1994: The proposal should include a threatened aquatic species
   assessment (as per part 7A Fisheries Management Act 1994) to address whether there are
   likely to be any significant impacts on listed threatened species, populations or ecological
   communities listed under the Fisheries Management Act 1994. Threatened fish species
   mapping distributions are available at <a href="https://www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw">https://www.dpi.nsw.gov.au/fishing/species protection/threatened-species-distributions-in-nsw</a>

Any further referrals to Department of Industry can be sent by email to landuse.enquiries@dpi.nsw.gov.au.

Yours sincerely

E Roges

Liz Rogers Manager, Assessments Lands and Water – Strategic Relations 16 May 2019





DOC19/398099

# DIVISION OF RESOURCES & GEOSCIENCE ADVICE RESPONSE

Philip Nevill Resource Assessments - Planning Services Division Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

philip.nevill@planning.nsw.gov.au

Dear Philip

#### Project: Bowden's Silver Project Stage: Request for Modification of Secretary's Environmental Assessment Requirements Development Application: SSD 5765

I refer to your email dated 30 April 2019 inviting the Division of Resources & Geoscience (the Division) to provide input into the modified Secretary's Environmental Assessment Requirements (SEARs) on the *Bowden's Silver Project* (the project or proposal).

The relevant units internal to the Division have been consulted in generating this advice. The Department of Planning and Environment - Planning Services Division and the Proponent should be aware that matters pertaining to rehabilitation, final landform, environmental impacts of subsidence, subsidence management, mine operator and safety are assessed by the Resources Regulator.

The Division recommends that the Environmental Impact Statement (EIS) for the Project includes all the requirements set out in both the '*Mine Application Guideline (2015)*', where it relates to the EIS, and the '*Indicative Secretary's Environmental Assessment Requirements (SEARs) for state significant mining developments (October 2015)*'. These inclusions will ensure the resource has been adequately assessed to facilitate appropriate and efficient recovery and utilisation of the State's resources.

The Division acknowledges that the Project Scoping Report contains some of the general requirements outlined in the above documents. The EIS must also include the following specific requirements:

#### 1. <u>Project Description</u>

• A comprehensive description of all aspects of the Project (including mineral extraction and mining purposes).

## 2. <u>Geology</u>

- Provide a summary of the regional and local geology, including information of the stratigraphic unit or units within which the resource is located.
- Document the physical dimensions of the resource. Plans and cross-sections showing the location of drill holes and the area proposed for extraction, the extent of the mineralised zones to be mined and those located adjacent to or beneath planned mining voids which may be sterilised by planned activities. Relevant supporting documentation such as drill logs should be included or appended.
- Whole rock, minor and trace element geochemistry of the ore, tailings and waste rock.

NSW Department of Planning and Environment
Division of Resources & Geoscience – Resource Operations – Assessment Coordination Unit
516 High St Maitland NSW 2320 PO | Box 344 Hunter Region Mail Centre NSW 2310
Tel: (02) 4063 6500 Fax: (02) 4063 6974 Email: assessment.coordination@planning.nsw.gov.au
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ABN 38 755 709 681



Bowdens Silver Project Report No. 429/24

• A description of the mineralogy of the ore for all minerals present, including silver sulphosalts and mineralised sulfides. Appropriate figures and sections showing the distribution of the various styles of mineralisation, such as the upper silver-rich and deeper sulfide-lead-zinc zones must also be included.

# 3. Resource and Reserve Statement

• Include an updated resource/reserve statement outlining the resource in the subject area, that has been prepared in accordance with the current version of the Joint Ore Reserve Committee Code (JORC code) to a minimum of Indicated Resource level of confidence. It is preferred that at least some of the resource estimate is to a higher confidence level (measured/proved/probable).

The Division understands that it may not be feasible to convert the majority of an Inferred Resource to Indicated (or higher) level of confidence. The Proponent needs to demonstrate that there are sufficient resources to support the majority of the initial life of mine production schedule. Any contribution from Inferred Resource(s) to the schedule needs to be justified.

# 4. <u>Resource Recovery</u>

The Proponent is to supply a full assessment of resource recovery including:

- Explain how the proposed mine plan and extraction method maximise resource recovery.
- What resources will be sterilised or excluded and with what justification.
- Detail of the proposed recovery processes and expected recoveries for silver, lead and zinc.
- List all economic, environmental, other constraints to the resource/reserve impacting the Project.

# 5. <u>Life of Mine Schedule</u>

The Proponent must supply a life of mine production schedule for each year of operation of the mine and for the life of the Project. The production schedule is to include:

- Details of run-of-mine ore, low-grade ore-mineralised waste and waste rock tonnage planned to be extracted for each year and for the life of the Project, and an estimate of the saleable product produced for each year and the life of the Project.
- In terms of text, plans or charts, the EIS must clearly show the proposed extent and sequence of the development.
- An estimate of which market segment that products would be sold into.

# 6. <u>Project Economics</u>

The Proponent is to supply an assessment of project economics including:

- Price forecasts by product type used by the Proponent. The Division requires these forecasts to analyse the Proponent's calculations of royalty value and export value.
- Product tonnages split into market segment. These estimates are necessary to arrive at total revenue value and royalty calculations. Include justification for market segment based on quality parameters.
- CAPEX & OPEX necessary for the Project broken down into the various sub-categories and equipment type.
- Estimates of employment generation broken down into direct, indirect, ongoing, construction and contract workers.
- Total royalty generated to the state over the life of the Project.
- Relationship and interaction with other mines. How the Project impacts on the surrounding mines.
- Details on derivation/analysis of Run-of-Mine (ROM) production rate; to answer why this is the optimum rate.



The Division understands that an estimate of product split into individual market segments is difficult to estimate at a point in time and is dependent on market conditions as the life of the Project progresses. The Division requires the Proponent to provide its best estimate of their market mix at the initial stages of the Project.

The above information should be summarised in the EIS, with full documentation appended. If deemed commercial-in-confidence, the resource assessment summary included in the EIS must commit to providing the Division with full resource assessment documentation separately via the Division's Assessment Coordination Unit.

# Additional Matters for Attention

#### **Biodiversity Offsets**

The Division requests that the Proponent consider potential resource sterilisation in relation to any proposed biodiversity offsets areas. Biodiversity offsets have the potential to preclude access for future resource discovery and extraction and could also potentially permanently sterilise access to mineral resources.

The EIS must therefore clearly illustrate the location (including offsite locations) of any biodiversity offsets being considered for the project and their spatial relationship to known and potential mineral and construction material resources and existing mining & exploration titles.

The Division requests consultation with both the Geological Survey of NSW and holders of existing mining and exploration authorities affected by planned biodiversity offsets. Evidence of consultation should be included in the EIS.

## Water Supply Pipeline

The Division has identified that the proposed pipeline route intersects the northern portion of Exploration Licence 7391 (Act 1992) (EL 7391) held by Thompson Resources Ltd. Contact with the title holder is required to determine the level of interaction and impact with evidence of authentic consultation to be provided to the Division. This should include a letter of notification of the proposal to the title holder including a map indicating the pipeline route in relation to the exploration title boundaries, and a letter of response from the title holder to the proponent. If responses are not received from the title holder, the proponent is to contact the Division.

The contact details the Department has on record for EL 7391 are:

Thomson Resources Ltd PO Box 956 CROWS NEST NSW 2065

The proponent must check for new mineral and energy titles that may be granted in the vicinity of the proposed pipeline during all decision-making stages of the project. This is to ensure that all other stakeholders with interests in the subject area are made aware of the project.

For future titles searches the proponent should refer to:

https://minview.geoscience.nsw.gov.au

#### **Mining Titles**

The Division notes that this Project is located within the existing Exploration Licence 5920 (Act 1992) (EL 5920) and Exploration Licence 6354 (Act 1992) (EL 6354).

The Proponent must obtain the appropriate mining title(s), such as a mining lease, from the Division allowing for mineral extraction (coal) under the *Mining Act* (1992).

A development application under the *Environmental Planning and Assessment Act 1979* must be approved before a mining lease can be granted. A mining lease will only be granted for activities specified in the development consent.



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For further enquiries regarding this matter, please contact the Assessment Coordination Unit on 02 4063 6534 or <u>assessment.coordination@planning.nsw.gov.au</u>.

Yours sincerely

Scott Anson Manager Assessment Coordination Resource Operations Division of Resources & Geoscience 14 May 2019

for Dr David Blackmore A/Executive Director Resource Operations Division of Resources & Geoscience

# ENVIRONMENTAL IMPACT STATEMENT

Appendix 2

BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



Your reference Our reference Contact

: EF13/4940 & DOC16/604301-02 : M Darryl Clift (02) 6333 3800

Mr Philip Nevill Resource Assessments Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

14 May 2019

Dear Mrs Donnelley

#### REQUEST FOR REVISED SEARS – ENVIRONMENT PROTECTION AUTHORITY BOWDENS SILVER PROJECT (SSD 5765)

I refer to your email of 1 May 2019 requesting the Environment Protection Authority (EPA) provide revised Secretary's Environmental Assessment Requirements (SEARs) for the proposed "Bowden's Silver Project" (SSD 5765) ("the Project").

The EPA understands that the application will be assessed by the Department of Planning and Environment (DPE) under Part 4 of the *Environmental Planning and Assessment Act 1979* as State Significant Development.

The EPA has considered the details provided regarding the Proposal, including the Preliminary Environmental Assessment (PEA) prepared by RW Corkery & Co, dated November 2016. The EPA considers the Project, if approved, would require licensing by the EPA.

The applicant should address the issues in **Attachments A** to this letter during the preparation of the Environmental Impact Statement (EIS) to adequately assess the environmental impacts of the proposal. In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in **Attachment B** and any relevant industry codes of practice and best practice management guidelines. The EPA requests that the applicant is provided with the EPA's assessment requirements and guidelines as set out in **Attachments A and B**.

Should you have any enquiries regarding this matter, please don't hesitate to contact me at the Bathurst Office of the EPA on (02) 6333 3802.

Yours sincerely

DARRYL CLIFT Head Regional Operations Central Environment Protection Authority

> PO Box 1388 Bathurst NSW 2795 Level 2, 203 – 209 Russell Street Bathurst NSW 2795 Tel: (02) 6332 7600 Fax: (02) 6332 7630 ABN 43 692 285 758 www.epa.nsw.gov.au



R. W. CORKERY & CO. PTY. LIMITED

# <u>Attachment A</u>

# Bowden's Silver Project EPA Secretary's Environmental Assessment Requirements

#### Licensing requirements

On the basis of the information submitted, the proposal is a scheduled activity, being "Mining for Minerals" under the *Protection of the Environment Operations Act 1997* (POEO Act) and if approval is granted, proponent will be required to submit a licence application to obtain an environment protection licence (EPL) from the EPA.

As such, the EIS should also address the requirements of Section 45 of the POEO Act determining the extent of each impact and providing sufficient information to enable the EPA to determine appropriate conditions for the licence.

#### Environmental impacts of the project

The EIS must include a comprehensive description of the proposed development including project water supply, production processes, all discharges and emissions to the environment, an assessment of likely environmental impacts, particularly in relation to waste storages and include a detailed description of any proposed control measures.

The environmental sensitivity of the site and surrounds should be discussed. Details are required on the location of the proposed development, including the affected environment, to place the Project in its local and regional environmental context including surrounding land uses, land use zonings and most importantly potential sensitive receptors.

The EIS should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

The following environmental impacts of the project need to be assessed, quantified and reported on:

- Water
- Air
- Noise
- Waste, including waste storages
- Construction
- Soils
- Contaminated Land

The EIS should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of these guidelines is at **Attachment B**.

#### **Description of proposal and premises**

#### The Proposal

The objectives of the Project should be clearly stated and refer to:



- the size and type of the operation;
- the nature of the processes and the products, by-products and wastes produced;
- the use or disposal of products;
- the anticipated level of performance in meeting required environmental standards and cleaner production principles;
- the staging and timing of the proposal; and
- the Project's relationship to any other industry or facility.

#### <u>The Premises</u>

The EIS will need to fully identify all of the processes and activities intended for the Project over the life of the development. This will include details of:

- the location of all the proposed facilities associated with the development and details of the surrounding environment including the affected environment to place the Project in its local and regional environmental context. This should include surrounding land uses, planning zonings, potential sensitive receptors, catchments and adjoining sensitive areas, surface and sub-surface areas, features of conservation significance and environmental sensitivity (associated maps to be included);
- the proposed layout of the site (associated maps to be included);
- ownership details of any residence and/or land likely to be affected by the Project;
- maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc in the locality that may be affected by the Project;
- all equipment proposed for use at the site;
- chemicals, including fuel, used on the site and proposed methods for their transportation, storage, use and emergency management;
- waste generation and disposal;
- methods to mitigate any expected environmental impacts of the development; and
- site rehabilitation following completion of the Project.

#### Site Layout

The EIS should:

- 1. Provide maps, at an appropriate scale, which clearly identifies the proposed site layout and proposed water pipeline corridor and relevant environmental features such as drainage lines, terrain etc, over the life of the Project.
- 2. Provide maps which show land ownership information, the proposed site layout and impact assessment information at an appropriate scale.

#### Assessment of the environmental impacts of the Project

The potential environmental impacts related to the following environmental issues need to be assessed, quantified and reported on. It should be noted that the following requirements apply to all aspects of the development, which may include offsite works, including but not necessarily limited to, the relocation/establishment of infrastructure eg roads, railway crossings, pipelines and electricity transmission lines and services, and the establishment of access roads to the Project site.



#### <u>Air Quality</u>

The goal should be to maintain existing rural air quality and protect sensitive receptors, both on and off site from adverse impacts of dust and odour and other relevant air pollutants. Background ambient air levels should be identified to inform the assessment.

Dust is of primary concern with potential emissions from general mining activities, onsite roads, conveyors, transfer points, loading facilities, coal stockpiles, overburden emplacements etc.

The EA should include a detailed air quality impact assessment (AQIA). The AQIA should:

- 1. Assess the risk associated with potential discharges of fugitive and point source emissions for <u>all</u> <u>stages</u> of the Project. Assessment of risk relates to environmental harm, risk to human heath and amenity.
- 2. Justify the level of assessment undertaken on the basis of risk factors, including but not limited to:
  - a. proposal location;
  - b. characteristics of the receiving environment; and
  - c. type and quantity of pollutants emitted.
- Describe the receiving environment in detail. The Project must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to:
  - a. meteorology and climate a minimum of 12 months data obtained from the meteorological station located at the Project site must be provided;
  - b. topography;
  - c. surrounding land-use;
  - d. receptors; and
  - e. ambient air quality.
- 4. Include a detailed description of the Development in full. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of <u>all emissions</u> must be provided. Include a detailed process diagram/flowchart of the Project specifying all air inputs, air outputs and air discharge points.
- 5. Identification and location of all fixed and mobile sources of dust/air emissions from the development, including rehabilitation, needs to be provided. The location of all emission sources should be clearly marked on a plan for key years of the mine development. The EIS needs to identify all pollutants of concern and estimate emissions by quantity (and size of particles), source(s) and discharge point(s).

Note: emissions can be classed as either:

- a. point (eg emissions from stack or vent), or
- b. fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, crushing/screening, conveyors, storage facilities, plant and yard operation, vehicle movements [dust from road, exhausts, loss from load], land clearing and construction works).
   Fugitive emissions include coal dust emissions and leaks and spills of coal during rail transport to port facilities (as influenced by management methods and procedures employed by the proposal).



6. Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2005). http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf.

This assessment should include the following parameters:

- a. dust deposition;
- b. total suspended particles;
- c. PM<sub>10</sub> and PM<sub>2.5</sub> particulate matter.
- 7. Demonstrate the Project's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations* (*Clean Air*) *Regulation 2002*.
- 8. Provide an assessment of the project in terms of the priorities and targets adopted under the NSW State Plan 2010 and its implementation plan Action for Air.
- 9. Detail air emission control techniques/practices that will be employed by the Project.
  - All emission control techniques/practices must be benchmarked against best practice process design and emission control. The Project must be assessed by applying the procedure outlined in in *Coal Mine Particulate Matter Control Best Practice - Site-specific determination guideline* (November 2011). http://www.environment.nsw.gov.au/resources/air/20110813coalmineparticulate.pdf
  - b. Nominated controls must be explicitly linked to calculated emission reductions adopted in the air quality impact assessment emissions inventory, with all assumptions documented and justified.
- 10. Detail emission control techniques/practices that will be employed by the proposal, including the development of real-time monitoring/management procedures, response (adverse weather) trigger levels and predictive meteorological monitoring/modelling for dust management.
- 11. Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.
- 12. Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.

#### Noise and Vibration

Potential impacts on the noise amenity of the surrounding area should be assessed in accordance with the NSW Noise Policy or Industry 2017 (NPI) and other relevant guidelines mentioned below, accounting for all noise sources associated with the Project. In particular, seasonality assessments are to be undertaken to assess the impact of temperature inversions and wind conditions.

A noise and vibration impact assessment for both construction and operational scenarios should be undertaken as part of the EIS. The assessment should consider the issues outlined below and identify noise mitigation measures to be implemented to meet project specific noise levels developed for the Project. The EIS will need to assess all feasible and reasonable mitigation measures including an assessment of any residual impacts in accordance with section 3.2 of the NPI.

The noise assessment must include (but not be limited to) an assessment of the C-weighted noise (low frequency) as well as A-weighted noise.



In relation to noise, the following matters should be addressed (where relevant) as part of the Environmental Assessment.

#### General

- 1. Construction noise associated with the proposed development should be assessed using the Interim Construction Noise Guideline (DECC, 2009). <u>http://www.epa.nsw.gov.au/your-environment/noise/.htm</u>
- Operational noise from all industrial activities (including private haul roads and private railway lines) to be undertaken on the premises must be assessed in accordance with the guidelines contained in the Noise Policy for Industry (EPA, 2017) <u>http://www.epa.nsw.gov.au/your-environment/noise/industrial.htm</u>
- 3. Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the *Assessing Vibration: a technical guideline* (DEC, 2006). <u>http://www.epa.nsw.gov.au/your-environment/noise/vibrationguide.htm</u>
- 4. If blasting is required for any reasons during the construction or operational stage of the proposed development, blast impacts should be demonstrated to be capable of complying with the guidelines contained in Australian and New Zealand Environment Council Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990). http://www.epa.nsw.gov.au/your-environment/noise/blasting.htm

#### Road

- Noise on public roads from increased road traffic generated by land use developments should be assessed using the NSW Road Noise Policy (DECCW, 2011). <u>http://www.epa.nsw.gov.au/yourenvironment/noise/traffic.htm</u>
- 6. Noise from new or upgraded public roads should be assessed using the *NSW Road Noise Policy* (DECCW, 2011).<u>http://www.epa.nsw.gov.au/our-environment/noise/traffic.htm</u>

#### Noise Monitoring

Describe the noise monitoring system in detail, including the development and implementation of a monitoring program that:

- uses a combination of predictive meteorological forecasting and real-time noise monitoring, supplemented with attended monitoring measures to evaluate the performance of the mine complex;
- adequately supports the proactive and reactive noise management system on site;
- includes a protocol for determining exceedances of the conditions imposed on the project;
- evaluates and reports on the effectiveness of the noise management system on site;
- provides for the annual validation of the noise model for the mine complex.

The EIS must describe the system that will be implemented to enable the community to access up-to-date information regarding any proposed blasting schedule.



#### Waste

The EIS should identify all wastes to be generated by all aspects of the Project and identify procedures for the handling and management of all wastes produced. The handling of rejects, tailings and overburden material are important aspects which must be assessed in detail.

The EIS should:

- 1. Identify, characterise and classify all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste.
- Demonstrate how waste will be managed in accordance with the waste hierarchy, established under the <u>Waste Avoidance and Resource Recovery Act 2001</u>, which aims to that ensures that resource management options are considered against the following priorities:
  - Avoidance including action to reduce the amount of waste generated by households, industry and all levels of government
  - Resource recovery including reuse, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources
  - *Disposal* including management of all disposal options in the most environmentally responsible manner.
  - 3. Include a detailed plan for in-situ classification of waste material, including the sampling locations and sampling regime that will be employed to classify the waste, particularly with regards to the identification of contamination hotspots in accordance with the EPA's *Waste Classification Guidelines*.
  - 4. Provide details of the quantity and type of both liquid and non-liquid waste generated, handled, processed or disposed of at the premises. Wastes must be classified according to the Waste Classification Guidelines (DECC 2008).
  - 5. Details of procedures for the assessment, handling, storage, transport and disposal of all hazardous waste used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
  - 6. Identify, characterise and classify all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling. All waste must be classified in accordance with EPA's Waste Classification Guidelines.
  - 7. Provide, where relevant, the methods which will be utilised to ensure compliance with any approved Resource Recovery General Exemption for the offsite disposal of waste either generated onsite and disposed of offsite or received from offsite and disposed of onsite. Resource Recovery General Exemptions may only be utilised where the waste is land applied for use as fuel of a waste material is a genuine, fit for purpose, reuse of the waste rather than another path to waste disposal.
  - 8. Identify the management and disposal of tailings including actions to prevent potential impacts to groundwater, surface water or any other environmental aspect which may occur as a result of the



management technique utilised. The EIS must assess and commit to the implementation of all feasible and reasonable measures to minimise seeps, leaching, and/or leaks from the tailings storages facilities into the surrounding environment. The EIS must also include details of a monitoring program which will be established to assess leaks and/or seepages from any tailings storage facility, including a leak detection system.

- 9. Assess the potential for acid mine drainage from acid forming materials and identify the management /mitigation measures which will utilised for any PAF material identified.
- 10. Provide details of how waste will be handled and managed onsite to minimise pollution, including:
- a) Stockpile location and management
  - Labelling of stockpiles for identification, ensuring that all waste is clearly identified and stockpiled separately from other types of material (especially the separation of any contaminated and non-contaminated waste).
  - Proposed height limits for all waste to reduce the potential for dust and spontaneous combustion.
  - Procedures for minimising the movement of waste around the site and double handling.
- b) Provide details of waste rock emplacement areas with particular attention to:
  - The quantity of waste rock likely to be generated;
  - Proposed strategies for the handling, reuse/recycling and disposal of waste rock; and
  - Designation of transport routes for the transport of waste rock.

#### Chemicals and Hazardous Materials

The EIS should:

- 1. Provide details of the types and quantity of any chemical substances, including but not necessarily limited to, hydrocarbons (oils and fuels), hazardous or dangerous materials (eg explosives etc) to be used or stored onsite.
- 2. Provide details of procedures for the assessment, handling, storage, transport and disposal of all chemical substances, hazardous or dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
- 3. Outline pollution control measures relating to storage of wastes, materials, possibility of accidental spills (eg. Preparation of contingency plans), appropriate disposal methods and management of contaminated stormwater.

<u>Soils</u>

The EIS should include:

1. An assessment of potential impacts on soil and land resources should be undertaken, being guided by *Soil and Landscape Issues in Environmental Impact Assessment* (DLWC 2000). The nature and extent of any significant impacts should be identified. Particular attention should be given to:

- Soil erosion and sediment transport in accordance with *Managing urban stormwater: soils* and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008).
- Urban and regional salinity guidance given in the Local Government Salinity Initiative booklets which includes *Site Investigations for Urban Salinity* (DLWC, 2002).
- A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- 3. Where required, add any specific assessment requirements relevant to the Project.

#### <u>Water</u>

The environmental outcomes of the Project in relation to water should be:

- There is no pollution of waters (including surface and groundwater); and
- Polluted water (including process/tailings waters, wash down waters, polluted stormwater or sewerage) is captured onsite and collected, treated and beneficially reused, where safe and practical to do so.

The EIS should document the measures that will achieve the above outcomes in the construction, operation and post operations phases of the project. Construction activities <u>will need to demonstrate best</u> practice sediment and erosion control and management in accordance with the reference document *Managing Urban Stormwater: Soils and Construction (NSW Landcom).* 

The EIS should:

- 1. Describe existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the Project.
- 2. Describe any drainage lines, creeks lines etc that will be impacted by the Project.
- 3. Provide a water balance for the including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.
- 4. Describe the Project including position of any intakes and discharges, volumes, water quality and frequency of all water discharges (e.g. surface water discharge to a river/creek, groundwater, irrigation of waste water etc).
- 5. Assess the nature and degree of impact that any proposed discharges may have on the receiving environment. Assessment for discharge to surface waters should be guided by *Using the ANZECC Guidelines and Water Quality Objectives in NSW* (DEC, 2006) using local Water Quality Objectives determined from the *NSW Water Quality and River Flow Objectives* (DEC, 2006). Demonstrate how the Project will be designed and operated to:
  - protect the Water Quality Objectives for receiving waters where they are currently being achieved; and
  - contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.



- 6. Where the proponent intends to undertake the assessment using site-specific water quality trigger values, detail the water quality of a reference site that has been selected based on the site-specific considerations outlined in ANZECC (2000).
- 7. Identify potential impacts on watercourses and the management/mitigation measures that will be implemented where mining activities occur in proximity to or within a watercourse.
- 8. Identify whether any discharge, or the location of the Project, will cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
- 9. If the discharge requires treatment prior to disposal, any treatment measures should be described and the predicted water quality outcomes documented. Include a detailed process diagram/flowchart of the proposal specifying all water inputs, outputs and discharge points
- 10. Demonstrate that all practical options to avoid discharge have been investigated and implemented and outline measures that have been taken to reduce the pollutant load of the discharge so that the environmental impact is minimised where a discharge is necessary.
- 11. Describe how stormwater will be managed both during and after construction including a layout of the proposed stormwater system in accordance with *Managing Urban Stormwater, Soils and Construction Volume 1* (Landcom, 2004) and *Volumes 2A to 2E* (DECC, 2008), The EIS should:
  - Provide the proposed general location of all water management structures. These should be clearly indicated on appropriately scaled maps.
  - Demonstrate how clean, dirty and contaminated water will be managed (separated) on site throughout the life of the Project.
  - Provide detailed water management strategies for all disturbance areas including the management of channel and overland flows into and within the disturbance area.
  - Provide the proposed sizing of all water storage dams, sediment dams and other dams as required and justification for the sizing utilised.
  - Identify contingency measure which may be implemented during extreme rainfall events.
- 12. Where the management of sediment basins requires the use of flocculants, the EIS should include information about the type, toxicity and management of flocculants proposed to treat captured water before discharge.
- 13. Provide detailed water management strategies for all disturbance areas, paying particular attention to the waste rock emplacement areas and potential impacts on groundwater and offsite surface water resources including particular reference to the management of channel and overland flows into and within the disturbance area.
- 14. Determine and detail the tailings management and monitoring strategy and dam design to be implemented, including an assessment of the potential impacts of tailings storage on surface and groundwater resources, contingency plans in the event of a leak or seep, rehabilitation and the long-term management and feasibility.
- 15. Provide plans for the proposed relocation/realignment of all creeks and/or drainage lines including design, timelines and completion criteria and sufficient evidence to demonstrate that the proposed plans are achievable, reasonable and feasible in the short and the long term.

- 16. State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (<u>http://www.environment.nsw.gov.au/ieo/index.htm</u>). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values.
- 17. State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality (http://www.mincos.gov.au/publications/australian and new zealand guidelines for fresh and marin e water guality).
- 18. State any locally specific objectives, criteria or targets which have been endorsed by the NSW Government.
- 19. Assess impacts on groundwater and groundwater dependent ecosystems. The assessment should be guided by the principles in *The NSW State Groundwater Policy Framework Document* (DLWC,1997). Assessment and Management of Groundwater Contamination (DEC, 2007) provides guidance on assessing and managing groundwater contamination. Assess impacts against relevant water quality guidelines for:
  - potentially impacted environmental values and beneficial uses using local Water Quality Objectives;
  - contamination, such as investigation levels specified in National Environment Protection Measure Guideline on the Investigation Levels for Soil and Groundwater (EPHC, 1999).
- 20. Provide plans for any proposed relocation/realignment of all creeks and/or drainage lines including design, timelines and completion criteria and sufficient evidence to demonstrate that the proposed plans are achievable/sustainable, reasonable and feasible in the short and the long term.
- 21. Assess any irrigation areas proposed for wastewaters produced in accordance with the EPA Guideline "The Use of Effluent by Irrigation".
- 22. Describe how predicted impacts on surface water, groundwater and aquatic ecosystems will be monitored and assessed over time, including monitoring locations, relevant parameters, and sampling frequency. The EIS should:
  - Include a Trigger Action Response Plan, or similar response management plan, to identify appropriate trigger values and criteria and provide appropriate response actions if impacts are identified through the monitoring program.
  - Identify the process for identifying any trends in the monitoring data obtained.

Note: Water quality monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutant in NSW* (DEC, 2004). *Groundwater Sampling and Analysis: Field Guide* (Geosciences Australia, 2009) provides guidance on the design of a groundwater sampling program.

#### Monitoring, Assurance and Reporting Programs

- 1. The EIS should include a detailed assessment of any noise, air quality, water quality or waste monitoring required during the construction phase and on-going operation of the facility to prevent or minimise any adverse environmental impacts from the development.
- 2. Appropriate baseline data requirements are to be identified as part of the EIS, to form the basis for baseline and ongoing monitoring of environmental parameters.

- 3. It must be demonstrated that the proposed methods for baseline and subsequent monitoring are scientifically robust and statistically sound.
- 4. The EIS must also identify and describe monitoring programs, compliance assurance programs and reporting requirements and arrangements that will demonstrate the effectiveness of proposed management measures in meeting applicable requirements.
- 5. The EIS must, in addition to outlining proposed programs, clearly identify what is to be monitored and audited and why. This should include identification of monitoring locations, parameters to be monitored, sample analysis methods, the level of reporting proposed. The EIS should also include information on frequency and type of audits proposed to assure compliance with applicable requirements,
- 6. The EIS should demonstrate monitoring and audit programs must be designed appropriately, according to best practice, to provide objective evidence regarding activities associated with the development and have regard to whether these activities are adversely impacting on the environment in the short, medium and/or long term.

#### Cumulative impacts

The EIS should provide an assessment of the cumulative impacts of the project during construction and operation of the proposal with regard to noise, air quality, water quality or waste Assessment of cumulative impacts must consider past, current and future activities in the area surrounding the project, impacts associated with internal components of this project (where relevant – e.g. a project involving construction throughout a precinct or similar), as well as the construction impacts of any projects recently completed.

# Attachment B

# **Guidance Material**

Title	Web address	
Relevant Legislation		
Contaminated Land Management Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+140+1 997+cd+0+N	
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N	
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1 997+cd+0+N	
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N	
Licensing		
Guide to Licensing	http://www.epa.nsw.gov.au/licensing/licenceguide.htm	
Air Issues		
Air Quality		
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf	
POEO (Clean Air) Regulation 2010	http://www.legislation.nsw.gov.au/#/view/regulation/2010/428	
Dust	No EPA specific guidance material exists for the control of dust from construction sites. Consideration should be given to the POEO Act and the Local Government Air Quality Toolkit (DECC, 2007), accessed via: <u>http://www.epa.nsw.gov.au/air/lgaqt.htm</u>	
Odour - Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006	http://www.epa.nsw.gov.au/air/odour.htm	
80	Noise and Vibration	
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/your-environment/noise/09265cng.pdf	
Noise Policy for Industry	http://www.epa.nsw.gov.au/your-environment/noise/industrial.htm	
Assessing Vibration: A technical Guideline (DECC, 2006)	http://www.epa.nsw.gov.au/your-environment/your- environment/noise/vibrationguide0643.pdf	
SA EPA Environmental Noise Guidelines (SA EPA, 2009)	http://www.epa.sa.gov.au/environmental_info/noise/wind_farms	
Technical Basis for Guidelines to Minimise Annoyance due to Blasting	http://www.epa.nsw.gov.au/your- environment/noise/ANZECBlasting.pdf	

Title	Web address	
Overpressure and Ground Vibration		
NSW Road Noise Policy	http://www.epa.nsw.gov.au/your-environment/noise/traffic.htm	
Waste, Chemicals and Hazardous Materials and Radiation		
Chemical and Fuel Storage		
Bunding and Spill Management	http://www.epa.nsw.gov.au/mao/bundingspill.htm	
Storage and Handling of Dangerous Goods – Code of Practice (WorkCover, 2005)	http://www.workcover.nsw.gov.au/formspublications/publications/ Documents/storage-handling-dangerous-goods-1354.pdf	
Waste		
Environmental Guidelines: Solid Waste Landfills (EPA 2016)	http://www.epa.nsw.gov.au/resources/waste/solid-waste-landfill- guidelines-160259.pdf	
Waste Classification Guidelines	http://www.epa.nsw.gov.au/wasteregulation/classify- guidelines.htm	
Resource Recovery Orders and Exemptions	http://www.epa.nsw.gov.au/wasteregulation/orders- exemptions.htm	
	Soils	
Contaminated Sites Assessment and Remediation		
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.legislation.nsw.gov.au/#/view/EPI/1998/520	
Contaminated Sites Guidelines	http://www.epa.nsw.gov.au/clm/guidelines.htm	
Soils – general		
Soil Publications	http://www.environment.nsw.gov.au/soils/publications.htm	
Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads: F. Mines and guarries)	Vol 1 - <u>http://www.environment.nsw.gov.au/resources/water/BlueBookVol</u> <u>1.pdf</u> Vol 2 -	
(DECC 2008)	http://www.environment.nsw.gov.au/stormwater/publications.htm	
Water		
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm	
,	http://www.environment.gov.au/water/publications/quality/pubs/nw gms-guidelines-4-vol1.pdf	
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.mincos.gov.au/publications/australian and new zeala nd guidelines for fresh and marine water quality	
	http://www.environment.gov.au/water/publications/quality/nwqms- guidelines-4-vol1.html	
	http://www.environment.gov.au/water/publications/quality/pubs/nw	

Title	Web address
	gms-guidelines-4-vol1.pdf
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve dmethods-water.pdf





DOC19/400114 SSD 5765

> Mr Philip Nevill Environmental Assessment Officer Resource Assessments Department of Planning and Environment philip.nevill@planning.nsw.gov.au

Dear Philip

## Bowden's Silver Project - SSD 5765 - Modification of SEARs

I refer to your email dated 30 April 2019 requesting advice from the Office of Environment and Heritage (OEH) on the proposed revised SEARs for the Bowden's Silver Project. The changes to the scope of the project with direct relevance to OEH relate to the proposed water supply pipeline which will provide water to the project site from two mines 40 kilometres to the north-west of the project site – Ulan Coal Mine and Moolarben Coal Mine.

OEH has considered your request and provides SEARs for the proposed development in **Attachment A**, and guidance material in **Attachment B**. OEH notes that the Department of Planning and Environment (DPE) has informed the proponent that they have undertaken substantial environmental assessment and therefore future environmental assessment may continue under the former biodiversity assessment pathway, the Framework for Biodiversity Assessment (FBA). This is reflected in Attachment A.

OEH recommends the EIS needs to appropriately address the following:

- 1. Biodiversity and offsetting
- 2. Aboriginal cultural heritage
- 3. Historic heritage
- 4. Water and soils
- 5. Flooding

If you have any further questions regarding this issue please contact Renee Shepherd, Senior Conservation Planning Officer on 02 6883 5355 or renee.shepherd@environment.nsw.gov.au.

Yours sincerely

PETER CHRISTIE Director North West <u>Conservation and Regional Delivery</u>

14 May 2019

PO Box 2111 Dubbo NSW 2830 Level 1, 48-52 Wingewarra Street Dubbo NSW 2830 Tel: (02) 6883 5330 Fax: (02) 6884 8675 ABN 30 841 387 271 www.environment.nsw.gov.au



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#### Attachment A

# Standard Environmental Assessment Requirements

Dia	
ы	odiversity
1.	Biodiversity impacts related to the proposed Bowdens Silver Project are to be assessed and
	documented in accordance with the Framework for Biodiversity Assessment, unless otherwise
	agreed by OEH, by a person accredited in accordance with s142B(1)(c) of the <i>Threatened</i>
	Species Conservation Act 1995.
2.	Impacts on the following species/populations/ecological communities will require further
	consideration and provision of the information specified in s9.2 of the Framework for Biodiversity
	Assessment:
	a. Anthochaera Phrygia (Regent Honeyeater)
	b. Lathamus discolor (Swift Parrot)
	c. White Box Yellow Box Blakely's Red Gum Woodland
З.	Impacts on the following species/populations/ecological communities will not require further
	consideration and provision of the information specified in s9.2 of the Framework for Biodiversity
	Assessment, unless they are recorded during the ecological surveys:
	a. Bossiaea fragrans
	b. Caladenia attenuata
	c. Calidris ferruginea (Curlew Sandpiper)
	d. Euphrasia arguta
	e. Pomaderris reperta (Denman Pomaderris)
	f. Prasophyllum sp.Wybong
	g. Pultenaea sp.Genowlan Point
	h. Synemon plana (Golden Sun Moth)
Ab	original cultural heritage
4.	The EIS must identify and describe the Aboriginal cultural heritage values that exist across the
	whole area that will be affected by the development and document these in an Aboriginal Cultural
	Heritage Assessment Report (ACHAR). This may include the need for surface survey and test
	Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with
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	Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010), and guided by the <i>Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW</i> (DECCW, 2011) and consultation with OEH regional branch officers.
5.	Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010), and guided by the <u>Guide to investigating</u> , assessing and reporting on Aboriginal Cultural Heritage <u>in NSW (DECCW, 2011)</u> and consultation with OEH regional branch officers. Consultation with Aboriginal people must be undertaken and documented in accordance with the
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5.	<ul> <li>Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010), and guided by the <u>Guide to investigating</u>, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) and consultation with OEH regional branch officers.</li> <li>Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.</li> <li>Impacts on Aboriginal cultural heritage values are to be assessed and documented in the</li> </ul>
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Lie	tori	a haritaga		
7.	The EIS must provide a heritage assessment including but not limited to an assessment of			
	impacts to State and local heritage including conservation areas, natural heritage areas, places of			
	Aboriginal heritage value, buildings, works, relics, gardens, landscapes, views, trees should b			
	assessed. Where impacts to State or locally significant heritage items are identified, the			
	assessment shall:			
	a.	outline the proposed mitigation and management measures (including measures to avoid		
		significant impacts and an evaluation of the effectiveness of the mitigation measures)		
		generally consistent with the NSW Heritage Manual (1996)		
	h	be undertaken by a suitably qualified beritage consultant(s) (note: where archaeological		
	excavations are proposed the relevant consultant must meet the NSW Heritage Council's			
		Excavation Director criteria)		
	~	include a statement of boritage impact for all boritage items (including significance		
	υ.	accessement)		
	d	assessment),		
	u.			
	disturbance, altered historical arrangements and access, landscape and vistas, and			
		architectural holse treatment (as relevant), and		
	e.	where potential archaeological impacts have been identified develop an appropriate		
		archaeological assessment methodology, including research design, to guide physical		
		archaeological test excavations (terrestrial and maritime as relevant) and include the results		
		of these test excavations.		
Wa	ater :	and soils a FIS must man the following features relevant to water and soils including:		
0.	3	Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Man)		
	а. ь	Divers streams wetlands estuaries		
	D.	Motlands		
	с. d	Groupdwater		
	u.			
	e.	Browned intelle and discharge leasting		
	T.	Proposed Intake and discharge locations.		
9.	I he	e EIS must describe background conditions for any water resource likely to be affected by the		
	dev	/elopment, including:		
	a.	Existing surface and groundwater.		
	b.	Hydrology, including volume, frequency and quality of discharges at proposed intake and		
		discharge locations.		
	C.	Water Quality Objectives (as endorsed by the NSW Government		
		http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that		
		http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.		
	d.	<ul> <li><u>http://www.environment.nsw.gov.au/ieo/index.htm</u>) including groundwater as appropriate that represent the community's uses and values for the receiving waters.</li> <li>Indicators and trigger values/criteria for the environmental values identified at (c) in</li> </ul>		
	d.	http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or		
	d.	<ul> <li><u>http://www.environment.nsw.gov.au/ieo/index.htm</u>) including groundwater as appropriate that represent the community's uses and values for the receiving waters.</li> <li>Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.</li> </ul>		
	d. e.	<ul> <li><u>http://www.environment.nsw.gov.au/ieo/index.htm</u>) including groundwater as appropriate that represent the community's uses and values for the receiving waters.</li> <li>Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.</li> <li>Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use</li> </ul>		



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		publications/publications-search/risk-based-framework-for-considering-waterway-health-
		outcomes-in-strategic-land-use-planning
10.	The	EIS must assess the impacts of the development on water quality, including:
	a.	The nature and degree of impact on receiving waters for both surface and groundwater,
		demonstrating how the development protects the Water Quality Objectives where they are
		currently being achieved, and contributes towards achievement of the Water Quality
		Objectives over time where they are currently not being achieved. This should include an
		assessment of the mitigating effects of proposed stormwater and wastewater management
		during and after construction.
	b.	Identification of proposed monitoring of water quality.
11.	The	EIS must assess the impact of the development on hydrology, including:
	a.	Water balance including quantity, quality and source.
	b.	Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
	C.	Effects to downstream water-dependent fauna and flora including groundwater dependent
		ecosystems.
	d.	Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains
		that affect river system and landscape health such as nutrient flow, aquatic connectivity and
		access to habitat for spawning and refuge (e.g. river benches).
	e.	Changes to environmental water availability, both regulated/licensed and unregulated/rules-
		based sources of such water.
	f.	Mitigating effects of proposed stormwater and wastewater management during and after
		construction on hydrological attributes such as volumes, flow rates, management methods
		and re-use options.
	g.	Identification of proposed monitoring of hydrological attributes.
Flo	odin	g
12.	Ine	EIS must map the following features relevant to flooding as described in the Floodplain
	Dev	elopment Manual 2005 (NSW Government 2005) including:
	a.	
	D.	Flood planning area, the area below the flood planning level.
	С.	Hydraulic categorisation (floodways and flood storage areas).
	d.	Flood hazard
13.	I he	EIS must describe flood assessment and modelling undertaken in determining the design
	floo	d levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1%
	AEF	P, flood levels and the probable maximum flood, or an equivalent extreme event.
14.	The	EIS must model the effect of the proposed development (including fill) on the flood behaviour
	und	er the following scenarios:
	a.	Current flood behaviour for a range of design events as identified in 14 above. This includes
		the 0.5% and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase
		in rainfall intensity of flood producing rainfall events due to climate change.
15.	Мос	delling in the EIS must consider and document:
	a. I	Existing council flood studies in the area and examine consistency to the flood behaviour
		documented in these studies.



	b.	The impact on existing flood behaviour for a full range of flood events including up to the
		probable maximum flood, or an equivalent extreme flood.
	C.	Impacts of the development on flood behaviour resulting in detrimental changes in potential
		flood affection of other developments or land. This may include redirection of flow, flow
		velocities, flood levels, hazard categories and hydraulic categories.
	d.	Relevant provisions of the NSW Floodplain Development Manual 2005.
16.	The	EIS must assess the impacts on the proposed development on flood behaviour, including:
	a.	Whether there will be detrimental increases in the potential flood affectation of other
		properties, assets and infrastructure.
	b.	Consistency with Council floodplain risk management plans.
	C.	Consistency with any Rural Floodplain Management Plans.
	d.	Compatibility with the flood hazard of the land.
	e.	Compatibility with the hydraulic functions of flow conveyance in floodways and storage in
		flood storage areas of the land.
	f.	Whether there will be adverse effect to beneficial inundation of the floodplain environment,
		on, adjacent to or downstream of the site.
	g.	Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian
		vegetation or a reduction in the stability of river banks or watercourses.
	h.	Any impacts the development may have upon existing community emergency management
		arrangements for flooding. These matters are to be discussed with the NSW SES and
		Council.
	i.	Whether the proposal incorporates specific measures to manage risk to life from flood.
		These matters are to be discussed with the NSW SES and Council.
	j.	Emergency management, evacuation and access, and contingency measures for the
		development considering the full range or flood risk (based upon the probable maximum
		flood or an equivalent extreme flood event). These matters are to be discussed with and
		have the support of Council and the NSW SES.
	k.	Any impacts the development may have on the social and economic costs to the community
		as consequence of flooding.



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#### Attachment B

# **Guidance Material**

Title	Web address	
Relevant Legislation		
Coastal Management Act 2016	https://www.legislation.nsw.gov.au/#/view/act/2016/20/full	
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/	
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N	
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+19 94+cd+0+N	
Marine Parks Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+64+19 97+cd+0+N	
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+19 74+cd+0+N	
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1 997+cd+0+N	
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N	
Wilderness Act 1987	http://www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+FIRST+0+N	
	Biodiversity	
Framework for Biodiversity Assessment	https://www.environment.nsw.gov.au/-/media/OEH/Corporate- Site/Documents/Animals-and-plants/BioBanking/framework- biodiversity-assessment-140675.pdf	
NSW biodiversity offsets policy for major projects	https://www.environment.nsw.gov.au/resources/biodiversity/1406 72biopolicy.pdf	
Accreditation Scheme for Application of the Biodiversity Assessment Metho Order 2017	https://www.legislation.nsw.gov.au/regulations/2017-471.pdf	
Biodiversity conservation actions	www.environment.nsw.gov.au/resources/bcact/ancillary-rules- biodiversity-actions-170496.pdf	
Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules	www.environment.nsw.gov.au/resources/bcact/ancillary-rules- reasonable-steps-170498.pdf	
OEH Threatened Species Website	www.environment.nsw.gov.au/threatenedspecies/	
NSW BioNet (Atlas of NSW Wildlife)	www.bionet.nsw.gov.au/	
NSW guide to surveying threatened plants (OEH 2016)	www.environment.nsw.gov.au/resources/threatenedspecies/1601 29-threatened-plants-survey-guide.pdf	
OEH threatened species survey and assessment guideline information	www.environment.nsw.gov.au/threatenedspecies/surveyassessm entgdlns.htm	
BioNet Vegetation Classification - NSW Plant Community Type (PCT) database	www.environment.nsw.gov.au/research/Vegetationinformationsystem.htm	
OEH Data Portal (access to online spatial data)	http://data.environment.nsw.gov.au/	



Title	Web address	
Fisheries NSW policies and guidelines	http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,- guidelines-and-manuals/fish-habitat-conservation	
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchato z.aspx	
Revocation, recategorisation and road adjustment policy (OEH, 2012)	http://www.environment.nsw.gov.au/policies/RevocationOfLandPolicy.htm	
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	http://www.environment.nsw.gov.au/protectedareas/developmnta djoiningdecc.htm	
<u>Heritage</u>		
The Burra Charter (The Australia ICOMOS charter for places of cultural significance)	http://australia.icomos.org/wp-content/uploads/The-Burra-Charter- 2013-Adopted-31.10.2013.pdf	
Statements of Heritage Impact 2002 (HO & DUAP)	http://www.environment.nsw.gov.au/resources/heritagebranch/heri tage/hmstatementsofhi.pdf	
NSW Heritage Manual (DUAP) (scroll through alphabetical list to 'N')	http://www.environment.nsw.gov.au/Heritage/publications/	
Ab	original Cultural Heritage	
Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/com mconsultation/09781ACHconsultreq.pdf	
Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/107 83FinalArchCoP.pdf	
Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)	http://www.environment.nsw.gov.au/resources/cultureheritage/201 10263ACHguide.pdf	
Aboriginal Site Recording Form	http://www.environment.nsw.gov.au/resources/parks/SiteCardMain V1_1.pdf	
Aboriginal Site Impact Recording Form	http://www.environment.nsw.gov.au/resources/cultureheritage/120 558asirf.pdf	
Aboriginal Heritage Information Management System (AHIMS) Registrar	http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm	
Care Agreement Application form	http://www.environment.nsw.gov.au/resources/cultureheritage/201 10914TransferObject.pdf	
	Water and Soils	
Acid sulphate soils		
Acid Sulfate Soils Planning Maps via Data.NSW	http://data.nsw.gov.au/data/	
Acid Sulfate Soils Manual (Stone et al. 1998)	http://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate- Manual-1998.pdf	
Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004)	http://www.environment.nsw.gov.au/resources/soils/acid-sulfate- soils-laboratory-methods-guidelines.pdf This replaces Chapter 4 of the Acid Sulfate Soils Manual above.	



Bowdens Silver Project Report No. 429/24

Title	Web address	
Flooding and Coastal Erosion		
Reforms to coastal erosion management	http://www.environment.nsw.gov.au/coasts/coastalerosionmgmt.htm_	
Floodplain development manual	http://www.environment.nsw.gov.au/floodplains/manual.htm	
Guidelines for Preparing Coastal Zone Management Plans	Guidelines for Preparing Coastal Zone Management Plans http://www.environment.nsw.gov.au/resources/coasts/130224CZM PGuide.pdf	
NSW Climate Impact Profile	http://climatechange.environment.nsw.gov.au/	
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation	
Water		
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm	
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	www.environment.gov.au/water/publications/quality/australian- and-new-zealand-guidelines-fresh-marine-water-quality-volume-1	
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	http://deccnet/water/resources/AWQGuidance7.pdf	
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve_ dmethods-water.pdf	





7 May 2019

SF2013/003834; WST13/00010/03

The Manager Resource Assessment Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

Attention: Mr Philip Nevill

Dear Mr Nevill

#### SSD5765: Bowdens Silver Project Request for updated Secretary's Environmental Assessment Requirements (SEARs)

Thank you for your email on 30 April 2019 seeking revised SEARs from Roads and Maritime Services for the proposed Bowdens Silver Project. Reference is made to Roads and Maritime's previous submissions in relation to this proposal dated 8 December 2016 and 29 January 2013.

I note the modified proposal now includes construction of a water pipeline from mines at Ulan to the project site. The pipeline will interface with Wollar Road (MR208) and Ulan Road (MR214).

The requirements provided in Roads and Maritime's original submission dated 29 January 2013 stand. To address the modification proposal, Roads and Maritime requires the following additional information:

 Details of pipeline crossings and encroachments of/within classified roads. Details are to include locations, depths and minimum clearances. Prior to the installation of pipe within classified road reserves, pursuant to section 138 of the *Roads Act 1993*, the prior consent of Mid Western Regional Council with Roads and Maritime concurrence, is required.

Please forward a copy of the updated SEARs to Roads and Maritime at the same time they are sent to the applicant. Should you require further information, please contact the undersigned on 02 6861 1453.

Yours faithfully

0 an Th

Andrew McIntyre Manager Land Use Assessment Western Roads and Maritime Services

51-55 Currajong Street Parkes NSW 2870 | PO Box 334 Parkes NSW 2870 | DX20256 T 02 6861 1444 | F 02 6861 1414

www.rms.nsw.gov.au | 131 782



#### **ENVIRONMENTAL IMPACT STATEMENT** Appendix 2



MID-WESTERN REGIONAL COUNCIL PO Box 156, MUDGEE NSW 2850

86 Market Street, Mudgee | 109 Herbert Street, Gulgong | 77 Louee Street, Rylstone T 1300 765 002 or 02 6378 2850 | F 02 6378 2815 E council@midwestern.nsw.gov.au

JR:LD:A0420245

23 May 2019

Attention: Philip Nevill NSW Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

Dear Philip,

#### **RE: MODIFICATION TO SEARS FOR BOWDENS SILVER PROJECT (SSD 5765)**

Thank you for providing Mid-Western Regional Council (Council) with the opportunity to provide input into the proposed modification to the Secretary's Environmental Assessment Requirements (SEAR's) SSD 5765 for the Bowdens Silver Project. Council has reviewed the proposed modification to SEAR's and provides the following feedback for your consideration.

#### **Pipeline Corridor**

The Scoping Report provides a high level overview of the proposed route for the water supply pipeline corridor proposed for the Bowdens Silver Project and a broad analysis of the likely impacts. In order to fully assess the proposal and the extent of any impacts associated with the pipeline, a detailed site survey for the full length of the pipeline corridor should be submitted as part of the EIS documentation.

In addition to the site survey, the proponent should identify and address any expected impacts on Council's road network and associated infrastructure during construction and ongoing operation of the pipeline. This will include management of traffic impacts, scope of physical works required, location and timing of works. Council has advised the proponent that where there are any discrepancies between the physical and paper road alignment, the proponent will be required to go through the relevant process of formalising these access arrangements.

It is acknowledged that the proponent has commenced consultation with landholders (including Council) who will be impacted by the pipeline corridor. Council will require a formal agreement to be established in accordance with the Roads Act (including Sec 138 approval and lease) for the use of the road reserve for the life of the project, which specifies the rights and responsibilities of both parties for construction, ongoing maintenance and decommissioning stages.

Any costs associated with construction, maintenance and decommissioning of the pipeline, formalising road access arrangements and legal costs for both parties will be the responsibility of the proponent.

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# Water Sharing

It is noted that the proposed water supply relies on the availability of water from both the Ulan Coal and Moolarben Coal SSD projects. The Scoping Report indicates that amendments to the Water Management Plans for both SSD projects will be required.

The EIS should address the potential impacts of redirecting water under the existing management practices for current SSD projects to the new management practices associated with the proposed pipeline for the Bowdens Silver project. Council understands that this may necessitate modifications to the relevant SSD project approvals applying to these mines.

Should you have any questions or wish to discuss the matters raised above in further detail, please contact Council on (02) 6378 2850.

Yours sincerely

BRAD CAM GENERAL MANAGER

PAGE 2 OF 2



# BOWDENS SILVER PTY LIMITED

ENVIRONMENTAL IMPACT STATEMENT Appendix 2

**Timothy Olliver** From: Philip Nevill To: Cc: Phillipa Duncar Subject: RE: Request for Modification of Secretary's Environmental Assessment Requirements - Bowden's Silver Project (SSD 5765) Friday, 10 May 2019 2:54:53 PM Date: image007.png Attachments: image008.jpg image009.jpg mage010.jpg image011.jpg image001.png

Hi Philip,

Thanks for the referral.

There are no concerns in relation to State Heritage for this proposal. DPE no longer needs to refer this proposal (or future modifications) to the Heritage Council.

NB other divisions of OEH may respond in relation to Biodiversity or Aboriginal Cultural Heritage.

Kind regards

?	<b>Tim Olliver</b> Heritage Operations Officer Regional Heritage Operations North Metro Heritage Division	26 Honeysuckle Dr, Newcastle 2300 Locked Bag 5020, Parramatta 2150 <b>T</b> 02 4927 3203		
cid:image002.png@01D4B7AF.9B8484A0				

From: Philip Nevill

Sent: Tuesday, 30 April 2019 5:22 PM

**To:** Planning Matters Mailbox <planning.matters@environment.nsw.gov.au>; Adam Oehlman <landuse.enquiries@dpi.nsw.gov.au>; OEH HD Heritage Mailbox

<HERITAGEMailbox@environment.nsw.gov.au>; DRG RO Assessment Coordination Mailbox

<assessment.coordination@planning.nsw.gov.au>; Angela Stewart

<development.western@rms.nsw.gov.au>; OLG - Mid Western Regional Council

<council@midwestern.nsw.gov.au>

Cc: Phillipa Duncan <phillipa.duncan@planning.nsw.gov.au>

**Subject:** Request for Modification of Secretary's Environmental Assessment Requirements -Bowden's Silver Project (SSD 5765)

# Bowden's Silver Project (SSD 5765) Modification of Secretary's Environmental Assessment Requirements (SEARs)

Good afternoon

R.W. Corkery & Co. Pty Ltd on behalf of Bowden's Silver Pty Ltd is currently preparing anEnvironmental Impact Statement for the Bowden's Silver Project (SSD 5765), located approximately2.5 kms northeast of Lue Village in the Mid-Western Region local government area. SEARs werepreviously issued on 15 August 2017 for this project. However, due to the changes in the scope of



the proposal, the Department is preparing revised SEARs for the project.

I have attached the following documents for your reference:

- request for modification of SEARs letter prepared by R.W. Corkery & Co. Pty Ltd dated 17 April 2019;
- the SEARs issued 15 August 2017 (incl. previous agency responses Attachment 2); and
- the Scoping Report dated April 2019.

The Department requests you input on the revised SEARs for the project. It would be greatly appreciated if we could receive your advice by **Tuesday 14<sup>th</sup> May 2019**.

If you have any enquires, please contact me on the details below.

Kind Regards,

## Philip Nevill

Environmental Assessment Officer Resource Assessments | Planning Services 320 Pitt Street | GPO Box 39 | Sydney NSW 2001 T 02 82751036 E <u>philip.nevill@planning.nsw.gov.au</u>





## **ENVIRONMENTAL IMPACT STATEMENT**

Appendix 2

From:	Anna London		
To:	Philip Nevill		
Cc:	Adrian Hohenzollern		
Subject:	Updated heritage SEARs - Request for Modification of Secretary"s Environmental Assessment Requirements - Bowden"s Silver Project (SSD 5765)		
Date:	Wednesday, 29 May 2019 8:36:25 AM		
Attachments:	image001.png image002.png image003.jpg image004.jpg image005.jpg image006.jpg		

Hi Philip,

Further to your conversation with my STL, Adrian Hohenzollern, yesterday, my apologies but there seems to have been some confusion in relation to the revised SEARs requested for Bowden's Silver Mine. SEARs recommendations were previously provided in 2013, then again in 2016. The 2016 recommendations were included in your draft SEARs and are still appropriate and should remain. The 2016 SEARs recommendations are reproduced below:

- 1. The EIS shall include a Heritage Impact Assessment (HIS) prepared in accordance with the guidelines in the NSW Heritage Manual that addresses the significance of, and provides an assessment of, the impact on the heritage significance of heritage items on the development site and in the vicinity.
- 2. The EIS shall also include an historical archaeological assessment prepared by a suitably qualified historical archaeologist in accordance with the Heritage Division, Office of Environment and Heritage Guidelines 'Assessing Significance for Historical Archaeological Sites and Relics' 2009. This assessment should identify what relics, if any, are likely to be present, assess their significance and consider the impacts from the proposal on this potential resource. Where harm is likely to occur, it is recommended that the significance of the relics be considered in determining an appropriate mitigation strategy. In the event that harm cannot be avoided in whole or part, an appropriate Research Design and Excavation Methodology should also be prepared to guide any proposed excavations.

My apologies for any inconvenience caused.

Regards,

Anna

Anna London Senior Customer Strategies Officer Heritage Division Office of Environment & Heritage 9873 8608



BOWDENS SILVER PTY LIMITED

Bowdens Silver Project Report No. 429/24



Level 6, 10 Valentine Avenue Parramatta NSW 2150 Locked Bag 5020 Parramatta NSW 2124 DX 8225 PARRAMATTA Telephone: 61 2 9873 8500 Facsimile: 61 2 9873 8599 heritage@heritage.nsw.gov.au www.heritage.nsw.gov.au

File No: SF16/54269 Ref No: DOC16/604167

Elle Donnelley Planner, Resource Assessments Planning Services GPO BOX 39 SYDNEY NSW 2001

Sent by e-mail to: elle.donnelley@planning.nsw.gov.au

Dear Ms Donnelley

# Request for input into revised Secretary's Environmental Assessment Requirements (SEARs) for Bowden's Silver Project, near Lue, Mid-Western Regional Council LGA (SSD 5765)

Reference is made to your correspondence received on 29 November 2016 seeking input into the revised Secretary's Environmental Assessment Requirements (SEARs) from the Heritage Council of NSW (the Heritage Council) for the above proposal.

A revision of the SEARs is required because the project will not be able to meet the required two year timeframe for submission of the Environmental Impact Assessment and the ownership and project scope has changed from the original application. A review of the documentation associated with the request has been undertaken, in particular the:

 'Preliminary Environmental Assessment for Bowdens Silver Project (State Significant Development No. 5765)' prepared by R.W. Cokery & Co. Pty. Limited dated November 2016 (the Assessment).

The original SEARs issued in February 2015 indicate that a heritage assessment would be required. The Assessment has noted that within the indicative Mine Site, three European heritage features, comprising of two historic mine shafts and hut ruins are extant. However, no further assessment of these heritage items has been provided.

It is further noted that the Assessment has identified sites of Aboriginal archaeological significance based on previous cultural heritage surveys undertaken in 2003 and 2011. The surveys indicated that twenty five Aboriginal heritage sites were identified comprising of seventeen stone artefact scatters and eight isolated finds of stone artefacts. The assessment has indicated that additional investigation will be undertaken with a cultural heritage survey proposed within the area of the proposed access road and project related infrastructure that may be located to the northwest of the proposed open cut pit. The Assessment indicates that a detailed Cultural Heritage assessment of the entire proposed disturbance footprint will be undertaken and an assessment of significance of any identified objects assessed in accordance with the relevant guidelines.

The Heritage Division advises the Department of Planning and Environment that historic and archaeological heritage issues have not been adequately considered in the preparation of the Assessment for this project. Whilst the Assessment has identified the existence of the

Page 1 of 2


abovementioned historic heritage items within the project area, an updated EIS should identify if these potential heritage items are likely to be affected. The following SEARs are recommended to ensure that heritage concerns are adequately addressed prior to project approval:

- The EIS shall include a Heritage Impact Assessment (HIS) prepared in accordance with the guidelines in the NSW Heritage Manual that addresses the significance of, and provides an assessment of the impact on the heritage significance of heritage items on the development site and in the vicinity.
- 2. The EIS shall also a historical archaeological assessment prepared by a suitably qualified historical archaeologist in accordance with the Heritage Division, Office of Environment and Heritage Guidelines 'Assessing Significance for Historical Archaeological Sites and 'Relics' 2009. This assessment should identify what relics, if any, are likely to be present, assess their significance and consider the impacts from the proposal on this potential resource. Where harm is likely to occur, it is recommended that the significance of the relics be considered in determining an appropriate mitigation strategy. In the event that harm cannot be avoided in whole or part, an appropriate Research Design and Excavation Methodology should also be prepared to guide any proposed excavations.

If you have any questions regarding the above matter, please contact Anna Foroozani, Heritage Assessment Officer at the Heritage Division, Office of Environment and Heritage on telephone (02) 9985 6479 or at anna.foroozani@environment.nsw.gov.au.

Yours sincerely

k ////

Katrina Stankowski Acting Manager, Conservation Heritage Division Office of Environment & Heritage As Delegate of the Heritage Council of NSW 08/12/2016

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Bowdens Silver Project Report No. 429/24

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# ATTACHMENT 3

# Commonwealth Department of Environment and Energy assessment requirements

# Guidelines for preparing assessment documentation relevant to the EPBC Act for proposals being assessed under an Accredited NSW Assessment Process

# Bowden's Silver Project (EPBC 2018/8372) (SSD 5765)

## Introduction

- 1. On 5 April 2019, a delegate of the Federal Minister for the Department of the Environment and Energy determined that the Bowden's Silver Project was a controlled action under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act controlling provisions for the proposed action are:
  - i. listed threatened species and communities (sections 18 and 18A).
- 2. The proposed action will be assessed in accordance with the *NSW Bilateral Agreement relating to environmental assessment 2015* and as such, is required to be assessed in the manner specified in Schedule 1 to that Agreement including, addressing the matters outlined in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations).
- 3. The proponent must undertake an assessment of all protected matters that may be impacted by the development under the controlling provisions identified in paragraph 1. The Commonwealth Department of the Environment and Energy (DoEE) considers that the proposed action is likely to have a significant impact on the following:
  - i. listed threatened species and communities (sections 18 and 18A):
    - a) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland -Critically Endangered;
    - b) Koala (Qld, NSW and the ACT) (*Phascolarctus cinereus*) Vulnerable;
    - c) Regent Honeyeater (Anthochaera phrygia) Critically Endangered;
    - d) Swift Parrot (Lathamus discolor) Critically Endangered; and
    - e) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (SE mainland population) (*Dasyurus maculatus maculatus* (SE mainland population)) Endangered.
- 4. Based on DoEE's Environment Reporting Tool and information provided by the Species Profiles and Threats Database (SPRAT), DoEE considers that there is a real chance or possibility that project activities will significantly impact on the following:
  - a) a leek-orchid (*Prasophyllum sp. Wybong (C.Phelps ORG 5269*)) Critically Endangered (pipeline only);
  - b) Philotheca ericifolia Vulnerable;
  - c) Tarengo Leek Orchid (*Prasophyllum petilum*) Endangered;
  - d) Small Purple-pea (Swainsona recta) Endangered;
  - e) Euphrasia arguta Critically Endangered;
  - f) Booroolong Frog (Litoria booroolongensis) Endangered;
  - g) Striped Legless Lizard (Delma impar) Vulnerable;
  - h) Superb Parrot (Polytelis swainsonii) Vulnerable;
  - i) Brush-tailed Rock Wallaby (Petrogale penicillata) Vulnerable;
  - j) Grey-headed Flying-fox (Pteropus poliocephalus) Vulnerable;
  - k) Pink-tailed Worm-lizard (Aprasia parapulchella) Vulnerable;
  - *I*) Corben's Long-eared Bat (*Nyctophilis corben*) Vulnerable;
  - m) Painted Honeyeater (Grantiella picta) Vulnerable; and

n) Large-eared Pied Bat (Chalinolobus dwyeri) - Vulnerable.

These species require further assessment, surveys and analysis to determine whether they are likely to be significantly impacted. Note that this may not be a complete list and it is the responsibility of the proponent to ensure any protected matters under this controlling provision are assessed for the Commonwealth decision-makers consideration.

5. The proponent must consider each of the protected matters under the triggered controlling provisions that may be impacted by the action. Note that this may not be a complete list and it is the responsibility of the proponent to undertake an analysis of the significance of the relevant impacts and ensure that all protected matters that are likely to be significantly impacted are assessed for the Commonwealth Minister's consideration.

## **General Requirements**

Relevant Regulations

6. The Environmental Impact Statement (EIS) must address the matters outlined in Schedule 4 of the EPBC Regulations and the matters outlined below in relation to the controlling provisions.

## Project Description

- 7. The title of the action, background to the action of the action and current status.
- The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on MNES.
- 9. How the action relates to any other actions that have been, or are being taken in the region affected by the action.
- 10. How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.

## Impacts

- 11. The EIS must include an assessment of the relevant impacts<sup>1</sup> of the action on the matters protected by the controlling provisions, including:
  - i. a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts;
  - ii. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
  - iii. analysis of the significance of the relevant impacts; and
  - iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

## Avoidance, mitigation and offsetting

- 12. For <u>each</u> of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including:
  - i. a description, and an assessment of the expected or predicted effectiveness of the mitigation measures,
  - ii. any statutory policy basis for the mitigation measures;

<sup>&</sup>lt;sup>1</sup> Relevant impacts are those impacts likely to significantly impact on any matter protected under the EPBC Act

- iii. the cost of the mitigation measures;
- iv. an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;
- v. the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.
- 13. Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.
- 14. For each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any:
  - i. conservation advice or recovery plan for the species or community,
  - ii. relevant threat abatement plan for a process that threatens the species or community
  - iii. wildlife conservation plan for the species
  - iv. any strategic assessment.

[Note: the relevant guidelines and policy statements for each species and community are available from the Department of the Environment Species Profiles and Threats Database. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl]

## Specific Risks

Key risks from the Commonwealth perspective include:

- 15. Impacts to threatened species and the ecological community listed above from clearing the vegetation.
- 16. Impacts from piping water, of unknown quality, from the Ulan Coalfield which could impacts GDEs.

## Key Issues

## Biodiversity (threatened species and communities and migratory species)

## Assessment Requirements

- 17. The EIS must identify <u>each\_EPBC</u> Act listed threatened species and community and migratory species likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the project area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted.
- 18. For <u>each</u> of the EPBC Act listed threatened species and communities and migratory species likely to be impacted by the action the EIS must provide a separate:
  - a. description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans;
  - b. details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements;
  - c. description of the relevant impacts of the action having regard to the full national extent of the species or community's range; and



- d. description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action;
- e. identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account;
- f. a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established.
- g. details of how the current published NSW Framework for Biodiversity Assessment (FBA) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; and
- details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the FBA and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites;

[Note: For the purposes of approval under the EPBC Act, it is a requirement that offsets directly contribute to the ongoing viability of the specific protected matter impacted by a proposed action and deliver an overall conservation outcome that improves or maintains the viability of the MNES i.e. 'like for like'. In applying the FBA, residual impacts on EPBC Act listed threatened ecological communities must be offset with Plant Community Type(s) (PCT) that are ascribed to the specific EPBC listed ecological community. PCTs from a different vegetation class will not generally be acceptable as offsets for EPBC listed communities.]

19. Any significant residual impacts not addressed by the FBA may need to be addressed in accordance with the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy. http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

# Other approvals and conditions

20. Information in relation to any other approvals or conditions required must include the information prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC Regulations 2000.

# Environmental Record of person proposing to take the action

21. Information in relation to the environmental record of a person proposing to take the action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations 2000.

# Information Sources

22. For information given in an EIS, the EIS must state the source of the information, how recent the information is, how the reliability of the information was tested; and what uncertainties (if any) are in the information.

# REFERENCES

- Environment Protection and Biodiversity Conservation Act 1999 section 51-55, section 96A(3)(a)(b), 101A(3)(a)(b), section 136, section 527E
- Environment Protection and Biodiversity Conservation Regulations 2000 Schedule 4
- NSW Assessment Bilateral Agreement (2015) Item 18.1, Item 18.5, Schedule 1
- Matters of National Environmental Significance Significant impact guidelines 1.1 (2013) EPBC
   Act
- Environment Protect and Biodiversity Conservation Act 1999 Environmental Offsets Policy
   October 2012
- Information Guidelines for Independent Expert Scientific Committee advice on coal seam gas and large coal mining development proposals (2014)

# Attachment 4

# Agencies Correspondence (2013 to 2015)

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BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

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Attachment 4 is only available on the digital version of this document





Development Assessments, Systems & Approvals Mining Projects Contact: Kane Winwood Phone: 02 9228 6298 Fax: 02 9228 6466 Email: kane.winwood@planning.nsw.gov.au

Mr Bob Markovich Kingsgate Bowdens Pty Limited 801/14 Martin Place SYDNEY NSW 2000

Dear Mr Markovich

#### State Significant Development - Director-General's Requirements Bowdens Silver Project (SSD-5765)

I have attached a copy of the Director General's environmental assessment requirements (DGRs) for the preparation of an Environmental Impact Statement (EIS) for the Bowdens Silver Project.

These DGRs are based on the information you have provided to date, and have been prepared in consultation with relevant government agencies. I have attached a copy of their comments for your information (see Attachment 2).

I wish to emphasise the importance of effective and genuine community consultation and the need for proposals to proactively respond to the community's concerns. Accordingly a comprehensive, detailed and genuine community consultation and engagement process must be undertaken during preparation of the EIS. This process must ensure that the community, including key special interests such as the Lue Action Group (LAG), is both informed of the proposal and is actively engaged in issues of concern to them. Sufficient information must be provided to the community so that it has a good understanding of what is being proposed and of the potential impacts.

On 6 February 2013 the Department met with representatives of the Lue community, including the LAG. Following this meeting the LAG provided the Department with a document which highlights a number of its concerns (see Attachment 3). The matters raised in this document should be considered during the preparation of the EIS.

Please note that the Department may alter these requirements at any time, and that you must consult further with the Department if you do not lodge a development application and EIS for the project within two years of the date of issue of these DGRs. The Department will review the EIS for the project carefully before putting it on public exhibition, and will require you to submit an amended EIS if it does not adequately address the DGRs.

Your project may require separate approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Department encourages you to confirm whether such an approval will be required as soon as possible. If an EPBC Act approval is required, I would appreciate it if you would advise the Department accordingly, as the Commonwealth approval process may be integrated into the NSW approval process, and supplementary DGRs may need to be issued.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit the development application and EIS for your project. This will enable the Department to:

- confirm the applicable fee (see Division 1AA, Part 15 of the Environmental Planning and Assessment Regulation 2000); and
- determine the number of copies (hard-copy and CD-ROM) of the EIS required for review.

Major Projects Assessment 23-33 Bridge St Sydney NSW 2000 GPO Box 39 Sydney NSW 2001 Phone 02 9228 6111 Fax 02 9228 6455 Website planning.nsw.gov.au



If you have any enquiries about these requirements, please contact Kane Winwood at the details listed above.

Yours sincerely

Blutto 25/2/13

David Kitto Director Mining & Industry Projects as delegate of the Director-General

# **Director General's Environmental Assessment Requirements**

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

# State Significant Development

Application Number	SSD 5765
Development	<ul> <li>The Bowdens Silver Project, which includes:</li> <li>developing an open cut silver, lead and zinc mine and associated infrastructure;</li> <li>extracting and processing up to 4 million tonnes of ore a year for up to 12 years;</li> <li>transporting the processed ore from the mine via road; and</li> <li>rehabilitating the site.</li> </ul>
Location	Maloneys (Bara) Road, Lue, in the Mid-Western Regional LGA
Applicant	Kingsgate Bowdens Pty Limited
Date of Issue	25 February 2013
Date of Issue General Requirements	<ul> <li>25 February 2013</li> <li>The Environmental Impact Statement (EIS) for the development must meet the form and content requirements in Clauses 6 and 7 of Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i>.</li> <li>In addition, the EIS must include a: <ul> <li>detailed description of the development, including:</li> <li>need for the proposed development;</li> <li>justification for the proposed mine plan, including efficiency of resource recovery, mine safety, and environmental protection;</li> <li>likely staging of the development - including construction, operational stage/s and rehabilitation;</li> <li>likely interactions between the development and existing, approved and proposed mining operations in the vicinity of the site;</li> <li>plans of any proposed building works;</li> </ul> </li> <li>consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments;</li> <li>risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment;</li> <li>detailed assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and</li> <li>a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the development, and</li> <li>consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS.</li> </ul>
	<ul> <li>a detailed calculation of the capital investment value (CIV) (as defined in clause 3 of the Environmental Planning and Assessment Regulation 2000) of the proposal, including details of all the assumptions and components from which the CIV calculation is derived;</li> <li>a close estimate of the jobs that will be created by the development during</li> </ul>

	<ul> <li>the construction and operational phases of the development; and</li> <li>certification that the information provided is accurate at the date of preparation.</li> </ul>
Key issues	<ul> <li>The EIS must address the following specific issues:</li> <li>Land Resources – including an Agricultural Impact Statement which includes a detailed assessment of the potential impacts on:</li> <li>soils and land capability (including salinisation and contamination);</li> <li>landforms and topography, including cliffs, rock formations, steep slopes, etc; and</li> <li>land use, including agricultural, forestry, conservation and recreational use;</li> <li>Air Quality – including a quantitative assessment of potential:</li> <li>construction and operational impacts, with a particular focus on extraction, processing and transport dust emissions, as well as diesel and blast firme emissions:</li> </ul>
	<ul> <li>reasonable and feasible mitigation measures to minimise processing, dust, diesel and blast fume emissions, including evidence that there are no such measures available other than those proposed; and</li> <li>monitoring and management measures, in particular real-time air quality monitoring;</li> </ul>
	Human Health – including:
	<ul> <li>a detailed Human Health Risk Assessment addressing how the project's environmental impacts in relation to air quality (including heavy metals), noise and drinking water quality, may impact on the health of the local community; and</li> </ul>
	- monitoring and management measures to reduce risk to numan nealth;
	<ul> <li>Water Resources – including.</li> <li>A detailed assessment of potential impacts on the quality and quantity of existing surface and ground water resources in accordance with the NSW Aquifer Interference Policy, including:</li> </ul>
	<ul> <li>o detailed modelling of potential groundwater impacts including identification of any highly productive groundwater (as defined by the Aquifer Interference Policy) or groundwater dependent ecosystems;</li> <li>o impacts on affected licensed water users and basic landholder</li> </ul>
	<ul> <li>rights; and</li> <li>impacts on riparian, ecological, geomorphological and hydrological values of watercourses, including watercourse diversions and environmental flows:</li> </ul>
	<ul> <li>a detailed site water balance, including a description of site water demands, water disposal methods (inclusive of volume and frequency of any water discharges), water supply infrastructure and water storage structures;</li> </ul>
	<ul> <li>an assessment of proposed water discharge quantities and quality/ies against receiving water quality and flow objectives;</li> <li>identification of any licensing requirements or other approvals upder the</li> </ul>
	Water Act 1912 and/or Water Management Act 2000;
	<ul> <li>demonstration that water for the construction and operation of the development can be obtained from an appropriately authorised and reliable supply in accordance with the operating rules of any relevant Water Sharing Plan (WSP);</li> </ul>
	<ul> <li>a description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant WSP or water source embargo; and</li> </ul>
	<ul> <li>a detailed description of the proposed water management system (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts;</li> </ul>
	Noise, Vibration & Blasting – including a quantitative assessment of
	potential: - construction, operational and off-site transport noise impacts; blasting impacts on people livesteck and property;
	- biasting impacts on people, investork and property,

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	<ul> <li>reasonable and feasible mitigation measures, including evidence that there are no such measures available other than those proposed; and</li> </ul>
	- monitoring and management measures, in particular real-time,
	attended noise monitoring and predictive meteorological forecasting;
•	Biodiversity – including:
	<ul> <li>measures taken to avoid, reduce or mitigate impacts on biodiversity;</li> <li>accurate estimates of proposed vogetation clearing;</li> </ul>
	- a detailed assessment of potential impacts of the development on any:
	<ul> <li>terrestrial or aquatic threatened species or populations and their</li> </ul>
	habitats, endangered ecological communities and groundwater
	dependent ecosystems; and
	<ul> <li>regionally significant remnant vegetation, or vegetation corridors;</li> <li>comprehensive offset strategy to ensure the development maintains</li> </ul>
	or improves the terrestrial and aquatic biodiversity values of the region
	in the medium to long term;
•	Heritage – including:
	- an Aboriginal cultural heritage assessment (including both cultural and
	archaeological significance) which must:
	determining and assessing impacts and developing and selecting
	mitigation options and measures;
	<ul> <li>outline any proposed impact mitigation and management measures</li> </ul>
	(Including an evaluation of the effectiveness and reliability of the
	- a Historic heritage assessment (including archaeology) which must
	<ul> <li>include a statement of heritage impact (including significance)</li> </ul>
	assessment) for any State significant or locally significant historic
	heritage items; and
	<ul> <li>outline any proposed mitigation and management measures (including an evaluation of the effectiveness and reliability of the</li> </ul>
	measures);
•	Traffic & Transport – including:
	- accurate predictions of the road traffic generated by the construction
	and operation of the project, - an assessment of potential traffic impacts on the safety and efficiency
	of the road network; and
	- a detailed description of the measures that would be implemented to
	maintain and/or improve the capacity, efficiency and safety of the road
	Visual – including
1	- a detailed assessment of the:
	<ul> <li>changing landforms on the site during the various stages of the</li> </ul>
	project; and
	<ul> <li>potential visual impacts of the project on private landowhers in the surrounding area as well as key vantage points in the public.</li> </ul>
	domain, including lighting impacts; and
	- a detailed description of the measures that would be implemented to
	minimise the visual impacts of the project;
•	waste - including:
	streams of the development, including leachate and acid-generating
	potential;
	- a leachate disposal strategy; and
	- a description of measures that would be implemented to minimise
	production of other waste, and ensure that that waste is appropriately
	Hazards – including:
	- a detailed description of the management of cyanide including
	transport, storage and handling; and
	- bushtires;
•	- a quantitative assessment of potential Scope 1 2 and 3 greenhouse
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	<ul> <li>gas emissions;</li> <li>a qualitative assessment of the potential impacts of these emissions on the environment; and</li> <li>an assessment of reasonable and feasible measures to minimise greenhouse gas emissions and ensure energy efficiency;</li> <li>Social &amp; Economic – including an assessment of the: <ul> <li>potential direct and indirect economic benefits of the project for local and regional communities and the State;</li> <li>potential impacts on local and regional communities, including: <ul> <li>increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services); and</li> <li>impacts on social amenity;</li> <li>a detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the project, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanism; and</li> <li>a detailed assessment of the costs and benefits of the development as a whole, and whether it would result in a net benefit for the NSW community;</li> </ul> </li> <li>Rehabilitation – including the proposed rehabilitation strategy for the site, having regard to the key principles in the Strategic Framework for Mine Closure, including: <ul> <li>rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria;</li> <li>nominated final land use, having regard to any relevant strategic land use planning or resource management plans or policies; and</li> <li>the potential for integrating this strategy with any other rehabilitation and/or offset strategies in the region</li> </ul> </li> </ul></li></ul>
Plans and Documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the <i>Environmental Planning and Assessment Regulation 2000.</i> These documents should be included as part of the EIS rather than as separate documents.
Consultation	<ul> <li>During the preparation of the EIS, you must consult with relevant local, State and Commonwealth Government authorities, service providers, community groups and potentially affected landowners.</li> <li>In particular you must consult with the: <ul> <li>Commonwealth Department of Sustainability, Environment, Water, Population and Communities;</li> <li>Office of Environment and Heritage (including the Heritage Branch);</li> <li>Environment Protection Authority;</li> <li>Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services;</li> <li>Department of Primary Industries (including the NSW Office of Water, NSW Forestry, Agriculture and Fisheries sections, Catchments and Lands (Crown Lands Division));</li> <li>Transport for NSW (including the Centre for Transport Planning, Roads and Maritime Services);</li> <li>NSW Ministry of Health;</li> <li>Department of Education and Communities;</li> <li>Transgrid;</li> <li>Central West Catchment Management Authority (CMA);</li> <li>Mid-Western Regional Council; and</li> <li>the Lue community, including the Lue Action Group.</li> </ul> </li> <li>The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.</li> </ul>

Further consultation after 2 years	If you do not lodge a DA and an EIS for the development within 2 years of the issue date of these DGRs, you must consult further with the Director-General in relation to the requirements for lodgement.
References	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, Attachment 1 contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this development.

BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

#### ATTACHMENT 1 Technical and Policy Guidelines

The following guidelines may assist in the preparation of the Environmental Impact Statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites: <u>http://www.planning.nsw.gov.au</u> <u>http://www.bookshop.nsw.gov.au</u> <u>http://www.publications.gov.au</u>

# Policies, Guidelines & Plans

Risk Assessment	
	AS/NZS 4360:2004 Risk Management (Standards Australia)
	HB 203: 203:2006 Environmental Risk Management – Principles & Process (Standards Australia)
Land Resources	
	Agricultural Impact Assessment Guidelines 2012 (DP&I)
	Agfact AC25: Agricultural Land Classification (NSW Agriculture)
	State Environmental Planning Policy No. 55 – Remediation of Land
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC)
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2002
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)
Health	
	Environmental Health Risk Assessment - Guidelines for assessing human
	health risks from environmental hazards (Commonwealth) Department of Health
Motor Decourses	and Ageing, and enHealth Council (2012).
water Resources	National Water Quality Management Strategy: Australian Guidelines for Fresh and
	Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water
	Quality Monitoring and Reporting (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems – _Effluent Management (ARMCANZ/ANZECC)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems – Use of Reclaimed Water (ARMCANZ/ANZECC)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (DEC)
	State Water Management Outcomes Plan
Surface Water	NSW Government Water Quality and River Flow Objectives (DECC)
Surface Water	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC)
	Managing Urban Stormwater: Soils & Construction (Landcom) and associated Volume 2E: Mines and Quarries.
	Managing Urban Stormwater: Treatment Techniques (DECC)
	Managing Urban Stormwater: Source Control (DECC)
	Floodplain Development Manual (DIPNR)
	Floodplain Risk Management Guideline (DECC)
	A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH)
	Technical Guidelines: Bunding & Spill Management (DECC)
	Environmental Guidelines: Use of Effluent by Irrigation (DECC)



	Office of Water Guidelines for Controlled Activities (2012)
	NSW Aquifer Interference Policy (DPI, 2012)
	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	NSW State Groundwater Policy Framework Document (DLWC, 1997)
	NSW State Groundwater Quality Protection Policy (DLWC, 1998)
Croundwatar	NSW State Groundwater Quantity Management Policy (DLWC, 1998)
Groundwater	Murray-Darling Basin Groundwater Quality. Sampling Guidelines. Technical Report
	Murray-Darling Basin Commission. Groundwater Flow Modelling Guideline
	Guidelines for the Assessment & Management of Groundwater Contamination
	Any relevant Water Sharing Plan for groundwater and surface water resources
Noise & Blasting	
Noise & Blasting	NSM Industrial Naisa Baliau (DECC)
	NSW Industrial Noise Policy (DECC)
	Environmental Noise Management – Assessing Vibration: a technical guide (DEC)
	NSW Road Noise Policy (DECCW)
	and around vibration (ANZECC)
Biodiversity	
	Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna – Amphibians (DECCW 2009)
	Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft (DECC 2004)
	Threatened Species Assessment Guidelines: the Assessment of Significance (DECC 2007)
	Guidelines for Threatened Species Assessment (DoP 2005)
	BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECCW 2008)
	NSW State Groundwater Dependent Ecosystem Policy (DLWC)
	Policy & Guidelines - Aquatic Habitat Management and Fish Conservation (NSW Fisheries)
	Policy & Guidelines - Fish Friendly Waterway Crossings (NSW Fisheries)
	State Environmental Planning Policy No. 44 – Koala Habitat Protection
	Principles for the Use of Biodiversity Offsets in NSW (OEH)
Heritage	
	Draft Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation (DEC 2005)
Abonginai	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)
	NSW Heritage Manual (NSW Heritage Office)
Historic	The Burra Charter (The Australia ICOMOS charter for places of cultural
Traffic O Transmost	significance)
Iraπic & Iransport	
	Guide to Traffic Generating Development (RTA)
Masta	Road Design Guide (RTA)
waste	Waste Classification Guidelines (DECC)
Hazarde	Waste Olassinication Ouldennes (DECO)
	State Environmental Planning Policy No. 33 – Hazardous and Offensive
	Development
	Hazardous and Offensive Development Application Guidelines - Applying SEPP 33
	Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis
Greenhouse Gases	
	National Greenhouse Accounts Factors (Australian Department of Climate Change (DCC))
	Guidelines for Energy Savings Action Plans (DEUS)



Socio-Economic	
	Draft Economic Evaluation in Environmental Impact Assessment (DoP)
_	Techniques for Effective Social Impact Assessment: A Practical Guide (Office of Social Policy, NSW Government Social Policy Directorate)
Rehabilitation	
	Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)
	Mine Closure and Completion – Leading Practice Sustainable Development
	Program for the Mining Industry (Commonwealth of Australia)
	Strategic Framework for Mine Closure (ANZMEC-MCA)



ATTACHMENT 2 Agency Input into Key Assessment Issues





Our reference Contact : FIL07/5599-07 & DOC13/4753 : Sheridan Ledger (02) 6332 7608

Mr Kane Winwood Team Leader, Mining Projects Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

13 February 2013

#### Dear Mr Winwood

I refer to your request for final Director-General's Requirements (DGRs) for the Proposed Bowden's Silver Project (the Project) from the Environment Protection Authority (EPA) following the Planning Focus Meeting (PFM) held on 6 February 2013.

As you would be aware, the EPA submitted draft DGRs for the Project to the Department of Planning and Infrastructure (DP&I) on 31 January 2013. Following the PFM, the EPA considers it appropriate to provide DP&I with assessment requirements additional to those previously provided. The additions to the EPA's DGR's are contained in Attachment 1.

Should you have any enquiries regarding this matter, please contact Sheridan Ledger at the Bathurst office of the EPA on (02) 6332 7608.

Yours sincerely

DARRYL CLIFT Head Central West Unit Environment Protection Authority

> PO Box 1386 Bathurst NSW 2795 Level 2, 203 – 209 Russell Street Bathurst NSW 2795 Tel: (02) 63 327 600 Fax: (02) 63 327 630 ABN 30 841 387 271 www.environment.nsw.gov.au



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#### Attachment 1 - EPA Additional DGRs Bowdens Silver Project

#### Air Quality

 Detail air emission control techniques/practices that will be employed by the proposal and demonstrate that these are best management practice, by applying the procedure outlined in *Coal Mine Particulate Matter Control Best Practice - Site-specific determination guideline* (November 2011). <u>http://www.environment.nsw.gov.au/resources/air/20110813coalmineparticulate.pdf</u>

#### Water

- Provide detailed water management strategies for all disturbance areas, paying particular attention to the waste rock emplacement areas and potential impacts on groundwater and offsite surface water resources including particular reference to the management of channel and overland flows into and within the disturbance area.
- Determine and detail the tailings management and monitoring strategy and dam design to be implemented, including an assessment of the potential impacts of tailings storage on surface and groundwater resources, contingency plans in the event of a leak or seep, rehabilitation and the long term management and feasibility.
- 3. Provide plans for the proposed relocation/realignment of all creeks and/or drainage lines including design, timelines and completion criteria and sufficient evidence to demonstrate that the proposed plans are achievable, reasonable and feasible in the short and the long term.

#### Noise

- 1. Detail the proposed hours of operation for each major noise source activity.
- Detail the monitoring program and justification process that will be utilised to alter mining activities from day and afternoon to 24 hour.
- Undertake a road traffic noise assessment in accordance with the requirements of the NSW Road Noise Policy <u>http://www.environment.nsw.gov.au/noise/traffic.htm</u>.

<u>Note</u>: The NSW Road Noise Policy replaced the Environmental Criteria for Road Traffic Noise from 1 July 2011. Guidance has been developed to assist practitioners and authorities understand which policy is to be applied to projects during the transition period from the Environmental Criteria for Road Traffic Noise (ECRTN) to the Road Noise Policy (RNP). The guidance material is at <u>http://www.environment.nsw.gov.au/noise/traffic.htm</u>

#### Site Layout

- Provide maps, at an appropriate scale, which clearly identifies the proposed site layout relevant to environmental features such as drainage lines, terrain etc, over the life of the Project.
- 2. Provide maps which show land ownership information and impacts assessment information at an appropriate scale.

#### Ancillary Activities

 Detail and assess the impacts of any onsite and offsite activity related to the Project, particularly electricity transmission lines, water pipe work, road realignments etc. Report No. 429/24



Our reference Contact : FII07/5599-07 & DOC13/1267 : Sheridan Ledger (02) 6332 7608

Mr Kane Winwood Team Leader, Mining Projects Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

31 January 2013

#### Dear Mr Winwood

I refer to your request, dated 11 January 2013, for the Environment Protection Authority (EPA) to provide draft Director-Generals Requirements (DGR's) for the proposed Bowden's Silver Project near Lue (the project).

The EPA has considered the details of the project as provided by the proponent. Utilising such information, please find attached the EPA's draft DGRs which the EPA expects to assist with the discussion of key issues at the Planning Focus Meeting (PFM) to be held on 6 February 2013.

Following the PFM, the EPA will provide to the Department of Planning and Infrastructure its DGRs.

Should you have any enquiries regarding this matter, please contact Sheridan Ledger at the Bathurst office of the EPA on (02) 6332 7608.

Yours sincerely

DARRYL CLIFT Head Central West Unit Environment Protection Authority

> PO Box 1386 Bathurst NSW 2795 Level 2, 203 – 209 Russell Street Bathurst NSW 2795 Tel: (02) 63 327 600 Fax: (02) 63 327 630 ABN 30 841 387 271 www.environment.nsw.gov.au

## Attachment 1 -- Draft Director-General's Requirements

#### Environmental impacts of the project

Impacts related to the following environmental issues need to be assessed, quantified and reported on:

- Air Issues
  - air quality
  - greenhouse gas
- Noise and vibration
- Water quantity and quality (surface and groundwater)
- Waste management (waste rock, tailings, sewage, chemical waste, general solid and putrescibles waste)
- Soils and contamination
- Offsite impacts from the relocation, replacement and/or addition of power lines and roads

Environmental assessments (EAs) should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is at Attachment 2.

#### Licensing requirements

On the basis of the information submitted to date, it appears the proposal is a scheduled activity Mining for Minerals under the *Protection of the Environment Operations Act 1997* (POEO Act) and will therefore require an Environment Protection Licence (EPL) if approval is granted. The EA should address the requirements of Section 45 of the POEO Act determining the extent of each impact and providing sufficient information to enable the EPA to determine appropriate limits for the EPL.

Should project approval be granted, the proponent will need to make a separate application to the EPA for an EPL for the proposed facility prior to undertaking any on site works. Additional information is available through the *DECCW Guide to Licensing* document (www.environment.nsw.gov.au/licensing/licenceguide.htm).

### SPECIFIC ISSUES

Air issues

#### Air quality

The goal should be to maintain existing rural air quality and protect sensitive receptors, both on and off site from adverse impacts of dust and odour and other relevant air pollutants. Background ambient air levels should be identified to inform the assessment.

Dust is of primary concern with potential emissions from general mining activities, onsite roads, conveyors, transfer points, loading facilities, stockpiles, the tailings dam etc.

The EA should include a detailed air quality impact assessment (AQIA). The AQIA should:

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# BOWDENS SILVER PTY LIMITED

Bowdens Silver Project

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- Assess the risk associated with potential discharges of fugitive and point source emissions for <u>all stages</u> of the proposal. Assessment of risk relates to environmental harm, risk to human heath and amenity.
- Justify the level of assessment undertaken on the basis of risk factors, including but not limited to:
  - a. proposal location;
  - b. characteristics of the receiving environment; and
  - c. type and quantity of pollutants emitted.
- Describe the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to:
  - a. meteorology and climate;
  - b. topography;
  - c. surrounding land-use; receptors; and
  - d. ambient air quality.
- 4. Include a detailed description of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of <u>all emissions</u> must be provided.
- Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.
- Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.
- Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2005)

http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf.

- 8. Demonstrate the projects ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997)* and the *POEO (Clean Air) Regulation (2002)*.
- 9. Provide an assessment of the project in terms of the priorities and targets adopted under the NSW State Plan 2010 and its implementation plan Action for Air.
- Detail emission control techniques/practices that will be employed by the proposal.

#### Greenhouse gas

- The EA should include a comprehensive assessment of, and report on, the project's predicted greenhouse gas emissions (tCO2e). Emissions should be reported broken down by:
  - a) direct emissions (scope 1 as defined by the Greenhouse Gas Protocol see reference below),



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 b) scope 2 and 3 indirect emissions (all other emissions that are a consequence of the mine's activities, including annual emissions for each year of the project; before and after implementation of the project, including annual emissions for each year of the project (construction, operation and decommissioning)).

- If relevant, greenhouse emission intensity (per unit of production) should be compared before and after the project. Emission intensity should be compared with best practice if possible.
- Greenhouse emissions should be estimated using an appropriate methodology in accordance with NSW, Australian and International Guidelines (refer guidelines mentioned in Attachment B).
- 4. The EA should identify which emissions would be covered by the Federal Government's Carbon Pollution reduction Scheme.
- The EA should also evaluate and report on the feasibility of measures to reduce greenhouse gas emissions associated with the project, concentrating on emissions not covered by the CPRS
- The proponent should also identify if there are any cost-effective opportunities to reduce scope 3 emissions (eg by using different methods of supply or distribution).

#### Impacts of Noise and Vibration

Potential impacts on the noise amenity of the surrounding area should be assessed in accordance with the NSW Government's Industrial Noise Policy (INP) and other relevant guidelines mentioned below, accounting for all noise sources associated with the project. In particular, seasonality assessments are to be undertaken to assess the impact of temperature inversions and wind conditions.

The noise assessment must include (but not be limited to) an assessment of the C-weighted noise (low frequency) as well as A-weighted noise.

 In relation to noise, the following matters should be addressed (where relevant) as part of the Environmental Assessment.

#### <u>General</u>

- 2. Construction noise associated with the proposed development should be assessed using the *Interim Construction Noise Guideline* (DECC, 2009). http://www.environment.nsw.gov.au/noise/constructnoise.htm
- 3. Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the Assessing Vibration: a technical guideline (DEC, 2006). http://www.environment.nsw.gov.au/noise/vibrationguide.htm
- 4. If blasting is required for any reasons during the construction or operational stage of the proposed development, blast impacts should be demonstrated to be capable of complying with the guidelines contained in *Australian and New Zealand Environment Council – Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration* (ANZEC, 1990). <u>http://www.environment.nsw.gov.au/noise/blasting.htm</u>

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Industry

- 5. Operational noise from all industrial activities (including private haul roads and private railway lines) to be undertaken on the premises should be assessed using the guidelines contained in the *NSW Industrial Noise Policy* (EPA, 2000) and *Industrial Noise Policy Application Notes.* 
  - http://www.environment.nsw.gov.au/noise/industrial.htm

#### Road

- Noise on public roads from increased road traffic generated by land use developments should be assessed using the guidelines contained in the Environmental Criteria for Road Traffic Noise (EPA, 1999). http://www.environment.nsw.gov.au/noise/traffic.htm
- Noise from new or upgraded public roads should be assessed using the Environmental Criteria for Road Traffic Noise (EPA, 1999). <u>http://www.environment.nsw.gov.au/noise/traffic.htm</u>

#### Waste, chemicals and hazardous materials

The EA should identify all wastes to be generated by all aspects of the project and identify procedures for the handling and management of all wastes produced. The handling of tailings and overburden material are important aspects for consideration.

Assessment of the potential for acid mine drainage from acid forming materials should be assessed and management /mitigation measures identified.

Management actions for tailings material during processing should be identified, including actions to prevent potential impacts to groundwater, surface water or any other environmental aspect.

Provide details of the quantity and type of both liquid and non-liquid waste generated, handled, processed or disposed of at the premises. Wastes must be classified according to the Waste Classification Guidelines (DECC 2008).

Provide details of how waste will be handled and managed onsite to minimise pollution, including:

a) Stockpile location and management

- Labelling of stockpiles for identification, ensuring that all waste is clearly identified and stockpiled separately from other types of material (especially the separation of any contaminated and non-contaminated waste).
- Proposed height limits for all waste to reduce the potential for dust and odour.
- Procedures for minimising the movement of waste around the site and double handling.
- Measures to minimise leaching from stockpiles into the surrounding environment, such as sediment fencing, geofabric liners etc.

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b) Provide details of waste rock emplacement areas with particular attention to:

- The quantity of waste rock likely to be generated;
- Proposed strategies for the handling, reuse/recycling and disposal of waste rock;
- Identification of the history of the waste rock and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material; and
- Designation of transport routes for the transport of waste rock.

Details of procedures for the assessment, handling, storage, transport and disposal of all **hazardous waste** used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.

Details of the type and quantity of any chemical substances (including hydrocarbon (oils and fuels), explosives etc.) to be used or stored and describe arrangements for their safe use and storage.

#### Soils

The EA should include:

- An assessment of potential impacts on soil and land resources should be undertaken, being guided by Soil and Landscape Issues in Environmental Impact Assessment (DLWC 2000). The nature and extent of any significant impacts should be identified. Particular attention should be given to:
  - Soil erosion and sediment transport in accordance with Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008).
- A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- Where required, add any specific assessment requirements relevant to the project.

#### Water

The environmental outcomes of the project in relation to water should be that:

- There is no pollution of waters (including surface and groundwater); and
- Polluted water (including process/tailings waters, wash down waters, polluted stormwater or sewerage) is captured onsite and collected, treated and beneficially reused, where safe and practical to do so.

The EA should document the measures that will achieve the above outcomes in the construction, operation and post operations phases of the project. Construction activities will need to demonstrate best practice sediment and erosion control and



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management in accordance with the reference document Managing Urban Stormwater: Soils and Construction (NSW Landcom)

#### Describe Proposal

- 1. Describe the project including position of any intakes and discharges, volumes, water quality and frequency of all water discharges.
- 2. Demonstrate that all practical options to avoid discharge have been implemented and environmental impact minimised where discharge is necessary.
- Include a water balance for the including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

#### Background Conditions

- Describe existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the proposal.
- 5. Describe any drainage lines, creeks lines etc that will be impacted by the project.
- 6. State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (<u>http://www.environment.nsw.gov.au/ieo/index.htm</u>). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values.
- State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality (<u>http://www.mincos.gov.au/publications/australian and new zealand guidelines</u> for fresh and marine water quality).
- State any locally specific objectives, criteria or targets which have been endorsed by the NSW Government.

Impact Assessment

- Describe the nature and degree of impact that any proposed discharges will have on the receiving environment.
- 10. Whether the project will significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
- Identify potential impacts on watercourses and the management/mitigation measures that will be implemented where mining activities occur in proximity to or within a watercourse.
- 12. Assess impacts against the relevant ambient water quality outcomes. Demonstrate how the proposal will be designed and operated to:

- protect the Water Quality Objectives for receiving waters where they are currently being achieved;
- contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.

13. Assess impacts on groundwater and groundwater dependent ecosystems.

14. Describe in detail how stormwater will be managed both during and after construction.

#### Monitoring

15. Describe how predicted impacts will be monitored and assessed over time.

- 16. The proponent should develop a water quality and aquatic ecosystem monitoring program to monitor the responses for each component or process that affects the Water Quality Objectives that includes, for example:
  - adequate data for evaluating compliance with water quality standards and/or Water Quality Objectives
  - measurement of pollutants identified or expected to be present in any discharge
- Water quality monitoring should be undertaken in accordance with the Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004) (http://www.environment.nsw.gov.au/resources/legislation/approvedmethodswater.pdf).

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# Attachment 2 - Guidance Material

· · · · · ·	Relevant Legislation
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+19 94+cd+0+N
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+19 74+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1 997+cd+0+N
Threatened Species Conservation Act 1995	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+101+1 995+cd+0+N
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N
· · · ·	Licensing
DECCW Guide to Licensing	www.environment.nsw.gov.au/licensing/licenceguide.htm
	Air Issues
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.environment.nsw.gov.au/resources/air/ammodelling053 61.pdf
POEO (Clean Air) Regulation 2002	http://www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+ 642+2002+cd+0+N
Greenhouse Gas	
The Greenhouse Gas Protocol: Corporate Standard, World Council for Sustainable Business Development & World Resources Institute	http://www.ghgprotocol.org/standards/corporate-standard
National Greenhouse Accounts (NGA) Factors, Australian Department of Climate Change (Latest release),	http://www.climatechange.gov.au/publications/greenhouse- acctg/national-greenhouse-factors.aspx
National Greenhouse and Energy Reporting System, Technical Guidelines (latest release)	http://www.climatechange.gov.au/en/government/initiatives/nation al-greenhouse-energy-reporting/tools-resources.aspx
National Carbon Accounting Toolbox	http://www.climatechange.gov.au/government/initiatives/ncat.aspx
Australian Greenhouse Emissions nformation System (AGEIS)	http://ageis.climatechange.gov.au/
	Noise and Vibration
nterim Construction Noise Guideline	http://www.environment.nsw.gov.au/noise/constructnoise.htm



Title	Web address
Assessing Vibration: a technical guideline (DEC, 2006)	http://www.environment.nsw.gov.au/noise/vibrationguide.htm
Australian and New Zealand Environment Council – Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990)	http://www.environment.nsw.gov.au/noise/blasting.htm
Industrial Noise Policy Application Notes	http://www.environment.nsw.gov.au/noise/traffic.htm
Environmental Criteria for Road Traffic Noise (EPA, 1999)	http://www.environment.nsw.gov.au/noise/traffic.htm
Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects (DECC, 2007)	http://www.environment.nsw.gov.au/noise/railinfranoise.htm
Environmental assessment requirements for rail traffic-generating developments	http://www.environment.nsw.gov.au/noise/railnoise.htm
Waste, Chemicals	and Hazardous Materials and Radiation
Waste	
Environmental Guidelines: Solid Waste Landfills (EPA, 1996)	http://www.environment.nsw.gov.au/resources/waste/envguidIns/s olidlandfill.pdf
Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)	http://www.environment.nsw.gov.au/resources/waste/envguidIns/in dustrialfill.pdf
Waste Classification Guidelines (DECC, 2008)	http://www.environment.nsw.gov.au/waste/envguidIns/index.htm
DECCW Resource recovery exemption	http://www.environment.nsw.gov.au/waste/RRecoveryExemptions. htm
5 x 5	Water and Soils
Acid sulphate soils	
Acid Sulfate Soils Planning Maps	http://canri.nsw.gov.au/download/
Acid Sulfate Soils Manual (Stone et al. 1998)	Manual available for purchase from: <u>http://www.landcom.com.au/whats-new/the-blue-book.aspx</u> Chapters 1 and 2 are on DoP's Guidelines Register at: Chapter 1 Acid Sulfate Soils Planning Guidelines: <u>http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%2</u> <u>OAcid%20Sulfate%20Soils%20Planning%20Guidelines.pdf</u> Chapter 2 Acid Sulfate Soils Assessment Guidelines:
Anid Culture Caile Laboratory Martha	http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%2 0Acid%20Sulfate%20Solls%20Assessment%20Guidelines.pdf
Guidelines (Ahern et al. 2004)	This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.planning.nsw.gov.au/DevelopmentAssessments/Regist erofDevelopmentAssessmentGuidelines/tabid/207/language/en- US/Default.aspx



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Title	Web address
Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	http://www.environment.nsw.gov.au/resources/clm/97104consulta ntsglines.pdf
Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	http://www.environment.nsw.gov.au/resources/clm/auditorglines06 121.pdf
Sampling Design Guidelines (EPA, 1995)	Available by request from DECCW's Environment Line
National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	http://www.ephc.gov.au/taxonomy/term/44
Soils – general .	
Soll and Landscape Issues in Environmental Impact Assessment (DLWC 2000)	http://www.dnr.nsw.gov.au/care/soil/soil_pubs/pdfs/tech_rep_34_n ew.pdf
Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008)	Vol 1 - Available for purchase at http://www.landcom.com.au/whats-new/publications-reports/the- blue-book.aspx Vol 2 - http://www.environment.nsw.gov.au/stormwater/publications.htm
Landslide risk management guidelines	http://www.australiangeomechanics.org/resources/downloads/
Site Investigations for Urban Salinity (DLWC, 2002)	http://www.environment.nsw.gov.au/resources/salinity/booklet3site investigationsforurbansalinity.pdf
Local Government Salinity Initiative Booklets	http://www.environment.nsw.gov.au/salinity/solutions/urban.htm
Water ·	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.mincos.gov.au/publications/australian and new zeala nd guidelines for fresh and marine water guality
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve dmethods-water.pdf

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Our Reference: V13/52 OUT13/2105

Mr Howard Reed Manager Mining Projects Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

Attention Kane Winwood

Dear Mr Reed

## Proposed Bowdens Silver Project Draft Director General's Requirements

Further to your email dated 25 January 2013 requesting draft Director General's Requirements please find below the NSW Trade & Investment, Division of Resources and Energy (DRE) comments for Kingsgate Bowdens Pty Ltd's silver project for the scheduled Planning Focus Meeting on 6 February 2013.

The following draft comments are provided by DRE to facilitate discussions at the upcoming meeting:

## Mineral Resource Issues:

The following issues need to be addressed in the EIS:

- A summary of the regional and local geology including information on the geological units in which the resource is located (stratigraphy, structure etc.)
- A description of the material to be mined including a description of the ore, low grade/mineralised waste and waste rock. This needs to include the mineralogy of the ore and related alteration and a description of each zone/lens to be mined (length, width depth, and any features different to the more general description).
- Detailed resource statement(s) including estimates for each pit/zone/lens to be mined.
- Plans and cross-sections summarising the resource and the extraction data. This needs to show the continuity of mineralised zones (including if it extends beyond the pit shells) as well as the pit shells etc.
- Project period details including the time taken for construction/establishment, mining and processing operations and rehabilitation/close down.

Minerals and Energy Division Level 6, 201 Elizabeth Street, Sydney NSW 2000 PO Box K220 HAYMARKET NSW 1240 Tel: (02)8289 3930 Fax: 02 9286 3208 ABN 51 734 124 190 www.industry.nsw.gov.au

R. W. CORKERY & CO. PTY. LIMITED

Bowdens Silver Project Report No. 429/24

- The amount of ore, low grade and waste rock to be mined and/or treated annually and during the life of the project from each pit. The intended life of the operation and planned annual extraction schedule including waste rock should be included.
- The characteristics of the ore to be treated as well as the characteristics of waste rock and tailings produced - including average major and trace element geochemistry and sulphide content (%) for each lens/zone.
- If there will be remnant zones of ore/mineralisation remaining in or adjacent to the planned open-cuts - this material should be included in future mining operations (particularly important if pits are to be backfilled).
- The EIS will also need to demonstrate that sufficient investigative drilling has been undertaken within areas of proposed infrastructure development to minimise possible sterilisation of valuable mineral resources.

Mining operations for this proposal will require the grant of a mining lease. Any mining lease granted will include the Mining Rehabilitation Environmental Management Process (MREMP).

#### Landform Design/Management:

#### Visual Amenity

A description of the visual impact and mitigation measures should be given. Consideration should be given to the aesthetics of Lue village and the surrounding rural area.

#### Open Cut

A description of the open cut pit geotechnical stability, predicted standing water level and long term water quality should be given. Options should be given in regards to the potential backfilling of open voids as to reduce long term safety and water quality issues that may arise.

#### **Residue Storage Facilities**

A description of residue storage facility design, including final cover design, should be given. The company should also demonstrate that permeability rates for the floor of the facility meet with current standards. A description of the characterisation of residue also needs to be provided.

#### Waste Rock Emplacements

A description of the final landform design should be given including final surface water management. Waste rock characterisation should detail the types of waste produced and the management and handling to ensure long term stability of any potential leachates.

#### Rehabilitation and Revegetation

Progressive rehabilitation methods are to be described including the management of topsoil and subsoil. A description of sediment and erosion control will also need to be provided.

Vegetation types and species are required to be documented. A description of potential species selection to be used in the regeneration of the area for future land use should also be given.

PAGE 2 OF 3



# Mine Closure:

Stakeholder Liaison

A commitment to effectively liaise with relevant stakeholders and the community regarding mine closure and concepts are to be documented.

#### Final Land Use

Conceptual final landforms are to be documented, including final surface water drainage design. Final land use options are to be consistent with relevant planning, environmental, rural and community values.

#### Monitoring:

Monitoring should include the provision of baseline data before mining commences, continuing to the end of mine life to ensure that the mining area is not contributing to any long term environmental degradation.

Parameters should be measured by licensing conditions and continual consultation with DRE.

Should you have any queries regarding these draft requirements, please contact Steve Cozens, Senior Project Officer, Development Coordination on telephone 8281 7335.

Yours sincerely

31/1/13 Will Hughes Acting Director Minerals Operations

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OUT13/ 3527

1 9 FEB 2013

Mr Kane Winwood Team Leader, Mining Projects NSW Department of Planning and Infrastructure GPO Box 39 SYDNEY NSW 2001

Email:kane.winwood@planning.nsw.gov.au

Dear Mr Winwood

Thank you for your email dated 11 February 2013 concerning Bowdens Silver Project, and the request from the Planning Focus Meeting for final version of Director General Requirements to be supplied.

The Office of Agricultural Sustainability & Food Security (O AS&FS) has reviewed the documentation supporting an application for Director – General's Requirements and considered the opinions of Departmental officers that attended the Planning Focus Meeting on 6 February 2013. It is requested that an Agricultural Impact Statement is included in the EA in accordance with the DP&I guidelines. It is noted that there is still some commercial agricultural activity in the immediate locality that should be noted in term of impact assessment, along with any rehabilitation objective that seeks to re-establish some of the site for agricultural use.

Attached is the standard format for an Agricultural Impact Statement.

If you wish to discuss the issue further please call Liz Rogers on telephone 02 63913642 or by email <u>liz.rogers@dpi.nsw.gov.au</u>

Yours sincerely

Rym Logos

Dr Regina Fogarty Director Office of Agricultural Sustainability & Food Security

Encl

Locked Bag 21, Orange NSW 2800 (161 Kite Street, Orange NSW 2800) Tel: 02 6391 3223 | Fax: 02 6391 3551 | www.dpi.nsw.gov.au | ABN: 72 189 919 072


# Attachment 1

# Suggested format for the Agricultural Impact Statement

1.0 AIS Introduction

- 2.0 Detailed assessment of the agricultural resources and agricultural production of the project area.
  - 2.1 Soil information
  - 2.2 Slope and land characteristics
  - 2.3 History of agricultural enterprises within project areas
  - 2.4 Location and areas of land to be temporarily removed from agriculture
  - 2.5 Location and area of land to be returned to agricultural use post project
  - 2.6 Location and area of land that will not be returned to agriculture, including areas to be used for environmental plantings or biodiversity offsets
  - 2.7 Agricultural enterprises to be undertaken on any buffer and/or offset zone lands for the life of the project
- 3.0 Identification of the agricultural resources and current enterprises within the surrounding locality of the project
  - 3.1 Agricultural resources within the locality
    - 3.1.1 Soil characteristics including soil type and depth
    - 3.1.2 Topography land capability tabulated
    - 3.1.3 Agricultural support infrastructure
    - 3.1.4 Water resources and extraction locations
    - 3.1.5 Location and type of agricultural industries

    - 3.1.6 Vegetation 3.1.7 Climate conditions
  - 3.2 Current agricultural enterprises within the surrounding locality

4.0 Assessment of impacts

- 4.1 Identification and assessment of the impacts of the project on agricultural resources or industries
  - 4.1.1 Effects on agricultural resources
  - 4.1.2 Consequential productivity effects on agricultural enterprises
  - 4.1.3 Uncertainty associated with the predicted impacts and mitigation measures
  - 4.1.4 Further risks
- 4.2 Account for physical movement of water away from agriculture
- 4.3 Assessment of socio-economic impacts
  - 4.3.1 Agricultural land values
  - 4.3.2 Local and regional agricultural enterprises
  - 4.3.3 Agricultural support services, local and regional employment
  - 4.3.4 Regional communities
  - 4.3.5 Visual amenity, landscape values and tourism infrastructure
  - 4.3.6 Economic analysis of project scenarios
  - Suggested references for methodologies
- 5.0 Mitigation measures
  - 5.1 Project alternatives
  - 5.2 Proposed monitoring programs to assess predicted versus actual impacts as the project progresses
  - 5.3 Trigger response plans and trigger points at which operations will cease or be modified or remedial actions will occur to address impacts including a process to respond to unforseen impacts.
  - 5.4 The proposed remedial actions to be taken in response to a trigger event
  - 5.5 The basis for assumptions made about the extent to which remedial actions will address and respond to impacts.
  - 5.6 demonstrated capacity for the rehabilitation of disturbed lands to achieve the final land use and restore natural resources
  - 5.7 demonstrated planning for progressive rehabilitation that minimises the extent of disturbance

6.0 Consultation

Further information

Appendix I checklist of maps and information





V13/480 OUT13/1674 24<sup>th</sup> January 2013 Kane Winwood Team Leader, Mining Projects NSW Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

Department of Planning Received
2 9 JAN 2013
Scanning Room

Dear Kane

# RE: Kinsgate- Bowdens' Silver Project (SSD12\_5765) – Fisheries NSW Director General Requirements

*Fisheries NSW* are responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, the Department ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act respectively) and the associated *Policy and Guidelines for Aquatic Habitat Management and Fish Conservation* (1999).

*Fisheries NSW* has reviewed the PEA and offers the following comments. The EA should specifically address the impacts on the aquatic ecology and controls to be established as proposed below.

# AQUATIC ECOLOGICAL ASSESSMENT

The aquatic ecological environmental assessment should include the following information;

- A recent aerial photograph (preferably colour) of the locality (or reproduction of such a photograph) should be provided.
- Area which may be affected either directly or indirectly by the development or activity should be identified and shown on an appropriately scaled map (and aerial photographs).
- · Waterways within the area of development are to be identified.
- Description of aquatic and riparian vegetation should be presented and mapped.
- The extent of aquatic habitat and riparian vegetation removal or modification
   which may result from the proposed development,
- Aspects of the management of the proposal which relate to impact minimisation and site rehabilitation e.g. Rehabilitation Plans, Environment Management Plans, etc.

FISHERIES AQUACULTURE, CONSERVATION & MARINE PARKS BRANCH TAMWORTH AGRICULTURAL INSTITUTE 4 Marsden Park Road CALALA NSW 2340 www.industry.nsw.gov.au

Tel: 02 6763 1255 Fax: 02 6763 1265



# **KEY ISSUES**

# Waterway Crossings & Fish Barriers

*Fisheries NSW* strongly supports the *NSW Weirs Policy*. The goal of this policy is to halt and, where possible, reduce and remediate the environmental impact of weirs. *"The Installation and Operation of Instream Structures that alter Natural Flow Regimes of Rivers and Streams"* has been listed as a Key Threatening Process under Schedule 6 Of the *Fisheries Management Act* 1994 and the department has a responsibility to limit these impacts where possible.

As the project involves the construction of gauging stations on waterways and may involve the construction of new culverts or access tracks it is important that the construction of waterway crossings is in accordance with *Fisheries NSW* Guideline document: *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.* As for gauging stations, it is important that best management practice is used so as to minimise and ameliorate the impacts on fish passage.

#### Riparian Buffer Zones

Fisheries NSW policy advocates the use of riparian buffer zones as per the Policy and Guidelines Aquatic Habitat Management and Fish Conservation 1999 available on the Department's website at http://www.dpi.nsw.gov.au/fisheries/habitat/protecting-habitats/toolkit#Policies-&guidelines which states that "Terrestrial areas adjoining freshwater, estuarine or coastal habitats be carefully managed in order to minimise land use impacts on these aquatic habitats. As a precautionary approach, buffer zones of at least 50 metres wide should be established and maintained, with their natural features and vegetation preserved". The department anticipates that adequate riparian buffer zones will be established adjacent to Hawkins Creek and its tributaries in order to minimise the impacts of works on waterways.

If you have any queries please call me on 6763 1255 or 0429 908 856.

Yours Sincerely

D. Word

David Ward Fisheries Conservation Manager (Greater Darling Region)

FISHERIES AQUACULTURE, CONSERVATION & MARINE PARKS BRANCH TAMWORTH AGRICULTURAL INSTITUTE 4 Marsden Park Road CALALA NSW 2340

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BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

Office of Environment & Heritage

> Your reference: Our reference: Contact:

DOC13/2095 Renee Shepherd Ph: 02 6883 5358

Kane Winwood Team Leader, Mining Projects Department of Planning and Infrastructure GPO Box 39 Sydney NSW 2001

Dear Mr Winwood

# **RE: Bowdens Silver Project, Lue NSW**

I refer to your email dated 11 January 2013 requesting Director General's requirements on the above proposal from the Office of Environment and Heritage (OEH). These are provided in Attachment 1 and 2.

Should you require further information please contact Renee Shepherd, Conservation Planning Officer on (02) 6883 5358.

Yours sincerely,

R. Jaylor

ROBERT TAYLOR Manager, Environment and Conservation Programs Regional Operations Group

> PO Box 2111 Dubbo NSW 2830 Level 1 48-52 Wingewarra Street Dubbo NSW Tel: (02) 6883 5312 Fax: (02) 6884 8675 ABN 30 841 387 271 www.environment.nsw.gov.au



Attachment 1

# The OEH's Recommended Environmental Assessment Requirements (EARs) For Bowdens Silver Project, Lue NSW

# 1. Environmental impacts of the project

1. Impacts related to the following environmental issues need to be assessed, quantified and reported on:

- Aboriginal cultural heritage
- Biodiversity
- Greenhouse gas emissions

Environmental assessments (EAs) should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is at **Attachment 2**.

# 2. Aboriginal cultural heritage

The EA report should contain:

- 1. A description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed development.
- 2. A description of the sensitivity (in relation to cultural heritage) of different landforms present in the landscape affected by the project.
- 3. A description of the cultural heritage values, including the significance of the Aboriginal objects and declared Aboriginal places, that exist across the whole area that will be affected by the proposed development, and the significance of these values for the Aboriginal people who have a cultural association with the land.
- A description of how the requirements for consultation with Aboriginal people as specified in clause 80C of the National Parks and Wildlife Regulation 2009 have been met.
- 5. The views of those Aboriginal people regarding the likely impact of the proposed development on their cultural heritage. If any submissions have been received as a part of the consultation requirements, then the report must include a copy of each submission and your response.
- A description of the actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified.
- 7. A description of any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places.



- A description of any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm or, if this is not possible, to manage (minimise) harm.
- Documentation of discussions with the Aboriginal stakeholders regarding commitments from the proponent related to social, economic and/or conservation gains to offset any loss of cultural heritage.
- 10. A specific Statement of Commitment that the proponent will complete an Aboriginal Site Impact Recording Form and submit it to the Aboriginal Heritage Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through the proposed development.
- 11. The Assessment must be undertaken by a suitable qualified heritage consultant.

In addressing these requirements, the proponent must refer to the following documents:

- a) Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (Department of Planning, 2005). These guidelines identify the factors to be considered in Aboriginal cultural heritage assessments for development proposals under Part 3A of the EP&A Act.
- b) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010) - <u>http://www.environment.nsw.gov.au/licences/consultation.htm</u>. This document further explains the consultation requirements that are set out in clause 80C of the National Parks and Wildlife Regulation 2009. The process set out in this document must be followed and documented in the Environmental Assessment Report.
- c) Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010) -<u>http://www.environment.nsw.gov.au/licences/archinvestigations.htm</u>. The process described in this Code should be followed and documented where the assessment of Aboriginal cultural heritage requires an archaeological investigation to be undertaken.

### Notes:

1. An Aboriginal Site Impact Recording Form

(http://www.environment.nsw.gov.au/licences/DECCAHIMSSiteRecordingForm.ht m) must be completed and submitted to the Aboriginal Heritage Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through archaeological investigations required or permitted through these environmental assessment requirements.

 Under section 89A of the National Parks and Wildlife Act 1974, it is an offence for a person not to notify DECCW of the location of any Aboriginal object the person becomes aware of, not already recorded on the Aboriginal Heritage Information Management System (AHIMS). An AHIMS Site Recording Form should be completed and submitted to the AHIMS Registrar (http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm), for each Aboriginal site found during investigations.

# 3. Greenhouse gas

1. The EA should include a comprehensive assessment of, and report on, the project's predicted greenhouse gas emissions (tCO2e). Emissions should be reported broken down by:



- a) direct emissions (scope 1 as defined by the Greenhouse Gas Protocol see reference below),
- b) indirect emissions from electricity (scope 2), and
- c) upstream and downstream emissions (scope 3)

before and after implementation of the project, including annual emissions for each year of the project (construction, operation and decommissioning).

- The EA should include an estimate of the greenhouse emissions intensity (per unit of production). Emissions intensity should be compared with best practice if possible.
- 3. The emissions should be estimated using an appropriate methodology, in accordance with NSW, Australian and international guidelines (see below).
- 4. The proponent should also evaluate and report on the feasibility of measures to reduce greenhouse gas emissions associated with the project. This could include a consideration of energy efficiency opportunities or undertaking an energy use audit for the site.

#### 4. Biodiversity

Biodiversity impacts can be assessed using **either** the BioBanking Assessment Methodology (scenario 1) or a detailed biodiversity assessment (scenario 2). The requirements for each of these approaches are detailed below.

The BioBanking Assessment Methodology can be used **either** to obtain a BioBanking statement, or to assess impacts of a proposal and to determine required offsets without obtaining a statement. In the latter instances, if the required credits are not available for offsetting, appropriate alternative options may be developed in consultation with OEH officers and in accordance with the 'NSW OEH interim policy on assessing and offsetting biodiversity impacts of Part 3A, State significant development (SSD) and State significant infrastructure (SSI) projects.'

Scenario 1 - Where a proposal is assessed using the BioBanking Assessment Methodology (BBAM)

- Where a BioBanking Statement is being sought under Part 7A of the Threatened Species Conservation Act 1995 (TSC Act), the assessment must be undertaken by an accredited BioBanking assessor (as specified under Section 142B (1)(c) of the TSC Act 1995) and done in accordance with the <u>BioBanking Assessment Methodology and Credit Calculator Operational Manual</u> (DECCW, 2008). To qualify for a BioBanking Statement a proposal must meet the 'improve or maintain' standard.
  - 1a. The Environmental Impact Statement (EIS) should include a specific Statement of Commitments that reflects all requirements of the BioBanking Statement including the number of credits required and any DG approved variations to impact on Red Flags.
- Where the BioBanking Assessment Methodology is being used to assess impacts of a proposal and to determine required offsets, and a BioBanking Statement is not being obtained, the EIS should contain a detailed biodiversity assessment and all components of the assessment must be undertaken in accordance with the <u>BioBanking Assessment Methodology and Credit Calculator Operational</u> <u>Manual</u> (DECCW, 2008).

2a. The EIS should include a specific Statement of Commitments which:



- is informed by the outcomes of the proposed BioBanking assessment offset package;
- sets out the ecosystem and species credits required by the BioBanking Assessment Methodology and how these ecosystem and/or species credits will be secured and obtained;
- if the ecosystem or species credits cannot be obtained, provides appropriate alternative options to offset expected impacts, noting that an appropriate alternative option may be developed in consultation with OEH officers and in accordance with OEH policy;
- demonstrates how all options have been explored to avoid red flag areas; and
- includes all relevant 'BioBanking files (e.g. \*.xml output files), data sheets, underlying assumptions (particularly in the selection of vegetation types from the vegetation types database), and documentation (including maps, aerial photographs, GIS shape files, other remote sensing imagery etc.) to ensure that the OEH can conduct an appropriate review of the assessment.
- 3. Where the 'NSW OEH interim policy on assessing and offsetting biodiversity impacts of Part 3A, State significant development (SSD) and State significant infrastructure (SSI) projects' is being used then the proponent must stipulate which level(s) of offset is being offered in relation to each of the vegetation communities and threatened species that require species credits. In accordance with the interim policy, justification must be provided as to why it is appropriate to apply the Tier 2 ('no net loss') or Tier 3 ('mitigated net loss') outcomes. In considering whether the mitigated net loss standard is appropriate, justification must be provided on: (i) whether alternative offset sites (other than credits) are available on the market; and (iii) the overall cost of the offsets and whether these costs are reasonable given the circumstances'. This must be to satisfaction of, and in consultation with, OEH.
- 4. Where appropriate, likely impacts (both direct and indirect) on any adjoining and/or nearby OEH estate reserved under the National Parks and Wildlife Act 1974 or any marine and estuarine protected areas under the Fisheries Management Act 1994 or the Marine Parks Act 1997 should be considered. Please refer to the <u>Guidelines for developments adjoining land and water</u> <u>managed by the Department of Environment, Climate Change and Water</u> (DECCW, 2010).
- 5. With regard to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, the assessment should identify and assess any relevant Matters of National Environmental Significance and whether the proposal has been referred to the Commonwealth or already determined to be a controlled action.

Scenario 2 - Where a proposal is assessed outside the BioBanking Assessment Methodology:

- 1. The EIS should include a detailed biodiversity assessment, including assessment of impacts on threatened biodiversity, native vegetation and habitat. This assessment should address the matters included in the following sections.
- A field survey of the site should be conducted and documented in accordance with relevant guidelines, including:



- the <u>Threatened Species Survey and Assessment Guidelines: Field Survey</u> <u>Methods for Fauna -Amphibians</u> (DECCW, 2009);
- <u>Threatened Biodiversity Survey and Assessment: Guidelines for</u> <u>Developments and Activities - Working Draft</u> (DEC, 2004); and
- Threatened species survey and assessment guideline information on <u>www.environment.nsw.gov.au/threatenedspecies/surveyassessmentgdlns.ht</u> m.
- Commonwealth survey requirements (birds, bats, reptiles, frogs, fish and mammals):<u>http://www.environment.gov.au/epbc/publications/guidelines.html</u>.
   These are relevant when species or communities listed under the Environment Protection and Biodiversity Conservation Act are present.

It is preferable for proponents to use the Interim Vegetation Mapping Standard data form to collect the vegetation plot data for the project site, and any offset site associated with the project. This will provide data that is useful for vegetation mapping as well as in the BioBanking Assessment Methodology. This is available at <a href="http://www.environment.nsw.gov.au/research/VISplot.htm">http://www.environment.nsw.gov.au/research/VISplot.htm</a>.

If a proposed survey methodology is likely to vary significantly from the above methods, the proponent should discuss the proposed methodology with the OEH prior to undertaking the EIS, to determine whether the OEH considers that it is appropriate.

Recent (less than five years old) surveys and assessments may be used. However, previous surveys should not be used if they have:

- been undertaken in seasons, weather conditions or following extensive disturbance events when the subject species are unlikely to be detected or present, or
- utilised methodologies, survey sampling intensities, timeframes or baits that are not the most appropriate for detecting the target subject species,

unless these differences can be clearly demonstrated to have had an insignificant impact upon the outcomes of the surveys. If a previous survey is used, any additional species listed under the TSC Act since the previous survey took place, must be surveyed for.

Determining the list of potential threatened species for the site must be done in accordance with the Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft (DEC, 2004) and the Guidelines for Threatened Species Assessment (Department of Planning, July 2005). The OEH Threatened Species website http://www.environment.nsw.gov.au/threatenedspecies/ and the Atlas of NSW Wildlife database must be the primary information sources for the list of threatened species present. The BioBanking Threatened Species Database, the Vegetation Types databases (available OEH on website at http://www.environment.nsw.gov.au/biobanking/biobankingtspd.htm and http://www.environment.nsw.gov.au/biobanking/vegtypedatabase.htm, respectively) and other data sources (e.g. PlantNET, Online Zoological Collections of Australian Museums (http://www.ozcam.org/), previous or nearby surveys etc.) may also be used to compile the list.

- 3. The EIS should contain the following information as a minimum:
  - a. The requirements set out in the *Guidelines for Threatened Species* Assessment (Department of Planning, July 2005);



- b. Description and geo-referenced mapping of study area (and associated spatial data files), e.g. overlays on topographic maps, satellite images and /or aerial photos, including details of map datum, projection and zone, all survey locations, vegetation communities (including classification and methodology used to classify), key habitat features and reported locations of threatened species, populations and ecological communities present in the subject site and study area. Separate spatial files (.shp format) to be provided to the OEH should include, at a minimum, shapefiles of the project site, impact footprint, vegetation mapping and classification for both the impact and any offset site(s);
- Description of survey methodologies used, including timing, location and weather conditions;
- d. Detailed description of vegetation communities (including classification and methodology used to classify) and including all plot data. The vegetation classification used needs to be matched with Biometric and Endangered Ecological Community classifications. The condition of vegetation needs to be documented included areas of derived grassland. Plot data should be supplied to the OEH in electronic format (eg MS-Excel) and organised by vegetation community;
- e. Details, including qualifications and experience of all staff undertaking the surveys, mapping and assessment of impacts as part of the EIA;
- f. Identification of national and state listed threatened biota known or likely to occur in the study area and their conservation status;
- g. Description of the likely impacts of the proposal on biodiversity and wildlife corridors, including direct and indirect and construction and operation impacts. Wherever possible, quantify these impacts such as the amount of each vegetation community or species habitat to be cleared or impacted, or any fragmentation of a wildlife corridor;
- Identification of the avoidance, mitigation and management measures that will be put in place as part of the proposal to avoid or minimise impacts, including details about alternative options considered and how long term management arrangements will be guaranteed;
- Description of the residual impacts of the proposal. If the proposal cannot adequately avoid or mitigate impacts on biodiversity, then a biodiversity offset package is expected (see the requirements for this at point 6 below); and
- j. Provision of specific Statement of Commitments relating to biodiversity.
- 4. An assessment of the significance of direct and indirect impacts of the proposal must be undertaken for threatened biodiversity known or considered likely to occur in the study area based on the presence of suitable habitat. This assessment must take into account:
  - a. the factors identified in s.5A of the EP&A Act; and
  - b. the guidance provided by The Threatened Species Assessment Guideline The Assessment of Significance (DECCW, 2007) which is available at: <u>http://www.environment.nsw.gov.au/resources/threatenedspecies/tsaguide0</u> <u>7393.pdf</u>
- 5. Where an offsets package is proposed by a proponent for impacts to biodiversity (and a BioBanking Statement has not been sought) this package should:

- a) Meet either the OEH's Principles for the use of biodiversity offsets in NSW<sup>1</sup>, which are available at: <u>www.environment.nsw.gov.au/biocertification/offsets.htm</u>, or the OEH Interim policy on assessing and offsetting biodiversity impacts of part 3A developments;
- b) Take account of landscape design principles such patch size and building onto and connecting existing remnants.
- c) Identify the conservation mechanisms to be used to ensure the long term protection and management of the offset sites; and
- d) Include an appropriate Management Plan (such as vegetation or habitat) that has been developed as a key amelioration measure to ensure any proposed compensatory offsets, retained habitat enhancement features within the development footprint and/or impact mitigation measures (including proposed rehabilitation and/or monitoring programs) are appropriately managed and funded.
- 6. Where appropriate, likely impacts (both direct and indirect) on any adjoining and/or nearby OEH estate reserved under the *National Parks and Wildlife Act* 1974 or any marine and estuarine protected areas under the *Fisheries Management Act* 1994 or the *Marine Parks Act* 1997 should be considered. Refer to the *Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water* (DECC, 2010).
- An assessment of the cumulative impacts on biodiversity, and surface and ground water quality and quantity (including flooding) needs to be undertaken in the context of other mining developments in the vicinity of the Bowdens Silver Project.
- 8. With regard to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the assessment should identify any relevant Matters of National Environmental Significance and whether the proposal has been referred to the Commonwealth or already determined to be a controlled action.

# 5. GIS layers

The proponent must include with their Environmental Assessment to OEH spatial layer(s) that details the:

- Legal Premise boundary or Mining Lease (ML) / Application boundary;
- Mine's footprint or Proposed Extraction Approval Area;
- Mine Infrastructure;

<sup>1</sup> Please note that the OEH's *Principles for the use of biodiversity offsets in NSW* ('the Principles') and the *Interim policy on assessing and offsetting biodiversity impacts of Part 3A developments* ('the Interim policy') require offsets to be based on a quantitative assessment of the loss in biodiversity from the proposal and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable, and used for calculating both the impact and offset sites. Even where a proponent does not intend to use the BioBanking Assessment Methodology and Credit Calculator (Scenario 1), use of a suitable alternative metric, justified in the EA, is necessary to demonstrate that the proposal is consistent with the Principles or the Interim policy. Ultimately the proponent is expected to demonstrate quantitatively that the biodiversity losses associated with the project will be adequately compensated for by the improvement in vegetation condition and security expected from the offset site. This cannot be properly determined by a hectare comparison alone.



- Boundary of any offset sites;
- Vegetation mapping for both the impact and any offset site(s); and
- Vegetation sample plot location for both the impact and offset site(s).

This information must be provided in an Esri geodatabase (9.3) or shapefile format or any esri compatible dataset' in GDA or MGA 94.'

 Distribution records for plants and animal species in a format suitable to upload to the NSW Wildlife Atlas. See http://www.environment.nsw.gov.au/wildlifeatlas/about.htm#contribute

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# Attachment 2 - Guidance Material

Title	Web address			
Relevant Legislation				
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/			
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N			
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+19 94+cd+0+N			
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+19 74+cd+0+N			
Threatened Species Conservation Act 1995	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+101+1 995+cd+0+N			
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N			
Aboriginal Cultural Heritage				
Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (2005)	Available from DoP&1.			
Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	http://www.environment.nsw.gov.au/licences/consultation.htm			
Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)	http://www.environment.nsw.gov.au/licences/archinvestigations.ht m			
Aboriginal Site Impact Recording Form	http://www.environment.nsw.gov.au/licences/DECCAHIMSSiteRec ordingForm.htm			
Aboriginal Heritage Information Management System (AHIMS) Registrar	http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm			
Greenhouse Gas				
The Oreachaura Ore Data d				
Corporate Standard, World Council for Sustainable Business Development & World Resources Institute	http://www.ghgprotocol.org/standards/corporate-standard			
National Greenhouse Accounts (NGA) Factors, Australian Department of Climate Change (Latest release),	http://www.climatechange.gov.au/publications/greenhouse- acctg/national-greenhouse-factors.aspx			
National Greenhouse and Energy Reporting System, Technical Guidelines (latest release)	http://www.climatechange.gov.au/en/government/initiatives/nation al-greenhouse-energy-reporting/tools-resources.aspx			
National Carbon Accounting Toolbox	http://www.climatechange.gov.au/government/initiatives/ncat.aspx			
Australian Greenhouse Emissions Information System (AGEIS)	http://ageis.climatechange.gov.au/			



Title	Web address	
	Biodiversity	
BioBanking Assessment Methodology (DECC, 2008)	http://www.environment.nsw.gov.au/resources/biobanking/08385b bassessmethod.pdf	
BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECCW, 2008)	http://www.environment.nsw.gov.au/biobanking/operationalmanual .htm	
Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna -Amphibians (DECCW, 2009)	http://www.environment.nsw.gov.au/resources/threatenedspecies/ 09213amphibians.pdf	
Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft (DEC, 2004)	http://www.environment.nsw.gov.au/resources/nature/TBSAGuidel inesDraft.pdf	
Guidelines for Threatened Species Assessment (Department of Planning, July 2005)	Draft available from DoP&I	
The OEH Threatened Species website	http://www.environment.nsw.gov.au/threatenedspecies/	
Atlas of NSW Wildlife	http://wildlifeatlas.nationalparks.nsw.gov.au/wildlifeatlas/watlas.jsp	
BioBanking Threatened Species Database	http://www.environment.nsw.gov.au/biobanking/biobankingtspd.ht m	
Vegetation Types databases	http://www.environment.nsw.gov.au/biobanking/vegtypedatabase. htm	
PlantNET	http://plantnet.rbgsyd.nsw.gov.au/	
Online Zoological Collections of Australian Museums	http://www.ozcam.org/	
Threatened Species Assessment Guideline - The Assessment of Significance (DECCW, 2007)	http://www.environment.nsw.gov.au/resources/threatenedspecies/t saguide07393.pdf	
Principles for the use of biodiversity offsets in NSW	http://www.environment.nsw.gov.au/biocertification/offsets.htm	
OEH Interim policy on assessing and offsetting biodiversity impacts of State Significant developments	URL not currently available	
OEH Estate		
Land reserved or acquired under the NPW Act		
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchatoz .aspx	
OEH Revocation of Land Policy	http://www.environment.nsw.gov.au/policies/RevocationOfLandPol icy.htm	
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/protectedareas/105 09devadjdeccw.pdf	
Flooding		
Floodplain development manual	http://www.dnr.nsw.gov.au/floodplains/manual.shtml	



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Page 1 of 3

# Kane Winwood - Re: Bowdens Silver Project - Request for DGRs - Mid-Western LGA

From:	<therese.jones@gwahs.health.nsw.gov.au></therese.jones@gwahs.health.nsw.gov.au>
то:	"Winwood, Kane" <kane.winwood@planning.nsw.gov.au></kane.winwood@planning.nsw.gov.au>
Date:	24/01/2013 1:35 PM
Subject:	Re: Bowdens Silver Project - Request for DGRs - Mid-Western LGA
CC:	"Ingo Steppat" <ingo.steppat@gwahs.health.nsw.gov.au></ingo.steppat@gwahs.health.nsw.gov.au>

Hi Kane

Ingo Steppat will be the Western NSW LHD rep at the meeting. he can be contacted on 02 68 415579 and email: <a href="mailto:ingo.steppat@gwahs.health.nsw.gov.au">ingo.steppat@gwahs.health.nsw.gov.au</a>

After review of the background document we have identified a number of concerns:

1. Run off from the area eventually ends up in the Cudgegong river which feeds into Burrendong dam. A tailings dam has been identified for construction. Concern over possible failure of the dam which could lead to contaminated water entering the river system. The Mine must have an emergency plan in place which covers for this type of event.

2. Dust suppression spraying is briefly discussed. As it is in a river catchment we need to know what may/will be used for dust suppression. If substances other than water are used they should be in the project plan with controls identified.

3. Ground water bores: It has been identified that there are bores in the area and that some of the neighboring properties rely on these for water. Information on the depth of the open cut mine, effect and disruption to aquifers and what preventative controls will be put into place to prevent contamination of these aquifers would be useful.

4. Lead is an issue as they will be processing it along with all other extracted material. Lead has already been found in the environment without mining contributing to levels. Dust control on site and during processing of materials should be at a level to prevent further contamination.

5. Information required on what they intend to do with the tailings dam at the end of the project.

6. It would have been beneficial for key stakeholders to undertake a site visit prior to the meeting in order to see the area in question.

Hope these issues assist you.

#### Regards

Lyndal O'Leary

A/Director Population Health

Mobile: 0429921431

#### Office: 02 68412370

for Dr Thérèse Jones Director Population Health | Population Health Executive Officer, Greater Western Human Research Ethics Committee - Adjunct Senior Lecturer, School of

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Public Health|University of Sydney, Level 1, 230 Howick Street, BATHURST NSW 2795 Tel. 02 6339 5600 | Fax. 02 6339 5632 | Mob. 0427 894 454 | therese.jones@gwahs.health.nsw.gov.au

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>>> "Kane Winwood" <Kane.Winwood@planning.nsw.gov.au> 11/01/2013 3:50 pm >>> All,

The Department has received a request from Kingsgate Bowdens Pty Ltd for the provision of Director-General's Requirements (DGRs) for the Bowdens Silbver Project near Lue, in the Mid-Western Regional Council local government area.

It is the Department's intent to hold a Planning Focus Meeting for the proposal, tentatively scheduled for the first week in February, venue TBA. Please advise who would attend a PFM and the available dates for attendance.

To assist with the discussion of the key issues for the proposal at this meeting, it would be appreciated if draft requirements from each agency could be provided to the Department by **31 January 2013**. The final version of the requirements can be provided following the PFM.

A copy of the background document supporting Kingsgate's request can be downloaded at the Department's website (<u>http://majorprojects.planning.nsw.gov.au/index.pl?action=view\_job&job\_id=5765</u>).

Any enquiries please contact me on 9228 6298.

Regards, Kane

Kane Winwood Team Leader, Mining Projects NSW Department of Planning & Infrastructure | GPO Box 39 | Sydney NSW 2001 T 02 9228 6298 E kane.winwood@planning.nsw.qov.au

Planning & Infrastructure

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WST13/00010

The Manager Mining Projects Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

Attention: Mr Kane Winwood

Dear Mr Winwood

#### SSD 12\_5765; Bowdens Silver Project Request for input into Director-General's Requirements (DGRs)

Thank you for your email of 11 January 2013 requesting input into DGRs for the Bowdens Silver Project from Roads and Maritime Services (RMS).

RMS notes that the concentrates extracted from the proposed mine will be transported by road. Routes and destinations are unknown at this time.

The Preliminary Environmental Assessment has been reviewed and provided below are key issues which should be addressed in the final Environmental Assessment:

- A traffic impact study prepared in accordance with the methodology set out in Section 2 of the RTA's Guide to Traffic Generating Developments and including:
  - hours and days of construction and operation for each stage of the project and how proposed operations will interact with other road users;

  - any oversize and over-mass vehicles and loads expected for the construction, operation or decommissioning of the project;
  - the shortest and least trafficked route having been given priority for the movement of construction materials and machinery to minimise the risk and impact to other motorists so far as is reasonably practicable;
  - temporary and permanent staff numbers (including employees and contractors) and staff parking arrangements during construction, operation and decommissioning of the project.

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

51-55 Currajong Street PARKES NSW 2870 PO Box 334 PARKES NSW 2870 DX 20256 www.rta.nsw.gov.au | 13 17 82



# BOWDENS SILVER PTY LIMITED

Bowdens Silver Project Report No. 429/24

Modes and volumes of transportation of mining staff to and from the site, details of measures proposed to minimise staff commuter traffic on the local and classified road network and measures to improve commuter safety should also be included;

 the impact of generated traffic and measures employed to ensure efficiency and safety on the public road network during construction, operation and decommissioning of the project;

- o any mitigating measures required to address expected traffic generation;
- local climate conditions that may affect road safety for vehicles used during construction and operation of the project (e.g. dust, fog, wet weather, etc).
- Proposed access treatments should be identified and be in accordance with Austroads Guide to Road Design 2010 and RMS Supplements including safe intersection sight distance;
- Details of any required infrastructure works to support any increased demand on the road network as a result of this project. Alternative transport modes such as rall should also be explored.

RMS appreciates the opportunity to contribute to the DGRs and requests that a copy of the DGRs be forwarded to RMS at the same time they are sent to the applicant.

Should you require further information please contact Andrew McIntyre on (02) 6861 1453.

Yours faithfully

2 9 JAN 2013

Joshua/Parkin Acting Road Safety & Traffic Manager Western



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Page 1 of 2

# Caitlin Elliott - RE: Bowdens Silver Project - Request for DGRs - Mid-Western LGA - WST12/00010

From:	MCINTYRE Andrew R <andrew.mcintyre@rms.nsw.gov.au></andrew.mcintyre@rms.nsw.gov.au>
To:	Kane Winwood <kane.winwood@planning.nsw.gov.au></kane.winwood@planning.nsw.gov.au>
Date:	Friday, 15 February 2013 11:39 AM
Subject:	RE: Bowdens Silver Project - Request for DGRs - Mid-Western LGA - WST12/00010
CC:	Development Western <development.western@rms.nsw.gov.au></development.western@rms.nsw.gov.au>

Good morning Kane,

Further to the 'Input into DGRs' submission made by RMS in relation to this project and following the PFM in Mudgee last week, RMS requests that the following additional matter be provided in the EA:

A Safety Audit of roads between the proposed mine site and Mudgee town.

Thank you and kind regards,

#### Andrew McIntyre

Development Assessment Officer RCS Western Rstm & D | Traffic Management T (02) 6861 1453 F (02) 6861 1414 www.rms.nsw.gov.au

Roads and Maritime Services 51-55 Currajong Street Parkes NSW 2870 PO Box 334 Parkes NSW 2870

> From: Kane Winwood [mailto:Kane.Winwood@planning.nsw.gov.au]
> Sent: Friday, 11 January 2013 3:51 PM
> To: council@midwestern.nsw.gov.au; Development Western; landuse.enquiries@industry.nsw.gov.au; planning.matters@environment.nsw.gov.au; Therese.Jones@gwahs.health.nsw.gov.au; Vincent Sicari
> Cc: Caitlin Elliott; catherine.vanlaeren@midwestern.nsw.gov.au; steve.cozens@industry.nsw.gov.au; Tim Baker; tony\_hendry@rms.nsw.gov.au
> Subject: Bowdens Silver Project - Request for DGRs - Mid-Western LGA

All,

The Department has received a request from Kingsgate Bowdens Pty Ltd for the provision of Director-General's Requirements (DGRs) for the Bowdens Silbver Project near Lue, in the Mid-Western Regional Council local government area.

It is the Department's intent to hold a Planning Focus Meeting for the proposal, tentatively scheduled for the first week in February, venue TBA. Please advise who would attend a PFM and the available dates for attendance.

To assist with the discussion of the key issues for the proposal at this meeting, it would be appreciated if draft requirements from each agency could be provided to the Department by **31** January **2013**. The final version of the requirements can be provided following the PFM.

A copy of the background document supporting Kingsgate's request can be downloaded at the Department's website (<u>http://majorprojects.planning.nsw.gov.au/index.pl?</u> action=view\_job&job\_id=5765).

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R. W. CORKERY & CO. PTY. LIMITED

Page 2 of 2

Any enquiries please contact me on 9228 6298.

Regards, Kane

Kane Winwood Team Leader, Mining Projects NSW Department of Planning & Infrastructure | GPO Box 39 | Sydney NSW 2001 T 02 9228 6298 E kane.winwood@planning.nsw.gov.au



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Kane Winwood Team Leader, Mining Projects NSW Department of Planning and Infrastructure GPO Box 39, Sydney NSW 2001

DOC13/33163

Cc Helen Ptolemy, NSW Health

Dear Kane,

#### RE: LUE MINING PROPOSAL - DGRs (ADDENDUM)

Thank you for the invitation to attend the planning focus meeting at Mudgee on 6 February 2013. As an addendum to the Department's previous Director General's Requirements (DGRs) for the project at Lue, please include the following assessment requirements:

The physical impacts on the school from increased traffic and transport, including;

- the number and timing of increased private traffic trips per annum from mine staff passing the school site during operation and construction periods, .
- the route, number, timing and type of heavy vehicle trips per annum to transport mine materials that pass the school site during construction and operation periods,
- The potential for noise and vibration from the heavy vehicles passing the school site to adversely impact the structure of school buildings and internal classroom noise levels. .

Please also note that the school does not have access to town water and is reliant on rainwater tanks collecting potable water from the school building's roofs as well bore water if required during times of drought. Therefore any adverse impacts on water quality and/or availability issues due to mining activities should be addressed, including:

- Impacts on the availability and quality of the school's bore water supply from nearby mining activities during construction and operation periods, and
- Impact on the quality of school's rooftop rainwater supply from mine pollutants and traffic fumes during construction and operation periods.

Please contact Ruth Thomason, Regional Asset Planner Western NSW on 6391 4077 or ruth.thomason2@det.nsw.edu.au should you have any further questions.

Yours sincerely,

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Tony McCabe **Director, Planning and Delivery** 

February 2013 13

> NSW Department of Education & Communities – Asset Management Directorate Level 4, 35 Bridge Street Sydney NSW 2000 GPO Box 33 Sydney NSW 2001 T 02 9561 8000 F 02 9561 8077 www.det.nsw.edu.au



BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



Kane Winwood Team Leader, Mining Projects NSW Department of Planning and Infrastructure GPO Box 39, Sydney NSW 2001

DOC13/33163

Dear Mr Winwood,

Thank you for the opportunity to respond to the draft Director General's Requirements (DGRs) for the Bowden's Silver Project at Lue.

The Department requests that the DGRs include an item to identify and assess any potential impacts on the Lue Public School. In particular the physical and social impacts on the school should be included as separate line items in the DGRs.

The physical impacts on the school to be identified and assessed should include; dust levels, toxicity of dust (lead) generated, traffic impacts, noise and blasting impacts within school grounds as well as general noise impacts during school hours.

The social impacts on the town generally will impact on the school and should be identified and assessed both during the mine's life (15 years) and at the conclusion of mining activities.

In addition, the Department request that the DGRs also ensure that the proponent carry out a reasonable and justified level of consultation with Lue Public School staff and Parents and Citizens Association.

Please contact Ruth Thomason, Regional Asset Planner Western NSW on 6391 4077 or ruth.thomason2@det.nsw.edu.au should you have any further questions.

Yours sincerely, Tony McCabe

Director, Planning and Delivery

U February 2013

NSW Department of Education & Communities – Asset Management Directorate Level 4, 35 Bridge Street Sydney NSW 2000 GPO Box 33 Sydney NSW 2001 T 02 9561 8000 F 02 9561 8077 www.det.nsw.edu.au





3 Marist Place Parramatta NSW 2150 Telephone: 61 2 9873 8500 Facsimile: 61 2 9873 8599 heritage@heritage.nsw.gov.au

www.heritage.nsw.gov.au

Locked Bag 5020 Parramatta NSW 2124 DX 8225 PARRAMATTA

> Contact. Katrina Stankowski Telephone: (02) 9873 8569 Katrina Stankowski@heritage.nsw.gov.au File: 13/02620

Job ID No: A1286275 Your Ref: SSD 12\_5765

Kane Winwood Team Leader – Mining Projects Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

Dear Mr Winwood

PCU041155

RE: Review of Environmental Factors – Bowdens Silver Project near Lue, Mid-Western Regional Council LGA.

I refer to your email dated received by this Branch on 11<sup>th</sup> of January, requesting information regarding the NSW Heritage Council's requirements for the preparation of the above mentioned Review of Environmental Factors (REF).

It is advised that the REF should address the following issues:

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Scanning Room

- The heritage significance of the site and any impacts the development may have upon this significance should be assessed. This assessment should include natural areas and places of Aboriginal, historic or archaeological significance. It should also include a consideration of wider heritage impacts in the area surrounding the site.
- The Heritage Council maintains the State Heritage Inventory which lists some items protected under the Heritage Act, 1977 and other statutory instruments. This register can be accessed through the Heritage Branch home page on the internet (http://www.heritage.nsw.gov.au).
- It should be noted that the legal standing of items listed on the State Heritage Register can also be provided by applying for a section 167 Certificate through the Heritage Branch home page.
- In addition, you should consult lists maintained by the National Trust, any heritage listed under the Australian Government's Environment Protection and Biodiversity Conservation Act 1999 and the local council in order to identify any identified items of heritage significance in the area affected by the proposal. Please be aware, however, that these lists are constantly evolving and that items with potential heritage significance may not yet be listed.
- Non-Aboriginal heritage items within the area affected by the proposal should be identified by field survey. This should include any buildings, works, relics (including relics underwater), gardens, landscapes, views, trees or places of non-Aboriginal heritage significance. A statement of significance and an assessment of the impact

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BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

of the proposal on the heritage significance of these items should be undertaken. Any policies/measures to conserve their heritage significance should be identified. This assessment should be undertaken in accordance with the guidelines in the NSW Heritage Manual. The field survey and assessment should be undertaken by a qualified practitioner/consultant with historic sites experience. The Heritage Branch can provide a list of suitable consultants.

- The proposal should have regard to any impacts on places, items or relics of significance to Aboriginal people. Where it is likely that the project will impact on Aboriginal heritage, adequate community consultation should take place regarding the assessment of significance, likely impacts and management/mitigation measures.
- The relics provisions in the Heritage Act require an excavation permit to be obtained from the Heritage Council, or an exception to be endorsed by the Heritage Council, prior to commencement of works if disturbance to a site with known or potential archaeological relics is proposed. Where possible refer to archaeological zoning plans or archaeological management plans held by Local Councils. If any unexpected archaeological relics are uncovered during the course of work excavation should cease and an excavation permit, or an exception notification endorsement, obtained.
- If approval is required under the Heritage Act due to the listing of an item or place on the State Heritage Register, or being subject to an Interim Heritage Order, the Heritage Council's approval must be sought prior to an approval being issued by the consent authority under the *Environmental Planning and Assessment Act 1979* (except where application relates to Integrated Development OR State Significant Infrastructure/State Significant Development Major Infrastructure Projects, as well as projects proceeding under the (former) Part 3A of the *EP&A Act, 1979*). In accordance with section 67 of the Heritage Act, an approval given by a consent authority in these cases before the Heritage Council's determination of the application has been notified to the consent authority, is void.

The requirements for the preparation of EIS heritage assessments prepared by the Department of Planning may also be referred to and applied to the preparation of the REF.

The Heritage Branch would be happy to review any further documentation that may address any likely heritage impacts. If you have any further enquiries regarding this matter, please contact Katrina Stankowski on (02) 9873 8569.

Yours Sincerely

au) 30/01/2013

Vincent Sicari Manager - Conservation Team Heritage Branch Regional Operations Office of Environment & Heritage As Delegate of the NSW Heritage Council





(CVL) A0420245

NSW Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2000

Attention: Mr Kane Winwood - Team Leader - Mining Projects

Dear Sir,

#### PRELIMINARY RESPONSE TO DIRECTOR GENERAL'S REQUIREMENT BOWDENS SILVER PROJECT -

Thank you for the opportunity to provide a preliminary response to the Director General's Requirements for the Bowden's Silver Project. Council has reviewed Preliminary Environmental Assessment and Draft DGRs and would request that the following specific issues be included in the DGRs:

Traffic movements

It is requested that a detailed analysis should be carried out of the impact of all traffic movements (type and frequency) that are anticipated for the whole of the period of the construction and operation of the project – this should include commuter traffic, transport of equipment and the transport of concentration. The analysis should include an assessment of the ability of all roads, intersection, culverts and bridges to cope with the additional traffic and the changing nature of the traffic. Should heavy haulage routes involve haulage through existing towns and villages than the analysis should include the assessment on traffic flow through those towns and villages and potential noise impacts. The study is to provide a detail safety audit and a schedule of works necessary to upgrade the road to ensure that current levels of services are maintained. All roads should be upgraded to comply with Austroad standards in accordance with the standard dictated by traffic volumes including consideration of heavy haulage.

In addition the proponent should address the likely impact and proposed procedures for the transportation of hazardous materials along the proposed haulage routes.

Council would suggest the proponent commence discussions with Council's Engineering Officers are soon as possible regarding all aspects of road works

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86 Market Street MUDGEE 109 Herbert Street GULGONG 77 Louee Street RYLSTONE

Ph: 1300 765 002 or (02) 6378 2850 Fax: (02) 6378 2815 email: council@midwestern.nsw.gov.au

14 February 2013

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### MID-WESTERN REGIONAL COUNCIL

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# Road Dilapidation Report

Council requests that an assessment of the condition of the road, that is a dilapidation report, is to take place prior to the commencement of construction and again at the completion of works. Weekly inspections of the roads will also be required, to ensure that any damage to the road is repaired immediately. Council will also be seeking assurances that any road damage that occurs as a result of increased vehicle movements associated with the construction will be funded by the developer and not by Council.

Road Upgrades

Council requires that all road upgrades required as indentified by the study be undertaken at the full cost to the developer and that all upgrades are required as a condition of approval prior to the commencement of any construction on site.

Road Maintenance

Council requires that a full assessment of all haulage and commuter routes be undertaken to assess the lifecycle maintenance requirement of the routes and undertake a details schedule of works and schedule of costs. All works and costs are to be borne by the proponent.

# • Realignment of Maloneys Road (Bara) Road

Council requires detailed consultation with Mid-Western Regional Council throughout the design of Maloneys Road including the selection of the new realignment. As this road will become a Mid-Western Council asset Council will require that the roadworks are undertaken by Mid-Western Regional Council at the full cost to the proponent.

Dust

Council notes that the Draft DGRs will require a quantative assessment of the potential impacts of dust. It is requested that the DGRs include specific reference to variable wind patterns, including seasonal wind patterns and the need for a detailed air dispersal model. Council also requires specific details on the specific dust suppression measures that will be in place during operations and also on the haulage routes.

Noise Impacts.

Council considers that the application of the Industrial Noise Policy is inappropriate in this environment due to the extremely low existing background noise levels. Council stresses that the baseline for the assessment of noise impacts should be less than that allowed by the Industrial Noise Policy having regard to the rural nature of the area. It is considered that having regard to the difficulty to meet acceptable noise levels during nighttime operation and the rural nature of the area that reconsideration should be given to the 24 hour operation of the site.

Council would also require a detailed Traffic Noise Assessment to be carried out on the proposed haulage routes to ascertain the level of impact associated off-site going to be generated as a result of the mining operations.

# Complaints Register

Council requires details on how the company proposed to address and monitor all complaints associated with the operations of the mine.

# Water

Council requests that a moratorium be placed on the sale of high security licenses to the Bowden's Silver Project until detailed assessment of the impact on other water users, such as agricultural users can be modeled and extensive consultation undertaken with existing users. Until such time as it can be demonstrated that the existing and future Water Sharing Plan for the Cudgegong River will provide sufficient

#### MID-WESTERN REGIONAL COUNCIL

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protection for town water supplies it is consider irresponsible for further high security licenses to be sold that allow the transfer of water allocations within the catchment. It is considered imperative that the modeling, adjustment of the WSP and extensive consultation be undertaken prior to the sale of the water license.

Council considers that potential impact on water security for both agricultural users and town water supply is a determinative issue. It is considered that the cumulative impact of the establishment of mining projects within the catchment and their water demands needs to assessed. In addition, it is imperative that potential adverse impact on water allocations during periods of drought to other industries, agriculture and the town water supply be considered and that the cost of the development include the potential decline of agriculture and growth of other industries due to the restricted access to water. Council considers that it is critical that a diverse economic base be maintain in the region and the potential threat to that diversity should be fully assessed as part of this application.

It is noted that a *Human Health Risk Assessment* is a requirement of the Draft DGRs. Council would request that a particular focus be placed on the assessment on the impacts on dust on drinking water.

Visual Amenity

It is requested that the DGRs include an assessment of the lighting and light spillage on the rural character of the area and impact on the residential amenity of both the villages and surrounding properties.

Council will also require light shielding modeling carried out as part of the assessment to demonstrate the likely impacts of light onto the neighboring properties and Lue. Mechanisms on how to limit light shielding and the likely impacts it will have will also need to be demonstrated by the proponent.

#### Socio Economic Impacts

Council considers that the assumptions regarding available workforce within the supporting information is flawed and fails to take into account the cumulative impact of mining and wind farm projects within the region. Whilst it is acknowledged that some of the construction and operation workforce will be sourced locally it is considered that the majority will need to be imported. Council requests that the DGRs include the requirement for the proponent to identify the likely domicile for 90 % of the construction and operational workforce and undertake a full analysis of the impacts on housing, rental housing, infrastructure, traffic, health and other social impacts and provide realistic measure to mitigate those impacts. The literature review should have regard to the Local Service Assessment Report undertaken by Manidis Roberts on behalf of the DOPI in 2012. A copy is located on Council website at <a href="http://www.midwestern.nsw.gov.au/Economic-Development/Publications/">http://www.midwestern.nsw.gov.au/Economic-Development/Publications/</a>. Upon the completion of the demand assessment for temporary accommodation should the project recognise a need for Temporary Workers Accommodation then reference should be made the Mid-Western Regional Comprehensive DCP.

Council is concerned regarding the ongoing viability of the village of Lue and the school. The village of Lue is a successful vibrant community and Council has witnessed the demise of other villages such as Wollar due the impacts of mining. It should be noted that demise of Wollar was not predicted in the EA prepared in support of the mine. Council considers that a full assessment should be made on the potential impacts on Lue with an investigation of student numbers and the potential threat to maintaining those numbers should families leave the village.

#### MID-WESTERN REGIONAL COUNCIL

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### Agricultural Impact Analysis

While Council recogonises that the area may not be regarded as prime agricultural lands, Council would like to see the likely off-site impacts on adjoining agricultural lands that are likely to occur as a result of the mine. Council would also like to see what soil resources and land capabilities are likely to be altered.

#### Environmental Offsets

In identifying proposed environmental offset the proponent should identify the proposed ongoing management program for the offsets including land tenure, Council does not support the conversion of environmental offsets to National Park or transfer to government ownership.

# Voluntary Planning Agreement

To date no discussions have taken place regarding a Voluntary Planning Agreement (VPA) with Mid-Western Regional Council. -Council will be seeking an agreement to compensate for the additional demand on facilities and services provided by the Council. -It should be noted that Council expects that all road upgrades will be required as a condition of approval prior to the commencement of the construction on site rather than included in a VPA.

#### Acid Forming Material

Council is concerned regarding the potential for acid forming material left in situ but exposed due to mining activities. Council requests that a complete assessment be undertaken and if necessary that a bond or guarantee be imposed to ensure the ongoing management of the site after the closure of the mine.

### Fauna and Flora

Council would like to see details on proposed native fish waterway crossings that are likely to be obstructed and altered as a result of the proposal and any critical habitats likely to be affected by the proposal.

# Site Rehabilitation Works post Mine Life

Council would require information on the post mine life rehabilitation plans and proposed uses for the site. As part of this information Council would require quantified information on the lands capabilities post mine life.

#### Lue Action Group

Please find attached a response from the Lue Action Group. Council fully supports the requests included in their response for inclusion in the DGRs.

Council\_supports site specific Director General Requirements with regard to Major Projects.

Should you have any further enquiries in relation to this matter please contact Catherine Van Laeren on 02 6378 2850 during office hours.

Yours faithfully

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CATHERINE VAN LAEREN GROUP MANAGER – DEVELOPMENT & COMMUNITY SERVICES





OUT13/3952

'- 4 MAR 2013

Mr Kane Winwood Mining and Industry Projects NSW Department of Planning and Infrastructure GPO Box 39 SYDNEY NSW 2001

Kane.Winwood@planning.nsw.gov.au

Dear Mr Winwood

#### Bowdens Silver Project (SSD-5765) Request for input into Director-General Requirements

I refer to your emails of 11 and 22 January 2013 to the Department of Primary Industries in respect to the above matter.

#### Comment by NSW Office of Water

The NSW Office of Water advises that the following key issues and the detailed assessment requirements listed in Attachment A should be addressed:

- An adequate and secure water supply for the proposal. Confirmation that water supplies for construction and operation can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.
- Identification of site water demands, water sources (surface and groundwater), water disposal methods and water storage structures in the form of a water balance. The water balance is to outline the proposed water management on the site and to also include details of any water reticulation infrastructure that supplies water to and within the site.
- 3. An impact assessment on adjacent licensed water users (surface and groundwater), riparian ecosystems and groundwater-dependent ecosystems. This is to meet the requirements of relevant state policy in addition to the objects and principles of the Water Management Act 2000, which can be accessed at: http://www.water.nsw.gov.au/Water-management/Law-and-Policy/default.aspx.
- 4. An assessment of the potential to intercept and/or impact groundwater and predicted dewatering volumes, water quality and disposal/retention methods. This will need to address the requirements of relevant policy including the Aquifer Interference Policy. This is to include the modelled zone of influence for a number of stages both during mining operations and post-mine life until equilibrium is achieved. It is recommended final landforms of open voids containing groundwater are minimised. Where there is ongoing groundwater take induced by evaporative loss this must be identified and addressed by retaining the appropriate water licence entitlement at the site.

NSW Department of Primary Industries Level 6, 201 Elizabeth Street, Sydney NSW 2000 PO Box K220, Haymarket NSW 1240 Tel: 02 8289 3999 Fax: 02 9286 3208 www.dpi.nsw.gov.au ABN: 72 189 919 072

- 5. An assessment of existing baseflow contributions to local surface water systems and potential impacts to the environment and water users due to proposed dewatering and/or water extraction activities. Potential impediments to natural groundwater flow paths and impacts to springs due to the project also need to be assessed.
- An impact assessment of the construction, operation and final landform of the proposed on-site waste rock emplacement, tailings storage facility and other potentially contaminating facilities.
- 7. An assessment of impacts to existing surface water systems in terms of potential modifications to natural ecological, hydrologic and hydraulic function and potential impacts to local water users and the environment. This needs to be addressed for both during and post mine life with the use of stabilised landforms and mitigation of impacts. This is to also include modelling of redistribution of waters due to the project.
- 8. An impact assessment of any proposed works within or adjacent to watercourses and adequate provision of buffer requirements. This is to also include proposed pipelines, bridge upgrades and temporary or permanent vehicle crossings within the project application area. Ability to achieve the principles of the Water Management Act 2000 and the requirements of the Guidelines for Controlled Activity Approvals. The relevant guidelines can be accessed at the following link: http://www.water.nsw.gov.au/Water-Licensing/Approvals/Controlledactivities/default.aspx.
- Preparation of a surface water management plan and groundwater management plan to integrate the proposed water balance and management for the site and to identify adequate mitigating and monitoring requirements for both water quality and water volume.
- 10. Existing and proposed water licensing requirements in accordance with the Water Act 1912 and Water Management Act 2000 (whichever is relevant). This is to demonstrate that existing licences (include licence numbers) and licensed uses are appropriate, and to identify where additional licences are proposed. The proponent will be required to ensure they hold adequate licensed entitlement commensurate with the anticipated volume of groundwater take and surface water take prior to this take occurring. Groundwater take includes the volume of water intercepted by the proposed activities both via the mine pit and any extraction bores, in addition to any ongoing take induced by evaporative loss within the pit. The annual requirements need to be regularly reviewed through updates of modelling and reviews of metering data.
- 11. Adequate mitigating and monitoring requirements to address surface water and groundwater impacts.

The proposal is located within the Lachlan Fold Belt MDB Groundwater Source of the Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources and the Sydney Basin Groundwater Source of the Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources. Any requirement for additional groundwater entitlement will need to be obtained through purchase and trade in accordance with these plans. Other relevant water sharing plans for surface water include the Water Sharing Plan for the Macquarie-Cudgegong Regulated Rivers Water

Source and the Draft Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources. These plans can be accessed at: http://www.water.nsw.gov.au/Water-management/Water-sharing/default.aspx.

For further information please contact Tim Baker, A/ Manager Major Projects (Newcastle office) on 6884 2560, or at: tim.baker@water.nsw.gov.au.

### Comment by Fisheries NSW

Fisheries NSW is responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, Fisheries NSW ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A) and the associated *Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (1999)*.

In this regard, Fisheries NSW advise that the environmental assessment should address the matters detailed in Attachment B.

For further information please contact David Ward, Fisheries Conservation Manager (Tamworth office) on 6763 1255, or at: david.ward@industry.nsw.gov.au.

#### Comment by Crown Lands:

The environmental assessment is to identify all Crown land that may be affected, including Crown roads and Crown waterway and in respect to any affected parcels address applicable matters listed in Attachment C.

For further information please contact Elizabeth Burke, Group Leader, Property Management Services (Dubbo office) on 6883 5410, or at: elizabeth.burke@lands.nsw.gov.au.

<u>Comment by Office of Agricultural Sustainability & Food Security</u> In accordance with arrangements for mining projects that affect agricultural land the Office of Agricultural Sustainability & Food Security will respond direct to your Department by separate letter.

For further information please contact Liz Rogers (Orange office) on 63913642, or at; liz.rogers@dpi.nsw.gov.au.

Yours sincerely

Phil Anquetil Executive Director, Business Services

Bowdens Silver Project Report No. 429/24

#### Attachment A

# Bowdens Silver Mine (SSD-5765) Request for Input into Director-General Requirements for Environmental Assessment Comment by NSW Office of Water

#### 1. Relevant Legislation

The assessment is required to take into account the requirements of the following legislation (administered by the NSW Office of Water), as applicable:

• Water Management Act 2000 (WMA) where a Water Sharing Plan (WSP) has commenced.

• Water Act 1912, where a WSP is not yet in place.

In particular, proposals and management plans should be consistent with the Objects (s.3) and Water Management Principles (s.5) of the *WMA*.

#### 2. Water Sharing Plans

Gazetted Water Sharing Plans (WSPs) prepared under the provisions of the WMA establish rules for access to, and the sharing of water between the environmental needs of the surface or groundwater source and water users. If the proposal is within a gazetted WSP area the assessment is required to demonstrate how the proposal is consistent with the relevant access and trading rules of the WSP. Refer to: http://www.water.nsw.gov.au/Water-Management/Water-sharing/default.aspx.

# 3. Relevant Policies

The assessment is to take into account the following NSW Government policies, as applicable:

- NSW Aquifer Interference Policy (2012)
- NSW Groundwater Policy Framework Document General (August 1997)
- NSW Groundwater Quality Protection Policy (1998)
- NSW State Groundwater Dependent Ecosystem Policy (2002)
- NSW State Rivers and Estuaries Policy (1993)
- NSW Sand and Gravel Extraction Policy for Non-Tidal Rivers (1992)
- NSW Wetlands Policy (2010)
- Guidelines for the Assessment and Management of Groundwater Contamination (2007)
- Guidelines for Groundwater Protection in Australia (1995)
- MDBC Guidelines on Groundwater Flow Modelling (2000)
- Water Sharing Plan for the NSW Murray-Darling Basin Fractured Rock Groundwater Sources
- Water Sharing Plan for the NSW Murray-Darling Basin Porous Rock Groundwater Sources
- Water Sharing Plan for the Macquarie-Cudgegong Regulated Rivers Water Source
- Draft Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources

These documents can be found at:

http://www.water.nsw.gov.au/Water-Management/Law-and-Policy/Key-policies/default.aspx and http://www.water.nsw.gov.au/Water-Management/Water-availability/Groundwater/default.aspx.

#### 4. Guidelines

The assessment is required to take into account the following *Guidelines for Controlled Activities*, as applicable:

- Riparian corridors (and associated Vegetation Management Plans)
- Watercourse crossings

Report No. 429/24

Laying pipes and cables in watercourses

- Outlet structures
- In-stream works

Refer: http://www.water.nsw.gov.au/Water-Licensing/Approvals/Controlled-activities/default.aspx.

#### 5. Groundwater

The NSW Office of Water is responsible for the management of groundwater resources so they can sustain environmental, social and economic uses for the people of New South Wales.

#### Groundwater Source

The assessment is required to identify groundwater issues and potential degradation to the groundwater source and provide the following:

- · details of the predicted highest groundwater table at the development site.
- details of any works likely to intercept, connect with or result in pollutants infiltrating into the groundwater sources.
- details of any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- description of the flow directions and rates and the physical and chemical characteristics of the groundwater source.
- details of the predicted impacts of any final landform on the groundwater regime.
- details of the existing groundwater users within the area (including the environment) and include details of any potential impacts on these users.
- assessment of the quality of the groundwater for the local groundwater catchment.
- details of how the proposed development will not potentially diminish the current quality of groundwater, both in the short and long term.
- details on preventing groundwater pollution so that remediation is not required.
- quantification of impacts on groundwater dependent ecosystems (GDEs).
- details on protective measures to minimise any impacts on groundwater dependent ecosystems.
- details of proposed methods of the disposal of waste water and approval from the relevant authority.
- assessment of the potential for saline intrusion of the groundwater and measures to prevent such intrusion into the groundwater aquifer.
- details of the results of any models or predictive tools used to predict groundwater drawdown, inflows to the site and impacts on affected water sources.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- any proposed monitoring programs, including water levels and quality data.
- reporting procedures for any monitoring program including mechanism for transfer of information.
- assessment of any groundwater source/aquifer that may be sterilised as a consequence of the proposal.
- identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- remedial measures or contingency plans proposed.
- any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.
- any other assurances to account for the post-closure impacts such as retiring held water licences or ongoing pumping return proposals to minimise base flow losses.



#### Licensing

All proposed groundwater works, including bores for the purpose of investigation, extraction, dewatering, testing or monitoring must be identified in the proposal and an approval obtained from the Office of Water prior to their installation.

All predicted groundwater take must be accounted for through adequate licensing.

# Groundwater Dependent Ecosystems (GDEs)

The assessment is required to identify any impacts on GDEs. GDEs are ecosystems which have their species composition and natural ecological processes wholly or partially determined by groundwater. GDEs represent a vital component of the natural environment. GDEs can vary dramatically in how they depend on groundwater from having occasional or no apparent dependence through to being entirely dependent. GDEs occur across both the surface and subsurface landscapes ranging in area from a few metres to many kilometres. Increasingly, it is being recognised that surface and groundwaters are often interlinked and aquatic ecosystems may have a dependence on both.

Ecosystems that can depend on groundwater and that may support threatened or endangered species, communities and populations, include:

- terrestrial vegetation that show seasonal or episodic reliance on groundwater.
- river base flow systems which are aquatic and riparian ecosystems in or adjacent to streams/rivers dependent on the input of groundwater to base flows.
- aquifer and cave ecosystems.
- wetlands.
- estuarine and near-shore marine discharge ecosystems.
- fauna which directly depend on groundwater as a source of drinking water or that live within water which provide a source.

The NSW Aquifer Interference Policy and the NSW Groundwater Dependent Ecosystem Policy provides guidance on the protection and management of GDEs. It sets out management objectives and principles to:

- ensure the most vulnerable and valuable ecosystems are protected.
- manage groundwater extraction within defined limits thereby providing flow sufficient to sustain ecological processes and maintain biodiversity.
- ensure sufficient groundwater of suitable quality is available to ecosystems when needed.
- ensure the precautionary principle is applied to protect GDEs, particularly the dynamics of flow and availability and the species reliant on these attributes.

A number of gazetted WSPs list and map priority GDEs and set out the management strategies and actions for sharing and protecting groundwater quality, quantity and dependent ecosystems. As indicated above, any GDEs that may be affected significantly need to be clearly identified and the impacts quantified to enable proper assessment.

#### Surface Water

The NSW Office of Water is responsible for the management of rivers, estuaries, wetlands and adjacent riverine plains so they can sustain environmental, social and economic uses for the people of New South Wales.

#### Watercourse/Riparian

The assessment is required to consider the impact of the proposal on the watercourses and associated riparian vegetation within the site and provide the following:

- identification of sources of surface water.
- details of stream order (using the Strahler System).
- details of any proposed surface water extraction, including quantity, purpose, location of existing pumps, dams, diversions, cuttings and levees.

 details of available surface water licences that could be purchased to account for any proposed extractions.

- detailed description of any proposed development or diversion works including all construction, clearing, draining, excavation and filling.
- assessment of the impacts of the proposed methods of excavation, construction and material placement on the watercourse and associated vegetation.
- detailed description of all potential water related environmental impacts of any proposed development in terms of riparian vegetation, sediment movement, water quality and hydrologic regime.
- description of the design features and measures to be incorporated into any proposed development to guard against anything more than minimal long term actual and potential environmental disturbances, particularly in respect of maintaining the natural hydrologic regime and sediment movement patterns and the identification of riparian buffers. (See note below)
- details of the impact on water quality and remedial measures proposed to address more than minimal adverse effects.

Riparian corridors form a transition zone between terrestrial and aquatic environments and perform a range of important environmental functions. The protection or restoration of vegetated riparian areas is important to maintain or improve the geomorphic form and ecological functions of watercourses through a range of hydrologic conditions in normal seasons and also in extreme events.

Refer to NSW Office of Water *Guidelines for Controlled Activities (August 2012)* - available via: http://www.water.nsw.gov.au/Water-Licensing/Approvals/Controlled-activities/default.aspx.

#### Water Management Structures/Dams

The NSW Office of Water is responsible for the management and licensing of these structures under water legislation. If the proposal includes existing or proposed water management structures/dams, the assessment should provide information on the following:

- date of construction (for existing structure/s).
- details of the legal status/approval for existing structure/s.
- · details of any proposal to change the purpose of existing structure/s.
- · details if any remedial work is required to maintain the integrity of the existing structure/s.
- clarification if the structure/s is on a watercourse.
- details of the purpose, location and design specifications for the structure/s.
- size and storage capacity of the structure/s.
- calculation of the Maximum Harvestable Right Dam Capacity (MHRDC) for the site.
- details if the structure/s is affected by flood flows.
- details of any proposal for shared use, rights and entitlement of the structure/s.
- details if the proposed development/subdivision has the potential to bisect the structure/s.

NSW Office of Water Farm Dams Assessment Guide provides details on harvestable rights and the calculation of the MHRDC. Refer to: http://www.water.nsw.gov.au/Water-Licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff/default.aspx.

# 7. Basic Landholder Rights

The WMA identifies Basic Landholder Rights (BLRs) for access to water whereby landholders over an aquifer or with river or lake frontage can access water for domestic (household) purposes or to water stock without the need for a water licence (although a works approval may still be required for a bore utilising BLR). Pipeline constructions and easements may therefore affect existing BLR users and therefore all potentially affected BLR users need to be identified and the impacts quantified.

# 8. Sustainable Water Supply

Competition for water in NSW is extremely high. In areas where a Water Sharing Plan (WSP) has commenced, a long term average extraction limit has been established which constrains overall growth in extractions in an area. In these areas there are limited types of new licenses that can be issued, for example for Aboriginal cultural purposes or growth in town water supplies. Therefore in most instances new enterprises are required to enter the water market to purchase adequate water licences to meet their water demand requirements.

In areas where a WSP has not yet commenced, the NSW Government has established embargoes on applying for new licences. There are limited exemptions in some areas which need to be considered and applied for by a proponent. If an exemption does not apply, then again new enterprises need to enter the water market to purchase the required water licences. In some areas where a WSP has not yet commenced, there is still available water and the proponent may be able to apply for a new licence to account for the water taken from that water source.

The onus is on the proponent to assess which of the above is relevant and identify the potential sources of water of an appropriate reliability and quantity to meet their water supply requirements. The water supply requirements and potential water available should be identified in the EIS to enable NOW to assess the viability of the water supply required. Assurances should also be made that the proponent will enter the water market as required.

Therefore the assessment is required to address the issue of provision of a sustainable water supply for any project proposal. The assessment should include Water Management Plans detailing how a sustainable water supply can be sourced and implemented. Any proposed development should also exhibit high water use efficiency, for example through the implementation of BASIX, Integrated Water Cycle Management and Water Sensitive Urban Design.

End Attachment A
#### Attachment B

#### Bowdens Silver Mine (SSD-5765) Request for Input into Director-General Requirements for Environmental Assessment Comment by Fisheries NSW

#### 1. Aquatic Ecological Assessment

The aquatic ecological environmental assessment should include the following information:

- a recent aerial photograph (preferably colour) of the locality (or reproduction of such a photograph) should be provided.
- the area which may be affected either directly or indirectly by the development or activity should be identified and shown on an appropriately scaled map (and aerial photographs). identification of water use within the area of development
- identification of waterways within the area of development.
- description and quantification of aquatic and riparian vegetation should be presented and mapped. This should include an assessment of the extent and condition of riparian vegetation and the extent and condition of freshwater aquatic vegetation and the presence of significant habitat features (e.g. gravel beds, snags, reed beds, etc).
- quantification of the extent of aquatic and riparian habitat removal or modification which will result from the proposed development.
- detailed maps outlining the proposed realignment of new waterways within the project area.
- detailed maps outlining compensatory habitats and significant habitat features that will be created to offset the loss of habitat.
- detailed maps that outline and assess the geomorphic stability of the proposed realignments of the new waterways including re-creation of the sinuosity/complexity of the new waterways.
- details of the location of all waterways crossings and construction designs, such as bridges or culverts, access tracks, or water pipelines.
- details of the location of all waterway realignments, including a detailed rehabilitation plan for the aquatic environment and the adjacent riparian zone, and a timetable for construction of the proposal with details of various phases of construction.
- aspects of the management of the proposal, both during construction and after completion, which relate to impact minimisation e.g. Environment Management Plans monitoring the geomorphic stability of the system and mitigation strategies in place to address any bed lowering, scouring or other impacts that arise as a result of the project, and monitoring of the water quality in receiving waters such as the diverted creeks, particularly during the construction phase, and also during the operational phase.

#### 2. Key issues

#### Waterway Crossings & Fish Barriers

Fisheries NSW strongly supports the *NSW Weirs Policy*. The goal of this Policy is to halt and where possible reduce and remediate the environmental impact of weirs. The *Installation and Operation of Instream Structures that Alter Natural Flow Regimes of Rivers and Streams* has been listed as a Key Threatening Process under Schedule 6 Of the *Fisheries Management Act 1994* and Fisheries NSW has a responsibility to limit these impacts where possible.

As the project involves the construction of gauging stations on waterways and may involve the construction of new culverts or access tracks and water pipelines it is important that the construction of waterway crossings is in accordance with the Fisheries NSW document *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.* 

In respect to gauging stations, it is important that best management practice is used so as to minimise and ameliorate the impacts on fish passage.

#### Riparian Buffer Zones

Fisheries NSW advocates the use of riparian buffer zones as per the Policy and Guidelines Aquatic Habitat Management and Fish Conservation 1999 available at: http://www.dpi.nsw.gov.au/fisheries/habitat/protecting-habitats/toolkit#Policies-&-guidelines.

This document states: Terrestrial areas adjoining freshwater, estuarine or coastal habitats be carefully managed in order to minimise land use impacts on these aquatic habitats. As a precautionary approach, buffer zones of at least 50 metres wide should be established and maintained, with their natural features and vegetation preserved. Fisheries NSW anticipates that adequate riparian buffer zones will be established adjacent to Hawkins Creek and its tributaries in order to minimise the impacts of works on waterways.

#### Compensatory Habitats and Offsets

The proposed area of development (Proposed Mining Lease Area) contains some Key Fish Habitats (Definition - 3<sup>rd</sup> order streams or greater - Strahler stream order system), such as Blackmans Gully (3<sup>rd</sup> order) and Price Creek (4<sup>th</sup> order) so may potentially have direct adverse impacts on aquatic habitats and threatened species, populations or ecological communities listed under the *Fisheries Management Act 1994*. A key outcome sought with rehabilitation and compensation measures is to ensure their longevity and ongoing management post initial construction or implementation. Compensatory habitats are a requirement if the environmental assessment indicates there may be a loss of aquatic or riparian habitats, and may need to be included in site rehabilitation plans or compensatory aquatic habitat offsets elsewhere in the catchment on other aquatic rehabilitation projects.

Fisheries NSW has guidelines for compensatory habitat outlined in the document *Policy and Guidelines Aquatic Habitat Management and Fish Conservation* 1999 available at: http://www.dpi.nsw.gov.au/fisheries/habitat/protecting-habitats/toolkit#Policies-&-guidelines.

Fisheries NSW maintains a policy of no net loss of aquatic habitat. Compensatory habitats are calculated on a 2:1 basis. Fisheries NSW may therefore require the negotiation of a compensatory habitat package to ensure that such outcomes are achieved.

End Attachment B

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#### Bowdens Silver Mine (SSD-5765) Request for Input into Director-General Requirements for Environmental Assessment Comment by Crown Lands

1.	Where Crown roads are utilised for the purposes of the project or impacted on by the project activities, the applicant must within 12 months of project approval, obtain a Licence or Lease over the Crown road in accordance with the <i>Crown Lands Act 1989</i> .
2.	Crown roads within holdings owned by the applicant or impacted on by the project activities as described above, may be included in a road closing application lodged by the applicant. Where Crown roads under application cannot be closed and purchased within a 12 month period following project approval, then the applicant must obtain a Licence or Lease over the Crown road in accordance with the <i>Crown Lands Act 1989</i> .
3.	Where Crown land (other than Crown roads) is utilised for the purposes of the project, the applicant must within 12 months of project approval, obtain a Licence or Lease over the Crown land in accordance with the <i>Crown Lands Act 1989</i> . Note the applicant has no authority to occupy or utilise Crown land until a tenure under the <i>Crown Lands Act 1989</i> is granted. Given the complexities in regard to Native Title that affect many Crown lands it is in the Applicant's best interest to inform and apply to Crown Lands for a tenure as early as possible in the development process.
4.	Where the purpose of any existing Crown land Licence or Lease, held or acquired by the applicant, is not compatible with the proposed project activities and land uses, the applican must within 12 months of project approval, obtain a new Licence or Lease over the Crown land that reflects the proposed use of the land in accordance with the <i>Crown Lands Ac</i> 1989.
5.	The Applicant shall consult with Crown Lands on any requirement of the applicant to restric public access to Crown land for the reasons of public safety, in particular in relation to prevent public access to land subjected to subsidence, blasting affects, water and ai quality impact, and general security around access roads haulage roads and mining infrastructure.
6.	The applicant shall provide Crown Lands details of any proposed Environmental Offsets to be located on Crown land, in particular any conditions proposed by the Applicant that seel long term security of those offsets.
7.	The Applicant shall consult with Crown Lands in respect to the preparation and implementation of all Environmental Management Plans that affect Crown land, including but not limited to management plans relating to: archaeology and cultural management
	<ul> <li>flora and fauna</li> <li>biodiversity management</li> <li>heritage management</li> <li>erosion and sediment control</li> <li>landscape management</li> <li>bushfire management</li> </ul>
	<ul> <li>land management</li> <li>property subsidence</li> </ul>

- final void management
- water management
- dust management
- noise management
- blast management.
- The Applicant shall provide Crown Lands with detailed information and location diagrams of any proposed use of Crown land, including but not restricted the following land uses:
  - hazard and industrial waste disposal
  - waste water utilisation areas
  - point discharge areas
  - waste rock and tailings structures
  - processing plants and other high impact Infrastructure sites
  - gravel borrow pits
  - environmental offset areas.
- 9. The applicant may be requested by the Minister administering Crown lands to purchase Crown land considered to be impacted on to the extent that it is in the interests of the public of NSW that the land be sold to the applicant.

End Attachment C





 Central West Catchment Management Authority
 30 Warne St, PO Box 227
 WELLINGTON NSW 2820

 T
 (02) 6840 7800
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 (02) 6840 7801

 www.cw.cma.nsw.gov.au
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Contact: Tracey MacDonald T (02) 68407802 M 0437 273343 email: tracey.macdonald@cma.nsw.gov.au

File: CW 00082

Mr Chris Dickson R. W. Corkery and Co. Pty. Ltd. 1<sup>st</sup> Floor 12 Dangar Road BROOKLYN NSW 2083

21 March 2013

Dear Mr Dickson

# Subject: Central West CMA input into issues to be addressed within the environmental impact assessment for the proposed Bowdens Silver Project (SSD\_5765)

Thank you for the opportunity to provide input into the content for the environmental assessment of the proposed Bowdens Silver Project (SSD\_5765).

The Central West Catchment Management Authority (CMA) is a statutory authority under the *Catchment Management Authorities Act* (2003) and has the charter of working with the community in the sustainable management of natural resources. We acknowledge the balance required to support our biophysical and social assets across the catchment. These systems are intrinsically linked and it is therefore imperative that developments such as the proposed project address a number of key asset areas in the assessment. These areas include native vegetation, water sources, soil, cultural heritage and the local community and are explored in detail within the Central West Catchment Action Plan (CAP). This document can be accessed at <u>www.cw.cma.nsw.gov.au</u>. The CMA strongly suggests that the CAP is referenced throughout the environmental assessment with regard to impact identification and the development of avoidance or mitigation strategies.

#### Strategic Planning and Project Justification:

The environmental impact assessment must include a strategic assessment of the need, scale, scope and location of the project in relation to environmental factors listed following and the current and future demands for silver and current supplies.

#### **Biodiversity**:

Existing studies have identified the presence of a White Box - Yellow Box - Blakelys Red Gum community within the development footprint. This community is listed as a Critically Endangered Ecological Community (Commonwealth *Environment Protection and Biodiversity Act 1999*) and an Endangered Ecological Community (EEC) (NSW *Threatened Species Conservation Act 1995*). This community has been significantly cleared within the Central West landscape (>85%) and as such the CMA is extremely concerned with any proposal to clear remnant stands.

Vibrant Communities, Healthy Landscapes www.cw.cma.nsw.gov.au



With this in mind, we would expect the environmental impact assessment for this project to include options to avoid any impact to the EEC. Should the option to avoid not be adopted, the assessment will need to outline a biodiversity offset strategy to compensate for the destruction of the EEC. This offset strategy must adequately display like-for-like protection at appropriate ratio's.

The CMA notes the previous identification of 12 threatened fauna species in the proposed project area. The environmental assessment should therefore identify clear strategies of how the risks to native fauna will be avoided or mitigated during site preparation and operation. There should be particular focus on strategies to reduce impacts to the threatened woodland bird species as these species are in considerable decline in the central western slopes of NSW.

#### Water sources:

We request an assessment of the surface water impacts of the proposed developments, particularly in terms of the surface water flow in the site and potential for contamination from leachate and soil/sedimentation risks.

We request an assessment of the risks of groundwater interference during establishment and operation and that assessment outlines mitigation measures to these risks.

The assessment should outline the potential water demands during operation and demonstrate the availability of adequate and secure water supplies for the life of the project.

#### Soil:

The assessment must outline the soil types covered in the proposed site and outline how the operation will mitigate risks in regard to the removal of the topsoil, storage of the overburden, replacement of the waste material and rehabilitation of the area upon completion of operation.

#### Cultural Heritage:

The assessment must include the impacts on Aboriginal cultural heritage. This includes information to demonstrate the impacts on Aboriginal heritage values, both archaeological and culturally in the broader sense.

The assessment must demonstrate the consultation processes with the local Aboriginal community and the Central West CMA prefers to see a proposed approach that undertakes a more detailed consultation with local people than simply the requirements outlined in the OEH Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation. The Central West CMA would favourably view the inclusion of a local Aboriginal community member in the site assessments for cultural heritage.

#### Social Impacts and Community Consultation:

The assessment must outline the social benefits to the local community as well as identifying the social impacts and mitigation strategies for the project. The CMA notes strong opposition within some sectors of the Lue community and the assessment must address ongoing consultation with this sector.

Consultation on the project must include the Central West CMA, relevant agencies, the local Aboriginal community as well as the Local Aboriginal Land Council (LALC), relevant local interest community groups e.g. Landcare, Local Council, and community stakeholders in the community.

The consultation process should outline the approach to distribute information about the project during the assessment, preparation, operation and rehabilitation phases. The assessment should also outline the methods of actively engaging stakeholders on issues that are of concern to them.

The assessment must clearly show the dates of consultation and copies of information distributed as part of the consultation process and describe the issues raised during the consultation and where the issues are addressed in the assessment.

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#### Rehabilitation of the site:

The assessment must include a detailed outline of how the site will be rehabilitated at the end of the project's operational phase. This plan should have the objective of rehabilitating the site to a level that demonstrates an increase in the environmental values of sites when compared to the pre-operational site.

This rehabilitation strategy should strive to include the employment of local people throughout implementation.

The strategy also needs to outline ongoing environmental monitoring of the site, post rehabilitation to ensure minimal potential for degradation in the future.

We thank you once again for the opportunity to have input into the DGRs for this project and look forward to commenting further during the consultation and assessment phases.

If you have any questions in regard to this submission, please contact Tracey MacDonald on the details listed at the top of this letter.

Yours sincerely,

, Block on

Tracey MacDonald Program Manager - Strategy and Planning, Central West CMA

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BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



ABN 19 622 755 774

201 Elizabeth Street (onr Park St) PO Box A1000 Sydney South NewSouth Wales 1235 Australia Facsimile (02) 9284 3456 Telephone (02) 9284 3000 Web <u>http://www.transgrid.com.au</u> DX 1122 Sydney

Robert Corkery R.W. Corkery & Co. Pty Ltd Level 1, 12 Dangar Road PO Box 239 BROOKLYN NSW 2083

25 March 2013

Attention: Robert Corkery

Dear Sir,

#### RE: Issues to be addressed in the Environmental Impact Statement of the Bowdens Silver Project

We refer to your letter dated 5 March 2013 regarding the submission of issues by TransGrid for the Bowdens Silver Project Environmental Impact Statement (EIS).

TransGrid is a State Owned Corporation responsible for the planning, development, operation and maintenance of the high-voltage electricity transmission system in New South Wales. TransGrid appreciates that R.W. Corkery & Co. Pty. Limited, on behalf of Kingsgate Bowdens Pty Limited (Kingsgate), is undertaking direct consultation with TransGrid throughout the EIS process.

TransGrid understands that the Bowdens Silver Project (the project) would comprise an open cut silver, lead and zinc mine and associated infrastructure. The project would be located in close proximity to TransGrid's existing No. 5A3 Bayswater to Mt Piper 500 kilovolt (kV) transmission line. The project must ensure the safe, reliable and efficient continued operation and maintenance of TransGrid's electricity network. The structural integrity and operation of the transmission lines and structures shall not be compromised by the construction, operation and/or decommissioning of the mine.

TransGrid has identified potential issues with the proximity of the mine to the existing transmission line that should be considered in the EIS. These are identified below:

#### Ground Movements:

- The impacts on transmission line towers from ground movements from mining activities shall be considered. The mine may result in transmission lines being subject to vertical and horizontal displacements. Vertical displacements may reduce clearance from the ground surface which may lead to infringements of requirements for clearance of transmission lines. Horizontal displacements (and tilt) may affect the alignment and tension of the transmission lines. Ground disturbance effects on a transmission tower may render it unserviceable or lead to collapse of the towers (Guidelines for Coal Mining and Transmission Lines with Respect to Subsidence, Mine Subsidence Board 1997).
- Any necessary precautionary measures to mitigate ground movements from mining activities on affected transmission lines must be undertaken. If the expected ground movement effects are so severe that the transmission line structures and/or foundations are inadequate and that TransGrid's electricity network is compromised, then major redesigning, modification or relocation of the line is likely to be required.



TransGrid is a NSW statutory State-owned corporation

- Any blasting occurring near the transmission line easement shall consider vibration impacts on the stability of transmission line structures. Blasting shall have a maximum charge of 2kg/delay, with a maximum peak particle velocity of 50mm/second. Furthermore, the impacts on the transmission line from potential flyrock associated with blasting operations also need to be considered.
- No excavation shall occur within 35 metres of any TransGrid structure without prior approval from TransGrid.

#### Access:

- TransGrid requires access to each transmission structure of the transmission line, for construction, maintenance and emergency situations. TransGrid maintenance vehicles and plant that access the easement have weights up to 35 tonnes GVM. Access tracks shall be maintained to accommodate these heavy vehicles.
- A continuous and unobstructed access way along the entire length of the easement is to be
  maintained at all times during construction and operation of the line. TransGrid requests
  consultation regarding any possible restrictions to TransGrid access to the transmission line. The
  easement shall not be used by any vehicles or for the laydown of materials, without prior
  consultation with TransGrid.
- No obstructions shall be placed in the easement area or within 35 metres of any part of a
  transmission structure or supporting ropes, wires or chains. The area around the base of the
  transmission line structures shall have easy vehicle access from all sides, and be available at all
  times as a clear working area for line maintenance crews and plant.

#### Electrical Safety:

- All works (including construction and operation of the project) within the easement is subject to safe working distances. All work within TransGrid's easement shall comply with the WorkCover Code of Practice 2006 for Work Near Overhead Powerlines, Catalogue No. 1394. The Code of Practice requires that any plant that has the potential to impinge on the "Accredited Person Zone" must be operated by an "Accredited Person" as per the aforementioned Code of Practice.
- Vehicle or plant equipment which can exceed 4.6 metres in height are not permitted upon the
  easement except when operating under the procedures outlined in the WorkCover Code of
  Practice 1394.
- The erection of any structure within the easement greater than 4.6 metres in height is prohibited.
- Infringement of the WorkCover Code of Practice (in particular Approach Distances as listed in Table 2, Section 3.3) by any plant may result in dangerous induced voltages causing human injury or death.
- TransGrid considers that an arc incident caused by equipment under the control of the proponent would jeopardise TransGrid's capacity to exercise its functions and discharge its responsibilities under the *Energy Services Corporations Act 1995*. The potential for the construction and operation of the mine to affect electrical safety will need to be considered in the EIS.

#### Electrical Induction:

- An Electrical Induction Study for the mine construction and continued operation shall be prepared by the proponent and provided to TransGrid.
- Any metallic structures shall not be placed within 35 metres of a structure, or within 35 metres of the centre of the easement without adequate protection for ground currents, earth potential rise and induction.

#### Other Issues:

- No hazardous substances shall be placed with the easement.
- All disturbed earthworks within the easement shall be reinstated to original surface level, and compacted to 95% standard compaction. Disturbed ground surface within the easement shall be stabilised with a suitable ground cover.



TransGrid is a NSW statutory State-owned corporation



- No drainage or surface storm waters shall wash over the easement within 35 metres of any transmission line structure.
- Dust shall be controlled to prevent impact on the insulators.
- No vegetation with a mature height above 4 metres shall be planted within the easement.
- The easement shall be left free of waste or any other materials during construction and operation.

TransGrid appreciates ongoing consultation in relation to issues affecting the electricity network. Please contact Jason Kennedy on (02) 9284 3135 or <u>jason.kennedy@transgrid.com.au</u> should you wish to discuss any other issues in relation to this project.

Yours sincerely

V

Darren Clarke Senior Environmental Officer Environment, Property and Development Compliance



TransGrid is a NSW statutory State-owned corporation



Your reference: Our reference: Contact: Date: SSD-5765 DOC14/320119-02 Renee Shepherd 02 6883 5355 19 January 2014

Kane Winwood Team Leader, Mining Projects NSW Department of Planning & Environment GPO Box 39 SYDNEY NSW 2001

Dear Mr Winwood

#### RE: SEARs for Bowdens Silver Project (SSD-5765)

I refer to your e-mail dated 15 December 2014 seeking input into the Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Assessment (EIS) for the Bowdens Silver Project (SSD-5765).

OEH has considered your request and provides SEARs for the proposed development in Attachments A and B and guidance material in Attachment C.

OEH recommends the EIS needs to appropriately address the following:

- 1. Biodiversity and offsetting
- 2. Aboriginal cultural heritage
- 3. Water and soils
- 4. Flooding

NSW Please note that the Biodiversity Offsets Policy for Major Projects http://www.environment.nsw.gov.au/resources/biodiversity/140672biopolicy.pdf is now being implemented. The policy provides a standard method for assessing impacts of major projects on biodiversity and determining offsetting arrangements. The policy is underpinned by the Framework for Biodiversity Assessment (FBA) http://www.environment.nsw.gov.au/resources/biodiversity/140675fba.pdf which contains the assessment methodology that is adopted by the policy to quantify and describe the impact assessment requirements and offset guidance that applies to Major Projects. The FBA must be used by a proponent to assess all biodiversity values on the development site.

> PO Box 2111 Dubbo NSW 2830 Level 1 48-52 Wingewarra Street Dubbo NSW Tel: (02) 6883 5330 Fax: (02) 6884 8675 ABN 30 841 387 271 www.environment.nsw.gov.au



BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

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If you have any questions regarding this matter further please contact Renee Shepherd on 02 6883 5355.

Yours sincerely,

PETER CHRISTIE Regional Manager North West Region

Attachment A - Standard Environmental Assessment Requirements Attachment B - Project Specific Environmental Assessment Requirements Attachment C - Guidance material



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## Attachment A – Standard Environmental Assessment Requirements

Bio	odiversity		
1.	Biodiversity impacts related to the proposed Bowdens Silver Project are to be assessed and documented in accordance with the <u>Framework for Biodiversity Assessment</u> , unless otherwise agreed by OEH, by a person accredited in accordance with s142B(1)(c) of the <i>Threatened Species Conservation Act</i> 1995.		
Abo	original cultural heritage		
2.	The EIS must identify and describe the tangible and intangible Aboriginal cultural heritage values that exist across the whole area that will be affected by the Bowdens Silver Project and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the <u>Guide to investigating</u> .		
3.	Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the <u>Aboriginal cultural heritage consultation</u> <u>requirements for proponents 2010 (DECCW)</u> . The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS.		
4.	Impacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS. The EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment will be documented and notified to OEH.		
Wat	ter and soils		
5.	<ul> <li>The EIS must map the following features relevant to water and soils including:</li> <li>a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).</li> <li>b. Rivers, streams, wetlands, estuaries (as described in Appendix 2 of the Framework for Biodiversity Assessment).</li> <li>c. Groundwater.</li> <li>d. Groundwater dependent ecosystems.</li> <li>e. Proposed intake and discharge locations.</li> </ul>		
6.	<ul> <li>The EIS must describe background conditions for any water resource likely to be affected by the Bowdens Silver Project, including:</li> <li>a. Existing surface and groundwater.</li> <li>b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.</li> <li>c. Water Quality Objectives (as endorsed by the NSW Government)</li> </ul>		
	http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters).		

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	d.	Indicators and trigger values/criteria for the environmental values identified at (c) in
		accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or
		local objectives, criteria or targets endorsed by the NSW Government.
7.	Th	e EIS must assess the impacts of the Bowdens Silver Project on water quality, including:
	a.	The nature and degree of impact on receiving waters for both surface and groundwater,
		demonstrating how the project protects the Water Quality Objectives where they are currently
		being achieved, and contributes towards achievement of the Water Quality Objectives over
		time where they are currently not being achieved. This should include an assessment of the
		mitigating effects of proposed stormwater and wastewater management during and after
		construction.
	b.	Identification of proposed monitoring of water quality.
8.	Th	e EIS must assess the impact of the Bowdens Silver Project on hydrology, including:
	a.	Water balance including quantity, quality and source.
	b.	Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
	c.	Effects to downstream water-dependent fauna and flora including groundwater dependent
		ecosystems.
	d.	Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains
		that affect river system and landscape health such as nutrient flow, aquatic connectivity and
		access to habitat for spawning and refuge (eg river benches).
	e.	Changes to environmental water availability, both regulated/licensed and unregulated/rules-
		based sources of such water.
	f.	Mitigating effects of proposed stormwater and wastewater management during and after
		construction on hydrological attributes such as volumes flow rates management methods
		and re-use options.
	a.	Identification of proposed monitoring of hydrological attributes
Flo	odin	g and coastal erosion
9	The	FIS must man the following features relevant to flooding as described in the Electrolein
•.	Des	velopment Manual 2005 (NSW Government 2005) including:
	2	Elood prope land
	a. h	Flood plone land
	D.	Hode planning area, the area below the flood planning level.
	υ.	Hydraulic categorisation (hoodways and hood storage areas).
10.	The	EIS must describe flood assessment and modelling undertaken in determining the design
	floo	d levels for events, including a minimum of the 1 in 10 year, 1 in 100 year flood levels and the
	prol	bable maximum flood, or an equivalent extreme event.
11.	The	EIS must model the effect of the proposed Bowdens Silver Project (including fill) on the flood
	beh	aviour under the following scenarios:
	a.	Current flood behaviour for a range of design events as identified in 8) above. The 1 in 200
		and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall
		, , , , , , , , , , , , , , , , , , ,



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12.	М	odelling in the EIS must consider and document:
	a.	The impact on existing flood behaviour for a full range of flood events including up to the
		probable maximum flood.
	b.	Impacts of the development on flood behaviour resulting in detrimental changes in potential
		flood affection of other developments or land. This may include redirection of flow, flow
		velocities, flood levels, hazards and hydraulic categories.
	c.	Relevant provisions of the NSW Floodplain Development Manual 2005.
13.	Th	e EIS must assess the impacts on the proposed Bowdens Silver Project on flood behaviour
	inc	sluding:
	a.	Whether there will be detrimental increases in the potential flood affectation of other
		properties, assets and infrastructure.
	b.	Consistency with Council floodplain risk management plans.
	C.	Compatibility with the flood hazard of the land.
	d.	Compatibility with the hydraulic functions of flow conveyance in floodways and storage in
		flood storage areas of the land.
	e.	Whether there will be adverse effect to beneficial inundation of the floodplain environment,
		on, adjacent to or downstream of the site.
1	f.	Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian
		vegetation or a reduction in the stability of river banks or watercourses.
ç	g.	Any impacts the development may have upon existing community emergency management
		arrangements for flooding. These matters are to be discussed with the SES and Council.
ł	٦.	Whether the proposal incorporates specific measures to manage risk to life from flood.
i		Emergency management, evacuation and access, and contingency measures for the
		development considering the full range or flood risk (based upon the probable maximum
		flood or an equivalent extreme flood event). These matters are to be discussed with and
		have the support of Council and the SES.
j.		Any impacts the development may have on the social and economic costs to the community
		as consequence of flooding.



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## Attachment B – Project Specific Environmental Assessment Requirements

#### Biodiversity

14. Impacts on the species and ecological community listed below will require further consideration and provision of the information specified in s9.2 of the Framework for Biodiversity Assessment:

- Regent Honeyeater Anthochaera phrygia
- White Box Yellow Box Blakely's Red Gum Woodland



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### Attachment C - Guidance material

Title	Web address
	Relevant Legislation
Coastal Protection Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+13+19 79+cd+0+N
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1 979+cd+0+N
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+19 94+cd+0+N
Marine Parks Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+64+19 97+cd+0+N
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+19 74+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1 997+cd+0+N
Threatened Species Conservation Act 1995	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+101+1 995+cd+0+N
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+20 00+cd+0+N
Wilderness Act 1987	http://www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+ FIRST+0+N
	Biodiversity
NSW Biodiversity Offsets Policy for Major Projects (OEH, 2013)	http://www.environment.nsw.gov.au/biodivoffsets/1480biofpolmp. htm
Framework for Biodiversity Assessment (OEH, 2013)	http://www.environment.nsw.gov.au/biodivoffsets/1480biofpolmp. htm
Fisheries NSW policies and guidelines	http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,- guidelines-and-manuals/fish-habitat-conservation
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchato z.aspx
Revocation, recategorisation and road adjustment policy (OEH, 2012)	http://www.environment.nsw.gov.au/policies/RevocationOfLandPo licy.htm
Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/parks/policyRevoc ations.pdf
Abo	original Cultural Heritage
Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/com mconsultation/09781ACHconsultreg.pdf
Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)	http://www.environment.nsw.gov.au/resources/cultureheritage/107 83FinalArchCoP.pdf

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Title	Web address
Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011)	http://www.environment.nsw.gov.au/resources/cultureheritage/201 10263ACHguide.pdf
Aboriginal Site Recording Form	http://www.environment.nsw.gov.au/resources/parks/SiteCardMain V1_1.pdf
Aboriginal Site Impact Recording Form	http://www.environment.nsw.gov.au/resources/cultureheritage/120 558asirf.pdf
Aboriginal Heritage Information Management System (AHIMS) Registrar	http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm
Care Agreement Application form	http://www.environment.nsw.gov.au/resources/cultureheritage/201 10914TransferObject.pdf
	Water and Soils
Acid sulphate soils	
Acid Sulfate Soils Planning Maps	http://canri.nsw.gov.au/download/
Acid Sulfate Soils Manual (Stone et al. 1998)	Manual available for purchase from: http://www.landcom.com.au/whats-new/the-blue-book.aspx Chapters 1 and 2 are on DPI's Guidelines Register at:
	Chapter 1 Acid Sulfate Soils Planning Guidelines:
	http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%2 0Acid%20Sulfate%20Soils%20Planning%20Guidelines.pdf
	Chapter 2 Acid Sulfate Soils Assessment Guidelines:
	http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%2 0Acid%20Sulfate%20Soils%20Assessment%20Guidelines.pdf
Acid Sulfate Soils Laboratory Methods	http://www.derm.gld.gov.au/land/ass/pdfs/lmg.pdf
	This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Flooding and Coastal Erosion	
Reforms to coastal erosion management	http://www.environment.nsw.gov.au/coasts/coastalerosionmgmt.ht m
Floodplain development manual	http://www.dnr.nsw.gov.au/floodplains/manual.shtml
Guidelines for Preparing Coastal Zone Management Plans	Guidelines for Preparing Coastal Zone Management Plans http://www.environment.nsw.gov.au/resources/coasts/101019Gdln sCZMPs.pdf
NSW Climate Impact Profile	NSW Climate Impact Profile
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.mincos.gov.au/publications/australian and new zeala nd guidelines for fresh and marine water guality
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	http://deccnet/water/resources/AWQGuidance7.pdf
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve dmethods-water.pdf



Contact Tim Baker Phone 6841 7403 Email Tim.Baker@dpi.nsw.gov.au Our ref ER22188

Kane Winwood Team Leader, Mining Projects NSW Planning & Environment By email: kane.winwood@planning.nsw.gov.au

#### Dear Kane

# Request for revised Secretary's Environmental Assessment Requirements for Bowdens Silver Project (SSD-5765) [Our Ref: ER22188]

The NSW Office of Water (Office of Water) has reviewed the supporting documentation accompanying the request for revised Secretary's Environmental Assessment Requirements (SEARs) and provides the following comments below, and further detail in **Attachment A**.

It is recommended that the EIS be required to include:

- Details of water proposed to be taken (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.
- Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project).
- The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.
- A detailed and consolidated site water balance.
- A detailed assessment against the NSW Aquifer Interference Policy (2012) using the NSW Office of Water's assessment framework.
- Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.
- An assessment of impacts to existing surface water systems in terms of potential modifications to natural ecological, hydrologic and hydraulic function and potential impacts to local water users and the environment. This needs to be addressed for both during and post mine life with the use of stabilised landforms and mitigation of impacts. Consideration of the "Guidelines for Controlled Activities on Waterfront Land (2012)" and modelling of redistribution of waters due to the project is required.
- Full technical details and data of all surface and groundwater modelling, and an independent peer review.
- Proposed surface and groundwater monitoring activities and methodologies.
- Proposed management and disposal of produced or incidental water

Level 11, 10 Valentine Avenue, Parramatta | PO Box 3720 Parramatta NSW 2124 t (02) 8281 7777 | f (02) 8838 7554 | www.water.nsw.gov.au



- Details surrounding the final landform of the site, including final void management (where relevant) and rehabilitation measures.
- Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.
- Consideration of relevant policies and guidelines.
- A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).

Should you require further information please contact Tim Baker, Senior Water Regulation Officer on (02) 6841 7403.

Yours sincerely

Mitchell Isaacs Manager Strategic Stakeholder Liaison 19 December 2014

Encl.

NSW Office of Water | Page 2 of 8



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#### ATTACHMENT A

#### NSW Office of Water Comments on Secretary's Environmental Assessment Requirements Bowdens Silver Project (SSD-5765)

The following detailed assessment requirements are provided to assist in adequately addressing the assessment requirements for this proposal.

For further information visit the NSW Office of Water website, www.water.nsw.gov.au

#### **Key Relevant Legislative Instruments**

This section provides a basic summary to aid proponents in the development of an Environmental Impact Statement (EIS), and should not be considered a complete list or comprehensive summary of relevant legislative instruments that may apply to the regulation of water resources for a project.

The EIS should take into account the objects and regulatory requirements of the *Water Act 1912* (WA 1912) and *Water Management Act 2000* (WMA 2000), and associated regulations and instruments, as applicable.

# Water Management Act 2000 (WMA 2000)

Key points:

- Volumetric licensing in areas covered by water sharing plans
- Works within 40m of waterfront land
- SSD & SSI projects are exempt from requiring water supply work approvals and controlled activity approvals as a result of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*.
- No exemptions for volumetric licensing apply as a result of the EP&A Act.
- Basic landholder rights, including harvestable rights dams
- Aquifer interference activity approval and flood management work approval provisions have not yet commenced and are regulated by the *Water Act 1912*
- Maximum penalties of \$2.2 million plus \$264,000 for each day an offence continues apply under the WMA 2000

### Water Act 1912 (WA 1912)

Key points:

- Volumetric licensing in areas where no water sharing plan applies
- Monitoring bores
- Aquifer interference activities that are not regulated as a water supply work under the WMA 2000.
- Flood management works
- No exemptions apply to licences or permits under the WA 1912 as a result of the EP&A Act.
- Regulation of water bore driller licensing.

Water Management (General) Regulation 2011

- Key points:
  - Provides various exemptions for volumetric licensing and activity approvals
  - Provides further detail on requirements for dealings and applications.

Water Sharing Plans - these are considered regulations under the WMA 2000

Access Licence Dealing Principles Order 2004

Harvestable Rights Orders

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#### Water Sharing Plans

The proposal is located within the area covered by the Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources, the WSP for the NSW Murray Darling Basin Porous Rock Groundwater Sources, the WSP for the Macquarie-Cudgegong Regulated Rivers Water Source and the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Source. The EIS is required to:

- Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing
  Plan including rules for access licences, distance restrictions for water supply works and
  rules for the management of local impacts in respect of surface water and groundwater
  sources, ecosystem protection (including groundwater dependent ecosystems), water
  quality and surface-groundwater connectivity.
- Provide a description of any site water use (amount of water to be taken from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.
- Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP, including:
  - o Sufficient market depth to acquire the necessary entitlements for each water source.
  - Ability to carry out a "dealing" to transfer the water to relevant location under the rules of the WSP.
  - o Daily and long-term access rules.
  - o Account management and carryover provisions.
- Provide a detailed and consolidated site water balance.
- Further detail on licensing requirements is provided below.

#### **Relevant Policies and Guidelines**

The EIS should take into account the following policies (as applicable):

- NSW Guidelines for Controlled Activities on Waterfront Land (NOW, 2012)
- NSW Aquifer Interference Policy (NOW, 2012)
- Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW, 2012)
- Australian Groundwater Modelling Guidelines (NWC, 2012)
- NSW State Rivers and Estuary Policy (1993)
- NSW State Groundwater Policy Framework Document (1997)
- NSW State Groundwater Quality Protection Policy (1998)
- NSW State Groundwater Dependent Ecosystems Policy (2002)
- NSW Water Extraction Monitoring Policy (2007)

Office of Water policies can be accessed at the following links: http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/default.aspx http://www.water.nsw.gov.au/Water-licensing/Approvals/Controlled-activities/default.aspx

An assessment framework for the NSW Aquifer Interference Policy can be found online at: <u>http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/Aquifer-interference</u>.

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#### **Licensing Considerations**

The EIS is required to provide:

- Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site – such as evaporative loss from open voids or inflows).
- Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.
- Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.).
- Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc).
- Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing.
- Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages
- Details on the location, purpose, size and capacity of any new proposed dams/storages.
- Applicability of any exemptions under the Water Management (General) Regulation 2011 to the project.

Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.

The Harvestable Right gives landholders the right to capture and use for any purpose 10 % of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor. The MHRDC includes the capacity of all existing dams on the property that do not have a current water licence. Storages capturing up to the harvestable right capacity are not required to be licensed but any capacity of the total of all storages/dams on the property greater than the MHRDC may require a licence.

For more information on Harvestable Right dams, including a calculator, visit: http://www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvestingrunoff

#### Dam Safety

Where new or modified dams are proposed, or where new development will occur below an existing dam, the NSW Dams Safety Committee should be consulted in relation to any safety issues that may arise. Conditions of approval may be recommended to ensure safety in relation to any new or existing dams.

See www.damsafety.nsw.gov.au for further information.

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#### Surface Water Assessment

The predictive assessment of the impact of the proposed project on surface water sources should include the following:

- Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.
- Identification of all surface water sources as described by the relevant water sharing plan.
- Detailed description of dependent ecosystems and existing surface water users within the area, including basic landholder rights to water and adjacent/downstream licensed water users.
- Description of all works and surface infrastructure that will intercept, store, convey, or otherwise interact with surface water resources.
- Assessment of predicted impacts on the following:
  - o flow of surface water, sediment movement, channel stability, and hydraulic regime,
  - o water quality,
  - o flood regime,
  - o dependent ecosystems,
  - o existing surface water users, and
  - planned environmental water and water sharing arrangements prescribed in the relevant water sharing plans.

#### Groundwater Assessment

To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources including:

- Works likely to intercept, connect with or infiltrate the groundwater sources.
- Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- Bore construction information is to be supplied to the Office of Water by submitting a "Form A" template. The Office of Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used as consistent and unique bore identifiers for all future reporting.
- A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).
- Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.
- · The predicted impacts of any final landform on the groundwater regime.
- The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.
- An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.
- An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).
- Measures proposed to protect groundwater quality, both in the short and long term.
- Measures for preventing groundwater pollution so that remediation is not required.

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- Protective measures for any groundwater dependent ecosystems (GDEs).
- · Proposed methods of the disposal of waste water and approval from the relevant authority.
- · The results of any models or predictive tools used.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.
- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

#### **Groundwater Dependent Ecosystems**

The EIS must consider the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:

- Identify any potential impacts on GDEs as a result of the proposal including:
  - o the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections; and
  - o the effect on the function of GDEs (habitat, groundwater levels, connectivity).
- Provide safeguard measures for any GDEs.

#### Watercourses, Wetlands and Riparian Land

The EIS should address the potential impacts of the project on all watercourses likely to be affected by the project, existing riparian vegetation and the rehabilitation of riparian land. It is recommended the EIS provides details on all watercourses potentially affected by the proposal, including:

- Scaled plans showing the location of:
  - o wetlands/swamps, watercourses and top of bank;
  - o riparian corridor widths to be established along the creeks;
  - existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);
  - $\circ\,$  the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and
  - o proposed location of any asset protection zones.
- Photographs of the watercourses/wetlands and a map showing the point from which the photos were taken.
- · A detailed description of all potential impacts on the watercourses/riparian land.

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- A detailed description of all potential impacts on the wetlands, including potential impacts to the wetlands hydrologic regime; groundwater recharge; habitat and any species that depend on the wetlands.
- A description of the design features and measures to be incorporated to mitigate potential impacts.
- Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.

#### Drill Pad, Well and Access Road Construction

- Any construction activity within 40m of a watercourse, should be designed by a suitably qualified person, consistent with the NSW *Guidelines for Controlled Activities on Waterfront Land* (July 2012).
- Construction of all wells must be undertaken in accordance with the *Minimum Construction* Requirements for Water Bores in Australia (3rd edition 2012) by a driller holding a bore drillers' licence valid in New South Wales.
- The length of time that a core hole is maintained as an open hole should be minimised.

#### Landform rehabilitation (including final void management)

The Environmental Impact Statement report should include:

- Justification of the proposed final landform with regard to its impact on local and regional surface and groundwater systems;
- A detailed description of how the site would be progressively rehabilitated and integrated into the surrounding landscape;
- Outline of proposed construction and restoration of topography and surface drainage features if affected by the project;
- Detailed modelling of potential groundwater volume, flow and quality impacts of the
  presence of an inundated final void (where relevant) on identified receptors specifically
  considering those environmental systems that are likely to be groundwater dependent;
- An outline of the measures to be put in place to ensure that sufficient resources are
   available to implement the proposed rehabilitation; and
- The measures that would be established for the long-term protection of local and regional aquifer systems and for the ongoing management of the site following the cessation of the project.

**End Attachment A** 

NSW Office of Water | Page 8 of 8



 Resource Assessments

 Contact:
 Kane Winwood

 Phone:
 (02) 9228 6298

 Email:
 kane.winwood@planning.nsw.gov.au

Our Ref: 12/03353-1

Mr Bob Markovich Kingsgate Bowdens Pty Limited 801/14 Martin Place SYDNEY NSW 2000

Dear Mr Markovich

#### State Significant Development - Secretary's Requirements Bowdens Silver Project (SSD 5765)

I have attached the Secretary's environmental assessment requirements (EARs) for the preparation of an Environmental Impact Statement (EIS) for the Bowdens Silver Project.

These requirements are based on the information you have provided to date and the previous Director-General's Requirements, which were prepared in consultation with the relevant government agencies. Further consultation with these agencies was recently undertaken and the agencies' comments are attached for your information (see Attachment 2).

Please note that the Department may alter these requirements at any time, and that you must consult further with the Department if you do not lodge a development application and EIS for the project within two years of the date of issue of these EARs.

Given the strong community interest in the proposal and the proposed changes to the project, the Department considers it timely for further consultation with the Lue community. To this end, it is recommended that a project update be provided to the Lue Action Group and other residents of Lue prior to the end of February. It would also be appreciated if you would forward a description of the consultation that occurs to the Department by 13 March 2015.

Consistent with the Department's letter of 25 February 2013, I also draw your attention to the need to consider the Lue Action Group's concerns during the preparation of the EIS.

As discussed at our meeting of 24 November 2014, clause 50A of the *Environmental Planning and Assessment Regulation 2000* requires that any development application for a mining proposal must be accompanied by either a Gateway Certificate or a site verification certificate. In this regard, you may either:

- apply for a site verification certificate to confirm that the project area does <u>not</u> contain any biophysical strategic agricultural land (BSAL); or
- elect to proceed straight to the Gateway process on the basis that the project area or part of the project area contains BSAL.

An Interim protocol for site verification and mapping of BSAL has been produced to outline the process, which is available on the Department's website (www.planning.nsw.gov.au).

You should also establish whether the proposal requires a separate approval under the *Environment Protection and Biodiversity Conservation Act 1999* as soon as possible. If such an approval is required, please notify the Department immediately, as the Commonwealth approval process is likely to be integrated with the NSW approval process (under the bilateral agreement), and supplementary requirements will need to be issued.

I would appreciate if you would contact the Department at least two weeks before you plan to submit the EIS for the project. This will enable the Department to:

Department of Planning & Environment

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- confirm the applicable fee (see Division 1AA, Part 15 of the Environmental Planning and Assessment Regulation 2000); and
  - · determine the required number of copies (hard copy and digital) of the EIS required for review.

The Department will review the EIS for the project carefully before putting it on public exhibition, and will require you to submit an amended EIS if it does not adequately address the EARs.

If you have any enquiries about these requirements, please contact Kane Winwood.

Yours sincerely ichal 6.2.15. Mike Houng

Manager Mining Projects as delegate of the Secretary

# Secretary's Environmental Assessment Requirements

### **State Significant Development**

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

Application Number	SSD 5765
Development	<ul> <li>The Bowdens Silver Project, which involves:</li> <li>developing an open cut silver, lead and zinc mine and associated infrastructure;</li> <li>extracting and processing up to 4 million tonnes of ore a year for up to 12 years;</li> <li>transporting the processed ore from the mine via road; and</li> <li>rehabilitating the site.</li> </ul>
Location	Maloneys (Bara) Road, Lue, in the Mid-Western Regional LGA
Applicant	Kingsgate Bowdens Pty Limited
Date of Issue	6 February 2015
General Requirements	<ul> <li>The Environmental Impact Statement (EIS) for the development must comply with the requirements in Clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.</li> <li>In particular, the EIS must include: <ul> <li>a full description of the development, including:</li> <li>the resource to be extracted, demonstrating efficient resource recovery within environmental constraints, and having regard to DRE's requirements (see Attachment 2);</li> <li>the mine layout and scheduling;</li> <li>ore processing;</li> <li>surface infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process);</li> <li>a waste (overburden, tailings, etc.) management strategy, having regard to the EPA's requirements (see Attachment 2);</li> <li>a waste (overburden, tailings, etc.) management strategy, having regard to the EPA's and NOW's requirements (see Attachment 2);</li> <li>a waste (see Attachment 2);</li> <li>a water management strategy, having regard to the EPA's and NOW's requirements (see Attachment 2);</li> <li>a rehabilitation strategy, having regard to the key principles in the Strategic Framework for Mine Closure; and</li> <li>the likely interactions between the development and any other existing, approved or proposed extractive industry development in the vicinity of the site;</li> </ul> </li> <li>a list of any approvals that must be obtained before the development may commence;</li> <ul> <li>an assessment of the likely impacts of the development on the environment, focussing on the specific issues identified below, including:</li> <ul> <li>a description of the existing environment likely to be affected by the development, using sufficient baseline data;</li> <li>an assessment of the likely impacts of all stages of the development, including any cumulative impacts, taking into consideration any relevant laws, environmental planning instruments, guidelines, policies, plans and industry codes of practice</li></ul></ul></ul>

	<ul> <li>whether contingency plans would be necessary to manage any residual risks;</li> <li>a description of the measures that would be implemented to monitor and report on the environmental performance of the development if it is approved;</li> </ul>
	<ul> <li>a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS;</li> <li>consideration of the development against all relevant environmental planning instruments (including Part 3 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007); and</li> <li>the reasons why the development should be approved having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development.</li> </ul>
	While not exhaustive, Attachment 1 contains a list of some of the environmental planning instruments, guidelines, policies, and plans that may be relevant to the environmental assessment of this development.
	<ul> <li>In addition to the matters set out in Schedule 1 of the Environmental Planning and Assessment Regulation 2000, the development application must be accompanied by a signed report from a suitably qualified expert that includes an accurate estimate of the:</li> <li>capital investment value (as defined in Clause 3 of the Environmental Planning and Assessment Regulation 2000) of the development, including details of all the assumptions and components from which the capital investment value calculation is derived; and</li> <li>jobs that would be created during each stage of the development.</li> </ul>
Key issues	<ul> <li>The EIS must address the following specific matters:</li> <li>Land – including: <ul> <li>an assessment of the likely impacts of the development on the soils and land capability of the site and surrounds;</li> <li>an assessment of the likely agricultural impacts of the development;</li> <li>an assessment of the likely impact of the development on landforms (topography), including the long term geotechnical stability of any new landforms (such as overburden dumps); and</li> <li>an assessment of the compatibility of the development with other land uses in the vicinity of the development in accordance with the requirements in Clause 12 of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007, paying particular attention to the agricultural land use in the region;</li> </ul> </li> <li>Air Quality – including: <ul> <li>an assessment of the likely air quality impacts of the development in accordance with the likely are used and use in the development in accordance for the development in assessment of the likely are used and and the likely are used to the development in accordance for the development</li></ul></li></ul>
	<ul> <li>accordance with the Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW and the EPA's additional requirements (see Attachment 2); and</li> <li>an assessment of the likely greenhouse gas impacts of the development, having regard to the EPA's requirements (see Attachment 2);</li> <li>Human Health – including: <ul> <li>a detailed Human Health Risk Assessment addressing how the project's environmental impacts in relation to air quality (including heavy metals), noise and drinking water quality, may impact on the health of the local community; and</li> <li>monitoring and management measures to reduce risk to human health;</li> </ul> </li> <li>Water – including: <ul> <li>an assessment of the likely impacts of the development on the quantity and guality of the region's surface and groundwater resources, having</li> </ul> </li> </ul>
	<ul> <li>regard to the EPA's and NOW's requirements (see Attachment 2);</li> <li>an assessment of the likely impacts of the development on aquifers, watercourses, riparian land, water-related infrastructure, and other</li> </ul>

	<ul> <li>water users; and <ul> <li>an assessment of the likely flooding impacts of the development;</li> </ul> </li> <li>Noise – including: <ul> <li>an assessment of the likely operational noise impacts of the development (including construction noise) under the NSW <i>Industrial Noise Policy</i>, having regard to the EPA's requirements (see Attachment 2);</li> <li>if a claim is made for specific construction noise criteria for certain activities, then this claim must be justified and accompanied by an assessment of the likely construction noise impacts of these activities under the <i>Interim Construction Noise Guideline</i>; and</li> <li>an assessment of the likely road noise impacts of the development under the NSW <i>Road Noise Policy</i>,</li> </ul> </li> <li>Biodiversity – including: <ul> <li>an assessment of the likely biodiversity impacts of the development using the Framework for Biodiversity Assessment, having regard to the OEH's requirements (see Attachment 2); and</li> <li>an offset strategy to ensure the development maintains and improves the biodiversity values of the region in the medium to long term;</li> </ul> </li> <li>Heritage – including an assessment of the likely transport impacts of the development, having regard to the OEH's requirements (see Attachment 2);</li> </ul> <li>Transport – including an assessment of the likely transport impacts of the development on the capacity, condition, safety and efficiency of the local and State road network, having regard to the RMS' requirements (see Attachment 2);</li> <li>Visual – including an assessment of the likely visual impacts of the development and key vantage points in the public domain, paying particular attention to the creation of any new landforms (bunds, etc.) and minimising the lighting impacts of the development;</li> <li>Public Safety – including an assessment of the likely risks to public safety, paying particular attention to potential bushfire risks and the handling and use of any dangerous goods; and</li> <li>an assessment of t</li>
	<ul> <li>the significance of the resource;</li> <li>economic benefits of the project for the State and region; and</li> <li>the demand for the provision of local infrastructure and services.</li> </ul>
Consultation	<ul> <li>During the preparation of the EIS, you must consult with relevant local, State and Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with the:</li> <li>Commonwealth Department of the Environment;</li> <li>Office of Environment and Heritage (including the Heritage Branch);</li> <li>Environment Protection Authority;</li> <li>Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services;</li> <li>Department of Primary Industries (including the NSW Office of Water, NSW Forestry, Agriculture and Fisheries sections and Crown Lands);</li> <li>Roads and Maritime Services;</li> <li>Central West Local Land Services;</li> <li>Mid Western Regional Council; and</li> <li>the Lue community, including the Lue Action Group.</li> </ul>
	raised during this consultation, and explain how these issues have been addressed in the EIS.



BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



PO BOX 156 MUDGEE NSW 2850

86 Market Street MUDGEE 109 Herbert Street GULGONG 77 Louee Street RYLSTONE

Ph: 1300 765 002 or (02) 6378 2850 Fax: (02) 6378 2815 email: council@midwestern.nsw.gov.au

15 January 2015

A0420245

Mr Kane Winwood NSW Planning & Environment GPO Box 39 SYDNEY NSW 2001

Dear Mr Winwood

#### **BOWDENS SILVER PROJECT - REVISED SEARs**

I refer to the email dated 15 December 2014 inviting Council to provide comment on the proposed amended Secretary's Environmental Assessment Requirements (SEARs).

Council has reviewed the updated proposal and would like to add the following comments as an addendum to our original submission dated 14 February 2013:

- Council require the applicant to undertake a full assessment of the impacts on air quality
  from dust and particulate matter as a result of the project including monitoring of
  background lead levels to ensure that there are no adverse impacts on the Lue community
  and surrounding area. Council requests that consideration be given to the findings in Port
  Augusta where unexpected high lead levels were found locally and at sites remote from
  the mine site.
- Council reaffirms that it considers that water is a determining issue. To date the applicant
  has been unable to identify the exact amount of water required, the source of water and
  the proposed method of reticulation to the mine site. Council remains concerned regarding
  the potential impact on agricultural users and objects to any scheme that requires the
  transfer of water licences from below Burrendong Dam. Council requests that the
  assessment clearly identifies the source of water, amount and proposed reticulation.
- Council reaffirms its requirement that all road upgrades identified in the Preliminary Environmental Assessment be undertaken at full cost to the developer and that all upgrades are required as a condition of approval prior to the commencement of construction on the site. This includes the re-alignment and sealing of Maloneys (Bara) Road from the Lue Road intersection to the mine entrance.

MID-WESTERN REGIONAL COUNCIL

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Council reaffirms that it fully supports the response form the Lue Action Group and requests that their requirements be included in the SEARs. Should you have any queries in relation to this matter please contact Catherine Van Laeren on (02) 6378 2850.

Yours faithfully

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CATHERINE VAN LAEREN DIRECTOR - DEVELOPMENT

www.midwestern.nsw.gov.au

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Our Reference: OUT15/1119

Mr Kane Winwood Team Leader, Mining Projects NSW Planning & Environment GPO Box 39 SYDNEY NSW 2001

kane.winwood@planning.nsw.gov.au

Dear Mr Winwood

#### Bowdens Silver Project Revised Secretary's Environmental Assessment Requirements

I refer to an email dated 15 December 2014 to the NSW Trade & Investment Division of Resources & Energy (the Division), inviting comments to the Department of Planning & Environment regarding revised Secretary's Environmental Assessment Requirements (SEARs) for the Bowdens Silver Project.

Given the nature of the project the Division recommends that the following requirements be included in the revised SEARs.

### PROJECT DESCRIPTION

To ensure that a project and its environmental interactions can be understood and assessed by the Division of Resources & Energy (DRE), an Environmental Impact Statement (EIS) should provide a comprehensive description of all aspects (including the mineral extraction and mining purposes) of the project. In terms of text, plans or charts, it must also clearly show the proposed extent and sequence of the development.

All plans and maps should be presented at an appropriate scale.

#### GEOLOGY

The EIS is to include a brief description of the geological setting of the deposit. Of importance is a description of the geology and mineralisation of the deposit itself. This should include specific details about the shape, physical dimensions, mineralogy and ore mineral distribution for individual ore bodies/lenses.

Supporting information including plans and cross-sections need to show the extent of the mineralised zones to be mined and those located adjacent/beneath planned mining voids which may be sterilised by planned activities. Where this may impact on resource utilisation and planned final voids, information such as grade and width/tonnes needs to be included.

The EIS is to include whole rock, minor and trace element geochemistry of the ore, tailings and waste rock. This information is often a key component in understanding the environmental effects of the proposal.

Department of Trade & Investment, Regional Infrastructure & Services Division of Resources and Energy PO Box 344 Hunter Region Mail Centre NSW 2310 516 High St Maitland NSW 2323 Tel: 02 4931 6666 Fax: 02 4931 6776 www.industry.nsw.gov.au ABN 72 189 919 072



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#### RESOURCE AND RESERVE STATEMENT

The EIS is to include a resource/reserve statement that has been prepared in accordance with the current version of the Joint Ore Reserve Committee Code (JORC code) to a minimum of Indicated Resource level of confidence. It is preferred that at least some of the resource estimate is to a higher confidence level than Indicated. The statement must include resource and reserve estimates for each ore body proposed to be mined. The statement must include the ore grades for each ore body including product specifications and yields.

DRE understands that it may not be feasible to convert the majority of an Inferred Resource to Indicated (or higher) level of confidence, however the proponent needs to demonstrate that there are sufficient resources to support the majority of the initial life of mine production schedule. Any contribution from Inferred Resource(s) to the schedule needs to be justified.

#### LIFE OF MINE PRODUCTION SCHEDULE

The proponent must supply a life of mine production schedule for each year of operation of the mine and for the life of the project. The production schedule is to include:

- details of run-of-mine ore, low grade ore-mineralised waste and waste rock tonnage planned to be extracted for each year and for the life of the project, and an estimate of the saleable product produced for each year and the life of the project;
- in terms of text, plans or charts, an EIS must clearly show the proposed extent and sequence of the development; and
- an estimate of which market segment that product tonnes would be sold into e.g. export/domestic thermal/metallurgical coal, export/domestic mineral product, Sydney construction materials, local/NSW or interstate etc.

#### MINING TITLE

An EIS for a project should clearly identify existing mineral titles, mineral title applications and the final proposed mining lease area(s) for the project site and areas surrounding the proposed project area and address the environmental impacts and management measures for the mining and mining purpose activities as licensed under the Mining Act 1992.

Where a proposal includes Crown Land the proponent is required to comply with the Commonwealth Native Title Act 1993 and undertake the right to negotiate process for the Crown Lands within the current exploration licence area(s) if proof of extinguishment cannot be determined.

# DESCRIPTION OF EXISTING ENVIRONMENT, IDENTIFICATION OF IMPACTS AND CONSTRAINTS

All areas affected by the proposal should be shown in the context of the natural and built environments. This should be in sufficient detail to enable an understanding of the scale of impacts and gauge the effectiveness of proposed control measures.

The EIS should state the interaction between the proposed mining activities and the existing environment and so include a comprehensive description of the following activities and their impacts:

 mine layout and scheduling, including maximising opportunities for progressive final rehabilitation. The final rehabilitation schedule should be mapped against key production milestones (i.e. ROM tonnes or recovered ore) of the mine layout sequence before being translated to indicative timeframes throughout the mine life. The mine plan should maximise opportunities for progressive rehabilitation;

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 mineral processing and handling, rejects handling and disposal management activities;

- infrastructure facilities and storage requirements;
- · surface and groundwater usage and management; and
- mine closure including rehabilitation and decommissioning activities.

The proponent must clearly demonstrate by way of plans, cross sections and/or long sections the extent of mineralised zones adjacent to the planned mine extraction area/void that may be effectively sterilised by the proposed mine infrastructure or be sterilised should back filling of any planned pits be required.

Impacts associated with the operational and post closure stages of the project must also be identified in detail and control management strategies outlined. The identification and description of impacts must draw out those aspects of the site that may present barriers or limitations to effective rehabilitation and which may limit the mine closure potential of the land. The following are the key issues to be addressed in the EIS that are likely to have a bearing on rehabilitation and mine closure:

- an evaluation of current rehabilitation techniques and performance against existing rehabilitation objectives and completion criteria;
- an assessment and life of mine management strategy of the potential for geochemical constraints to rehabilitation (e.g. acid rock drainage, spontaneous combustion etc.), particularly associated with the management of overburden/interburden and reject material. Based on this assessment, the EIS is to document the processes that will be implemented throughout the mine life to identify and appropriately manage geochemical risks that may affect the ability to achieve sustainable rehabilitation outcomes;
- a life of mine tailings management strategy, which details measures to be implemented to avoid the exposure of tailings material that may cause environmental risk, as well as promote geotechnical stability of the rehabilitated landform;
- existing and surrounding landforms (showing contours and slopes) and how similar characteristics can be incorporated into the post-mining final landform design. This should include an evaluation of how the key geomorphological characteristics evident in stable landforms within the natural landscape can be adapted to the materials and other constraints associated with the site;
- where a void is proposed to remain as part of the final landform, the assessment is to provide details in regards to the following:
  - a constraints and opportunities analysis of final void options, including backfilling, to justify that the proposed design is the most feasible and environmentally sustainable option to minimise the sterilisation of land post-mining;
  - a preliminary geotechnical assessment to identify the likely long term stability risks associated with the proposed remaining high wall(s) and low wall(s) along with associated measures that will be required to minimise potential risks to public safety; and
  - outcomes of the surface and groundwater assessments in relation to the likely final water level in the void. This should include an assessment of the potential for fill and spill along with measures required be implemented to minimise associated impacts to the environment and downstream water users.

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- assess the biological resources associated with the proposed disturbance area and how they can be practically salvaged for utilisation in rehabilitation (i.e. topsoil, seed banks, tree hollows and logs, native seed etc.). This should include an evaluation of how topsoil/subsoil of suitable quality can be direct-returned for use in rehabilitation
- assess the flora, fauna and ecological attributes of the disturbed area should be recorded and placed in a regional context
- carry out an evaluation of current land capability class and associated condition
- characterise soils across the proposed area of surface disturbance and assess their value and identify opportunities and constraints for use in rehabilitation
- Where an agricultural land use is proposed, the EIS should demonstrate:
  - 1. that the landscape will be returned to the Agricultural Suitability Class that existed before mining commenced or better
  - where the intended land use is likely to be grazing, the existing capacity in terms of Dry Sheep Equivalent or similar must be calculated and a timeframe from vegetation establishment be given for the return to agricultural production to at least the existing stock capacity
  - provide information on how soil would be developed in order to achieve the proposed stock capacity.
- The EIS must assess surface water flow and flooding regimes and how these will be impacted and mitigated by the project both during and after mining has ceased. This is to include an evaluation of potential impacts from the final void on both surface and groundwater quality and flow regimes.

#### **REHABILITATION & MINE CLOSURE STRATEGY**

DRE's role focuses on ensuring that mined land in NSW is effectively rehabilitated and returned to beneficial post mining land uses. This is undertaken by requiring mine operators to have strategies in place to ensure the rehabilitation of all mined land, and strategies for an orderly transition from a mining land use to an agreed stable and beneficial post mining use. At the EIS stage, the strategies may be conceptual in nature.

The EIS is to include a detailed description of the scope of decommissioning and rehabilitation activities required to meet the nominated closure objectives and completion criteria for each domain. The scope of these activities must be developed in consideration of the existing environment, identification of impacts and constraints as listed above.

Each of the following aspects of rehabilitation planning should be addressed in the strategy:

- Post Mining Land Use the proponent must identify and assess post mining land use options and provide a statement of the preferred post mining land use outcome in the EIS. This should include a discussion of how the final land use(s) are aligned with relevant local and regional strategic land use objectives. In addition, the benefits of the post mining land to the surrounding environment, a subsequent landowner, the local community and the state of NSW.
- In addition, the proponent must identify how the rehabilitation of the project will
  integrate with the rehabilitation strategies of neighbouring mines within the region.
  On a local scale this should include the project and adjacent mines, with a particular
  emphasis on the coordination of rehabilitation activities along common boundary
  areas.
- Rehabilitation Objectives and Domains a set of project rehabilitation objectives and completion criteria must be included that clearly define the environmental

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outcomes required to achieve the final land use for each domain. The completion criteria must be specific, measurable, achievable, realistic and time-bound.

- If necessary, objective criteria may be presented as ranges rather than finite indicator levels. Subjective criteria may also apply where a gap in technical knowledge is experienced. Further refinement of these criteria will be undertaken and included in the Rehabilitation Management Plan (RMP).
- **Rehabilitation Methodology** provide details regarding the rehabilitation methods for disturbed areas and expected time frames for each stage of the rehabilitation process. Provide details on proposed rehabilitation monitoring and an outline of proposed rehabilitation research programs and trials.
- Conceptual Final Landform Design a drawing at an appropriate scale with final landform contours should be provided. This drawing should identify the following attributes of the final landform: vegetation types; habitat features; contaminated areas; final voids; drainage infrastructure; access and internal roads; fencing design; and other remaining infrastructure such as sheds, dams, bores and pipelines.
- Monitoring and Research outline the proposed monitoring programs that will be implemented to assess how rehabilitation is trending towards the nominated land use objectives and completion criteria. This should include details of the process for triggering intervention and adaptive management measures to address potential adverse results as well as continuously improve rehabilitation practices.

In addition, an outline of proposed rehabilitation research programs and trials, including objectives, are to be included in the EIS. This should include details of how the outcomes of research are considered as part of the ongoing review and improvement of rehabilitation practices

Post-closure maintenance: - Describe how post-rehabilitation areas will be actively
managed and maintained in accordance with the intended land use(s) in order to
demonstrate progress towards meeting the closure objectives and completion criteria
in a timely manner.

Should you have any queries regarding these draft requirements, please contact Steve Cozens, Senior Project Officer, Industry Coordination on phone 9842 8573.

Yours sincerely

Adrian Delany Acting Director Industry Coordination

28.1.15

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# **Appendix 3**

# Coverage of Secretary's Environmental Assessment Requirements, Government Agency Assessment Requirements and Issues Raised by the Lue and District Community for Consideration in the EIS

(Total No. of pages including blank pages = 90)

Table A3.1	Coverage of Secretary's Environmental Assessment Requirements in the EIS
Table A3.2	Coverage of Environmental Planning Instruments, Policies, Guidelines and Plans
Table A3.3	Coverage of Department of Environment & Energy Assessment Requirements in the EIS
Table A3.4	Coverage of Assessment Requirements provided by other Government Agencies for Consideration in the EIS
Table A3.5	Coverage of Issues raised by the Lue and District Community for Consideration in the EIS



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The EIS for the Bowdens Project has been prepared with reference to the following documentation provided by State and Local Government Agencies between 2013 and 2019. For some agencies, more than one set of requirements are provided as reference has been made in the more recent requirements to the earlier requirements. In some cases, some agencies have not updated their requirements since 2013.

	DGRs	SEARs			
Government Agency	2013*	2014-2015*	2016**	2017-2018**	2019**
State Government					
Department of Planning and Environment					21/06/2019
Environment Protection Authority				20/12/2018	14/05/2019
Department of Industry (Division of Resources and Energy)			23/02/2016		
Department of Planning & Environment – Division of Resources and Geoscience					14/05/2019
Department of Primary Industries – Agriculture					16/05/2019
Department of Primary Industries – Fisheries			12/12/2016		16/05/2019
Department of Primary Industries – Crown Lands	04/03/2013				
Department of Primary Industries (Office of Water)		19/12/2014	12/12/2016		
Department of Industry – Water and Natural Resource Regulator					16/05/2019
Office of Environment and Heritage					14/05/2019
Greater Western Area Health Service	24/01/2013				
Department of Health (Western NSW Local Health District)			Undated		
Roads and Maritime Services	29/01/2013		08/12/2016		07/05/2019
	15/02/2013				
Department of Education and Communities	04/02/2013 13/02/2013				
Department of Education			03/08/2017		
Heritage Council			08/12/2016		
TransGrid	25/03/2013		23/08/2017		
Local Government					
Mid-Western Regional Council	14/02/2013	15/01/2015	12/12/2016		23/05/2019
<ul> <li>Provided to Kingsgate Bowdens Pty Limited and reproduced on the digital version of this document.</li> <li>Provided to Bowdens Silver Pty Limited and included in Attachments 2A and 2B (see Appendix 2).</li> </ul>					



The following table lists the requirements provided by the Department of Planning & Environment that need to be addressed in the EIS for the Bowdens Silver Project.

# Table A3.1 Coverage of Secretary's Environmental Assessment Requirements in the EIS

		Page 1 of 5
Re	elevant Requirement	Relevant EIS Section(s)
	GENERAL REQUIREMENTS	
Th an <i>Pl</i> a	ne Environmental Impact Statement (EIS) for the development must meet the form and content requirements in Clauses 6 and 7 of Schedule 2 of the <i>Environmental</i> Canning and Assessment Regulation 2000.	
Th	ne EIS must include:	
•	a stand-alone executive summary;	Executive Summary
•	a full description of the development, including:	
	<ul> <li>the resource to be extracted, demonstrating efficient resource recovery within environmental constraints, and having regard to DRG/DRE's requirements (see Attachment 2A and 2B);</li> </ul>	2.2.3
	- the mine layout and scheduling;	Figures 2.1, 2.12, 2.14, 2.27, Table 2.2
	- minerals processing;	2.7
	<ul> <li>surface infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process);</li> </ul>	2.10.4
	- a waste (overburden, tailings, etc.) management strategy;	2.5.4, 2.8
	<ul> <li>a water management strategy, having regard to the EPA's and DPI's requirements (see Attachment 2A and 2B);</li> </ul>	2.10.3, 4.7.4
	<ul> <li>a rehabilitation strategy, having regard to DRG/DRE's requirements (see Attachment 2A and 2B); and</li> </ul>	2.16.1 to 2.16.3
	<ul> <li>the likely interactions between the development and any other existing, approved or proposed mining related development in the vicinity of the site;</li> </ul>	Not relevant
•	a list of any approvals that must be obtained before the development may commence;	2.1.3
•	the terms of any proposed voluntary planning agreement with the relevant local council;	3.2.3.6
•	an assessment of the likely impacts of the development on the environment focussing on the specific issues identified below, including;	
	<ul> <li>a description of the existing environment, likely to be affected by the development, using sufficient baseline data;</li> </ul>	All Section 4 subsections
	<ul> <li>an assessment of the likely impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice; and</li> </ul>	Section 4, Preamble
	<ul> <li>a description of the measures that would be implemented to mitigate and/or offset the likely impacts of the development, and an assessment of:</li> </ul>	5
	<ul> <li>whether these measures are consistent with industry best practice, and represent the full range of reasonable and feasible mitigation measures that could be implemented;</li> </ul>	

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Relevant Requirement	Relevant EIS Section(s)
GENERAL REQUIREMENTS (Cont'd)	
<ul> <li>the likely effectiveness of these measures, including performance measures where relevant; and</li> </ul>	
• whether contingency plans would be necessary to manage any residual risks;	
<ul> <li>a description of the measures that would be implemented to monitor and report on the environmental performance of the development if it is approved;</li> </ul>	4.2.4, 4.3.7, 4.4.4, 4.6.8.2, 4.7.6, 4.8.9, 4.9.4, 4.10.5, 4.11.5, 4.11.7, 4.12.4
a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS.	5
consideration of the development against all relevant environmental planning     instruments (including Part 3 of the <i>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007);</i> and	6.1.4, Table 3.1
<ul> <li>a conclusion evaluating the merits of the project as a whole, having regard to the requirements in Section 4.15 of the Environmental Planning and Assessment Act 1979; and</li> </ul>	6.1.1 - 6.1.4.1
• a signed statement from the author of the EIS, certifying that the information contained within the document is neither false nor misleading.	Page iii
Matters set out in Schedule 1 of the Environmental Planning and Assessment Regulation 2000.	This Document
The development application must be accompanied by a signed report from a suitably qualified and experienced person that includes an accurate estimate of the capital investment value (CIV) (as defined in clause 3 of the Environmental Planning and Assessment Regulation 2000) of the development, including details of all the assumptions and components from which the CIV calculation is derived.	Appendix 8
SPECIFIC ISSUES	
LAND RESOURCES	
The EIS must address the following specific issues:	
<ul> <li>an assessment of the likely impacts of the development on soils and land capability of the site and surrounds;</li> </ul>	4.13.3
an assessment of the likely agricultural impacts of the development, including identification of any strategic agricultural land;	4.18.1, 4.18.6, 4.18.3.2
• an assessment of the likely impacts of the development on landforms (topography), including the long term geotechnical stability of any new landforms on site; and	4.18.6
• an assessment of the compatibility of the development with other land uses in the vicinity of the development in accordance with the requirements of Clause 12 of <i>State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007</i> , paying particular attention to the agricultural land use in the region.	4.18.6, Table 3.1

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Relevant Requirement	Relevant EIS Section(s)
SPECIFIC ISSUES (Cont'd)	
AIR QUALITY	
The EIS must address the following specific issues:	
• an assessment of the likely air quality impacts of the development in accordance with the <i>Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW</i> , having regard to EPA's requirements (see Attachment 2A and 2B); and	4.4
an assessment of the likely greenhouse gas impacts of the development.	4.5.3
HUMAN HEALTH	
The EIS must address the following specific issues:	
<ul> <li>a Human Health Risk Assessment, addressing how the development's environmental impacts in relation to air quality (including heavy metals) and noise may impact on the health of the local community; and</li> </ul>	4.8, SCSC Part 7
monitoring and management measures to reduce risk to human health.	4.8.9
WATER RESOURCES	
The EIS must address the following specific issues:	
• an assessment of the likely impacts of the development on the quantity and quality of the region's surface and groundwater resources (including but not limited to, Lawsons Creek and Price Creek), having regards to EPA's, DPI's and OEH's requirements (see Attachment 2A and 2B); and	4.6, 4.7
• an assessment of the likely impacts of the development on aquifers, watercourses, riparian land, water-related infrastructure and other water users, including:	4.7
<ul> <li>a detailed site water balance, including an assessment of the reliability of water supply imported to the site, and management of excess water, supported by sensitivity analysis; and</li> </ul>	
<ul> <li>an assessment of the water quality and management of the imported water, including spill/leak management.</li> </ul>	
NOISE AND BLASTING	
The EIS must address the following specific issues:	
<ul> <li>an assessment of the likely operational noise impacts of the development (including construction noise) under the <i>Noise Policy for Industry</i> (EPA) and the <i>Voluntary Land Acquisition and Mitigation Policy</i>, and having regard to the EPA's requirements (see Attachment 2A and 2B);</li> </ul>	4.2
• if a claim is made for specific construction noise criteria for certain activities, then this claim must be justified and accompanied by an assessment of the likely construction noise impacts of these activities under the <i>Interim Construction Noise Guideline</i> ;	4.2.2.4
• an assessment of the likely road noise impacts of the development under the NSW Road Noise Policy; and	4.2.2.4, 4.2.2.7
• an assessment of the likely blasting impacts of the development on people, animals, buildings and infrastructure, and significant natural features, having regard to the relevant ANZECC guidelines.	4.3.6.1

	Page 4 of 5
Relevant Requirement	Relevant EIS
SPECIFIC ISSUES (Cont'd)	00000000
BIODIVERSITY	
The EIS must address the following specific issues:	
<ul> <li>an assessment of the likely biodiversity impacts of the development, in accordance with the <i>Framework for Biodiversity Assessment</i>, and having regard to OEH's requirements (see Attachment 2A and 2B); and</li> </ul>	4.10
<ul> <li>a strategy to offset any residual impacts of the development in accordance with the NSW Biodiversity Offsets Policy for Major Projects.</li> </ul>	4.10.5.4
HERITAGE	
The EIS must include an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development, having regard to OEH's requirements (including the Heritage Division) (see Attachment 2A and 2B).	4.14, 4.15
TRAFFIC AND TRANSPORT	
The EIS must include an assessment of the likely transport impacts of the development on the capacity, condition, safety and efficiency of the local and State road network, having regard to Mid-Western Regional Council's and RMS's requirements (see Attachment 2A and 2B).	4.12
VISUAL	
The EIS must include a detailed assessment of the likely visual impacts of the development on private landowners in the vicinity of the development and key vantage points in the public domain, paying particular attention to the creation of any new landforms and minimising the lighting impacts of the development.	4.9
HAZARDS	
The EIS must include an assessment of the likely risks to public safety, paying particular attention to potential subsidence risks, bushfire risks, and the handling and use of any dangerous goods, having regard to the EPA's requirements (see Attachment 2A and 2B).	4.16
SOCIAL AND ECONOMIC	
The EIS must address the following specific issues:	
<ul> <li>an assessment of likely social impacts of the development on the local and regional community generally in accordance with the Social Impact Assessment Guidelines for State Significant Mining, Petroleum Production and Extractive Industry Development (2017), including the likely impacts of the development on the local community, cumulative impacts (considering other mining developments in the locality), and consideration of workforce accommodation; and</li> </ul>	4.20
<ul> <li>an assessment of likely economic impacts of the development, paying particular attention to the:</li> </ul>	4.19
- significance of the resource;	
- economic benefits of the development for the State and region; and,	
- demand for the provision of local infrastructure and services.	



	Page 5 of 5
Relevant Requirement	Relevant EIS Section(s)
SPECIFIC ISSUES (Cont'd)	
CONSULTATION	
• During the preparation of the EIS and subsequent assessment process establish and operate a Community Consultative Committee (CCC) fo development in accordance with the <i>Community Consultative Commit</i> <i>Guidelines: State Significant Projects dated November 2016.</i>	is you must 3.2.2.1 In the ttee
<ul> <li>You should also consult with relevant local, State or Commonwealth G authorities, infrastructure and service providers, community groups an landowners.</li> </ul>	Sovernment 3.2.2, 3.2.3 ad affected
<ul> <li>The EIS must describe the consultation that was carried out, identify the raised during this consultation (including by the CCC), and explain how issues have been addressed in the EIS.</li> </ul>	he issues 3.2, 3.3 w these
REFERENCES	
While not exhaustive, Attachment 1 contains a list of some of the environr planning instruments, guidelines, policies, and plans that may be relevant environmental assessment of this development.	nental Appendix 3 to the Table A3.2



The following table incorporates the relevant documents listed in Attachment 1 of the SEARs.

		Page 1 of 4
	Relevant EIS Section(s)	Relevant SCSC Section(s)
Land		
Agfact AC25: Agricultural Land Classification (NSW Agriculture)	Not relevant	Not relevant
Soil and Landscape Issues in Environmental Impact Assessment (NOW)	-	Part 12
State Environmental Planning Policy No. 55 – Remediation of Land	3.2.3.4	-
Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC)	Not relevant	Not relevant
Air Quality		
Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (EPA)	4.4	Part 2 Section 2.1
Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA)	4.4.4	Part 2 Section 9.1
Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)	4.4.2.5	Part 2 Appendix 3 Table A3.4
Voluntary Land Acquisition and Mitigation Policy (DP&E)	4.4.2.1, 4.4.2.5	Part 2 Section 7.10
National Greenhouse Accounts Factors (Commonwealth)	-	Part 2 Section 8.1
Water		
Water Sharing Plans		
Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources	4.6.6	Part 5 Section 2.1.2.1
Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources	4.6.6	Part 5 Section 2.1.2.1
Water Sharing Plan for the Macquarie-Cudgegong Regulated Rivers Water Source	Not relevant	Not relevant
Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources	4.6.6	Part 5 Section 2.1.2.1
Groundwater		
NSW State Groundwater Policy Framework Document (NOW)	Not relevant	Not relevant
NSW State Groundwater Quality Protection Policy (NOW)	-	Part 5 Section 2.1.5
NSW State Groundwater Quantity Management Policy (NOW)	Not relevant	Not relevant
NSW Aquifer Interference Policy 2012 (NOW)	4.6.7.5, 4.6.4	-
Australian Groundwater Modelling Guidelines 2012 (Commonwealth)	4.6.5.2	Part 5 Section 5
National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)	-	Part 5 Section 4.5.12.5
Guidelines for the Assessment & Management of Groundwater Contamination (EPA)	Not relevant	Not relevant

 Table A3.2

 Coverage of Environmental Planning Instruments, Policies, Guidelines & Plans

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# Table A3.2 (Cont'd)

# Coverage of Environmental Planning Instruments, Policies, Guidelines & Plans

		Page 2 of 4
	Relevant EIS Section(s)	Relevant SCSC Section(s)
Surface Water		
NSW State Rivers and Estuary Policy (NOW)	Not relevant	Not relevant
NSW Government Water Quality and River Flow Objectives (EPA)	4.7	-
Water Quality Objectives in NSW (EPA)	-	Part 6 Section 3.1
ANZECC Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)	-	Part 6 Section 3.7
National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)	-	Part 6 Section 9.2
Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA)	-	Part 6 Section 9.2
Managing Urban Stormwater: Soils & Construction (Landcom) and associated Volumes 2A to 2E (DECC)	-	Part 6 Section 4.6.2
Managing Urban Stormwater: Treatment Techniques (EPA)	*	*
Managing Urban Stormwater: Source Control (EPA)	*	*
Technical Guidelines: Bunding & Spill Management (EPA)	*	*
A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH)	*	*
NSW Guidelines for Controlled Activities (NOW)	Not relevant	Not relevant
Flooding		
Floodplain Development Manual (OEH)	-	Part 6 Appendix B
Floodplain Risk Management Guideline (OEH)	-	SCSC Part 6 Section 3.6
Noise & Blasting		
NSW Noise Policy for Industry (EPA)	4.2.1	Part 1 Sections 12.2, 7
Interim Construction Noise Guideline (EPA)	4.2.1, 4.2.2.4	Part 1 Sections 6.1.1
NSW Road Noise Policy (EPA)	4.2.1, 4.2.2.4, 4.2.2.6, 4.2.2.7	Part 1 Sections 11, 12.5
Assessing Vibration: a Technical Guideline (EPA)	4.3.3.2	Part 1 Sections 11.6.1, 12.6.1
Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC)	4.3.3.1	Part 1 Sections 10.1.2, 12.4.1
Voluntary Land Acquisition and Mitigation Policy (DP&E)	4.2.1, 4.2.2.4, 4.2.2.5	Part 1 Sections 4.3, 5.4, Annexure 14
* This document will be addressed in the relevant Management Plans for the Project		

# Table A3.2 (Cont'd) Coverage of Environmental Planning Instruments, Policies, Guidelines & Plans

	•	Page 3 of 4
	Relevant EIS Section(s)	Relevant SCSC Section(s)
Biodiversity		
Framework for Biodiversity Assessment (OEH)	4.10.1	Part 9a Sections 2.1.2, BAR
NSW Biodiversity Offsets Policy for Major Projects (OEH)	4.10.5.4	Part 9a Sections 8
Threatened Species Assessment Guidelines (OEH)	-	Part 9a Sections 2.1.2
Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (Fisheries NSW)	-	Part 10 Section 2.3.1
NSW State Groundwater Dependent Ecosystem Policy (NOW)	Not relevant	Not relevant
Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW)	-	Part 5 Section 6.1.2
State Environmental Planning Policy No. 44 – Koala Habitat Protection	4.10.6.4	Part 9a Section 7.7
Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI)	-	Part 10 Section 2.3.2
Heritage		
The Burra Charter (The Australia ICOMOS charter for places of cultural significance)	-	Part 13 Section 6.3.1
Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH)	-	Part 13 Section 2.2.5
Code of Practice for Archaeological Investigations of Objects in NSW (OEH)	-	Part 13 Section 5
Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (OEH)	-	SCSC Part 13 Section 5
NSW Heritage Manual (OEH)	-	Part 13 Section 5
Statements of Heritage Impact (OEH)	-	Part 13 Section 7.3.1
Assessing Significance for Historical Archaeological Sites and 'Relics' (OEH)	-	Part 13 Section 6.3
Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH)	-	Part 13 Section 5
Transport		
Guide to Traffic Generating Developments 2002 (RTA)	4.12.1	Part 11 Section 3.11
Austroads Guide to Road Design and RMS supplements to road design	4.12.4.1	Part 11 Sections 6.9, 6.10, 8
Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development	-	Part 11 (entire document)
Hazards		, ,
State Environmental Planning Policy No. 33 – Hazardous and Offensive Development	4.16.1.2	Part 4 Sections 1.6, 2
Hazardous and Offensive Development Application Guidelines – Applying SEPP 33	4.16.1.2	Part 4 Sections 1.6, 2
Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis	4.16.1.3	Part 4 Sections 1.6, 3.1



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# Table A3.2 (Cont'd)

#### Coverage of Environmental Planning Instruments, Policies, Guidelines & Plans

		Page 4 of 4
	Relevant EIS Section(s)	Relevant SCSC Section(s)
Resource		
Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 (JORC)	2.2.3	-
Waste		
Waste Classification Guidelines (EPA)	2.14	-
Rehabilitation		
Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth)	2.16.1	-
Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth)	2.16.1	-
Strategic Framework for Mine Closure (ANZMEC-MCA)	2.16.1	-
Environmental Planning Instruments – General		
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007	3.2.2.4, Table 3.1	-
State Environmental Planning Policy (State and Regional Development) 2011	3.2.3.4	-
State Environmental Planning Policy (Infrastructure) 2007	3.2.3.4	-
State Environmental Planning Policy No. 55 – Remediation of Land	3.2.3.4	-
State Environmental Planning Policy No. 44 – Koala Habitat Protection	3.2.3.4, 4.10.6.4	Part 9a Section 7.7
State Environmental Planning Policy No. 33 – Hazardous and Offensive Development	3.2.3.4, 4.16.1.2	Part 4 Section 2
Mid-Western Regional Local Environmental Plan 2012	3.2.3.6	Part 17



#### Table A3.3

	Page 1 of 4
Relevant Requirement	Relevant EIS Section(s)
Introduction	Noted
On 5 April 2019, a delegate of the Federal Minister for the Department of the Environment and Energy determined that the Bowden's Silver Project was a controlled action under section 75 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act controlling provisions for the proposed action are:	
i. listed threatened species and communities (sections 18 and 18A).	
The proposed action will be assessed in accordance with the <i>NSW Bilateral Agreement relating to environmental assessment 2015</i> and as such, is required to be assessed in the manner specified in Schedule 1 to that Agreement including, addressing the matters outlined in Schedule 4 of the <i>Environment Protection and Biodiversity Conservation Regulations 2000</i> (EPBC Regulations).	Noted
The proponent must undertake an assessment of all protected matters that may be impacted by the development under the controlling provisions identified in section 18 and 18A of the EPBC Act. The Commonwealth Department of the Environment and Energy (DoEE) considers that the proposed action is likely to have a significant impact on the following:	
Insted threatened species and communities (sections to and toA).     White Day Vallage Day Distribute Day Oversey Weadland and Darived	1 10 1 0
A) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland -Critically Endangered;	4.10.4.2
b) Koala (Qld, NSW and the ACT) (Phascolarctus cinereus) – Vulnerable;	4.10.3.3, 4.10.4.4, 4.10.6.4, 4.10.6.5, 4.10.8
c) Regent Honeyeater (Anthochaera phrygia) - Critically Endangered;	4.10.4.4, 4.10.6.5
d) Swift Parrot (Lathamus discolor) - Critically Endangered; and	4.10.4.4, 4.10.6.5
<ul> <li>e) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (SE mainland population) (Dasyurus maculatus (SE mainland population)) – Endangered.</li> </ul>	4.10.4.4, 4.10.6.5
Based on DoEE's Environment Reporting Tool and information provided by the Species Profiles and Threats Database (SPRAT), DoEE considers that there is a real chance or possibility that project activities will significantly impact on the following:	
<ul> <li>a leek-orchid (<i>Prasophyllum</i> sp. Wybong (C.Phelps ORG 5269)) – Critically Endangered (pipeline only);</li> </ul>	SCSC Part 9a Table 28
b) Philotheca ericifolia – Vulnerable;	
c) Tarengo Leek Orchid ( <i>Prasophyllum petilum</i> ) – Endangered;	
d) Small Purple-pea ( <i>Swainsona recta</i> ) – Endangered;	
e) Euphrasia arguta – Critically Endangered;	
f) Booroolong Frog ( <i>Litoria booroolongensis</i> ) – Endangered;	
g) Striped Legless Lizard ( <i>Delma impar</i> ) – Vulnerable;	
h) Superb Parrot ( <i>Polytelis swainsonii</i> ) – Vulnerable;	
i) Brush-tailed Rock Wallaby ( <i>Petrogale penicillata</i> ) – Vulnerable;	
j) Grey-headed Flying-fox ( <i>Pteropus poliocephalus</i> ) – Vulnerable;	
k) Pink-tailed Worm-lizard (Aprasia parapulchella) – Vulnerable;	

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#### Table A3.3 (Cont'd)

	Page 2 of 4
Relevant Requirement	Relevant EIS Section(s)
I) Corben's Long-eared Bat ( <i>Nyctophilis corben</i> ) – Vulnerable;	SCSC Part 9a
m) Painted Honeyeater (Grantiella picta) – Vulnerable; and	Table 28
n) Large-eared Pied Bat ( <i>Chalinolobus dwyeri</i> ) – Vulnerable.	4.10.4.4, 4.10.6.5
These species require further assessment, surveys and analysis to determine whether they are likely to be significantly impacted. Note that this may not be a complete list and it is the responsibility of the proponent to ensure any protected matters under this controlling provision are assessed for the Commonwealth decision-makers consideration.	SCSC Part 9a Section 5.8
The proponent must consider each of the protected matters under the triggered controlling provisions that may be impacted by the action. Note that this may not be a complete list and it is the responsibility of the proponent to undertake an analysis of the significance of the relevant impacts and ensure that all protected matters that are likely to be significantly impacted are assessed for the Commonwealth Minister's consideration.	SCSC Part 9a Section 5.8
General Requirements	
The Environmental Impact Statement (EIS) must address the matters outlined in Schedule 4 of the EPBC Regulations and the matters outlined below in relation to the controlling provisions.	
The title of the action, background to the action of the action and current status.	1.5, 4
The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on MNES.	2, Appendix 5
How the action relates to any other actions that have been, or are being taken in the region affected by the action.	Not relevant
How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.	2, Appendix 5
The EIS must include an assessment of the relevant impacts <sup>1</sup> of the action on the matters protected by the controlling provisions, including:	
<sup>1</sup> Relevant impacts are those impacts likely to significantly impact on any matter protected under the EPBC Act	
<ul> <li>a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts;</li> </ul>	4.10.6, 4.10.7
ii. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;	4.10.6.2, 4.10.6.3
iii. analysis of the significance of the relevant impacts; and	SCSC Part 9a Annexure 6, Section 7
iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.	4.10.4
For <u>each</u> of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including:	
i. a description, and an assessment of the expected or predicted effectiveness of the mitigation measures,	4.10.5
ii. any statutory policy basis for the mitigation measures;	4.10.5



	Page 3 of 4			
Rel	evant Requirement	Relevant EIS Section(s)		
	General Requirements (Cont'd)			
iii.	the cost of the mitigation measures;	SCSC Part 15		
iv.	an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;	1		
۷.	the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.	DPIE		
Wh con incl stra	ere a significant residual adverse impact to a relevant protected matter is sidered likely, the EIS must provide information on the proposed offset strategy, uding discussion of the conservation benefit associated with the proposed offset itegy.	4.10 and SCSC Part 9b		
For pro poli	each of the relevant matters likely to be impacted by the action the EIS must vide reference to, and consideration of, relevant Commonwealth guidelines and cy statements including any:			
i.	conservation advice or recovery plan for the species or community,	SCSC Part 9a Annexure 6		
ii.	relevant threat abatement plan for a process that threatens the species or community	4.10.5		
iii.	wildlife conservation plan for the species	Not relevant		
iv.	any strategic assessment.	Not relevant		
	Specific Risks			
Key	risks from the Commonwealth perspective include:			
•	Impacts to threatened species and the ecological community listed above from clearing the vegetation.	4.10.6, 4.10.7		
•	Impacts from piping water, of unknown quality, from the Ulan Coalfield which could impacts GDEs.	2.10		
	Key Issues			
	Biodiversity (threatened species and communities and migratory spec	ies)		
The mig that qua loca evic	EIS must identify <u>each</u> EPBC Act listed threatened species and community and ratory species likely to be impacted by the action. For any species and communities a relikely to be impacted, the proponent must provide a description of the nature, antum and consequences of the impacts. For species and communities potentially ated in the project area or in the vicinity that are not likely to be impacted, provide dence why they are not likely to be impacted.	4.10 and SCSC Part 9a		
For spe	each of the EPBC Act listed threatened species and communities and migratory cies likely to be impacted by the action the EIS must provide a separate:			
a.	description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans;	SCSC Part 9a Section 5		
b.	details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements;	4.10.3		



Page	4	of	4

Rel	evant Requirement	Relevant EIS Section(s)	
	Key Issues (Cont'd)		
	Biodiversity (threatened species and communities and migratory species)	(Cont'd)	
C.	description of the relevant impacts of the action having regard to the full national extent of the species or community's range; and	4.10.6, 4.10.7	
d.	description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action;	4.10.5	
e.	identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account;	4.10.6	
f.	a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established.	4.10.5.4	
g.	details of how the current published NSW Framework for Biodiversity Assessment (FBA) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; and	SCSC Part 9b	
h.	details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the FBA and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites;	SCSC Part 9b	
	contribute to the ongoing viability of the specific protected matter impacted by a proposed action and deliver an overall conservation outcome that improves or maintains the viability of the MNES i.e. 'like for like'. In applying the FBA, residual impacts on EPBC Act listed threatened ecological communities must be offset with Plant Community Type(s) (PCT) that are ascribed to the specific EPBC listed ecological community. PCTs from a different vegetation class will not generally be acceptable as offsets for EPBC listed communities.]		
Any in a Env act-	v significant residual impacts not addressed by the FBA may need to be addressed accordance with the Environment Protection and Biodiversity Conservation Act 1999 vironmental Offset Policy. http://www.environment.gov.au/epbc/publications/epbc- environmental-offsets-policy.	4.10	
	Other approvals and conditions		
Info info Reg	ormation in relation to any other approvals or conditions required must include the ormation prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC gulations 2000.	2.1.3, 3.2.3	
	Environmental Record of person proposing to take the action		
Info acti Reg	rmation in relation to the environmental record of a person proposing to take the on must include details as prescribed in Schedule 4 Clause 6 of the EPBC gulations 2000.	3.2.2.3	
Information Sources			
For rece unc	information given in an EIS, the EIS must state the source of the information, how ent the information is, how the reliability of the information was tested; and what rertainties (if any) are in the information.	SCSC Part 9a Section 7	

The following table incorporates the issues raised by the other State Government Agencies and the Mid-Western Regional Council for consideration, where applicable, during the preparation of the Environmental Impact Statement. Only those requirements relevant to the administration of the respective agencies have been included in this table.

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#### Table A3.4

Δαρησιγί		Page 1 of 47	
Organisation	Paraphrased Relevant Requirement	Section(s)	
GENERAL ISSUES			
Environment Protection Authority 14/05/19	The EIS must include a comprehensive description of the proposed development including project water supply, production processes, all discharges and emissions to the environment, and assessment of likely environmental impacts, particularly in relation to waste storages and include a detailed description of any proposed control measures.	2.4, 2.5, 2.7, 2.8, 2.10, 4 (various sections)	
	The environmental sensitivity of the site and surrounds should be discussed. Details are required on the location of the proposed development, including the affected environment, to place the Project in its local and regional environmental context including surrounding land uses, land use zonings and most importantly potential sensitive receptors.	3.2.3.6, 4.1	
	The EIS should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified environmental impacts associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.	4 (various sections), 5	
	The following environmental impacts of the project need to be assessed, quantified and reported on:		
	Water	4.6, 4.7	
	• Air	4.4	
	Noise	4.2	
	Waste, including waste storages	2.5, 2.8	
	Construction	2.3	
	Soils	4.13	
	Contaminated Land	3.2.3.4, 4.7.4.4	
	The objectives of the Project should be clearly stated and refer to:		
	the size and type of the operation;	2.1.1, 2.1.2	
	<ul> <li>the nature of the processes and the products, by-products and wastes produced;</li> </ul>	2.5, 2.7, 2.8	
	the use or disposal of products;	6, Appendix 4	
	the anticipated level of performance in meeting required environmental standards and cleaner production principles	2 and 4 (various sections)	
	the staging and timing of the proposal; and	2.3, Figures 2.12, 2.14, 2.27	
	the Project's relationship to any other industry or facility.	2.10, 2.11	

		Page 2 of 47			
Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)			
	GENERAL ISSUES (Cont'd)				
Environment Protection Authority 14/05/19 (Cont'd)	The EIS will need to fully identify all of the processes and activities intended for the Project over the life of the development. This will include details of:				
	• the location of all the proposed facilities associated with the development and details of the surrounding environment including the affected environment to place the Project in its local and regional environmental context. This should include surrounding land uses, planning zonings, potential sensitive receptors, catchments and adjoining sensitive areas, surface and subsurface areas, features of conservation significance and environmental sensitivity (associated maps to be included);	Figure 2.1 and numerous supporting figures in Sections 2, 3 and 4			
	• the proposed layout of the site (associated maps to be included);	Figure 2.1			
	<ul> <li>ownership details of any residence and/or land likely to be affected by the Project;</li> </ul>	4.1.3			
	• maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc. in the locality that may be affected by the Project;	Figures 4.1.J, 4.1.K, 4.1.L, 4.1.M			
	all equipment proposed for use at the site;	Appendix 5 Tables A5.2, A5.7, A5.10,			
	• chemicals, including fuel, used on the site and proposed methods for their transportation, storage, use and emergency management	2.10.5, 2.11, 4.16			
	waste generation and disposal;	2.14 (all sections)			
	methods to mitigate any expected environmental impacts of the development; and	4 (various sections)			
	site rehabilitation following completion of the Project.	2.16 (various subsections), Appendix 5 Section A5.10			
	The EIS should:				
	1. Provide maps, at an appropriate scale, which clearly identifies the proposed site layout and proposed water pipeline corridor and relevant environmental features such as drainage lines, terrain etc, over the life of the Project.	Section 2			
	2. Provide maps which show land ownership information, the proposed site layout and impact assessment information at an appropriate scale.	Appendix 6			



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Agency / Organisation	Paranhrased Relevant Requirement	Section(s)	
GENERAL ISSUES (Cont'd)			
Environment Protection Authority 14/05/19 (Cont'd)	The potential environmental impacts related to the following environmental issues need to be assessed, quantified and reported on. It should be noted that the following requirements apply to all aspects of the development, which may include offsite works, including but not necessarily limited to, the relocation/establishment of infrastructure e.g. roads, railway crossings, pipelines and electricity transmission lines and services, and the establishment of access roads to the Project site.	Noted	
	The EIS should include a detailed assessment of any noise, air quality, water quality or waste monitoring required during the construction phase and on-going operation of the facility to prevent or minimise any adverse environmental impacts from the development.	2.14, 4.2, 4.4, 4.6, 4.7, SCSC Part 1, 2, 5 and 6	
	Appropriate baseline data requirements are to be identified as part of the EIS, to form the basis for baseline and ongoing monitoring of environmental parameters.	Section 4 (various)	
	It must be demonstrated that the proposed methods for baseline and subsequent monitoring are scientifically robust and statistically sound.	Section 4 (various)	
	The EIS must also identify and describe monitoring programs, compliance assurance programs and reporting requirements and arrangements that will demonstrate the effectiveness of proposed management measures in meeting applicable requirements.	Section 4 (various)	
	The EIS must, in addition to outlining proposed programs, clearly identify what is to be monitored and audited and why. This should include identification of monitoring locations, parameters to be monitored, sample analysis methods, the level of reporting proposed. The EIS should also include information on frequency and type of audits proposed to assure compliance with applicable requirements,	Section 4 (various)	
	The EIS should demonstrate monitoring and audit programs must be designed appropriately, according to best practice, to provide objective evidence regarding activities associated with the development and have regard to whether these activities are adversely impacting on the environment in the short, medium and/or long term.	Section 4 (various)	
	The EIS should provide an assessment of the cumulative impacts of the project during construction and operation of the proposal with regard to noise, air quality, water quality or waste Assessment of cumulative impacts must consider past, current and future activities in the area surrounding the project, impacts associated with internal components of this project (where relevant - e.g. a project involving construction throughout a precinct or similar), as well as the construction impacts of any projects recently completed.	2.14, 4.2, 4.4, 4.6, 4.7, SCSC Part 1, 2, 5 and 6	
Mid-Western Regional Council 14/02/13	Council requires details on how the company proposed approach to address and monitor all complaints associated with the operations of the mine.	1.8.2	

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Agency /	Deventures and Delevient Demoirsment	Relevant EIS		
Organisation	Paraphrased Relevant Requirement	Section(s)		
	GENERAL ISSUES (Cont'd)			
Mid-Western Regional Council 14/02/13 (Cont'd)	<ul> <li>To date no discussions have taken place regarding a Voluntary Planning Agreement (VPA) with Mid-Western Regional Council Council will be seeking an agreement to compensate for the additional demand on facilities and services provided by the CouncilIt should be noted that Council expects that all road upgrades will be required as a condition of approval prior to the commencement of the construction on site rather than included in a VPA.</li> </ul>	Noted		
NSW Division of Resources & Geoscience 14/05/19	<ul> <li>The Division has identified that the proposed pipeline route intersects the northern portion of Exploration Licence 7391 (Act 1992) (EL 7391) held by Thompson Resources Ltd. Contact with the title holder is required to determine the level of interaction and impact with evidence of authentic consultation to be provided to the Division. This should include a letter of notification of the proposal to the title holder including a map indicating the pipeline route in relation to the exploration title boundaries, and a letter of response from the title holder, the proponent. If responses are not received from the title holder, the proponent is to contact the Division.</li> <li>The proponent must check for new mineral and energy titles that may be granted in the vicinity of the proposed pipeline during all decision-making stages of the project. This is to ensure that all other stakeholders with interests in the subject area are made aware of the project.</li> </ul>	1.3.1		
	• The Proponent must obtain the appropriate mining title(s), such as a mining lease, from the Division allowing for mineral extraction (coal) under the Mining Act (1992).	Noted		
	<ul> <li>A development application under the Environmental Planning and Assessment Act 1979 must be approved before a mining lease can be granted. A mining lease will only be granted for activities specified in the development consent.</li> </ul>	Noted		
Crown Lands 04/03/13 (adjusted given Crown Lands	Where Crown roads are utilised for the purposes of the project or impacted on by the project activities, the applicant must within 12 months of project approval, obtain a Licence or Lease over the Crown road in accordance with the. Crown Lands Act 1989.	Noted		
Act 1989 has been repealed)	Crown roads within holdings owned by the applicant or impacted on by the project activities as described above, may be included in a road closing application. lodged by the applicant. Where Crown roads under application cannot be closed and purchased within a 12 month period following project approval, then the applicant must obtain a Licence or Lease over the Crown road in accordance with the <i>Crown Lands Act 1989</i> .	Noted		



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)		
Crown Lands 04/03/13 (Cont'd) (adjusted given Crown Lands Act 1989 has been repealed)	Noted			
	Where the purpose of any existing Crown land Licence or Lease, held or acquired by the application, is not compatible with the proposed project activities and land uses, the applicant must within 12 months of project approval, obtain a new Licence or Lease over the Crown land that reflects the proposed use of the land in accordance with the <i>Crown Land Management Act 1989</i> .	Noted		
	The Applicant shall consult consultation with Crown Lands on any requirement of the applicant to restrict public access to Crown land for the reasons of public safety, in particular in relation to prevent public access to land subjected to subsidence, blasting affects, water and air quality impact, and general security around access roads haulage roads and mining infrastructure.			
	The applicant shall provide Crown Lands details of any proposed Environmental Offsets to be located on Crown land, in particular any conditions proposed by the Applicant that seek long term security of those offsets.	SCSC Part 9b		
	Include detailed information and location diagrams of any proposed use of Crown land.	Appendix 1 and 6		
	The Applicant shall consult with Crown Lands in respect to the preparation and implementation of all Environmental Management Plans that affect Crown land, including but not limited to management plans relating to:	Noted		
	<ul> <li>archaeology and cultural</li> <li>property subsidence</li> <li>management</li> </ul>			
	flora and fauna     longwall subsidence			
	biodiversity management     rehabilitation			
	heritage management         final void management			
	erosion and sediment control     water management			
	Iandscape management     dust management			
	bushfire management     onoise management			
	land management     blast management			

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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)			
	GENERAL ISSUES (Cont'd)				
Crown Lands 04/03/13 (Cont'd)	The Applicant shall provide Crown Lands with detailed information and location diagrams of any proposed use of Crown land, including but not restricted the following land uses:	Noted			
(adjusted given	<ul> <li>hazard and industrial waste disposal</li> </ul>				
Act 1989 has	waste water utilisation areas				
been repealed)	point-discharge areas				
	<ul> <li>waste rock and tailings structures</li> </ul>				
	processing plants and other high impact Infrastructure sites				
	gravel borrow pits				
	environmental offset areas.				
	The applicant may be requested by the Minister administering Crown lands to purchase Crown land considered to be impacted on to the extent that it is in the interests of the public of NSW that the land be sold to the applicant.	Noted			
GEO	DLOGY, RESOURCES AND WASTE MATERIALS CHARACTERISAT	ION			
NSW Division of Resources & Geoscience	• Provide a summary of the regional and local geology, including information of the stratigraphic unit or units within which the resource is located.	2.2			
14/05/19	• Document the physical dimensions of the resource. Plans and cross-sections showing the location of drill holes and the area proposed for extraction, the extent of the mineralised zones to be mined and those located adjacent to or beneath planned mining voids which may be sterilised by planned activities. Relevant supporting documentation such as drill logs should be included or appended.	2.2, 5.1, Appendix 5 Section A5.1			
	<ul> <li>Whole rock, minor and trace element geochemistry of the ore, tailings and waste rock.</li> </ul>	2.2.3, 2.5.2, Appendix 5 Section A5.7.2			
	• A description of the mineralogy of the ore for all minerals present, including silver sulphosalts and mineralised sulfides. Appropriate figures and sections showing the distribution of the various styles of mineralisation, such as the upper silver-rich and deeper sulfide-lead-zinc zones must also be included.	2.2.3			
	Include an updated resource/reserve statement outlining the resource in the subject area, that has been prepared in accordance with the current version of the Joint Ore Reserve Committee Code (JORC code) to a minimum of Indicated Resource level of confidence. It is preferred that at least some of the resource estimate is to a higher confidence level (measured/proved/probable)	2.2.3			
	<ul><li>The Proponent is to supply a full assessment of resource recovery including:</li><li>Explain how the proposed mine plan and extraction method</li></ul>	Appendix 5 Section 5.1			
	maximise resource recovery.				



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# Table A3.4 (Cont'd)

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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)	
GEOLOGY, RESOURCES AND WASTE MATERIALS CHARACTERISATION (Cont'd)			
NSW Division of Resources &	What resources will be sterilised or excluded and with what justification.	2.2, 2.4 and A5.1	
Geoscience 14/05/19 (Cont'd)	<ul> <li>Detail of the proposed recovery processes and expected recoveries for silver, lead and zinc.</li> </ul>	2.2.3	
	List all economic, environmental, other constraints to the resource/reserve impacting the Project.	2.2. A5.1	
	The Proponent must supply a life of mine production schedule for each year of operation of the mine and for the life of the Project. The production schedule is to include:	2.5, 2.6, Appendix 5 Table A5.6	
	• Details of run-of-mine ore, low-grade ore-mineralised waste and waste rock tonnage planned to be extracted for each year and for the life of the Project, and an estimate of the saleable product produced for each year and the life of the Project.		
	• In terms of text, plans or charts, the EIS must clearly show the proposed extent and sequence of the development.	2	
	• An estimate of which market segment that products would be sold into.	1.6	
	The EIS must clearly show the proposed extent and sequence of the development.	Figures 2.1, 2.12, 2.14, 2.27, Appendix 5 Figure A5.2	
	• The EIS must therefore clearly illustrate the location (including offsite locations) of any biodiversity offsets being considered for the project and their spatial relationship to known and potential mineral and construction material resources and existing mining & exploration titles.	4.10.5.4, SCSC Part 9b	
	NOISE, VIBRATION AND BLASTING		
Environment Protection Authority 14/05/19	Potential impacts on the noise amenity of the surrounding area should be assessed in accordance with the NSW Noise Policy for Industry 2017 (NPI) and other relevant guidelines, mentioned below, accounting for all noise sources associated with the Project. In particular, seasonality assessments are to be undertaken to assess the impact of temperature inversions and wind conditions.	4.2.2.3, 4.2.2.4, 4.2.3.2, 4.2.3.3, 4.2.2.7 4.2.3.6	
	A noise and vibration impact assessment for both construction and operational scenarios should be undertaken as part of the EIS. The assessment should consider the issues outlined below and identify noise mitigation measures to be implemented to meet project specific noise levels developed for the Project. The EIS will need to assess all feasible and reasonable mitigation measures including an assessment of any residual impacts in accordance with section 3.2 of the NPI.	4.2, 4.3	
	The noise assessment must include (but not be limited to) an assessment of the C-weighted noise (low frequency) as well as A-weighted noise.	4.2.4.1	

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Agency /		Relevant EIS	
Organisation	Paraphrased Relevant Requirement	Section(s)	
NOISE, VIBRATION AND BLASTING (Cont'd)			
Environment Protection	In relation to noise, the following matters should be addressed (where relevant) as part of the Environmental Assessment:	4.2.2.4, 4.2.2.7.	
Authority 14/05/19 (Cont'd)	<ul> <li>Construction noise associated with the proposed development should be assessed using the <i>Interim Construction Noise</i> <i>Guideline</i> (DECC, 2009). http://www.epa.nsw.gov.au/your- environmentlnoise/.htm</li> </ul>	4.2.3.6	
	• Operational noise from all industrial activities (including private haul roads and private railway lines) to be undertaken on the premises must be assessed in accordance with the guidelines contained in the NSW Noise Policy for Industry (EPA, 2017). http://www.epa.nsw.gov.au/your-environmentInoise /industrial.htm	4.2.2.1, 4.2.2.2, 4.2.2.4, 4.2.2.6, 4.2.2.7, 4.2.5	
	<ul> <li>Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the Assessing Vibration: a technical guideline (DEC, 2006). http://www.epa.nsw.gov.au/your- environmentlnoise/vibrationguide.htm</li> </ul>	4.3.3.2, 4.3.6	
	<ul> <li>If blasting is required for any reasons during the construction or operational stage of the proposed development, blast impacts should be demonstrated to be capable of complying with the guidelines contained in Australian and New Zealand Environment Council - Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990). http://www.epa.nsw.gov.au/your- environmentlnoise/blasting.htm</li> </ul>	4.3.3., 4.3.6.1	
	<ul> <li>Noise on public roads from increased road traffic generated by land use developments should be assessed using the NSW Road Noise Policy (DECCW, 2011). http://www.epa.nsw.gov.au/yourenvironmentInoise/traffic.htm</li> </ul>	4.2.2.4, 4.2.2.6, 4.2.2.7	
	<ul> <li>Noise from new or upgraded public roads should be assessed using the NSW Road Noise Policy (DECCW, 2011). http://www.epa.nsw.gov.au/our-environmentlnoise/traffic.htm</li> </ul>		
	Describe the noise monitoring system in detail, including the development and implementation of a monitoring program that:		
	<ul> <li>uses a combination of predictive meteorological forecasting and real-time noise monitoring, supplemented with attended monitoring measures to evaluate the performance of the mine complex;</li> </ul>		
	<ul> <li>adequately supports the proactive and reactive noise management system on site;</li> </ul>	4.2.4	
	<ul> <li>includes a protocol for determining exceedances of the conditions imposed on the project;</li> </ul>		
	<ul> <li>evaluates and reports on the effectiveness of the noise management system on site;</li> </ul>		
	<ul> <li>provides for the annual validation of the noise model for the mine complex.</li> </ul>		
	The EIS must describe the system that will be implemented to enable the community to access up-to-date information regarding any proposed blasting schedule.	4.3.4.1	



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)		
	NOISE, VIBRATION AND BLASTING (Cont'd)			
Department of Education and Communities 13/02/13	Assess the potential of noise and vibration from blasting, and vehicles passing the school site, to adversely impact the structure of school buildings and internal classroom noise levels.	4.2.2.7, 4.3.6		
Mid-Western Regional Council 14/02/13	Council considers that the application of the Industrial Noise Policy is inappropriate in this environment due to the extremely low existing background noise levels. Council stresses that the baseline for the assessment of noise impacts should be less than that allowed by the Industrial Noise Policy having regard to the rural nature of the	4.2.2.4, 4.2.2.7		
	area. It is considered that having regard to the difficulty to meet acceptable noise levels during night-time operation and the rural nature of the area that reconsideration should be given to the 24 hour operation of the site.			
	Council would also require a detailed Traffic Noise Assessment to be carried out on the proposed haulage routes to ascertain the level of impact associated off-site going to be generated as a result of the mining operations.	SCSC Part 11		
	AIR QUALITY			
Environment Protection Authority 14/05/19	The goal should be to maintain existing rural air quality and protect sensitive receptors, both on and off site from adverse impacts of dust and odour and other relevant air pollutants. Background ambient air levels should be identified to inform the assessment.	Noted		
	Dust is of primary concern with potential emissions from general mining activities, onsite roads, conveyors, transfer points, loading facilities, coal stockpiles, overburden emplacements etc.	Noted		
	The EA should include a detailed air quality impact assessment (AQIA). The AQIA should:	SCSC Part 2,		
	<ul> <li>Assess the risk associated with potential discharges of fugitive and point source emissions for <u>all stages</u> of the Project. Assessment of risk relates to environmental harm, risk to human health and amenity.</li> </ul>	4.4.5, 4.8		
	<ul> <li>Justify the level of assessment undertaken on the basis of risk factors, including but not limited to:</li> </ul>			
	a. proposal location;	4.4.5, 4.4.2.5,		
	b. characteristics of the receiving environment; and	4.4.2.2		
	c. type and quantity of pollutants emitted.			
	• Describe the receiving environment in detail. The Project must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to:			
	<ul> <li>a. meteorology and climate - a minimum of 12 months data obtained from the meteorological station located at the Project site must be provided;</li> </ul>	4.1.2		
	b. topography;	4.1.1		
	c. surrounding land-use;	4.1.4		
	d. receptors; and	4.1.3, 4.4.2.2		



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)	
Environment	e. ambient air quality.	4.4.2.2	
Protection	Include a detailed description of the Development in full.	4.4.2.1	
14/05/19 (Cont'd)	<ul> <li>All processes that could result in air emissions must be identified and described.</li> </ul>	4.4.2.2 and 4.4.2.5	
	• Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided.	4.4.2.5	
	<ul> <li>Include a detailed process diagram/flowchart of the Project specifying all air inputs, air outputs and air discharge points.</li> </ul>	4.4.2.1	
	<ul> <li>Identification and location of all fixed and mobile sources of dust/air emissions from the development, including rehabilitation, needs to be provided. The location of all emission sources should be clearly marked on a plan for key years of the mine development. The EIS needs to identify all pollutants of concern and estimate emissions by quantity (and size of particles), source(s) and discharge point(s). Note: emissions can be classed as either:</li> </ul>	SCSC Part 2 Annexure 3	
	<ul> <li>a. point (e.g. emissions from stack or vent), or</li> <li>b. fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, crushing/screening, conveyors, storage facilities, plant and yard operation, vehicle movements [dust from road, exhausts, loss from load], land clearing and construction works). Fugitive emissions include coal dust emissions and leaks and spills of coal during rail transport to port facilities (as influenced by management methods and procedures employed by the proposal).</li> </ul>		
	<ul> <li>Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> (2005). http://www.environment.nsw.gov.au/resources/air/ammodeilingO5361.pdf This assessment should include the following parameters:         <ul> <li>a. dust deposition;</li> <li>b. total suspended particles;</li> <li>a. DM</li></ul></li></ul>	4.4.2.5, 4.4.2.4	
	<ul> <li>C. PIVI10 and PIVI2.5 particulate matter.</li> <li>Demonstrate the Project's ability to comply with the relevant regulatory framework, specifically the <i>Protection</i> of <i>the Environment Operations Act</i> 1997 and the <i>Protection of the Environment Operations (Clean Air) Regulation 2002.</i></li> </ul>	SCSC Part 2 Section 2.7	
	• Provide an assessment of the project in terms of the priorities and targets adopted under the NSW State Plan 2010 and its implementation plan Action for Air.	SCSC Part 2 Section 2.8	



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Agency /		Relevant EIS	
Organisation	Paraphrased Relevant Requirement	Section(s)	
AIR QUALITY (Cont'd)			
Environment Protection Authority 14/05/19 (Cont'd)	<ul> <li>Detail air emission control techniques/practices that will be employed by the Project</li> <li>a. All emission control techniques/practices must be bench marked against best practice process design and emission control. The Project must be assessed by applying the procedure outlined in in <i>Coal Mine Particulate Matter Control Best Practice – Site-specific determination guideline</i> (November 2011). http://www.environment.nsw.gov.au/resources/air/2011 0813coalmineparticulate. pdf</li> </ul>	4.4.4 4.4.2.3	
	<ul> <li>Nominated controls must be explicitly linked to calculated emission reductions adopted in the air quality impact assessment emissions inventory, with all assumptions documented and justified</li> </ul>	4.4.2.4	
	• Detail emission control techniques/practices that will be employed by the proposal, including the development of real-time monitoring/management procedures, response (adverse weather) trigger levels and predictive meteorological monitoring/modelling for dust management.	4.4.2.3, 4.4.2.4, 4.4.4,	
	Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.	4.4.2.5	
	• Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.	4.4.2.5	
Greater Western Area Health Service 24/01/2013	Dust suppression spraying is briefly discussed. As it is in a river catchment we need to know what may/will be used for dust suppression. If substances other than water are used they should be in the project plan with controls identified.	Not relevant	
Department of Education and Communities 04/02/13	The physical impacts on the school to be identified and assessed should include; dust levels, toxicity of dust (lead) generated, traffic impacts, noise and blasting impacts within school grounds as well as general noise impacts during school hours.	4.4.2.5, 4.12.2.5, 4.12.5, 4.2.2, 4.3.6	
Department of Education and Communities 13/02/13	The impacts on the quality of school's rooftop rainwater supply from mine pollutants and traffic fumes during construction and operation period.	SCSC Part 7 Section 5.2.6.4	
Mid-Western Regional Council	It is requested that the DGRs include specific reference to variable wind patterns, including seasonal wind patterns and the need for a detailed air dispersal model.	4.1.2.6	
14/02/13	Council also requires specific details on the specific dust suppression measures that will be in place during operations and also on the haulage routes.	4.4.2.3	
Mid-Western Regional Council 15/01/15	Council requires the applicant to undertake a full assessment of the impacts on air quality from dust and particulate matter as a result of the Project including monitoring of background lead levels to ensure there are no adverse impacts on the Lue community and the surrounding area. Council requests that consideration be given to the findings in Port Augusta[ <i>sic</i> ] (Pirie) where unexpected high lead levels were found locally and at sites remote from the mine site [ <i>sic</i> ] (smelter).	SCSC Part 2 SCSC Part 7	



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)	
	WATER – GENERAL		
Department of Primary Industry – Water	Details of the water to be taken (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.	4.6.5.3 to 4.6.6, 4.7.2.6, 4.7.4.5, 4.7.4.6, 2.10.1	
19/12/14	Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project.	4.6.6, 4.6.5.4, 4.7.5.5, 4.7.5.6	
	The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.	4.6.5.3, 4.6.5.4, 4.7.4.5, 4.7.4.6, 4.7.7.1, 2.10.1	
	A detailed and consolidated site water balance.	4.7.4.6	
	A detailed assessment against the NSW Aquifer Interference Policy (2012) using the NSW Office of Water's assessment framework.	4.6.7.5	
	An assessment of impacts to existing surface water systems in terms of potential modifications to natural ecological, hydrologic and hydraulic function and potential impacts to local water users and the environment. This needs to be addressed for both during and post mine life with the use of stabilised landforms and mitigation of impacts.	4.7, SCSC Part 6	
	Consideration of the "Guidelines for Controlled Activities on Waterfront Land (2012)" and modelling of redistribution of waters due to the project is required.	Not Relevant	
	Full technical details and data of all surface and groundwater modelling and an independent peer review.	4.6.5, 4.7.4.6, SCSC Part 6 Appendix C	
	Proposed management and disposal of produced or incidental water.	4.7.4.4	
	Proposed surface and groundwater monitoring activities and methodologies.	4.6.8, 4.7.6	
	Details surrounding the final landform of the site, including final void management (where relevant) and rehabilitation measures.	2.16, 4.6.8.5	
	Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.	4.6.4, 4.6.8, 4.6.7, 4.7.3, 4.7.4, 4.7.5	
	Consider relevant Policies and Guidelines.	4.6.6, 4.7.5.9, 4.6.7.5	
	A statement of where each element of the SEARs is addressed in the EIS (Le. in the form of a table).	Appendix 3	



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Agency /	Deventure and Delevient Demuinement	Relevant EIS	
Organisation	Paraphrased Relevant Requirement	Section(s)	
WATER – GENERAL (Cont'd)			
Department of Primary Industry – Water 19/12/14 (Cont'd)	The proposal is located within the area covered by the Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources, the WSP for the NSW Murray Darling Basin Porous Rock Groundwater Sources, the WSP for the Macquarie-Cudgegong Regulated Rivers Water Source and the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Source. The EIS is required to:		
	• Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection (including groundwater dependent ecosystems), water quality and surface- groundwater connectivity.	4.6, 4.7	
	<ul> <li>Provide a description of any site water use (amount of water to be taken from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.</li> </ul>	2.10.1, SCSC Part 6 Section 4.7.1 to 4.7.2	
	<ul> <li>Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP, including:</li> <li>Sufficient market depth to acquire the necessary entitlements for each water source.</li> </ul>	4.7.5.9, 4.6.6, 4.6.7.5	
	<ul> <li>Ability to carry out a "dealing" to transfer the water to relevant location under the rules of the WSP.</li> </ul>		
	- Daily and long-term access rules.		
	<ul> <li>Account management and carryover provisions.</li> </ul>		
	Provide a detailed and consolidated site water balance.	4.7.4.6	
	The EIS is required to:		
	<ul> <li>Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.</li> </ul>	4.7.2	
	<ul> <li>Identification of all surface water sources as described by the relevant water sharing plan.</li> </ul>	4.7.4.5	
	<ul> <li>Detailed description of dependent ecosystems and existing surface water users within the area, including basic landholder rights to water and adjacent/downstream licensed water users.</li> </ul>	4.7.2.6, 4.6.7.2	
	<ul> <li>Description of all works and surface infrastructure that will intercept, store, convey, or otherwise interact with surface water resources.</li> </ul>	SCSC Part 6 Section 4.7	
	Assessment of predicted impacts on the following:	4.7.2, 4.7.5.7,	
	<ul> <li>flow of surface water, sediment movement, channel stability, and hydraulic regime,</li> </ul>	4.6.7.2	
	- water quality,		

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Agency /		Relevant EIS	
Organisation	Paraphrased Relevant Requirement	Section(s)	
	WATER – GENERAL (Cont'd)	1	
Department of Primary Industry – Water 19/12/14	<ul> <li>flood regime,</li> <li>dependent ecosystems,</li> <li>existing surface water users, and</li> <li>planned environmental water and water sharing arrangements prescribed in the relevant water sharing plans.</li> </ul>		
(Cont'd)	Legislation		
	Water Management Act 2000 (WMA) and Water Act 1912. In particular, Objects (s.3) and Water Management Principles (s.5) of the WMA.	4.7.2.6, 4.7.5.8, 4.7.5.9	
	Policies and Guidelines		
	NSW Aquifer Interference Policy (2012)	4.6.4, 4.6.7.5	
	NSW Water Extraction Monitoring Policy (2007)	Not relevant	
	NSW Groundwater Policy Framework Document – General (August 1997)	Not relevant	
	NSW Groundwater Quality Protection Policy (1998)	SCSC Part 5 Section 2.1.5	
	NSW State Groundwater Dependent Ecosystem Policy (2002)	Not Relevant	
	NSW State Rivers and Estuaries Policy (1993)	Not relevant	
	NSW Wetlands Policy (2010)	Not relevant	
	Guidelines for the Assessment and Management of Groundwater Contamination (2007)	Not relevant	
	Guidelines for Groundwater Protection in Australia (1995)	Not relevant	
	Australian Groundwater Modelling Guidelines (2012)	4.6.5.2	
	Guidelines for Controlled Activities on Waterfront Land (2012)	Not relevant	
	Risk Assessment Guidelines for Groundwater Dependent Ecosystems (2012)	SCSC Part 5 Section 6.1.2	
	Water Sharing Plans		
	Water Sharing Plan for the Macquarie-Cudgegong Regulated Rivers Water Source	Not relevant	
	Water Sharing Plan for the NSW Murray-Darling Basin Fractured Rock Groundwater Sources	4.6.6, SCSC Part 5 Section 2.1.2.1	
	Water Sharing Plan for the NSW Murray-Darling Basin Porous Rock Groundwater Sources		
	Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources		
Department of	The EIS is required to include the following issues relating to water:		
Primary Industry –	Identify water demand and determine whether an adequate and secure water supply is available for the Project;	2.10.1, 4.7.4.6	
12/12/16	Identify water sources (surface and groundwater), water disposal/discharge methods and water storage structures in the form of a detailed and consolidated water balance.	2.10.1, 4.6.5.3, 4.6.5.4, 4.7.4.4 4.7.4.5, 4.7.4.6	
	An assessment against the NSW Aquifer Interference Policy     (2012) using DPI Water's assessment framework.	4.6.7.5	



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)	
WATER – GENERAL (Cont'd)			
Department of Primary Industry – Water 12/12/16 (Cont'd)	Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts	4.6.7 - 4.6.8, and 4.7.4- 4.7.5	
DPI – Water & NRAR 16/05/19	• The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.	2.10	
	A detailed and consolidated site water balance.	4.7.4.6	
	<ul> <li>Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.</li> </ul>	4.6.7, 4.6.8, 4.7.4, 4.7.5	
	<ul> <li>Proposed surface and groundwater monitoring activities and methodologies.</li> </ul>	4.6.8, 4.7.6	
	Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), and	SCSC Part 5 and Part 6	
	• the Guidelines for Controlled Activities on Waterfront Land (2018)	Not Relevant	
	<ul> <li>the relevant Water Sharing Plans (available at https://www.industry.nsw.gov.au/water).</li> </ul>	4.6.6	
Environment Protection Authority 14/05/19	Describe the proposal including position of any intakes and discharges, volumes, water quality and frequency of all water discharges (e.g. surface water discharge to a river/creek, groundwater, irrigation of waste water etc).	4.7.4, 4.7.5	
	Demonstrate that all practical options to avoid discharge have been investigated and implemented and outline measures that have been taken to reduce the pollutant load of the discharge so that the environmental impact minimised where a discharge is necessary.	4.7.4.4	
	Provide a water balance for the including water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.	4.7.4.6	
	If the discharge requires treatment prior to disposal, any treatment measures should be described and the predicted water quality outcomes documented. Include a detailed process diagram/flowchart of the proposal specifying all water inputs, outputs and discharge points.	4.7.4.4, 4.7.5.4, SCSC Part 6 Figure 4.2	
	Describe the existing surface and groundwater quality. An assessment needs to be undertaken for any water resource likely to be affected by the project.	4.6.3, 4.6.4, 4.6.7, 4.7.2, 4.7.3, 4.7.5	
	Where the proponent intends to undertake the assessment using site specific water quality trigger values, detail the water quality of a reference site that has been selected based on the site specific considerations outlined in ANZECC (2000).	SCSC Part 6 Annexure A	



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Agency / Organisation	Paraphrased Relevant Requirement	Section(s)	
WATER – GENERAL (Cont'd)			
Environment Protection Authority 14/05/19 (Cont'd)	State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (http://www.environment.nsw.gov.au/ieo/index.htm). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values	SCSC Part 6 Annexure A Sections 2.2 and 2.3	
	State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality (http://www.mincos.gov.au/publications/australian and new zealand guidelines for fresh and marine water quality).	SCSC Part 6 Annexure A Sections 2.2, 2.3,	
	State any locally specific objectives, criteria of targets which have been endorsed by the NSW Government.	Not Relevant	
	Provide detailed water management strategies for all disturbance areas, paying particular attention to the waste rock emplacement areas and potential impacts to groundwater and off site surface water resources including particular reference to the management of channel and overland flows into and within the disturbance area.	4.7.4.4	
	Determine and detail the tailings management and monitoring strategy and dam design to be implemented, including an assessment of the potential impacts of tailings storage on surface and groundwater resources, contingency plans in the event of a leak or seep, rehabilitation and the long term management and feasibility.	2.8, Appendix 5 Sections A5.7, A5.10.7	
	Assess any irrigation areas proposed for wastewaters produced in accordance with the EPA Guideline <i>"The Use of Effluent by Irrigation"</i> .	Not Relevant	
	Describe how predicted impacts on surface water, groundwater and aquatic ecosystems will be monitored and assessed over time, including monitoring locations, relevant parameters and sampling frequency. The EIS should:	4.6.8, 4.7.6	
	<ul> <li>include a Trigger Action Response Plan, or similar response management plan, to identify appropriate trigger values and criteria and provide appropriate response actions if impacts are identified through the monitoring program.</li> </ul>		
	<ul> <li>identify the process for identifying any trends in the monitoring data obtained.</li> <li>Note: Water quality monitoring should be undertaken in accordance with the Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (DEC, 2004).</li> <li>Groundwater Sampling and Analysis: Field Guide (Geosciences Australia, 2009) provides guidance on the design of a groundwater sampling program.</li> </ul>		
	The EIS must map the following features relevant to water and soils including:		
	Rivers, streams, wetlands, estuaries.	SCSC Part 6 Section 3	
	Groundwater.	SCSC Part 5 Section 4.5	
	Groundwater dependent ecosystems	SCSC Part 9a Section 3.5	
	Proposed intake and discharge locations.	SCSC Part 6 Section 4.7	



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)	
WATER – GENERAL (Cont'd)			
Environment Protection	The EIS must describe background conditions for any water resource likely to be affected by the development, including:		
Authority	Existing surface and groundwater.	4.6.3, 4.7.2	
(Cont'd)	Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.	SCSC Part 6 Section 4.6, 5.5, 4.7	
	<ul> <li>Water Quality Objectives (as endorsed by the NSW Government including groundwater as appropriate that represent the community's uses and values for the receiving waters.</li> </ul>	SCSC Part 6 Appendix A Section 2.2	
	<ul> <li>Indicators and trigger values/criteria for the environmental values identified in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government</li> </ul>	SCSC Part 6 Appendix A Section 2.2	
	The EIS must assess the impacts of the development on water quality, including:		
	<ul> <li>The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction.</li> </ul>	4.6.7, 4.7.2.7, 4.7.4, 4.7.5	
	<ul> <li>Identification of proposed monitoring of water quality</li> </ul>	4.7.6, SCSC Part 6 Appendix A Sections 2.2, 2.3	
Mid-Western Regional	Ensure water usage complies with applicable criteria with reference to Water Sharing Plans.	4.7.2.6	
Council 14/02/13	it is imperative that potential adverse impact on water allocations during periods of drought to other industries, agriculture and the town water supply be considered and that the cost of the development include the potential decline of agriculture and growth of other industries due to the restricted access to water.	4.6.8.4, 4.6.9, 4.7.7.2	
	Council requests that a moratorium be placed on the sale of high security licenses to the Bowden's Silver Project until detailed assessment of the impact on other water users, such as agricultural users can be modelled and extensive consultation undertaken with existing users.	Not Relevant (Water from Ulan and/or Moolarben Coal Mines)	
	Until such time as it can be demonstrated that the existing and future Water Sharing Plan for the Cudgegong River will provide sufficient protection for town water supplies it is consider irresponsible for further high security licenses to be sold that allow the transfer of water allocations within the catchment. It is considered imperative that the modelling, adjustment of the WSP and extensive consultation be undertaken prior to the sale of the water license.	Not Relevant (Water from Ulan and/or Moolarben Coal Mines)	
	Council considers that it is critical that a diverse economic base be maintain in the region and the potential threat to that diversity should be fully assessed as part of this application.	Noted	


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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)
	WATER – GENERAL (Cont'd)	
Mid-Western Regional Council 14/02/13 (Cont'd)	It is noted that a Human Health Risk Assessment is a requirement of the Draft DGRs. Council would request that a particular focus be placed on the assessment on the impacts on dust on drinking water.	4.8.3.4, 4.8.4, 4.8.5.3
Mid-Western Regional Council 14/02/13	Council considers that potential impact on water security for both agricultural users and town water supply is a determinative issue. It is considered that the cumulative impact of the establishment of mining projects within the catchment and their water demands needs to be assessed. In addition, it is imperative that potential adverse impact on water allocations during periods of drought to other industries, agriculture and the town water supply be considered and that the cost of the development include the potential decline of agriculture and growth of other industries due to the restricted access to water. Council considers that it is critical that a diverse economic base be maintain in the region and the potential threat to that diversity should be fully assessed as part of this application.	2.10, 4.7.4.6, 4.7.5, 4.6.7
Mid-Western Regional Council 15/01/15	Council reaffirms that it considers that water is a determining issue. To date the applicant has been unable to identify the exact amount of water required, the source of water and the proposed method of reticulation to the mine site. Council remains concerned regarding the potential impact on agricultural users and objects to any scheme that requires the transfer of water licences from below Burrendong Dam. Council requests that the assessment clearly identifies the source of water, amount and proposed reticulation.	2.10, 4.7.4.6
	WATER – GROUNDWATER	
Department of Primary	A detailed assessment against the NSW Aquifer Interference Policy 2012.	4.6.7.5
Industry – Office of Water 19/12/14	To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources including:	
	<ul> <li>Works likely to intercept, connect with or infiltrate the groundwater sources.</li> </ul>	4.6.5.3, 4.6.5.4, 4.6.7.3
	<ul> <li>Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.</li> </ul>	3.6, 4.5
	• Bore construction information is to be supplied to DPI Water by submitting a "Form A" template. DPI Water will supply "GW" registration numbers (and licence/approval numbers if required) which must be used as consistent and unique bore identifiers for all future reporting.	Previously completed
	<ul> <li>A description of the water table and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).</li> </ul>	4.6



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Agency /	Paranhrased Relevant Pequirement	Relevant EIS
organisation	WATER _ GROUNDWATER (Contid)	Geotion(S)
		1.0.0
Department of Primary Industry –	<ul> <li>Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.</li> </ul>	4.6.8
Office of vvater 19/12/14 (Cont'd)	<ul> <li>The predicted impacts of any final landform on the groundwater regime.</li> </ul>	4.6.9
(00110)	• The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.	4.6.3, 4.6.7.1, 4.6.8, Table 4.6A
	<ul> <li>An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.</li> </ul>	4.6.3, 4.6.7.4, 4.6.4
	<ul> <li>An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).</li> </ul>	4.6.1, 4.6.4
	<ul> <li>Measures proposed to protect groundwater quality, both in the short and long term.</li> </ul>	4.6.8
	<ul> <li>Measures for preventing groundwater pollution so that remediation is not required.</li> </ul>	4.6.8
	<ul> <li>Protective measures for any groundwater dependent ecosystems (GDEs).</li> </ul>	4.6.7.2
	<ul> <li>Proposed methods of the disposal of waste water and approval from the relevant authority.</li> </ul>	Not relevant
	The results of any models or predictive tools used.	4.6.5
	Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:	
	<ul> <li>Any proposed monitoring programs, including water levels and quality data.</li> </ul>	4.6.7, 4.6.8
	<ul> <li>Reporting procedures for any monitoring program including mechanism for transfer of information.</li> </ul>	4.6.7, 4.6.8
	<ul> <li>An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.</li> </ul>	Not relevant
	• Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).	4.6.8
	<ul> <li>Description of the remedial measures or contingency plans proposed.</li> </ul>	4.6.8.4
	<ul> <li>Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.</li> </ul>	4.6.8.2



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Agency /	Deventures and Delevient Demoirsment	Relevant EIS
Organisation	Paraphrased Relevant Requirement	Section(s)
	WATER – GROUNDWATER (Contrd)	
Department of Primary Industry – Office of Water 19/12/14 (Cont'd)	<ul> <li>The EIS is required to provide:</li> <li>Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site - such as evaporative loss from open voids or inflows).</li> </ul>	2.10.1, 4.6.5.3, 4.6.5.4, 4.6.7.3
	• Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.	2.10.1, 4.6.5.3, 4.6.5.4, 4.6.7.3, 4.7.4.5, 4.7.4.6, 4.7.5.3
	<ul> <li>Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.).</li> </ul>	2.1.3, 4.6.7.5, 4.7.5.9
	<ul> <li>Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc).</li> </ul>	2.10.1, 4.7.4.5, SCSC Part 6 Section 4.6, 5.5, 4.7
	<ul> <li>Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing.</li> </ul>	4.6
	<ul> <li>Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages</li> </ul>	Not Relevant
	<ul> <li>Details on the location, purpose, size and capacity of any new proposed dams/storages.</li> </ul>	SCSC Part 6 Section 4.7
	<ul> <li>Applicability of any exemptions under the Water Management (General) Regulation 2011 to the project.</li> </ul>	4.7.5.9
	Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.	Noted
Environment Protection Authority 14/05/19	This EIS should assess impacts on groundwater and groundwater dependent ecosystems. The assessment should be guided by the principles in <i>The NSW State Groundwater Policy Framework</i> <i>Document</i> (DLWC,1997). <i>Assessment and Management of</i> <i>Groundwater Contamination</i> (DEC, 2007) provides guidance on assessing and managing groundwater contamination. Assess impacts against relevant water quality guidelines for:	4.6.7, 4.6.8
	<ul> <li>potentially impacted environmental values and beneficial uses using local Water Quality Objectives;</li> </ul>	
	<ul> <li>contamination, such as investigation levels specified in National Environment Protection Measure Guideline on the Investigation Levels for Soil and Groundwater (EPHC, 1999).</li> </ul>	



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# Table A3.4 (Cont'd)

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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)
	WATER – GROUNDWATER (Cont'd)	
Greater Western Area Health Service 24/01/13	Ground water bores: It has been identified that there are bores in the area and that some of the / neighbouring properties rely on these for water. Information on the depth of the open cut mine, effect and disruption to aquifers and what preventative controls will be put into place to prevent contamination of these aquifers would be useful.	4.6.7.1, 4.6.8
Department of Education and Communities 13/02/13	Assess the impact to the availability and quality of the school's bore water supply from nearby mining activities during construction and operation periods.	4.6.7.1
Department of	Where the mine includes underground workings:	Not relevant
Resources and Energy 23/12/16	<ul> <li>determine (with reference to the groundwater assessment) the likelihood and associated impacts of groundwater accumulating and subsequently discharging (e.g. acid or neutral mine drainage) from the underground workings post cessation of mining; and</li> </ul>	
	<ul> <li>consideration of the likely controls required to either prevent or mitigate against these risks as part of the closure plan for the site.</li> </ul>	
	Consideration of the controls likely to be required to either prevent or mitigate against rehabilitation risks as part of the closure plan for the site;	2.16, A5.10
	WATER – SURFACE WATER	
Department of Primary	Identification of all surface water sources as described by the relevant water sharing plan.	4.7.2.6
Industry – Water 19/12/14	Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.	4.7.2.1 to 4.7.2.4
	Scaled plans showing the location of:	
	<ul> <li>Wetlands/swamps, watercourses and top of bank;</li> </ul>	SCSC Part 6 Appendix A Figure 3
	Riparian Corridor Widths To Be Established Along The Creeks;	Not relevant
	<ul> <li>Existing riparian vegetation surrounding the watercourses (identifying any areas to be protected or proposed to be removed);</li> </ul>	SCSC Part 10
	• The site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and	SCSC Part 6 Figure 1.2
	Proposed location of any asset protection zones.	Not relevant
	Photographs of the watercourses/wetlands and a map showing the point from which the photos were taken.	SCSC Part 6 Annexure A
	A detailed description of all potential impacts on the watercourses / riparian land.	4.7.5
	A detailed description of all potential impacts on the wetlands, including potential impacts to the wetlands hydrologic regime; groundwater recharge; habitat and any species that depend on the wetlands.	Not relevant
	A description of the design features and measures to be incorporated to mitigate potential impacts.	4.7.4



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Agency /		Relevant EIS		
Organisation	Paraphrased Relevant Requirement	Section(s)		
	WATER – SURFACE WATER (Cont'd)			
Department of Primary Industry – Water 19/12/14 (Cont'd)	Geomorphic and hydrological assessment of watercourses including details of stream order (Strahler system), river style and energy regimes both in channel and on adjacent floodplains.	4.7.2.2 to 4.7.2.5		
	Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water	SCSC Part 6, Section 4.7		
	Details on existing dams/storages (including date of construction, location, purpose, size and capacity) of any proposal to change the purpose of existing dams/storages	N/A		
	Details on the location, purpose, size and capacity of any new proposed dams/storages.	4.7.4, SCSC Part 6 Section 4.7		
	Description of all works and surface infrastructure that will intercept, store, convey or otherwise interact with surface water resources	SCSC Part 6 Section 4.7		
	An assessment of the impacts to existing surface water systems in terms of potential modifications to natural ecological, hydrological and hydraulic function and potential impacts to local water users and the environment. This needs to be addressed for both during and post mine life with the use of stabilised landforms and mitigation of impacts.	4.7.4, 4.7.5, 4.7.6		
Environment Protection Authority 14/05/19	<ul> <li>The environmental outcomes of the Project in relation to water should be:</li> <li>There is no pollution of waters (including surface and groundwater); and</li> </ul>	4.7.4.4		
	<ul> <li>Polluted water (including process/tailings waters, wash down waters, polluted stormwater or sewerage) is captured onsite and collected, treated and beneficially reused, where safe and practical to do so.</li> </ul>			
	The EIS should document the measures that will achieve the above outcomes in the construction, operation and post operations phases of the project. Construction activities will need to demonstrate best practice sediment and erosion control and management in accordance with the reference document <i>Managing Urban Stormwater: Soils and Construction (NSW Landcom).</i>	4.7.4.4, 4.7.5.9		
	Describe any drainage lines, creeks lines etc. that will be impacted by the Project.	4.7.5, 4.7.7		
	Assess the nature and degree of impact that any proposed discharges may have on the receiving environment. Assessment for discharge to surface waters guided by using the <i>ANZECC Guidelines</i> <i>and Water Quality Objectives in NSW</i> (DEC, 2006) using local Water Quality Objectives determined from the NSW Water Quality and River Flow Objectives (DEC, 2006). Demonstrate how the Project will be designed and operated to:	SCSC Part 6 Section 8.6		
	they are currently being achieved; and			



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#### Table A3.4 (Cont'd)

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Agency /	Percentraged Belovent Pequirement	Relevant EIS
Organisation	WATER - SURFACE WATER (Cont'd)	Section(s)
	WATER - SORTACE WATER (Contra)	
Environment Protection Authority 14/05/19 (Cont'd)	<ul> <li>contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.</li> </ul>	SCSC Part 6 Section 8.6
	Identify potential impacts on watercourses and the management/mitigation measures that will be implemented where mining activities occur in proximity to or within a watercourse.	4.7.4, 4.7.5
	Identify whether any discharge, or the location of the Project, will cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	SCSC Part 6 Section 8
	Describe how stormwater will be managed both during and after construction including a layout of the proposed stormwater system in accordance with <i>Managing Urban Stormwater, Soils and Construction</i> - <i>Volume</i> 1 (Landcom, 2004) and <i>Volumes</i> 2A <i>to</i> 2E (DECC, 2008), The EIS should:	
	<ul> <li>Provide the proposed general location of all water management structures. These should be clearly indicated on appropriately scaled maps.</li> </ul>	SCSC Part 6 Figure 4.4 - 4.7
	<ul> <li>Demonstrate how clean, dirty and contaminated water will be managed (separated) on site throughout the life of the Project.</li> </ul>	4.7.4.4
	<ul> <li>Provide detailed water management strategies for all disturbance areas including the management of channel and overland flows into and within the disturbance area.</li> </ul>	4.7.4.4
	<ul> <li>Provide the proposed sizing of all water storage dams, sediment dams and other dams as required and justification for the sizing utilised.</li> </ul>	4.7.4.4
	<ul> <li>Identify contingency measure which may be implemented during extreme rainfall events.</li> </ul>	SCSC Part 6 Section 9
	Where the management of sediment basins requires the use of flocculants, the EIS should include information about the type, toxicity and management of flocculants proposed to treat captured water before discharge.	4.7.3, 4.7.4
	Provide plans for any proposed relocation/realignment of all creeks and/or drainage lines including design, timelines and completion criteria and sufficient evidence to demonstrate that the proposed plans are achievable/sustainable, reasonable and feasible in the short and the long term.	To be included in Water Management Plan
Office of Environment	The EIS must assess the impact of the development on hydrology, including:	4.7.5.6, 4.7.4
and Heritage	Water balance including quantity, quality and source.	
	• Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.	4.7.5.2 to 4.7.5.5
	<ul> <li>Changes to environmental water availability, both regulated/licensed and unregulated/rules based sources of such water.</li> </ul>	4.7.5.3, SCSC Part 6 Section 8



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Agency /	Deventures and Delevant Demoinsment	Relevant EIS
Organisation		Section(s)
	WATER - SURFACE WATER (Cont'd)	
Office of Environment and Heritage 14/05/19	<ul> <li>Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.</li> </ul>	4.7.4
(Conta)	Identification of proposed monitoring of hydrological attributes.	4.7.6
	WATER – FLOODING	
Office of Environment and Heritage 14/05/19	The EIS must map the following features relevant to flooding as described in the NSW <i>Floodplain Development Manual</i> 2005 including:	4.7.2.5, 4.7.5.7, SCSC Part 6 Appendix B
	<ul> <li>Flood plonning area, the area below the flood planning level</li> </ul>	
	• Flood planning area, the area below the flood planning level.	
	Hydraulic categorisation (floodways and flood storage areas).	
	The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1% AEP, flood levels and the probable maximum flood, or an equivalent extreme event.	4.7.2.5, 4.7.5.7, SCSC Part 6 Appendix B
	The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios:	4.7.2.5, 4.7.5.7,
	<ul> <li>Current flood behaviour for a range of design events as identified above. This includes the 0.5% and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.</li> </ul>	SCSC Part 6 Appendix B
	Modelling in the EIS must consider and document:	SCSC Part 6
	• Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies.	Appendix B
	<ul> <li>The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood, or an equivalent extreme flood.</li> </ul>	4.7.5.7
	<ul> <li>Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazards and hydraulic categories.</li> </ul>	4.7.5.7
	Relevant provisions of the NSW Floodplain Development Manual 2005.	SCSC Part 6 Section 6.2
	The EIS must assess the impacts on the proposed development on flood behaviour, including:	
	<ul> <li>Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.</li> </ul>	4.7.5.7
	Consistency with Council floodplain risk management plans.	
	Consistency with any Rural Floodplain Management Plans.	Not Relevant
	Compatibility with the flood hazard of the land	4.7.2.5, 4.7.5.7



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)
	WATER – FLOODING (Cont'd)	
Office of Environment	Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.	SCSC Part 6 Appendix B
and Heritage 14/05/19 (Cont'd)	• Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.	Section 7
	<ul> <li>Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.</li> </ul>	4.7.5.7
	• Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council.	4.7.5.7
	• Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council.	4.7
	• Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES.	4.7
	<ul> <li>Any impacts the development may have on the social and economic costs to the community as consequence of flooding.</li> </ul>	4.7.5.7
	HEALTH IMPACTS	
Health Western NSW – Local Health District	The Proponent must assess the potential health impacts of the project, in accordance with current guidelines. The guidelines include, but are not limited to:	
Undated	• Environmental Health Risk Assessment, Guidelines for assessing human health risks from environmental hazards, Commonwealth of Australia (enHealth,2012)	SCSC Part 7 Section 1.4
	Health Impact Assessment Guidelines, Commonwealth     Department of Health and Aged Care (enHealth, 2001)	SCSC Part 7 Section 1.4
	The assessment must:	
	<ul> <li>assess health risks associated with exposure to environmental hazards;</li> </ul>	4.16.1.3, 4.8.5, 4.8.6, 4.8.7
	<ul> <li>provide appropriate and proven management and monitoring measures to reduce any identified risk,</li> </ul>	4.8.9
	<ul> <li>assess opportunities for health improvement; and</li> </ul>	
	<ul> <li>discuss how, in the broader social and economic context of the project, the project will minimise negative health impacts while maximising the health benefits.</li> </ul>	
Greater Western Area Health Service 24/01/13	Lead is an issue as they will be processing it along with all other extracted material. Lead has already been found in the environment without mining contributing to levels. Dust control on site and during processing of materials should be of a level to prevent further contamination.	4.8.9, SCSC Part 2 Sections 5.2, 9.1



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Agency /		Relevant EIS
Organisation	Paraphrased Relevant Requirement	Section(s)
	HEALTH IMPACTS (Cont'd)	
Greater Western Area Health Service 24/01/13	Dust suppression spraying is briefly discussed. As it is in a river catchment we need to know what may/will be used for dust suppression. If substances other than water are used they should be in the project plan with controls identified.	4.8.6, SCSC Part 2 Section 9.1
(Cont'd)	Run off from the area eventually ends up in the Cudgegong river which feeds into Burrendong dam. A tailings dam has been identified for construction. Concern over possible failure of the dam which could lead to contaminated water entering the river system. The Mine must have an emergency plan in place which covers for this type of event.	2.8.2.1, 2.8.2.2
Mid-Western Regional Council 15/01/15	Council requires the applicant to undertake a full assessment of the impacts on air quality from dust and particulate matter as a result of the Project including monitoring of background lead levels to ensure there are no adverse impacts on the Lue community and the surrounding area. Council requests that consideration be given to the findings in Port Augusta[ <i>sic</i> ] (Pirie) where unexpected high lead levels were found locally and at sites remote from the mine site [ <i>sic</i> ] (smelter).	4.8.5, SCSC Part 7 Section 5
Department of Education and Communities 04/02/13	The physical impacts on the school to be identified and assessed should include; dust levels, toxicity of dust (lead) generated, traffic impacts, noise and blasting impacts within school grounds as well as general noise impacts during school hours.	4.8.5.3, 4.8.7.4
Department of Education and Communities 13/02/13	The impacts on the quality of school's rooftop rainwater supply from mine pollutants and traffic fumes during construction and operation period.	4.8.5.3
	LIGHTING	
Mid-Western Regional Council 14/02/13	It is requested that the DGRs include an assessment of the lighting and light spillage on the neighbouring properties, Lue village and the rural character of the area and impact on the residential amenity of both the villages and surrounding properties	4.9.5, 4.9.3
	Council will also require light shielding modelling carried out as part of the assessment to demonstrate the likely impacts of light onto the neighbouring properties and Lue. Mechanisms on how to limit light shielding and the likely impacts it will have will also need to be demonstrated by the proponent.	SCSC Part 8b Section 6.1, 5
TERI	RESTRIAL ECOLOGY (INCLUDING BIODIVERSITY OFFSET STRATE	EGY)
Office of Environment & Heritage 14/05/19	1. Biodiversity impacts related to the proposed Bowdens Silver Project are to be assessed and documented in accordance with the <u>Framework for Biodiversity Assessment</u> , unless otherwise agreed by OEH, by a person accredited in accordance with s142B(1)(c) of the <i>Threatened Species Conservation Act 1995</i> .	4.10
	<ol> <li>Impacts on the following species/populations/ecological communities will require further consideration and provision of the information specified in s9.2 of the Framework for Biodiversity Assessment:         <ul> <li>Anthochaera Phrygia (Regent Honeyeater)</li> </ul> </li> </ol>	4.10.4.4,
		4.10.6.5



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)
TERRES	TRIAL ECOLOGY (INCLUDING BIODIVERSITY OFFSET STRATEGY)	(Cont'd)
Office of Environment &	b. Lathamus discolor (Swift Parrot)	4.10.4.4, 4.10.6.5
Heritage	c. White Box Yellow Box Blakely's Red Gum Woodland	4.10.4.2
(Cont'd)	3. Impacts on the following species/populations/ecological communities <u>will not</u> require further consideration and provision of the information specified in s9.2 of the Framework for Biodiversity Assessment, unless they are recorded during the ecological surveys:	
	a. Bossiaea fragrans	Not recorded
	b. Caladenia attenuata	ecological
	c. Calidris ferruginea (Curlew Sandpiper)	surveys,
	d. Euphrasia arguta	therefore not
	e. Pomaderris reperta (Denman Pomaderris)	further in the
	f. Prasophyllum sp. Wybong	BAR.
	g. Pultenaea sp. Genowlan Point	
	h. Synemon plana (Golden Sun Moth)	
NSW Division of Resources & Geoscience 14/05/19	The Division requests that the Proponent consider potential resource sterilisation in relation to any proposed biodiversity offsets areas. Biodiversity offsets have the potential to preclude access for future resource discovery and extraction and could also potentially permanently sterilise access to mineral resources.	4.10.5.4, SCSC Part 9b
	The Division requests consultation with both the Geological Survey of NSW and holders of existing mining and exploration authorities affected by planned biodiversity offsets. Evidence of consultation should be included in the EIS.	3.2.2.2
Mid-Western Regional Council 14/02/13	In identifying proposed environmental offset the proponent should identify the proposed ongoing management program for the offsets including land tenure, Council does not support the conversion of environmental offsets to National Park or transfer to government ownership.	4.10.5.4, SCSC Part 9b
AQUATIC ECOLOGY		
Department of Primary Industries (Fisheries) 16/05/19	Waterway Crossings: The design and construction of pipeline crossings across all waterways should be undertaken in accordance with the Department's Policy and Guidelines for Fish Friendly Waterway Crossings (2004) and Why Do Fish Need to Cross the Road? The waterway crossings need to ensure that the works are undertaken with minimal impact on the aquatic environment within the immediate vicinity of the proposed works. DPI Fisheries need to be consulted with regards to any temporary measures that will result in blocking fish passage.	2.10.3, 4.11.5, SCSC Part 10 Section 2.3.2,

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Agency /	Paraphrasod Polovant Poquiromont	Relevant EIS
Organisation		Section(s)
Department of Primary Industries (Fisheries) 16/05/19 (Cont'd)	Riparian Buffer Zones: DPI Fisheries policy advocates the use of terrestrial buffer zones as per the Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013) available on the Department's website at https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish- habitat-conservation which states that "NSW DPI will generally require riparian buffer zones to be established and maintained for developments or activities in or adjacent to TYPE 1 or 2 habitats or CLASS 1-3 waterways."	Noted
	Threatened Species, Populations and Ecological Communities – Fisheries Management Act 1994: The proposal should include a threatened aquatic species assessment (as per part 7A Fisheries Management Act 1994) to address whether there are likely to be any significant impacts on listed threatened species, populations or ecological communities listed under the Fisheries Management Act 1994. Threatened fish species mapping distributions are available at https://www.dpi.nsw.gov.au/fishing/speciesprotection/threatened- species-distributions-in-nsw	SCSC Part 10 Section 3.1.3, 3.1.4, 4
Office of Environment and Heritage 14/05/19	<ul> <li>Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.</li> </ul>	4.11.6, SCSC Part 10
	<ul> <li>Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches).</li> </ul>	4.7.5, 4.11.6 and SCSC Parts 7 and 10
Department of Primary	The aquatic ecological environmental assessment should include the following information.	
Industries (Fisheries) 12/12/16	<ul> <li>A recent aerial photograph (preferably colour), map or GIS of the locality which maps the key fish habitat of the development site, and the waterway classes as defined in Tables 1 and 2 of the Policy &amp; Guidelines document above.</li> </ul>	SCSC Part 10 Section 3.2.4 and Figure 3.5
	<ul> <li>Aerial extent of the key fish habitat types to be affected either directly or indirectly by the development or activity should be identified and shown on recent aerial photograph map or GIS.</li> </ul>	SCSC Part 10 Figure 3.5
	• Description and quantification of aquatic and riparian vegetation should be presented and mapped. This should include an assessment of the extent and condition of riparian vegetation and the extent and condition of freshwater aquatic vegetation and the presence of significant habitat features (e.g. gravel beds, snags, reed beds, etc)	SCSC Part 10 Figure 3.5
	<ul> <li>Quantification of the extent of aquatic and riparian habitat removal or modification which will result from the proposed development, and impacts on fish passage.</li> </ul>	4.11.6.1, 4.11.6.2



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Agency /		Relevant EIS		
Organisation	Paraphrased Relevant Requirement	Section(s)		
	AQUATIC ECOLOGY (Cont'd)			
Department of Primary Industries (Fisheries) 12/12/16	<ul> <li>Determination of aquatic biodiversity offsets required (see NSW Biodiversity Offsets Policy for Major Projects, Fact Sheet: Aquatic Biodiversity) at http://www.environment.nsw.gov.au/resources/biodiversity/14817a qoffs.pdf.</li> </ul>	Noted		
(Cont'd)	Targeted on-ground surveys for threatened species (see below)	SCSC Part 10 Sections 3.2, 3.3.2		
	<ul> <li>Detailed maps outlining the proposed realignment of new waterways within the project area.</li> </ul>	Appendix 5 Section A5.10, Figures A5.11, A5.12, A5.13, A5.15		
	<ul> <li>Detailed maps outlining compensatory habitats and significant habitat features that will be created to offset the loss of aquatic and riparian habitat.</li> </ul>	Appendix 5 Section A5.10, Figures A5.11, A5.12, A5.13, A5.15		
	<ul> <li>Detailed maps that outline and assess the geomorphic stability of the proposed realignments of the new waterways including re- creation of the sinuosity/complexity of the new waterways.</li> </ul>	Appendix 5 Section A5.10, Figures A5.11, A5.12, A5.13, A5.15		
	<ul> <li>Details of the location of all waterways crossings and construction designs, such as bridges or culverts, access tracks, gauging stations or water pipelines.</li> </ul>	2.9.2, 2.10.3, 2.10.4, 2.11.3		
	• Details of the location of all waterway realignments, including a detailed rehabilitation plan for the aquatic environment and the adjacent riparian zone, and a timetable for construction of the proposal with details of various phases of construction.	Appendix 5 Section A5.10, Figures A5.11, A5.12, A5.13, A5.15		
	<ul> <li>Aspects of the management of the proposal, both during construction and after completion, which relate to impact minimisation e.g. Environment Management Plans. e.g. Monitoring geomorphic stability of the system and mitigation strategies in place to address any bed lowering, scouring or other impacts that arise as a result of the project. Monitoring of the water quality in receiving waters such as the diverted creeks, particularly during the construction phase, and also during the operational phase.</li> </ul>	4, 5, SCSC Part 10		
Mid-Western Regional Council 14/02/13	Council would like to see details on proposed native fish waterway crossings that are likely to be obstructed and altered as a result of the proposal and any critical habitats likely to be affected by the proposal.	4.11.6.2		
Department of Primary Industry – Water 12/12/16	Biodiversity should include a requirement for an aquatic ecological environmental assessment that specifically addresses the impacts on aquatic ecology, loss of Key Fish Habitats, threatened species and proposed offsets. Information to assist the proponent in undertaking this assessment has been included at Attachment A.	SCSC Part 10		



Agency /

Organisation

NSW Office of

Water 19/12/14

Roads & Maritime Services 29/01/13

#### Table A3.4 (Cont'd)

#### Coverage of Issues Identified by Other Government Agencies for Consideration in the EIS

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Paraphrased Relevant Requirement	Relevant EIS Section(s)
GROUNDWATER DEPENDENT ECOSYSTEMS	
The EIS must consider the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:	
Identify any potential impacts on GDEs as a result of the proposal including:	4.6.7.2
<ul> <li>the effect of the proposal on the recharge to groundwater systems;</li> </ul>	
<ul> <li>the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections; and</li> </ul>	
- the effect on the function of GDEs (habitat, groundwater levels, connectivity).	
Provide safeguard measures for any GDEs.	4.6.9
TRAFFIC AND TRANSPORT	
Prepare a traffic impact study in accordance with the methodology set out in Section 2 of the RTA's Guide to Traffic Generating Developments and including:	
<ul> <li>hours and days of construction and operation for each stage of the project and how proposed operations will interact with other road users;</li> </ul>	4.12.5, 2.13
<ul> <li>road transport volumes and types broken down into origin and destination, travel routes, peak hours for the construction, operation and decommissioning of the project. The study should provide details of projected transport operations including volumes of traffic and tonnage to be transported. Volumes should also include mine input related traffic generation (e.g. fuel deliveries, potable water deliveries, maintenance, services) and impacts of mine related traffic generation on public roads. The traffic study should address internal traffic movements and parking facilities;</li> </ul>	4.12.3, 4.12.4, SCSC Part 11 Sections 4,6
<ul> <li>any oversize and over-mass vehicles and loads expected for the construction, operation or decommissioning of the project;</li> </ul>	4.12.4.3
• the shortest and least trafficked route having been given priority for the movement of construction materials and machinery to minimise the risk and impact to other motorists so far as is reasonably practicable;	4.12.4.2

	reasonably practicable;	
•	temporary and permanent staff numbers (including employees and contractors) and staff parking arrangements during construction, operation and decommissioning of the project. Modes and volumes of transportation of mining staff to and from the site, details of measures proposed to minimise staff commuter traffic on the local and classified road network and measures to improve commuter safety should also be included;	4.12.4 SCSC Part 11 Sections 2.3, 4.1.2, 4.2.2, 6.12
•	the impact of generated traffic and measures employed to ensure efficiency and safety on the public road network during construction, operation and decommissioning of the project;	4.12.4, 4.12.5
•	any mitigating measures required to address expected traffic generation;	4.12.4



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#### Table A3.4 (Cont'd)

	Ι	Page 31 of 47
Agency /	Paranhrased Relevant Requirement	Relevant EIS
organisation	00011011(3)	
Poade &	<ul> <li>local alimete conditions that may affect road asfety for vahiales</li> </ul>	SCSC Part 11
Maritime Services	• local climate conditions that may affect road safety for vehicles used during construction and operation of the project (e.g. dust, fog, wet weather, etc.).	Section 3.12
(Cont'd)	<ul> <li>Proposed access treatments should be identified and be in accordance with Austroads Guide to Road Design 2010 and RMS Supplements including safe intersection sight distance;</li> </ul>	4.12.2.4, 4.12.4.1
	• Details of any required infrastructure works to support any increased demand on the road network as a result of this project. Alternative transport modes such as rail should also be explored.	4.12.2, 4.12.4.2
Roads and Maritime Services 15/02/13	Prepare a Safety Audit of roads between the proposed mine site and Mudgee.	4.12.2.7
Roads and Maritime Services	Details of pipeline crossings and encroachments of/within classified roads. Details are to include locations, depths and minimum clearances.	4.12.6
07/05/19	• Prior to the installation of pipe within classified road reserves, pursuant to section 138 of the Roads Act 1993, the prior consent of Mid-Western Regional Council with Roads and Maritime concurrence, is required.	2.10.3
Department of Education and Communities	Assess potential impacts from the number and timing of private traffic trips per annum from mine staff passing the school site during operation and construction periods.	4.12.5
13/02/13	Describe the route, number, timing and type of heavy vehicle trips per annum to transport mine materials that passes the school site during construction and operation periods.	4.12.2.5, 4.12.4.2
	The potential for noise and vibration from the heavy vehicles passing the school site to adversely impact the structure of school buildings and internal classroom noise levels.	4.2.2.7, 4.3.6
Mid-Western Regional Council 14/02/13	It is requested that a detailed analysis should be carried out of the impact of all traffic movements (type and frequency) that are anticipated for the whole of the period of the construction and operation of the project this should include commuter traffic, transport of equipment and the transport of concentration.	4.12.5
	The analysis should include an assessment of the ability of roads, intersections, culverts and bridges to cope with the additional traffic and the changing nature of the traffic.	4.12.5
	Should heavy haulage routes involve haulage through existing towns and villages than the analysis should include the assessment on traffic flow through those towns and villages and potential noise impacts.	4.12.5, 4.2.2.7
	The study is to provide a detail safety audit and a schedule of works necessary to upgrade the road to ensure that current levels of services are maintained.	Subject to discussions
	All roads should be upgraded to comply with Austroads standards in accordance with the standard dictated by traffic volumes including consideration of heavy haulage.	4.12.2.4, 4.12.4.2



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)			
TRAFFIC AND TRANSPORT (Cont'd)					
Mid-Western Regional Council 14/02/13 (Cont'd)	In addition the proponent should address the likely impact and proposed procedures for the transportation of hazardous materials along the proposed haulage routes.	4.12.4.2, 4.12.2.7, 4.12.4.8			
	Council requests that an assessment of the condition of the road, that is a dilapidation report, is to take place prior to the commencement of construction and again at the completion of works. Weekly inspections of the roads will also be required, to ensure that any damage to the road is repaired immediately. Council will also be seeking assurances that any road damage that occurs as a result of increased vehicle movements associated with the construction will be funded by the developer and not by Council.	2.9.2, 2.10, 4.12.4.1			
	Council requires that all road upgrades required as identified by the study be undertaken at the full cost to the developer and that all upgrades are required as a condition of approval prior to the commencement of any construction on site.	Noted			
	Council requires that a full assessment of all haulage and commuter routes be undertaken to assess the lifecycle maintenance requirement of the routes and undertake a details schedule of works and schedule of costs. All works and costs are to be borne by the proponent.	Subject to Discussions			
	Council requires detailed consultation with Mid-Western Regional Council throughout the design of Maloneys Road including the selection of the new realignment. As this road will become a Mid- Western Council asset Council will require that the roadworks are undertaken by Mid-Western Regional Council at the full cost to the proponent.	Noted			
Mid-Western Regional Council 15/01/15	Council reaffirms its requirement that all road upgrades identified in the Preliminary Environmental Assessment be undertaken at full cost to the developer and that all upgrades are required as a condition of approval prior to the commencement of construction on the site. This includes the re-alignment and sealing of Maloneys (Sara) Road from the Lue Road intersection to the mine entrance.	Noted			
	SOILS / LAND CAPABILITY / AGRICULTURAL SUITABILITY				
Environment Protection Authority 14/05/19	<ul> <li>The EIS should include:</li> <li>An assessment of potential impacts on soil and land resources should be undertaken, being guided by <i>Soil and Landscape Issues in Environmental Impact Assessment</i> (DLWC 2000).</li> </ul>	4.13			
	<ul> <li>Soil erosion and sediment transport - in accordance with Managing urban stormwater: soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008).</li> </ul>	SCSC Part 6			
	<ul> <li>Urban and regional salinity - guidance given in the Local Government Salinity Initiative booklets which includes Site Investigations for Urban Salinity (DLWC, 2002).</li> </ul>	SCSC Part 12 Section 5.6, 8			



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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)
	)	
Environment Protection Authority 14/05/19 (Cont'd)	A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.	4.13.4
	Where required, add any specific assessment requirements relevant to the Project.	Noted
Department of Industry -	We request you include the following in the "Policies Plans and Guidelines" – Land Resources section:	4.18, SCSC Part 14
Agriculture 16/05/19	<ul> <li>an Agricultural Impact Statement in accordance with the NSW Government Guideline for Agricultural Impact Statements (2012) and Agricultural Impact Statement Technical Notes 2013</li> </ul>	
	NSW DPI Agriculture notes the inclusion of the proposed water pipeline from Ulan to the project. We suggest the following requirements:	4.13.2.4
	• The pipeline route planning and construction should consider the construction impacts on areas of erosion and salinity, including steep lands.	
	• An assessment of agricultural land uses and production values along the pipeline route, along with estimates of loss of land. Agricultural production information can be used to provide relevant agricultural baseline data for rehabilitated land outcomes. This can include information gained as part of the agricultural landholder consultation process to deal with the pipeline construction and its decommissioning if required.	4.18.4
	• Any land identified as cropping or special use land (such as viticulture) should have the pipeline depths adjusted to deal with these land uses in consultation with stakeholders so as not to impact on agricultural operations.	4.18.5
	• A landholder consultation process should be outlined in relation to pipeline access, construction and ongoing maintenance.	3.2.2.1, A5.9
Office of Environment & Heritage 14/05/19	<ul> <li>The EIS must map the following features relevant to water and soils including:</li> <li>Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).</li> </ul>	SCSC Part 12 Maps 1 - 11
Mid-Western Regional Council 14/02/13	While Council recognises that the area may not be regarded as prime agricultural lands, Council would like to see the likely off-site impacts on adjoining agricultural lands that are likely to occur as a result of the mine. Council would also like to see what soil resources and land capabilities are likely to be altered.	4.18.6
Department of Primary Industry –	A requirement to complete an Agricultural Impact Statement in accordance with the DPI Agricultural Impact Statement Technical Notes.	SCSC Part 14
Water 12/12/16	An assessment of the pre mining (baseline) agricultural capability of the land to facilitate rehabilitation to pre-existing agricultural use at the close of the project. This should include monitoring programs to measure the return of land back to pre-existing condition.	4.13.2, 2.16



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Agency / Organisation	Paranhrased Relevant Requirement	Relevant EIS
organisation	Section(3)	
Office of Environment & Heritage 14/05/19	<ul> <li>The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010), and guided by the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) and consultation with OEH regional branch officers.</li> </ul>	4.14.3, 4.14.8, SCSC Part 13
	<ul> <li>Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.</li> </ul>	4.14.4, 4.14.7
	<ul> <li>Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.</li> </ul>	4.14.8, 4.14.9, SCSC Part 13 Sections 7, 8
	HISTORIC HERITAGE	
NSW Heritage Council 08/12/16	The EIS shall include a Heritage Impact Assessment (HIS) prepared in accordance with the guidelines in the NSW Heritage Manual that addresses the significance of, and provides an assessment of the impact on the heritage significance of heritage items on the development site and in the vicinity.	4.15, SCSC Part 13
	The EIS shall also (include) a historical archaeological assessment prepared by a suitably qualified historical archaeologist in accordance with the Heritage Division, Office of Environment and Heritage Guidelines Assessing Significance for Historical Archaeological Sites and 'Relics 2009. This assessment should identify what relics, if any, are likely to be present, assess their significance and consider the impacts from the proposal on this potential resource.	4.15.5, 4.15.7, 4.15.8, SCSC Part 13 Sections 5, 6.3, 7
	Where harm is likely to occur, it is recommended that the significance of the relics be considered in determining an appropriate mitigation strategy.	4.15.6
	In the event that harm cannot be avoided in whole or part, an appropriate Research Design and Excavation Methodology should also be prepared to guide any proposed excavations.	4.15.6



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# Table A3.4 (Cont'd)

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Agency /		Relevant EIS			
Organisation	Paraphrased Relevant Requirement	Section(s)			
HISTORIC HERITAGE (Cont'd)					
Office of Environment & Heritage 14/05/19	The EIS must provide a heritage assessment including but not limited to an assessment of impacts to <i>State and local heritage</i> including conservation areas, natural heritage areas, places of Aboriginal heritage value, buildings, works, relics, gardens, landscapes, views, trees should be assessed. Where impacts to State or locally significant heritage items are identified, the assessment shall:	4 15 6			
	(including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the NSW Heritage Manual (1996),	SCSC Part 13 Section 8, 9			
	<ul> <li>be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria),</li> </ul>	No excavations undertaken			
	<ul> <li>include a statement of heritage impact for all heritage items (including significance assessment),</li> </ul>	4.15.7			
	<ul> <li>consider impacts including, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment (as relevant); and</li> </ul>	4.15.5, 4.15.8			
	<ul> <li>where potential archaeological impacts have been identified develop an appropriate archaeological assessment methodology, including research design, to guide physical archaeological test excavations (terrestrial and maritime as relevant) and include the results of these test excavations.</li> </ul>	4.14.5, 4.15.3, 4.15.4			
	ECONOMIC				
NSW Division of Resources & Geoscience	<ul> <li>Price forecasts by product type used by the Proponent. The Division requires these forecasts to analyse the Proponent's calculations of royalty value and export value.</li> </ul>	Table 2.2 SCSC Part 15			
14/05/19	<ul> <li>Product tonnages split into market segment. These estimates are necessary to arrive at total revenue value and royalty calculations. Include justification for market segment based on quality parameters.</li> </ul>	Not Relevant			
	CAPEX & OPEX necessary for the Project – broken down into the various sub-categories and equipment type.	Appendix 8			
	Estimates of employment generation broken down into direct, indirect, ongoing, construction and contract workers.	2.12			
	Total royalty generated to the state over the life of the Project.	4.19.2			
	<ul> <li>Relationship and interaction with other mines. How the Project impacts on the surrounding mines.</li> </ul>	Not Relevant			
	Details on derivation/analysis of Run-of-Mine (ROM) production rate; to answer why this is the optimum rate.	Not Relevant			
	The Division understands that an estimate of product split into individual market segments is difficult to estimate at a point in time and is dependent on market conditions as the life of the Project progresses. The Division requires the Proponent to provide its best estimate of their market mix at the initial stages of the Project.	Not Relevant			



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Agency / Organisation	Paranhrased Relevant Requirement	Relevant EIS Section(s)
- guille and the	SOCIAL	
Mid-Western Regional Council 14/02/13	Council considers that the assumptions regarding available workforce within the supporting information is flawed and fails to take into account the cumulative impact of mining and wind farm projects within the region. Whilst it is acknowledged that some of the construction and operation workforce will be sourced locally it is considered that the majority will need to be imported. Council requests that the DGRs include the requirement for the proponent to identify the likely domicile for 90% of the construction and operational workforce and undertake a full analysis of the impacts on housing, rental housing, infrastructure, traffic, health and other social impacts and provide realistic measure to mitigate those impacts.	2.12, 4.20.5, 4.20.6
	The literature review should have regard to the Local Service Assessment Report undertaken by Manidis Roberts on behalf of the DP&I in 2012. A copy is located on Council website at htlp://www.mldwestern .nsw.gov.au/EconomIc- DevelopmentlPublications/. Upon the completion of the demand assessment for temporary accommodation should the project recognise a need for Temporary Workers Accommodation then reference should be made the Mid-Western Regional Comprehensive DCP.	SCSC Part 17 Sections 5 and 7
	Council is concerned regarding the ongoing viability of the village of Lue and the school. The village of Lue is a successful vibrant community and Council has witnessed the demise of other villages such as Wollar due the impacts of mining. It should be noted that demise of Wollar was not predicted in the EA prepared in support of the mine. Council considers that a full assessment should be made on the potential impacts on Lue with an investigation of student numbers and the potential threat to maintaining those numbers should families leave the village.	4.20.6.3
	CONSULTATION	
Education & Communities 04/02/13	The Department requests that the DGRs include an item to identify and assess any potential impacts on the Lue Public School. In particular the physical and social impacts on the school should be included as separate line items in the DGRs.	4.20.6.3
	The social impacts on the town generally will impact on the school and should be identified and assessed both during the mine's life (15 years) and at the conclusion of mining activities.	4.20.6.3
	Department request that the DGRs also ensure that the proponent carry out a reasonable and justified level of consultation with Lue Public School staff and Parents and Citizens Association.	3.2.2.1
Greater Western Area Health Service 24/01/13	It would have been beneficial for key stakeholders to undertake a site visit prior to the meeting in order to see the area in question.	3.2.2.1, 3.2.2.3



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Agency /		Relevant EIS		
Organisation	Paraphrased Relevant Requirement	Section(s)		
	PROJECT DESIGN			
Environment Protection Authority 20/12/18	<ul> <li>Tailings Storage Facility (TSF)</li> <li>The EPA has prepared a Tailings Dam Liner Policy 2016 (the tailings dam policy). A copy of the tailings dam policy is appended to this letter for your information. In summary, the tailings dam policy adopts a benchmark requirement for the TSF liners to achieve a hydraulic conductivity of 1 x10<sup>-9</sup> m/s or less utilising a constructed clay liner of at least 1.0 metre (or a geosynthetic liner). The tailings dam policy does permit the proponent to propose an alternative liner system to the benchmark, however this requires a robust hydrogeological investigation and impact assessment to prove the efficacy of the liner system and/or natural geology to demonstrate the prevention of water pollution, which includes the pollution of groundwater. The tailings dam policy does also state that in the event the tailings pose a high risk</li> </ul>	2.8.2.2, SCSC Part 16a Section 17		
	<ul> <li>to the water environment, a liner system that provides a higher level of protection is likely to be required. The EPA therefore expects that the proponent proposes a TSF liner system that will satisfy the tailings dam policy.</li> <li>The preliminary environmental assessment indicates that the</li> </ul>	SCSC Part 16a		
	tailings will be pumped to the tailings storage facility as a slurry. The Australian Government has produced a 'Tailings Management - Leading Practice Sustainable Development Program for the Mining Industry' (Australian Government 2016). This document provides guidance on world leading experience and expertise in mine management and planning; in particular, new and advanced methods of tailings disposal. New methods of tailings disposal include, thickened and paste disposal, dry stacking, co-disposal of coarse wastes and tailings, and integrated disposal of coarse waste and tailings along with backfilling open- pits. The underlying substantial benefit to each of the above new methods produces tailings with far less moisture content. Paste or filtered tailings have the advantages of improved water and process chemical recovery, potentially reduced tailings storage volume, reduced seepage, more stable landforms, and reduced chance of overtopping. "Management of tailings across the world is increasingly moving towards pre-disposal thickening and filtering of tailings, with some increase in surface paste tailings disposal and the co-disposal of tailings and coarse-grained waste" (Australian Government 2016). The EPA expects that this Project utilise best management practice as detailed in the referenced document.	(Entire Document)		
	• The EPA requests that the proponent undertake a tailings risk assessment based on the estimated tailings composition. The risk assessment should contain sufficient information to enable the EPA to carry out an independent assessment to determine if the tailings pose a high risk to the environment, as per the tailings dam policy, and therefore requiring a higher level of protection as stated in the tailings dam policy. The risk assessment should include detailed discussion of options to dispose of, and handle tailings as described above, which are substantial improvements to the dated method of slurry disposal within valley filled tailings dams.	Appendix 5 Section A5.7.2.2, SCSC Part 3 Annexure 2, SCSC Part 16a Section 8,		



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Agency /	Paraphrasod Polovant Poquiromont	Relevant EIS		
Organisation		Section(s)		
E. Survey				
Protection Authority 20/12/18 (Cont'd)	<ul> <li>The EPA notes from both the PEA and from the information provided in your e-mail that approximately 26.6 million tonnes of potentially acid forming (PAF) waste rock will be generated as part of the project. Points 9 and 10 of the Waste section of Attachment A to the EPA's SEARs specifically require the proponent to describe the generation and handling of waste rock materials and to provide details on the potential for PAF material to be generated and the associated management/mitigation measures to be adopted for the project.</li> </ul>	2.5.2, 2.5.4		
	<ul> <li>The finalised indicative site layout figure provided in your e-mail shows the proposed waste rock emplacement area located along the eastern edge of the mine site boundary. The waste rock emplacement is bounded on its entire eastern side by Price Creek. The EPA reiterates the need for the proponent to provide adequate details of waste rock generation and management as per points 9 and 10 in the EPA's SEARs, to enable the EPA to assess any likely impacts of this material on the local environment and the measures to be adopted to mitigate the risk of these impacts.</li> </ul>	2.5.4, Appendix 5 Table A5.6		
	Ore Processing Plant			
	• The PEA provides a brief description of the processing plant and the intention to form concentrate by means of a conventional froth flotation methodology. The EPA requests that the proponent provides details in the EIS of all chemicals to be used in this process including quantities stored, quantities to be used (on a daily basis) and the fate of these chemicals to be used in this process including quantities stored, quantities to be used (on a daily basis) and the fate of these chemicals (i.e. are they recovered and reused at the processing plant or become part of the slurry that is transferred to the tailings dam).	2.7.2, 2.7.3		
TransGrid	500kV Realignment			
25/03/13	Ground Movements	4.3,		
	• The impacts on transmission line towers from ground movements from mining activities shall be considered. The mine may result in transmission lines being subject to vertical and horizontal displacements. Vertical displacements may reduce clearance from the ground surface which may lead to infringements of requirements for clearance of transmission lines. Horizontal displacements (and tilt) may affect the alignment and tension of the transmission lines. Ground disturbance effects on a transmission tower may render it unserviceable or lead to collapse of the towers (Guidelines for Coal Mining and Transmission Lines with Respect to Subsidence, Mine Subsidence Board 1997).	Table 4.3.C SCSC Part 1 Section 10.4		

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Agency /	Deventure and Delevent Demuirement	Relevant EIS		
Organisation	Paraphrased Relevant Requirement	Section(s)		
TransGrid 25/03/13 (Cont'd)	<ul> <li>Any necessary precautionary measures to mitigate ground movements from mining activities on affected transmission lines must be undertaken. If the expected ground movement effects are so severe that the transmission line structures and/or foundations are inadequate and that TransGrid's electricity network is compromised, then major redesigning, modification or relocation of the line is likely to be required.</li> </ul>	4.3.4		
	<ul> <li>Any blasting occurring near the transmission line easement shall consider vibration impacts on the stability of transmission line structures. Blasting shall have a maximum charge of 2kg/delay, with a maximum peak particle velocity of 50mm/second.</li> <li>Furthermore, the impacts on the transmission line from potential flyrock associated with blasting operations also need to be considered.</li> </ul>	4.3.6.1, SCSC Part 1 Section 10.4		
	<ul> <li>No excavation shall occur within 35 metres of any TransGrid structure without prior approval from TransGrid.</li> </ul>	4.17.2		
	Access			
	• TransGrid requires access to each transmission structure of the transmission line, for construction, maintenance and emergency situations. TransGrid maintenance vehicles and plant that access the easement have weights up to 35 tonnes GVM. Access tracks shall be maintained to accommodate these heavy vehicles.	4.17.2		
	• A continuous and unobstructed access way along the entire length of the easement is to be maintained at all times during construction and operation of the line. TransGrid requests consultation regarding any possible restrictions to TransGrid access to the transmission line. The easement shall not be used by any vehicles or for the laydown of materials, without prior consultation with TransGrid.	4.17.2		
	• No obstructions shall be placed in the easement area or within 35 metres of any part of a transmission structure or supporting ropes, wires or chains. The area around the base of the transmission line structures shall have easy vehicle access from all sides, and be available at all times as a clear working area for line maintenance crews and plant.	4.17.2		
	Electrical Safety			
	• All works (including construction and operation of the project) within the easement is subject to safe working distances. All work within TransGrid's easement shall comply with the WorkCover Code of Practice 2006 for Work Near Overhead Powerlines, Catalogue No. 1394. The Code of Practice requires that any plant that has the potential to impinge on the "Accredited Person Zone" must be operated by an "Accredited Person" as per the aforementioned Code of Practice.	Noted		
	• Vehicle or plant equipment which can exceed 4.6 metres in height are not permitted upon the easement except when operating under the procedures outlined in the WorkCover Code of Practice 1394.	4.17.2		



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Agency / Organisation	gency / anisation Paraphrased Relevant Requirement				
	PROJECT DESIGN (Cont'd)				
TransGrid 25/03/13	• The erection of any structure within the easement greater than 4.6 metres in height is prohibited.	4.17.2			
(Cont'd)	<ul> <li>Infringement of the WorkCover Code of Practice (in particular Approach Distances as listed in Table 2, Section 3.3) by any plant may result in dangerous induced voltages causing human injury or death.</li> </ul>	Noted			
	• TransGrid considers that an arc incident caused by equipment under the control of the proponent would jeopardise TransGrid's capacity to exercise its functions and discharge its responsibilities under the Energy Services Corporations Act 1995. The potential for the construction and operation of the mine to affect electrical safety will need to be considered in the EIS.	Not relevant			
	Electrical Induction				
	<ul> <li>An Electrical Induction Study for the mine construction and continued operation shall be prepared by the proponent and provided to TransGrid.</li> </ul>	Not relevant			
	• Any metallic structures shall not be placed within 35 metres of a structure, or within 35 metres of the centre of the easement without adequate protection for ground currents, earth potential rise and induction.	Noted			
	Other Issues				
	<ul> <li>No hazardous substances or waste shall be placed with the easement.</li> </ul>	4.17.2			
	<ul> <li>All disturbed earthworks within the easement shall be reinstated to original surface level, and compacted to 95% standard compaction. Disturbed ground surface within the easement shall be stabilised with a suitable ground cover.</li> </ul>	Noted			
	<ul> <li>No drainage or surface storm waters shall wash over the easement within 35 metres of any transmission line structure.</li> </ul>	Noted			
	• Dust shall be controlled to prevent impact on the insulators.	4.4.2.3			
	<ul> <li>No vegetation with a mature height above 4 metres shall be planted within the easement.</li> </ul>	Noted			
	• The easement shall be left free of waste or any other materials during construction and operation.	Noted			
TransGrid 23/08/2017	There will be no engineering reason for the line relocation to be unfeasible. Network outages, constructability and design can all be managed however the timeframe and costs for the works are variable.	3.2.2.2			
WATER SUPPLY PIPELINE					
Mid-Western Regional Council 23/05/19	<ul> <li>In order to fully assess the proposal and the extent of any impacts associated with the pipeline, a detailed site survey for the full length of the pipeline corridor should be submitted as part of the EIS documentation.</li> </ul>	2.10.2, A5.9,			



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#### Table A3.4 (Cont'd)

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Agency / Organisation	Paraphrased Relevant Requirement	Section(s)		
WATER SUPPLY PIPELINE (Cont'd)				
Mid-Western Regional Council 23/05/19 (Cont'd)	• In addition to the site survey, the proponent should identify and address any expected impacts on Council's road network and associated infrastructure during construction and ongoing operation of the pipeline. This will include management of traffic impacts, scope of physical works required , location and timing of works.	4.12.6		
	<ul> <li>Council has advised the proponent that where there are any discrepancies between the physical and paper road alignment, the proponent will be required to go through the relevant process of formalising these access arrangements.</li> </ul>	Noted		
	• Council will require a formal agreement to be established in accordance with the Roads Act (including Sec 138 approval and lease) for the use of the road reserve for the life of the project, which specifies the rights and responsibilities of both parties for construction, ongoing maintenance and decommissioning stages.	2.10.3		
	<ul> <li>The EIS should address the potential impacts of redirecting water under the existing management practices for current SSD projects to the new management practices associated with the proposed pipeline for the Bowdens Silver project.</li> </ul>	4.7		
Environment Protection Authority 20/12/18	• With regard to the proposed construction and use of a water supply pipe line from Ulan Coal Mine, the EPA would expect the proponent to provide routine details on the proposed route of the pipe line and referencing the intention for the preparation of a construction management plan which will detail all relevant sediment and erosion controls to be implemented.	2.10, A5.9		
	• The EPA will require the proponent to provide details of how the pipeline will be constructed including the use of any leak detection technologies.	2.10.3, 2.10.4 Appendix 5 Section A5.9		
	<ul> <li>The EPA will also require the proponent to provide details of the proposed management of the pipe line throughout the life of the mine with respect to preventative maintenance, inspection schedules and protocols to minimise the environmental impact that may result from any failure along the length of the pipe line. The EPA understands that the electrical conductivity of the water to be transferred from Ulan Coal Mine exceeds 3,000µS/cm and therefore must not be released in to the local environment as a result of any pipe line failure.</li> </ul>	2.10, A5.9		
Roads and Maritime Services 07/05/19	• Details of pipeline crossings and encroachments of/within classified roads. Details are to include locations, depths and minimum clearances.	4.12.6.2		
	<ul> <li>Prior to the installation of pipe within classified road reserves, pursuant to section 138 of the Roads Act 1993, the prior consent of Mid-Western Regional Council with Roads and Maritime concurrence, is required.</li> </ul>	2.10.3		

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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)				
	CHEMICALS AND HAZARDOUS MATERIALS					
Environment Protection Authority 14/05/19	Provide details of the types and quantity of any chemical substances, including but not necessarily limited to, hydrocarbons (oils and fuels), hazardous or dangerous materials (e.g. explosives etc) to be used or 4/05/19 stored onsite.					
	Provide details of procedures for the assessment, handling, storage, transport and disposal of all chemical substances, hazardous or dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.	4.16.1.4, 4.16.2				
	Outline pollution control measures relating to storage of wastes, materials, possibility of accidental spills (e.g. Preparation of contingency plans), appropriate disposal methods and management of contaminated stormwater.	4.16.2.1, 4.7.4.4				
	WASTE					
Environment Protection Authority 14/05/19	The EIS should identify all wastes to be generated by all aspects of the Project and identify procedures for the handling and management of all wastes produced. The handling of rejects, tailings and overburden material are important aspects which must be assessed in detail.	2.5.3-2.5.5, 2.8, 2.14, 4.16, and A5.4				
	<ul> <li>Identify, characterise and classify all waste that will be generated onsite through excavation, demolition or construction activities, including proposed quantities of the waste.</li> </ul>					
	• Demonstrate how waste will be managed in accordance with the waste hierarchy, established under the <i>Waste Avoidance and Resource Recovery Act 2001</i> which aims to that ensures that resource management options are considered against the following priorities:	2.14				
	<ul> <li>Avoidance including action to reduce the amount of waste generated by households, industry and all levels of government</li> </ul>					
	<ul> <li>Resource recovery including reuse, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources</li> </ul>					
	<ul> <li>Disposal including management of all disposal options in the most environmentally responsible manner.</li> </ul>					
	• Include a detailed plan for in-situ classification of waste material, including the sampling locations and sampling regime that will be employed to classify the waste, particularly with regards to the identification of contamination hotspots in accordance with the EPA's <i>Waste Classification Guidelines</i> .	SCSC Part 3				
	• Provide details of the quantity and type of both liquid and non- liquid waste generated, handled, processed or disposed of at the premises. Wastes must be classified according to the Waste Classification Guidelines (DECC 2008).	2.14				

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Agency / Organisation	on Paraphrased Relevant Requirement					
	WASTE (Cont'd)					
Environment Protection Authority 14/05/19 (Cont'd)	• Details of procedures for the assessment, handling, storage, transport and disposal of all hazardous waste used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.					
	• Identify, characterise and classify all waste that is proposed to be disposed of to an offsite location, including proposed quantities of the waste and the disposal locations for the waste. This includes waste that is intended for re-use or recycling. All waste must be classified in accordance with EPA's Waste Classification Guidelines.	2.14				
	<ul> <li>Provide, where relevant, the methods which will be utilised to ensure compliance with any approved Resource Recovery General Exemption for the offsite disposal of waste either generated on site and disposed of offsite or received from offsite and disposed of onsite. Resource Recovery General Exemptions may only be utilised where the waste is land applied for use as fuel of a waste material is a genuine, fit for purpose, reuse of the waste rather than another path to waste disposal.</li> </ul>	Not relevant				
	• Identify the management and disposal of tailings including actions to prevent potential impacts to groundwater, surface water or any other environmental aspect which may occur as a result of the management technique utilised. The EIS must assess and commit to the implementation of all feasible and reasonable measures to minimise seeps, leaching, and/or leaks from the tailings storages facilities into the surrounding environment. The EIS must also include details of a monitoring program which will be established to assess leaks and/or seepages from any tailings storage facility, including a leak detection system.	2.8, Appendix 5 Section A5.7.7, A5.7.6, SCSC Part 16a Section 25				
	<ul> <li>Assess the potential for acid mine drainage from acid forming materials and identify the management {mitigation measures which will utilised for any PAF material identified.</li> </ul>	2.4.2, 2.4.3.2, 2.5.1 to 2.5.4, 2.6.1.2, 2.8.2.2, Appendix 5 Sections A5.1.3.3, A5.1.4, A5. 3.4, A5.4, a5.7.2.2, A5.10.5				
	Provide details of how waste will be handled and managed onsite to minimise pollution, including:					
	<ul> <li>Stockpile location and management</li> </ul>					
	<ul> <li>Labelling of stockpiles for identification, ensuring that all waste is clearly identified and stockpiled separately from other types of material (especially the separation of any contaminated and non-contaminated waste).</li> </ul>	2.5, 2.13				

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Agency / Organisation	Paranhrased Relevant Requirement	Relevant EIS			
organisation	WASTE (Cont'd)	00000000			
Environment	Drapaged height limits for all waste to reduce the potential for	2541			
Protection Authority 14/05/19	- Proposed height limits for all waste to reduce the potential for dust and spontaneous combustion.	Appendix 5 Section A5.3.2.2			
(Cont'd)	<ul> <li>Procedures for minimising the movement of waste around the site and double handling.</li> </ul>	Appendix 5 Section A5.4.4			
	• Provide details of waste rock emplacement areas with particular attention to:				
	<ul> <li>The quantity of waste rock likely to be generated;</li> </ul>	Appendix 5 Section A5.4.3			
	<ul> <li>Proposed strategies for the handling, reuse/recycling and disposal of waste rock; and</li> </ul>	2.5.4, 2.5.5			
	- Designation of transport routes for the transport of waste rock.	2.5.1			
Mid-Western Regional Council 14/02/13	n Council is concerned regarding the potential for acid forming material left in situ but exposed due to mining activities. Council requests that a complete assessment be undertaken and if necessary that a bond or guarantee be imposed to ensure the ongoing management of the site after the closure of the mine.				
	REHABILITATION				
Department of	The EIS shall include:				
Resources and	Post-mining land use				
23/12/16	- Identification and assessment of post-mining land use options;	2.16.9			
	<ul> <li>Identification and justification of the preferred post-mining land use outcome(s) and discussion of how the final land uses(s) are aligned with relevant local and regional strategic land use objectives;</li> </ul>	2.16.9			
	<ul> <li>How the rehabilitation of the project will relate to the rehabilitation strategies of neighbouring mines within the region, with a particular emphasis on the coordination of rehabilitation activities along common boundary areas.</li> </ul>	Not relevant			
	Rehabilitation objectives and domains				
	- Inclusion of a set of project rehabilitation objectives and completion criteria that clearly define the outcomes required to achieve the post-mining land use for each domain. Completion criteria should be specific, measurable, achievable, realistic and time-bound. If necessary, objective criteria may be presented as ranges;	2.16.9.2, A5.10			
	Rehabilitation Methodology				
	<ul> <li>Details regarding the rehabilitation methods for disturbed areas and expected time frames for each stage of the rehabilitation process.</li> </ul>	Appendix 5 Section A5.10, 2.16			

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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)			
REHABILITATION (Cont'd)					
Department of Resources and Energy 23/12/16 (Cont'd)	<ul> <li>Mine layout and scheduling, including maximising opportunities for progressive final rehabilitation. The final rehabilitation schedule should be mapped against key production milestones (i.e. ROM tonnes) of the mine layout sequence before being translated to indicative timeframes throughout the mine life. The mine plan should maximise opportunities for progressive rehabilitation.</li> </ul>	2.16.7			
	Conceptual Final Landform Design				
	<ul> <li>Inclusion of a drawing at an appropriate scale identifying key attributes of the final landform including final landform contours and the location of the proposed final land uses(s)</li> </ul>	2.16.5			
	Monitoring and Research				
	<ul> <li>Outlining the monitoring programs that will be implemented to assess how rehabilitation is trending towards the nominated land use objectives and completion criteria.</li> </ul>	2.16.8, 2.16.9			
	<ul> <li>Details of the process for triggering intervention and adaptive management measures to address potential adverse results as well as continuously improve rehabilitation practices.</li> </ul>	Rehabilitation Management Plan			
	<ul> <li>Outlining any proposed rehabilitation research programs and trials, including their objectives. This should include details of how the outcomes of research are considered as part of the ongoing review and improvement of rehabilitation practices;</li> </ul>				
	Post-closure maintenance				
	<ul> <li>Description of how post-rehabilitation areas will be actively managed and maintained in accordance with the intended land use(s) in order to demonstrate progress towards meeting the rehabilitation objectives and completion criteria in a timely manner;</li> </ul>	2.16.9, 4.18.5			
	Barriers or limitations to effective rehabilitation				
	<ul> <li>Identification and description of those aspects of the site or operations that may present barriers or limitations to effective rehabilitation, including:</li> </ul>				
	<ul> <li>evaluation of the likely effectiveness of the proposed rehabilitation techniques against the rehabilitation objectives and completion criteria;</li> </ul>	Rehabilitation Management Plan			
	<ul> <li>assessment and life of mine management strategy of the potential for geochemical constraints to rehabilitation (e.g. acid rock drainage, spontaneous combustion, etc.), particularly associated with the management of overburden/interburden and reject material;</li> </ul>	Rehabilitation Management Plan			
	<ul> <li>the processes that will be implemented throughout the mine life to identify and appropriately manage geochemical risks that may affect the ability to achieve sustainable rehabilitation outcomes.</li> </ul>	Rehabilitation Management Plan			

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Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)			
REHABILITATION (Cont'd)					
Department of Resources and Energy 23/12/16 (Cont'd)	iv) a life of mine tailings management strategy, which details measures to be implemented to avoid the exposure of tailings material that may cause environmental risk, as well as promote geotechnical stability of the rehabilitated landform; and.	Rehabilitation Management Plan			
	<ul> <li>v) existing and surrounding landforms (showing contours and slopes) and how similar characteristics can be incorporated into the post-mining final landform design. This should include an evaluation of how key geomorphological characteristics evident in stable landforms within the natural landscape can be adapted to the materials and other constraints associated with the site.</li> </ul>	Rehabilitation Management Plan			
	<ul> <li>Where a void is proposed to remain as part of the final landform, include</li> </ul>				
	<ul> <li>a constraints and opportunities analysis of final void options, including backfilling, to justify that the proposed design is the most feasible and environmentally sustainable option to minimise the sterilisation of land post-mining:</li> </ul>	Economically not viable			
	<ul> <li>preliminary geotechnical assessment to identify the likely long term stability risks associated with the proposed remaining high wall(s) and low wall(s) along with associated measures that will be required to minimise potential risks to public safety; and</li> </ul>	Appendix 5 A5.10.3			
	iii) outcomes of the surface and groundwater assessments in relation to the likely final water level in the void. This should include an assessment of the potential for fill and spill along with measures required be implemented to minimise associated impacts to the environment and downstream water users.	4.7.5.5, 4.7.5.6, 4.7.4.3, 4.7.4.4, 4.6.8.5, 4.6.7			
	<ul> <li>Where an ecological land use is proposed, demonstrate how the revegetation strategy (e.g. seed mix, habitat features, corridor width etc.) has been developed in consideration of the target vegetation community(s);</li> </ul>	4.18.5			
	<ul> <li>Where the intended land use is agriculture, demonstrate that the landscape, vegetation and soil will be return to a condition capable of supporting this; and</li> </ul>	4.18.5			
	<ul> <li>Consider any relevant government policies.</li> </ul>	2.16.1			
	Note: The following government policies should be considered when addressing rehabilitation issues:				
	<ul> <li>Mine Rehabilitation (Leading Practice Sustainable Development Program for the Mining Industry, 2006)</li> </ul>				
	<ul> <li>Mine Closure and Completion (Leading Practice Sustainable Development Program for the Mining Industry, 2006)</li> </ul>				
	Strategic Framework for Mine Closure (ANZMEC-MCA, 2000)				

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# Table A3.4 (Cont'd)

		Page 47 of 47
Agency / Organisation	Paraphrased Relevant Requirement	Relevant EIS Section(s)
	REHABILITATION (Cont'd)	
Department of Primary	<ul> <li>Justification of the proposed final landform with regard to its impact on local and regional surface and groundwater systems;</li> </ul>	2.16.8, 2.16.9
Industry – Office of Water 19/12/14	<ul> <li>A detailed description of how the site would be progressively rehabilitated and integrated into the surrounding landscape;</li> </ul>	Appendix 5, Section A5.10
	<ul> <li>Outline of proposed construction and restoration of topography and surface drainage features if affected by the project;</li> </ul>	Appendix 5
	<ul> <li>Detailed modelling of potential groundwater volume, flow and quality impacts of the presence of an inundated final void (where relevant) on identified receptors specifically considering those environmental systems that are likely to be groundwater dependent;</li> </ul>	4.7.5.5, 4.7.5.6, Appendix 5
	<ul> <li>An outline of the measures to be put in place to ensure that sufficient resources are available to implement the proposed rehabilitation; and</li> </ul>	A5.10.2
	<ul> <li>The measures that would be established for the long-term protection of local and regional aquifer systems and for the ongoing management of the site following the cessation of the project.</li> </ul>	4.6.8
Mid-Western Regional Council 14/02/13	Council would require information on the post mine life rehabilitation plans and proposed uses for the site. As part of this information Council would require quantified information on the lands capabilities post mine life.	4.18.5, Appendix 5
Greater Western Area Health Service 24/01/2013	Provide information on what they intend to do with the tailings dam at the end of the project.	Appendix 5 A5.10.7

The following table incorporates the issues raised by a number of community members throughout the Lue and District Community during the extensive consultation undertaken by Bowdens Silver and its consultants during the preparation of the EIS. A range of issues raised previously by the Lue Action Group and its consultants have also been included. The source(s) of the comments or questions are also documented. For the purposes of this table, only issues relevant to an EIS are listed and then only the issue is described without providing detail of the preferred outcome of the group or individual.

# Table A3.5 Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

Issue / Question	Frequency	Source	Relevant EIS Section(s)
General Issues			
Trucking of topsoil to the site for rehabilitation.	1	1	Not intended
Provide accurate distances from residences to the proposed activities within the mine site and from the closest Mine Site boundary (within at least 3km of the proposed mine)	1	4	Appendix 6 Tables A6.2, A6.3, A6.4
Coverage of Crown land lease by a proposed tailings	1	4	Not relevant
Increased fire risk due to the facility.	1	4	4.16.3
We value the many friends they have in the area and don't want that to change by relocating out of the area.	1	3	4.20.6.5
What are the requirements for land acquisition and mitigation?	1	3	4.2.2.5
"Assuming the best, and you get through the bureaucracy and red tape, when will you be looking to put people on the ground?"	1	4	2022
"Are you looking to expand as you mine the site?"	1	4	2.2.4
Project Design			
Why wasn't the mine designed to be an underground operation?	4	2, 5	1.5.7
How will long-term historical data be incorporated into the planning of the mine?	1	2	4.2, 4.4, 4.6, 4.7
When will you stop adjusting the layout?	1	3	Appendix 5 Section A5.1
Is the buffer zone around the mine adequate? Why isn't it 8km like coal mines?	4	1, 3, 5	4.4.2.5, 4.2.2.7 and 4.8.9
Are there any comparable silver mines around the world that can be used for comparison?	1	2	Appendix 4 Section A4.1.2
How big will the equipment be on the Mine Site? - photographs	1	4	Appendix 5 Plates A5.1 to A5.6
How much ore and other material will be removed each year?	1	2	Appendix 5 Table A5.6
How long after the mine is approved will it be until Bowdens Silver lodges an application to expand?	1	3	2.2.4

Source(s) of Comment / Question

1 = LAG/Noller Reports 2 = CCC 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)

4 = Bowdens Silver (direct) 5 = Umwelt 6 = Comm

6 = Community Events 7 = Private correspondence

 8 = Other Community Groups, Institutions, and Businesses (e.g. Gulgong Chamber of Commerce, Mudgee Chamber of Commerce, Kandos Rylstone Business Group, Rotary Club of Mudgee, Lue Public School, Rylstone Public School and P&C Members, Kandos Public School, Kandos High School, TAFE)



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#### Table A3.5 (Cont'd)

#### Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 2 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Project Design (Cont'd)			
What will the depth of the pit be?	1	2	180m 2.4.2
What quantity of lead is present in the mine?	1	2	2.2.3
What proportion of lead will be in the lead/silver concentrate?	1	2	2.7.1
Can silver, zinc, and lead be reported in the same way?	2	2	2.2.3
Will the lead/silver be processed on site?	1	2	No
Why is the proposed mine smaller than previous proposals?	1	5	1.5.7
Will there be a map provided showing distance between the mine and nearest residents?	1	2	Appendix 6 Figures A6.1, A6.2
The processing plant is now located closer to Lue village which is unacceptable. Can the project move further north? (Comment provided prior to Project re-design)	2	3, 5	1.5.7
Is there a plan to move the rubbish tip?	1	3	No
What is the likely lifespan of the mine?	1	2	2.13.3
What are the likely hours of operation?	8	2, 3, 5	Tables 2.3, 2.13
Will the mine operate in the night-time?	1	3	2.13
What is the earliest expected timeframe operations could commence?	1	2	2022
How can we be sure mining will be carried out in the correct sequence?	1	5	2.4
We don't trust engineering controls in extreme events – how can we be sure the plant will be designed to the highest standards?	1	3	2.7.2
Why is the company name 'Bowdens Silver' when it is really a lead mine?	1	3	Appendix 4 Section A4.1.1
What community guidelines does Bowdens Silver fall under?	1	3	CCC, 4.20.2.2, SCSC Part 17 Section 5.3
What happens if the results from the science come back and shows that there will be an impact on Lue village?	1	3	Adaptive Management
What will happen to Bowdens Silver and the mine if the proposal is not approved?	1	3	1.5.7
Does Bowdens Silver plan to get approval then sell the Site?	1	3	No
With no prior experience how can we be confident in the performance of Bowdens Silver?	2	3, 5	1.3.1
Source(c) of Commont / Question			

#### Source(s) of Comment / Question

3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019) 1 = LAG/Noller Reports 2 = CCC

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7 = Private correspondence

Coverage of Issues Raised k	y the Lue and District Communit	y for Consideration in the EIS
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			Page 3 01 23
Issue / Question	Frequency	Source	Section(s)
Project Design (Cont'd)			
Why are the project costs so much lower than Kingsgate?	1	5	1.5.7
Is the mine economically viable?	4	2, 3, 5	Yes
What will happen to the land you purchase? Will you continue to run a farm?	1	3	Section 4.18
Will water be provided to neighbours and for how long?	1	5	No
Will Bowdens Silver buy Lue village?	1	5	No
Will Bowdens Silver consider buying my property?	3	4, 5	Yes, if a VLAMP property
What is happening with all the houses Bowdens Silver own?	1	4	4.20.6.2
Will people be compensated for impacts?	2	3, 5	Yes, if a VLAMP property
What rights do landowners have regarding property access?	1	2	Standard Legal Rights
Will Bowdens Silver be creating an on-site worker's accommodation camp?	2	5, 8	No 1.5.7
Will ongoing information be available for locals?	3	5	Yes 1.8.3
Bowdens Silver has conducted itself in a highly professional and transparent manner to day – will this continue in the future?	1	8	Yes
How can we be sure Bowdens Silver is being transparent and accountable?	2	1, 5	1.3.1
Will Bowdens Silver continue to pay to maintain all the areas covered by the exploration licences?	1	2	1.3.1
Who determines the value of the bonds for acid and heavy metal management for the 50+ years during rehabilitation?	1	2	DRG 1.8.2
Will the mine operate 24/7?	4	3	2.13
Where is the processing plant?	2	3	Figure 2.1
What is the life of the mine?	2	3	2.13.3
What chemicals will be in the tailings?	3	3	A5.7.2
Will the roads be asphalt or dirt?	1	3	2.9.2
There are significant exploration licence areas!	2	3	1.3.1
Where else do you intend to explore around Lue?	3	3	1.3.1
When will you know whether you will develop a mine around Barabolar	2	3	1.3.1
Are they processing lead?	1	4	No

#### Source(s) of Comment / Question

1 = LAG/Noller Reports 4 = Bowdens Silver (direct)

- 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019) 5 = Umwelt
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2 = CCC

# Report No. 429/24

#### Table A3.5 (Cont'd)

#### Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	r	Page 4 of 25
loove / Question	Frequency	Sauraa	Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Project Design (Cont'd)	I	r	
We would like more info on the processes involved used in the mining and processing of products.	1	4	EIS Sections
Would like 12 hour operation	1	4	2.13
Tailing Storage Facility (TSF) and Waste Rock	Emplacem	ent (WRE	E)
What is a TSF and how does it work?	1	3	2.8, Appendix 5 Section A5.7
What contaminants will go into the TSF?	1	3	2.7.3, Appendix 5 Section A5.7.2
How much cyanide will be used during processing?	1	3	4.16.1.3, Appendix 5 Sections A5.6.4, A5.6.5
How much cyanide will end up in the TSF?	1	3	4.7.4.4, 4.16.1.3
Will the TSF be properly sealed?	1	5	2.8.2.3, Appendix 5 Section A5.7.3
What happens if the TSF leaks or otherwise fails?	3	2, 8	4.7.4.4, Appendix 5 Sections A5.7.3, A5.7.7
What are the potential impacts of seepage from the TSF (especially concerning cyanide)?	2	1, 3	4.6.7.4, 4.7.4.4, 4.7.3
Is soluble arsenic in groundwater likely to increase from tailings seepage?	1	1	No
How will you prevent animals drinking from the TSF impacting adjacent properties when they go there and die?	2	1, 3	4.6.5.3, 4.10.6, Appendix 5 Section A5.7.6
How will you prevent acid generation and seepage from the TSF?	2	1, 2	4.7.4.4, Appendix 5 Section A5.7.3
How would any potential leaks from the TSF be dealt with?	1	3	4.7.4.4, Appendix 5 Sections A5.7.3 - A5.7.7
What will happen if the TSF overflows?	1	3	4.7.4.4 Appendix 5 Section A5.7.3
What is the worst-case rain event the TSF will be designed to withstand?	2	2	2.8.2.2, 4.7.4.4

Source(s) of Comment / Question

2 = CCC

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#### Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 5 of 25
	_		Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Tailing Storage Facility (TSF) and Waste Rock Em	placement (	WRE) (C	ont'd)
We don't trust engineering controls during extreme events – how can we be sure the TSF won't be breached?	1	3	Appendix 5 Section A5.7.3, SCSC Part 16A Sections 9 to 12
We are planning on building a residence backing onto the southeastern abutment of the TSF – will this still be viable and safe?	1	3	Yes
How will you prevent acid generation and seepage from the waste rock emplacement?	2	1, 2	Appendix 5 Sections A5.7.3, A5.4.4
How will acid mine drainage generated on site be managed?	1	3	4.7.4.4
What are the acid generation properties of the sulphide mineralisation ore and waste rock based on measurement of % sulfur (S), net acid producing potential (NAPP) and net acid generation (NAG) and associated pH paste tests? How does the generation of acid affect the release of metals and metalloids to water?	1	1	2.5.2, Appendix 5 Sections A5.4, A5.5
Will the tests on acid generation properties be undertaken on ore and waste rock samples during the evaluation stage and be used to inform the design of waste dumps and tailings storage facilities in order to minimise acid generation in the future?	1	1	2.5.2, SCSC Part 3
Will a detailed Hazard Assessment be included in the EIS?	1	1	4.16, SCSC Part 4
Lead mineralisation, i.e. establish properties of lead of sulphide/carbonate.	1	1	Appendix 5 Section A5.1.3.1
Annual yields of silver, lead, zinc.	1	1	2.2.3
Verifiable indication of ore quality and uncertainties surrounding the ore bodies.	1	1	2.2.3
What happens to tailings dams after the mine?	1	4	Appendix 5 Section A5.10.7
"I don't think there are any tailings dams that have been rehabilitated"	1	4	Appendix 5 Section A5.10.7
"Every tailings dam in the world has failed"	1	4	Appendix 5 Section A5.10.7
"Will it [TSF] be the same as Cadia?" "The same construction?"	1	4	2.8.2
What are the chemicals that will be in the tailings dam?	1	4	Appendix 5 Section A5.7.2
How far from Lue is the tailings dam?	1	4	2.1.2 (Figure 2.1)
"Isn't the purpose of the tailings dam to destroy cyanide?	1	4	No
Source(s) of Comment / Question			

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2 = CCC

#### Bowdens Silver Project Report No. 429/24

#### Table A3.5 (Cont'd)

#### Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

		1	Page 6 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Water Supply Pipeline			
What diameter will the pipeline be and will it be buried?	1	3	2.10.3
Where will the fire-fighting points be along the pipeline?	1	3	2.10.3
How wide will the pipeline corridor be?	1	3	2.10.2, 2.10.3
Ulan has a commitment that they must return the Goulbourn water catchment.	1	4	Incorrect
Will you use all of the water that is going through the pipeline?	1	4	Yes
What type of compensation are you offering for the pipeline being on someone's property? There is a 12m easement – that has to be worth something?	1	4	Subject of individual negotiations
Concern if pipeline is on their land then it will be a liability, especially when they sell the land.	1	4	Noted
What is the advantage is the pipeline to residents if they cannot access the water?	1	4	2.10
Community member stated that they have 3 creeks on their property so asked if the pipeline would have to go under the creek and if that would impact on the creek.	1	4	2.10.2, 2.10.3, Appendix 5 Section A5.9
How do you reasonably expect for all the work and the possibility for the pipeline to break that there isn't any compensation offered?	1	4	Compensation is being offered
At the end of the mine, will you turn the water off?	1	4	2.10.6
Wont lots of trucks be required in the construction of the pipeline and will road works be required?	1	4	2.10.4, A5.9
Will the Ulan mine be pumping the water or Bowdens Silver? What happens if Ulan closes what happens to the water and pipeline?	1	4	3.2.2.2
Noise and Vibration			
We are concerned about how much noise mining operations will generate. How loud will it be and what is Bowdens Silver going to do about it?	18	1, 2, 3, 4 5, 8	4.2.2.7, 4.2.2.3, 4.2.2.5, 4.2.4.1
What is the area of impact for noise?	1	2	4.2.2.7
How much noise will be generated at night?	10	1, 2, 3, 5, 8	4.2.2.7
How much noise will be generated on weekends?	4	5	4.2.2.7
How will operational noise compare to current noise generated from drilling and the rock breaker?	1	3	4.2.2.1, 4.2.2.7
I live in an elevated location – how will noise impact me?	1	3	4.2.2.7
Will the proposed noise mitigation strategies be adequate?	6	2, 5	4.2.2.5, 4.2.4.1

#### Source(s) of Comment / Question

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 7 of 25
			Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Noise and Vibration (Cont	'd)		
Will earth noise bunds be constructed across the front of the property?	1	5	4.2.2.5
Will double glazing be provided, if required?	2	4, 5	4.2.2.4, 4.2.2.5, Table 4.1.E
Will Bowdens Silver ensure that machinery isn't operating unnecessarily to reduce noise?	1	5	4.2.2.5
Can the product be sent via conveyer off site to reduce noise?	1	5	1.5.7
Why has the location of the Plant moved south? Could the processing plant be moved further to the north? Would this make a difference to noise impacts in Lue village?	2	3, 5	4.2.2.5
I am concerned about noise from traffic – how bad will it be and what will be done about it?	1	3	4.2.2.5, 4.2.2.7
Will speed limits be changed to ensure truck-related noise from exhaust brakes is minimised?	1	5	4.2.2.5
What noise monitoring will be undertaken?	1	5	4.2.4
Is the noise logger microphone omnidirectional?	1	3	SCSC Part 1 Annexure 12
The existing background noise level is "zero", so 35 dB(A) from the mine is unacceptable. What will Bowdens Silver do to keep reduce noise?	1	3	4.2.2.1, 4.2.2.5, 4.2.3.1, 4.2.3.4
We have lived here for 40 years and enjoy the peace and quiet – how are you going to ensure there are no impacts to our lifestyle?	1	3	4.2.2.5, 4.2.3.4, 4.2.4, 4.2.5
What will you do if people find noise generated from the mine is unacceptable?	1	3	4.2.2.5, 4.2.3.4, 4.2.5
I live about 7km south of the mine and am concerned about mine noise impacting my beef cattle operation – will operations be audible at my location and what impacts will it have on my livestock?	1	3	4.2.2.7
Noise levels should comply with applicable noise criteria.	1	1	4.2.2.4, 4.2.3.3, 4.2.2.7, 4.2.3.6
Noise impact conditions based on existing noise levels rather than nominal minimum noise levels set in current Industrial Noise Policy.	1	1	4.2.2.1, 4.2.3.1
Avoidance of the use of the term 'to the extent practicable' when assessing noise impacts.	1	1	Not used
Catalogue of photographs (internal and external) of all residences and masonry structures located within 3km of the proposed pit.	1	1	4.3.4.1, Figure 4.1.10
Traffic noise impacts on the proposed new deviation of Maloneys (Bara) Road.	1	1	4.2.2.7

Source(s) of Comment / Question

1 = LAG/Noller Reports

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2 = CCC

5 = Umwelt

#### Bowdens Silver Project Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	_	-	Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Noise and Vibration (Cont'	d)		
Accurate assessment of noise impacts to residences rather than use of 'approximate distances' from the mine site.	1	1	4.2.2.7, 4.2.1
Will the operation be running 24/7?	1	4	4.2.2.3
How much noise will we hear and vibration will we feel (and when)?	1	4	4.2.2.7, 4.3.6
We would like to understand how noisy 35dB(A) and 40dB(A) would be.	1	3	SCSC Part 1 Table A3.2
What if the noise predictions are wrong, like they were at Wollar? Have any comparisons made between noise predictions and actual noise levels?	1	3	SCSC Part 1 Table A3.2
Our residence is located well to east of the Mine Site, stated that their <i>'silence was very precious to us!'</i> Motor bikes can be heard at times on the weekends.	1	3	4.2.2.2, 4.2.2.7
What would be the noise criteria and noise levels from the mine in Lue village during the day and night-time?	1	3	4.2.2.7
Will the mine be audible beyond 25dB(A) noise contour shown on your map?	1	3	4.2.2.7
My home is of a solar passive design and therefore not suitable for acoustic treatments. Noise from the mine would remain 'deafening'.	1	3	SCSC Part 1 Table A3.2
I am not unduly concerned being within the 1-2dBA noise impact zone from the Mine Site.	1	3	4.2.2.4, 4.2.2.7
We are concerned about potential mine related traffic (and noise) through Lue village, but somewhat relieved by the proposed relocated Maloneys Road.	1	3	4.2.2.7, 4.12.5
Won't the noise escape 1.5km? (location of their residence)	1	4	4.2.2.7
Blast			
How much vibration will be caused by blasting and will this cause any damage?	1	1, 2	4.3.2, 4.3.6
Will blasting notices be sent out?	1	5	4.3.4.1
Blasting and vibration impacts to existing livestock, wildlife and recreational activities.	1	1	4.3.6.1
What will be the difference between the mine operating noise criteria and that for blasting?	1	3	4.3.3.1, 4.2.2.4
How will blast scheduling occur to avoid adverse weather conditions?	1	3	SCSC Part 1 Annexure 3 Table A3.2
What will be the effect of the blasts on our home, outbuildings and concrete tanks.	1	3	4.3.6.1

#### Source(s) of Comment / Question

1 = LAG/Noller Reports 2 = CCC 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)

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Coverage of Issues Raised by the Lue and Distric	t Community for Consideration in the EIS

			Page 9 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Air Quality			
How can we be sure dust modelling is sufficiently robust?	1	2	4.4.2.4
Will wind monitoring be conducted at higher levels to accurately determine prevailing wind conditions?	2	2	4.4.4
Will peak wind speed, wind frequency and wind direction be considered when assessing air quality?	2	1, 2	4.4.2.4
Will adequate meteorological data, including wind roses, be provided in the EIS?	3	1, 2, 3	4.1.2
What wind monitoring will be conducted to the east of the mine?	2	2	4.4.4
What is the prevailing wind direction? Will this spread dust to Lue village?	2	2	4.1.2, 4.4.2.5
What dust monitoring will be conducted close to Lue village?	1	1	4.4.4
Will background air quality data include concentrations of lead and other heavy metals?	1	1	4.4.2.2
Dust will be unbearable even without the lead. How much dust will be generated from the mine (including haul roads)?	8	1,5	4.4.2.5
Dust is already visible from the road from drilling – will this get worse?	1	3	4.4.2.5
How much dust will be dispersed during concentrate handling?	1	1	SCSC Part 2 Annexure 4
How much dust will be generated from the transport route?	2	5	4.4.2.5
How much dust will be generated during blasting?	1	5	4.4.2.5
Would blasting still be allowed on windy days?	1	5	Yes
To what extent will dust from the mine disperse?	2	2, 3	4.4.2.5
Is the buffer zone around the mine adequate? Why isn't it 8km like coal mines?	3	1, 3, 5	4.8.9
What will comprise the dust from the mine and where will it go?	1	3	4.4.2.5
Is it likely that dust and contaminants will become re-suspended and spread beyond the current buffer?	1	1	4.4.2.5
What are the expected quantities of dust that will be deposited at Lue village and other residences?	1	3	4.4.2.5
What mitigation measures will be implemented to reduce dust generation?	1		4.4.2.3, 4.4.4
Will Bowdens Silver use a water cart or seal roads used by mine-related traffic?	2	5	4.4.2.3 and 4.4.4
Will Bowdens Silver use dust blankets during blasts?	1	5	4.3.4.1
Will Bowdens Silver use dust suppression chemicals on haul roads?	1	2	4.4.2.5, 4.4.2.3
Will a detailed Hazard Assessment be included in the EIS?	1	1	4.16

#### Source(s) of Comment / Question

1 = LAG/Noller Reports

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Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

			Page 10 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Air Quality (Cont'd)			
Baseline levels of metals and minerals in soils with reference to guidelines including the National Environment Protection Measure (NEPM) soil criteria and the ANZECC/ARMCANZ water and sediment criteria.	1	1	4.8.6.2, 4.8.6.3
Potential impacts from dust and any associated metals on drinking water supplies, livestock and aquatic environments.	1	1	4.4.2.5
Modelling of dust dispersion from the mine and processing activities.	1	1	4.4.2.4, 4.4.2.5
Potential impacts from dust and any associated metals on human health.	1	1	4.4.2.5, 4.8.5
Buffer zones with reference to dust dispersion.	1	1	4.4.2.5, 4.8.9
PM <sub>2.5</sub> and PM <sub>10</sub> dust monitoring systems surrounding the mine.	1	1	4.4.4
Use of real-time air quality monitoring for on-going management.	1	1	4.4.4, 4.4.2.4
Dust monitoring results and approach to air modelling, measurement and analysis.	1	4	4.4.2.4, 4.4.2.5, 4.4.4
Concentrations of lead in dust.	1	4	4.4.2.5
How will blast scheduling occur to avoid adverse weather conditions?	1	3	4.4.2.3
What is in the dust?	1	3	4.4.2.5
What metals are in the dust?	1	3	4.4.2.5
How far will the dust travel from the Mine?	1	3	4.4.2.5
What distance have you modelled air quality from the Mine Site?	1	3	4.4.2.5
Dust issues east of mine: Modelling doesn't fit with local knowledge in our case.	1	4	4.4.2.5, 4.4.2.4
Lead and other Contaminat	nts		
We are concerned about the dispersion of heavy metals and lead in dust. Could you provide more information on the risks associated with lead exposure?	6	1, 2, 3, 5	SCSC Part 7 Section 5.2.2.3
Will potentially toxic materials from the mine (e.g. lead, arsenic, cadmium, other heavy metals and sulphides) be quantified and assessed in the EIS?	1	1	4.4.2.5
Will background data include concentrations of lead and other heavy metals?	1	1	4.4.2.2
How far can lead disperse in the air?	2	2, 3	4.4.2.5
What is the area of impact on human health around the mine?	1	2	4.8.5 - 4.8.8
What are the background lead levels in the area?	1	3	4.4.2.2

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Coverage of Issues Raised by	the Lue and District Communit	y for Consideration in the EIS
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			Page 11 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Lead and other Contaminants (	Cont'd)		
What form is lead from the mine in?	1	2	Appendix 5 Section A5.1.3.1
What processes can make lead more bioavailable? Will any of these be used on the mine site?	2	2	SCSC Part 7 Section 5.2.2.4
What are the potential human exposure pathways to heavy metals (particularly lead)?	3	2, 5	4.8.3.6
What are the potential impacts of heavy metals on human health (particularly lead)?	2	2, 5	4.8.5.3, SCSC Part 7 Section 5.2.2.3
Will the impacts of metals other than lead be assessed?	1	3	4.4.2.5 (Table 4.4.N), 4.8.5.3 - 4.8.5.5
Is it true that lead is never eliminated from the body?	1	3	4.8
Can lead exposure have an accumulative impact of human health?	1	2	4.8.5.3, SCSC Part 7 Section 5.2.2.3
What are the health impacts of lead exposure on children?	3	2, 7, 5	4.8.5.3
What are the health impacts of lead exposure for older people?	1	2	4.8.5.3
What are the potential impacts of dust and contaminants on drinking water quality (water tanks)?	2	5	SCSC Part 7 Section 5.2.1
Will it be safe to drink water from rainwater tanks in Lue?	1	3	Yes
What is the likelihood that surface water may be contaminated by heavy metals? What impacts could this have?	1	2	4.7.5.4
Will the school be able to stay open with dust/lead fallout? Will the children be poisoned?	2	3, 5	4.4.2.5, 4.8.10
We are concerned that the impacts of lead will be felt at our home in Lue village – how can we be sure it is safe?	1	3	4.4.2.5
We just put in an offer on a home 10-15km from the mine – will it be safe to live there?	1	3	4.4.2.5
Mixed information on lead. Will it really be safe?	2	5	4.4.2.5, 4.4.5, 4.8.5.3, 4.8.10
How much lead will be recovered during processing?	2	2	2.2.3
Will baseline blood testing for lead be conducted? Is it recommended?	3	2	4.8.9
Will the EIS establish background lead, arsenic, cadmium, copper, silver and zinc levels in deposited dust in houses and at the school?	1	1	4.4.2.5, 4.4.2.2 (Table 4.4.N), 4.8.3

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	r	n	Page 12 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Lead and other Contaminants (	Cont'd)		
Will background levels of lead be assessed in surface water and sediments?	1	1	SCSC Part 6 Appendix A Section 2.5.2.1
What measures will be implemented by Bowdens Silver to contain lead?	1	3	4.4.2.3, 4.7.4.4
Can filters be implemented on tanks/taps to filter out lead? Is there any other way of removing lead from the water?	2	5	No
What are the potential impacts of lead on produce and agriculture?	4	2, 5	SCSC Part 7 Section 5.2.1
Will I be able to safely eat vegetables grown in Lue?	3	2, 5	Yes
We own and operate an olive farm approximately 4.0km to 7.5km from the mine. We use rainwater collected from our roof during processing and are concerned about dust and lead affecting the quality of our product. Our olives currently contain zero lead and must not contain lead. How can we be sure this will remain the case if a silver/lead mine opens nearby? What impacts will dust and lead from the mine have on our products and business (we currently employ 15 people)?	1	3	4.4.2.5, 4.4.5
What is the ecotoxicity of lead and other heavy metals to animals and plants?	1	5	SCSC Part 7
What will happen if my business is impacted by lead?	1	3	4.4.2.5
Can blood testing be conducted on livestock in the area to get a baseline?	2	3	SCSC Part 7 Section 5.5
Will there be a "Living with Lead Alliance" strategy akin to Imparja TV's advertisement?	1	2	No
Will a "Health Risk Assessment" and "Ecological Risk Assessment" be undertaken to properly assess all hazards associated with lead and other heavy metals?	1	1	SCSC Parts 7, 9a, 9b, 10
Will an assessment of soil contaminant levels according to the NEPM contamination guidelines be included in the EIS?	1	1	SCSC Part 7 Section 4.3
Will an assessment of surface lead sulphide mineralisation (that may have converted to lead carbonate) be made?	1	1	No
Trigger levels of lead in blood, water and soil requiring follow-up	1	1	4.7.3 (Table 4.7.A) SCSC Part 7 (Table 4.2)
Accurate prediction of odour from sources e.g. flotation process/tailings storage facility.	1	1	4.4.2.5
Potential impacts from odour generated in mine construction and general operations on the local community.	1	1	4.4.2.5

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 13 of 25			
Issue / Question	Frequency	Source	Relevant EIS Section(s)			
Lead and other Contaminants (	Lead and other Contaminants (Cont'd)					
Measurement of the morbidity and mortality of the town's and surrounding area's residents with Lead and metal poisoning.	1	4	4.8.3.5, 4.8.10			
Dust fallout on crops and plants particularly lead dust in the same way that plants and houses were covered by coal dust in the 2009 Camberwell report.	1	4	4.4.2.5			
Lead particles spreading over large distances through prevailing winds and contaminating water supply and contributing to airborne respiratory lead poisoning in adults and children.	1	4	4.4.2.5, 4.7.5.4, 4.8.3.5, 4.8.10			
When mining and blasting, how will lead be contained?	1	4	4.3.4, 4.7.4.4			
Water – General						
The need for clean water (meeting potable drinking water guidelines) for the production of extra virgin olive oil.	1	4	4.18.6.5			
Groundwater						
How can we be sure groundwater levels and quality are rigorously assessed prior to mining?	3	2, 3, 5	4.6, SCSC Part 5			
Will the groundwater model used in the assessment be a "Class 3 Model" under national modelling guidelines?	1	2	SCSC Part 5 Section 5.1			
How rigorous is the groundwater modelling? Is it based on assumptions or real-world data?	1	2	4.6.5			
Is 6 years data sufficient to inform assessment and base modelling on?	1	3	Yes			
How much groundwater does Bowdens Silver propose to extract during the developmental and operational phases of the Project? Is this sustainable?	5	2, 3, 5	SCSC Part 5 Section 5.3.5			
Where will groundwater entering the pit end up?	1	2	4.6.5.3			
Will mining activities result in the drawdown of groundwater?	4	2, 3, 5	4.6.5.3, 4.6.7			
Will groundwater drawdown impact the flow of Lawsons Creek?	2	3	4.6.5.3, 4.6.5.4, 4.6.7.2, 4.6.7.3, 4.6.7.5			
Will mining activities impact on the quality of groundwater?	4	3, 5	4.6.7.4			
What is the area of impact for groundwater levels and quality?	1	2	4.6.5.3			
We rely on our groundwater bores – how can we be sure there will be no impacts to our supply?	1	3	4.6.7.1			
We are concerned about groundwater quality and the potential for contamination. How likely is this and what will be done to prevent it?	2	3	4.6.8			
Will ongoing monitoring of groundwater quality and levels be implemented?	1	5	4.6.8.2			
Will groundwater monitoring only occur within the footprint of the mine or will a broader area be considered?	1	2	4.6.8.2			

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## Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 14 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Groundwater (Cont'd)	•	L	
How many bores will be monitored?	1	2	4.6.8.2
Will any private bores be monitored?	1	2	SCSC Part 5 Section 6.1.1
What parameters will be monitored (e.g. pH, metals) and what kind of changes to water quality could be expected?	2	1, 2	4.6.8.2, Table 4.6.D, 4.7.5.4
Will background groundwater quality data include concentrations of lead and other heavy metals?	1	1	4.6.3.2
Is soluble arsenic in groundwater likely to increase from tailings seepage?	1	1	SCSC Part 5 Section 8.4
Will groundwater monitoring be self-reported or independent/audited?	2	2	4.6.8
Will groundwater monitoring results be made available on the website?	1	2	Yes
Will historical groundwater sampling data be made available?	1	2	Yes
What mitigation strategies will be implemented to reduce impacts to groundwater?	2	2, 5	4.6.8
Are there any "make good" provisions for surrounding landowners if groundwater becomes unusable or depleted?	1	2	4.6.8.4
Is it likely that there will be a build up of nitrates in the groundwater?	1	1	SCSC Part 5 Sections 6.1, 6.2, 6.3
Will the suitability of groundwater for drinking be assessed in the EIS?	1	1	4.6.3.2
How many peer reviews will be conducted?	1	2	4.6.5.2
Will a detailed Hazard Assessment be included in the EIS?	1	1	4.16 SCSC Part 4
What will be the effects of groundwater drawdown on flows in Lawsons Creek, especially during droughts?	1		4.6.5.3, 4.6.5.4, 4.6.7.2, 4.6.7.3, 4.6.8.2, 4.6.8.4
Potential impacts to groundwater supplies including impact on any highly productive groundwater (as defined in the Aquifer Interference Policy) and any potential groundwater dependent ecosystems.	1	1	4.6.7.2, 4.6.7.3
Use of a double thickness HDPE liner for the Tailings Storage Facility.	1	1	SCSC Part 5 Section 8.4
What effect will there be on local bores? (Effects to the water table)	1	4	4.6.7.1
I am relieved that our bore will be outside of the drawdown area	1	3	4.6.7.1

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

			Page 15 of 25
		•	Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Groundwater (Cont'd)	•		
We are concerned about reduced flows in Lawsons Creek as a result of groundwater flowing into the open cut pit	1	3	4.6.5.3, 4.6.5.4, 4.6.7.2, 4.6.7.3, 4.6.8.4
Baseline levels in groundwater and surface water of metals e.g. arsenic and pH.	1	1	4.6.3.2
You will have a drawdown of the groundwater – will it impact on Lawsons Creek?	1	4	4.6.5.3, 4.6.5.4, 4.6.7.2, 4.6.7.3, 4.6.8.4
Surface Water			
When did monitoring of surface water commence? Is this sufficient data to base modelling on?	1	3	4.7.2.7
What impact will mine water use have on the town's water supply?	2	5	None
Will mining activities result in the drawdown of surface water?	3	2, 3	4.7.5
Where does Bowdens Silver propose to source water during the developmental and operational phases of the Project? Is this sustainable?	15+	2, 3, 4, 5, 6	2.10.1
Will water be sourced from Dunns Swamp?	1	2	No
What is the daily consumption projection for water that Bowdens Silver will need during operations?	1	2	2.10.1
How much water will be diverted around the mine?	1	2	SCSC Part 6 Section 4.6.3
How much water will be prevented from entering the natural system (i.e. Lawsons Creek)?	2	2	4.7.5.3
I rely on Lawsons Creek for stock watering – will mining result in reduced flow and access?	1	3	4.7.5.3
Have studies been conducted on potential impacts on the Lawsons Creek catchment?	1	2	4.7.5
Surface water supplies are already unreliable – how will the mine impact us?	1	3	4.7.5
What contingencies are in place if Bowdens Silver causes reduced flows in Lawsons Creek?	1	3	4.7.4
Will diverted water remain within the same catchment or be diverted to another catchment?	1	2	4.7.4
Will water quality be impacted by mine runoff?	1	3	4.7.5.4
Will the mine cause reduced flows on neighbouring properties?	1	5	4.7.5.5, 4.7.5.3
What impacts will mining activities have on surface water quality?	3	3, 5	4.7.5.4

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#### Bowdens Silver Project Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

Г	1	1	Page 16 of 25					
Issue / Question	Frequency	Source	Relevant EIS Section(s)					
Surface Water (Cont'd)								
What is the area of impact for surface water?	1	2	4.7.5					
What parameters will be monitored (e.g. pH, metals) and what kind of changes to water quality could potentially occur?	2	1, 2	4.7.4, 4.7.5					
Will background surface water quality data include concentrations of lead and other heavy metals?	1	1	4.7.2.7					
What are the potential impacts of mining on Lawsons Creek and what measures will be put in place to prevent potentially contaminated water entering the creek?	5	2, 3, 5	4.7.4, 4.7.5					
How will you prevent cyanide from entering Lawsons Creek and affecting my water supply?	1	3	SCSC Part 6 Section 8.6 Table 8.2					
Will Bowdens Silver be conducting ongoing water quality monitoring?	1	5	4.7.6					
Will background pH levels of Lawsons Creek be included in the EIS?	1	1	Table 4.7.A					
Will monitoring be self-reported or independent/audited?	2	2	4.7.6					
Will surface water monitoring results be made available on the website?	1	2	Yes					
Will historical surface water sampling data be made available?	1	2	Yes					
What extreme weather event planning will be undertaken during the design and ongoing operation of the mine?	2	3	SCSC Part 6 Section 6, 7.9, Appendix B					
What mitigation measures will be implemented to prevent any surface water quality issues?	1	5	4.7.4					
How will water be accessed for infrastructure and development before the water storage dams are operational?	1	2	2.10					
What will the capacity of the dams be on the mine site and what will they be used for?	1	2	SCSC Part 6 Section 4.7					
What size storm event will the dams be made to withstand?	1	2	4.7.4.3					
How many peer reviews will be conducted?	1	2	SCSC Part 6 Appendix C					
Will a detailed Hazard Assessment be included in the EIS?	1	1	SCSC Part 4					
What reduction in flow in Hawkins Creek and Lawsons Creek will occur as a result of the Mine.	1		4.7.5					
Waste water containment procedures, including tailings storage facility design, based on applicable criteria including material selection and protocols to accommodate significant environmental events.	1	1	SCSC Part 6 Section 4.6					

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	r	1	Page 17 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Surface Water (Cont'd)		•	
Impact to water supply of Lake Windamere arising from sourcing water from the Cudgegong River system. Reference given to drought management water plans.	1	1	Not relevant
Tailings Storage Facility capacity to prevent overflow and contamination of downstream waterways.	1	1	SCSC Part 16 Section 4.7.9
Consider ANZFA food safety guidelines re use of potable water in the processing of extra virgin olive oil.	1	4	4.18.6.5
Consider the responsibility for the potable drinking water in the town of Lue and surrounding area.	1	4	4.20.6.9
Potable water supplies for the Rylstone Australian Olive Oil processing plant, situated at Monivae, 8km southeast of Lue.	1	4	Not Relevant
Will tailings/water storage dams reduce the flow of water into creeks and rivers downstream.	1	4	4.7.5
Effect of the mine to runoff water.	1	4	4.7.5
Can I access water from water supply pipeline for my stock?	1	3	No
I am concerned about the transfer of water from Goulburn River sources to the Mine Site.	1	3	4.7.4
Baseline levels in groundwater and surface water of metals e.g. arsenic and pH.	1	1	SCSC Part 6 Section 3.7, SCSC Part 5 Section 4.5.12
"you are taking water out of the environment"	1	4	4.7.5
Health			
What contaminants are likely to be disbursed by air and water as a result of mining operations?	2	3, 5	4.4.2.5, 4.7.3
Is the buffer zone around the mine adequate? Why isn't it 8km like coal mines?	4	1, 3, 5	4.8.9
What are the potential health impacts of the potential contaminants/minerals comprising the dust?	1	2	4.8.5 to 4.8.9
Which metals / contaminants will be assessed in the EIS?	1	3	4.6.3.2, 4.7.5.4, 4.8.5.3
Will it still be safe to drink water from rainwater tanks?	1	3	4.8.5.3, 4.8.10
What are the impacts of dust on human health?	5	7, 5	SCSC Part 7 Section 5
What other health effects will people be exposed to from the mine?	1	3	4.8.5 to 4.8.8
Will the mine result in more people on dialysis?	1	3	4.8.10
Does silica have the capacity to cause health impacts (e.g. silicosis)?	1	2	4.8.5.4

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## Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 18 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Health (Cont'd)	•		
How will stress and anxiety within the community be managed?	1	5	4.8.8
What are the health impacts of noise fatigue?	3	2, 5	4.8.7.1
What is a safe distance to be living from the mine?	1	3	4 (Various)
Will a more detailed health and environmental risk assessment be conducted?	1	1	4.8.9
What level of lead would we be exposed to in Lue?	1	3	Figure 4.8.6
How will the lead from the mine enter bodies?	1	3	4.8.5.3
How will the exposures to lead in Lue compare to those in Mt Isa?	1	3	SCSC Part 7 Section 5.1
Concerned about the health, and psychological impacts / "Will be very traumatic for everyone" (having the project approved and in operation	1	4	4.8.8
Visual Amenity			
How visible will the mine be from nearby residences and Lue Village?	3	5	4.9.3
We live in an elevated location and will probably see the mine from our property. What will be done to reduce visual impacts?	1	3	4.9.4
Will tree screening be implemented to minimise visual impacts? Will cleared areas be revegetated quickly?	1	5	4.9.4
How much impact will light spillage from the mine have?	3	5	4.9.3.2
What light mitigation measures will be implemented by Bowdens Silver?	2	5	4.9.4.4
Impact to visual amenity of night time operations.	1	1	4.9.3.2
Impact of stockpiles of overburden and waste rock – prefer not in prominent locations.	1	1	4.9.3.1
The potential for early rehabilitation of waste rock emplacements to reduce impact to visual amenity.	1	1	4.9.4.3
The impacts to visual amenity of the relocated 500kV power transmission lines.	1	1	4.9.3.1
The impacts to visual amenity of floodlighting and potential to reduce this during non-operational phases.	1	1	4.9.5.3
Visual impact of lighting on local community, livestock and wildlife.	1	1	4.9.5.3
The extent of night light.	1	4	4.9.3.2
How have the cross-sections been prepared between the Mine Site and the residences?	1	3	4.9.5.1
Will there be sufficient topsoil to put on the final landform to adequately vegetate the areas disturbed and make the Mine Site visually acceptable?	1	3	4.9.4.3

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			Page 19 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Lighting	riequency	Couloc	
We enjoy a clear dark sky – what would change when the mine is operational through a night glow.	1	3	4.9.3.2
Will the lighting on the mine affect astronomy activities at Breakfast Creek?	1	3	4.9.5.3
Negative impact will be 24 hours of light on community	1	4	4.9.3.2
Terrestrial Ecology			
What impacts will the mine have on wildlife habitat (e.g. Koalas)?	1	2	4.10.6.2 to 4.10.6.4
Where will the biodiversity offsets for EECs be located?	2	2	4.10.5.4
How would exposure to cyanide and other toxins impact wildlife?	2	1, 3	4.10.6.3
Will there be an increase in invasive species as a result of mining?	1	5	4.10.5.3, 4.10.6.3
Will Bowdens Silver continue to actively manage weeds and pests in the future?	1	8	4.10.5.3
Will a detailed Preliminary Hazard Assessment be included in the EIS?	1	1	4.16
Scale of environmental offsets and property acquisitions for biodiversity offsets.	1	4	4.10.5.4
What investigations have been completed into effects on flora/fauna?	1	4	4.10.4
Do you take into account the use of vegetation for breeding when considering its value for an offset?	1	3	4.10.5.4
Aquatic Ecology			
What are the potential impacts of silver on aquatic species?	1	1	4.11.4
How would exposure to cyanide and other toxins impact aquatic organisms?	2	1, 3	4.11.6.4, 4.11.4
Will a more detailed environmental risk assessment be conducted	1	1	4.11.7
Will a detailed toxicity assessment of water and sediment, according to ANZECC/ARMCANZ guidelines, be included in the EIS?	1	1	SCSC Part 6 Appendix A Table 3
Will a detailed assessment of the existing population of aquatic species using the AUSRIVAS approach be undertaken?	1	1	4.11.3.1
Baseline levels in groundwater and surface water of aquatic species populations (using AUSRIVAS).	1	1	4.11.3
Traffic and Transport			
How will the concentrate be transported from the Mine Site?	10+	2, 3, 4, 6	4.12.4.3

 Source(s) of Comment / Question

 1 = LAG/Noller Reports
 2 = CCC
 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)

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- 6 = Community Events
  - 7 = Private correspondence

8 = Other Community Groups, Institutions, and Businesses (e.g. Gulgong Chamber of Commerce, Mudgee Chamber of Commerce, Kandos Rylstone Business Group, Rotary Club of Mudgee, Lue Public School, Rylstone Public School and P&C Members, Kandos Public School, Kandos High School, TAFE)

5 = Umwelt

Bowdens Silver Project Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1		Page 20 of 25
		-	Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Traffic and Transport (Con	ťd)		
What contingencies will be implemented to ensure the	1	1	4.12.4.8,
concentrate doesn't escape in the event of a vehicular accident?			4.12.4.3
Will the concentrate be sealed?			
Will the transport of cyanide to the site and its handling be	1	1	4.16.1.4
Covered by the international Cyanide Management Code?	40	<b>F 7</b>	4 4 0 5
we are concerned about the increased traffic during	10	5, 7	4.12.5
there actually be?			
Do the local roads have the capacity to cope with the extra	1	3	4 12 5
traffic?	-	C C	
Will transport hours be restricted?	1	5	4.12.4
What is the proposed transport route?	10+	5, 6, 7	4.12.4
Where will the new access road be located?	1	2, 3	4.12.4.2
We are concerned about the preferred location of the	1	3	4.12.4.2
intersection of Lue Road and the new access road. Can this be			
moved further west for safety reasons and to reduce noise?			
There are frequent fogs at the proposed location of the	1	3	4.12.2.7
intersection – will this be considered in the design?	-		
We are concerned that the new access road will be located near	2	3, 4	SCSC Part 11
Bowdens Silver considering?			Figure 2
Will the new access road be sealed?	1	3	SCSC Part 11
	•	0	Section 6.9
What road improvements will be carried out?	6	5	2.9
Who will maintain the roads used by trucks?	1	3	4.12.4
Will adequate signage be provided to ensure safety for other	1	5	SCSC Part 11
drivers and pedestrians?			Section 6.16
How will driver speed and behaviour be managed?	2	3, 5	4.12.4.1
Will truck drivers obey the road rules? We don't think they will.	1	3	4.12.4.1
Will a detailed Hazard Assessment be included in the EIS?	1	1	4.16
Traffic impact to existing roads in the mine vicinity and potential	1	1	4.12.4, 4.12.3,
mitigation options, e.g. road sealing.			4.12.5
Hazardous material, e.g. cyanide transportation in accordance	1	1	4.12.4.3,
with applicable codes.			4.16.1.4
The effect of the mine on traffic levels.	1	4	4.12.5
How many trucks will there be down Lue Road per day?	1	4	SCSC Part 11
			Sections 4.1.5,
R doubles are not permissible on Lus Read will you be doing	4	Λ	
road works? "Transport must be a problem then?"		4	Section 3.1
			00000110.1

## Source(s) of Comment / Question

1 = LAG/Noller Reports 2 = CCC

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5 = Umwelt 6 = Community Events

munity Events 7 = Private correspondence

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 21 of 25					
			Relevant EIS					
Issue / Question	Frequency	Source	Section(s)					
Traffic and Transport (Cont'd)								
What roads will they be using to go through Mudgee?	1	4	4.12.4.2, 2.9					
Where will be the transfer point between trucks and rail?	1	4	SCSC Part 11 Section 2.4					
Is there a plan to bring rail to Lue?	1	4	Not relevant					
To get to Parkes, will you go through Dubbo? Will you improve those roads?	1	4	SCSC Part 11 Section 2.4					
Aboriginal / Historic Heritage \	/alues							
What are the likely impacts of the mine on Aboriginal and historic heritage?	1	2	4.14.6, 4.14.8, 4.15.5, 4.15.8					
Where will the keeping place be for the Aboriginal artefacts?	1	3	4.14.9					
Agricultural Productivity	1	L						
The viability of the businesses of Lue and surrounding areas and in particular, our extra virgin olive oil food processing plant and the viability of our continued practice of growing and processing extra virgin olive oil.	1	4	SCSC Part 14 Section 7.3.2					
The viability of the Beef, Lamb and Grape enterprises in the surrounding area.	1	4	SCSC Part 14 Section 7.3.1, Part 15 Section 5.5.1					
Economic								
What impact will the mine have on property values? Will property values increase or decrease?	14	4, 5	4.19.4.5					
What impact will the mine have on the ability of landowners to sell their property?	4	5	4.19.4.5					
What will the impacts of the mine be on agriculture (e.g. soil quality, marketing restrictions due to presence of lead, loss of land etc.)?	2	5	4.19.4.5, 4.19.3.3, 4.19.3.4					
What is the area of economic impact around the mine?	1	2	4.19.3 - 4.19.5					
What is the area of impact on property values around the mine?	1	2	4.19.4.5					
What will happen if my business is impacted by lead?	1	3	4.19.4.5					
How will the mine impact local businesses?	4	5	4.19.4.5					
Will Bowdens Silver continue its involvement with local business groups?	1	8	4.19.4.5, 4.19.5.2 SCSC Part 15 Section 2.3,					
What positive impacts will the mine have on local businesses and when can we expect to see these impacts?	1	8	4.19.4.2 to 4.19.4.5, 4.19.5.2, SCSC Part 15 Section 6.4					

Source(s) of Comment / Question

1 = LAG/Noller Reports 2 = CCC 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)

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8 = Other Community Groups, Institutions, and Businesses (e.g. Gulgong Chamber of Commerce, Mudgee Chamber of Commerce, Kandos Rylstone Business Group, Rotary Club of Mudgee, Lue Public School, Rylstone Public School and P&C Members, Kandos Public School, Kandos High School, TAFE)

5 = Umwelt

## Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

	1	1	Page 22 of 25
Issue / Question	Frequency	Source	Relevant EIS Section(s)
Economic (Cont'd)			
The mine will give our economy a significant boost. How many direct and indirect jobs and training opportunities will be created for locals?	60+	2, 3, 5, 6, 8	4.19.4.2, SCSC Part 15 Section 6.3.3
Does Bowdens Silver have a policy about hiring local staff and contractors?	1	8	4.19.4.2, SCSC Part 15 Section 2.3
In what other ways will Bowdens Silver positively impact the local and regional economy?	1	2	4.19.4, 4.19.5
Bowdens Silver has already provided sponsorship for a number of local projects (installation of water bore, IT equipment, event nights, teaching infrastructure, playground equipment) – is this something Bowdens Silver plans to continue in the future?	1	8	SCSC Part 15 Section 2.3
What is your policy on sponsorships? Who/what do you sponsor?	7	3, 5	SCSC Part 17 Section 4.1.1
How can our business be involved with the project?	30+	4, 6, 7, 8	SCSC Part 15 Sections 2.3, 6
Cost-benefit conditions extending beyond the life of the mine	1	1	4.19.5.3
Distribution of costs and benefits to local, state, national and international stakeholders.	1	1	4.19.3 to 4.19.5
"Project isn't financially viable"; "They say that it is a high grade resource, which it isn't. It's a low grade resource, its marginal".	1	4	SCSC Part 15 Section 4.8
Bowdens will put the Project on the market once the EIS is approved.	1	4	No
I'm sure any sponsorship to any local schools, businesses, sporting groups, not for profit groups, etc. will be appreciative of support.	1		Yes
Would like the Open Days to continue post EIS submission.	1	4	1.8.3
Would like communication to continue around the project e.g. newsletter updates	1	4	1.8.3
Would like to see Bowdens invest in local communities.	1	4	4.19.4, 4.19.5, SCSC Part 15 Sections 2.3, 6
Employment			
When can we apply for a job?	1	3	Following approval of Project
How much training will you give to a local farmer?	1	3	4.18.7, 4.19.5.1, 4.20.5, SCSC Part 15 Section 2.3
The mine would help to reverse the current decline in jobs in the local area, especially for those not academically inclined.	1	3	4.19.4.2
Source(s) of Comment / Question			

- 1 = LAG/Noller Reports
- 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)
- 4 = Bowdens Silver (direct) 5 = Umwelt

2 = CCC

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

			Page 23 of 25
Issue / Question	Frequencv	Source	Relevant EIS Section(s)
Employment (Cont'd)			
How many jobs will be created by the mine and what type?	1	3	4.19.4.2
Will the Company support local people in traineeships and apprenticeships?	1	3	SCSC Part 15 Section 2.3
This mine is what I need to make my business viable as it isn't quite there yet.	1	3	4.19.4.5, 4.19.5.2
We are very keen to supply fuel and other consumables to us now and in the future.	1	3	4.20.5
Local employment at the mine would mean my son would return from South Australia.	1	3	4.19.4.2
Believe that the Ulan workers won't want to come and work for Bowdens as it is not a secure source.	1	4	2.2
How can people with no skills gain employment?	1	4	SCSC Part 15 Section 2.3
Job for Rylstone, Kandos and Mudgee people	1	4	4.19.4.2
Hopefully there will be some employment opportunities for locals.	1	4	4.19.4.2
Project will have a positive impact on Upskilling community	1	4	4.19.4.2, 4.20.5 SCSC Part 15 Section 2.3
Positive impact is that all levels of education can get employment	1	4	SCSC Part 15 Section 2.3
"Rural areas are needing cash flow input. I am agriculturalist and I understand the land a bit we can't go on with agricultural industry, need to diversify.	1	4	Yes
How can local people (in particular young people) gain employment at the Company?	1	4	SCSC Part 15 Section 2.3
Is there a particular course that someone should take to increase their chances of being able to gain employment with the company?	1	4	4.20.6.3, SCSC Part 15 Section 2.3
Social			
Will the proximity of Lue village to the mine change the quiet, 'family-oriented' nature of the area?	4	2, 3, 5	4.20.6
How will mining impact the 'sense of community'?	4	5	4.20.6.5
Will Bowdens Silver look to integrate and remain involved with the local community?	1	8	4.20.6.9, 4.20.6.10
What are the likely impacts of mining operations on Lue village?	4	5	4.20.6
Will Lue village become a ghost town?	4	5	4.20.6.2
Will Lue village experience an increase in population?	4	5	4.20.6.2

## Source(s) of Comment / Question

1 = LAG/Noller Reports 2 = CCC 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)

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## Report No. 429/24

## Table A3.5 (Cont'd)

## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

Γ			Page 24 of 25
leave / Outertien	<b>F</b> ******	Courses	Relevant EIS
Issue / Question	Frequency	Source	Section(s)
Social (Cont'd)		0	
How will the development of the mine impact future generations in the area?	2	5	4.20.6.8
What impacts will the mine have on Lue Public School?	3	5	4.20.6.3
Will Bowdens Silver increase student numbers at Lue Public School? What effects might this have?	1	8	4.20.6.3
What measures will be put in place to ensure the community benefits?	1	5	4.20.6.9
How will the mine impact the growing reputation of the area as a food/wine destination for tourists?	1	5	SCSC Part 14 Section 7.3.2
What measures will be put in place to ensure Bowdens Silver maintains its property? e.g. installation of cattle grids	1	3	SCSC Part 14 Section 4.8
How involved will the community be in the decision making process?	1	2	3.2.2.1
Does Bowdens Silver plan to continue its involvement with local schools and community events in the future?	2	3, 8	3.2.2.1, 4.20.6.9
Will Bowdens Silver offer access to the mine for school excursions and educational trips in the future?	1	8	4.20.5
How can we support and/or get involved with your project?	1	8	3.2.2.1, 4.20.6.9
The impact upon the Lue community separate from broader community impacts.	1	1	4.20.6
Cumulative effects of growth in mining activity in the region on such issues as housing and services.	1	1	4.20.6.3, 4.20.6.9
Potential impacts on stress and anxiety levels of local residents, local property values, likely change in demographics of local population of Lue, health implications, impact upon future viability of Lue Public School, etc.	1	1	4.20.6.2 to 4.20.6.4, 4.20.6.9
Detailed description of alternatives considered and justification of alternative adopted, e.g. underground -v- open cut, cementising tailings.	1	1	1.5.7
Falling house and land prices	1	4	4.20.6.9
Changes to the demographics of Lue	1	4	4.20.6.2
Does Bowdens Silver support the idea of school-based traineeships, apprenticeship?	1	8	4.20.6.3
I'm sure any sponsorship to any local schools, businesses, sporting groups, not for profit groups etc will be appreciative of support.	1	4	4.19, 4.20.6.9
Rehabilitation and Legacy Iss	sues		
What is involved in the rehabilitation process?	1	3	A5.10
What is the timeframe for rehabilitation?	1	1	2.16.9.3
Who will pay for rehabilitation?	1	3	2.16.1

## Source(s) of Comment / Question

5 = Umwelt

1 = LAG/Noller Reports 2 = CCC 3 = Community Open Days (20 November 2016, 7 May 2017 and 15 June 2019)

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## Coverage of Issues Raised by the Lue and District Community for Consideration in the EIS

Γ		1	Page 25 of 25				
Issue / Question	Frequency	Source	Relevant EIS Section(s)				
Rehabilitation and Legacy Issues (Cont'd)							
How is rehabilitation assured should the business fail?	2	2	2.16.9.4				
Will the void be filled?	4	2, 3	No				
Will the land be left contaminated?	1	5	2.16.2				
How will Bowdens Silver minimise the potential acidification of water resources after mining activities cease?	1	1	A5.10.3.4 & 4.7.4.4				
How will Bowdens Silver minimise the potential uptake of heavy metals by livestock post-rehabilitation?	1	1	A5.10.5.3				
Will a detailed Preliminary Hazard Assessment be included in the EIS?	1	1	4.16.1.3				
When will the Company sell the land around the mine (outside the Mine Site) and areas that are rehabilitated?	1	3	2.16.9				
Will the Company hold on to the land which the TSF, WRE & open cut in perpetuity?	1	3	2.16.9				
Will the final lake be suitable for water sports?	2	3	No				
What are Bowdens Silver's obligations relating to rehabilitation?	2	3	2.16.1				
Will the Company have to pay a guarantee bond for rehabilitation?	1	3	2.16.9.4				
Consultation							
Consultation with Lue community members, including where possible attending public meetings and making direct communication with affected landholders.	1	1	3.2.2.1				
Consult with Cudgegong Water Users Association.	1	1	Not Relevant				
Adequacy of Environmental Ass	essment						
Will more information regarding the responsible government agencies be provided in the EIS?	1	1	3.2.2.3				
Will more information regarding the derivation of environmental values be provided in the EIS?	1	1	4				
Will more effective maps, showing all mine features and drainage lines, be provided in the EIS?	1	1	Figure 2.5				
How broad is the consultation boundary?	2	2, 5	4.1.1, Figures 4.1.A, 4.1.B				
Approvals and Consent Cond	itions						
Which government body makes the decision on approvals?	1	3	2.1.3				
The timing before the EIS is on exhibition; the approvals process; the likely timeframe to a decision.	1	3	1.2, 2.1.3				
It's a shame the approvals process is overly complicated and takes so much time to get good projects like yours underway	1	3	Agreed				

#### Source(s) of Comment / Question

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# **Appendix 4**

## Silver, Zinc and Lead Properties, Uses, Sources and Prices

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## A4.1 SILVER, ZINC AND LEAD

## A4.1.1 Introduction

Bowdens Silver proposes to process all ore extracted from the open cut pits within an on-site processing plant to produce two mineral concentrates, namely:

- a silver/lead concentrate; and
- a zinc concentrate (with a small content of silver).

It is noted that the Project's emphasis is placed upon silver given approximately 70% of the income from the Project would be derived from the silver recovered from the two concentrates.

This Appendix describes the properties and uses of silver, zinc and lead, and their current sources both in Australia and internationally together with a summary of the economics and pricing of silver, zinc and lead.

Forward-looking statements are provided as well as historical information concerning the silver, zinc and lead, other commodities and capital markets. Forward-looking statements include, but are not limited to prices, data, interpretations, and forecasts. Important factors that could cause actual results to differ from forward-looking statements include changes to commodity supply, demand, industry structure, and regulatory regime. Although Bowdens Silver, consultant Rexerro Capital Limited and other consultants believe the information used in preparing this section to be reliable, no representations regarding its completeness and accuracy is made.

## A4.1.2 Silver

## **Properties and Uses**

As an element, silver is the best electrical and thermal conductor among metals, and a superior reflector of visible light.

Demand for silver is currently benefiting from new applications in photovoltaic cells (for solar panels), electronics, electric vehicles, robotics, industrial automation, aerospace, and biosciences.

Silver is used as a store of wealth, traded as a commodity and used in industrial processes, consumer electronics, medical products and increasingly in renewable power production (**Plates A4.1** to **A4.4**). Broadly, the physical demand for silver can be broken down into four segments, namely: industrial fabrication (60%), jewellery (20%), coins and bars (15%) and silverware (5%). These proportions have been relatively stable since about 2008.

Physical silver demand is approximately 1000Moz per year and has varied within a narrow band since 2010. According to The Silver Institute, in 2019, physical demand for silver declined -3% year on year with industrial fabrication and jewellery reducing by -7% each offset by net physical investment increasing by +16%.

In 2018, the use of silver by industry comprised of:

- Electrical and Electronic (43%);
- Photovoltaic cells (14%);



BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24



- Brazing Alloys and Solders (10%);
- Photography (7%);
- Ethylene Oxide (1%); and

Other industrial uses (25%).Silver is commonly used in electronic switches of all kinds. Silver has anti-bacterial properties recognised since Roman times. Today, this property is being harnessed in a variety of applications from impregnation in high technology clothing, anti-bacterial wound dressings and water purification filters. Many hospital water supplies have a silver ionisation treatment to prevent Legionnaires' disease, as do many swimming pools where silver is used in conjunction with free chlorine to treat water. Silver is the critical element in water purification filters in the form of silver-coated ceramic or as nanoparticle impregnated mediums that ensure safe drinking water globally.

Nearly all modern cars include silver in their electronics. Silver has excellent electrical conductivity, stability at high temperatures and resistance to acids, which lends it to use on nearly all contacts for electronic switches in cars. Silver plated switches start the engine, open windows and lock all the doors, and the applications in electric cars and autonomous vehicles is also growing. Demand for silver for automotive applications is forecast to double between 2020 and 2040.

Over time, the changing uses for silver in industry has been driven by technological advances. For example, the use of silver decreased with the switch from film to digital photographic technology and is increasing with the growth of photovoltaic cell production. Photovoltaic cells are the principal component in solar panels which are forecast to reach between 20% and 40% of power production globally by 2050.

Silver is also an important catalyst for ethylene oxide which is used to sterilise medical equipment, in fabricating polyester for fabric and carpets, and in household detergents and cosmetics.

**Table A4.1** displays the records of silver supply and demand and the respective uses for the period 2010 to 2019e.

World Silver Supply/Demai	nd									
Millions of Ounces	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019E
SUPPLY										
Mine Production	753	758	792	823	868	894	893	877	855.8	860
Scrap	227	261	254	191	167	150	152	154	151	160
Net Hedging Supply	50	12	(47)	(35)	17	8	(19)	2	(3)	-
Net Gov't Sales	44	12	7	8	-	-	-	-	-	-
Total Supply	1,075	1,044	1,006	988	1,052	1,052	1,026	1,033	1,004	1,020
Scrap Ratio	21%	25%	25%	19%	16%	14%	15%	15%	15%	16%
DEMAND										
Jewelry	190	192	187	220	227	223	203	205	213	215
Bar & Coin	174	212	161	241	234	294	209	150	181	190
Silverware	52	47	44	59	61	63	52	58	61	60
Fabrication										
- Electrical	301	291	267	266	264	246	234	243	249	255
- Brazing Alloys & Solders	61	63	61	64	67	62	55	58	58	60
- Photography	68	61	54	51	49	46	45	41	39	36
- Photovoltaic	-	67	64	55	54	65	75	89	81	90
- Ethylene Oxide	9	6	5	8	5	10	10	7	5	5
- Other Industrial	195	164	149	162	159	154	147	148	147	145
Subtotal, Fabrication	634	653	600	605	597	583	566	586	579	591
YoY Chg	20.0%	3.0%	-8.1%	0.8%	-1.4%	-2.3%	-2.8%	3.4%	-1.2%	2.1%
Subtotal, Physical Demand	1,050	1,103	992	1,124	1,119	1,163	1,030	998	1,033	1,056
YoY Chg	25.3%	5.1%	-10.1%	13.4%	-0.5%	4.0%	-11.4%	-3.1%	3.5%	2.2%
ETF & ETP Flows	130	(24)	55	3	1	(18)	50	2	(20)	40
Exchange Inventory	(7)	12	62	9	(5)	13	80	52	71	-
Total Demand	1,172	1,092	1,109	1,136	1,115	1,158	1,160	1,052	1,084	1,096
Fabricated Surplus / Deficit	25	(60)	14	(137)	(67)	(111)	(4)	34	(29)	(36)
Silver Market Balance	(97)	(48)	(103)	(148)	(63)	(106)	(134)	(19)	(80)	(76)

## Table A4.1Supply and Demand for Silver - 2010 to 2019

Source: GFMS, Silver Institute

Physical silver demand is approximately 1000 million ounces (Moz) per year and has varied within a narrow band since 2010. In 2018, physical demand rose +3.5% year on year, with strength in bar/coin, electronics, and brazing/alloys. Industrial fabrication eased by 1.2%, as photovoltaic cell demand fell due to silver thrifting, despite global photovoltaic installations increasing 8% in 2018. Although photovoltaic cell demand is growing rapidly, average solar cell silver loadings, in the form of front/back paste and converter connections, decreased 6% year on year.

Electronics and electrical contacts account for roughly 24% of physical silver demand (43% in USA, 41% in China) and benefit from manufacturing automation and robotics. Approximately 52 Moz per year is used in the automotive industry, an increase of 4% year on year. Due to its superior electrical conductivity, silver is used in contacts throughout modern vehicles. There are greater requirements in complex electric and hybrid vehicle powertrains and controls, as well as aerospace and defence equipment. Assembly plant robots are also silver-intense, in the form of printed circuit boards and connectors.

The physical demand, for jewellery, silverware, and bar/coin has increased by 10% and in 2018 accounted for approximately 40% of demand. Jewellery is typically GDP-driven while bar/coin is an investment component that tends to follow prices.

## Silver Sources

Recent estimates from The Silver Institute as of 2019, Mexico, Peru, and China represented the three largest global silver producers responsible for 23%, 16%, and 13% of all silver produced respectively. In 2019, Australia was the world's fourth largest producer of silver, with 43 million ounces (Moz), well off the 2013 high of 59Moz due to lower by-product values at major base metal mines.

Mine supply of silver has fallen for the past three years, most sharply at primary silver operations and most recently driven by the Escobal (Guatemala/regulatory) shutdown, environmental restrictions on mines and smelters in China, and a series of minor outages globally.

In recent years, silver scrap has ranged between 150 to 250 Moz per year or roughly 15% of total supply comprising:

- 1. Recycled electronics containing silver wire, solder, and connectors;
- 2. Anode slimes from copper electrowinning at mines and refineries; and
- 3. Industrial solutions. Any sustained silver price increase is likely to result in an increase in silver scrap, possibly in the range of 10% of mine supply.

Currently, there are few major silver projects in or near construction (see **Table A4.2**). Most notable are Juanicipio (MAG/Fresnillo) and Las Chispas (SilverCrest), both in Mexico. The newly commissioned Chinchillas mine (Argentina, SSR Mining) will produce approximately 8 Moz of silver per year. By-product silver volumes from lead/zinc mines are likely to be constrained in the near/medium term, with Glencore withholding 400 - 500 kilotonnes of zinc capacity per year (4% of global mine production).

**Table A4.2** lists the estimated annual production of silver from six new silver projects globally, including the Bowdens Silver Project.

Appendix 4

 Bowdens Silver	Project
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Status of Major Global Silver Projects										
SILVER	Est Prodn									
<b>Major Projects</b>	Country	Company	(Moz/yr)	Туре	Status	Notes				
Juanicipio	Mexico	MAG / Fresnillo	11.6	UG	Construction	+43 koz/yr gold				
Las Chispas	Mexico	SilverCrest	5.3	UG	Feasibility	+55 koz/yr gold				
Bowdens	Australia	Silver Mines	5.5	OP	DA Stage	first 3 years average				
Keno Hill	Canada / Yukon	Alexco	4.0	UG	Pre-Feasibility	remote location				
Terronera	Mexico	Endeavour Silver	5.1	UG	Pre-Feasibility	+28 koz gold				
Prognoz	Russia / Far East	Polymetal	20.0	OP	Pre-Feasibility	remote location				

Table A4.2 tatus of Major Global Silver Project

Source: Rexerro Capital

## Silver Economics and Pricing

The underlying silver market appears positive with falling mine supply, new demand from photovoltaic and electronics and physical deficits for five of the past six years. Including investment demand via exchange-traded funds (ETFs) and Exchange Traded Products (ETPs), silver has been in slight deficit for the last decade. Defining features of silver relative to gold are greater industrial demand (+50% versus 10%), absence of major central bank holdings or activity (versus 10% of gold demand; 20% of above-ground holdings), and more dissipative end-use losses (est. 50% versus 10%).

One of the most unusual features of the precious metals markets in 2019 has been the upward trend in the gold/silver price ratio to record highs above 90x. This is probably due to a mix of factors, from active central bank accumulation of gold, to safe-haven preferences, trend-following trading models, and thematic silver selling on risk-off trade-war or China slowdown themes. The gold/silver ratio is statistically and fundamentally extended, and tends to fall during gold rallies. A high gold/silver price ratio is a positive indicator for future silver markets.

The macroeconomic setting has recently been negative for industrial metals, with recession fears in the capital markets, the US treasury yield curve inverted, German sovereign yields negative, and emerging market currencies volatile. Silver has been heavily sold on the COMEX (commodity futures exchange, USA) along with other industrial metals, showing intermittent, highly-anomalous net-short positions. As central banks ease monetary policy to encourage inflation, silver is well positioned with its mix of industrial and investment demand.

While physical supply and demand determine the tenor of the silver market and the degree to which it is fundamentally taut or slack, investment demand determines direction and sets the price. This includes bar/coin, exchange-traded products, estimates of over-the-counter (OTC) activity, plus the net impact of futures and options. Investment demand is the only category that can vary the silver market by 100 - 150 Moz in a year.

Silver ETF holdings have been durable (approximately 650 Moz) compared to gold and platinum, where there has been significant drawdown. This reflects a patient, diversification-oriented silver investor demographic but also potential supply.

In order for silver prices to break out of the range of the past three years to challenge US\$20 per ounce, ETF/ETP flows will need to shift from negative (20.3 Moz in 2018) to positive (50 - 100 Moz) as seen in 2016. Key indicators will be COMEX speculators shifting long, and equity valuation multiples expanding along with coin premiums.



Break-even prices for primary silver producers are currently in the US15 - US17 per ounce range. Figure A4.1 shows primary silver producers cost of production curve. The incentive price for expanded or new primary silver mines is likely to be +US20 per ounce as illustrated in Figure A4.1.

Table A4.3 lists the individual component costs relating to the US \$20 per ounce price for silver.



Figure A4.1 Primary Silver Cost Curve

Table A4.3
Silver Component Costs

SILVER	
Incentive Prices for New Capacity	US\$ Per Oz
Co-Product Cash Costs (70th percentile)	12
Growth Capex	2
Corporate Costs incl. Tax	3
Financing	1
Return on Investment	2
Total	20
Source: Silver Institute, Rexerro Capital	

Silver tends to follow gold with a correlation of 0.7 - 0.8, with greater volatility, and often a lag, reflecting a greater retail demand component and lack of central bank involvement. Figure A4.2 displays the gold : silver ratio from 2000 to 2019. In 2019, however, gold has risen while silver languished, lifting the gold/silver ratio to records above 90x. This may be accounted for by the lag effect, with diversification and safe-haven seeking institutions favouring gold ahead of mainstream investor participation. Also influencing is probable active central bank accumulation in gold, running roughly 10% of total demand. Trend-following trading models and thematic silver selling due to risk-off trade-war or China slowdown themes have added lift to the ratio.

During the past decade (January 2000 through December 2019), silver prices have ranged between approximately US\$13.80 per ounce to approximately US\$48.60 per ounce with an average of approximately US\$21.20 per ounce.

Since 2000, the gold/silver price ratio has ranged between 32 and 92 and averaged 64x.





At levels in December 2019, the gold/silver ratio is fundamentally and statistically extended by almost any measure. A ratio of 65-70x on gold at US\$1,500/oz would bring silver pricing into the target US\$22 to US\$25 range. Various combinations are shown in **Table A4.4**.

	Gold Price US\$/oz											
		1,250	1,300	1,350	1,400	1,450	1,500	1,550	1,600			
	50	25	26	27	28	29	30	31	32			
io	55	23	24	25	25	26	27	28	29			
Rat	60	21	22	23	23	24	25	26	27			
/er	65	19	20	21	22	22	23	24	25			
Silv	70	18	19	19	20	21	21	22	23			
/plc	75	17	17	18	19	19	20	21	21			
õ	80	16	16	17	18	18	19	19	20			
	85	15	15	16	16	17	18	18	19			
	90	14	14	15	16	16	17	17	18			
	95	13	14	14	15	15	16	16	17			

 Table A4.4

 Silver Target Prices at Different Gold & Ratio Combinations

Recently, silver has been heavily sold on the COMEX, with intermittent, highly-anomalous speculator net-short positions in silver futures since early 2018 (**Figures A4.3** and **A4.4**). Catalysts may be pro-cyclical and incremental, or confidence-driven and sharper.



CMX Specs

an-12

Silver Price vs COMEX Specs

Silver P:

Jan-16

120,000

100,000

80.000

60,000

40,000

20,000

(20,000)

(40,000)

Comex Net Long/(Short)

## Figure A4.4 Silver ETF Holdings



Hedging price realisations on a portion of production is an important element of mining project finance, typically used to limit cash flow risk during debt repayment in the first 3 to 5 years of operation. This hedging can take form of customised swaps, forward sales, offtakes, or gold (silver) loans negotiated directly with a counterparty, or standardised exchange-traded futures and options. Programs can be designed to cover operating costs, or a percentage of production, typically to 50%. Terms seldom exceed 3 to 5 years, since liquidity becomes limited further out, particularly in base metals. Since mines typically sell concentrates and intermediate products rather than refined metal, hedging transactions are usually purely financial. Regardless, hedging is typically executed via the commodity derivatives desk of the lead bank (**Figures A4.5** and **A4.6**). A key consideration for Bowdens Silver is that the silver futures curve has an upward slope (contango).

The global silver mining hedge book has shrunk dramatically in recent years, now standing at 30 to 40 Moz down from 70 Moz in 2015 and 200 Moz at the peak (**Figure A4.6**). This reflects delivery into older, higher-priced contracts up to \$30 per ounce, and hesitance to renew at US\$15.



Bowdens Silver and its consultants have surveyed a number of leading North American analysts and banks to ascertain availability, terms, and capacity to hedge the current mine development. Minimal new silver hedging has recently been undertaken, however the most common structure used by gold miners has been the Zero Cost Producer Collar. This involves purchasing put options at a lower strike price, and selling call options at a higher strike price, effectively establishing a floor and ceiling to realisations. This has the advantage of transparency, liquidity, and "zero" premiums paid.

Related but distinct subjects are the royalty and streaming models, which are quasi-equity sources of capital and have been analysed by Bowdens Silver and its consultants.

## A4.1.3 Zinc

## **Properties and Uses**

Zinc is also the fourth most widely used metal in the world, principally for a wide range of industrial and medical uses. The process of galvanising through adding a zinc/iron alloy layer on steel protects steel from corrosion up to 170 years (see **Plate A4.5** and **Plate A4.6**). The global cost of corrosion to steel is estimated to be in excess of US\$2.0 trillion annually. By significantly increasing the service life of steel, zinc reduces these costs and protects valuable steel resources.



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#### ENVIRONMENTAL IMPACT STATEMENT Appendix 4

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In all forms of life, zinc works at the cellular level by enhancing protein and enzyme function. Zinc serves many functions related to gene maintenance, immune function, eyesight, organ and tissue growth, and synaptic plasticity (learning).

Other primary zinc uses are:

- Brass when zinc (30%) is combined with copper (70%) it forms a particularly rust-resistant alloy called brass. Brass is used extensively in the manufacture of sailing boat hulls and other marine hardware, musical instruments and for various scientific applications.
- Diecast Objects the low melting point of zinc allows it to be mixed with aluminium to form a strong alloy which can be diecast to make a range of items. Common examples of diecast objects include carburettors, staples and zippers.



- Batteries (**Plate A4.8**) are produced using a variety of chemistries including: zincbromine, zinc-air, zinc-carbon and zinc-nickel. Due to zinc's abundance, it is an attractive research area for battery cell technology.
- Zinc Oxide zinc oxide has a range of applications and is used in the production of rubber, skin products (e.g. zinc cream), paints, floor coverings, plastics and ceramic glazes.

## Zinc Sources

In 2018, primary production of zinc on a global basis totalled 13 million tonnes, with some 30% of zinc originated globally from recycled or secondary zinc. This proportion or recycling has been increasing on a yearly basis. As zinc's primary use is in galvanising steel, consumption is strongly correlated to steel use.

In 2018, the key global zinc producers were, China (33%), Peru (12%), Australia (7%) and India (6%)

Between 2009 and 2018, global zinc production increased by approximately 4.2% from 11.6 million tonnes to 13 million tonnes (**Table A4.5**). In the same period, Australia's zinc production decreased by approximately 44.6% from 1.5 million tonnes to 0.8 million tonnes.

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Zinc											
Global	(kt)	11 600	12 500	12 600	13 500	13 600	13 700	13 400	12 600	12 500	13 000
China	(kt)	3 324	3 842	4 050	4 930	5 188	5 118	4 749	4 711	4 300	4 300
	(%) <sup>1</sup>	29	31	32	37	38	37	35	37	34	33
Peru	(kt)	1 513	1 470	1 256	1 281	1 351	1 315	1 421	1 337	1 473	1 600
	(%) <sup>1</sup>	13	12	10	9	10	10	11	11	12	12
Australia	(kt)	1 290	1 480	1 516	1 542	1 511	1 506	1 610	884	841	940
	(%) <sup>1</sup>	11	12	12	11	11	11	12	7	7	7
India	(kt)	678	730	723	764	770	767	741	756	784	800
	(%) <sup>1</sup>	6	6	6	6	6	6	6	6	6	6
Note 1: % = percentage of global production for that year. Sources: British Geological Survey – World Mineral Production Reports 2008-2012 and 2013-2017, U.S. Geological Survey, Mineral Commodity Summaries, February 2019.											

Table A4.5Global Zinc Production 2009 to 2018

Zinc markets benefits from Glencore withholding 400-500 kilotonnes per year of production. However, sharply higher zinc smelter treatment charges suggest abundant supply, with concentrate surplus ex-China largely due to the Dugald River (MMG Limited) mine start-up.

## Zinc Pricing

For 2019, the International Lead and Zinc Study Group (ILZSG) expects zinc demand growth of 0.6% and an increase in mine supply of 6.2% following three flat or down years). **Figure A4.7** displays the monthly average zinc price between May 2014 and May 2019. Refined metal supply will increase 3.6%, narrowing but not eliminating zinc market deficits that have run since 2016.





During the period May 2014 and May 2019, the monthly average price of zinc varied from approximately US\$1,500 to US\$3,500 per tonne. The price of zinc in December 2019 was approximately \$2,300 per tonne.

## A4.1.4 Lead

## **Properties and Uses**

Lead is a very corrosion-resistant, dense, ductile, and malleable blue-grey metal that has been in use for at least 6,400 years. Although historically it has been widely used due to its softness and ease of working, as the negative impacts on health have been recognised, the suitable uses have narrowed over time. Today its main use is in batteries.

Lead-acid batteries make up 82% of total lead use. Other significant uses are in ammunition 3%, oxides in glass and ceramics 5%, the remaining 13% are used in solders, bearing metals, brass and bronze billets, covering for cable, caulking lead, and extruded products.

The uses for these products range widely from in health services where lead is used as a radiation shield around X-ray and radiotherapy equipment and nuclear equipment. The high density and softness of lead makes it an extremely effective insulator of noise and vibration. Lead is often laid in thin sheets between building materials to provide very effective sound insulation. Leads innate property of being stable in corrosive environments means it is still widely used to line containers and pipes for storing and carrying corrosive chemicals.

## Lead Sources

Deposits of lead typically occur in ore that contains zinc, silver and commonly copper. Lead is commonly used in car batteries (**Plate A4.9**) and is known for use in lead light or stained-glass windows (**Plate A4.10**). Lead is also one of the most successfully recycled metals. Rates of recycling are estimated to be near 99.3% within the USA and 90% within Australia. As a result of this, up to 80% of apparent consumption of lead is from recycled materials.



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Protective Positive casing terminal Negative terminal Cell divider Positive electrode (lead dioxide) Negative electrode (lead) Dilute H2SO4 Plate A4.9 A standard car battery Plate A4.10 Stained Glass

In 2018, the key global lead primary producers were China (47%), Australia (10%), Peru (7%) and USA (6%).

From 2009 to 2018, total global lead primary production increased by approximately 29% from 3.8 million tonnes to 4.4 million tonnes although during 2012 to 2014, primary production increased to 5.3 million tonnes (**Table A4.6**). In the same period, Australia's lead production fell by approximately 29% from 650 000 tonnes to 459 000 tonnes. Between 2009 and 2018, Australia's lead production as a proportion of global production fell from approximately 17% to 9%.

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Lead											
Global	(kt)	3 900	4 400	4 800	5 300	5 300	5 300	5 000	4 800	4 900	4 400
China	(kt)	1 604	1 981	2 406	2 838	2 697	2 609	2 335	2 337	2 300	2 100
	(%) <sup>1</sup>	41	45	50	54	51	49	47	49	47	47
Australia	(kt)	566	712	621	622	711	728	653	441	459	450
	(%) <sup>1</sup>	15	16	13	12	13	14	13	9	9	10
Peru	(kt)	302	262	230	249	266	277	316	314	307	300
	(%) <sup>1</sup>	8	6	5	5	5	5	6	7	6	7
USA	(kt)	406	369	342	345	339	379	367	336	302	260
	(%) <sup>1</sup>	10	8	7	7	6		7	7	6	6
Note 1: % = percentage of global production for that year. Sources: British Geological Survey – World Mineral Production Reports 2008-2012 and 2013-2017, U.S. Geological Survey, Mineral Commodity Summaries, February 2019.											

Table A4.6 Global Lead Productions 2009 to 2018

Lead Pricing

For 2019, the ILZSG expects lead demand growth of 1.2% and mine supply growth 1.8%. However, refined metal supply will run 2.5% as smelters catch-up to prior mine additions, resulting in slight market surplus after two years of deficit. **Figure A4.8** displays the monthly average lead price between May 2014 and May 2019.





During the period May 2014 to May 2019, the monthly price of lead varied from approximately US\$1,650 per tonne to almost US\$2,500 per tonne. The price of lead in December 2019 was approximately US\$1,920 per tonne.



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# **Appendix 5**

# Documentation Supporting the Project Description

(Total No. of pages including blank pages = 74)

The Project Description (EIS Section 2) focuses on describing what Project components would be constructed and operated on site. This Appendix provides supporting information on how each of the Project components would be constructed or operated during the site establishment and construction stage and throughout the Project life, including all rehabilitation activities. A range of supporting technical information is also provided which has been relied upon in the various technical assessments included in the Specialist Consultant Studies Compendium.



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## A5.1 MINE DESIGN AND PLANNING CONSIDERATIONS

## A5.1.1 Introduction

The design of the Mine Site layout (**Figure 2.1** and reproduced as **Figure A5.1**) and its development and operation has involved substantial planning. All relevant considerations have been identified, investigated and evaluated to ensure the final design and methods of operation are technically and economically feasible and environmentally and socially responsible, as well as being safe and secure.

This subsection reviews the range of issues considered by Bowdens Silver demonstrating the extent to which the Project has been planned and designed to achieve the objectives set out in Section 2.1.1.

## A5.1.2 Economic Considerations

The concentration and distribution of silver, and to a lesser extent zinc and lead, within the ore body has the most significant impact on which particular blocks<sup>1</sup> of mineralised rock may be economically mined and processed. Bowdens Silver has comprehensively reviewed all data and determined the grade and distribution of the three metals within the ore body.

Commodity prices, ore grades, waste rock/ore stripping ratios, consistency of ore tonnages, process recoveries, mining and other costs have been used to optimise the recovery of ore from the open cut pits and have therefore influenced the proposed design and staging within the open cut pits. In the event that commodity prices increase sufficiently, a proportion of, or all, low grade ore may be able to be economically processed, and ore with higher strip ratios may be able to be recovered. Therefore, the Project has been designed to provide for dedicated low grade ore storage areas located adjacent to the processing plant and on the northern margin of the WRE, to store approximately 2.6 million tonnes of the low grade ore. This would enable potential future recovery and processing of this material should economic favourable circumstances arise throughout the Project life.

Sufficient setback of the perimeter safety bund wall has also been provided to allow adjustments of the open cut pit crest, if required, to access ore with higher strip ratios. Alternatively, underground mining techniques may be considered at a later date. Any substantial changes to the proposed footprint of the open cut pits or use of underground mining techniques would be the subject of a separate development application or modification of the granted development consent for the Project.

## A5.1.3 Geological and Related Considerations

## A5.1.3.1 Geological Considerations

The local geology and resources are discussed in Section 2.2. Based on the evaluation of the Mine Site geology, the presence of ore at ground level in some areas, ore grades and likely stripping ratios, the preferred mining method is open cut mining.

<sup>&</sup>lt;sup>1</sup> Open cut pit modelling has been undertaken based upon individual 390m<sup>3</sup>, i.e. blocks 6.25mE x 12.5mN x 5.0m (vertical).

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The eastern side of the main open cut pit has been defined by a north-south oriented geological fault. The remaining boundaries of the main open cut pit have been defined based upon the mineral grades estimated from the resource model, i.e. the mineral grades beyond the other sides of the main open cut pit are not sufficient to economically recover the defined mineralisation.

The staged mining sequence has been designed to recover ore at or near the surface within the initial years of mining and to recover sufficient quantities of each rock type and ore grades to allow optimal blending of materials within the processing plant.

The nominated locations of the TSF, WRE and processing plant have been drill tested to confirm that no economic ore reserves that could be recovered by open cut means are located beneath these components.

The silver mineralisation occurs within flat-lying to moderately-dipping zones in the Rylstone Volcanics (ignimbrite, crystal tuff and volcanic breccia) and is primarily hosted by sulphides of zinc, lead, iron and arsenic. The highest-grade silver mineralisation, located in the northeastern section of the deposit, is generally intimately associated with steeply dipping, narrow, fracture fill veins. The silver-hosting minerals within the groundmass of the host rock most commonly occur as minute inclusions within other minerals, or overgrowths on other silver-hosting minerals. The dominant silver sulphide minerals<sup>2</sup> present are argentite/acanthite (Ag<sub>2</sub>S) and stephanite (Ag<sub>2</sub>SbS<sub>4</sub>) whilst the zinc is mainly present as sphalerite (Zn<sub>2</sub>S) and the lead is present as galena (PbS). The silver is also present as sulfosalts which are dominated in decreasing abundance by the Pearceite-Polybasite series >Argyrodite>Tetrahedrite-Freibergite-Tennantite series >Stephanite and Pyrargyrite-Proustite series. High grade silver mineralisation is also hosted in steeply-dipping fracture zones which host-banded sulphide veins.

Approximately 95% of the defined sulphide mineralisation referred to above lies below the interpreted base of oxidation which varies from 1m to 35m below natural ground surface and averages approximately 9m. The dominant silver minerals identified in the oxide zone are the halides cerargyrite (AgCl) and embolite (Ag(Cl, Br)). Other minerals include plumbojarosite (PbFe<sub>3+6</sub>(SO<sub>4</sub>)<sub>4</sub>(OH)<sub>12</sub>), haematite (Fe<sub>2</sub>O<sub>3</sub>), goethite (FeO(OH)) and trace sphalerite and galena.

The four main rock types to be mined and the quantity of each to be extracted as ore or waste rock are listed in **Table A5.1**.

	Primary and Lo	w Grade Ore	Waste Rock and Oxide Ore*				
Rock Type	Quantity (Mt)	%	Quantity (Mt)	%			
Crystal Tuff	11.6	38.6	13.2	27.5			
Welded Tuff	12.6	42.2	8.8	18.3			
Rhyolite Breccia	5.4	18.1	15.2	31.5			
Upper Ash Tuff	0.3	1.1	10.9	22.7			
Totals	29.9	100	48.1	100			
* The total quantity of oxide ore is approximately 1.8Mt or approximately 3.7% of the combined waste rock and ores							
Source: AMC Consultants Pty Ltd							

Table A5.1 Stratigraphic Breakdown of Material Volumes

<sup>&</sup>lt;sup>2</sup> Mineral elements include Ag = silver, Zn = zinc, Pb = lead, Sb = antimony and S = sulphur

## A5.1.3.2 Geotechnical Considerations

A geotechnical study of the ore and waste rock and their properties was relied upon to define the angles and orientation of the benches and batters within the open cut pits and to maximise slope stability. Geotechnical parameters considered included weathering, rock strength, average joint spacing, and mean block size.

## A5.1.3.3 Materials Characterisation

The physical and chemical properties of the waste rock and tailings have been established by Graeme Campbell and Associates (GCA, 2020)<sup>3</sup>. Geochemical testing was undertaken on 127 representative samples of waste rock, five samples of low grade ore and two samples of ore collected from drill core across the proposed open cut pits. Six tailings samples and three composite soil samples were also tested.

These investigations have identified that approximately 57% of waste rock to be extracted from the open cut pits is potentially-acid forming (PAF) due largely to the presence of iron sulphide minerals such as pyrite and marcasite (FeS<sub>2</sub>) leading to total sulphur (Total-S) concentrations greater than 0.3% (as S). Distinction is made between waste rock situated within the uppermost 20m to 30m of the open cut pits (the "weathered zone") and the underlying material (the "primary zone") with the benign waste rock (i.e. non-acid forming (NAF)) being situated within both the weathered zone and the primary zone. GCA (2020) also records that the bulk of the NAF waste rock from the primary zone is located in the northern section of the main open cut pit. The waste rock from both the weathered and primary zones is further sub-classified as follows.

## Weathered Zone

- WZ1: Total-S < 0.3% (a proportion is initially subneutral that evolves to NAF over time).
- WZ2: Total-S  $\geq$  0.3% (PAF).
- **Primary Zone** 
  - PZ1: Total-S  $\leq$  0.1% (NAF).
  - PZ2: Total-S > 0.1% and <0.3% (NAF).
  - PZ3: Total-S  $\geq$  0.3% (PAF).

GCA (2020) identifies that, based on static and long-term kinetic testing, the waste rock that is sub-classified as WZ1, PZ1 and PZ2 is benign and suitable for use as a construction material for the Project. The determination of NAF for the PZ1 waste rock generally reflects the absence of sulphide minerals whilst the NAF determination for the PZ2 waste rock reflects trace-pyrites in the presence of dolomite (CaMg[CO<sub>3</sub>]<sub>2</sub>), ankerite (Ca[Fe, Mg, Mn][CO<sub>3</sub>]<sub>2</sub>) or rhodochrosite (MnCO<sub>3</sub>), all of which are carbonate minerals that provide for circum-neutral buffering capacity during the weathering of the PZ2 waste rock. In the case of WZ1, although sulphides are generally absent, aluminium-hydroxysulphate minerals (e.g. alunites) occur associated with partial decomposition of sulphides over geological time. Within the WZ1 waste rock, interstratified smectitic and illitic clays are a common component of the groundmass, and through interactions with soluble aluminium forms (released from the dissolution of aluminium-hydroxysulphate minerals) buffer the pH near 5. With progressive dissolution of the aluminium-hydroxysulphate minerals, the pH regime stabilises near 6. Accordingly, whilst some of the WZ1 waste rock

<sup>&</sup>lt;sup>3</sup> The material characterisation for the Project with respect to the physical and chemical properties of the waste rock and tailings, is presented in Part 3 of the Specialist Consultant Studies Compendium accompanying this EIS.



initially generates sub-neutral leachate, this trends over time to circum-neutral. In addition, the waste rock sub-classified as being WZ1 also includes material that is totally devoid of aluminium-hydrosulphates and sulphides.

The Project would have an ongoing, but varying, supply of benign NAF waste rock available for construction activities (e.g. TSF embankment raises) throughout the Project life (see Section A5.4.3). Furthermore, the use of NAF waste rock and other suitable materials would be focussed in those areas where it has long term benefits, particularly for rehabilitation of the final landform.

Manganese enrichment is a characteristic feature of mineralisation at Bowdens, and therefore soluble forms of manganese would accompany weathering reactions. However, the WZ1, PZ1 and PZ2 waste rock constitute a weak source of soluble manganese overall, and this source would steadily subside over time.

The tailings generated in the processing plant have also been identified as PAF, due to the occurrence of traces of pyrite (corresponding to around 1% (as Total-S)) with traces of rhodochrosite (MnCO<sub>3</sub>).

## A5.1.4 Environmental Considerations

A wide range of environmental considerations were taken into account in the design of both the Mine Site layout and the proposed operations, principally to avoid or minimise potential environmental impacts. Each of the following considerations is discussed in detail later in this section or in Section 4 of this document.

## Noise

Consideration of noise has been reflected in the placement of the processing plant in the central section of the Mine Site, north of the main open cut pit. This is an area approximately 3.5km from Lue where both distance and intervening topographic relief would assist to ameliorate the propagation of noise generated by the plant. This consideration was essential given the need to operate the grinding and metal recovery components within the processing plant 24 hours per day, 7 days per week, whilst satisfying relevant noise criteria.

The construction of the WRE has, to the greatest extent possible, been designed to provide shielding from the noise generated by mobile equipment during the bulk of its construction during the day-time and evening. Emphasis has been placed upon identifying operational areas during the evening and night-time periods that would ultimately allow mining operations to occur 24 hours per day, 7 days per week<sup>4</sup>. Essentially, only ore transportation would be feasible from certain areas of the main open cut pit to the ROM pad at night.

Consideration has been given to the generation of noise under adverse weather conditions, particularly under temperature inversions and gentle noise-enhancing winds.

<sup>&</sup>lt;sup>4</sup> Placement of waste rock in the WRE would commence initially during the day-time and progressively extend into the evening and night-time subject to satisfying the relevant noise limits.



## Surface Water

Emphasis has been placed upon directing as much upslope runoff as possible around mine components to maintain flows into Hawkins Creek and Lawsons Creek.

A setback from Hawkins Creek has been included in the design of the WRE so that the crests with freeboard of the WRE flood bund and leachate management dam remain above the modelled water surface level of the Probable Maximum Precipitation flood event (WRM, 2020). A number of water storage dams/water quality control ponds/interception dams have been included to provide sufficient storage capacity for all potentially contaminated runoff generated within the Mine Site which in turn would be used on site.

Store and release capping layers, specifically designed for the climatic conditions of the Mine Site, would be progressively installed to cover the WRE and ultimately the TSF post mining operations. These layers would prevent rainfall and surface water from ponding and subsequently infiltrating into the encapsulated tailings within the TSF and the PAF waste rock within the WRE.

## Groundwater

The occurrence of groundwater within and around the proposed open cut pits would provide a proportion of the water needed for processing. The main open cut pit void would remain a groundwater sink following mine closure, thereby preventing discharge to the surrounding aquifers as well as limiting the oxidation of any remaining sulphide minerals on the terminal walls of the main open cut pit. This would be achieved by directing, to the greatest extent possible, surface water around the main open cut pit void. The standing water level is predicted to return to an elevation approximately 5m lower than that which currently exists (and which is likely to occur prior to the commencement of mining). Underdrainage collection infrastructure for the TSF and WRE would return any seepage to the process water circuit during mining and processing operations.

As noted above, during closure and decommissioning, store and release capping layers would be installed to cover the TSF and WRE. This would prevent seepage from the TSF and WRE post mining operations.

## **Terrestrial Ecology**

The Mine Site contains a range of native vegetation communities and resident/transitory native fauna. Emphasis has been placed upon designing the Project to minimise the areas of disturbance in areas where endangered ecological communities have been identified. This is particularly evident in the areas proposed for topsoil and subsoil storage.

## Soils

The recovery and stockpiling of both topsoil and subsoil would be maximised in areas to be disturbed. Wherever possible, topsoil and subsoil would be directly transferred to assist in revegetation of these areas. Stockpiled topsoil and subsoil would subsequently be used in the rehabilitation of interim and final landforms. A number of areas within the Mine Site have been identified for the stockpiling/storage of topsoil and subsoil required for the revegetation of disturbed areas. These areas would be located principally in cleared areas and areas that avoid endangered ecological communities, whenever possible.



## Visibility

The dominant light colour of the waste rock (and low grade ore) to be extracted from the open cut pits would require areas where these materials are visible from beyond the Mine Site to be progressively revegetated or shielded to limit the visual contrast against the surrounding vegetated landforms. Planting of vegetation around the perimeter of the Mine Site together with progressive rehabilitation/revegetation activities on interim/completed landforms would be undertaken in order to minimise visual impacts to the greatest extent possible. The WRE has been designed so that the final landform provides for a long-term, non-geometric shape and slopes.

## A5.1.5 Safety and Security Considerations

A range of security and safety considerations pertaining to the workforce, visitors and public have been reflected in the design, planned operation and closure of the Project, including the following.

- With the exception of those areas where topography naturally restricts access, either security or agricultural fencing would be installed around the Mine Site boundary (see **Figure A5.1**) as well as around the perimeters of key operational areas within the Mine Site such as the processing plant.
- All vehicles travelling to the Mine Site would be required to travel via the relocated Maloneys Road (from the south) or Maloneys Road (from the north) and the mine access road. Entry to the operational sections of the Mine Site for vehicles and personnel would be controlled by a gated security system located at the Mine Site entrance.
- The perimeter safety bund wall around the entire perimeter of the main open cut pit would be positioned and constructed in accordance with *Safety Bund Walls Around Abandoned Open Pit Mine Guideline* (WA Department of Industry and Resources, 1997).
- A fire suppression system designed to Australian Standard, ATS 5387.7-2006 (Guidelines Fire safety engineering Detection, activation and suppression) would be installed within the processing plant, administration and mining services areas. Water would be drawn from a dedicated 320 000L fire water tank located close to the processing plant.

All personnel working within the Mine Site and visitors would undertake a safety induction when first on site to ensure they are fully aware of the relevant safety procedures and expectations of Bowdens Silver to avoid any safety incidents while they are on site.

A comprehensive Health and Safety Management Plan would be prepared and regularly reviewed and updated to accommodate the progressive development of the Mine Site. This would address a wide range of factors including fatigue management and fitness for work for all site personnel.



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## A5.2 SITE ESTABLISHMENT AND CONSTRUCTION EQUIPMENT

Throughout the site establishment and construction stage, the equipment identified in **Table A5.2** would be utilised, as required, at the nominated locations. This table also records the indicative type and number of equipment to be used during the construction of the water supply pipeline and the construction and dismantling of the 500kV power transmission line prior to the end of Year 4 of mining.

Туре	Ref.	No.	Model <sup>1</sup>	Function
			Processing Plant Earth	works
Bulldozer	В	1	D11R	Vegetation clearing, soil stripping, ripping and earth moving
Excavator	Ex	2	70t (x1), 30t (x1)	Cut and fill, vegetation clearing
Front-end Loader	Fel	3	988F (x2), 950F (x1)	Cut and fill
Articulated Haul Truck	AT	2	40t	Relocating excavated fill
Truck Semi Tipper	RT	2	Road Train (50t)	Relocating excavated fill
Grader	G	3	16G (x1), 12G (x2)	Shaping/road construction (entire site)
Water Truck	WT	1	10 000L	Dust Suppression
Vibrating Roller	R	1	CS54XT	Compaction of plant site and TSF embankment/impoundment
Rock Drill	Dr	1	Airtrac, Hydraulic	Blast hole drilling
Tool Carrier#	Tool Carrier#     -     1     IT28     Integrated Tool Carrier		Integrated Tool Carrier	
			TSF Earthworks	
Bulldozer	В	2	D11R (x1), D7R (x1)	Vegetation clearing, soil stripping, ripping and earth moving
Front-end Loader	Fel	2	988F (x1), 950F (x1)	Cut and fill
Grader	G	2	16G	Shaping/road construction (entire site)
Excavator	Ex	2	70t (x1), 30t (x1)	Vegetation clearing
Crusher/Screen	CS	1	McCloskey J40 & S80	On-site production of road base/ aggregate
Water Truck	WT	1	10 000L	Dust Suppression
Vibrating Roller	R	1	CS54XT	Compaction of plant site and TSF embankment/impoundment
Haul Truck	HT	2	35t	Transfer crushed rock for TSF
Mulching Unit	MU	1	Vermeer BC 1800 XL	Mulching vegetation
Chain Saw	С	2	Husqvarna 455 Rancher	Vegetation removal
B-double Truck	RT	6 <sup>2.</sup>	Freightliner Coronado 114	NAF waste rock to TSF

Table A5.2	
Site Establishment and Construction Mobile Equipment	

1. The Model(s) indicated are typically Caterpillar models, however, those are indicative of the class or type of equipment proposed to be used and are not definitive

2. It is envisaged that the 6 trucks would undertake two return trips per hour between the main open cut pit NAF stockpile and the TSF NAF stockpile area

3. Not included in operational scenario

Source re. power transmission line: Energy and Management Services Pty Ltd

Source re. all earthmoving and processing plant installation: GR Engineering Services Limited / AMC Consultants Pty Ltd



	1			Page 2 of 3
Туре	Ref.	No.	Model <sup>1</sup>	Function
			Water Supply Pipel	ine
Bulldozer	В	2	D6 (x1), D9 (x1)	Vegetation clearing, shaping corridor
Excavator	Ex	1	24t	Vegetation clearing
Mulching Unit	MU	1	Vermeer BC 1800 XL	Mulching vegetation
Excavator	Ex	2	30t	Trench excavation and stringing/laying pipe (with hydraulic hammer and caged screen), as required
Trencher	Т	1	Vermeer 1255	Trench excavation
Welder	W	1	McElroy T500	Welding HDPE pipes
Padfoot Roller	PR	1	8t	Compacting backfill above pipeline
Tipper Truck	TT	1	3t	Relocation of excavated fill
Water Truck	WT	1	10 000L	Dust suppression/revegetation
			Mining Pre-Strip	
Bulldozer	В	2	D11R (x1), D9R (x1)	Vegetation clearing, soil stripping, ripping and earth moving
Excavator	Ex	1	Ex 1900 (190t)	Earthmoving loading ore/waste rock
Grader	G	1	16G	Road maintenance
Front-end Loader	Fel	3	950F (x2), 930F (x1)	Loading B-double trucks / shaping oxide ore
Haul Truck	HT	4	777G (90t)	Hauling ore/waste rock
Water Truck	WT	1	10 000L	Dust Suppression
Rock Drill	Dr	1	Airtrac, Hydraulic	Blast hole drilling
Mulching Unit	MU	1	Vermeer BC 1800 XL	Mulching vegetation
Chain Saw	С	1	Husqvarna 455 Rancher	Vegetation removal
			Processing Plant Insta	Illation
Crane	-	1	Terex UC15 (Franna)	Crane – 15t Pick and Carry
Crane	-	1	Terex AC80-2 (Demag)	Crane – 80t All Terrain
Front-end Loader	Fel	3	Komatsu WA 900 FEL	Loading of haul trucks and management of ROM material
Tool Carrier <sup>3</sup>	-	1	924G Integrated Tool Carrier IT924G-Igor	Integrated Tool Carrier
Loader	-	2	262C Skid Steer Loader	Skid-Steer Loader
Forklift	-	1	Clark CMP 50sD	Forklift (Reagents) 5t
Forklift	-	1	Hyster H28-32XM-16CH	Forklift (Concentrate) carry 20ft containers
Pump <sup>3</sup>	-	1	SE Megapump	Mobile diesel pumps
Scissor Lift <sup>3</sup>	-	2	Haulotte compact 10DX	Elevated work platform – scissor lift small

# Table A5.2 (Cont'd) Site Establishment and Construction Mobile Equipment

1. The Model(s) indicated are typically Caterpillar models, however, those are indicative of the class or type of equipment proposed to be used and are not definitive

2. It is envisaged that the 6 trucks would undertake two return trips per hour between the main open cut pit NAF stockpile and the TSF NAF stockpile area

3. Not included in operational scenario

Source re. power transmission line: Energy and Management Services Pty Ltd

Source re. all earthmoving and processing plant installation: GR Engineering Services Limited / AMC Consultants Pty Ltd

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Table A5.2 (Cont'd)	
Site Establishment and Construction Mobile Equipment	

Type	Ref	No	re Ref No Model <sup>1</sup> Eunction					
		atod	Malanave Road and Asso					
	eloc	aleu						
Bulldozer	В	1	D9R	Vegetation clearing, topsoil stripping/ripping and earthmoving				
Excavator	Ex	2	30t	Excavation of road embankments				
Articulated Haul Truck	AT	2	35t	Transfer of excavated material				
Roller Compactor	R	1	CS533	Road compaction				
Grader	G	1	16M	Road profiling				
Water Truck	WT	1	10 000L	Dust suppression/moisture control				
Constru	ictio	n and	d Dismantling of the 500k	/ Power Transmission Line				
Bulldozer	-	1	D9R	Vegetation clearing, track construction				
Excavator	-	2	325 FL	Vegetation clearing, preparation of tower footings, loading haul trucks				
Mulching Unit	-	1	272 D2	Mulching vegetation				
Articulated Heavy Vehicle	-	5	Semi-trailer	Delivery (and removal) of tower components				
Articulated Haul Truck	-	2	38t	Transportation of excess excavated material				
Crane	-	2	Up to 250t Alterain	Erection and dismantling towers and stringing power transmission lines				
Franna Cranes	-	2	Up to 25 tonne	Foundations, erection and dismantling towers and stringing power transmission lines				
Elevated Work Platform	-	3	70m 8X8 truck units	Stringing power transmission lines				
Soilmac Drill Rigs	-	2	SR 30-60 size	Foundation works				
Pozitrack	-	2		Access and foundation works				
4WD & Light Vehicles	-	15	Various	Personnel/delivery of tools				
4 The Medel(a) is directed as								

1. The Model(s) indicated are typically Caterpillar models, however, those are indicative of the class or type of equipment proposed to be used and are not definitive

2. It is envisaged that the 6 trucks would undertake two return trips per hour between the main open cut pit NAF stockpile and the TSF NAF stockpile area

3. Not included in operational scenario

Source re. power transmission line: Energy and Management Services Pty Ltd

Source re. all earthmoving and processing plant installation: GR Engineering Services Limited / AMC Consultants Pty Ltd

## A5.3 MINING OPERATIONS

## A5.3.1 Introduction

Section 2.4 presents details of the design of the open cut pits, the mining sequence and mining methods to be used. This subsection provides information on the vegetation clearing and soil stripping activities and the annual ore and waste rock production together with details of the equipment to be used throughout the mining operations.



## A5.3.2 Site Preparation

## A5.3.2.1 Vegetation Clearing

Vegetation clearing would be undertaken on a campaign basis to provide for the progressive development of each stage of the mining operations. **Figure A5.2** displays that vegetation clearing during the site establishment and construction stage, and Years 3, 4, 6, 8 and 10. **Table A5.3** presents the indicative areas to be cleared and the proposed years in which clearing would occur throughout the Project life.

Year	Component Area(s)	Area (ha)
Site establishment and construction stage	Main open cut pit, processing area and mining facility, TSF embankment stages 1 and 2 and entire TSF impoundment area and NAF stockpile area, various soil stockpiles, Cells 1 and 2 of WRE, leachate management dam, southern barrier (initial barrier) and internal roads.	237
Year 1	Cells 3 and 4 of WRE and southern barrier.	14
Year 3	Various soil stockpiles, main open cut pit, Cell 5 of WRE, oxide ore stockpile area and southern barrier.	80
Year 4	Cell 6 of WRE.	8
Year 6	Southern Barrier (extended barrier) various soil stockpiles.	
Year 8	TSF embankment stage 3, various soil stockpiles, Cells 6 and 7 (first section) of WRE, main open cut pit and satellite pits and southern barrier.	
Year 10	Various soil stockpiles, main open cut pit and remainder of Cell 7 of WRE.	31

Table A5.3 Indicative Areas and Years for Vegetation Clearing

The area to be cleared for each stage would be clearly marked on the ground and all personnel involved in vegetation clearing operations would be made aware of the boundaries of clearing prior to removal. Large trees containing hollows would be visually inspected by suitably trained personnel to identify any occupied nests/hollows prior to clearing. In the event a threatened fauna species is identified, the tree would not be felled until the threatened fauna moves away from the area to be cleared during each campaign or has been appropriately relocated. In addition, and where practicable, available seed would be harvested from suitable native species during clearing operations. Wombat burrows would also be checked for habitation and, if present, wombats would be removed by suitably trained personnel to suitable habitat areas outside of the Mine Site boundary, i.e. with the required relocation approvals.

Larger vegetation would be removed by a mechanical harvester or by chain saw felling to recover the natural resources. The remaining smaller vegetation and groundcover vegetation would be removed using a bulldozer with a rotary drum designed to mulch the material into the topsoil, where practicable. This vegetation would be recovered with the topsoil to maximise the retention of the seed bank, enhance microbiological activity and minimise soil compaction and soil structure degradation.



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Following removal, the larger vegetation would either be cut into manageable pieces and/or mulched for use in rehabilitation or set aside for enhancing habitat value (e.g. large tree trunks, hollows and brush containing native seed). Ideally, and where practicable, hollow sections suitable for tree hollow habitat would be fixed onto suitable trees that would not be cleared and some trunks suitable as ground habitat repositioned on rehabilitation areas or undisturbed vegetation to enhance habitat value. Any excess vegetation not required for rehabilitation operations would, where practicable, be used for other off-site beneficial uses, such as sawlogs, fencing posts, mulch or firewood.

## A5.3.2.2 Soil Stripping

Topsoil and subsoil stripping would follow each vegetation clearing campaign. Recovered topsoil and subsoil would be separated at the time of stripping and subjected to different handling and stockpiling methods. All topsoil would either be stored in "topsoil only" stockpiles not greater than 2m in height or draped in a 1m layer over subsoil that would be placed to a height not greater than 5m, thus resulting in stockpiles with a maximum height of 6m. All stockpiles would be stabilised and vegetated as soon as practicable and would generally be within the areas displayed on **Figure A5.3**. It is recognised that the stockpile areas nominated on **Table A5.4** are conservative and represent the area required for stockpiling all topsoil and subsoil stripped, whereas it is likely that subsoil material that meets engineering specifications, would be utilised in the construction of the TSF or the WRE. In addition, topsoil and subsoil would be periodically recovered from stockpiles over the Project life for the progressive rehabilitation of completed WRE cells as well as the vegetation of the embankment of the completed TSF (Stage 3 raise) and the temporary vegetation of the southern barrier.

Stockpile ID*	Area (ha)	Topsoil Volume (m <sup>3</sup> )	Subsoil Volume (m <sup>3</sup> )
S1	6.4	54 000	281 200
S2	12.8	106 800	561 800
S3	7.1	110 800	0
S4	6.4	108 500	0
S5	22.8	185 100	971 900
S6	6.4	100 400	0
Total	61.9	665 600	1 814 900
* see: Figure A5.3			

Table A5.4 Soil Stockpile Areas

Investigations undertaken by Soil Management Designs (SMD, 2020) have determined the locations and approximate depths of the topsoil and subsoil across the Mine Site. **Figure A5.3** presents the location of the various soil types beneath the main components of the Mine Site and lists the range of topsoil and subsoil thicknesses that would be stripped.

Section 4.13 describes in detail how the topsoil and subsoil would be managed throughout the Project life for each mine component.

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## A5.3.3 Blast Design

**Table A5.5** lists the design parameters for an indicative ore and waste rock blast. The design for both types of blasts would be regularly reviewed in light of the monitoring data assembled for all blasts.

	-	
Parameter	Typical Waste rock Blast Design	Typical Ore Blast Design
Bench Height	5m (5.5m with sub-drill)	5m (5.5m with sub-drill)
Burden and Spacing	4.6m x 4.9m	3.3m x 3.6m
Stemming	1.9m (aggregate)	2.0m (aggregate)
Hole Diameter	152mm	127mm
Number of Holes	Typically 220 holes	Typically 220 holes
Holes per Delay	Typically 4 holes	Typically 3 holes
Explosive Type	Wet (bulk emulsion), Dry (ANFO) <sup>1</sup>	Wet (bulk emulsion), Dry (ANFO) <sup>1</sup>
Effective Powder Factor	Typically 0.48kg per bcm <sup>2</sup>	Typically 0.65kg per bcm <sup>2</sup>
Maximum Instantaneous Charge (MIC)	Typically 216kg	Typically 117kg
Note 1: ammonium nitrate fuel oil (AN	IFO).	•
Note 2: bank cubic metre (bcm).		
Source: SLR (2020) – Table 51		

 Table A5.5

 Indicative Waste Rock and Ore Blast Design Parameters

## A5.3.4 Annual Production

**Table A5.6** provides a summary of the indicative quantities of ore, low grade ore and waste rock (NAF and PAF) to be extracted (in tonnes) during each year of operation. The maximum quantity of ore extracted annually would be approximately 2.07 million tonnes (in Year 6).

**Figure 2.7** displays the sequential development of the open cut pits during the Project life. Essentially, mining operations would commence within the northeastern side of the main open cut pit and gradually proceed westward and deeper.

## A5.3.5 Mobile Equipment

**Table A5.7** lists the number, types and indicative models of the earthmoving equipment to be used within the open cut pits to deliver the ore to the ROM pad and the waste rock types to their respective locations.

Distinction is made with respect to the number of items of equipment that would be used during the day-time (7:00am to 6:00pm), evening (6:00pm to 10:00pm) and night-time (10:00pm to 7:00am). The number of items of equipment would vary given the need to contain noise during the evening and night-time periods, particularly when temperature inversions are present.

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		Ore (t)		Waste				
		Low Grade		Non-Acid	Potentially-Acid			
Year	Ore	Ore*	Oxide Ore	Forming <sup>1</sup>	Forming <sup>2</sup>	Total		
SE&CS	113 722	27 212	94 467	3 886 107	1 201 545	5 323 052		
1	1 744 717	260 511	293 439	927 755	2 773 578	6 000 000		
2	1 908 260	228 710	237 645	2 433 037	1 192 348	6 000 000		
3	1 702 839	411 050	338 161	2 057 928	1 490 023	6 000 000		
4	1 955 782	575 512	96 984	1 712 068	1 659 655	6 000 000		
5	2 010 709	505 487	-	1 601 690	1 882 114	6 000 000		
6	2 070 259	504 965	1 463	1 109 668	1 313 645	5 000 000		
7	2 048 673	435 549	144 594	909 633	1 408 766	4 947 215		
8	1 477 833	368 361	255 872	1 720 556	1 177 379	5 000 000		
9	498 246	203 257	263 882	2 381 835	1 652 780	5 000 000		
10	1 313 773	338 695	56 406	807 046	2 484 080	5 000 000		
11	1 377 297	474 018	-	200 188	2 948 498	5 000 000		
12	1 679 457	568 307	-	49 706	2 702 531	5 000 000		
13	1 661 617	427 979	-	19 573	1 413 339	3 522 508		
14	1 501 122	498 878	-	588	1 061 239	3 061 827		
15	769 451	230 549	-	-	221 093	1 221 093		
Total	23 833 753	6 059 040	1 782 913	19 817 378	26 582 611	78 075 696		
* Low grad	le ore treated in ad	dition to ore when	required	SE&CS =	site establishment and	construction stage		
1 <0.3% S	ulphur content – Fr	esh, <0.3% Sulphu	ur content – Oxide,					
2 >0.3% S	2 >0.3% Sulphur Content							

Table A5.6 **Estimated Annual Waste Rock and Ore Production** 

Source: AMC Consultants Pty Ltd

### Table A5.7

## Indicative Mobile Equipment List – Mining and Processing Operations and TSF Raises

Equipment				St	ages 1 and	2
Туре	Ref. Model Function			Day	Evening	Night
Hydraulic Drill	Dr	Pv275	Blast hole drilling	2	1 or 2	
Excavator	Ex	190t (EX1900)	Loading ore/waste rock	1	1	1
Haul Truck**	ΗT	777G (XQ)	Hauling ore/waste rock	4	3 or 4	3 or 4
Grader	G	16M (XQ)	Haul road maintenance	2	1	1
Front-end Loader	Fel	988K (XQ)	Loading NAF waste rock	1		
Bulldozer	В	D9	Spreading waste rock/land clearing	2		
Articulated Truck	AT	40t	Soil transfer	2		
Fuel Truck	FT	Road Truck	Fuel for equipment	1		
Service Truck	ST	Road Truck	Mobile vehicle support	1		
Water Truck	WT	Road Truck	Dust suppression	1	1***	1***



						Page 2 of 2	
Equipment				St	ages 1 and	2	
Туре	Ref.	Model	Function	Day	Evening	Night	
			Processing Operations				
Bulldozer	В	D10 (XQ)	Shaping delivered ore	1			
Front-end Loader	Fel	988K (XQ)	Loading hopper above primary jaw crusher	1	1		
Rock Breaker	RB	336DL	Breaking over-size rock	1			
Tele-handler	Т		General operations	1			
Container-lifter	CL		Loading trucks with containers	1			
	TSF Raises (Year 3 (29 weeks) and Year 8 (41 weeks))						
Mobile Crusher	CS	McCloskey J40 & S80	Crushing NAF Waste Rock	1			
Haul truck	HT	35t	Transfer of crushed rock for TSF	2			
Bulldozer	В	D9R	Shaping of materials for TSF	2			
Vibrating Roller	R	C554XT	Compacting materials for TSF	1			
Water truck	WT	Road Truck	Dust suppression	1			
Excavator	Ex	40t	Feeding crusher and loading haul trucks	1			
B-double Truck	RT	Freightliner Coronado 114	NAF waste rock transfer to TSFs	3*			
Day = 7:00am - 6:00p	om	Even	ing = 6:00pm – 10:00pm	1	Night = 10:00p	m – 7:00am	
* It is envisaged that the 3 trucks would undertake two return trips per hour between the main open cut pit NAF stockpile and							

## Table A5.7 (Cont'd)

Indicative Mobile Equipment List – Mining and Processing Operations and TSF Raises

aged that the 3 trucks would undertake two return trips per hour between the main open cut pit NAF stockpile and the TSF

\*\* The number of haul trucks operating would reflect the travel distance from the ore in the open cut pit to the ROM pad

\*\*\* The water truck would only operate when a maximum of three haul trucks are operational to ensure no more than four trucks are operating concurrently

#### A5.4 WASTE ROCK MANAGEMENT

#### A5.4.1 Introduction

Details of waste rock characterisation and quantities/proportions of NAF and PAF waste rock within the open cut pits is presented in Sections 2.5.2 and 2.5.3.

#### A5.4.2 Waste Rock Characterisation

Table A5.8 presents a breakdown of the annual volumes (thousand loose cubic metres [klcm] and thousand tonnes [kt]) of the various waste rock sub-classifications that are described above and which are anticipated to be extracted from the open cut pits throughout the Project life.



	Weathered Zone				Primary Zone					Totals		
	WZ1 (NAF)		WZ2 (PAF)		PZ1 (NAF)		PZ2 (NAF)		PZ3 (PAF)		All Waste Rock	
Year	kt	klcm	kt	klcm	kt	klcm	kt	klcm	kt	klcm	kt	klcm
SE&CS	3 618	2 167	811	486	90	49	178	97	390	212	5 088	3 010
1	349	209	778	466	50	27	529	287	1 995	1 084	3 701	2 074
2	1 655	991	517	309	266	145	512	278	676	367	3 625	2 090
3	912	546	272	163	666	362	479	260	1 218	662	3 548	1 994
4	74	44	76	46	475	258	1 163	632	1 583	861	3 372	1 841
5	0	0	3	2	465	252	1 137	618	1 879	1 021	3 484	1 894
6	35	21	4	2	396	215	679	369	1 310	712	2 423	1 319
7	152	91	219	131	192	104	566	308	1 190	647	2 318	1 280
8	1 459	874	381	228	125	68	137	74	797	433	2 898	1 677
9	1 668	999	856	513	480	261	234	127	797	433	4 035	2 332
10	88	53	142	85	283	154	436	237	2 342	1 273	3 291	1 801
11	0	0	0	0	28	15	173	94	2 948	1 602	3 149	1 711
12	0	0	0	0	0	0	50	27	2 703	1 469	2 752	1 496
13	0	0	0	0	0	0	20	11	1 413	768	1 433	779
14	0	0	0	0	0	0	1	0	1 061	577	1 062	577
15	0	0	0	0	0	0	0	0	221	120	221	120
Total	10 009	5 994	4 058	2 430	3 516	1 911	6 292	3 420	22 524	12 241	46 400	25 996
Source:	AMC Consultants Pty Ltd SE&CS = site establishment and construction stage						ion stage					

Table A5.8 Estimated Annual Waste Rock Production

## A5.4.3 Waste Rock Quantities

**Table A5.9** lists the annual quantities in thousand tonnes [kt] and volumes in thousand loose cubic metres [klcm] of NAF waste rock to be produced annually together with the locations where these materials would be utilised or stored.

## A5.4.4 Waste Rock Emplacement Design Elements

The WRE design has been prepared by Advisian whose report is included as Part 16B in the Specialist Consultant Studies Compendium. The layout and section through the WRE is displayed in **Figure 2.8**. The following design elements of the WRE have been included for the purpose of waste rock management, Mine Site access and environmental management.



	Total Quantity Produced (NAF)*	TSF Construction	TSF Cover and Capping	WRE Construction	WRE Cover and Capping	Back Filling	Southern Barrier	
Year#	kt (annual)	kt	kt	kt	kt	kt	Kt	
SE&CS	3 886	2 042	0	564	309	0	970	
1	928	720	0	46	424	0	-262	
2	2 433	720	20	18	130	0	1 545	
3	2 058	720	0	0	83	0	1 255	
4	1 712	614	0	0	208	0	895	
5	1 602	614	0	1	143	0	844	
6	1 110	614	0	0	119	0	376	
7	910	614	0	0	119	0	176	
8	1 721	614	0	0	119	0	987	
9	2 382	0	0	0	119	0	2 262	
10	807	0	0	0	119	600	88	
11	200	0	0	0	119	600	-519	
12	50	0	0	0	119	683	-753	
13	20	0	0	0	119	0	-100	
14	1	0	336	0	119	0	-455	
15	0	0	2 582	0	121	0	-2 703	
Closure	0	0	2 838	0	0	0	-2 838	
Total	19 817	7 273	5 776	624	2 492	1 883	1 768	
# Processing Year SE&CS = site establishment and construction stage								
Source: * AMC Consultants Pty Ltd **ATC Williams Pty Ltd *** Advisi								

Table A5.9 Annual Utilisation / Storage of NAF Waste Rock

## Internal Drainage and Leachate Management Dam

A leachate drainage system would be installed prior to the delivery of the first PAF waste rock to collect the low pH liquor generated by the ingress of incident rainfall that would percolate into the PAF waste rock emplaced in the WRE. The leachate drainage system would extend to the lowest point in each developed or active cell and adjacent to the intercell embankment that would delineate the progressive extent of each development cell. All drainage would then be transferred through the intercell embankment to a temporary collection sump that would be constructed in the subsequent cell. The drainage collected in the collection sumps would be transferred via pipe to the leachate management dam for subsequent use in the processing circuit.

The leachate management dam would be located adjacent to an approximately 300m section of the southern perimeter of the WRE. The leachate management dam has been positioned such that the downstream toe of the dam embankment is above the modelled water level of the probable maximum flood event (WRM, 2020).



The design of the leachate management dam incorporates a 1.5mm thick HDPE low permeability liner that would be anchored to the embankment of the dam, which would have a crest elevation of 578m AHD. The embankment would be constructed from material excavated to form the storage area within the leachate management dam to achieve a consistent floor elevation of 574m AHD. The maximum storage volume of the leachate management dam would be 65ML, sufficient to contain the 72 hour 1% AEP (100 year) design rainfall event, assuming a runoff coefficient of 1.

Should a rainfall event be of sufficient volume to achieve the maximum storage volume of the leachate management dam, this would result in a maximum water level of 577m AHD, thus retaining a minimum 1m freeboard between the water level and the crest of the leachate management dam. The leachate management dam would be hydraulically connected to either the in-pit dewatering sump or the dewatering pond via pumping and transfer infrastructure that would facilitate the active management of leachate volumes and the subsequent maintenance of the minimum freeboard, thus preventing uncontrolled discharge from the leachate management dam.

However, in reality, it is anticipated that during operations, all inflow to the leachate management dam would be routinely pumped for use in the processing circuit so as to maximise the efficient use of water resources, reduce losses through evaporation and reduce the risk of uncontrolled discharge from the dam.

## Liner

The base of the WRE would comprise a 1.5mm thick, low permeability HDPE liner that would be installed as each cell is constructed and anchored to the upper and lower WRE perimeter embankments in an anchor trench (see **Figure A5.4 A** and **C**). In addition, the liner would be anchored to the intercell embankments that would be constructed internally within the WRE footprint to delineate the respective cell (see **Figure A5.4 D**) being developed and to segregate clean runoff from leachate generated in the active WRE cell that would be transferred via pipe to the leachate management dam.

The liner would be double welded so as to enable the testing of the seams for quality control, prior to commissioning of the respective cell and subsequent placement of waste rock. The liner would be underlain by a geotextile fabric with similar material being installed immediately over the liner as well. A 0.5m thick protective layer of crushed or screened rock (PAF) would then be placed above the geotextile and liner to provide protection (cushioning) from damage during the placement of the PAF waste rock during operations.

## **Upper Embankment**

As noted above, the upper embankment would provide the upper anchor point for the WRE liner and which would effectively define the western limit of the WRE. The upper embankment crest would generally be positioned along the western edge of the ridge that is located east of the main open cut pit although this alignment alters in the northern and southern sections of the WRE, where the upper embankment turns east and west respectively, to tie with the lower embankment.



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The upper embankment would be fully constructed during the site establishment and construction stage of the Project, using either excess material generated from the bulk earthworks activities or from NAF waste rock generated at the commencement of development for the main open cut pit. The crest of the upper embankment would be 1.5m high and 8m wide. The crest would be covered with a gravel wearing course so that it may also provide for vehicle access for the inspection and development of the WRE. The outer slope of the upper embankment would remain permanently exposed, forming the base of the WRE face over which runoff from the vegetated store and release cover would flow and subsequently drain away from the WRE. A typical section of the layout of the upper embankment is shown on **Figure A5.4 C**.

## Lower Embankment

Similar to the upper embankment, the lower embankment would be constructed in its entirety during the site establishment and construction stage of the Project using NAF material generated from the initial development of the main open cut pit. The lower embankment would separate the WRE from the perimeter haul road and would define the eastern, northern and southern limits of the WRE. As the lower embankment would provide the lower anchor point for the liner it would provide for the containment of leachate generated within the WRE and also direct leachate to the leachate management dam for storage and recycling through the processing circuit.

The location of the lower embankment in the valley of both Price Creek and Hawkins Creek has been informed by hydraulic modelling which defined the envelope of the modelled probable maximum flood event (WRM, 2020). Whilst the toe of the lower embankment is generally outside of this modelled flood envelope, some encroachment does occur on the southeastern perimeter of the lower embankment. Whilst the modelled water depth and velocities are low, upon closure and removal of the haul road and bunds, the downstream toe of the lower embankment would incorporate rock protection (300mm to 600mm rock). Following closure and rehabilitation, the outer slope of the lower embankment would remain permanently exposed, forming the base of the final WRE landform face over which any runoff from the vegetated store and release cover would flow. A typical section of the layout of the lower embankment is shown on **Figure A5.4 A** and **B**.

## Intercell Embankments

The progressive nature of the development of the WRE requires the development of six intercell embankments that would be constructed to delineate the limit of each cell. The intercell embankments would also provide anchor points for the HDPE liner and assist with managing the internal drainage of leachate and stormwater within each cell. As the intercell embankment would tie into the lower and upper embankments, the crest height of the intercell embankment would vary. A typical section of intercell embankment is shown on **Figure A5.4 D**.

## Haul Road

A 15m wide lower embankment haul road, incorporating a 500mm thick gravel wearing course would be constructed from NAF material adjacent to the downstream toe of the lower embankment during the site establishment and construction stage of the Project. The lower embankment haul road would be used as a two way haul route for the transportation of PAF waste rock to the active WRE cell, as well as for the haul of NAF waste rock for use in the construction of all the cells required for WRE development. The western sections of the lower embankment haul road would also provide for access to the southern barrier and oxide ore stockpile.



## **Flood Protection Bund**

As the lower embankment haul road would infrequently extend into the modelled probable maximum flood level (WRM, 2020) in certain sections of the Price Creek valley a flood protection bund has been incorporated into the lower embankment haul road design to protect the lower embankment haul road and the WRE so as to provide on average, an approximate 3m freeboard between the crest of the flood protection bund and the modelled water level. The flood protection bund would be constructed from NAF waste rock and have an upstream slope of 1: 2.5 (V:H) and downstream slope of 1:2 (V:H). The downstream face would also incorporate rock protection (300mm to 600mm rock). However, during rehabilitation and closure of the WRE, the lower embankment haul road and flood protection bund would be removed, thus keeping the final landform of the WRE out of modelled flood extent.

## **Noise Barrier**

In addition to the flood protection bund that would be constructed along the entire alignment of the lower embankment haul road the southern extents of the haul road would also incorporate a 5m high noise barrier to ameliorate noise generated by vehicles travelling along the haul route. This would lower the noise levels experienced by those residents located to the south and southeast of the WRE. Similar to the flood protection bund, which would essentially underlie the noise barrier in those where the noise barrier would be constructed, the upstream slope would be 1:2.5 (V:H) whilst the downstream slope would be 1:2 (V:H) and would also incorporate rock protection (300mm to 600mm rock).

An additional benefit of the noise barrier is that it provides additional flood protection for the WRE in the Hawkins Creek floodplain such that the average freeboard above the modelled water level for the probable maximum flood would be in the order of 4.5m. During rehabilitation and closure of the WRE, the noise barrier would be removed along with the lower embankment haul road and flood protection bund.

## A5.4.5 Southern Barrier

## A5.4.5.1 Introduction

**Figure 2.10** displays the layout of the southern barrier with the design of the initial and extended barriers. This subsection provides an overview of the activities that would be undertaken to construct the southern barrier.

## A5.4.5.2 Construction

All NAF waste rock would be transported to the southern barrier using haul trucks that would exit the main open cut pit via the eastern exit ramp and onto the lower embankment haul road. NAF waste rock would be placed in zones that would separate the WZ1 waste rock from the PZ1 and PZ2 waste rock. Similar to the WRE, the progressive development of the southern barrier would involve the placement of NAF waste rock in 10m lifts that would be comprised of 2m high layers that would subsequently be compacted to achieve an approximate density of 2t/m<sup>3</sup> for stability. Each lift would be initially developed with a perimeter noise bund wall constructed on its outer face.



## Initial Barrier Construction

The initial barrier would be developed over a period of approximately 6 years (site establishment and construction stage to Year 5) using NAF waste rock extracted from the main open cut pit. The objective of the initial barrier is to mitigate noise generated from mining activities propagating towards the south, limit visibility of operating equipment and permit access to the soil stockpiles on the ridges west of the main open cut pit for WRE rehabilitation. Based on the availability of NAF waste rock and, in order to achieve the required elevation whilst maintaining suitable grade for the access road, the indicative development of the initial barrier would occur as follows.

- 1. Placement of larger blocks of NAF waste rock across the low point of Blackmans Gully to allow the passage of runoff that has been generated from clean or sedimentladen catchments and which would subsequently be intercepted by water management infrastructure for capture and treatment.
- 2. Placement of NAF waste rock in the small valley south of the main open cut pit, between Blackmans Gully and the WRE to provide the ramp for the access road from the lower embankment haul road.
- 3. Continued placement of NAF waste rock in Blackmans Gully to complete the initial barrier across Blackmans Gully to reach a crest elevation (including noise barrier) of 640m AHD.

Whilst the initial embankment is a key component to manage the potential visual impacts of the mining operations, the NAF waste rock utilised for its construction would be recovered for use in rehabilitation and closure activities therefore resulting in the removal of this embankment at the end of the Project life.

## **Extended Barrier Construction**

The extended barrier would be developed on the southern side of the initial barrier for the subsequent stockpiling of NAF waste rock for use during rehabilitation and closure activities.

NAF waste rock would be extracted from the open cut pits between Year 6 and Year 14 with the construction of the extended barrier being undertaken in the following manner to store the anticipated 3.9 million tonnes of NAF waste rock.

- NAF waste rock would be transported using haul trucks, spread and compacted by a bulldozer into 2m layers that would result in 10m lifts progressing from the southern-most extent of the extended barrier, approximately 180m south of the toe of the initial barrier.
- stockpiling of NAF waste rock in each respective lift would commence with the construction/installation of a raised barrier at the southern extent of the lift so as to mitigate noise and dust impacts arising from the placement of the material.
- sequential lifts would continue until the final elevation of 625m AHD is reached.

The southern external face of the extended barrier would be progressively rehabilitated as each 10m lift is completed (see Section A5.10.4).



As noted above, as all stockpiled material would be utilised for rehabilitation and closure activities, the extended barrier would be fully removed during rehabilitation and closure activities.

## A5.5 LOW GRADE AND OXIDE ORE STOCKPILES

## A5.5.1 Low Grade Ore Stockpile

**Figure 2.11** displays the layout and sections through the low grade ore stockpile and Section 2.6.1 provides details of the low grade ore and the design of the stockpiles. This subsection presents information on the construction of the low grade ore stockpiles

Low grade ore extracted from the main open cut pit during the initial 2 years of operations would be transported by haul trucks to the western section of the low grade ore stockpile via the eastern haul road. Approximately 300 000m<sup>3</sup> of NAF waste rock are required to develop the perimeter embankment and pad for the western section, which would also require the installation of a 1.5mm HDPE liner that would be anchored to the perimeter embankment and connected to the liner that would underlie the eastern section. The western section of the low grade ore stockpile would be developed during the site establishment and construction stage using the material excavated during the bulk earthworks to develop the processing plant site.

Once the western section reaches its full capacity (0.4Mm<sup>3</sup>), all low grade ore extracted from the open cut pits would be hauled to and placed within the eastern section of the low grade ore stockpile that would be developed on the WRE.

The construction of the low grade ore stockpile would be undertaken in the following manner.

- Low grade ore would be placed in 2m layers for compaction that would result in 10m lifts progressing from the lowest elevation of the respective section to the final elevation at 670m AHD.
- Western section: the stockpiling of low grade ore would commence at the southwestern end and progress eastward until completed.
- Eastern section: the stockpiling of low grade ore would commence at the northern end of the eastern section (i.e. above Cell 1 of the WRE) and progress southward until completed.

Low grade ore placed on the low-grade ore stockpile would be periodically reclaimed as and when required for processing.

It is noted that any low grade ore stockpiled within the low grade stockpile area that is not processed at the end of the mine life would be capped and covered as part of the WRE closure and rehabilitation activities and shaped to produce the final WRE landform (see Section A5.10.5).



## A5.5.2 Oxide Ore

Oxide ore would be extracted from the open cut pits between Year 1 and Year 11. The construction of the oxide ore stockpile would be undertaken in the following manner.

- Oxide ore would be placed in 2m layers for compaction that would result in 10m lifts progressing from the southern-most extent of the stockpile of the initial lift to the final elevation of 600m AHD.
- Stockpiling of oxide ore in each respective lift would commence with the construction/installation of a raised barrier at the southern extent of the lift so as to mitigate noise and dust impacts arising from the placement of the material.

It is noted that any oxide ore stockpiled that is not processed at the end of the Project life would be capped and covered as part of the WRE closure and rehabilitation activities and integrated with the final WRE landform (see Section A5.10.5).

## A5.6 PROCESSING OPERATIONS

## A5.6.1 Introduction

Section 2.7 presents the processing plant design and process flowsheet together with the process water and reagent management. This subsection provides information on the stockpiling, crushing and grinding of the ore, details of the concentrate handling and the list of mobile equipment to be used within and around the processing plant.

## A5.6.2 Processing Plant and Mining Facility Development

Civil works to allow the construction of the processing plant and mining facility to commence would involve vegetation clearing (seed, fence post and wood recovery), topsoil and subsoil removal and storage and the excavation/placement (i.e. cut and fill) of the required landforms for the various mine infrastructure components. **Figure A5.5** displays the extent of earthworks proposed to create the six pads for the processing plant, mining facility, ROM pad and crushed ore stockpile (varying in elevation from 623.3m AHD to 661.3m AHD). When necessary, specific construction materials would be imported from local sources or drawn from stockpiles of crushed and screened construction materials produced on site.

The raw water pond would be constructed immediately south of the grinding and milling area as part of the civil works program (see **Figure A5.5**). Material excavated for the raw water pond would be used to form the compacted walls of this structure. The raw water pond would store water received from the decant return from the TSF, with its capacity of 8ML designed to maintain processing operations and concentrate production for a period of approximately four days.



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Y:Jobs 001 to 530\429\Post 29 June 2016\Reports\42924\_EIS\_2019\CAD\429BaseMGA55.dwg\_A5.5 Bulk Earthworks-13.12.2019-4:12 PM MN Mine Site Administration Entrance and Office Area Security Gate 655 Mine Access Road 660 670 +651.7 650 eno 655 +657 84 NAF Waste Rock Haul Road 656 6,45 Waste Rock Emplacement (Cell 1) 650 Mining Facility Processing Crushed Plant Ore Stockpile +629.5 +656.4635 +660 Raw Water **Open Cut Pit** Pond Dewatering Pond 630 -650 655 +661.3 Upper Embankment Haul Road +644 Jaw **ROM** Pad Crusher +633.9 +623.3 Stage 1 Low Grade Ore Stockpile S 625 **ROM Haul** Road 64 030 630 Main Open Cut Pit 30 REFERENCE Existing Contour (m AHD) (Interval = 2m) **Proposed Component** 640 Design Contour (m AHD) (Interval = 1m) Mine Access Road -640---Spot Height (m AHD) Pad Boundary +663.9 Open Cut Pit Watercourse / Drainage Line Stage 1 Low-grade Ore Stockpile Area Waste Rock Emplacement Cut / Fill **Shipping Containers** -Figure A5.5 SCALE EARTHWORKS FOR THE PROCESSING 50 0 50 100 150 200 250 m

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Source: GR Engineering Services

PLANT AND MINING FACILITY

A 1ML capacity dewatering pond of similar construction to the raw water pond would be constructed at the southeastern corner of the mining facility (see **Figure A5.5**) as part of the civil works program for the storage of water pumped from the open cut pits and the leachate management dam. The open cut pit dewatering pond would receive water pumped from sumps located in the floors of the open cut pits that would collect seepage and direct rainfall from the pit floor.

The planned excess excavated material from the earthworks within the processing plant and mining facility would be placed within the footprint of Stage 1 of the low grade ore stockpile area (see **Figure A5.5**) to establish a pad for this stage of the low grade ore stockpile (see Section 2.6).

Once the earthworks are completed, footings/foundations for the various mechanical plant items or infrastructure would be poured and erection/installation activities commenced. Concrete would be produced on site using a mobile concrete batching plant.

The construction of the processing plant and mining facility would involve the following.

- The assembly of the key components manufactured off site and transported to site in numerous pieces.
- The placement or construction of the various buildings and structures required to support the mining and processing operations.
- The on-site manufacture of specific components to complement the key mechanical plant components.
- The installation of all necessary electricals, communications and plumbing.

During the final stages of construction of the processing plant, Bowdens Silver would progress to commission the plant.

## A5.6.3 ROM Stockpiling and Primary Crushing

All ore would be transported from the open cut pits to the ROM pad by haul trucks where the ore would be placed in a series of longitudinal stockpiles (referred to as "fingers") which would be shaped by a bulldozer. A front-end loader would be used to transfer the ore from the longitudinal stockpiles to the 150t live capacity ROM feed bin. The ore would be selected from the stockpiles in a manner that would maintain a relatively consistent silver grade. Any oversize ore (>700mm) would be separated and reduced in size on a campaign basis using a hydraulic rock breaker. Size reduction of oversize ore would be conducted in a location on the ROM pad suitably shielded by surrounding ore stockpiles so as to manage noise generated by this activity.

From the ROM feed bin, ore would be fed by apron feeder into the single toggle primary jaw crusher which would reduce the size of the ore to a nominal 80% <109mm and 100% <231mm. It is anticipated that the primary crushing circuit would have a design throughput of approximately 270 tonnes per hour (tph). It is currently planned that the primary jaw crusher would operate with approximately 84% availability. The primary crushed ore would be stored in a crushed ore stockpile prior to being fed into the milling circuit. The crushed ore stockpile would have a live capacity of 6 000t which would be sufficient for approximately 1 day's operation of the milling circuit.



## A5.6.4 Milling and Pebble Crushing

The milling circuit has been designed to treat approximately 250tph for approximately 8 000 hours per year or 90% of available hours. Primary crushed ore would be conveyed from the crushed ore stockpile, combined with water to form a 56% solids slurry, and fed into the semi-autogenous grinding (SAG) mill. The SAG mill would have a 7.5m (inside shell) diameter with an effective grinding length of 3.5m. The SAG mill would utilise 100mm to 125mm diameter steel balls as the grinding media. Once within the SAG mill, the primary crushed ore would be ground to reduce the ore to a size  $\leq$  10mm.

Ground ore from the SAG mill would pass through a trommel screen with ore >10mm conveyed to the pebble crushing circuit (a cone crusher) and crushed to reduce the size of the ore to  $\leq$  10mm prior to being returned back to the SAG mill for regrinding.

Material passing through the SAG mill trommel screen would be pumped to a hydro-cyclone cluster to classify the ore with approximately  $80\% < 106\mu$ m. The hydro-cyclone underflow (approximately 65% solids) would gravitate to the ball mill feed chute. The ball mill would have an inside shell diameter of 5m with an effective grinding length of 7.5m. The ball mill would utilise 50mm to 65mm diameter steel balls as the grinding media. Output from the ball mill would pass through a trommel screen with material passing being returned to the hydro-cyclone cluster and mixed with the material passing the SAG mill circuit. Hydrated lime or soda ash slurry would be added to the ball mill output to maintain the optimum pH level.

Any remaining oversize material from the ball mill trommel would be placed in a scats bunker prior to removal and disposal within the WRE or recycled to the mill for regrinding.

The hydro-cyclone overflow would be the final ground product of the milling and pebble crushing circuit. The overflow would be screened to remove trash and then gravitate to a conditioning tank prior to flotation. A solution of zinc sulphate and sodium cyanide would be added to the milled ore in the conditioning tank to reduce the potential for sphalerite ((Zn, Fe) S) and pyrite (FeS<sub>2</sub>) minerals to float in the lead flotation circuit.

The SAG mill and ball mill would be located within a building approximately 36m x 28m and 10m high.

The crushing and grinding circuits would be remotely monitored and controlled from the control room.

## A5.6.5 Flotation Circuits

The milled ore would be pumped as a slurry from the conditioning tank to the silver/lead flotation circuit to extract the target minerals. The flotation process would utilise the different hydrophobic surface properties of minerals to attach them to air bubbles through the addition of reagents. The milled ore slurry would be sequentially processed via the following two flotation circuits, i.e. through the silver/lead circuit followed by the zinc circuit.

• Silver/Lead Flotation Circuit – The silver/lead flotation circuit would comprise conditioning, rougher flotation and then directing the rougher concentrate through a regrind mill circuit to further liberate silver and lead minerals. Cyclone underflow would be reground and subsequently report to the mill discharge hopper and be combined with the cyclone overflow. The reground slurry would be pumped from

the mill discharge hopper to the two-stage, six-cell cleaning flotation circuit to upgrade the silver and lead content of the concentrate to saleable grade. Flotation reagents (frother, lead collector and depressants) would be added to assist the silver/lead flotation process and suppress the zinc in the slurry. The two-stage cleaning / flotation process would yield the final silver/lead concentrate which would be pumped to the silver/lead concentrate dewatering circuit. The remaining silver/lead component would be combined with the rougher silver/lead material and subsequently pumped to the zinc flotation circuit for production of zinc concentrate.

• Zinc Flotation Circuit – The zinc flotation circuit would follow a similar process pathway to the silver/lead flotation circuit. The slurry from the silver/lead flotation circuit would be pumped to an agitated conditioning tank and then to the zinc rougher flotation cells. Flotation reagents, (zinc collector, frother and hydrated lime/soda ash) would be added to assist the zinc flotation process. Rougher concentrate would be pumped to the regrind mill circuit to further liberate the zinc minerals. Cyclone underflow would be reground and subsequently report to the mill discharge hopper and combined with the cyclone overflow. The reground slurry would be pumped from the mill discharge hopper to the two-stage cleaning/flotation circuit. The final zinc concentrate would be pumped to the zinc flotation circuit would be pumped to the tailings thickener to recover process water for recirculation and reuse in the process circuit. Thickened tailings would subsequently be pumped to the TSF.

Both flotation circuits would include on-stream analysis to provide real-time assay data which would be displayed in the control room.

Tailings from the flotation circuits would be pumped to the tailings thickener where flocculant would be added to assist fine particle settling. The thickened tailings underflow (approximately 56% solids by weight) would be pumped to the tailings storage facility (TSF) for storage and further water (decant) recovery. Recovered water from the TSF would be collected at a floating pontoon and pumped to the plant process water tank for re-use in the processing plant. Further information on the TSF is provided in Section 2.8.

Test work undertaken for the Project's Feasibility Study established that concentrations of free cyanide and weak acid dissociable cyanide in the tailings would be <3mg/L and 7mg/L respectively. The 7mg/L concentration for weak acid dissociable cyanide is substantially lower than the EPA's limit for NSW mines of  $30mg/L^5$ .

## A5.6.6 Concentrate Thickening and Filtration

Both the silver/lead and zinc concentrates would be pumped to separate thickeners and flocculant added to assist the settling of fine particles. Thickened underflow would be pumped to a concentrate storage tank and then filtered to produce a filter cake suitable for bagging and transport. The filter cake for both concentrates would contain approximately 10% moisture. All filtrate recovered by the dewatering process in the silver/lead and zinc filter circuits would be returned to the concentrate thickener of each respective circuit.

<sup>&</sup>lt;sup>5</sup> The 30mg/L limit is drawn from Condition L2.4 within EPL 20169 for the Tomingley Gold Mine, near Peak Hill.

## A5.6.7 Concentrate Handling

The silver/lead filter cake would be placed into 2t capacity sealed bulk bags and loaded into 6.1m shipping containers with a net capacity of 22t prior to despatch from the Mine Site.

The zinc filter cake would be placed in bulk into sealed 6.1m containers each with a net capacity of approximately 22t and stored prior to despatch from the Mine Site.

## A5.6.8 Mobile Equipment

**Table A5.10** lists the number, type and indicative models of mobile equipment to be used within and around the processing plant. The bulk of this equipment would operate throughout the day with some of the equipment used intermittently of an evening and/or night.

Equipment	1						
Туре	Ref.	Model	No.	Function			
Bulldozer	D	D10	1	Shaping delivered ore			
Front-end Loader	Fel	988F	1	Loading hopper above primary jaw crusher			
Rock Breaker	RB	336DL RB	1	Breaking oversize rock			
Truck 10t#	-	Isuzu FTR 150-260	1	Transporting consumables			
Truck 3t <sup>#</sup>	-	Isuzu NNR 65-150	1	Transporting consumables			
Forklift 3t#	-	Toyota 32-8FG30	2	Loading / unloading consumables			
Skid Steer Loader#	-	Toyota Huski 30-5SDK8	1	General operations			
Tele Handler 3t#	-	Manitou 1135	1	General operations			
Container Lifter#	-	Hyster 28-32	1	Loading containers onto trucks			
Tool Carrier <sup>#</sup>	-	Komatsu WA250P	1	Integrated tool carrier			
Mobile Crane 25t#	-	Terex MAC25	1	Miscellaneous lifting tasks			
Articulated Work Platform#		JLG450	1	Equipment maintenance			
* Not included in operational scenario as sound power levels are too low to contribute to predicted noise levels							
Source: GR Engineering Services Limited							

 Table A5.10

 Indicative Mobile Equipment List – Processing Operations

## A5.7 TAILINGS MANAGEMENT

## A5.7.1 Introduction

Section 2.8 describes the layout and design of the TSF while this subsection provides details of the characterisation of the tailings, the components of the TSF and its construction/operation. This information has been summarised from the Preliminary Design Report prepared by ATC Williams (ATCW (2020)).

## A5.7.2 Tailings Characterisation

## A5.7.2.1 Physical Characteristics

Laboratory testing was conducted on tailings samples derived from metallurgical test work in order to characterise the engineering properties of the tailings for the TSF design. The results of the test work indicated that the tailings properties vary with the ore type whilst the dry density of the tailings would vary with the depth of the deposited tailings within the tailings profile. The physical characteristics adopted for the TSF design, based on the results of the test work, are as follows.

- The tailings generated may be deposited as either a non-plastic, silty sand, comprising 42% fines or a low plasticity sandy clay, comprising 54% fines.
- Solids content: 56%
- Initial settled density: 1.04t/m<sup>3</sup>
- Settled density (Stage 1 TSF): 1.35t/m<sup>3</sup>
- Settled density: 1.6t/m<sup>3</sup>
- Tailings bleed (2Mtpa): 1 065m<sup>3</sup>/day<sup>6</sup>

Further tailings testing would be undertaken as part of the detailed design of the TSF and throughout the Project life to confirm or amend the adopted values presented above to manage the storage of the tailings in the impoundment and to manage the program of subsequent TSF embankment raises.

## A5.7.2.2 Geochemical Characteristics

Laboratory testing of the tailings solids samples derived from metallurgical test work was undertaken to establish the acid formation potential and to characterise the geochemical behaviour of the tailings. Details of the testing are provided in GCA (2020). The tailings samples were characterised by:

- Sulphide S values 0.63% to 1.1%;
- Carbonate C values 0.15% to 0.27%;
- Acid Neutralisation Capacity (ANC) 8 to14kg H<sub>2</sub>SO<sub>4</sub>/t; and
- Net Acid Generation (NAG) 13 to 19kg H<sub>2</sub>SO<sub>4</sub>/t.

The results of the test work program indicate that the tailings are classified as PAF due to the presence of trace/accessory sulphide minerals (e.g. pyrite and marcasite) and an absence of reactive carbonate minerals (e.g. calcite).

The water component of the tailings (decant) in the TSF would be neutral-to-alkaline (pH of 7 to 8), of low salinity (500-700 $\mu$ S/cm) with soluble manganese concentrations (10-30mg/L) and free cyanide and weak acid dissociable (WAD) cyanide of 3mg/L and 7mg/L respectively. With the

<sup>&</sup>lt;sup>6</sup> Tailings bleed is the difference between the volume of water in the tailings when discharged to the TSF at a solids concentration of 56% and the water retained in the tailings at the initial settled density (1.04t/m<sup>3</sup>).



exception of cyanide, hydrated lime and anti-scalant, the bulk of the chemical reagents required for processing would report to the produced silver/lead and zinc concentrates and would not be deposited as part of the tailings stream. Whilst hydrated lime and antiscalant are non-toxic, during tailings consolidation, some of the deposited cyanide would be converted to a stable form and retained in the tailings profile, whilst any cyanide remaining in liquid form would report to the decant pond. Cyanide present in the decant is anticipated to breakdown rapidly as the result of volatilisation, which would result in the loss of up to 90% of the cyanide present (NICNAS, 2010).

## A5.7.3 Tailings Storage Facility Components

The TSF would comprise the following principal components.

- Embankment (constructed in three stages)
- Impoundment
- Tailings discharge pipeline and three discharge points
- Decant Pond
- Water return system
- Emergency spillway
- Closure spillway

## **TSF Embankment**

The 56m high TSF embankment would be a zoned earth and rockfill embankment with an upstream low permeability geomembrane/clay zone (Zone 1) and a bituminous geomembrane liner (BGM) on the upstream face of the embankment and coarser material in the downstream zone (Zone 3) with an appropriate filter (Zone 2) between. The upstream Zone 1 would be constructed using in situ clay materials obtained within specific areas in the upstream portion of the TSF impoundment area. The downstream embankment Zone 3 would comprise benign waste rock from the main open cut pit. Details of the embankment are provided in ATCW (2020).

The embankment design would include a grout curtain beneath the toe of the upstream face of the embankment, to control and reduce seepage through the areas with more permeable rock. The bituminous geomembrane would be tied into the nominal 40m deep grout curtain to reduce seepage. Other seepage management methods, such as downstream seepage interception would also be utilised.

## **TSF Impoundment**

The TSF impoundment, covering an area of approximately 117ha, would be prepared through the compaction of either in situ or relocated clay to a minimum thickness of 0.45m across all areas below the maximum possible water level. ATC Williams (2020) has calculated the required thickness of compacted clay based upon the results of field tests of available clay and the required seepage rates to satisfy the EPA's requirements.



## **Tailings Discharge Pipeline**

Tailings would be pumped as a slurry from the flotation circuit to the thickener and onto one or more of the northern, central and southern tailings discharge points. Tailings delivery would be via a discharge pipeline at an average daily rate of approximately 4 300m<sup>3</sup> water with a solids content of approximately 56%. **Figure A5.6** displays the common pipeline from the processing plant and three separate pipelines together with the locations of the tailings discharge points into the TSF. The tailings discharge pipeline would be HDPE, approximately 250mm outside diameter and placed on the ground surface.



In order to manage the risk of pipeline failure, the tailings pipeline would be positioned in a manner that utilises local topography where possible, to direct any spill flowing from the tailings pipeline towards the TSF via gravity. In those areas where local topography or other factors prevent the pipeline being positioned in the above manner, the tailings pipeline would be located in a bunded corridor that would collect and contain any spill. Within this corridor, any spill would be contained within scour sumps that would have sufficient capacity to contain any spill for a period of time that is equal to the time taken to respond to a pressure drop (recorded at the control room). The pipeline would be shut down until such time as the cause can be investigated and, if required, any repairs made and the pipeline checked before tailings transfer resumes.


#### **Decant Pond**

Water separating from the tailings solids would report to a decant pond adjacent to the TSF embankment. The pond level would fluctuate both seasonally and annually with the maximum decant pond volume of approximately 1.4Mm<sup>3</sup> (end of Stage 1), 1.7Mm<sup>3</sup> (end of Stage 2) and 1.7Mm<sup>3</sup> (end of Stage 3) (WRM, 2020 – Table 5.7). **Figure A5.6** displays an indicative area of the decant pond. During commissioning of the water supply pipeline and the processing plant, as well as the ramp up to processing operations, all water from the water supply pipeline would be pumped to the turkeys nest dam, some of which would be pumped to the decant pond for storage.

The TSF decant pond would be lined with low hydraulic conductivity material to minimise seepage losses from the TSF impoundment. This material would comprise in situ clays that are mechanically worked and compacted to the required material specifications, as discussed earlier in this subsection. Generally, this would include moisture conditioning and compaction of approximately 0.45m of clay (with a permeability of  $5 \times 10^{-10}$  m/s) to meet the requisite engineering specifications within the impoundment area, i.e. equivalent permeability to 1m of  $1 \times 10^{-9}$  m/s.

#### Water Return System

A decant collection and recovery system, comprising a floating pontoon, pumps and pipeline would be installed for the return of decant water from the decant pond to the raw water dam for reuse in the process circuit. The return water pipeline would also be HDPE, approximately 200mm outside diameter and placed on the ground surface. Similar spillage controls to those proposed for the tailings discharge line would be adopted for the return water pipeline. Decant water would commence to be pumped to the raw water dam after approximately 6 months beyond which an average of approximately 2.6ML of water would be pumped daily.

#### **Emergency Spillway**

In accordance with ANCOLD (2012) Guidelines on Tailings Dams, an emergency spillway would be incorporated into the design of the TSF. Emergency spillways are required to cater for extreme weather events only and are not designed to discharge during the normal operational life of the TSF.

The emergency spillway would provide a discharge mechanism for storm flows from extreme storm events exceeding the design storage allowance capacity as determined by the Consequence Category. The spillway would accommodate the peak design discharge during the 0.00001% AEP equivalent to a 1 in 100 000 year rainfall event determined using the Australian Rainfall and Runoff (AR&R 2016) methodology for peak discharge estimation in NSW, along with the additional total freeboard requirements and design storage allowance.

Throughout the operational life of the TSF, an emergency spillway with the capacity to convey the peak design discharge during the design rainfall event would be maintained on the northern abutment of the TSF embankment which would direct flows to Walkers Creek downstream from the TSF embankment. The spillway would be constructed with suitable erosion protection and energy dissipaters.

The discharge capacity of the emergency spillway at each stage of the TSF would potentially be as follows.

• Stage 1:  $62m^{3}/s$ . • Stage 2:  $53m^{3}/s$ . • Stage 3:  $49m^{3}/s$ 

## **Closure Spillway**

The closure spillway for the TSF would be a permanent structure designed to accommodate the peak discharge from the final TSF catchment during the Probable Maximum Flood (PMF) in accordance with the ANCOLD (2012) Guidelines on Tailings Dams. The spillway would be constructed as part of the final raise of the TSF embankment, however, the spillway invert would ultimately be lowered at the end of the Project life to the top of the final cover on the surface of the impoundment. Additional controls such as energy dissipation and rock armouring would be incorporated downstream from the spillway to manage any discharge from the closure spillway.

## A5.7.4 Tailings Storage Facility Construction

The staged development of the TSF would comprise an initial starter embankment (Stage 1) followed by two subsequent downstream raises (Stages 2 and 3). The construction of the TSF would be undertaken in a manner that achieves the range of design parameters, such as earthquake loads for embankment stability, seepage containment/minimisation and storage containment for the combination of tailings decant water and rainfall runoff.

#### **Initial Starter Embankment**

The initial or Stage 1 starter embankment of the TSF would be constructed during the site establishment and construction stage and prior to the commencement of processing operations that would generate tailings. The Stage 1 embankment would provide adequate tailings storage capacity for the initial 3 years of processing operations and include all design requirements and considerations to accommodate the safe operation of the TSF over its operational life. The starter embankment would require approximately 2 042 000 tonnes of NAF waste rock and compacted clay.

The TSF construction activities to be undertaken during the site establishment and construction stage would involve the following.

- Removal of any ground cover vegetation from the footprint of the Stage 1 TSF embankment and impoundment area.
- Grouting of all remaining investigation, groundwater and sterilisation boreholes drilled in the area of the TSF.
- Stripping of topsoil and subsoil within the TSF impoundment and from the footprint of the TSF embankment, to be stockpiled for future reuse as part of subsequent embankment raises (subsoil) or site rehabilitation works (topsoil and subsoil).
- TSF Embankment foundation preparation involving the stripping of all material unsuitable for embankment foundations, cleaning the remaining surface of all fine and loose material and grouting, where required. Generally, the entire footprint of the TSF embankment would be stripped down to moderately to slightly weathered rock.
- Installation of curtain grouting adjacent to the upstream toe of the Stage 1 TSF embankment to control seepage through the foundation beneath the embankment.



- The TSF impoundment foundation preparation within the maximum decant pond area involving ripping, moisture conditioning and compaction of approximately 0.45m of clay (with a permeability of  $5 \times 10^{-10}$  m/s) to meet the requisite engineering specifications within the impoundment area, i.e. equivalent to 1m of  $1 \times 10^{-9}$  m/s.
- The TSF impoundment foundation preparation in the area of tailings impoundment (i.e. remote from the decant pond area), including compaction also to achieve the equivalent permeability of 1m at  $1 \times 10^{-9}$  m/s.
- Construction of the Stage 1 TSF zoned embankment utilising:
  - NAF waste rock (Zone 3) material from the main open cut pit;
  - Filter zone (Zone 2) material from on site or imported;
  - Low permeability clay materials (Zone 1) sourced from specific upstream areas within the TSF impoundment area; and
  - A low permeability Bituminous Geomembrane (BGM) placed over the Zone 1
     Low permeability clay materials, with the BGM connected to the upstream toe curtain grouting via a concrete plinth.
- Construction of the decant system to enable the return of decant water from the TSF to the processing plant.
- Installation of embankment underdrainage as required.
- Installation of the tailings distribution network including pipes and pumps.
- Construction of an emergency spillway including suitable armouring.

The construction methods relating to the initial embankment, would be repeated as required for the subsequent Stage 2 TSF and Stage 3 TSF raises of the TSF embankment.

## Embankment Raises 2 and 3

The construction of the two subsequent TSF embankment raises (Stage 2 and 3) would occur on a campaign basis based on processing plant operations and would be sufficient to maintain design storage allowance and freeboard requirements for a High C Consequence Category Dam. Both embankment raises would utilise downstream construction methods. The second and third embankment raises would require approximately 2 276 000 tonnes and 3 185 000 tonnes of NAF waste rock respectively. These raises would be undertaken for approximately 29 weeks at the end of the third year of processing and for approximately 41 weeks during the eighth year of processing.

## **TSF** Rehabilitation

Capping and rehabilitation of the TSF would be undertaken at the end of operations (see Section A5.10.7). A preliminary trial of TSF capping and rehabilitation would be commenced from Year 3 (indicatively) in order to demonstrate the long term structural and revegetation outcomes.



As the geometry of the tailings beach would vary throughout the depositional life of the TSF, the facility would have the capacity to store varying volumes of stormwater over its operational life. However, the construction schedule and operation of the TSF would ensure that sufficient design storage allowance and total freeboard requirements are maintained in accordance with the Consequence Category of the TSF throughout the operational life of the facility.

## A5.7.5 Tailings Storage Facility Operation

Tailings would be pumped from the processing plant to the TSF via an overland tailings delivery pipeline, as shown on **Figure A5.6**. Operations would generally be undertaken as follows.

- The tailings slurry would be discharged sub-aerially into the facility from the pipelines entering the tailings impoundment area from the northern, central and southern tailings discharge entry points at a rate of approximately 250t/hr. Initially, the discharge pipelines would be positioned within the tailings impoundment approximately mid-way between the entry point and the decant pond. The discharge pipelines would gradually be retracted or withdrawn up-valley as the impoundment area is filled with tailings. The trial rehabilitation area (see **Figure A5.6**) would be filled during the first year of operations to enable trials to commence.
- Water would be recovered from the TSF via the decant pond and returned to the process water tank via the water return pipeline (see **Figure A5.6**) for reuse in the process circuit.
- Tailings would continue to be pumped to the TSF throughout the Project life with the final deposition of tailings to be modified to relocate the low point within the TSF towards the closure spillway.

An Operations Manual would be developed for the TSF incorporating detailed operating procedures, inspection criteria, monitoring requirements, log sheets and a dam safety emergency plan for the TSF. The Operations Manual would include contingency measures that would be employed to avoid, as far as practicable, discharge from the TSF emergency spillway and would include measures and triggers based on real time information relating to rainfall monitoring, decant pond operating levels and the operational water balance model.

Bowdens Silver would adopt the following inspection and auditing requirements throughout the operational life of the TSF.

- Daily inspections of the tailings discharge pipelines, water return pipeline, discharge points, decant system and decant pond.
- Weekly inspections of the external embankment and associated structures, the tailings beach, decant pond level and all monitoring installations.



Monthly surveys of monuments installed on the crest of all embankments (Stages 1, 2 and 3) to monitor the settlement of the fill materials used in construction of the embankment.

- Operational, safety and environmental aspects would be periodically reviewed during an inspection by a suitably qualified and experienced engineer. This inspection would be undertaken at the frequency specified by ANCOLD (2012) and the DSC for a High C Consequence Category Dam.
- TSF monitoring instrumentation would be calibrated in accordance with manufacturer's requirements.

**Figure A5.7** displays the proposed final surface of the tailings within the TSF at the end of the processing operations in Year 16.



## A5.7.6 Risk, Safety and Security

The TSF has been assigned a High C Consequence Category based upon the NSW DSC guidelines 2012<sup>7</sup>. A dam safety emergency plan for the facility would be compiled to meet the requirements of the NSW DSC for the Consequence Category prior to the construction of the TSF. A "Safety in Design" assessment would be undertaken to address individual features such as fencing of the TSF to prevent stock and animal access.

<sup>&</sup>lt;sup>7</sup> See <u>https://www.damsafety.nsw.gov.au/DSC/Download/Info\_Sheets\_PDF/Dam/DSC3A.pdf</u>

## A5.7.7 Monitoring

Monitoring of the TSF during operations would be conducted to collect the relevant information required for the evaluation of the performance of the TSF with respect to the design criteria and management objectives. The information would be subsequently used to inform management actions such as maintenance programs or in the detailed design of the embankment raises.

Bowdens Silver would adopt the following TSF monitoring and instrumentation:

- vibrating wire and standpipe piezometers; and
- survey monitoring points on the embankment of the TSF.

A system of vibrating wire and standpipe piezometers would be installed, upstream and downstream of the foundation grouting, beneath the embankment, at the toe of the embankment and downstream of the seepage collection ponds. It is proposed that these would be read on a weekly basis.

The purpose of these bores would be to provide data on the presence, depth, and flow direction of any groundwater beneath the embankment. The standpipe piezometers would also be used to measure the quality of the groundwater together with the measurement of the quality of the water in the decant pond to ascertain the extent of seepage from the TSF beyond the seepage collection ponds. Water quality would be measured in the bores on a weekly basis.

Survey monuments would be installed on the crest of Stages 1, 2 and 3 TSF embankments to monitor settlement of the construction materials used to construct the embankment raises. The monuments would be surveyed through real-time monitoring.

## A5.8 RELOCATED MALONEYS ROAD CONSTRUCTION

The relocated Maloneys Road would be constructed by an approved contractor or Mid-Western Regional Council and would involve the following standard road construction activities. It is likely the road would be constructed in stages, hence the following activities would also be staged.

- 1. The alignment of the road would be marked with tops of batters and batter angle boards positioned.
- 2. The required erosion and sediment controls would be installed prior to any activities in the relevant section of the road and signed off prior to the commencement of construction (see Section 4.7 for details of the required erosion and sediment controls).
- 3. All vegetation within the road footprint would be progressively felled with natural resource recovery.
- 4. Topsoil would be stripped from the alignment of the road and its associated batter slopes and pushed to the upslope side of the road alignment or pushed into stockpiles within the road alignment. Topsoil which would be surplus to the needs for stabilising the roadside batters would be loaded into trucks and transported to a nominated topsoil stockpile area within the Mine Site.



- 5. Construction of the relocated Maloneys Road would commence from the intersection with the mine access road and progress southwards. Construction of the southern section of the relocated Maloneys Road would commence concurrently with the northern section of the road with the construction of the new Lawsons Creek crossing, T-intersection with Lue Road and railway bridge crossing. Access to the southern section of the road would be from Bara-Lue Road and Lue Road.
- 6. The materials within the proposed road alignment would be excavated, placed and compacted in the nominated fill areas. Once excavated to required depth/batter angle, the final section of the road would be trimmed, if necessary.

Subject to the nature of the substrate along the alignment of the relocated road, the contractor would form the base and surface of the road, if necessary, with road construction materials imported either from a local approved quarry or from within the Mine Site.

## A5.9 WATER SUPPLY PIPELINE CONSTRUCTION

The alignment of the water supply pipeline corridor is displayed on **Figure 2.22** with design details presented in Section 2.10.3.

The construction of the pipeline would be undertaken by an experienced pipeline contractor and involve the following component tasks.

- 1. A comprehensive search of Dial-Before-You-Dig (DBYD) records would be undertaken prior to the construction of pipeline to confirm the presence of any services referred to in the EIS. The results of the DBYD search would be discussed with the respective landowners to establish verification of the search results and to identify if there are any other buried services that they are aware of that should be considered.
- 2. A geotechnical assessment would be undertaken to establish the depth of topsoil and subsoil and the depth and strength of any rock within the proposed depth of trenching. This information would be used to define the method of trenching and/or approach to underboring. The extent of underboring beneath stands of native trees and shrubs would also be established at this stage.
- 3. The approved alignment of the pipeline would be marked out by a surveyor with the required survey pegs offset from the centreline of the proposed trench. The location of the centreline of the pipeline trench would be marked at regular intervals on the ground to allow the trencher or excavator operator to identify the area to be trenched.
- 4. Following the final definition of the pipeline corridor, the contractor would undertake the following.
  - The required Section 138 permit would be sought from MWRC to enable the works to proceed within the public road reserves. The application for the permit would be accompanied by a Traffic Management Plan identifying how traffic travelling along or near the construction site would be managed, in terms of diversions, re-direction, changed traffic conditions, etc.



- A program of consultation would be held with the landowners whose land would be traversed by the pipeline to discuss details of access to their properties during the period of construction and control of stock through temporary fencing, if relevant. Discussions would also be held with nearby landowners who similarly could be impacted upon by the works on or near the local road network.
- Liaise with all other stakeholders.
- 5. A series of small temporary compounds would be progressively established immediately adjacent to the corridor on privately-owned land at intervals of approximately 8km. The compounds would be used for the storage of pipes and fittings, sand and other consumables and would be relocated as the section of the pipeline serviced from each compound is completed. Worker amenities would be established in each compound. Each compound would cover an area of approximately 0.2ha and would be located in an area cleared of trees and shrubs as agreed with the respective landowner.
- 6. The proposed 10m width of the disturbance would be cleared of any substantial vegetation to enable the storage of excavated materials, pipeline sections, placement of topsoil, subsoil and any other excavated materials. The cleared vegetation would be mulched with the mulched material transported to the Mine Site unless the landowner requests otherwise.
- 7. Topsoil would be excavated from above the trench with the material placed adjacent to one boundary of the construction corridor. The remainder of the trench would be excavated with either a trencher or excavator to remove the subsoil and possibly rock to the proposed base of the trench. Where possible, the subsoil would also be separated. It is intended that the bulk of the trench for the pipeline would be excavated with a trencher with excavators used where trencher access would be difficult. These materials would be placed adjacent to the topsoil and the excavator in the event hard materials are encountered.
- 8. As each 200m section of the trench is excavated to its required depth, that section of the trench would be backfilled with approximately 0.25m of sand.
- 9. The pipeline sections would be placed adjacent to the completed trench and joined (and tested). Once testing confirms the joined sections of the pipeline are suitable for placement, the pipeline would be lowered into the trench and laid onto the bedding sand.
- 10. Once the placed pipeline is inspected and checked, sand or screened subsoil (if suitable) would be placed around and above the pipeline. A hydraulic vibrating plate would be used to compact the sand around the pipe. The remainder of the trench would be backfilled with a proportion of the stockpiled subsoil and compacted to approximately 95% compaction to within approximately 0.3m of the surface. Approximately 0.15m of subsoil and 0.15m of topsoil would be replaced onto the top section of the trench without compaction. Any retained topsoil would



be stockpiled for use in maintenance of any areas where subsidence occurs. This depth of both subsoil and topsoil may be varied to meet local conditions or requests from the landowners.

- 11. All excess subsoil and any other excavated materials not used would be loaded onto trucks and transported to the Mine Site for use and/or stockpiling on the Mine Site.
- 12. The full width of disturbance would be rehabilitated to ensure that no soil or other materials remain on the original ground surface and that the temporary access track has not caused any furrows or indentations.
- 13. As each 200m section is inspected and authorised as completed by the Contractor's Quality Controller, the disturbed area would be scarified and either seeded with a pasture mix agreed with the respective landowner or MWRC or rehabilitated to the pre-disturbance condition. The approach to rehabilitation along the pipeline corridor would reflect the topography, soils and vegetation within and adjacent to the corridor. In those areas to be seeded, placement of seed would be concentrated upon the surface of the trench and any other disturbed areas where vegetation had been removed. An appropriate quantity of an agreed fertiliser would be applied to the seeded area. A water truck with a side spray would be used to irrigate the planted area, as required.
- 14. A combination of silt-stop fencing and straw bales would be placed parallel to contour at appropriate intervals along the corridor. These controls would remain in place until the revegetation has adequately stabilised the disturbed area.
- 15. Once access for mobile equipment is no longer necessary, permanent fencing (and gates, if appropriate) would be re-installed.
- 16. The status of revegetation within the pipeline corridor would be monitored regularly throughout the pipeline construction program to ensure that there are no unacceptable areas of subsidence/collapse or substantial revegetation. Any areas requiring follow-up attention would be maintained, as required.

The above component tasks would be varied, where necessary to reflect the conditions at specific locations along the pipeline corridor.

## A5.10 REHABILITATION AND MINE CLOSURE

## A5.10.1 Introduction

Section 2.16 provides a range of information relating to the rehabilitation objectives for the Project, rehabilitation domains, the overall final landform and revegetation. This subsection provides details relating to the rehabilitation objectives, procedures and success criteria for each of the key components within the Mine Site. This section concludes with Bowdens Silver's plans for rehabilitation, monitoring and maintenance.



## A5.10.2 Site Establishment and Construction Stage

#### A5.10.2.1 Introduction and Objectives

The bulk of the activities undertaken during the site establishment and construction stage requiring rehabilitation would involve the stabilisation of excavated and formed slopes. These slopes would be constructed:

- adjacent to the relocated Maloneys Road (including the required intersections and bridges) and internal roads;
- during the excavation and placement of excavated materials within the processing area and mining facility; and
- during the construction of water management structures, principally, diversion banks and sediment dams.

The slopes generated during the excavation activities undertaken within the initial stage of the main open cut pit development and TSF embankment and impoundment would not be rehabilitated as they would form part of ongoing operation of those components.

The principal objectives for the rehabilitation of all excavated or formed slopes would be to achieve the stability of the slopes in the shortest period possible and to minimise the visual impacts of the exposed earth or rock, where practicable.

#### A5.10.2.2 Rehabilitation Procedures

#### **Road Construction**

The bulk of the relocated Maloneys Road would be excavated with steep batters created in rock with slopes typically 1:0.5 (V:H) or steeper (see **Figure 2.17**). These slopes would not require any form of stabilisation. A number of short sections of placed fill along the road alignment and one substantial section of fill approximately 0.4km in length (see **Figure 2.17**) would need to be stabilised following their construction.

Once topsoil is placed on the final slopes, a bulldozer would be used to track up and down the slopes (perpendicular to the slope) to partially compact the soil and leave track indentations parallel to contour to assist in retaining the soil on the slope during its period of revegetation. It is proposed to hydromulch each of the slopes using topsoil with a combination of a seed mix, fertiliser, binder and straw to provide a rapid means to establish vegetation on the subject slopes. If required, the slopes would also be watered from a water truck spraying water sideways onto the revegetated slopes. Watering would continue periodically, subject to rainfall, until the slopes are adequately vegetated.

#### **Processing Area Earthworks**

**Figure A5.5** displays a number of areas around the margins of the processing area and mining facility that would be completed as filled batters typically with slopes of 1:2.5 (V:H) to 1:3 (V:H). These slopes would be stabilised either through placed topsoil and the use of hydromulching or rock stabilisation with oversize (typically >0.2m) NAF waste rock. Mulch generated during the clearing component on the site establishment and construction stage could also be applied to the completed slopes.



### Water Management Structures

The diversion banks and sediment dams constructed during the site establishment and construction stage would be revegetated principally through the direct hand dispersal of seed and fertiliser onto the exposed soil surfaces. If appropriate, some of the mulch generated during the vegetation clearing component of the site establishment and construction stage would be applied to completed soil surfaces.

#### Seed and Fertiliser Selection

Temporary revegetation of disturbed areas, particularly slopes, would be undertaken with emphasis placed upon the use of exotic grasses suited to the planting season.

- For autumn/winter growth, fescue and landmaster phalaris would be sown at 18kg/ha under a cover crop of oats at 30kg/ha.
- For spring/summer growth, katambora hodes grass would be sown at 24kg/ha under a cover crop of millet at 10kg/ha.

Diammonium phosphate (DAP) fertiliser 80kg/ha would be applied at a rate of approximately 80kg/ha.

It is proposed that these seed mixes and fertiliser would be applied either with a hydromulch unit or conventional agricultural equipment.

Bowdens Silver currently holds an extensive seed bank with over 30 species, collected locally over several years on company-owned and adjacent properties. This seed is used to supply a small-scale nursery raising seed to provide tree and shrub tubestock for use in screen plantings. Bowdens Silver plans to ramp up on-site nursery activities in three stages.

- Stage 1
  - Expansion of the current nursery in 2020 to allow for increased screen planting capacity.
- Stage 2
  - Upon receiving development consent, these facilities would be transferred to a nursery within the Mine Site which would be constructed to the northeast of the administration and processing plant buildings.
  - An area 100m by 50m, that has already been subjected to extensive clearing of trees and shrubs and is currently for grazing purposes, has been set aside for this purpose.
  - Initially, this facility would enable the processes, preparation and storage of seed material collected during the site establishment and construction stage for use in stabilisation of disturbed areas and maintaining screen planting activities.
- Stage 3
  - A further expansion around Year 6 is expected in order to commence planning and preparation for mine closure rehabilitation.
  - Targeted seed collection programs would be ongoing through all three stages.

The components of the on-site nursery would include the following.

- Nursery office, crib room and first aid building.
- Equipment store including chemical storage.
- Seed processing and storage building.
- Greenhouses.
- Full shade, part-shade and unshaded hardening off/ tubestock storage areas.
- Vehicle parking.

Propagation techniques would include the following.

- Appropriate seed storage with temperature and humidity control.
- Preparation of seed using methods such as scarification, heat treatment, use of smoked water and soaking prior to or at the time of sowing.
- Use of appropriate growth media including low phosphorus and low nitrogen fertilisers, wetting agents, soil ameliorants and mycorrhiza application if necessary.
- Where seed collection and/or germination is difficult for a target species, plants may be grown from cuttings.
- Environmental controls such as automated watering system, greenhouse and/or shadehouse use to optimise atmospheric factors for propagation.
- Sufficient hardening off to reduce shock at the time of planting.

The nursery operation would focused on providing viable native seed and tubestock for use in targeted stabilisation / revegetation programs across the Mine Site. Where excess numbers of tubestock have been produced, they may be kept as more advanced plants for use in future programs.

**Table A5.11** lists the tree, shrub and ground cover species from which a selection of species would be planted on the final landform. EnviroKey has nominated the optimal geographical location on the final landform for the listed species, i.e. for ridges, mid slopes and flats and valleys (see **Figure A5.8**). EnviroKey (2020) also records the quantity of seed already collected and stored by Bowdens Silver and available for propagation (see Annexure 8) Bowdens Silver would propagate most of the tree and shrub species at its on-site nursery. The species of native grasses selected for long term stabilisation of disturbed areas would depend upon availability. Bowdens Silver would source the selected native grass seed locally through local agriculturalists and collection across properties owned by Bowdens Silver.

## A5.10.2.3 Success Criteria

The key success criteria for all slopes revegetated during the site establishment and construction stage are as follows.

- 1. A 70% grass coverage on the revegetated slope is achieved within 3 months.
- 2. All upslope runoff continues to be diverted around the revegetated slopes.
- 3. No substantial erosion gullies are present on the revegetated slopes.

#### **ENVIRONMENTAL IMPACT STATEMENT** *Appendix 5*

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Table A5.11					
Native Grass, Shrub and	Tree Species Suitable for Revegetation				

		1	Page 1 of 2
Species	Ridges	Mid Slope	Flats and Valleys
Trees	T	1	1
White Box ( <i>Eucalyptus albens</i> ) *	✓	✓	✓
Red Stringybark (Eucalyptus macrorhyncha)	✓	✓	
Black Cypress Pine (Callitris endlicheri)	$\checkmark$	$\checkmark$	$\checkmark$
Rough-barked Apple (Angophora floribunda)	✓	✓	
Inland Scribbly Gum (Eucalyptus rossii)	✓	✓	
Narrow-leaved Stringybark (Eucalyptus sparsifolia)	✓	✓	
Mugga Ironbark (Eucalyptus sideroxylon)	✓		
Blue-leaved Stringybark (Eucalyptus agglomerata)		✓	
Red Box (Eucalyptus polyanthemos)	✓	✓	
Yellow Box ( <i>Eucalyptus melliodora</i> ) *		✓	✓
Blakely's Red Gum ( <i>Eucalyptus blakelyi</i> ) *	✓	✓	✓
Apple Box ( <i>Eucalyptus bridgesiana</i> ) *		✓	✓
Kurrajong (Brachychiton populneus)			✓
Western Grey Box (Eucalyptus microcarpa)			✓
Black She-Oak (Allocasuarina) *	✓	✓	
Black Wattle (Acacia mearnsii) *	✓	✓	√
Grey Gum (Eucalyptus punctate) *		✓	✓
Sarsaparilla (Hardenbergia violacea) *	✓	✓	✓
Grey Ironbark (Eucalyptus paniculate) *	✓		
Paperbark (Melaleuca sp.) *			✓
Woolly Butt (Eucalyptus longifolia) *			✓
Shrubs			
Cassinia spp	✓		
Hickory Wattle (Acacia implexa)	✓	✓	✓
Tablelands Wattle (Acacia caesiella)	✓	✓	✓
Native Blackthorn (Bursaria spinosa)	✓	✓	✓
Sticky Daisy-bush (Olearia elliptica)	✓	✓	
Narrow-leaved Geebung (Persoonia linearis)		✓	
Sticky Hop-Bush (Dodonaea viscosa subsp. Angustifolia) *		✓	
Fern-leaf hop bush (Dodonaea borowiifolia)	✓	✓	✓
Dolly Bush (Cassinia aculeata)		✓	✓
Cassinia guinguefaria		✓	
Stiff-leaf Wattle (Acacia obtusifolia)		✓	✓
Sifton Bush (Cassinia arcuata)		✓	✓
Drooping She-oak (Allocasuarina verticillate)*	✓	✓	
Spurwing Wattle (Acacia triptera)		✓	
Fern-leaved Wattle (Acacia filicifolia) *			✓
Tree Violet (Melicytus dentatus)	1		✓
Australian Indigo (Indigofera australis)			✓
Ausfeld's wattle ( <i>Acacia ausfeldii</i> )			✓
* Seed already collected and stored in Bowdens Silver's seed bank	1	J	1



# Table A5.11 (Cont'd) Native Grass, Shrub and Tree Species Suitable for Revegetation

Page 2 of 2					
Species	Ridges	Mid Slope	Flats and Valleys		
Shrubs (Cont'd)					
Broome Bitter Pea ( <i>Daviesia genistifolia</i> )			✓		
Box-Leaf Wattle (Acacia buxifolia) *	✓	$\checkmark$			
Knife-Leaf Wattle (Acacia cultriformis) *	$\checkmark$	$\checkmark$			
Sword Wattle (Acacia gladiiformis) *	$\checkmark$	✓			
Ploughshare Wattle (Acacia gunnii) *	$\checkmark$	✓	$\checkmark$		
Spur-Wing Wattle (Acacia triptera) *	$\checkmark$	✓	$\checkmark$		
Fringe-Myrtle (Calytrix tetragona ) *	✓	✓			
Headache Vine (Clematis glycinoides) *	✓	✓	~		
Grevillea (Grevillea triternata) *	✓	✓	√		
Hovea sp. (Hovea lanceolate) *	✓	✓	~		
Kunzea <i>(Kunzea ambigua)</i> *	$\checkmark$	✓	✓		
Pink five-corners (Styphelia trifloral) *	√	✓	✓		
Ground Covers	5				
Weeping Grass (Microlaena stipoides)	$\checkmark$	✓	✓		
Ringed Wallaby Grass (Rytidosperma caespitosum)	$\checkmark$				
Common Wheatgrass (Elymus scaber)	✓	✓			
Shorthair Plumegrass (Dichelachne micrantha)	$\checkmark$	✓	✓		
Speargrass (Austrostipa sp.)	$\checkmark$	✓	✓		
Hoary Guinea Flower (Hibbertia obtusifolia)	$\checkmark$	✓	✓		
Wattle Mat-rush (Lomandra filiformis)		✓	✓		
Tussock (Poa labillardierei)		✓			
Kangaroo Grass (Themeda triandra)		✓			
Corrugated Sida (Sida corrugata)		✓			
Swamp Dock (Rumex brownii)		✓			
Daphne Heath (Brachyloma daphnoides)		✓			
Prickly Shaggy Pea (Podolobium ilicifolium) *		✓			
Ivy Goodenia (Goodenia hederacea)		✓			
Wallaby Grass ( <i>Rytidosperma sp.</i> )		✓	✓		
Silvertop Wallaby Grass (Joycea pallida)		✓			
Blown Grass (Lachnagrostis filiformis)			✓		
Wiregrass (Aristida sp.)			✓		
Yellow Burr-daisy (Calotis lappulacea)			✓		
Bidgee-widgee (Acaena novae-zelandiae)			✓		
Barbed Wire Grass (Cymbopogon refractus)			✓		
Bracken (Pteridium esculentum)			✓		
Tall Sedge (Carex appressa)			✓		
Red Grass (Bothriochloa macra)			√		
Daisy sp. (Bellis perennis) *	√	√	$\checkmark$		
Hop Bush (Dodonaea Vicosa) *	√	√	✓		
Soybean (Glycine sp.) *		√	✓		
* Seed already collected and stored in Bowdens Silver's seed bank			1		

Following the recognition of the satisfaction of these success criteria, the silt-stop fencing placed at the base of slopes would be removed.

## A5.10.3 Open Cut Pits

## A5.10.3.1 Introduction and Objectives

### Satellite Open Cut Pits

It is proposed that the two satellite open cut pits, and the southern pit extension of the main open cut pit would be backfilled with NAF waste rock transferred directly from the main open cut pit as it is extracted. Backfilling of the satellite open cut pits would be undertaken in a manner that avoids double handling of NAF waste rock. The exact timing of the progressive backfilling of the pits would depend upon the cessation of extraction in each pit.

The key objectives for the rehabilitation of the satellite open cut pits that would be backfilled would be as follows.

- 1. The slopes across the final landform blend into the surrounding natural slopes.
- 2. The channel constructed across the eastern satellite pit operates effectively long term to convey upstream runoff within Blackmans Gully towards Hawkins Creek.
- 3. The vegetated landform is consistent with the nearby vegetation not impacted upon by mining.

### Main Open Cut Pit

The main open cut pit would remain as a void at the end of the Project life. , for possible use should further ore be defined beneath the base of the main open cut pit which can be economically mined by underground methods with access obtained from a lower section of the open cut pit. Any underground mining project would require a further development consent. If the underground mining were to proceed, pumping of water accumulating in the sump at the lowest point of the pit would continue to remove the ongoing groundwater inflows and surface water runoff within the pit until access to the main open cut pit is no longer required.

The key objectives for the rehabilitation of the main open cut pit as described in Section 2.16.2 are as follows, i.e. in the event no underground mine entries are developed from the lower sections of the open cut pit.

- 1. The void is protected by a perimeter bund and/or dry moat, to prevent inadvertent vehicular access by any person.
- 2. The void remains as a "sink" to prevent any contaminated water within the pit from seeping from the void into the surrounding groundwater resources.
- 3. Benches above the projected final water level in the pit are revegetated to improve local biodiversity.
- 4. Access is restricted at the entrance to the northern and eastern ramps into the main open cut pit.



## A5.10.3.2 Safety Issues

**Figure A5.9** displays the final landform of the open cut pits at the cessation of mining. The landform would be largely that remaining after extraction with some areas in the southeastern side of the pit partially backfilled with NAF<sup>8</sup> waste rock below the projected long-term pit water level. Also displayed on **Figure A5.9** is a safety bund wall in a nominal location around the main open cut pit required to prevent inadvertent vehicular access to persons not aware of the presence of a void remaining following mining. The "nominal" location of the safety bund wall is referred to as it would need to be located outside the area designated assessed to be susceptible to wall collapse. WADIR (1997) records that the long-term stability of the main open cut pit edge would be dependent upon a number of geotechnical factors, the most important of which are as follows.

- The presence and orientation of major geological planes of weakness in the rock mass forming the pit walls.
- The strength of the rock mass within the pit walls.
- Variation in the strength of the rock mass with time.
- The geometry of the pit wall.
- The influence of groundwater and incident rainfall on pit walls.
- The influence of seismic events.

The location of the safety bund wall would be established either when mining operations are underway near the perimeter of the main open cut pit or towards the end of open cut mining and would take into account the above factors and the proximity of other nearby mine components that would remain at the end of the Project life.

#### A5.10.3.3 Final Landform

Figure A5.9 displays the final landform in the area of the open cut pits, the principal components of which are as follows.

- 1. The eastern and western satellite pits would be fully backfilled with NAF waste rock to re-instate contours similar to those that were present prior to mining.
- 2. A diversion channel around the western side of the main open cut pit to convey all upslope runoff around the main open cut pit to maintain long-term environmental flows in Hawkins Creek sourced from Blackmans Gully.
- 3. The landform along the western margin of the eastern satellite pit would be shaped to create a rock-lined channel for the re-establishment of upslope flows from Blackmans Gully to Hawkins Creek.

<sup>&</sup>lt;sup>8</sup> Should there be excess NAF waste rock generated towards the end of the operational Project life, it would be placed in the eastern section of the main open cut pit in the area as displayed on **Figure A5.9**.



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## A5.10.3.4 Water Level and Quality

**Figure A5.9** displays the location of the long term water level in the main open cut pit, i.e. between approximately 571m AHD and 577m AHD. These elevations are comparable with the existing groundwater table. Jacobs (2020) suggest these level would be re-established within approximately 50 years following the cessation of mining and active dewatering, although this level could be achieved sooner if:

- water that accumulates within the TSF after cessation of processing is pumped to the main open cut pit; and
- runoff from Blackmans Gully is allowed to flow into the main open cut pit until this level is approached.

It is Bowdens Silver's preference to allow flow from Blackmans Gully into the main open cut pit (within the bounds of the harvestable right dam capacity for its property) as it would reduce the period of oxidation of the sulphide minerals exposed on the walls of the main open cut pit and limit the reduction in water quality attributable to the sulphide minerals. Oxidation of the sulphide minerals would cease once the exposed minerals are beneath water. WRM (2020) has reviewed the occurrence of sulphide minerals above and below 574m AHD and the projected inflow of groundwater and potentially surface water from Blackmans Gully and predicted that over time, the salinity of the water in the final void would increase. It is estimated that 500 years after mining ceases, the electrical conductivity would be in the order of 5  $000\mu$ S/cm.

## A5.10.3.5 Rehabilitation Procedures

The rehabilitation procedures to be adopted for the two satellite open cut pits and the southern extension of the main open cut pit would comprise the following.

- 1. NAF waste rock would be transported by haul truck to a tipping point within the perimeter of the satellite pits close to the western side of the main open cut pit where it would then be pushed out with a bulldozer before further NAF rock is tipped into each pit. This process would continue until NAF waste rock is within approximately 1m to 2m of the surrounding land surface. The waste rock would be allowed to settle for 2 to 3 years. If necessary, further NAF rock could be placed on the settled waste rock to re-establish a landform approximately 2m below the surrounding landform.
- 2. After the settlement period, oxidised NAF waste rock would be placed on the settled waste rock to a depth of approximately 1.5m after which approximately 0.3m of subsoil and 0.2m of topsoil would be placed.
- 3. Once the topsoil is in place, some of the larger rocks forming part of the upslope interim perimeter safety bund wall would be pushed over the final landform amongst the topsoil to replicate the rock pre-mining land surface.
- 4. A seed mix comprising pasture species and a selection of local provenance native seed (and fertiliser) would be hand spread across the final surface and allowed to germinate.

As discussed in Section A5.10.3.1, the western side of the eastern satellite pit would be shaped to form a channel with a minimum cross-sectional area of approximately  $8m^2$  to convey upstream flows from Blackmans Gully. The channel base would be compacted with subsoil and then rock lined to re-create the long term channel for the re-instated Blackmans Gully.

The rehabilitation procedures to be implemented for the main open cut pit would include the following.

- 1. NAF waste rock would be placed in a random manner on the terminal open cut benches above the 574m AHD projected final water level to a thickness of approximately 1.0 to 1.5m. The waste rock would be placed on the benches prior to the final blast to fragment the ore/waste rock in the adjoining benches. Local provenance native seed for a range of native trees and shrubs would be planted on the placed waste rock.
- 2. A number of large (>0.5m) boulders would be placed at the exits from the northern and eastern ramps from the main open cut pit to prevent vehicular access into the former pit.
- 3. The perimeter safety bund wall discussed in Section A5.10.3.2 would be completed in those areas where the bund wall has not been constructed. The perimeter safety bund wall would be constructed principally from coarse rock >0.3m in size with steep sides (typically 1:1 (V:H)) to a height of approximately 1.5m to 2m. The bund wall would be constructed solely of rocks 0.3m in size in those sections where the bund wall traverses a minor watercourse / depression to ensure that flow in those watercourses / depressions is not substantially impeded. Both sides of the safety bund wall would be direct seeded with a range of local provenance shrubs and trees and this would also assist in restricting vehicular access to the rim of the main open cut pit in the future.

## A5.10.3.6 Success Criteria

The key success criteria for the rehabilitation of the open cut pits are as follows.

- 1. The slopes of the eastern and western satellite pits are revegetated with the density of native shrubs and trees comparable to pre-mining levels by the end of the Project life.
- 2. The re-constructed section of Blackmans Gully on the western side of the eastern satellite pit has a natural appearance and is able to convey through flows without water loss to the underlying backfilled open cut pit.
- 3. The perimeter safety bund wall and the surrounding vegetation is an effective barrier to any vehicular traffic in the vicinity of the main open cut pit.

## A5.10.4 Southern Barrier

#### A5.10.4.1 Introduction and Objectives

The southern barrier would be a temporary landform principally intended to:

- i) provide audio-visual protection to the mining-related activities within the southern extension of the main open cut pit and the eastern and western satellite pits and to a lesser extent in the main open cut pit; and
- ii) store NAF waste rock until it is required for rehabilitation activities within the Mine Site.

As discussed in Section A5.4.5, the barrier would be constructed progressively in two stages throughout the Project life and similarly require an ongoing program of progressive rehabilitation activities.

The key objectives for the progressive rehabilitation of the southern barrier would be as follows.

- 1. The southern face of the initial barrier would be rehabilitated progressively as the barrier is constructed to minimise the visual impacts of the barrier when viewed from the south, i.e. from Lue Road and Residences 39, 40 and 47.
- 2. The southern faces of the extended barrier would also be rehabilitated progressively as the barrier is constructed to similarly minimise visual impacts when viewed from the south.

## A5.10.4.2 Progressive Rehabilitation

The focus upon the rehabilitation of the southern barrier would be upon the progressive rehabilitation of the southern faces of the initial and extended barriers. **Figure A5.10** displays both plans and sections of the progressive rehabilitation of the southern faces of both the initial and extended barriers.

It is proposed that, as each 10m vertical section of the southern face of each barrier is constructed, the exposed face would be covered with up to 1m of subsoil and 0.2m of topsoil. The quantity of subsoil placed on each barrier would be comparatively high as the southern faces of the barrier would be relatively highly visible and it is important that sufficient material is placed on the slope to enable a high level of revegetation to be achieved. Furthermore, a sufficient thickness of subsoil and topsoil can be easily removed from the southern face of the initial barrier and as the barrier is deconstructed to allow it to be used in the final rehabilitation of the Mine Site.

Given the outer face of both the initial and extended barriers would be a slope between approximately 1:3 (V:H) and 1:4 (V:H), it would be feasible for small agricultural equipment to sow pasture grasses with fertiliser. In the event seasonal conditions do not result in sufficient rainfall, Bowdens Silver would install an irrigation system to assist in the germination and continued growth of the pasture grasses on the southern faces of the barriers.



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#### A5.10.4.3 Final Landform

By the end of the Project life, all NAF waste rock stockpiled within the southern barrier would be removed for use in rehabilitation of the various components of the Mine Site. The final landform after its removal would be comparable with the pre-mining landform (see **Figure A5.11**) including the re-instatement of a section of Watercourse A and Blackmans Gully. Final slopes on the final landform within the footprint of the southern barrier would be in the order of 1:40 (V:H).



#### A5.10.4.4 Surface Water Management

The final landform would comprise gentle slopes to carry cross flows towards the re-instated Watercourse A and Blackmans Gully. The channel for Watercourse A would typically be 2m wide and 1.5m deep, i.e. consistent with the existing channel in that location. The channel for Blackmans Gully would typically be 2m wide and 1.5m deep consistent with the pre-mining channel profile in that location.

## A5.10.4.5 Rehabilitation Procedures

#### **Progressive Rehabilitation**

The progressive rehabilitation program for the initial barrier would involve the recovery of subsoil from the footprint of the nearby extended barrier and its placement up to 1m thick on each 10m vertical section of the southern slope as it is constructed. Once in place, the subsoil would



be covered with approximately 0.2m of topsoil. This procedure would be repeated comparatively quickly following the construction of the outer southern section of each 10m lift within the barrier.

Once the topsoil is spread across each 10m section, it would be hydromulched with either the autumn/winter or spring/summer seed mix and fertilised. Emphasis in vegetation selection would be upon grasses and small shrubs given the barrier would be fully removed at the end of the Project life.

This above process would be adopted for each lift within the interim barrier. Following the construction of the interim barrier to its final height of approximately 635m AHD (approximately Year 5), the construction of the extended barrier would commence with a similar approach to the progressive rehabilitation. Topsoil and subsoil would be recovered from the first level of the revegetated interim barrier and transferred to the southern face of the first 10m section of the extended barrier. The topsoiled surface would be hydromulched (with fertiliser) immediately following the placement of topsoil on the southern face.

Once the initial 10m level of the extended barrier is constructed and blended with the southern face of the interim barrier, the previous process to recover topsoil and subsoil would be repeated from the second and subsequent levels of the initial barrier for placement on the outer southern face of the extended barrier. This process would continue with the construction and progressive revegetation of the southern face of the extended barrier with emphasis placed upon recovery of materials from its northern side, whenever practicable, to limit visibility of operating equipment and its related noise.

## Removal of the Southern Barrier

The southern barrier would effectively be a stockpile of NAF waste rock stockpiled throughout the Project life principally for use in the rehabilitation of the WRE and TSF. The recovery process for the NAF waste rock and rehabilitation of the footprint of the barrier itself would involve the following tasks.

- 1. Topsoil from the southern face of the extended barrier would be pushed down the outer slope of the barrier into a longitudinal stockpile for subsequent re-positioning back across the footprint of the barrier after the NAF waste rock is removed.
- 2. The pre-mining watercourses that previously traversed the footprint of the southern barrier, i.e. Blackmans Gully and Watercourse A would be reconstructed with the channels of comparable pre-mining cross-sections. Where necessary, the channels would be rock lined to limit erosion and sediment generation.
- 3. Subsoil remaining on the southern face after the topsoil is removed would be similarly pushed down the southern face and loaded by either a front-end loader or excavator and removed into the haul trucks for transfer to a rehabilitation site elsewhere within the Mine Site. Upon completion of the removal of the NAF waste rock, the residual subsoil would be ripped parallel to contour and the stockpiled topsoil spread across the ripped surface after which it would be scarified and sown with pasture seed and fertiliser (see **Table A5.11**).



It is noted that the recovery of the NAF waste rock would occur in sections across the southern barrier with emphasis placed upon recovery of the NAF waste rock from the northern side, wherever practicable, to limit noise propagation to the south.

## A5.10.4.6 Success Criteria

The key success criteria for the progressive rehabilitation of the southern barrier as it is constructed would be the successful screening of each 10m lift on both the initial and extended barriers when viewed from Pyangle Road at 3 months following the placement of soil and seeding.

The key success criteria for the final rehabilitated footprint of the southern barrier would be its return to pasture with >70% ground coverage within 3 months and no change in suspended solids concentrations for flows traversing the area in Blackmans Gully and Watercourse A.

## A5.10.5 Waste Rock Emplacement

## A5.10.5.1 Introduction and Objectives

For the purposes of this subsection, the discussions relating to the WRE domain also include the low grade ore stockpile and oxide ore stockpile given their proximity adjacent to and/or above the WRE.

The WRE is the sole repository of all PAF waste rock extracted from the open cut pits. It is a key design component of the Project that all PAF waste rock is isolated and encapsulated to prevent the long-term generation of acidic leachate and the related elevated concentrations of heavy metals. The rehabilitation of this component is planned in conjunction with the lower embankment haul road and the roadside noise barrier.

Apart from being designed to contain all acid generating waste rock, the WRE would be constructed with emphasis placed upon its engineering stability, both in the short term and in the long term.

The low grade ore stockpiles, also potentially-acid forming, require management to ensure that acidic leachate is also minimised and controlled until the ore is processed. For the purposes of the EIS, it is conservatively assumed that approximately 2.67 million tonnes of low grade ore remains unprocessed at the end of the Project life, however, it is Bowdens Silver's intention that all low grade ore is processed throughout the Project life and none remains following mine closure.

The oxide ore stockpile, whilst not a source of acidic leachate, would be constructed adjacent to the southwestern side of the WRE to enable the stockpile to be rehabilitated in conjunction with the WRE. It similarly remains Bowdens Silver's intention to process this ore either on site in the future or at an alternative location should sufficient oxide ore be identified and processed at another site.

The key objective of the rehabilitation of the WRE is to contain all PAF waste rock in a single structure in a manner that does not generate any long term acidic leachate from the stored PAF waste rock and provides for ongoing surface runoff that is comparable to existing natural flows.



A similar objective is relevant to the low grade ore stockpile should any of this material remain at the end of the Project life.

#### A5.10.5.2 Final Landform

Figure A5.12 displays the final landform within the waste rock emplacement domain, the principal components of which are as follows.

- 1. The eastern, southern and southwestern side slopes of the WRE would typically have gradients of approximately 1:3 (V:H) with a concave slope on the lower slopes and a convex slope near the upper surface (see **Figure A5.12**).
- 2. The design of the eastern, southern and southwestern slopes of the WRE incorporates a scalloped appearance to break up the potentially regular outer slopes.
- 3. The upper surface of the WRE would comprise an elevated northern and southern section (up to 10m) and a central comparatively flat area to create a varied upper surface.
- 4. The southern end of the WRE would have an elevation of approximately 670m AHD, i.e. approximately 80m above the Hawkins Creek floodplain and 20m to 30m above the surrounding nearby ridges adjacent to Price Creek.
- 5. The former low grade ore stockpile areas would be contained to levels similar to the former bases of the stockpiles.
- 6. The oxide ore stockpile would be rehabilitated as an extension to the southwestern side of the WRE with side slopes of between 1:3 (V:H) to 1:5 (V:H) and a maximum elevation of 600m AHD.

In the event a proportion of the low grade ore remains on site following the cessation of processing, it would be shaped either in Area 1 (to the west of the WRE) and/or in Area 2 on the northern end of the WRE. Shaping of the low grade ore would be undertaken with the objective of creating an undulating landform with slopes of 1:3 (V:H) to 1:5 (V:H) (see **Figure A5.13**).

## A5.10.5.3 Emplacement Cover Design

The final cover of the WRE has been designed by Advisian as a "store-and-release" cover designed to reduce percolation of rainfall into the stored waste rock by maximising the storage of water in the soil layer close to the surface for it to be subsequently removed from the cover by evapotranspiration. The top surface of the WRE final cover has been designed through the use of a one-dimensional computer model (Seep/w software) to optimise the storage of water in the cover and to minimise its transfer to the underlying waste rock.

A two-dimensional computer model was used for the design of the cover on the WRE side slopes. Reliance was placed upon an understanding of the characterisation and availability of various materials across the Mine Site when designing the cover, i.e. with respect to grading, saturated hydraulic conductivity, placed moisture content, void ratio and porosity.



**ENVIRONMENTAL IMPACT STATEMENT** Appendix 5

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The key materials available within the Mine Site to be used in the construction of the cover comprise:

- topsoil;
- subsoil;
- NAF waste rock (0.5cm to 30cm diameter); and
- NAF waste rock (30cm to 40cm diameter).

The computer modelling assisted to establish that the above materials would be best placed upon a geosynthetic clay liner (GCL) to avoid the potential for shrinkage cracking in the subsoil layer which would in turn enable infiltration into the PAF waste rock below.

The store and release cover would vary in thickness from 1.8m to 3.0m with the following layers.

- Layer 1: 0.0m-0.3m Topsoil
- Layer 2: 0.3m-0.6m Subsoil (not compacted)
- Layer 3: 0.6m-1.0m NAF waste rock (0.5cm to 30cm)
- Layer 4: 1.0m-1.4m NAF waste rock (30cm to 40cm) or 1.0m-2.6m – NAF waste rock (30cm to 40cm)



- Layer 5: 1.4m-1.8m Subsoil (compacted) or 2.6m-3.0m – Subsoil (compacted)
- Layer 6: 1.8m or 3.0m Geosynthetic Clay Liner

The determination of what thickness Layer 4 should be (and accordingly the depth of Layer 5) would be determined during early trials of the waste rock being produced on site and the initial cover construction on the side slopes of Cells 1 and 2.

## A5.10.5.4 Surface Water Management

The WRE has been designed to ensure that during the operational Project life all surface water that falls within the footprint of the WRE is considered as leachate and contained within the leachate management system for the WRE. However, it is Bowdens Silver's objective that the surface water flowing across the long-term final landform is of a quality that is suitable to allow it to flow to the east into Price Creek or to the west for diversion (as much as practicable) around the main open cut pit to the re-instated Blackmans Gully. Emphasis would be placed on maintaining natural side slopes (without berms) to minimise the collection of surface water. It is proposed that the runoff on the final landform replicates the existing patterns downslope.

Surface water runoff from the remaining rehabilitated low grade ore stockpiles would similarly be of an acceptable quality following the successful revegetation of the stockpile. Runoff would be managed in the same manner as for the WRE.

Runoff from the rehabilitated oxide ore stockpile would flow across the ground surface to the south towards Hawkins Creek.

The leachate management dam would be retained until no further leachate is generated from the WRE. This dam would be removed following the relinquishment of the mining lease covering the WRE.

## A5.10.5.5 Rehabilitation Procedures

The rehabilitation of the WRE would be undertaken in a progressive manner throughout the Project life, with a final rehabilitation campaign at the end of the Project life.

The progressive rehabilitation component would involve the following once each cell is filled with PAF waste rock.

- 1. The eastern slopes of the WRE Cells 1 to 5 would be profiled to remove the intermediate berms created during the construction of the emplacement.
- 2. The upper edge of the cell would be profiled to create a convex slope (see **Figure A5.14**) and the adjoining upper section profiled to achieve a 2% slope to the west, where practical.
- 3. The 1.8m to 3.0m thick cover as presented in Section A5.10.5.3 would be constructed on the final slope and upper surface of the emplacement. Trials would be undertaken when constructing the store-and-release cover above Cell 1 to establish the optimum thickness of Layer 4 in the cover.
- 4. Once in place, the cover would be hydromulched with a seed mix, fertiliser, binder and straw.



A progressive approach would also be adopted for the rehabilitation of Cells 6 and 7 given their considerable area (31ha) and visibility from Pyangle Road and Powells Road, its staged rehabilitation would be different to the eastern slopes of the WRE.

It is proposed that activities 1 to 4 above would similarly be undertaken in each vertical stage of Cell 7 as each outer 10m section on the perimeter of each cell is completed. It is currently envisaged that each section to be rehabilitated would be in the order of 1ha.

At the completion of the transportation of the NAF waste rock from the southern barrier for the rehabilitation of the TSF, the lower embankment haul road and its adjoining flood bund and noise barrier would be rehabilitated. The rehabilitation would involve scraping all topsoil off the outer face of the flood bund and noise barrier and pushing the materials within both structures over the former haul road and lapping the material onto the lower slopes of the WRE. **Figure A5.14** presents a cross-section of the lower slopes of the WRE and the final slope created by the pushed material. The reshaped material would effectively create a concave final landform around the lower slopes of the WRE. The final slope would be hydromulched with a seed mix, fertiliser, binder and straw.

It is noted that in order to retain the integrity of the store-and-release cover over the surface of the WRE no trees and substantive shrubs would be planted on the final surface of the WRE as roots could penetrate through the cover and potentially be impacted by the underlying PAF waste rock thereby causing impairment or death of the vegetation. Emphasis would be placed upon a seed mix with a suite of pasture grasses to rapidly stabilise the WRE surface and a suite of native perennial grasses for the long-term cover of the WRE.



Once it is determined that no further leachate is being collected within the leachate management dam, the dam would be filled by pushing the dam wall into the void to create a landform similar to the pre-Project landform. Topsoil/subsoil from the outer surface of the dam would be scraped off and placed on the final land surface after it is shaped.

### A5.10.5.6 Success Criteria

The key success criteria for the rehabilitation of the WRE would be as follows.

- 1. The outer slopes and surface of the emplacement would remain fully vegetated and stable.
- 2. The generation of leachate from the emplacement progressively reduces over time to zero to allow the leachate management dam to be removed.
- 3. The overall visual appearance of the WRE landform is comparable to the surrounding ridges, albeit without trees and shrubs.

## A5.10.6 Processing Area and Mining Facility

#### A5.10.6.1 Introduction and Objectives

At the end of the Project life, the processing area and mining facility would comprise a series of buildings, structures and landforms that would no longer be required. Hence, the rehabilitation of this area would involve the decommissioning of all buildings and structures, unless required for a future land use, and the reshaping and stabilisation of the landform within the area.

The key objectives for the rehabilitation of the processing area and mining facility are as follows.

- 1. All redundant equipment and structures are removed from site.
- 2. No areas of contamination from hydrocarbons or chemicals remain on site.
- 3. The landform is reshaped to remove the geometric landforms relied upon during the Project life (unless required for a future land use).
- 4. The reshaped landform is stable and well vegetated.

#### A5.10.6.2 Final Landform

**Figure A5.15** displays the indicative contours of the proposed reshaped landform across the processing plant area and mining facility. The main features of the reshaped final landform are as follows.

- 1. The flat platform areas for the processing plant, ROM pad, crushed ore stockpile and mining facility would all be reshaped largely through re-distribution of previously filled areas adjacent to those areas to create an undulating topography.
- 2. The area of the former primary jaw crusher would be excavated to re-instate the former channel of Blackmans Gully at approximately 619m AHD to 620m AHD.

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3. Drainage lines or watercourses would be re-established generally in their pre-Project location, albeit with a slightly different alignment and/or gradient with features consistent with those recorded in the Watercourse Assessment (Annexure A of WRM, 2020).

#### A5.10.6.3 Surface Water Management

**Figure A5.15** displays the planned watercourses on the final landform comprising both natural and reconstructed watercourses together with the catchment divide between Blackmans Gully and Price Creek. The reconstructed watercourses would either be positioned on excavated rocky areas or reconstructed using predominantly rock typically >100mm.

#### A5.10.6.4 Rehabilitation Procedures

The rehabilitation procedures to be adopted for the processing plant area and mining facility would comprise the following.

- All processing equipment and buildings would be dis-assembled in a manner that enables all relevant equipment or building components to be re-used at another site. It is noted that it is possible that some buildings may not be dis-assembled as they may be required for a future land use on the site.
- 2. All remaining consumables and spares used in the mining and processing operations would be removed from site.
- 3. All areas of hydrocarbon and chemical contamination would be excavated and the excavated material either bio-remediated on site or removed from site and disposed of at a suitably licensed facility.
- 4. All concrete foundations would be broken up and removed from site and disposed of at a suitably licensed facility.
- 5. For those sections of this domain that are traversed by watercourses, channels for each watercourse would be re-instated across the disturbed area and linked with the previously undisturbed adjoining sections of the watercourse. Emphasis would be placed upon the use of coarse rock (0.1m to 0.3m) to achieve stable, non-erosive watercourse channels in these areas of the Mine Site. **Figure A5.15** displays the sections of watercourses/drainage lines that would be re-instated during the rehabilitation of the processing area and mining facility.
- 6. Following the completion of the activities in 1 to 5 above, an earthmoving program would be undertaken to re-establish an undulating landform principally by pushing/placing the previous fill materials across the geometric platform areas. Emphasis would be placed upon replacing at least 1m of weathered material or broken rock on the former horizontal surfaces after which up to 0.4m of subsoil and 0.2m of topsoil would be placed on the final landform.
- 7. Once the topsoil is in place on the final landform, the land surface would either be hydromulched (mainly the slopes) or seeded and fertilised with conventional farming equipment. Emphasis would be placed upon the re-establishment of native trees and shrubs on the rehabilitated landform (see **Table A5.11**).

#### A5.10.6.5 Success Criteria

The key success criteria for the rehabilitation of the processing area and mining facility would be as follows.

- 1. No contaminated materials remain within the rehabilitated area.
- 2. A landform is created that blends with the surrounding natural landform.
- 3. The re-instated watercourses/drainage lines appear natural and are quickly stabilised.
- 4. The revegetated area contains a range of native tree and shrub species consistent with the adjoining non-disturbed areas.

## A5.10.7 Tailings Storage Facility

#### A5.10.7.1 Introduction and Objectives

The TSF would be the sole repository on site for the long-term storage of the tailings produced in the on-site processing plant. The tailings would be potentially acid-forming and within the TSF would slope towards the embankment at the end of processing operations (see **Figure A5.16**).

For the purposes of this subsection, the TSF domain covers the area of the TSF embankment, impoundment and the three tailings pipelines and return water pipeline.

The key objective of the rehabilitation of the TSF is to contain all tailings within the TSF without any potential for significant dispersal of tailings solids or liquids to the surrounding environment via groundwater, surface water or air.

## A5.10.7.2 Final Landform

Figure A5.16 displays the final landform of the TSF, the main features of which are as follows.

- The TSF embankment would be completed to achieve a more gentle downstream concave/convex profile constructed following the construction of the third raise of the embankment.
- The TSF impoundment (covering approximately 103ha) would comprise gentle slopes on the surface of the TSF from the three entry points to the proposed spillway near the northern abutment of the TSF embankment.
- Following the placement of the cover on the impoundment surface, the landform would slope from approximately 628m AHD to approximately 618m AHD, i.e. over a distance of approximately 1.0km to 1.4km with slopes of approximately 1:60 (V:H) to 1:150 (V:H).



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## A5.10.7.3 Cover Design

Advisian has established that the store-and-release cover proposed for the WRE (see Section A5.10.5.3) would be suitable for the long-term cover for the TSF. The optimum thickness of Layer 4 of the store-and-release cover above the TSF final surface would be established during the initial cover trials.

### A5.10.7.4 Surface Water Management

Management of surface water on the surface of the TSF would involve directing all runoff to the long-term or closure spillway near the northern abutment of the TSF embankment (see **Figure A5.16**). The slopes across the final landform of the former impoundment would achieve a suitable crossflow rate to limit infiltration and avoid scouring the surface of the rehabilitated TSF impoundment.

The TSF closure spillway would have a capacity to convey flows of up to 49L/s and direct the overflow to the stilling basin at the base of the spillway prior to flowing into a minor tributary of Walkers Creek.

The management of surface water in the vicinity of the three water tailings pipeline corridors and return water pipeline would involve the removal of the materials used to construct the containment bunds and backfill the scour sumps to re-establish pre-Project flows.

### A5.10.7.5 Rehabilitation Procedures

The rehabilitation of the TSF embankment would be undertaken following the construction of the final raise, i.e. after about Year 8. A key objective of the rehabilitation of the TSF embankment would be to reduce the visibility of the embankment due to the light colour of the waste rock used to construct the embankment. Rehabilitation would involve the following tasks.

- Oxidised NAF waste rock would be transported by B-double trucks from the open cut pits and placed at the toe of the embankment to depths from 0m to approximately 6m to form the lower concave component of the final slope.
   Figure A5.16 displays the toe of the rehabilitation embankment and the area where the NAF waste rock would be placed.
- 2. Oxidised NAF waste rock would also be transported by suitable trucks to the top of the embankment, via the northern access and perimeter road adjacent to the TSF impoundment, where it would be tipped over the outer face of the embankment. This procedure would continue until the final slope is created and the material blends with the material placed at the toe of the embankment.
- 3. Once the profile of the final slope is finalised, subsoil and then topsoil would similarly be tipped over the slope from the top of the embankment to achieve a suitable substrate for growth.
- 4. Following the completion of topsoil placement, the completed slope would be hydromulched with a seed mix of exotic and native groundcovers (see **Table A5.11**), fertiliser, binder and straw.


The rehabilitation of the surface of the TSF impoundment would commence during the last 6 months of operations, principally adjacent to the northern and southern discharge entry points. ATC Williams advise that the surface within these sections of the TSF impoundment would be sufficiently firm to withstand the delivery of cover materials and the bulldozer(s) pushing the materials across the surface of the impoundment. Following the cessation of tailings placement through the central tailings discharge point, it is proposed that the placement of the cover materials be undertaken progressively with the rate of advance reflective of rate of drying of the impoundment surface. It is estimated that the period of time to cover the impoundment surface would be in the order of three to five years, depending on material availability, the prevailing weather conditions, the drainage from the tailings surface and the development of a suitable surface crust to support construction plant.

Following the cessation of processing, the tailings pipelines and return water pipeline would be retrieved and removed site. Any spillages of tailings along the length of the pipelines, if not previously fully cleaned up, would be fully cleaned up and areas scarified and seeded. Minor soil/earth scarifying and seeding may be required in some areas where the return water pipeline was located.

Bowdens Silver proposes to establish a trial rehabilitation area near the northern tailings discharge entry point during the first year of operations to trial the proposed store-and-release cover, particularly the materials to be used to construct Layer 4 of the cover. The trial area (shown on **Figure A5.16**) would cover an area of approximately 2ha and require a small embankment constructed to an elevation of approximately 626m AHD, i.e. the elevation of the final landform on the long-term surface of the rehabilitated impoundment area. Details of the rehabilitation trial would be presented in the Project's Rehabilitation Management Plan.

#### A5.10.7.6 Rehabilitation Success Criteria

The key success criteria for the rehabilitation of the TSF would be as follows.

- 1. The quantity of seepage of contaminated water from beneath the TSF is consistent with the very low quantities predicted by Jacobs (2020).
- 2. The store-and-release cover is effective in minimising the quantity of water that infiltrates the tailings in the TSF.
- 3. The final southern face of the TSF embankment is well vegetated with minimal visual impact when viewed from distant residences.

#### A5.10.8 Mine Site Roads and Other Site Infrastructure

#### A5.10.8.1 Introduction and Objectives

The Project would operate with a range of roads and tracks across the Mine Site. At the conclusion of the Project, the ongoing need for the roads and tracks would be assessed and those no longer required would be rehabilitated, whereas some may be substantially reduced in width but retained for long-term access around the Mine Site.

Other infrastructure to be rehabilitated could include the administration building/amenities, exploration office and core library and the explosives magazine.



The key objectives for the rehabilitation of these additional components are as follows.

- 1. Only useful roads and tracks required for the ongoing management of the property would be retained long term.
- 2. Any remaining buildings or structures retained on site would be useful for the subsequent land uses.

#### A5.10.8.2 Rehabilitation Procedures

#### **Mine Site Roads**

Narrow unsealed tracks would be directly cross-ripped and seeded/fertilised. The surface layers and the more substantial roads would be removed and transported for use in the rehabilitation of other areas within the Mine Site. Following the removal of the surface layers, the remaining land surface would be ripped, topsoiled and seeded/fertilised. Some former haul roads would be reduced substantially in width to approximately 4m to 5m.

#### **Building and Other Infrastructure**

All buildings not required for the subsequent land use(s) would either be removed from site or disassembled/demolished with all materials taken off site.

#### **Explosives Magazine and Noise Mitigation Containers**

The containers/buildings used for the explosives magazine and for noise mitigation would be removed from site and the earthen embankments removed and used in rehabilitation of other areas of the Mine Site. All disturbance areas would be scarified, seeded and fertilised.

#### Soil Stockpile Areas

The stockpiled topsoil and subsoil across the Mine Site would be gradually removed for use predominantly in the permanent revegetation of completed areas. As the topsoil and subsoil is removed and the original ground surface is exposed, the ground would be scarified and then seeded with a pasture mix and fertiliser. The stockpile areas previously vegetated with native trees and shrubs would be planted with a range of species listed in **Table A5.11**. Areas previously used for grazing, with or without pasture improvement, would be returned for that use as part of the farm.

#### A5.10.8.3 Success Criteria

The key success criteria for the rehabilitation of the various on-site infrastructure components would be as follows.

• All areas are satisfactorily shaped, topsoiled and revegetated with the revegetation generally reflective of the adjoining non-disturbed areas.

# **Appendix 6**

### Land Ownership, Residence and Receiver Database

(Total No. of pages including blank pages = 14)

#### Mine Site and Surrounds

Table A6.1:	Schedule of Land Ownership – Lue Surrounds
Figure A6.1:	Land Ownership and Residences – Lue Surrounds
Figure A6.2:	Crown Land, Crown Roads and Council Roads within the Mine Site
Table A6.2:	Proximity of Mine Site Components to Privately-Owned Residences within Lue surrounds
Lue	
Table A6.3:	Schedule of Land Ownership – Lue
Figure A6.3:	Land Ownership and Residences– Lue
Table A6.4:	Schedule of Lue – Places of Interest

#### Table A6.5: Proximity of Mine Site components to Privately-Owned Residences within Lue

#### Water Supply Pipeline Corridor

Table A6.6:	Schedule of Land Ownership – Water Supply Pipeline Corridor
Figure A6.4:	Land Ownership – Water Supply Pipeline



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Ref <sup>1</sup>	Owner	Ref <sup>1</sup>	Owner
А	Crown Land	50	ACN 059 643 533 Pty Limited
1	Bowdens Silver Pty Limited <sup>2</sup>	51	
3	Monival Pastoral Company Pty Limited	52	
4		53	
6		54	Mudgee Local Aboriginal Land Council
7	Lochiely Pty. Limited	55	
8	Sam Lynch Electrical Pty Limited	56	
9		57	Havilah South Pty Limited
10 <sup>5</sup>		58	
12		59	
13		60	
14		61	
15		62	
16		63	
17		64	
18		65	
19		66	
20		67	
21		68	
22		69	
23		70	Tugulawa Homestead Pty Ltd
24		71	State Rail
25 <sup>3</sup>		72	
26		73	WJ Murdoch & Co Pty Limited
27		74	
28	Attunga 2850 Pty Ltd	75	
29		76	Merryvale Farm Pty Limited
30		77	
31		78	
33		79	Stanford (Botobolar) Pty Limited
34		80	
35 <sup>4</sup>		81	
36		82 <sup>3</sup>	
37 <sup>3</sup>		83 <sup>3</sup>	
38		84 <sup>3</sup>	
39		85 <sup>3</sup>	
40		86 <sup>3</sup>	
41	Lue Hospitality Pty Ltd	87 <sup>4</sup>	
42		88 <sup>3</sup>	
43		89 <sup>3</sup>	
44		90 <sup>3</sup>	
45		91	Lue Station Pty Ltd
46		92	
47		93	
48	ACN 059 643 533 Pty Limited	94	
49		95	

 Table A6.1

 Schedule of Land Ownership – Lue Surrounds (3 December 2019)

Notes:

1. Some reference numbers have been removed as some properties have been acquired by Bowdens Silver Pty Ltd or existing landowners in the Lue District since the reference numbers were first assigned.

2. Or under purchase option.

3. This property is located in the R5 Large Lot Residential Zone (LEP 2012) surrounding Lue.

4. This property is partly located in the R5 Large Lot Residential Zone (LEP 2012) surrounding Lue.

Bowdens Silver Pty Ltd has an agreement with this landowner to undertake the Project on their property.





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**ENVIRONMENTAL IMPACT STATEMENT** Appendix 6





Table A6.2	
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#### Proximity of Mine Site Components from Privately-Owned Residences (3 December 2019)

			1	T	1	1	r	Page 1 of 2
				Distance	_	Distance	Distance	Distance
		Crid	Elevation	to TSF	Distance	to Jaw	to Nearest	to Southorn
Ref	Landowner	Ref	(m AHD)	(m)	(m)	(m)	Pit (m)	Barrier (m)
04R		K7	589.5	4170	740	2290	1360	1280
06R		O10	616.5	8680	5420	6990	5940	5550
07R	Lochiely Pty. Limited	J8	582.3	3390	1430	2440	1190	690
09R		P10	612.0	9600	6350	7920	6870	6470
10R		18	614.0	2980	1290	2110	910	400
12R		H7	567.1	1730	2440	2370	1660	1390
13R		O11	619.1	9700	6530	8090	7010	6570
15R		N11	660.1	9280	6320	7850	6730	6220
16R		O12	653.4	9950	6940	8480	7370	6870
17R		14	659.7	2400	1760	2000	2210	3020
19R		O5	634.5	7940	4660	5880	5320	5290
21R		L5	612.0	4760	1670	2710	2200	2340
22R		M5	601.6	5810	2630	3760	3230	3270
24R		L7	615.2	5440	2020	3560	2620	2450
25R		G8	558.7	2100	3530	3370	2750	2480
27R		L7	627.0	5130	1780	3340	2330	2070
28RA	Attunga 2850 Pty Ltd	M9	572.2	6510	3410	4960	3850	3390
28RB	Attunga 2850 Pty Ltd	M9	574.2	6660	3560	5110	4000	3530
28RC	Attunga 2850 Pty Ltd	L10	587.3	6700	3770	5280	4160	3630
28RD	Attunga 2850 Pty Ltd	M10	583.6	6900	3960	5480	4350	3830
31R		M8	625.2	6650	3220	4760	3830	3620
33R		M6	601.5	5670	2380	3620	3040	3010
34R		M5	629.6	6480	3410	4440	3950	4060
35R		G7	553.7	1170	2810	2480	2050	1870
36RA		G6	543.7	770	3110	2610	2310	2300
36RB		G6	560.5	360	2950	2360	2130	2220
37R		G8	545.0	1880	2940	2840	2160	1890
39R		19	575.0	3990	2530	3460	2250	1740
40R		19	576.4	4100	2520	3500	2270	1770
42R		G9	547.2	2220	2920	2970	2180	1870
43R		N8	595.4	7270	3880	5430	4460	4190
44R		H9	549.3	3450	2820	3410	2350	1860
45RA		19	557.6	3670	2860	3540	2450	1940
45RB		H9	557.1	3820	3190	3830	2760	2250
46R		19	586.0	4140	2690	3630	2420	1920
47R		J9	585.0	4130	2440	3460	2230	1720
48R	ACN 059 643 533 Pty Limited	J10	625.2	5480	3740	4860	3610	3110
50R	ACN 059 643 533 Pty Limited	J11	619.7	6560	4770	5940	4690	4180
58R		C8	571.0	4770	7130	6740	6350	6110
60R		D5	559.3	3010	5940	5460	5350	5490



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#### Table A6.2 (Cont'd)

Proximity of Mine Site Components from Privately-Owned Residences (3 December 2019)

		1	1	I	1	1	I	Page 2 of 2
Ref	Landowner	Grid Ref	Elevation (m AHD)	Distance to TSF Embankment (m)	Distance to WRE (m)	Distance to Jaw Crusher (m)	Distance to Nearest Open Cut Pit (m)	Distance to Southern Barrier (m)
61R		C2	5966	4900	7500	7230	7330	7700
63R		B1	543.5	6130	8630	8410	8510	8900
68R		F2	662.8	3160	4900	4850	5010	5600
70R	Tugulawa Homestead Pty Ltd	H1	704.7	4050	4130	4430	4640	5440
73R	WJ Murdoch & Co Pty Limited	F4	563.5	1650	4140	3870	3970	4380
74R		12	661.3	3310	3040	3350	3560	4370
75R		H2	673.1	2960	3570	3710	3920	4650
76R	Merryvale Farm Pty Limited	E4	573.2	1730	4520	4160	4190	4500
80R		N9	597.3	7850	4520	6080	5070	4730
81R		F8	613.1	2230	4260	3930	3480	3250
82R		F8	598.4	2110	4030	3730	3250	3010
83R		F8	591.3	2470	4180	3970	3390	3130
84RA		F8	578.9	2360	4010	3810	3220	2960
84RB		F8	589.8	2620	4140	4000	3370	3090
85R		F8	574.3	2550	3850	3780	3090	2800
86R		F7	558.9	1830	3600	3320	2810	2580
87R		F7	537.6	1250	3400	2980	2610	2480
88R		E7	567.8	2480	4720	4340	3950	3740
89R		E7	578.5	2270	4490	4110	3730	3510
90R		E7	579.0	2180	4390	4000	3620	3410
91R	Lue Station Pty Limited	G10	584.5	4380	4550	4970	3990	3550
92RB		D7	544.0	3650	6270	5780	5480	5340
92RE		G9	563.4	3470	3660	4010	3050	2650
92RF		G9	566.1	3570	3740	4110	3140	2730
92RG		G9	568.9	3710	3850	4240	3270	2850
93RA		H9	571.5	3540	3400	3860	2850	2410
93RB		H9	568.7	3610	3350	3850	2830	2380
93RC		H9	571.8	3770	3570	4070	3050	2600
94RA		H9	566.4	3300	3230	3640	2650	2220
94RB		H9	561.7	3360	3230	3660	2660	2230
95R		H9	557.0	3790	3390	3960	2910	2430

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Ref	Owner	Ref	Owner
А	Crown Land	L26	
L1		L27*	
L2		L28	
L3		L29	
L4		L30	
L5		L31	
L6	Mid-Western Regional Council	L32	
L7		L33	
L8		L34	
L9		L35	
L10		L36	
L11	Lue Station Pty Limited	L37	
L12		L38	
L13		L39	
L14	Lue Public School	L40	
L15		L41	
L16		L42	
L17		L43	
L18		L44	
L19		L45	
L20		L46	
L21		L47	
L22		L48	
L23		L49	
L24		L50	
L25			
* Form	erly St Lukes Anglican Church	-	•

Table A6.3Schedule of Land Ownership – Lue (3 December 2019)

 Table A6.4

 Schedule of Lue Places of Interest (3 December 2019)

Ref	Places of Interest	Owner
1	Lue/Havilah Rural Fire Brigade	Mid-Western Regional Council
2	Lue Pottery	
3	Lue Public School	Department of Education
4	Lue Hall	
5	Lue Railway Station Buildings	NSW Rail Corporation

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#### **BOWDENS SILVER PTY LIMITED**

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#### Table A6.5

#### Proximity of Mine Site Components to Privately-owned Residences within Lue (3 December 2019)

-						I	n	Page 1 of 2
				Distance to		Distance	Distance	Distance
		Crid	Elevation	TSF	Distance	to Jaw	to Nearest	to Southorn
Ref	Landowner	Ref	(m AHD)	(m)	(m)	(m)	Pit (m)	Barrier (m)
L1		E3	552.6	2340	3020	3090	2280	1960
L2		E3	546.2	2350	2920	3020	2200	1870
L3		B2	557.6	2190	3440	3340	2670	2390
L4		B2	557.9	2180	3470	3360	2690	2410
L5		B2	554.2	2270	3380	3330	2620	2330
L7		D3	551.7	2390	3140	3200	2410	2090
L8		D3	552.5	2440	3200	3270	2470	2150
L9		E4	549.1	2620	3110	3280	2420	2060
L10		E5	553.6	2860	3200	3440	2530	2160
L12		E5	556.4	2870	3290	3510	2610	2250
L13		E5	556.5	2830	3300	3500	2620	2260
L15		D5	556.7	2750	3310	3480	2620	2270
L16		E6	558.8	2880	3350	3560	2670	2310
L17		E6	558.1	2920	3340	3570	2670	2300
L18		D5	556.1	2700	3340	3470	2630	2280
L19		D5	557.8	2690	3370	3490	2660	2310
L20		D4	557.9	2660	3390	3490	2670	2330
L21		C4	558.3	2650	3400	3490	2680	2340
L22		C4	558.3	2610	3400	3480	2680	2350
L23		C5	559.1	2680	3420	3520	2700	2370
L24		C5	560.0	2720	3440	3550	2730	2390
L25		D5	559.5	2730	3400	3530	2690	2350
L26		D5	560.0	2760	3400	3540	2700	2350
L27		C4	558.4	2560	3420	3480	2690	2370
L28A		C4	558.6	2500	3470	3490	2730	2420
L28B		B4	560.6	2520	3540	3550	2790	2490
L29		D6	566.5	2990	3480	3690	2810	2440
L30		D7	574.8	3100	3580	3800	2910	2540
L31		D6	563.7	2890	3440	3620	2750	2390
L32		D6	566.5	2850	3480	3640	2780	2430
L33		C5	569.2	2820	3610	3720	2900	2560
L34		C5	562.4	2690	3550	3620	2830	2500
L35		B4	563.1	2640	3580	3620	2850	2530
L37		B4	564.2	2590	3610	3620	2870	2560
L38		B4	566.8	2650	3670	3690	2930	2610
L39		B4	566.1	2670	3660	3690	2920	2600
L40		B5	565.6	2740	3620	3690	2890	2560
L41		F5	568.7	2800	3660	3740	2940	2610
L42		B5	570.6	2710	3740	3760	3000	2680
L43		A5	573.9	2780	3800	3830	3070	2750
L44		B5	571.1	2840	3720	3800	3000	2670



#### Table A6.5 (Cont'd)

Proximity of Mine Site Components to Privately-owned Residences within Lue (3 December 2019)

Ref	Landowner	Grid Ref	Elevation (m AHD)	Distance to TSF Embankment (m)	Distance to WRE (m)	Distance to Jaw Crusher (m)	Distance to Nearest Open Cut Pit (m)	Distance to Southern Barrier (m)
L45		A4	577.5	2660	3780	3770	3040	2730
L46		B4	565.0	2560	3630	3630	2880	2580
L47		A4	569.8	2590	3700	3690	2960	2650
L49		F5	551.1	2830	3060	3330	2410	2030
L50		C2	556.0	2080	3220	3140	2450	2170
			Places	of Interest				
LPOI1	Mid-Western Regional Council	C3	553.1	2420	3240	3290	2500	2190
LPOI2		C5	569.1	2810	3600	3710	2890	2550
LPOI3	Department of Education	E5	557.0	2800	3310	3500	2620	2270
LPOI4		E4	549.1	2620	3120	3280	2420	2070
LPOI5	NSW Rail Corporation	E5	552.8	2810	3170	3400	2500	2130



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Table A6.6
Schedule of Land Ownership – Water Supply Pipeline (3 December 2019)

Ref	Landowner
А	Crown Land
P1	W.J. Murdoch & Co. Pty Limited
P2	
P3	
P4	
P5	
P6	
P7	
P8	
P9	
P10	
P11	
P12	
P13	
P14	
P15	
P16	
P17	
P18	
P19	ICI Australia Operations Pty Limited
P20	Ulan Coal Mines Limited

**ENVIRONMENTAL IMPACT STATEMENT** Appendix 6



#### BOWDENS SILVER PTY LIMITED Bowdens Silver Project Report No. 429/24

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# Appendix 7

### Assessment of Environmental Risk

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#### A7.1 INTRODUCTION

Risk is the chance of something happening that will have an impact upon the objectives or the task which, in this case, is the safe and environmentally responsible construction and operation of the Project. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. The allocation of a qualitative consequence ranking of the potential impact(s) occurring for each risk source was based on the definitions defined **Table A7.1** whilst the qualitative likelihood or probability ranking was defined in accordance with **Table A7.2**. The risk ranking was then established based upon the matrix presented in **Table A7.3**. These tables have been developed generally in accordance with Standards Australia "HB 203:2012 Managing environment-related risk".

Level	Descriptor	Description
5	Catastrophic	The potential to cause regional environmental impact/ecosystem damage with impacts causing mine or business closure, e.g. major off-site release of a contaminant with long-term detrimental effects.
4	Major	The potential to cause substantial regional/local environmental damage which could result in major financial loss and/or prosecution, e.g. off-site release of a contaminant resulting in local ecosystem damage.
3	Moderate	The potential to cause substantial temporary or minor long-term damage, e.g. a minor water or large hydrocarbon off-site release with outside clean-up assistance required. May potentially result in a legal non-compliance.
2	Minor	The potential for a temporary or minor spill. No legal breach but may be non- compliant with internal environmental target, e.g. minor hydrocarbon spill.
1	Insignificant (I)	No detrimental effect, negligible environmental impact.

Table A7.1 Qualitative Consequence Ratings

Table A7.2
Qualitative Likelihood Ranking

Level	Descriptor	Description	
А	Almost Certain	Is expected to occur in most circumstances.	
В	Likely	Will probably occur in most circumstances.	
С	Possible	Could occur.	
D	Unlikely	Could occur but not expected.	
E	Rare	Occurs only in exceptional circumstances.	

Table A7.3 Risk Rankings

Likelihood						
		A - Certain	B - Likely	C - Possible	D – Unlikely	E - Rare
Sonsequence	1 – Catastrophic	1	2	4	7	11
	2 – Major	3	5	8	12	16
	3 – Moderate	6	9	13	17	20
	4 – Minor	10	14	18	21	23
Ŭ	5 – Insignificant	15	19	22	24	25
Low Medium High Extreme						

**Table A7.4** presents the identified risk sources and the potential consequences of the identified risk and the risk rankings assuming standard controls together with the location of the proposed management and control measures identified within Section 4 of the EIS. In a number of cases, the standard controls would be appropriate to achieve an acceptable level of impact whereas for some cases, additional project or site-specific controls are required to achieve the required level of impact.

The four risk rankings are defined as follows.

- Low (L): requiring a basic assessment of proposed controls and residual impacts. Any residual impacts are unlikely to have any major impact on the local environment or stakeholders.
- Medium (M): requiring a medium level assessment of proposed controls and residual impacts. It is unlikely to preclude the development of the Project but may result in impacts deemed unacceptable to some local or government stakeholders.
- High (H): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures. Ultimately, this level of risk may preclude the development of the Project.
- Extreme (E): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures and possible preparation of a specialised management plan. Unless considered to be adequately managed by the controls and/or management plan, this level of risk is likely to preclude the development of the Project.

Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.
	NOISE		
Site establishment and construction activities, both on and off site.	Noise emissions resulting in amenity impacts at residential and other sensitive receivers.	6 (A3)	4.2.2.5 4.2.3.4
Day-time and evening mining operations.	Noise emissions resulting in amenity impacts at residential and other sensitive receivers.	6 (A3)	4.2.2.5
Day-time, evening and night-time processing operations.	Noise emissions resulting in amenity impacts at residential and other sensitive receivers.	10 (A4)	4.2.2.5
Night-time mining operations	Noise emissions resulting in sleep disturbance at residential receivers.	14 (B4)	4.2.2.5
Night-time processing operations	Noise emissions resulting in sleep disturbance at residential receivers.	14 (B4)	4.2.2.5
Transportation of mobile equipment and processing plant components to the Mine Site together with workforce traffic resulting in noise emissions.	Noise emissions resulting in amenity impacts at residential and other sensitive receivers.	6 (A3)	4.2.2.5
Transportation of production consumables to, and concentrates from, the Mine Site together with workforce traffic resulting in noise emissions.	Noise emissions resulting in amenity impacts at residential and other sensitive receivers.	18 (C4)	4.2.2.5
			Future rec

Table A7.4 Analysis of Environmental Risks



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Page 2 of 8				
	- <i></i>	Risk with Standard Control	Proposed Control Measures EIS	
Risk Source	Consequence / Hazard	Measures	Section Ref.	
	BLASTING AND VIBRATION			
Ground vibration and airblast from blasting activities.	Amenity impacts on residential and other sensitive receivers.	18 (C4)	4.3.4.1	
Rock propelled outside the designed	Damage to nearby privately-owned property.	18 (C4)	4.3.4.1	
blast envelope (i.e. flyrock).	Injury or death.	11 (E1)	4.3.4.1	
Trucks travelling on public roads.	Vibration impacts to residences or buildings	18 (C4)	4.3.4.2	
	AIR QUALITY			
Emissions of TSP/PM <sub>10</sub> /PM <sub>2.5</sub> /Deposited dust from site establishment and construction activities.	Health and / or amenity impacts on occupants within the nearby privately-owned residences and other sensitive receivers.	17 (D3)	4.4.2.3, 4.4.3	
Emissions of TSP/PM <sub>10</sub> /PM <sub>2.5</sub> / Dust from mining and processing operations.	Health and / or amenity impacts on occupants within the nearby privately-owned residences and other sensitive receivers.	17 (D3)	4.4.2.3	
Generation of gaseous emissions and blasting fumes.	Health and / or amenity impacts on occupants within the nearby privately-owned residences and other sensitive receivers.	17 (D3)	4.4.2.3	
Generation of gaseous cyanide emissions.	Health and / or amenity impacts on occupants within the nearby privately-owned residences and other sensitive receivers.	20 (E3)	4.4.2.3	
Emissions of metals attached to particulate emissions and crystalline silica as a component of particulate emissions.	Health and / or amenity impacts on occupants within the nearby privately-owned residences and other sensitive receivers.	17 (D3)	4.4.2.3	
	GREENHOUSE GAS			
Scope 1 – on-site generation of Greenhouse Gas (GHG) emissions.	Climate change impacts from the Project, locally, regionally, and worldwide.	19 (B5)	4.5.4	
Scope 2 – off-site generation of GHG emissions.	Climate change impacts from the Project, locally, regionally, and worldwide.	19 (B5)	4.5.4	
Scope 3 – off-site impacts of GHG emissions.	Climate change impacts from the Project, locally, regionally, and worldwide.	19 (B5)	4.5.4	
	GROUNDWATER			
Interception of groundwater table by open cut mining.	Reduced groundwater levels and availability for existing groundwater users.	9 (B3)	4.6.8	
	Reduced baseflow contribution to Hawkins or Lawsons Creeks impacting on streamflow and aquatic ecosystem health.	13 (C3)	4.6.8	
Reduced baseflow contribution to a watercourse (Lawsons or Hawkins Creeks).	Impacts to groundwater dependent ecosystems.	13 (C3)	4.6.8	
Contaminated discharge/groundwater.	Impacts to groundwater dependent ecosystems.	17 (D3)	4.6.8	
Infiltration to shallow aquifers from contaminated water storage structures.	Reduced water quality in groundwater systems.	17 (D3)	4.6.8	
Low	Medium High		Extreme	

Page 3 of 8			
Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.
	GROUNDWATER (Cont'd)		
Discharge of contaminated groundwater into the terrestrial environment.	Reduced water quality in groundwater systems.	17 (D3)	4.6.8
Seepage from residue (tailings) in the TSF.	Reduced water quality in groundwater systems.	12 (D2)	4.6.8
Open cut mining.	Changes to structural geology in the vicinity of the open cut pits and the subsequent impact to the groundwater system.	23 (E4)	4.6.8
Infrastructure development.	Reduction in recharge to alluvium (shallow groundwater)	22 (C5)	4.6.8
Reduced water quality in groundwater systems.	Impacts on groundwater biota.	17 (D3)	4.6.8
	SURFACE WATER		
Construction of Mine components within natural catchments.	Reduction in flows downstream of Mine Site.	15 (A5)	4.7.4.4
Partial or full failure of tailings storage facility.	Damage to infrastructure and impacts on watercourse and aquatic ecosystem function.	11 (E1)	4.7.4.4
Release of sediment-laden water to downstream watercourses.	Impacts on aquatic ecosystem function.	13 (C3)	4.7.4.4
Partial or full failure of a sediment dam.	Rapid release of sediment-laden water into Hawkins and Lawsons Creeks catchments.	17 (D3)	4.7.4.4
Release of contaminated water to downstream watercourses.	Adverse impacts on aquatic ecosystem function and limitations upon use by current water users.	16 (E2)	4.7.4.4
Construction of mine components within watercourse floodplains.	Loss of floodplain storage leading to flood impacts upon local infrastructure and privately-owned residences.	18 (C4)	4.7.4.4
	HUMAN HEALTH RISK		
Emissions of TSP/PM <sub>10</sub> /PM <sub>2.5</sub> , including particulates containing elevated lead or other metals, during site establishment and construction and operational activities.	Impact upon the health of the surrounding local population due to inhalation.	12 (D2)	4.4.2.3, 4.4.3, 4.8.9
Deposition of particulates / dust containing lead, or other metals during site establishment and construction and operational activities.	Impact upon the health of surrounding local population due to deposition impacting soil quality, dust levels indoors, and tank water quality.	12 (D2)	4.4.2.3, 4.8.9
Mobilisation of contaminants (including lead and other metals) during construction and operation of the Project which influence the water quality in the surface water environment of Hawkins and Lawsons Creeks.	Impact upon the health of surface water users (where relevant).	17 (D3)	4.7.4, 4.8.9
Low	Medium High		Extreme



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Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.	
	HUMAN HEALTH RISK (Cont'd)			
Mobilisation of contaminants (including lead and other metals) during construction and operation of the Project which influence the water quality in the groundwater environment.	Impact upon the health of groundwater users (where relevant). Impact upon the health of surface water users where groundwater discharges to surface waters.	20 (E3)	4.6.8, 4.8.9	
Generation of noise during construction and operation of the Project impacting on the health of the local population	Impact upon the health of the local surrounding population.	21 (D4)	4.2.2.5, 4.2.3.4, 4.8.9	
	VISIBILITY			
Construction of the TSF embankment, southern barrier, oxide ore stockpile and the lower embankment haul road and barrier around the WRE.	Amenity impacts through the change in content and composition of views from six nearby privately-owned residences and the local public road network during the site establishment and construction stage.	10 (A4)	4.9.4	
Operations within the open cut pits, waste rock emplacement, southern barrier, oxide stockpile and low grade ore stockpiles.	Amenity impacts through the change in content and composition of views from six privately-owned residences and the local public road network.	6 (A3)	4.9.4	
	Visibility of on-site traffic and earthmoving equipment operating within the Mine Site (during the day-time and after dusk due to equipment lights) and visibility of increased traffic on local roads.	18 (C4)	4.9.4	
Lighting or sky glow impacts after dusk.	Visual intrusion or a reduction in scenic quality due to direct/indirect lighting or sky glow after dusk at nearby privately-owned residences and within Lue.	21 (D4)	4.9.4	
	Impacts on astronomical operations at the Siding Spring Observatory and local observatories due to night sky brightness above the observatories created by the Project lighting.	21 (D4)	4.9.4	
	TERRESTRIAL ECOLOGY			
Planned clearing of vegetation communities within Mine Site, Relocated Maloneys Road and/or Water Supply Pipeline Corridor.	Significant impacts upon habitat for terrestrial fauna species, threatened or rare native vegetation or vegetation communities and biodiversity values.	8 (C2)	4.10.5	
	Injuries to native fauna during clearing / earthworks.	14 (B4)	4.10.5	
Changes to groundwater and surface water systems.	Adverse impacts on groundwater dependent ecosystems.	17 (D3)	4.6.8, 4.10.5	
Site establishment and mining operations.	Indirect impacts to fauna communities due to light / noise / blasting etc.	18 (C4)	4.9.4.4, 4.10.5	
Low Medium High Extreme				

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Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.		
Т	ERRESTRIAL ECOLOGY (Cont'd)				
Inappropriate maintenance/management of weeds	Weeds and/or pests impede successful rehabilitation.	21 (D4)	4.10.5		
and pest species.	Weeds and/or pests propagating from the Mine Site impact the productivity of surrounding agricultural land or the biodiversity values of retained native vegetation communities.	21 (D4)	4.10.5		
	AQUATIC ECOLOGY				
Development of the open cut pits, TSF and other ancillary Mine components.	Displacement of ephemeral watercourses in the footprint of the open cut area and ancillary infrastructure	15 (A5)	4.11.5		
Construction of the relocated Maloneys Road.	Temporary or permanent barrier to fish passage in Lawsons Creek, loss of aquatic habitat.	18 (C4)	4.11.5		
Alteration to natural flow regimes and changes to flow inputs to Hawkins and Lawsons Creeks.	Changes to geomorphology and flow regimes of watercourses impacting aquatic ecology and riparian assemblages.	18 (C4)	4.11.5		
Lowering of water quality of watercourses and groundwater within the Study Area due to mobilisation of sediments and unplanned discharges.	Reduced water quality in Hawkins and Lawsons Creek catchments and impacts to local biota as a result of surface water and groundwater interaction.	17 (D3)	4.11.5		
Changes in water quality due to excavation of the open cut pits, possibly from exposure of unweathered PAF waste rock or ore.	Impacts on groundwater biota, aquatic ecological biodiversity, stygofauna and biota within Hawkins and Lawsons Creeks.	17 (D3)	4.11.5		
Reduced groundwater availability to stygofauna due to groundwater drawdown following inflow of groundwater into the main open cut pit void.	Loss of subterranean habitat and subsequent impacts to stygofauna species.	14 (B4)	4.11.5		
Unmanaged discharge of existing dams and other water impoundments on site.	Proliferation and spread of aquatic pest species in water bodies.	17 (D3)	4.11.5		
Degradation of riparian vegetation due to Key Threatening Processes (KTPs).	Reduced biodiversity values in Hawkins and Lawsons Creeks.	21 (D4)	4.11.5		
TRAFFIC					
Increased traffic on local and regional roads	Vehicle accidents on local and regional road network.	7 (D1)	4.12.4		
	Impacts on capacity of local and regional network affecting travel time for road users.	18 (C4)	4.12.4		
	Deterioration of road condition and serviceability as a result of increased traffic	18 (C4)	4.12.4		
Site establishment and construction traffic	Disruption to local and regional road users as a result of over mass transport movements	13 (C3)	4.12.4		
Low	Medium High		Extreme		



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Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.	
	LAND AND SOIL CAPABILITY			
Inappropriate soil management.	Inadequate soil available for closure and rehabilitation purposes leading to less successful rehabilitation and increased rehabilitation costs and maintenance.	17 (D3)	4.13.4	
	Degradation of soil in stockpiles leading to less successful rehabilitation and increased rehabilitation costs and maintenance.	17 (D3)	4.13.4	
	Erosion and loss of materials from soil stockpiles.	18 (C4)	4.13.4	
Changes to land uses impacting soil and land resources.	Reduction of the land and soil capability class within the Mine Site.	15 (A5)	4.13.4	
AE	SORIGINAL CULTURAL HERITAGE			
Inadvertent removal or destruction of known Aboriginal sites and/or artefacts.	Loss of Aboriginal cultural heritage values and reduction of in situ archaeological record.	23 (E4)	4.14.9	
Destruction of known Aboriginal artefacts during salvage and storage.	Loss of Aboriginal cultural heritage values and reduction of archaeological record.	17 (D3)	4.14.9	
Removal or destruction of currently unidentified Aboriginal sites and/or artefacts.	Loss of Aboriginal cultural heritage values and reduction of in situ archaeological record.	23 (E4)	4.14.9	
	HISTORIC HERITAGE			
Unauthorised destruction of known historic heritage sites.	Loss of heritage items displaying features of previous mining operations.	22 (C5)	4.15.6	
Unauthorised destruction of unknown historic heritage sites within approved disturbance areas.	Loss of heritage items displaying features of previous mining operations.	22 (C5)	4.15.6	
	PUBLIC SAFETY HAZARDS			
Sodium cyanide or cyanide solution spill and/or leak event within the Mine Site.	Impacts to the biophysical environment including impacts on human health, aquatic life, birds, plants and animals.	16 (E2)	4.16.1	
Sodium cyanide loss of containment events during transport.		16 (E2)	4.16.1	
Unplanned decomposition of blasting agent.	Off-site impacts to surrounding infrastructure and human health.	23 (E4)	4.16.1	
Fire initiated off site.	Threat to Mine Site operations and impacting on-site stock and infrastructure.	12 (D2)	4.16.3	
Fire initiated on site.	Threat to Mine Site operations.	17 (D3)	4.16.3	
	Fire spreading off site and impacting on stock and infrastructure.	17 (D3)	4.16.3	
Low	Medium High		Extreme	

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Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.
AGRIC	ULTURAL LANDS AND ENTERPRISES		
Deposited dust impacting agricultural productivity.	Increased dust load on crops and health impacts on livestock on surrounding agricultural land.	21 (D4)	4.4.2.3
Noise and vibration generated by mining operations.	Impacts to health of livestock on surrounding properties.	21 (D4)	4.2.2.5 & 4.3.4
Interception of groundwater table by open cut mining	Reduced groundwater levels and availability for existing authorised users.	9 (B3)	4.6.8
Construction of Mine components within natural catchments.	Reduction in flows downstream of Mine Site.	15 (A5)	4.7.4
Release of contaminated water to downstream watercourses.	Adverse impacts on aquatic ecosystem function and limitations upon use by current water users	16 (E2)	4.7.4
Mining operations.	Impacts on surrounding agricultural enterprises and agri-tourism businesses due to changes to existing land uses.	17 (D3)	4.18.5
	The fragmentation or alienation of land used for agriculture.	17 (D3)	4.18.5
	Reduction in agricultural productivity due to the removal of land used for agriculture.	17 (D3)	4.18.5
Inappropriate soil management.	Inadequate soil available for closure and rehabilitation purposes leading to less successful rehabilitation and increased rehabilitation costs and maintenance.	17 (D3)	4.13.4
	Degradation of soil in stockpiles leading to less successful rehabilitation and increased rehabilitation costs and maintenance.	17 (D3)	4.13.4
	Erosion of soil stockpiles.	18 (C4)	4.13.4
Changes to land uses impacting soil and land resources.	Reduction of land and soil capability within the Mine Site.	15 (A5)	4.13.4
	ECONOMIC		
Downturn in silver price or increase in operating costs.	Project becomes uneconomic and closes prematurely.	12 (D2)	4.19.3.5
Amenity impacts from construction and operations.	Localised impacts negatively affect the housing market and lead to decreases in housing and land prices.	13 (C3)	4.19.4.5
Increase employment and population reduce available housing stock.	Property values increase and housing markets become constrained leading to rent increases.	17 (D3)	4.19.4.5
Utilisation of resources (natural and human) for the construction and operation of the Project	Mining operations leads to a reduction in resources / increased cost of operation for other industries within Lue and Mid-Western LGA.	17 (D3)	4.19.4.5
Low	Medium High		Extreme



			Page 8 of 8
Risk Source	Consequence / Hazard	Risk with Standard Control Measures	Proposed Control Measures EIS Section Ref.
	SOCIAL		
Construction and operation of the Mine.	Changes to existing visual amenity for residents of surrounding properties.	10 (A4)	4.9.4, 4.20.4
	Creation of noise, vibration and dust that reduces social amenity.	6 (A3)	4.2.2.5, 4.3.4, 4.4.2.3, 4.20.4
	Impacts on ecosystem services including water use / availability and biodiversity that is valued by the community.	14 (B4)	4.6.8, 4.7.4, 4.10.5, 4.20.4
Land acquisitions.	Loss of community and generational properties resulting in changes in way of life.	6 (A3)	4.20.4
Lead contamination in air and water.	Impacts on health of community.	12 (D2)	4.8.9, 4.20.4
Increased traffic during Mine construction and operation.	Increased deterioration of road surfaces that are used by the public.	18 (C4)	4.12.4, 4.20.4
	Increased risk of traffic incidents resulting in injury or death.	7 (D1)	4.12.4, 4.20.4
	Increased maintenance costs to Mid-Western Regional Council beyond standard contribution payments.	18 (C4)	4.12.4, 4.20.4
Population increase associated with	Changes in way of life.	6 (A3)	4.20.4
employment growth.	Reduced housing availability and associated increased housing costs.	17 (D3)	4.20.4
	Inability of existing community services (i.e. health, education and childcare) in surrounding towns to accommodate additional demand.	13 (C3)	4.20.4
	Poor relationships between existing community and mine workers / new arrivals.	13 (C3)	4.20.4
Low	Medium High		Extreme

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# **Appendix 8**

### Capital Investment Value for the Bowdens Silver Project

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The Capital Investment Value for the Bowdens Silver Project would be \$246.55 million. This value has been compiled by GR Engineering Services Pty Ltd, the author of the May 2018 Feasibility Study for the Project.

The value of \$246.55 million comprises three components.

	Total	\$246.55 million
3.	Capitalised Operating Costs (to initial production)	\$24.21 million
2.	Mining Capex (including mobilisation)	\$4.54 million
1.	Equipment Costs (see Table A)	\$217.80 million

It is noted that Table A is a summary of 20 pages of detailed costs assembled for the Project.



# Bowdens Silver Project Feasibility Study - Area Cost Summary

AREA LEVEL 1	Supply Cost \$	Install Cost \$	Install Manhours	Freight Cost \$	Subtotal Cost \$	Contingency Cost \$	Total Pro Cost
211 Mine Development Surface	•	•			•	-	
310 Crushing	3,679,914	790,566	13,075	117,333	4,587,813	292,868	4,88
320 Ore Storage and Handling	6,802,877	1,968,442	32,735	147,032	8,918,350	595,369	9,51
330 Grinding and Classification	11,836,049	2,507,931	41,514	721,206	15,065,186	837,205	15,90
331 Pebble Crushing	655,446	268,618	4,446	27,457	951,522	64,932	1,01
336 Silver/Lead Flotation and Regrind	2,544,811	813,649	13,439	121,671	3,480,131	196,169	3,67
337 Zinc Flotation and Regrind	2,769,573	828,120	13,673	123,642	3,721,335	209,219	3,93
338 Silver/Lead Concentrate Thickening	273,011	28,884	468	24,428	326,323	18,033	34
339 Zinc Concentrate Thickening	383,020	87,519	1,449	25,550	496,089	28,744	52
346 Concentrate Bagging and Loadout	1,440,661	152,887	2,534	34,766	1,628,314	85,284	1,71
350 Tailings Thickening and Pumping	1,083,901	300,751	4,976	147,414	1,532,066	81,007	1,61
351 Concentrate Thickening	110,009	58,635	981	1,122	169,766	10,711	18
352 Concentrate Filtering	2,227,384	678,554	11,216	73,407	2,979,345	179,939	3,15
360 Reagents	1,213,582	328,198	5,392	117,430	1,659,210	94,851	1,75
371 Sampling	930,313	33,123	537	1,842	965,278	53,556	1,01
380 Plant Air Services (equipment)	278,176	53,391	882	1,446	333,012	17,051	35
390 Plant Water Services (equipment)	1,669,450	305,391	5,004	85,576	2,060,416	143,891	2,20
391 Plant Piping	2,339,112	2,503,807	40,579	140,347	4,983,266	298,752	5,28
395 Pipe Racks	333,712	145,394	2,427	5,217	484,322	30,995	51
401 Tailings Storage Facility		20,530,165			20,530,165	1,506,000	22,03
402 Tailings Return Water	21,456	2,366	38	246	24,068	1,203	5
410 Fuel Storage and Dispensing	355,595	94,759	1,585	26,799	477,153	25,852	50
421 Roads		8,002,765	6,465		8,002,765	463,859	8,46
422 Bulk Earthworks	ļ	4,531,129	28,516		4,531,129	453,113	4,98
424 Ponds	1,474,353	1,137,415	4,942	6,107	2,617,875	265,357	2,88
430 Administration Buildings and Misc Facilities	1,211,149	226,848	3,680	66,615	1,504,612	75,281	1,57
431 Wheel Wash and Weighbridge	127,893	38,940	639	6,640	173,473	8,823	18
432 Plant Buildings and Offices	1,514,859	478,056	7,920	47,138	2,040,053	104,753	2,14
440 Mine Buildings and Misc Facilities	1,801,427	1,323,403	21,852	58,564	3,183,393	190,447	3,37
450 Main Power Supply Line (132 kV)	23,400,000		'	. '	23,400,000	1,000,000	24,40
453 Power Distribution	10,158,569	2,859,965	45,008	400,404	13,418,938	882,126	14,30
459 Communications	2,945,159	1	1		2,945,159	294,516	3,23
460 Laboratory	1,115,991	1,278,441	2,346	19,878	2,414,310	121,465	2,53
470 Water Supply, Storage and Recovery	5,846,535	2,677,951	43,401	177,293	8,701,779	540,935	9,24
480 Waste Water	371,507	51,190	845	66,693	489,389	31,759	52
495 Mobile Equipment (non mining fleet)	3,768,979	'		7,980	3,776,959	188,848	3,96
511 First Fills	2,691,523	,			2,691,523	134,576	2,82
512 Spares	664,099	'	·	39,846	703,945	35,197	73
501 Project Management	210,684	3,806,522	24,400		4,017,206	200,860	4,21
502 Engineering and Drafting		9,035,347	78,460		9,035,347	451,767	9,48
311 Site Supervision and Management	ı	7,432,462	50,334		7,432,462	371,623	7,80
331 Site Construction Cranes and Equipment	3,760,751	849,115	13,541	52,440	4,662,305	291,035	4,95
532 Site Construction Facilities	1,168,080	109,662	1,764	35,217	1,312,960	91,907	1,40
340 Commissioning	45,520	1,408,872	9,806		1,454,392	72,720	1,52
350 Mobilisation / Demobilisation / Indirect Costs	1,600,798	10,371,355	ı		11,972,153	598,608	12,57
701 Owner's Costs	10,300,000		,	,	10,300,000		10,30
Grand Total	115 125 927	88 100 590	540 869	2 928 746	206 155 263	11 641 210	217 79

### 18/05/2018

R. W. CORKERY & CO. PTY. LIMITED

## **Appendix 9**

### Electricity Supply Options – Correspondence from JLE Group (6 May 2020)

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#### ENVIRONMENTAL IMPACT STATEMENT

Appendix 9



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Our Ref: 5907/3-6909: RSR

6 May 2020

#### BOWDENS SILVER PROJECT - ELECTRICAL SUPPLY OPTIONS

#### BACKGROUND

JLE Electrical were engaged by Bowdens Silver in October 2019 to review and investigate the Electrical Supply Options available to supply the proposed Bowdens Silver Project (the Project). This included a review of options investigated previously with TransGrid and to investigate further options that were potentially available.

Planning for the Project has identified that the required mine load of 15MVA is viable and following consultation with two NSW Transmission Network Service Providers (TNSP's), namely TransGrid and Endeavor Energy, there are at least seven electrical supply options available to Bowdens Silver for the electrical supply to the Project. Both TNSPs have provided a response to the technical enquiries received (TransGrid in November 2017 and Endeavour Energy in December 2019).

The options identified being;

- TransGrid 132kV Connection on Transmission Line 94M between Ilford and Mudgee with four possible connection points being;
  - Mudgee
  - Mudgee 2
  - Aarons Pass
  - Queens Pinch

A further option from Wollar north of the Mine Site has been identified post TransGrid's formal Connection Enquiry response and would require further consultation with TransGrid following the approval of the Project.

- Endeavour Energy 66kV Connection on Transmission Lines 841 and 839 and a 132kV Connection from Ilford 132 Transmission Substation (TS) – the two possible connection points being;
  - Ilford
  - o Breakfast Creek

An indicative alignment for the electricity supply options are shown in the attached "Figure A - Electrical **Supply Options**". It is noted that the final alignment may vary from that presented here depending on assessment of the viability of each option.

Further to the above, there exists Endeavour Energy overhead distribution network (11kV) within the Mine Site or that passes through the Mine Site to connect residences. This network would require removal or relocation. Endeavour Energy has identified this in its Connection Enquiry Response.

#### TRANSGRID CONNECTION OPTIONS

Prior to the engagement of JLE by Bowdens Silver, a formal Connection Enquiry had been submitted to TransGrid in August 2017, specifically identifying four (4) possible connection points for investigation by TransGrid as listed previously.

TransGrid provided a formal Connection Enquiry Response in November 2017 and following a preliminary assessment TransGrid provided notification that there was available connection capacity on the existing 132kV feeder 94M between llford and Mudgee with augmentation by way of the installation of dynamic reactive support (STATCOM or SVC) required to meet the load capacity needs of the project.

More detailed information regarding the TransGrid connection options is provided in the TransGrid Connection Enquiry Response.

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#### **BOWDENS SILVER PTY LIMITED**

Bowdens Silver Project

#### Report No. 429/24

#### ENVIRONMENTAL IMPACT STATEMENT Appendix 9



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As noted above a fifth option from Wollar north of the Mine Site has been identified since that original enquiry and would be reviewed in consultation with TransGrid following approval of the Project.

#### ENDEAVOUR ENERGY CONNECTION OPTIONS

JLE Electrical submitted a formal Technical Review Request to Endeavour Energy in November 2019, specifically identifying two (2) possible connection points for investigation by Endeavour Energy as listed previously (via Ilford or Breakfast Creek).

Following a preliminary assessment Endeavour Energy provided a formal Technical Review Response in December 2019 that identified that there was available connection capacity on Endeavour Energy's 66kV feeders 841 and 839 (Breakfast Creek option) following augmentation to a higher rating of the existing 66kV conductors. A 132kV connection from Endeavour Energy's 132kV Transmission Substation was also provided (Ilford option).

More detailed information regarding the Endeavour Energy connection options are provided in the Endeavour Energy Technical Review Response.

EXISTING ENDEAVOUR ENERGY DISTRIBTUION NETWORK

Section of the existing Endeavour Energy distribution network (11kV overhead) within the proposed Mine Site would need to either be removed for any redundant connections or be relocated to maintain supplies that are still required.

Detailed information regarding the Endeavour Energy distribution network is provided in the Endeavour Energy Technical Review Response, where the process for augmentation to Endeavour Energy's distribution network is discussed, specifically in relation to the Project.

#### SUMMARY OF ELECTRICAL CONNECTION OPTIONS & DISTRIBUTION AUGMENTATIONS

As described in this letter and accompanying attachment it is demonstrated there does existing multiple connection options available to Bowdens Silver to provide the 15MVA mine load required.

Following Project approval these options can be further investigated with TransGrid and Endeavour Energy whereby a preferred supply option selected and follow the formal Connection Process with the respective TNSP. Existing 11kV distribution network that traverses the Mine Site can be removed and/or realigned following the existing Endeavour Energy ASP3 and ASP1 as part of the application to secure power supply.

If any further information is required in relation to the available electrical supply options for the Bowdens Silver Project, please contact the author using the details below.

Regards,

Richie Richardson *AMIEAust* Level 3 Designer (ASP Accreditation: 5067) JLE Electrical Dubbo

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Attachment: Figure A – Electrical Supply Options









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## **ENVIRONMENTAL IMPACT STATEMENT** *Appendix* 9

## **BOWDENS SILVER PTY LIMITED**

Bowdens Silver Project Report No. 429/24



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