ACOUSTICS AND AIR

CADIA VALLEY OPERATIONS

MOLYBDENUM RECOVERY PLANT RELOCATION
MODIFICATION 10
NOISE REVIEW

REPORT NO. 06325-M10
VERSION A

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PREPARED FOR

CADIA HOLDINGS PTY LIMITED

WILKINSON MURRAY

DOCUMENT CONTROL

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

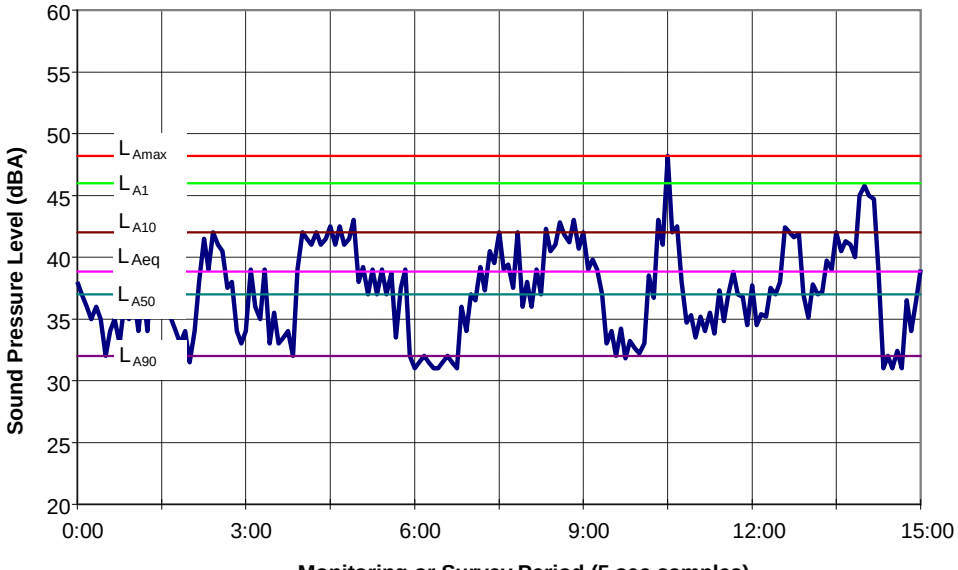
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10^{th} percentile (lowest 10^{th} percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period **–** daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

The Cadia Valley Operations (CVO) are located approximately 25 kilometres (km) south-west of Orange, in the Central Tablelands of New South Wales (NSW) (Figure 1-1). Cadia Holdings Pty Limited (CHPL) is the owner and operator of the CVO and is a wholly owned subsidiary of Newcrest Mining Limited.

The Cadia Hill open pit, Ridgeway underground mine and Cadia East underground mine are located in the Cadia Valley within Mining Lease (ML) 1405, ML 1690, ML 1689, ML 1472, ML 1481 and ML 1449 (Figure 1-2). The Concentrate Dewatering Facility is located approximately 25 km to the east of the Cadia Valley near the town of Blayney (Figure 1-1).

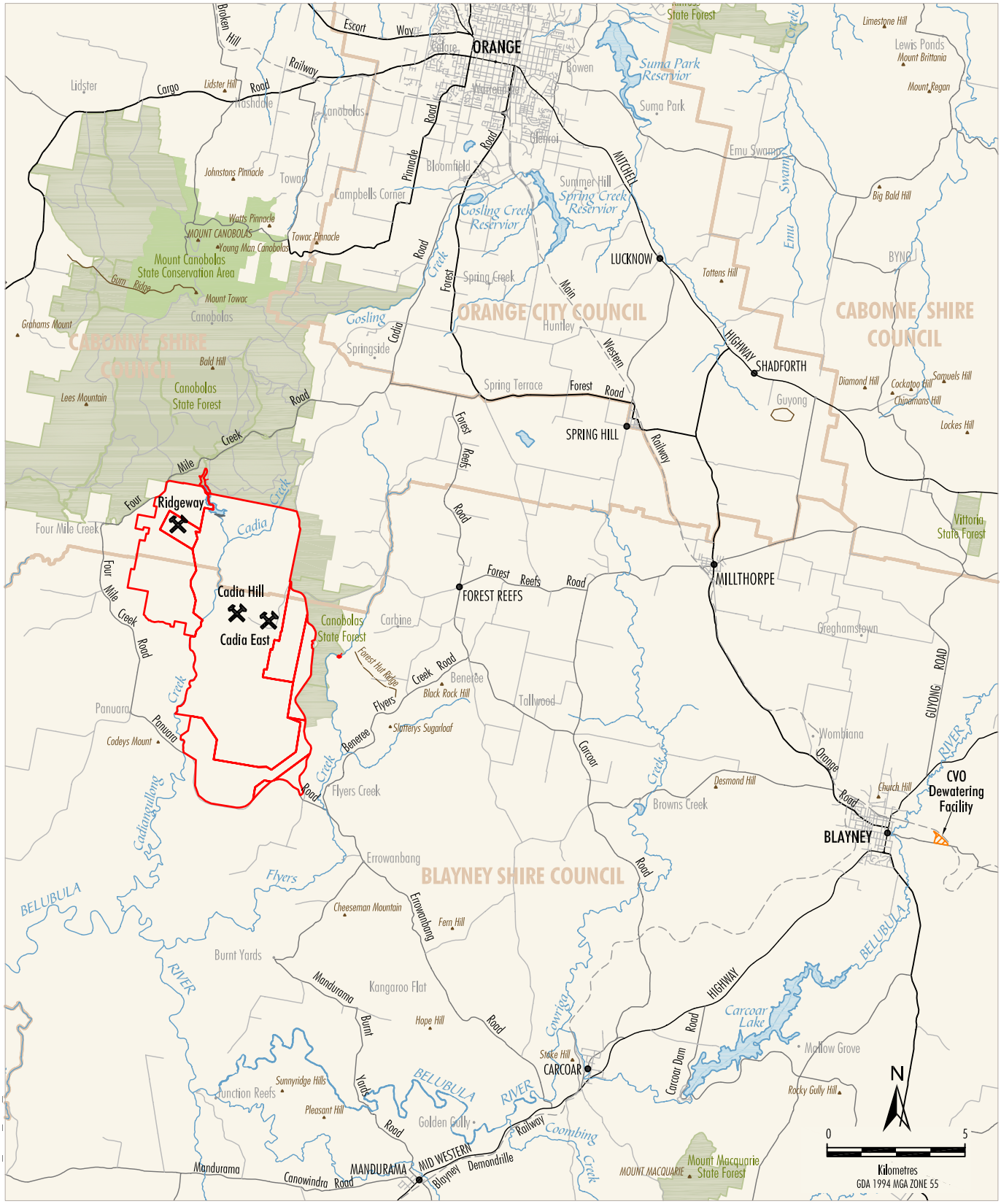
CHPL is proposing to relocate the approved Molybdenum Recovery Plant (MRP) from the approved location within the Ore Processing Facilities area to a new location just north-east of the Northern Tailings Storage Facility (Figure 1-2). The MRP, previously assessed and approved as part of the Cadia East Project Environmental Assessment (EA) (Cadia Holdings Pty Limited, 2009), has not yet been constructed.

Wilkinson Murray Pty Limited (WMPL) was commissioned by CHPL to prepare a noise review for the Modification addressing operational and construction noise.

The review is based on the following NSW noise policies and guidelines:

- NSW *Industrial Noise Policy* (*INP*) (Environment Protection Authority [EPA], 2000).
- *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2014).

The *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009) was also considered, however construction associated with the Modification was conservatively assessed cumulatively with operational noise in this noise review.



LEGEND

- Mining Lease/Mining Lease Application Boundary
- Local Government Area
- Road
- Railway
- NSW State Forest - Forest Commission Land
- NPWS Reserve

Source: Department of Lands NSW (2006); Department of Industry (2017)

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CADIA VALLEY OPERATIONS MODIFICATION 10

Regional Location

Figure 1-1

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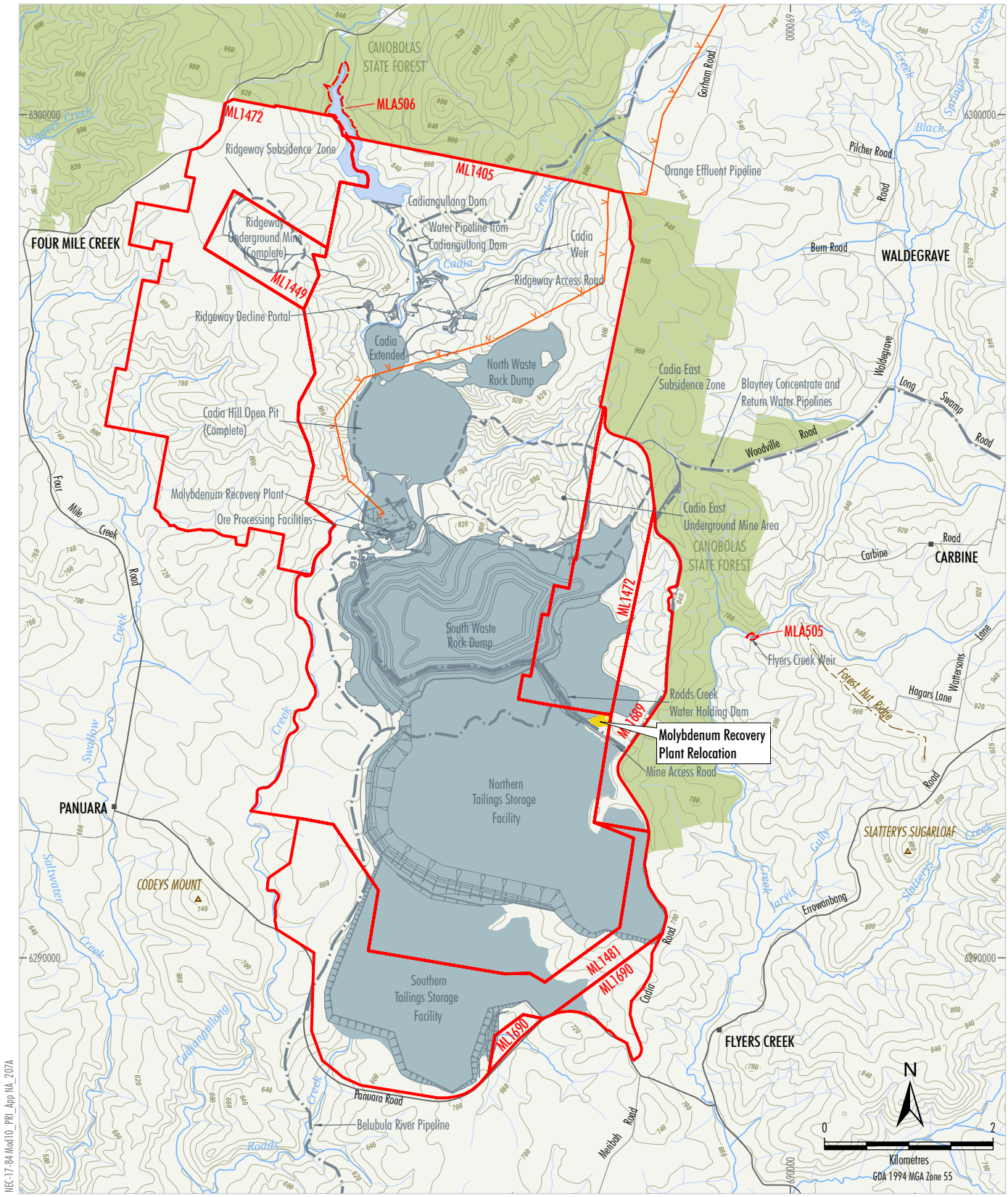

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LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- State Forest
- Powerline
- Existing/Approved Mine Infrastructure and Landforms
- Proposed Modifciation Infrastructure

Source: Land and Property Infromation (2017);
NSW Planning & Environment Resource & Energy (2017)

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CADIA VALLEY OPERATIONS MODIFICATION 10

Cadia Valley Operations
Modification 10 General Arrangement

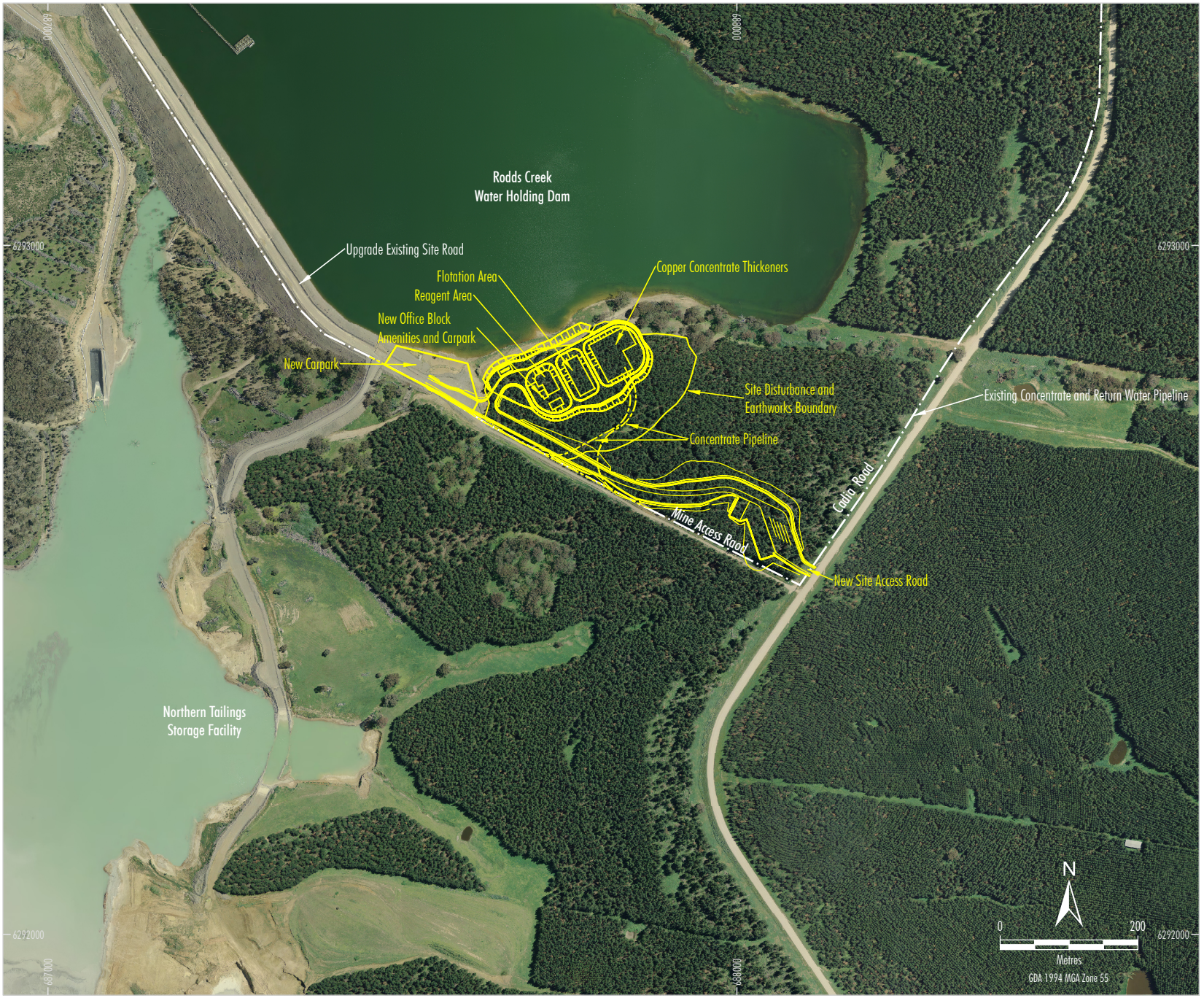
Figure 1-2

2 DESCRIPTION OF MODIFICATION

The Modification would include the relocation of the approved MRP.

The same processes described in the Cadia East EA (Cadia Holdings Pty Limited, 2009) would be used for the MRP.

Figure 2 shows the proposed MRP location.



LEGEND

Proposed Modifciation Infrastructure

Source: CHPL - Orthophoto (Nov 2016)

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CADIA VALLEY OPERATIONS MODIFICATION 10

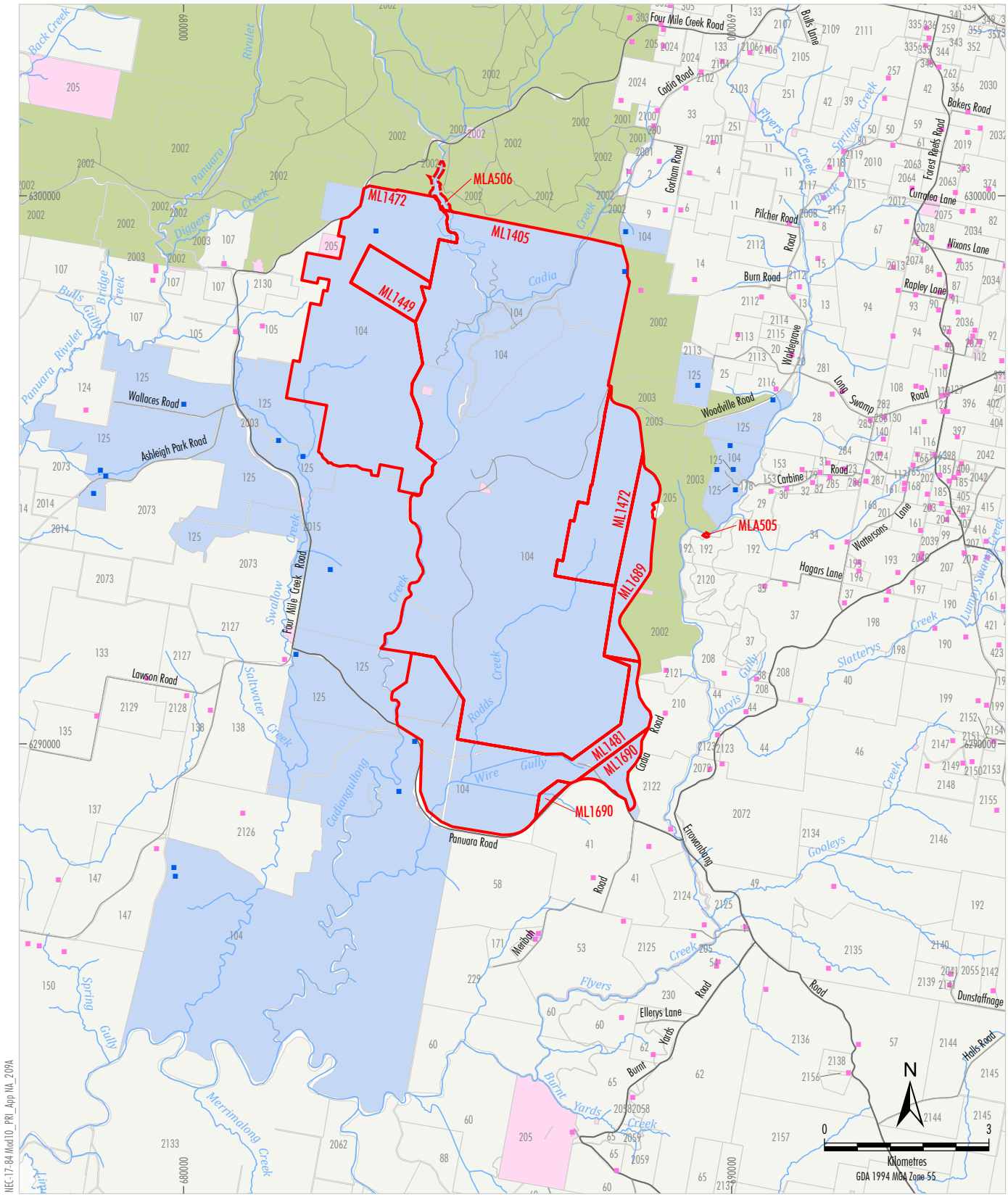
Relocated Molybdenum Recovery Plant Location

Figure 2

NEC-17-84 Mod10_PRI_App NA_208A

3 NOISE SENSITIVE RECEIVERS

Figure 3a and Figure 3b identify the nearest potentially affected sensitive receivers to the CVO mine site.



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LEGEND

- Mining Lease
- Mining Lease Application Boundary
- Mine Owned
- Privately Owned
- CHPL Owned
- Crown Land
- Local Government
- Privately Owned
- State Forest
- State Government

Source: Land and Property Information (2017);
NSW Planning & Environment Resource & Energy (2017)

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CADIA VALLEY OPERATIONS MODIFICATION 10

Cadia Valley Operations
Land Tenure

Figure 3a

Ref No	Landholder
1	CHRISTOU GT & JA
2	NOCK ER
4	NOCK DGT & ER
6	BARNES GJ
7	KENNEDY AP & SJ
8	WINDBERG HD & JE
9	CANE JA & JP
11	WANNAN JA & JS
13	TILSTON PE & VJ
14	TAYLOR CM & DJ
15	WOLF EM & GH
20	PENSON AJ & DJ
23	SMITH HE & TI
25	HICKS PJ
28	CARSON AE & N
29	WORLAND BD
30	PEPPER-EDWARDS DL & MS
31	COWPER JH
32	COLSON AM & C
33	GARDINER KJ & SL
34	WATTERSON AC
35	CANTRILL JH
37	CANTRILL JM
38	O'CONNOR JA & JL
39	HUNT CM & GB
40	J. F. MCBETH PTY LIMITED
41	KNOX CW
42	Mac TIER IR
44	COLMAN AR
46	ROANNY PTY LIMITED
49	ROWETH AG
50	NIXON CT
53	KNOX CW & HE
54	GERATHY JB
57	ROWETH AK
58	A A KNOX PASTORAL CO PTY LTD
59	TRIMMER WA
60	PAINE DA
61	RAYNER JE
62	GREEN DJ
65	BARRY SG and HARRIS TM
67	COLEMAN CJ & EM
72	MASTERS RJ & SR
76	WEBB DI & KL
82	DERRIG CV & JP
84	STANSFIELD CJ & DJ
87	PINKERTON GM & NE
88	BAKER AW & LF
90	WICKS AJ & BJ
91	PINKERTON GM
92	MAYVILLE PTY LIMITED
93	CORCORAN JP
94	STREATFEILD JI & KM
97	JONES BW & DRC
98	JONES CF & JK
99	STREATFEILD HCM
104	CADIA HOLDINGS PTY LIMITED
105	HUGHES KA
107	WILLIAMS KC
108	SHEA B & PA
110	BRITTON BG and GRANT LP
111	THE TRUSTEES OF THE ROMAN CATHOLIC CHURCH FOR THE DIOCESE OF BATHURST
112	FRAZIER W and GAINSFORD FWW
113	RAPLEY LK & NT
114	MASTERS EP & K
115	ROSS AJ & PL
116	KOVAC JS and MCFARLAND CD
117	CASHMAN RI and DAVIS JM
118	TOLHURST S
121	GERSBACH MR
123	HARRIS ME
124	CHRISTOPHERSON RM & TJ
125	CONTANGO AGRICULTURAL COMPANY PTY LIMITED
127	HAY EJ & JA
130	SHEA LV
131	ALEXANDER KJ and WYSE JM
133	BAKER LC & LR
133	BAKER L & LR
135	WILLIAMSON GJ
137	ELLIS LA & MP
138	BAILEY A & AC
140	CARSON DE
141	NYDEGGER RR
147	HAMILTON JC & V
150	ANGULLONG PTY LIMITED
153	JONES WW
156	BURTON MP & RJ
160	SCHNEIDER PE
161	MAY RW & VR
165	CRESSWELL DS & SA
166	DICKERSON TL
168	MAY RW
171	KNOX GA
173	THE UNITING CHURCH IN AUSTRALIA PROPERTY TRUST (NSW)
178	CHILCOTT DA
179	MASTERS NJ & TE
182	BEACH BJ
185	MAY BG
190	PASCOE HG
192	WATTERSON AC & JK
193	SCOTT KP & MJ
195	FAULKNER MF & WE
196	CAMPBELL M and FOSTER JE
197	SOUTHWELL PD
198	MASTERS EP & K & SR
199	OBORN GR
201	HILLIAR CC
202	SCOTT PA
203	COLQUHOUN PW & VI
204	MCLEOD MK and RODDA DJ
205	THE STATE OF NEW SOUTH WALES
206	MUNRO JL
207	MELLROSS PE and PASCOE SE & WD
208	WILSON RTC & SJ
210	KILBY BP
229	KNOX HE and A A KNOX PASTORAL CO PTY LTD
230	BRAEBURN GRAZING COMPANY PTY LIMITED
247	THE COUNCIL OF THE SHIRE OF BLAYNEY
251	BLACKWOOD AK & JF
257	BUNCARWAL PTY LIMITED
259	CROUCH GM
262	KING R and MATILKA L & MJ
280	POTTS KA & WA
281	KRIDEN INVESTMENTS PTY LIMITED
282	CLARKE NJ
283	STANCAZ PTY LIMITED
284	BROWN DG and CARSON-BROWN GL
285	HICKS BJ & RH
286	MCNAB EJ
287	LOVE AC and MCCRACKEN DCA
288	DUNCAN T
298	FARRELL PN
302	DE SANTIS CA
303	MIDDLETON BL & JP
304	MASTRANGELI N
305	SMITH KJ & PA
307	JONES CR & FL
314	KELSALL AD & GL
324	VERGA PTY LIMITED
330	PLAYFAIR SC
334	GRIFFITHS NH
335	CAMPBELL AR
336	HONEYMAN SA and NEWTON RG
338	LEE GJ & MR
339	SEAMAN JWA & SG
341	CHRYSTALL SH and GRIFFITH GJ
343	PHILLIPS CM
344	HUGHES BG & LJR
347	BURKE PD & VM
348	ANGLICAN PROPERTY TRUST DIOCESE OF BATHURST
349	KNIGHT EM & PA
350	CHARRY AA & MI
351	BARNES MM
352	ROYAL AJE & JA
354	MINISTER FOR EDUCATION AND TRAINING
355	DRING GWO
356	FADAEE M and SAMIMI M & M & S & S
357	PHILLIPS NJ
358	WESTON JA
361	KIRBY PJ
362	PHILLIPS NJ
373	RAPLEY CE & PJ
374	HOLMES J & JB
380	WATTS AC & WJ
396	WILKENS KA & MK
397	DICKERSON BM & LN
398	PEARCE MA
400	HILLIER DW & KM
401	MCKENZIE FE & RJ
402	BOWMAN GA
403	TURK DJ & JB
404	WILSON SJ
405	WILLING JW & LR
406	RILES DJ & SJ
407	BURTON DJ & MJ
414	WRIGHT DG & JH
415	HOOPER DJ
416	HOOPER BM & LD
417	WEIGHT JM and WOOD SJ
419	PASCOE DJ & SP
420	WILSON DH
421	PASH DJ
422	BARTIMOTE NJ & SJ
423	STURGESS MN
424	BURTON DJ & MJ
2001	THE MINISTER FOR PUBLIC WORKS
2002	STATE FOREST NEW SOUTH WALES
2003	HER MOST GRACIOUS MAJESTY QUEEN ELIZABETH THE SECOND
2008	CABONNE SHIRE COUNCIL
2010	REYNOLDS BP
2012	COLEMAN DIA & FG
2013	COLEMAN MC & ST
2014	DOUGLAS S
2015	THE COUNCIL OF THE SHIRE OF LYNDHURST
2018	TAYLOR SC & SG
2019	TRIMMER B
2024	TAYLOR H & HM
2024	HOOPER CW & J
2025	THE COUNCIL OF THE CITY OF ORANGE
2028	MILLER BS & KF
2030	BADIYAN SS and SAMIMI D & M & S & S
2032	MATHEWS KW & ME
2034	COULSON JA
2035	ANNETTS JA
2036	COWAN KL
2039	MILWARD HC
2040	SMITH M
2041	WILLIAMS MA & T
2042	BALDWIN BJ & JR
2055	GARLICK GR
2058	TAYLOR JC
2059	HEALY SPRINGS PTY LIMITED
2062	WONGALONG PTY LIMITED
2063	MOAD DD & JT
2064	THREE TREES HOLDINGS PTY LTD
2072	MCKENZIE RC
2073	STRATTON SDE
2074	DTQ HOLDINGS PTY LTD
2075	HARRIS AA & GL
2076	BASFORD CL & WB
2077	LYNCH JJ & RJ
2078	CLARKE W and HURST G
2100	ISBISTER MR and KING JK
2101	GODFREY GB & JR
2102	CLARK DB
2103	COOPER PJ
2104	MCDONALD KM & WA
2105	D & D SEARLE PROPERTY PTY LTD
2106	MUNRO PS
2106	FISHER BH & EW
2107	MUNRO DC
2109	MEYENN DL & KL
2110	CRISP JA & TM
2111	MEYENN RJ & VA
2112	TAYLER DW & RA
2113	HICKS TV
2114	BATMON PROPERTY PTY LTD
2115	NEWTON RE
2116	SHARP EL & TC
2117	WINDBERG JR & KL
2118	RINGBAUER JA & PJ
2119	GIFFORD J & KJ
2120	WATTERSON LC
2121	OVENDEN FJ & RM
2122	KNOX CW & GA
2123	COTTAGE ELA and PATRECH JT
2124	HARRIES JM
2125	HAMDAISY PTY LIMITED
2126	STONE DJ & KA
2127	DONLAN BK & KP
2128	MAKSACHEFF AI & DJ
2129	CLINTON DW
2130	BAILEY CA
2131	BAILEY A & AC & BA & NC
2132	BLUNT DF & SE
2133	RETALLACK FM & ML
2134	COWEN GW & JM
2135	GREEN GA & SJ
2136	GREEN SJ
2137	GREEN SI
2138	SAXON SUPER PTY LTD
2139	HOWARTH AR
2140	MACKILLOP FC
2141	KINGHORNE JM
2142	REDMOND GL
2143	ROWETH CK
2144	ROWETH CK & FJ
2145	LOWE L
2146	GRIFFIN RJ
2147	EVANS CT and PETERSON JC
2148	THORNTON WHITE I and WHITE A
2149	DALZELL FI & JA
2150	MUIR TC
2151	LARNACH SE
2152	DICKSON GA
2153	PLATINGA A & JS
2154	OBORN CT
2155	COLEMAN DE & MA
2156	BENNETT DW
2157	WILSON CJ & DH & HJ & PA

NEC-17-84 Mod10_PRI_001A

Source: Land and Property Information (2017)

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CADIA VALLEY OPERATIONS MODIFICATION 10

Landholder List

Figure 3b

4 NOISE IMPACT REVIEW

4.1 Project Approval Impact Assessment Criteria

The NSW *INP* states that the intrusiveness and amenity criteria have been selected to protect at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided the criteria in the *INP* are achieved, then it is unlikely that most people would consider the resultant noise levels excessive.

The Project Approval (06_0295) sets noise criteria for the Project (Schedule 3) consistent with the *INP*. The criteria relevant to the assessment of the CVO mine site are reproduced in Tables 4-1 to 4-3.

Table 4-1 Noise Impact Assessment Criteria (dBA)

Location	Day ($L_{Aeq,15min}$)	Evening ($L_{Aeq,15min}$)	Night ($L_{Aeq,15min}$)	Night ($L_{A1,1min}$)
Mining Operations				
41-CW Knox ('Meribah'), 43-CJ Healey* ('Triangle Park'), 138-AC & A Bailey ('Mayburies'), 45-CC Colman* ('Mirrabooka'), 246-CK Channell and KP & DV Donlan* ('Eastburn'), 209-JI McLennan* ('Northwest'), 171-GA Knox ('South Log').	43	38	38	45
1-GT & JA Christou ('Coorabin'), 137-MP & LA Ellis* ('Argyle'), 169-RL & SL Chamberlain* ('Weemalla').	43	38	37	45
44-AR Colman ('Triangle Flat'), 105-KA Hughes ('Barton Park'), 133-LC & LR Baker ('Bonnie Glen').	43	38	36	45
Other privately-owned land.	43	38	35	45

dBA = A – weighted decibels.

* Indicates property has changed ownership and therefore has an updated property number. The following are properties that have changed property numbers that are shown in Table 4-1

43-CJ Healey ('Triangle Park') > 2122-Knox CW & GA

45-CC Colman ('Mirrabooka') > 2123-Cottage ELA & Patrech JT

246-CK Channell and KP & DV Donlan ('Eastburn') > 2127-Donlan BK & KP

209-JI McLennan ('Northwest') > 2121-Ovenden FJ & RM

137-MP & LA Ellis ('Argyle') > 2128-Maksacheff AI & DJ

169-RL & SL Chamberlain* ('Weemalla') > 2126-Stone DJ & KA

Condition 3, Schedule 3, states that if noise generated by the Project exceeds the criteria in Table 4-2 at any residence on privately-owned land or on more than 25% of any privately-owned land, CHPL shall, upon receiving a written request for acquisition from the landowner, acquire the land.

Table 4-2 Land Acquisition Criteria (dBA)

Location	Day ($L_{Aeq,15min}$)	Evening ($L_{Aeq,15min}$)	Night ($L_{Aeq,15min}$)
Mining Operations			
All privately-owned land	43	43	40

The Project Approval (06_0295) also provided cumulative noise criteria (Condition 4, Schedule 3) consistent with the *INP*'s amenity criteria.

Table 4-3 Cumulative Noise Criteria (dBA)

Location	Day ($L_{Aeq,period}$)	Evening ($L_{Aeq,period}$)	Night ($L_{Aeq,period}$)
Mining Operations			
All privately-owned land	50	45	40

The cumulative noise criteria are based on the energy average noise level over the entire day, evening or night period rather than the 15-minute interval that applies for the noise impact assessment criteria. As can be seen from the above, the criteria contained in Table 4-1 are lower (i.e. more stringent) than those in Table 4-3. Hence, compliance with the noise impact assessment criteria would indicate compliance with the cumulative noise criteria. Therefore, given that there are no other industrial noise sources in the area, the noise assessment for the Project with the Modification is presented in comparison with the noise impact assessment criteria (Table 4-1), rather than the cumulative noise criteria.

Because the operational noise is expected to be a relatively constant source at low levels, the Modification is not expected to result in any additional noise impact relating to sleep disturbance. Therefore, $L_{A1,1min}$ noise levels (see Table 4-1) are not considered as part of this assessment.

4.2 Assessment Methodology

4.2.1 General Methodology

Potential noise impacts generated by construction activities associated with the Modification have been addressed in this review. It is considered reasonable to assess construction noise as part of general operations since additional noise impacts potentially generated by construction activities would be combined with those generated by the rest of the site. As such, it is proposed that the Project Approval impact assessment criteria outlined in Table 4-1 (derived from the *INP* intrusiveness criteria) should be used to assess construction noise. Noise generated by the construction and operation of the relocated MRP was modelled individually and the predicted noise levels at the identified receivers were added to the approved noise levels from the Processing Rate Modification (Modification 6) noise assessment (Wilkinson Murray, 2015).

The resultant noise levels were then compared against the relevant noise criteria set in the Project Approval (06_0295) (Tables 4-1 and 4-2) to determine whether any potential increase in noise associated with the Modification would trigger any exceedances.

It is noted that the *Noise Policy for Industry* was released in October 2017. References to the *INP* for this report are considered to be consistent with the *Implementation and transitional arrangements for the Noise Policy for Industry* because:

- environmental assessment of Modification 10 substantially commenced before release of the new policy; and
- the Modification does not constitute a significant change to existing plant, equipment or processes, therefore assessment using *INP* methodology to allow a direct comparison with previous noise assessments is advantageous.

The CVO Surface Preconditioning and On-site Warehouse Modification (Modification 9) was also considered as part of this review (i.e. from a potential cumulative impact perspective). WMPL (2017) conducted a review of the potential noise impacts of Modification 9 and it was concluded that the predicted noise levels of the additional noise sources associated with Modification 9 alone are at least 13 decibels (dB) below the relevant noise criteria during the worst-case night-time noise emission. At the most exposed receivers the noise from the Modification 9 sources alone could increase the overall mine noise level by up to 0.5 dB, an amount of change in noise levels generally regarded as being imperceptible by the majority of people. As such, noise sources associated with Modification 9 are not considered further in this report.

The additional infrastructure associated with the Modification would be operating on a 24-hour basis. Therefore, noise levels associated with the Modification were predicted for the day (7.00am-6.00pm), evening (6.00pm-10.00pm) and night (10.00pm-7.00am) assessment periods. Construction will occur during the day time only (i.e. 7.00am-6.00pm) and as such site noise during the construction period is only assessed against the daytime noise criteria.

4.2.2 Noise Sources Associated with Modification

Operational noise associated with the Modification was calculated based on a sound power level (SWL) of 100 dBA for the MRP obtained from the Noise and Blasting Impact Assessment for the Cadia East Project (WMPL, 2009).

An indicative construction fleet and corresponding SWLs are summarised in Table 4-4. Only mobile plant with material noise impact have been included.

Table 4-4 Indicative Construction Noise Sources & Sound Power Levels

Item Description	Number of Items	Indicative SWL per Item (dBA)
100t-250t Crane	3	109
Franna crane	3	103
Forklift	2	100
50t-80t Boom Lift	4	104
Diesel Welding Machine	4	95
Generator (enclosed)	4	90
Compressor (enclosed)	2	90
Fuel truck	1	108
Lighting Tower	4	90
Concrete Truck and Pump	2	108

t = tonnes.

A correction of -5 dB was applied to the total SWL for the construction fleet to account for time correction as the entire construction fleet would not always operate concurrently (i.e. all plant items are not expected to be operating all the time).

The estimated total SWL from the concurrent operation of all construction plant is 113 dBA.

4.2.3 Noise Modelling Software

Operational noise levels at nearby receivers were calculated using the Environmental Noise Model (ENM) in the original EA noise assessment. This model has been endorsed by the EPA for environmental noise assessments. The ENM (WMPL, 2009) takes account of the location of nearby noise sensitive receivers and surrounding terrain. In addition, the model takes into account noise attenuation due to geometric spreading of sound over distance, atmospheric absorption, shielding and the effect of acoustically soft ground. It can also be used to predict noise levels under various meteorological conditions, defined by a combination of temperature gradient, wind speed and wind direction.

Noise levels associated with the Modification used the same noise modelling procedure as used by WMPL for the Noise and Blasting Impact Assessment of the Cadia East Project (WMPL, 2009).

4.2.4 Meteorological Conditions

The *INP* generally directs the use of a single set of adverse meteorological data to use in the assessment of noise impacts. However, the original EA noise assessment (WMPL, 2009) adopted a more rigorous approach where noise levels at sensitive receivers are calculated under a varied set of existing meteorological conditions (wind speed and direction and temperature inversion strength), using meteorological data obtained from the Ridgeway station. Measured statistical occurrences of these conditions over a discrete period are then applied to the results, and a 10^{th} percentile exceedance level calculated (i.e. the level that is exceeded 10% of the time), which is then compared with relevant criteria.

The noise assessment for the Modification used the 10^{th} percentile exceedance approach based on the same set of existing meteorological conditions for consistency with the original EA. For further detail, please refer to the Noise and Blasting Impact Assessment of the Cadia East Project (WMPL, 2009).

4.3 Noise Assessment

4.3.1 Noise Assessment of Modification Operations

Table 4-5 presents the predicted noise levels generated at the CVO with the proposed Modification in place. Approved noise levels without the Modification and noise impact assessment criteria are also included. Noise levels are presented at a selection of the nearest receivers, rounded to the nearest dB.

Table 4-5 Predicted Noise Levels – Modification

Receiver ID	Approved [1] $L_{Aeq,15min}$ Noise Levels (dBA)			Approved + Proposed Modification $L_{Aeq,15min}$ Noise Levels (dBA)			Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
1	31	31	31	31	31	31	43	38	37
2	30	30	30	30	30	30	43	38	35
6	28	27	29	28	27	29	43	38	35
9	28	27	28	28	27	28	43	38	35
14	21	19	22	21	19	22	43	38	35
20	21	20	22	21	20	22	43	38	35
23	26	24	26	26	24	26	43	38	35
28	26	26	27	26	26	27	43	38	35
29	25	23	26	25	23	26	43	38	35

[1] Approved includes Cadia East Project (as Modified)

Receiver ID	Approved [1] $L_{Aeq,15min}$ Noise Levels (dBA)			Approved + Proposed Modification $L_{Aeq,15min}$ Noise Levels (dBA)			Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
30	26	25	27	26	25	27	43	38	35
31a	28	28	28	28	28	28	43	38	35
31b	28	28	28	28	28	28	43	38	35
32	29	29	30	29	29	30	43	38	35
33	28	28	29	28	28	29	43	38	35
34a	21	21	22	21	21	22	43	38	35
34b	27	27	28	27	27	28	43	38	35
37a	25	26	28	25	26	28	43	38	35
37b	25	21	23	25	21	23	43	38	35
37c	30	30	31	30	30	31	43	38	35
38	23	16	21	23	16	21	43	38	35
40	27	27	28	27	27	28	43	38	35
41a	30	27	28	30	27	28	43	38	38
41b	32	26	27	32	26	27	43	38	38
44	29	29	29	29	29	29	43	38	36
53	29	24	25	29	24	25	43	38	35
54	24	21	22	24	21	22	43	38	35
62	25	21	22	25	21	22	43	38	35
65	23	19	19	23	19	19	43	38	35
93	26	25	25	26	25	25	43	38	35
94a	26	26	26	26	26	26	43	38	35
94b	26	26	26	26	26	26	43	38	35
105a	21	17	19	21	17	19	43	38	36
105b	22	19	23	22	19	23	43	38	36
117	21	21	22	21	21	22	43	38	35
123a	25	25	25	25	25	25	43	38	35
123b	25	25	25	25	25	25	43	38	35
133	29	28	29	29	28	29	43	38	36
138	31	31	31	31	31	31	43	38	38
140	26	25	26	26	25	26	43	38	35
141	26	26	26	26	26	26	43	38	35
147	28	26	26	28	26	26	43	38	35
153	30	30	30	30	30	30	43	38	35
161	26	26	26	26	26	26	43	38	35

Receiver ID	Approved [1] $L_{Aeq,15min}$ Noise Levels (dBA)			Approved + Proposed Modification $L_{Aeq,15min}$ Noise Levels (dBA)			Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
165	26	26	26	26	26	26	43	38	35
166	26	26	26	26	26	26	43	38	35
167	26	25	25	26	25	25	43	38	35
171a	33	25	25	33	25	25	43	38	38
171b	33	24	25	33	24	25	43	38	38
179	24	24	24	24	24	24	43	38	35
185	25	25	25	25	25	25	43	38	35
286	29	29	29	29	29	29	43	38	35
287	28	28	28	28	28	28	43	38	35
193	25	25	25	25	25	25	43	38	35
195	28	27	27	28	27	27	43	38	35
196	28	28	28	28	28	28	43	38	35
198a	27	27	27	27	27	27	43	38	35
198b	27	26	27	27	26	27	43	38	35
202	26	26	26	26	26	26	43	38	35
203	25	24	24	25	24	24	43	38	35
205	24	20	21	24	20	21	43	38	35
208	30	31	31	30	31	31	43	38	35
210	26	19	28	26	19	28	43	38	35
280	29	29	29	29	29	29	43	38	35
281	26	26	28	26	26	28	43	38	35
283	26	26	27	26	26	27	43	38	35
2002a	25	18	27	25	18	27	43	38	35
2002b	26	15	27	26	15	27	43	38	35
2002c	24	23	25	24	23	25	43	38	35
2024a	27	26	27	27	26	27	43	38	35
2024b	21	20	22	21	20	22	43	38	35
2039	24	23	24	24	23	24	43	38	35
2058	24	20	21	24	20	21	43	38	35
2112	28	28	28	28	28	28	43	38	35
2113	30	30	30	30	30	30	43	38	35
2116	19	15	16	19	15	16	43	38	35
2100	27	27	27	27	27	27	43	38	35
2121	27	19	30	27	19	30	43	38	38

Receiver ID	Approved [1] $L_{Aeq,15min}$ Noise Levels (dBA)			Approved + Proposed Modification $L_{Aeq,15min}$ Noise Levels (dBA)			Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
2122	28	14	25	28	14	25	43	38	38
2123	25	17	26	25	17	26	43	38	38
2124	25	22	23	25	22	23	43	38	35
2125	24	11	13	24	11	13	43	38	35
2126	31	28	29	31	28	29	43	38	37
2127	34	34	35	34	34	35	43	38	38
2128	31	30	31	31	30	31	43	38	37

A review of Table 4-5 shows that the proposed Modification does not increase any of the approved noise levels and no exceedances of the impact assessment criteria are predicted at any of the identified receivers with the proposed Modification in place.

In view of the above, the proposed Modification is not expected to impact on the acoustic amenity of receivers in the vicinity of the CVO.

4.3.2 Noise Assessment of Modification Construction Works

Table 4-6 presents the predicted daytime noise levels generated at the CVO during the construction period. Approved noise levels without the Modification and noise impact assessment criteria are also included. Noise levels are presented at a selection of the nearest receivers, rounded to the nearest dB.

Table 4-6 Predicted Noise Levels – Construction Works

Receiver ID	Approved Day $L_{Aeq,15min}$ Noise Levels (dBA)	Approved + Proposed Modification Day $L_{Aeq,15min}$ Noise Levels (dBA)	Day Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)
1	31	31	43
2	30	30	43
6	28	28	43
9	28	28	43
14	21	21	43
20	21	21	43

Receiver ID	Approved Day $L_{Aeq,15min}$ Noise Levels (dBA)	Approved + Proposed Modification Day $L_{Aeq,15min}$ Noise Levels (dBA)	Day Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)
23	26	26	43
28	26	26	43
29	25	26	43
30	26	27	43
31a	28	28	43
31b	28	28	43
32	29	29	43
33	28	28	43
34a	21	23	43
34b	27	27	43
37a	25	25	43
37b	25	27	43
37c	30	30	43
38	23	23	43
40	27	27	43
41a	30	30	43
41b	32	32	43
44	29	29	43
53	29	29	43
54	24	24	43
62	25	25	43
65	23	23	43
93	26	26	43
94a	26	26	43
94b	26	26	43
105a	21	21	43
105b	22	22	43
117	21	21	43
123a	25	25	43
123b	25	25	43
133	29	29	43
138	31	31	43
140	26	26	43

Receiver ID	Approved Day $L_{Aeq,15min}$ Noise Levels (dBA)	Approved + Proposed Modification Day $L_{Aeq,15min}$ Noise Levels (dBA)	Day Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)
141	26	26	43
147	28	28	43
153	30	30	43
161	26	26	43
165	26	26	43
166	26	26	43
167	26	26	43
171a	33	33	43
171b	33	33	43
179	24	24	43
193	25	25	43
195	28	28	43
196	28	28	43
198a	27	27	43
198b	27	27	43
202	26	26	43
203	25	25	43
205	24	24	43
208	30	30	43
210	26	26	43
280	29	29	43
281	26	26	43
283	26	26	43
185	25	25	43
286	29	29	43
287	28	28	43
2002a	25	25	43
2002b	26	26	43
2002c	24	24	43
2024a	27	27	43
2024b	21	21	43
2039	24	24	43
2058	24	24	43

Receiver ID	Approved Day $L_{Aeq,15min}$ Noise Levels (dBA)	Approved + Proposed Modification Day $L_{Aeq,15min}$ Noise Levels (dBA)	Day Impact Assessment Criteria $L_{Aeq,15min}$ Noise Levels (dBA)
2100	27	27	43
2112	28	28	43
2113	30	30	43
2121	27	27	43
2122	28	28	43
2123	25	25	43
2124	25	25	43
2125	24	24	43
2116	19	21	43
2126	31	31	43
2127	34	34	43
2128	31	31	43

A review of Table 4-6 shows that no exceedances of the impact assessment criteria are predicted and the resultant noise levels during the construction period have increased by 0 to 2 dB when compared with the approved noise levels.

In view of the above, the short-term construction works associated with the proposed Modification are not expected to impact on the acoustic amenity of receivers in the vicinity of the CVO.

5 CONCLUSION

CHPL is proposing to relocate the approved MRP from the approved location within the Ore Processing Facilities area to a new location just north-east of the Northern Tailings Storage Facility.

Potential noise impacts associated with the Modification and construction works have been considered in the noise review.

Noise predictions indicate that operational and construction noise levels associated with the proposed Modification comply with the impact assessment criteria at all identified receivers. As such, the proposed Modification is not expected to impact on the acoustic amenity of receivers in the vicinity of the CVO.

6 REFERENCES

Cadia Holdings Pty Limited (2009) *Cadia East Project Environmental Assessment.*

Department of Environment and Climate Change (2009) *Interim Construction Noise Guideline*

Environmental Protection Authority (2000) *Industrial Noise Policy.*

New South Wales Government (2014) *Voluntary Land Acquisition and Mitigation Policy.*

Wilkinson Murray Pty Limited (2009) *Noise and Blasting Impact Assessment.* Report prepared for Cadia Holdings Pty Limited.

Wilkinson Murray Pty Limited (2015) *Cadia Valley Operations Processing Rate Modification Noise Assessment.* Report prepared for Cadia Holdings Pty Limited.

Wilkinson Murray Pty Limited (2017) *Cadia East Surface Preconditioning Program.* Letter report prepared for Cadia Holdings Pty Limited.