

Section 2

The Existing Quarry

This section presents an overview of the existing Quarry including a description of the operations undertaken, a summary of monitoring results, together with an assessment of compliance with the current consents and licences and the applicable environmental criteria and guidelines.

2.1 EXISTING OPERATIONS

2.1.1 Introduction

PBM has continued to provide its high quality products from the Quarry to a number of construction projects including a range of projects involved with the Pacific Highway upgrade program and a number of local customers. The on-site asphalt plant, which commenced production in December 2008, continues to service a range of local infrastructure projects. **Figure 2.1** displays the current layout of the Quarry and the location of the current activities. **Plates 2.1 to 2.4** display various activity areas within the Quarry.

The following subsections provide an overview of the activities currently undertaken at the Quarry.

2.1.2 Extraction Operations

Extraction operations continue to be undertaken in both Extraction Areas A and B comprising a combination of select material/weathered rock and fresh rock. All extraction has been undertaken by either ripping with excavators and bulldozers or drill and blast followed by load and haul. Each blast typically generates between 15 000t and 35 000t of fragmented rock, with up to 15 blasts initiated in one year. Broken and fragmented rock suitable for processing is transported to the on-site processing plant by off-road haul trucks. All oversize rock is either sold as armour rock or transported to protected areas within Areas A and B for size reduction using a hydraulic hammer.

2.1.3 Processing Activities

Processing continues to be undertaken at the processing plant which incorporates crushing and screening machinery and a state-of-the-art pugmill, with processing generally taking place 6 days per week, typically starting at 6:30am and concluding at or before 6:00pm on a weekday and typically starting at 7:00am and concluding at or before 3:00pm on a Saturday, public holidays excluded.

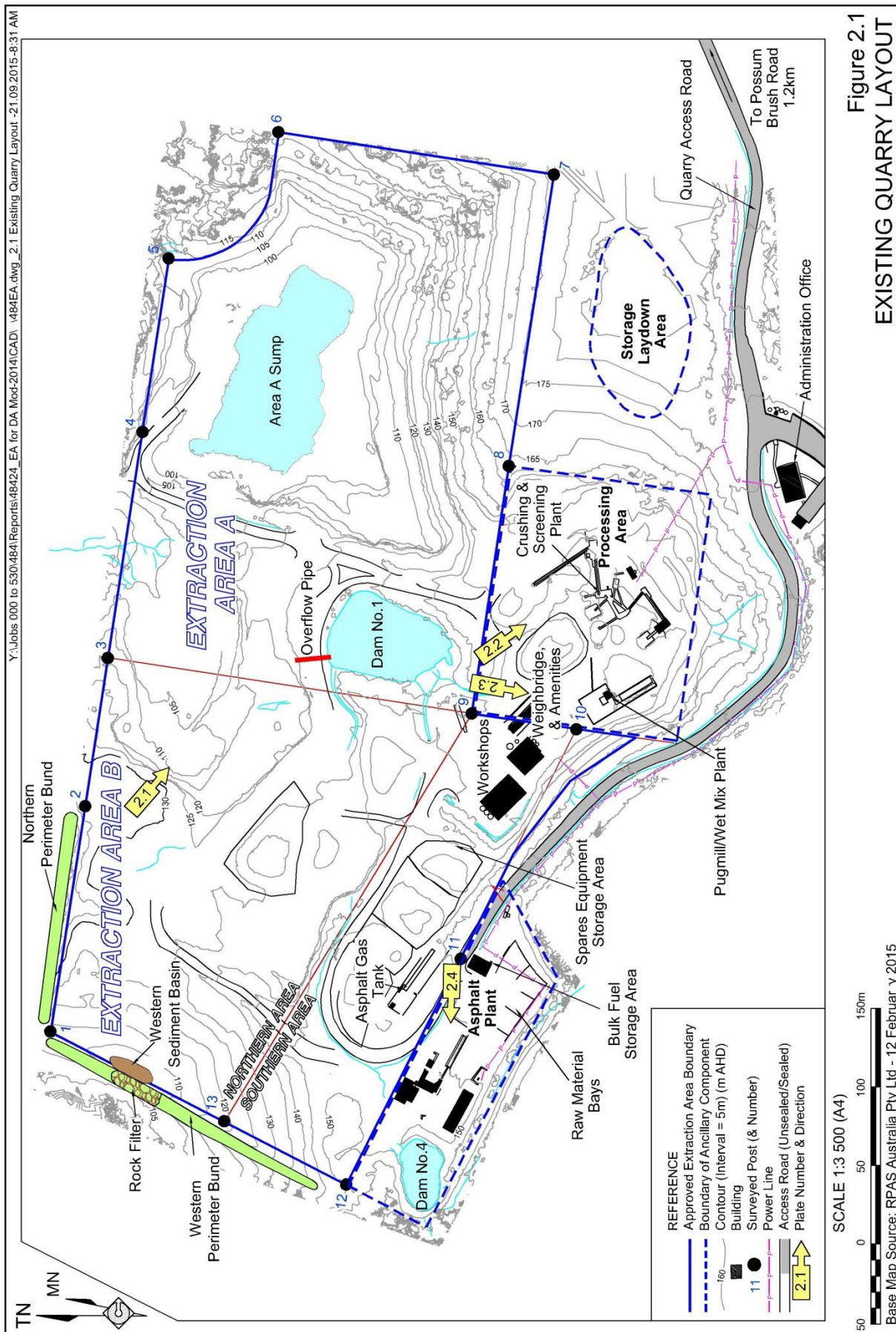


Figure 2.1
EXISTING QUARRY LAYOUT



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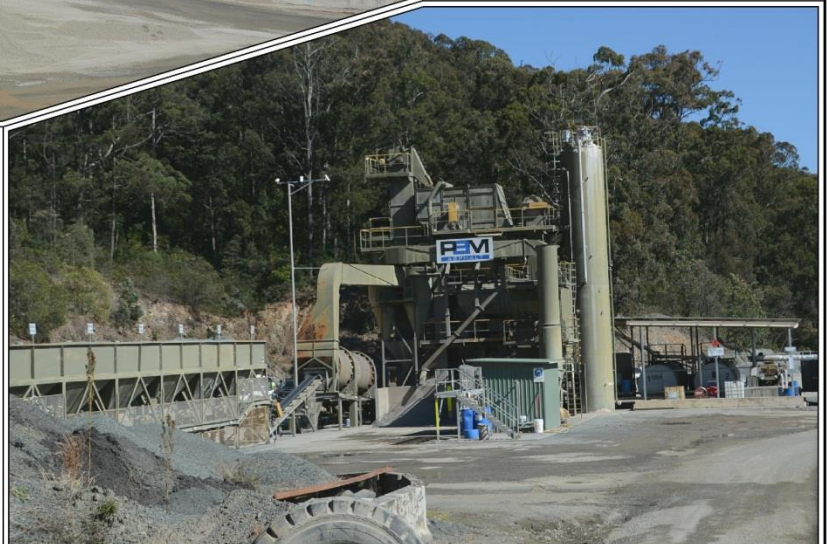
Plate 2.1: A view to the southwest across Extraction Area B
(Ref: E484M_019)

Plate 2.2: A view to the southwest towards the Processing Plant
(Ref: E484M_059)



Plate 2.3: A view towards the Pugmill/Wetmix Plant
(Ref: E484M_055)

Plate 2.4: A view to the west towards the Asphalt Plant
(Ref: E484M_005)



2.1.4 Product Despatch

All product trucks travel to and from the Pacific Highway via the Quarry Access Road and Possum Brush Road. The bulk of construction materials have been despatched to Pacific Highway upgrades and local Council projects. Gabion and oversize rock are also sold for use as rock lining/armouring.

2.1.5 Rehabilitation

Given the quarry layout and sequence of extraction, limited rehabilitation has been previously undertaken as the majority of areas disturbed remain operational. Notwithstanding this, the following rehabilitation has been previously undertaken in the following areas.

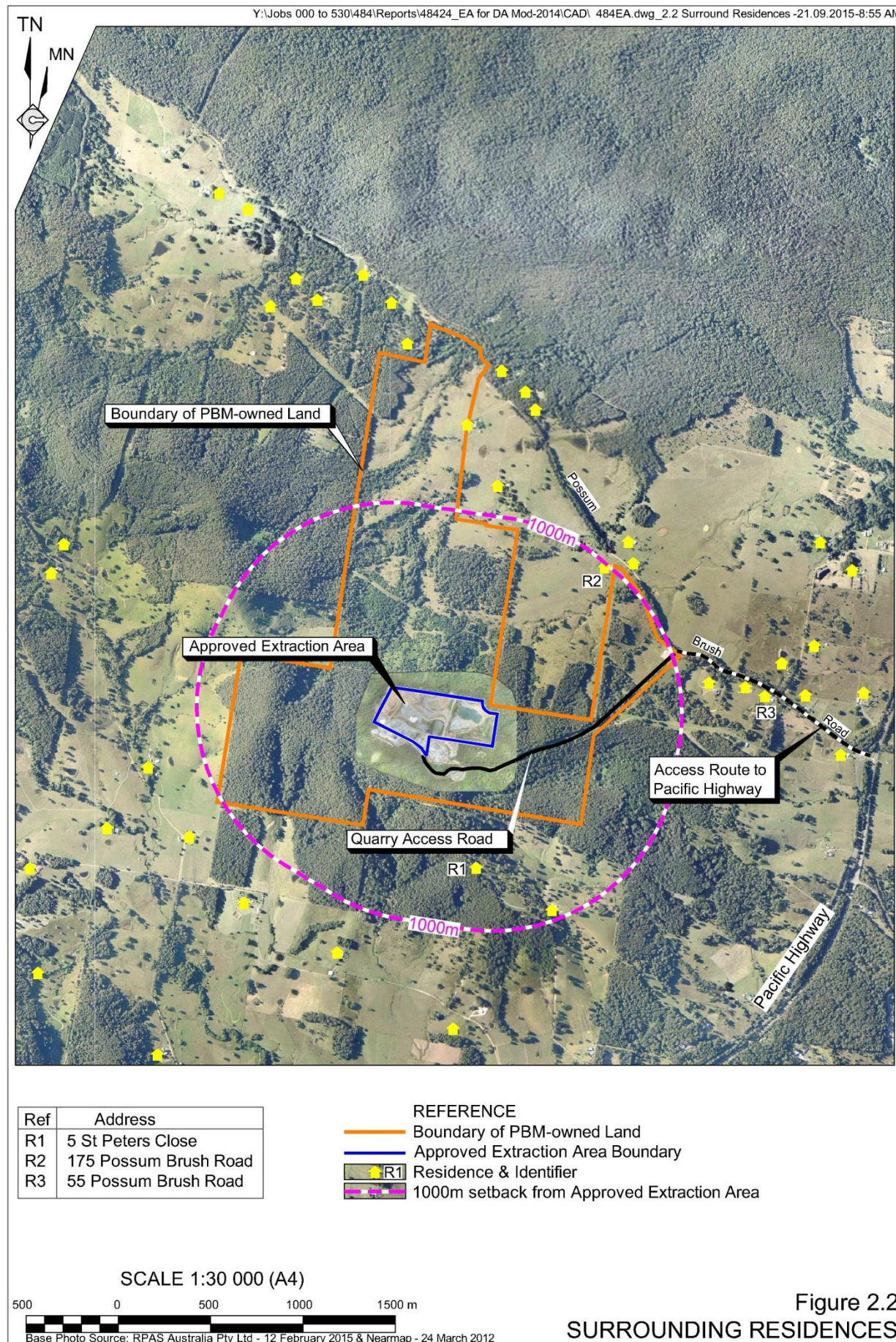
- **Quarry Access Road** – Roadside vegetation has been established and is regularly maintained, including weed spraying, as required.
- **Area A** – Interim revegetation of the upper southern and eastern extraction faces which is regularly maintained – principally to minimise visibility impacts. It is noted that this area is currently planned for further extraction beyond the end of Stage 2.
- **Area B** – Revegetation of the outer surface final western perimeter bund (still in progress).

Land adjacent to the active Quarry on the northern boundary is also owned by PBM with the following activities occurring within the identified areas (locations provided on **Figure 2.2**).

- **50m Buffer Zone** – A program of primary and secondary weeding is undertaken within the buffer zone. This program has been successful in controlling Lantana and White Passionfruit.
- **Wildlife Corridor** – Primary and secondary weed control programs are regularly undertaken in the Wildlife Corridor to progressively improve the ecological value of the corridor. Considerable success has been achieved with this program over the past 15 years.
- **Property Boundary** – Re-fencing activities around PBM's property boundary are undertaken as required, in conjunction with the adjacent landowners.

2.2 LAND OWNERSHIP AND SURROUNDING RESIDENCES

Figure 2.2 presents the land ownership surrounding the Quarry Site and the locations of residences on the surrounding agricultural land and rural lifestyle blocks, i.e. beyond a substantial vegetated buffer around the extraction areas. The Quarry has been intentionally located in an area that is well shielded both topographically and visually behind the substantial vegetation and at distances of greater than 1km to the residences to the east and northwest and approximately 0.5km from the closest residence to the south. It is noted that there is considerable topographic relief between the extraction areas and the various residences to the south and southeast.



The three residences at which noise monitoring is undertaken to establish compliance with Development Consent DA 283/87 and EPL 3393 conditions (see Section 2.3.2) are identified on **Figure 2.2. Table 2.1** identifies the owners of these three residences and their proximity to the extraction area.

Table 2.1
Land Ownership and Residences

Residence	Landowner	Distance from Residence to Nearest Side of the Extraction Area (km)
R1 – 5 St Peters Close	B.R. Wynn & J.S. Wynn	0.7
R2 – 175 Possum Brush Road	Lifestyle Investment Partners Pty Ltd	1.0
R3 – 55 Possum Brush Road	Shannavalla Pty Ltd	1.4

2.3 ENVIRONMENTAL PERFORMANCE

2.3.1 Introduction

As outlined within *Condition 4*, the requirement to summarise the environmental performance of the Quarry to the satisfaction of the Secretary is necessary, prior to proceeding to Stage 2 of the Quarry's operations. For the purposes of this document, environmental performance is established through a review of:

- environmental monitoring results;
- compliance with approvals and licences; and
- community environmental complaints

2.3.2 Environmental Monitoring

This subsection provides a summary of the environmental monitoring records collected within and surrounding the Possum Brush Quarry. These records have been summarised from the Environmental Management Reports provided to Greater Taree City Council between 1999 and 2014, together with the results of any additional monitoring activities. The three key parameters that are monitored for the Quarry are outlined within Development Consent DA 283/97 and EPL 3393 and relate to:

- noise;
- blasting; and
- surface water.

It is noted that the level of monitoring has been reflective of potential environmental harm and the opportunities when monitoring has been able to be undertaken.

2.3.2.1 Noise Monitoring

Noise monitoring results have been collated from noise monitoring reports, conducted for inclusion within the Quarry's Environmental Management Reports, as well as incorporating the results of additional noise monitoring reports undertaken since 1998. Noise has been monitored and/or calculated, in accordance with *Condition L3.1* of EPL 3393, for $L_{Aeq\ 15min}$ dB(A) and L_{Amax} dB(A).

Monitoring of noise is generally undertaken at the three locations displayed on **Figure 2.3** with **Table 2.2** providing the noise limits for each monitoring location as outlined within EPL 3393.

Table 2.2
Noise Monitoring Locations and Limits

Monitoring Location	dB(A) L_{eq} (15 min)	dB(A) L_{max}
R1 – 5 St Peters Close	39	45
R2 – 175 Possum Brush Road	38	45
R3 – 55 Possum Brush Road	37	45
Note: dB(A) L_{max} applies to 'night-time' operations only, i.e. between 10:00pm and 7:00am.		

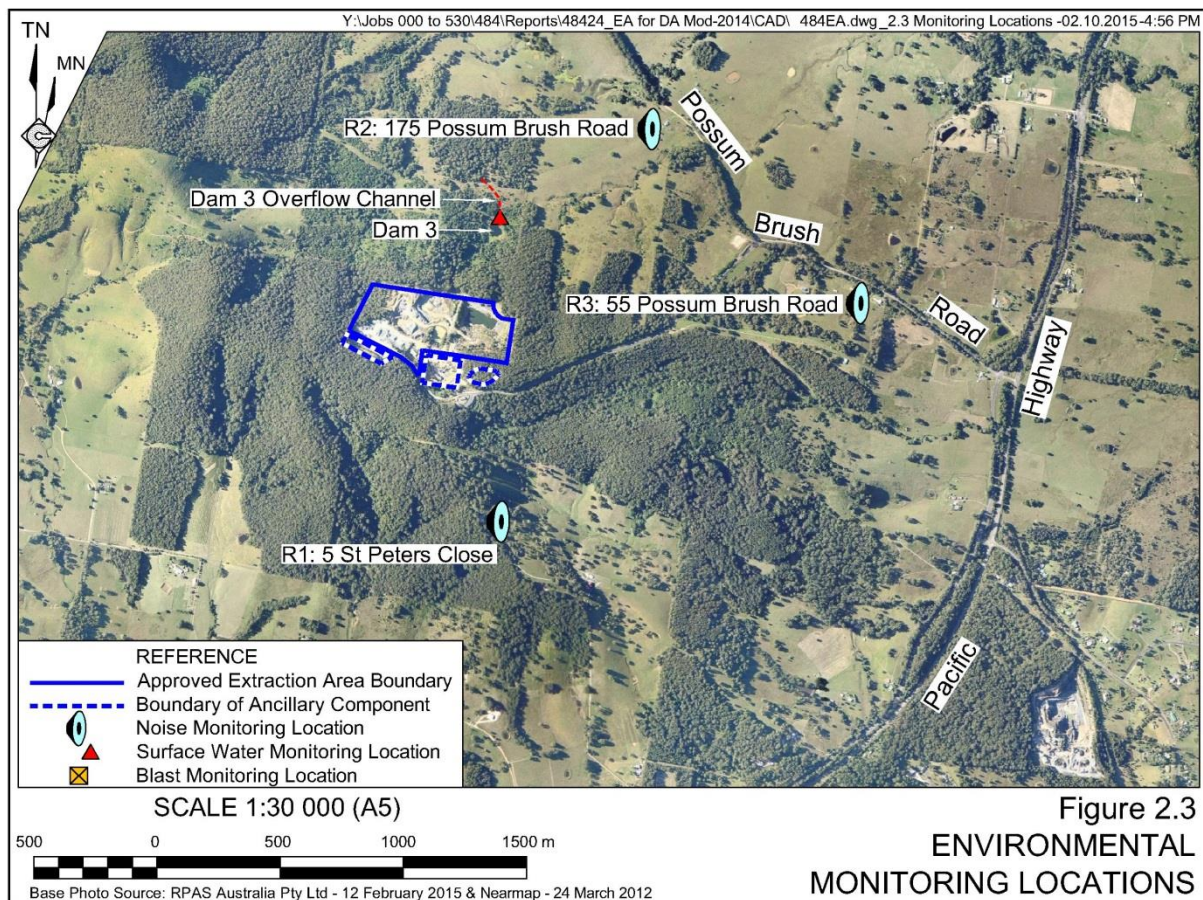


Figure 2.3
ENVIRONMENTAL
MONITORING LOCATIONS

Noise monitoring has been undertaken on the following dates and at the locations identified in **Table 2.1**, noting that the noise monitoring events showed results ranging from being below audible to 1dB(A) below the nominated criteria for both quarrying and transport operations, and thereby complying with the limits prescribed in EPL 3393. The information included within the parentheses indicates the location of noise monitoring when not measured at all three EPL locations.

- 5/6 January 1999 (Location 2 only)
- 4 December 2009 (Location 2 only)
- 25/26/27 February 2010
- 9/10 March 2010
- 3 November 2010
- 20 March 2011
- 10 April 2012
- 13 October 2012
- 19 June 2014
- 29 May 2015

The results from the three most recent noise monitoring activities, undertaken on 3 October 2012, 19 June 2014, 29 May 2015 by Spectrum Acoustics (2012), (2014) and (2015) respectively, are outlined in **Table 2.3**.

Table 2.3
Recent Monitoring Results

Monitoring Location	Monitoring Results ¹			
Noise Criteria	EPL 3393 Limits dB(A) L _{eq} (15 min) ¹		Industrial Noise Policy ²	
	Criteria	Results	Criteria	Results
2 October 2012				
R1 – 5 St Peters Close	39	33	-	-
R2 – 175 Possum Brush Road	38	Inaudible	-	-
R3 – 55 Possum Brush Road	37	Inaudible	-	-
19 June 2014				
R1 – 5 St Peters Close	39	31	-	-
R2 – 175 Possum Brush Road	38	24	-	-
R3 – 55 Possum Brush Road	37	Inaudible	55	38
29 May 2015				
R1 – 5 St Peters Close	39	22	-	-
R2 – 175 Possum Brush Road	38	26	-	-
R3 – 55 Possum Brush Road	37	Inaudible	55	38
¹ Quarry-related noise only. Other noise such as birds and Pacific Highway noise removed. ² Quarry-related traffic on public road network. Assessed separately to Quarry Site noise under the Road Noise Policy (2011) with 55dB(A) L _{eq} (1 hour) the prescribed criteria.				
Source: Spectrum Acoustics (2014) and Spectrum Acoustics (2015)				

It is noted that the majority of noise monitoring was undertaken post 2009, following a request from Council and the local community through the Quarry's Community Consultative Committee (CCC). Some additional monitoring had also been undertaken following a request from the EPA.

2.3.2.2 Blast Monitoring

Monitoring has been undertaken for all blasts initiated at the Possum Brush Quarry with the results included in **Table 2.4** recording the maximum airblast and ground vibration levels recorded during each year at the monitoring location within the Quarry boundary. It is noted that no blasts caused any exceedance of the airblast (120dB(L) or ground vibration limits (10mm/sec) outlined in EPL 3393 and only five blasts occurred outside the prescribed hours of 9:00am – 3:00pm Monday to Friday. On these five occurrences, blasting invariably occurred shortly after 3:00pm due to stemming and safety issues and was confirmed by Council and EPA that these blasting events did not constitute a non-compliance.

Table 2.4
Summary of Blast Monitoring – Maximum Results

Monitoring Period	No. of Blasts	Blast Time Range ¹	Location R1 [@]	
			Airblast (dB(L)) Over pressure	Ground Vibration (mm/s)
1998 - 1999	14	10:00 – 2:50	116.1	0.93
1999 - 2000	5	9:10 – 3:45	<100.0	<0.27
2000 - 2001	15	10:00 – 3:00	114.2	2.63
2001 - 2002	10	10:02 – 3:09	108.9	2.55
2002 - 2003	7	10:40 – 1:08	113.3	1.48
2003 - 2004	9	11:04 – 3:35	112.3	1.01
2004 - 2005	5	11:00 – 2:25	112.1	0.62
2005 - 2006	6	12:08 – 4:15	113.4	0.37
2006 - 2007	3	2:10 – 2:50	107.3	0.29
2007 - 2008	10	11:30 – 2:50	110.0	1.99
2008 - 2009	12	9:35 – 3:03	110.8	1.20
2009 - 2010	7	11:24 – 2:20	114.8	0.39
2010 - 2011	7	9:50 – 2:09	104.0	0.63
2011 - 2012	6	10:30 – 2:49	110.0	0.41
2012 - 2013	7	12:09 – 3:05	103.1	0.36
2013 - 2014 ²	6	12:34 – 1:58	107.7	2.27
2014 - 2015	5	12:20 – 2:57	111.4	4.03
[@] See Figure 2.3				
¹ DA Condition 11 – Blasting is to occur between 9:00am and 3:00pm Monday to Friday only.				
² Highest level recorded at both Locations 1 and 2				

An evaluation of all blasting results identified that one blast within the 1998-1999 monitoring period resulted in an airblast overpressure of 116.1dB(L) that is noted as being above the criteria of 115dB(L), however, as this single occurrence occurred less than 5% of the total blasts conducted at the Quarry and was within the 120dB(L) criteria limit, this single blast was not determined to be an exceedance of the blasting criteria nominated within EPL 3393. No blasts resulted in the ground vibration criteria (5mm/sec) being exceeded.

2.3.2.3 Surface Water

Water quality monitoring is required from within the overflow channel from Dam 3 (EPA Identification No. 2) during discharge events in accordance with DA *Conditions 25* and *26*, with water quality limits prescribed in EPL 3393 *Condition L2.5*. **Table 2.5** presents the summarised results of the surface water monitoring program since 1998. It is noted there have not been any discharges from Dam 3 requiring monitoring during 8 of the years of operations since 1998. The limits nominate a maximum total suspended solid limit of 50mg/L, pH values between 6.5 and 8.5 and no visible oil and grease at the time of sampling. Sulphate and chloride have been opportunistically measured to determine if these values are within suitable limits for use as make up process water for use in the processing operations. The appropriate ANZECC guideline levels for sulphate and chloride have been used for assessment, being 300mg/L and 400mg/L respectively.

Table 2.5
Surface Water Quality Monitoring – Maximum Values

Monitoring Period	No. of Samples	Total Suspended Solids (mg/L)	pH	Oil and Grease	Sulphate (mg/L)	Chloride (mg/L)
Limit/Criteria		50mg/L	6.5 – 8.5	No visible	300mg/L*	400mg/L*
1998 - 2003	0	-	-	-	-	-
2003 - 2004	1	6	-	ND	74	74
2004 - 2005	1	25	-	ND	65	44.5
2005 - 2006	0	-	-	-	-	-
2006 - 2007	0	-	-	-	-	-
2007 - 2008	1	2	-	ND	100	40
2008 - 2010	0	-	-	-	-	-
2010 - 2011	3	18	7.4	ND	-	-
2011 - 2012	4	20	8.3	ND	-	-
2012 - 2013	3	39	7.3	ND	-	-
2013 - 2014	2	25	-	ND	92	32
2014 – 2015	5	37	7.4	ND	110	50.5
ND – Not Detected						
* Represents site-based criteria only and is not included within EPL 3393.						

An evaluation of monitoring results has identified that discharges from the Quarry have not exceeded the EPL limits or water quality guidelines.

2.3.2.4 Air Quality Monitoring

No air quality monitoring is required to be undertaken surrounding the Possum Brush Quarry. Air quality has not been a substantive issue at the Quarry particularly given the extensive remnant vegetation that remains on PBM's property around the operational areas.

Initial air quality monitoring of the emissions from the asphalt plant was originally required by the EPA, however, this has been discontinued given the initial monitoring results were well below the relevant guideline levels.

2.3.3 Compliance with Approvals and Licences

Table 2.6 summarises the findings of the compliance undertaken for the Quarry as required by *Condition 39(a)* DA 283/97 within each Environmental Management Report from 1999 to 2014. It is noted that only the non-compliances have been outlined, as a number of conditions within Development Consent DA 283/97, Development Consent DA 1127/2005 and Environment Protection Licence 3393 have been assessed to be not applicable, not yet applicable, etc. since 1998.

Table 2.6
Possum Brush Quarry Non-Compliance Summary

Monitoring Period	Possum Brush Quarry (DA 283/97)	Possum Brush Asphalt Plant (DA1127/2005)	Possum Brush Recycling Plant (DA 769/2009)	EPL 3393
1998 - 1999	-	-	-	-
1999 - 2000	3	-	-	-
2000 - 2001	2	-	-	-
2001 - 2002	2	-	-	-
2003 - 2004	1	-	-	-
2004 - 2005	3	-	-	-
2005 - 2006	1	-	-	-
2006 - 2007	3	-	-	-
2007 - 2011	2	-	-	1
2011 - 2012	0	1	-	1
2012 - 2013	0	0	-	0
2013 - 2014	0	1	-	3
2014 - 2015	0	0	0	0

Source: PBM Environmental Management Reports 1999-2015.

Table 2.6 outlines that the Quarry has been historically operated with a high level of compliance since 1998 with the majority of non-compliances relating to issues such as truck queuing prior to the Quarry Site opening and other minor non-compliances. Importantly, the Quarry has not exceeded water quality or significant noise guideline values and has recently (2011-2015) operated at a very high compliance across all consents and licences.

The three non-compliances of EPL 3393 in 2013-2014 were minor in nature and did not pose significant environmental threats. The following extract (with minor additions) is taken from the 2013-2014 Environmental Management Report, highlighting the minor nature of the non-compliances.

“All relevant conditions of EPL 3393 were complied with on the date of the EPL review, with the exception of *Condition M7.1* and *Condition O4.2*, as described by the following.

Condition M7.1

The non-compliance of *Condition M7.1(e)* relates to same non-compliance of *Condition 12* of DA 1127/2005 in which noise monitoring during the night-time period was not undertaken, due to the fact that no trucks transporting asphalt departed the Quarry Site during the period of night-time operations, i.e. after 6:00pm or before 6:30am. This non-compliance, however, does not reflect upon the ongoing operations of the Quarry and the noise emissions at the surrounding residences.

Condition O4.2

The two non-compliances of *Condition O4.2* related to the absence of a defined collection sump and the presence of a threaded cap on a pipe through the solid bund wall around the covered bulk fuel storage area. Notwithstanding this observation, it was considered that PBM's procedures to avoid contamination of the surrounding area from the pipe through the bund wall were considered appropriate in the circumstances."

PBM has addressed both of the above non-compliances.

2.3.4 Community Environmental Complaints

Table 2.7 summarises the number and general types of complaints for the Possum Brush Quarry since 1998. The information has been collated and summarised from the Quarry's Environmental Management Reports.

Table 2.7
Possum Brush Quarry Complaint Summary

Period	No. of Complaints	Type
1998 - 1999	3	1 x not being aware of burning off 2 x blast (no blasting was undertaken that day)
2000 - 2001	1	Truck spillage (aggregate spill from subcontractor on public road network)
2003 - 2004	0	–
2004 - 2005	0	–
2005 - 2006	1	Truck movement (careless driving)
2006 - 2007	0	–
2007 – 2011 ¹	26	23 x truck movements (3 x early truck movements, 4 x delivery truck noise issue, 15 x quarry truck related noise movements, 2 westbound trucks on Possum Brush Road, 2 Sunday truck movements) 2 x blasts (noise related – shown to be compliant) 1 x out-of-hours operation (not sustained)
2011 – 2012 ¹	13	12 x truck movements 1 x out of hours operation
2012 - 2013	9	8 x truck movements 1 x blast
2013 - 2014	1	Noise
2014 – 2015	0	–

¹ During these periods, development applications were submitted to Council for proposed recycling activities and night time operations of the asphalt plant. This prompted an increase in complaints as part of the campaign from some local residents opposed to the development applications

It is recognised some complaints related to excessive engine-braking, noisy engines, westbound truck movements on Possum Brush Road and truck movements on Sundays, many of which have since been proven to be either unverified or not attributable to PBM. The Proponent in following up these complaints identified that noise monitoring results displayed levels within the prescribed levels at the nominated receivers. Non-Pacific Blue Metal trucks that continued to use engine-braking or emitted excessive noise were advised to not use engine-braking techniques or limit noise through mitigation techniques. Those who did not comply with these directions were not permitted back to the Quarry until complying with the Quarry rules or installing the necessary equipment.

2.3.5 Conclusion

Based upon the results of the above environmental monitoring results, the Quarry is considered to have been operated in a responsible manner with few justifiable complaints and only a few non-compliances with DA283/97 and EPL 3393. In many cases, the non-compliances have been extremely minor and did not contribute to any environmental harm.

It is noted that the Possum Brush Quarry is well located with respect to surrounding residences although it is acknowledged that some residences have been constructed closer to the Quarry since 1998 when DA283/97 was approved. The surrounding topography and the topography created by past extractions activities within the Quarry contribute substantially to the control of environmental issues such as noise and dust. It is anticipated that these benefits would improve the deeper the extraction activities occur within the Quarry.

Further to these conclusions, the Quarry operates with a Community Consultative Committee which overall has acknowledged that the Quarry has operated in an acceptable manner.

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