

**Responses to Issues Raised in Correspondence from Calga Peats Ridge Community Group Inc,
dated 9 September 2013**

INTRODUCTION

These responses have been compiled principally by Dundon Consulting, the author of the independent groundwater audit incorporated in the 2012 AEMR.

CELL 3/6 DRAWDOWN IMPACT

1. The CPR letter states on page 1 that “... according to the 2011 AEMR Rocla did not excavate below the regional groundwater table”.

This is not correct. The 2011 AEMR makes no reference to not excavating below the water table in Cell 3/6. Nor does the 2011 AEMR state that only overburden was removed from Cell 3/6, as claimed on page 3 of the CPR letter. The AEMR clearly states in Table 2.1 at page 5 that overburden stripping from Cell 3/6 occurred in March 2011, and initial sand extraction commenced in Cell 3/6 in April 2011.

2. The CPR letter then refers to the drawdown impact from sand extraction that was reported in the 2012 AEMR.

1. The first bullet point at the bottom of page 1 of the CPR letter states “*This level of drawdown (i.e. 3.9m at CQ4, 1.1m at CQ11S, 1.0m at CQ11D and 0.4m at CP3) was predicted on the basis of extraction to a final depth of approximately 185m – not as a response to removal of overburden i.e. excavation **above** the groundwater table.*”

The excavation from Cell 3/6 which occurred between April and October 2011 involved an excavation to a level of approximately 198-199m AHD, and involved excavation below the water table. The depth of excavation at the northern side of Cell 3/6 was approximately 12.5m to 15.5m from the original land surface elevation of between 212.5m and 213.5m AHD. The depth of excavation at the southern side of Cell 3/6 was approximately 8.5m to 10m from the original land surface elevation of approximately 208.5m AHD. The excavation extended to a depth of up to 6.5m below the water table, as the pre-extraction water table elevation is believed to have ranged from approximately 204.5m AHD at the northern side of Cell 3/6 to approximately 200.5m AHD at the southern side of this cell, or higher, as seepage observed on the faces of Cell 3/6 at these elevations in August 2012 indicated that the water table immediately adjacent to the excavation was still at these elevations, some 12 months after excavation of Cell 3/6 had been suspended.

As stated in the 2012 AEMR, the total off-site drawdown impact attributable to the Cell 3/6 extraction was limited to a small area immediately north of Cell 3/6. The area of impact was shown by contours in Figure 27 of the Dundon (2013) report appended to the 2012 AEMR. Only one private water supply bore is located inside the zone of drawdown impact, viz the Gazzana domestic bore referred to as Bore CP3. The drawdown at this bore due to the extraction operations was reported in Dundon (2013) as 0.7m. At all other private bores, there has been zero drawdown due to the extraction operations.

The actual drawdowns at the private bores to the north of the Quarry Site, and the predicted drawdowns as presented on Figure 7 in the 2005 Amendment Report¹ are listed in **Table A** for comparison.

¹ The ‘Amendment Report’ is the report entitled “*Amendment to a Proposal Submitted a Development Application (DA 94-4-2004) for an Extension to the Calga Sand Quarry*”, dated June 2005.

Table A
Predicted and Actual Drawdowns

Private Bore [#]	Predicted Drawdown (as in Figure 7 of 2005 Amendment Report)	Actual Drawdown (as reported in 2012 AEMR)
CP3	7.2m	0.7 m
CP4	4.5m	0
CP5	3.9m	0
CP6	5.0m	0
CP7	3.0m	0
[#] See Figure 4.1 - attached		

Table A shows clearly that the actual drawdowns that have occurred as a result of the extraction operations, and attributable to the extraction from Cell 3/6 as discussed in the 2012 AEMR, are very much less than those predicted in the Amendment Report. Extraction has to date only extended to 198m AHD in Cell 3/6, compared with the proposed final level of 185m AHD.

The drawdowns observed to date are consistent with the ultimate drawdowns predicted in the 2005 Amendment Report.

2. The second bullet at the bottom of page 1 of the CPR letter states that the drawdown impact to the north of Cell 3/6 *"... was withheld from the 2011 AEMR, and ... was not reported to the authorities at the time."*

No information was withheld from the 2011 AEMR. The drawdown effects reported in the 2012 AEMR, which range up to 3.9m at bore CQ4, are smaller in magnitude than the range of natural fluctuations in the groundwater levels due to climatic effects (rainfall recharge and natural discharge). At Bore CQ4, the range of natural groundwater level fluctuations is more than 5m (see Figure 4 of Dundon (2013)). As the drawdown impacts are small relative to natural variations in water levels, drawdown impacts can only be detected by changes in the trends of the water level hydrographs relative to the trends observed in other monitoring bores, rather than from individual water level measurements. Even trend changes themselves are not readily discernible for the small magnitudes of impact that have occurred to date, and in the event were only apparent after careful analysis that involved comparison of the hydrograph trends from different combinations of bores.

Trend changes can only be observed over a period of months to years, and it was not clear until the 2012 monitoring data review that any drawdown impact had occurred, as the 2011 data alone did not show any clear evidence of impact. When the drawdown impact became apparent as part of 2012 independent groundwater audit, it was notified to the agencies.

3. As soon as the magnitude of impact had been determined upon Bores CQ10 and CQ11, Rocla notified the occupier of the subject property (Property "D3") (the former landowner) and attempted to contact the new landowner for permission to re-test Bore CP3 (See Figure 3.1 - attached) in accordance with the Site Water Management Plan (SWMP) which was prepared pursuant to Consent Condition 19 of Schedule 3 (referred to as Condition of Consent 3-19 in the CPR letter). The magnitude of impact observed to date (of 0.7m) at the only affected private water supply bore (CP3 – the Gazzana domestic bore) is not considered sufficient to have any detectable impact on the bore's yield capacity. There has not been any "damage" to the bore, or to any other landholder's bore. Notwithstanding this, arrangements are in hand to re-test Bore CP3, which is a mandatory response action triggered by the detected drawdown due to sand extraction of more than 1.0m at bores CQ10 and CQ11 (see Section 6.4.1 on page 25 of the SWMP).

CELL 3/4 CURRENT EXCAVATION:

The CPR letter implies that Conditions of Consent 3-15 and 3-16 have not been complied with.

Condition of Consent 3-15 (i.e. Condition 15 of Schedule 3 of the Development Consent) has been fully complied with by Rocla. The monitoring program referred to in Condition 3-15 is detailed in Section 6 (pages 17 to 26) of the SWMP. This SWMP was prepared in consultation with NOW and was approved by DP&I.

The proposed depth of excavation within Cell 3/4 is similar to that proposed for Cell 3/6, i.e. approximately 185m AHD. The monitoring network in place is adequate to detect the impacts from excavation of Cell 3/4. It is not necessary to have piezometers located at all points on the perimeter of the Quarry Site in order to monitor impacts satisfactorily. The consistency in water level trend between bores CQ10 and CQ8 (Rozmanec bore) means that monitoring of CQ10, in conjunction with 6-monthly monitoring at CP8, supplemented as well by the remainder of the monitoring network, is considered adequate to detect impacts from extraction from Cell 3/4. This assessment of adequacy has been based upon the fact that the monitoring network was designed to ensure there were monitoring bores between the extraction areas and known private water supply bores. With respect to the Bore CP8 on the Rozmanec property, the current monitoring bore network is considered by Dundon Consulting to be adequate and sufficient. Monitoring of the Rozmanec Bore CP8 only twice per year is beyond Rocla's control as Rocla has only been granted access to this bore on two occasions annually.

All landowners surrounding the Calga Quarry were approached by Rocla prior to the submission of the preparation of the 2004 EIS and the 2005 Amendment Report. All water supply bores identified through this consultation with the neighbouring landowners were included in the list of potentially affected existing water supplies.

If, in spite of this process, Rocla did not identify all water supply bores (licensed or unlicensed) within the area of potential impact, it is prepared to engage in consultation at this time, and to include additional bores in the monitoring network, if desired.

SITE WATER MANAGEMENT PLAN (SWMP):

The CPR letter states that Rocla is non-compliant with the SWMP Assessment Criteria. This is not the case.

There is no evidence to suggest that any landowner's bore *"... has suffered a loss of yield greater than 10% due to declining groundwater levels ..."*.

Notwithstanding that there may be bores within 500m of the approved limit of extraction that Rocla is not aware of, the monitoring has shown that impacts due to extraction activities are limited to a small localised area extending not more than 100m beyond the northern boundary of the approved limit of extraction, and lower groundwater levels have only been detected at one private bore (CP3 the Gazzana domestic bore). The magnitude of drawdown detected at bore CP3 is considered insufficient to have caused any detectable loss of yield. Arrangements are in place to re-test Bore P3 in the near future to confirm this.

Rocla did make contact with the landowners of all three properties mentioned in the CPR letter (i.e. properties "O", "J" and "C". Only one landowner, Mrs King (Property "J"), indicated she had a bore on her property but declined Rocla's invitation to monitor the water level and water quality at the subject bore. Both Mr White (Property "O") and Ms Townsend (Property "C") advised Rocla that they did not accept Rocla's invitation to monitor any groundwater bores on their property. Rocla is happy to again contact all landowners surrounding the Calga Quarry to establish the existence of any additional bores, whether they were in existence at the time of the 2004 EIS or are new bores.

“HIGH RISK” OF IMPACTS:

The comments of John Williams of the NSW Office of Water (NOW) in 2004 and 2005 internal correspondence are noted. The monitoring data since 2005 have shown that the quarry operations have had minimal impact on the groundwater resource, and to date there is no evidence that any existing water supply or the environment has been adversely affected.

MONITORING BORES:

There is no evidence that Rocla’s quarrying activities are “... *creating a “high risk” of irreparable damage to the KMM Aquifer, the environment and neighbouring properties ...*”, as alleged on page 3 of the CPR letter.

Monitoring has shown only limited localised impact on drawdown levels local to the Quarry Site, no existing water supply has been adversely affected, and there is no evidence of any adverse impact on the environment. Even when the quarry reaches its full proposed extent, the level of impact predicted to occur could never be described as “irreparable damage” to the KMM Aquifer.

The monitoring network already installed is considered by Dundon Consulting to be adequate to monitor the potential impacts of the quarrying operations at all known private water supply bores surrounding the Quarry Site. The network installed (and documented in the Site Water Management Plan) has been developed in consultation with NOW, in compliance with the Conditions of Consent, and has been endorsed by DP&I.

The monitoring network and the baseline dataset collected to date is sufficient to tolerate periods of unavailability of one or more bores due to damage or other problems as can occur from time to time, without affecting the integrity of the network or the monitoring program. The monitoring results have confirmed that there is sufficient duplication within the network to ensure that the monitoring program will be able to function as desired, even if certain bores are out of service for periods of up to several months. Almost all monitoring bores are located outside of active or proposed sand extraction areas. Bore CQ2 was always expected to be lost to extraction activities, and did not form an essential component of the monitoring network. In the event that any other bore may be lost for other reasons, it would be replaced by Rocla, unless otherwise agreed by DP&I and NOW.

Although there are no monitoring bores along the eastern side of the Quarry Site between CQ4 (north) and the CQ10 (south), the present network is considered by Dundon Consulting to be adequate to monitor for potential impacts on known private water supply bores to the east (i.e. the Rozmanec bore). If other bores are present within the area of potential impact to the east of the Quarry Site, the necessity for additional monitoring bores would be re-assessed, and additional bores installed, if deemed necessary.

IN CONCLUSION:

The CPR letter claims that the “... 2012 AEMR provides evidence that Rocla’s operations are impacting the surrounding groundwater regime far more than was predicted in 2005”. This is not correct. The drawdowns in groundwater level are substantially lower than those predicted in the 2005 Amendment Report and the 2004 EIS, and no existing private water supply bore has been affected. There has also been no adverse impact on groundwater quality.

The CPR letter also claims that “... the level of drawdown (around Cell 3/6) is **far greater** than earlier predictions [for this depth of extraction] which were based on extraction to a final depth of approximately 185m.” This statement too is incorrect. Predicted drawdowns of up to more than 7m were predicted at existing private bores (albeit for extraction to 185m AHD), and extending over a wide area, whereas only 0.7m drawdown has been observed to date (for extraction to a depth of 198m AHD).

The CPR letter also alleges that Rocla's 2011 AEMR stated that "... *only overburden was removed* ..." from Cell 3/6. This too is incorrect. The 2011 AEMR clearly states in Table 2.1 that sand extraction from Cell 3/6 commenced in April 2011.

The seven areas of non-compliance claimed by CPR are disputed.

1. There is a very extensive baseline dataset which has clearly characterised the natural variation in groundwater levels. The monitoring data has also provided evidence of the impacts on groundwater levels caused by pumping extractions from some of the private bores.
2. All known private bores within the potential impact zone for which landowner approval was granted were subjected to pre-project yield testing and quality sampling. Most continue to be monitored on a regular basis for both water level and quality. Additional monitoring bores were installed to provide additional monitoring coverage.
3. Condition of Consent 3-15 has been fully complied with.
4. Condition of Consent 3-16 has been fully complied with.
5. Extraction of Cell 3/6 was commenced earlier than scheduled due to operational reasons. Rocla acknowledges that this was a breach of Condition of Consent 3-19. When this non-compliance was recognised, activity in Cell 3/6 was terminated and an assessment of the environmental consequences of the non-compliance was undertaken. The results of this assessment showed that there were no adverse impacts arising from the non-compliance.
6. The recommendations of C Mackie have been fully complied with.
7. The Water Access Licence matters have been the subject of ongoing consultation with NOW. Delays in resolution of these matters have been beyond the control of Rocla.

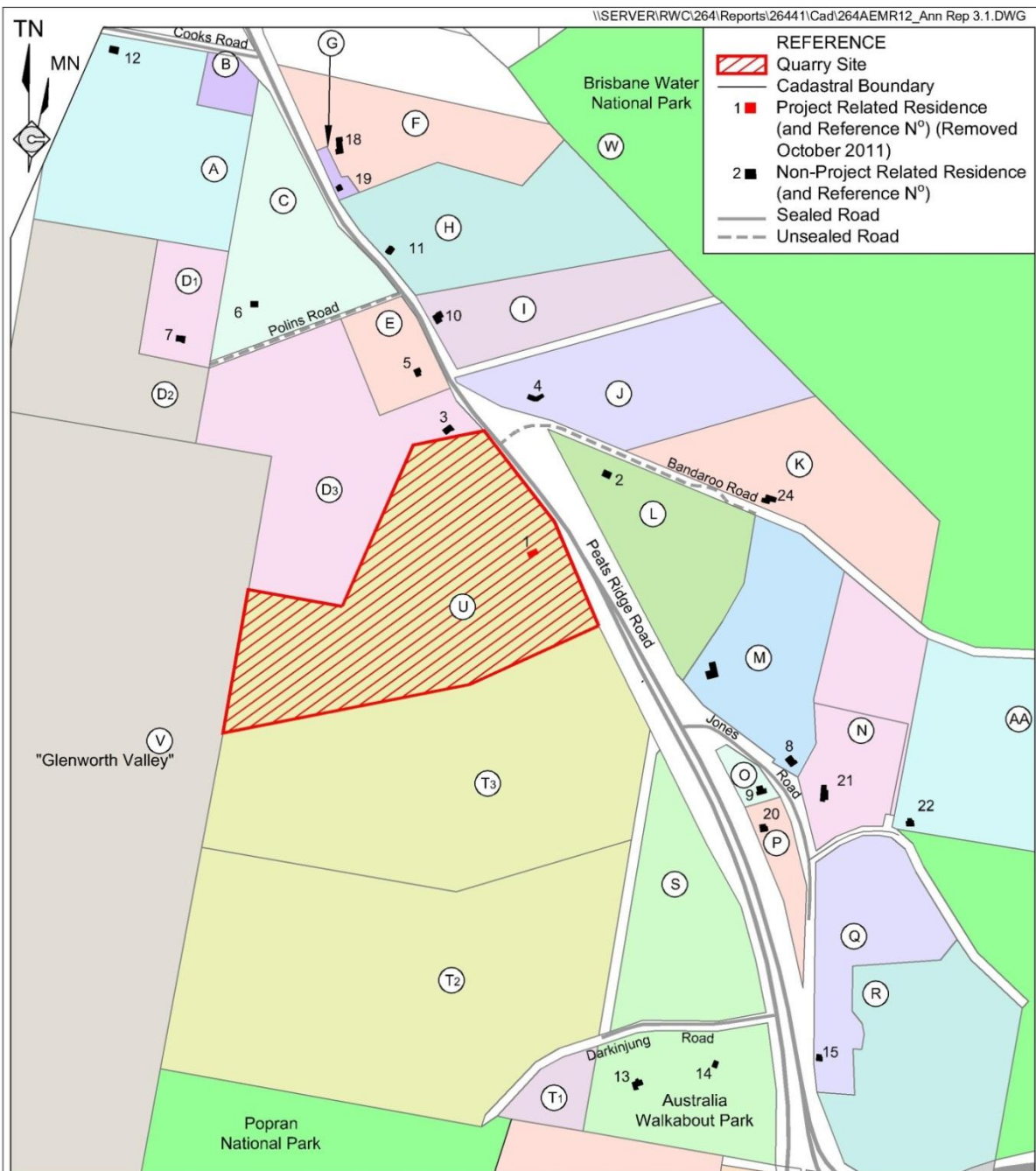
7. Water Access Licences

For the record, **Table B** lists the Water Access Licences held by Rocla. In total, Rocla holds licences for the interception of 108ML of groundwater, with a licence of 10ML for a surface water take.

Table B
Water Access Licences Held by Rocla at Calga

WAL	Former Owner	Units	Category	Current Works Approval
17384	Azzopardi	10	Unregulated R	20CA205778
27185	Azzopardi	15	Aquifer	20CA100205
20019	Craig	46	Aquifer	20CA100219
2541	Voutos	10	Aquifer	20WA100255
26321 to go to WAL 27185	Somersby Fields Partnership	37	Aquifer	20CA202706
	Total	118		

Attachments: **Figure 3.1 – Land Ownership and Surrounding Residences**
 Figure 4.1 – Groundwater Monitoring Bores



Property	Owner(s)	Residence Reference	Property	Owner(s)	Residence Reference
A	*G.D. & D.A. Marler	12	P	D. O'Bryan	20
B	Airservices Australia	-	Q	N. Soulis	15
C	A.M. & R.A. Townsend	6	R	J.H. Hunt	-
D1	Power Pastoral Holdings Pty Ltd	7	S	C.J. Barnard	13, 14#
D2	Glenworth Valley Pastoral Company	-	T1	Rocla Materials Pty Ltd	-
D3	Power Pastoral Holdings Pty Ltd	3	T2	Rocla Materials Pty Ltd	-
E	B. Kashouli	5	T3	Rocla Materials Pty Ltd	-
F	J. & A.V. Serou	18	U	Rocla Materials Pty Ltd	1
G	G.L. Gratton-Wilson	19	V	B.A. & B.J. Lawler	-
H	J. Hajje	11	W	Brisbane Water National Park	-
I	C.A. Goding	10	X	Popran National Park	-
J	R.D. King	4	Y	C.J. Barnard	-
K	G.B. & L.P. Miles	24	Z	C.J. Barnard	-
L	F. & G. Rozmanec	2	AA	Tokoloshe Pty Ltd	22
M	S. P.A. D.E & N.E. Cauchi	8	AB	J.R. & S.Y. Glover	23
N	J. & H. Simmonds	21	AC	M.J. Lambert	-
O	W. White	9			

SCALE 1:15 000

250 0 250 500 750 m

Cadastral Information Source: Digitised from LPI DCDB

Figure 3.1
**LAND OWNERSHIP AND
SURROUNDING RESIDENCES**

