

APEX ENERGY NL

DISCUSSION PAPER - APEX ENERGY NL & METROPOLITAN COLLIERY JV – CURRENT STATUS POTENTIAL SYNERGY

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WORKS CITED

Rogers, C. (2010). *Preliminary Evaluation of Gas Exploitation Possibilities on CCL 703 - May 2010*. Sydney: Apex Energy NL.

ABBREVIATIONS

Apex – Apex Energy NL

PP – Peabody Pacific

HC – Helensberg Coal Pty Ltd

JV – Joint Venture

CMG – Coal Mine Gas

CSG – Coal Seam Gas

CCL – Consolidated Coal Lease

PEL Petroleum Exploration Licence

ML – Mining Lease

CL – Coal Lease

OH&S – Occupational Health and Safety

CH₄ – Methane

CO₂ – Carbon Dioxide

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Metropolitan Collieries Pty Ltd, as mine Owner, and Helensburgh Coal Pty Ltd, as mine Operator, (both subsidiaries of Peabody Pacific) together with Apex Energy NL and (now) Sydney Basin CBM Pty Ltd (100% subsidiary of Apex), entered a Joint Venture Agreement on 18 April 2005 for extraction of methane, via an unincorporated JV (the JV), and that Agreement has been registered by the Department of Primary Industries against Coal Lease 379, CCL 703, Authorisation 200 and sub-lease (from Endeavour Coal) of CCL724

The JV assets are held as tenants in common in perpetuity, with initial interests, subject to Participating Interests (below), being 80% Apex/ SBCBM and 20% Metropolitan/ HC. Apex is the Manager of the JV and is to pay all JV and Project costs (subject to Participating Interests below). The participants have first right of refusal over any sale of JV interests.

With changes that have transpired since the 2005 JV Agreement was entered, including the regulatory regime under which methane can be exploited; the new carbon emissions environment; that the colliery emphasis has changed from drainage gas; a 22 year extension to the Metropolitan mine plan granted in June 2009; and the current commercial energy environment – the JV Agreement is under review to better align with the current circumstances. The ongoing discussions are acknowledged between the parties in a letter from Peabody dated 1 April 2009. Three boreholes under the JV have been included in the 18 borehole Part3A approval process, and though the three were removed from the final Application so as to avoid any possible disruption to the then Metropolitan mine Part3A (now approved), each of the parties, including the NSW Department of Planning, agree to reinstate those boreholes under variation.

Project “Participating Interests” (current Agreement)

- each party may take its % share of gas for own disposal on basis of:

- a) where gas is from Bulli seam (including goafs) 80% Apex and 20% Metropolitan
- b) gas from all other seams, on a per seam basis, at Metropolitan option:
 - i) Apex 100% costs for 95% of product and Metrop 5% of product free carried, or
 - ii) Apex 85% of costs for 80% of product and Metropolitan 15% contributing + 5% free carried

-Metropolitan is entitled to any carbon credits OTHER than credits for conversion of methane to electricity (including NGACS), with those credits to be vested in the electricity generating party.

2/ objectives of Peabody/ Metropolitan

Following the public scrutiny of the application for extension of the Metropolitan Colliery (now approved), and the problems they have had due to surface water disappearance and land subsidence, Peabody is very sensitive to having their name associated with any further resource development project (ie CSM extraction) lest it attract unnecessary attention and further aggravation.

Peabody would prefer not to have its name directly associated with surface aspects of exploitation. Whilst it has primary concerns about any drilling activity potentially impacting on coal mining operations (easily managed), more importantly it would rather not be directly involved with any surface problems which may be brought to the attention of the Sydney Catchment Authority or other Landowners, and that any public attention not be to the detriment of their underground coal mining activities.

Apex preferred position is also not to have Peabody (Metropolitan) directly associated with the gas extraction/ commercialization operations.

3/ the (Apex) proposed relationship

The preferred position, which also would appear to suit both parties purpose, is for Metropolitan Colliery to allow Apex (and Sydney Basin CBM Pty Ltd) to apply for a PEL over the CCL areas for exploitation of the methane by whatever means.

Metropolitan would be given a Net Profit Interest (NPI) in commercialization of gas, in the same format as other CCL relationships Apex currently has in the region. A collaborative committee would be formed where Metropolitan is kept informed on proposed activities on the CCL, and Metropolitan has the right of veto on the basis of any risk to their coal mining activities.

The primary focus of the PEL would be exploitation of gas away from the coal mining areas, however, there is definite additional opportunity to work with the mine to drain gas ahead of mining activities, and to commercialize, or reduce the mine liability, in relation to fugitive emissions from their underground activities.

Apex believes this NPI interest (with Committee) could be practical and functional for the parties to coexist in the same geographic area. Indeed, an Agreement for Apex to apply for a PEL over the area as executed by the parties in 2002 would still today be very relevant and require very little amendment.

Current legal advice to Apex on the approach of Apex applying for a PEL is positive. One recently emerged area which needs to be delineated is responsibility for fugitive gas emissions. With the proposed Carbon Pollution Reduction Scheme, and Carbon Trading system, it is imperative that Apex does not inadvertently take on any potential future liability in relation to emissions from coal mining activities.

DOCUMENT SUMMARY

Apex Energy NL has a JV agreement with Helensberg Coal for the exploitation and commercialisation of gas captured from Metropolitan Colliery mining areas. However, the JV predominantly addresses the utilisation of CMG from the south western mining area of the mine which is almost worked out. The mine has gained recent approval for the mining of a new area in the north west of its tenures. This area is known to have a high concentration of carbon dioxide in its coal as opposed to a gas content of predominantly methane in the south western area. This means that the terms of the JV need to be re-addressed and a replacement commercial agreement put in place in order for Apex to exploit the gas within Metropolitan Colliery's tenures. In addition a PEL will have to be put in place to overlay Metropolitan Colliery's coal tenures.

The entire management teams of both companies have changed since the creation of the JV and this adds a degree of complexity to the ongoing process of renewing the commercial agreement. This discussion paper describes the issues prevailing with the re-negotiation of a commercial agreement of both a technical and commercial nature. It describes progress-to-date and briefly spells out the process going forward.

INTRODUCTION

Apex has an unincorporated joint venture (Appendix 1) with Metropolitan Colliery (Helensberg Coal Pty Ltd) for gas exploitation within its coal lease CCL703, CL379 and Authorisation 200 (1973 Act). Helensberg Coal Pty Ltd is a subsidiary of Peabody Pacific (PP). During meetings held between 2008 and 2010 Apex and PP have been discussing the relevance of the current JV terms and the possibility of negotiating a new JV based on the current circumstances of the mine. The current JV is focused mainly on the utilisation of Coal Mine Gas (CMG) drilled for and drained by the mine. Figure 1 shows the area of the mine relevant to the JV in its current form. The mine is currently working its last sections of coal in this area (south west workings) and therefore much of the gas in this area has already been drained from the seam although some potential remains for goaf gas exploitation in the future.

The intent of the JV in its current form was for Apex to drill a hole near the mines upcast shaft in order to connect into the mines gas drainage range. This gas drainage pipe range reticulates gas captured by the gas drainage system to the upcast shaft where it is simply released into the ventilation air and expelled from the mine into the atmosphere. Clearly there was a significant opportunity to harness this high quality gas when the JV was first formed. Figure 2 shows an underground gas drilling rig at the mine which is used to drill directional 96mm horizontal holes into the coal seam. Holes are drilled across the longwall blocks in order to drain the gas out of the coal prior to mining taking place. Figure 3 shows the fan patterns drilled at the mine to capture the gas.

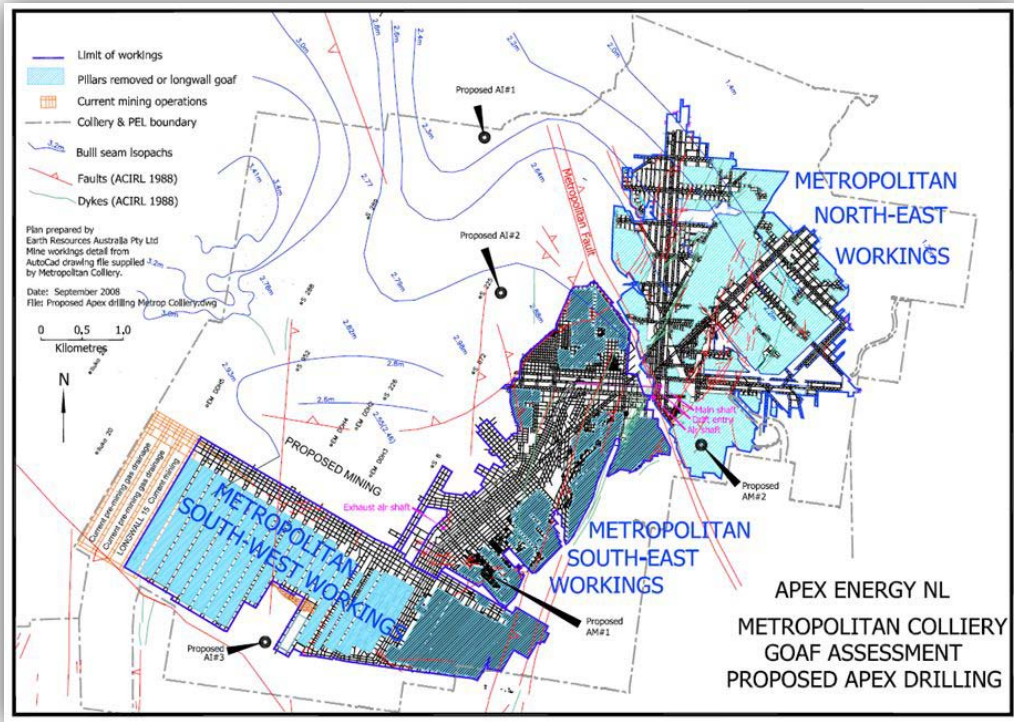


Figure 1 – Metropolitan Colliery workings showing south western area – high in methane gas



Figure 2 – Gas drainage drilling rig at Metropolitan Colliery

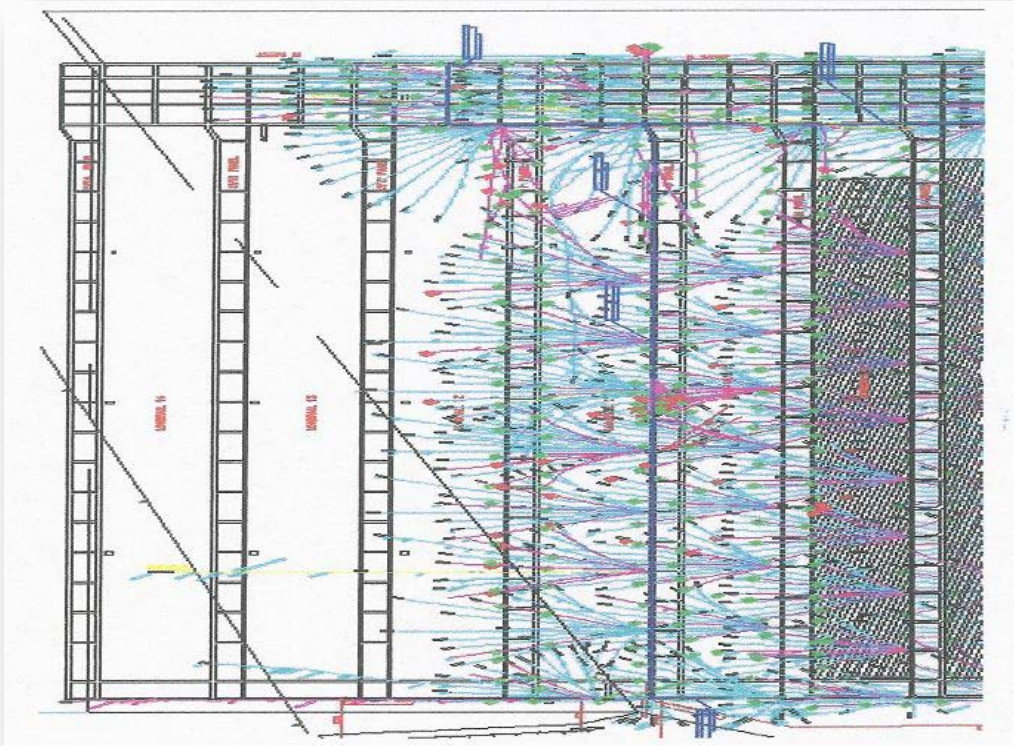


Figure 3 – Metropolitan Colliery gas drainage fan patterns drilled in the mines south western area

However, future workings within the Bulli seam lie within an area of coal high in carbon dioxide content and not suitable for gas utilisation without mixing with high quality gas to increase gas specification. Figure 4 shows the recently approved new mining area known to be high in carbon dioxide in the Bulli seam and the lower seams to the Wongawilli seam.

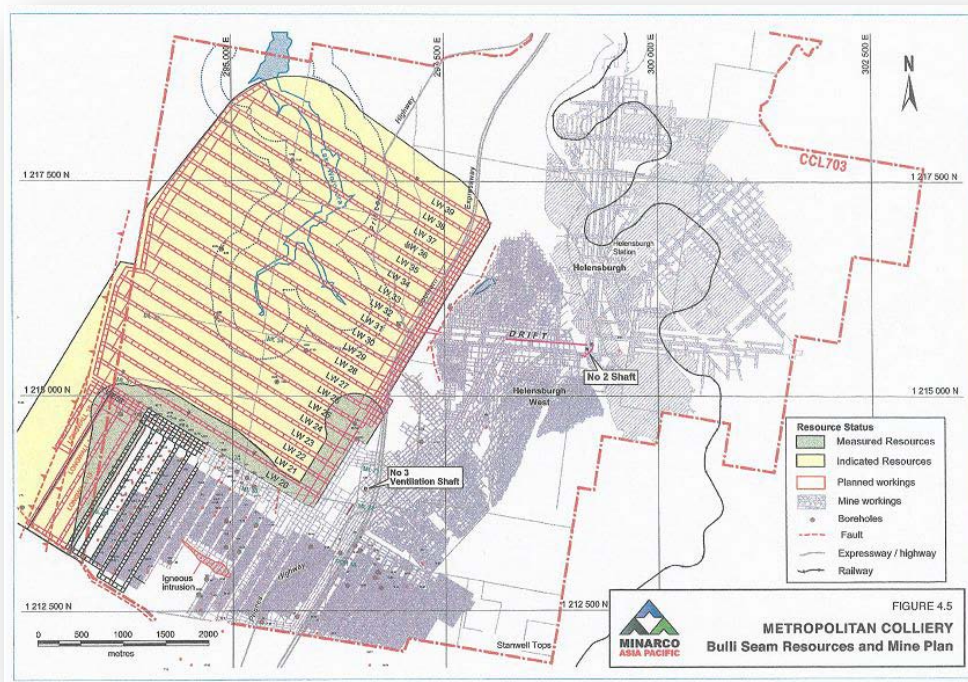


Figure 4 – Metropolitan mine plan showing newly approved area of mining

Figure 5 shows the position of three core holes drilled to the Woonona seam by Apex and Metropolitan Colliery in 2004. Tables 1, 2 and 3 show data from two of these holes - EM3 and EM5. EM3 was drilled towards the centre of the new mining block and EM5 was drilled at the western boundary with BHP Illawarra's coal lease. The results show the high carbon dioxide levels in the upper seams and the trend back towards higher methane content to the west. The results also show the high gas contents prevailing in the area of circa 10m³/tonne of coal.

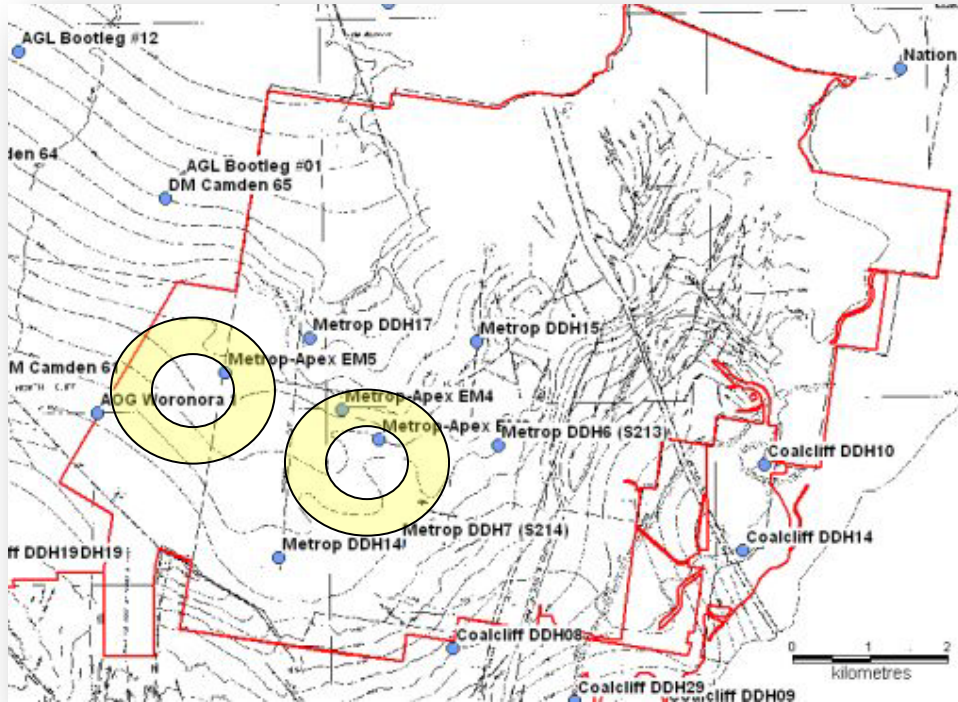


Figure 5 – Plan showing positions of core holes EM3 and EM5

Seam	Depth From (m)	Depth To (m)	Measured Gas Content Qm (m ³ /t)			IDR30 at Sample Ash (m ³ /t)	Gas Composition			Ash (% adb)	
			Directly Tested at Sample Ash	Pay Zones ex bands	at 15% Ash		CH4% Air Free	CO2% Air Free	N2% Air Free	Directly Tested Sample	Pay Zones ex bands
Borehole DDH3											
Bulli	432.09	432.84	10.67	N/A	10.09	0.58	25.9	69.3	4.7	10.1	N/A
Balgownie	445.31	446.84	8.64	8.65	8.61	0.55	16.1	79.9	4.0	14.7	14.6
Cape Horn	456.29	457.04	10.32	10.32	10.31	0.56	24.7	72.2	3.1	14.9	14.9
Woronora Upper	482.68	483.43	1.78	N/A	9.11	0.18	83.3	15.7	1.0	83.4	N/A
Woronora Lower	484.03	484.78	10.52	10.52	13.57	0.79	78.6	18.7	2.7	34.1	34.1
Wongawilli	508.28	511.48	8.33	8.64	15.36	0.67	85.6	10.4	3.9	53.9	52.2
American Creek Upper	529.43	532.98	11.96	11.75	17.69	2.05	92.9	3.6	3.5	42.5	42.7
American Creek Lower	543.22	544.61	12.16	9.95	15.73	1.48	90.5	5.9	3.5	34.3	48.1
Tongarra	583.05	585.74	11.72	11.24	16.68	1.58	94.7	1.4	4.0	40.3	42.7
Woonona Upper	640.35	641.85	12.13	12.13	13.46	2.09	95.9	1.2	2.9	23.4	23.4
Woonona Middle	643.36	646.54	14.03	10.68	15.87	1.49	94.9	0.6	4.5	24.9	40.3
Woonona Lower	647.80	649.90	12.86	11.93	14.73	1.46	96.1	0.6	3.0	25.8	27.4

Table 1 – EM3 core hole gas composition data – shows high CO₂ in upper seams

Seam	Depth From (m)	Depth To (m)	Measured Gas Content Qm (m ³ /t)			IDR30 at Sample Ash (m ³ /t)	Gas Composition			Ash (% adb)	
			Directly Tested at Sample Ash	Pay Zones	at 15% Ash		CH4% Air Free	CO2% Air Free	N2% Air Free	Directly Tested Sample	Pay Zones
Borehole DDH5											
Bulli	437.00	437.77	12.29	N/A	12.86	0.92	63.8	33.6	2.6	18.8	N/A
Balgownie	449.69	451.20	13.47	12.21	12.99	1.09	67.6	30.5	1.9	11.9	20.1
American Creek Upper	532.11	533.86	11.16	10.58	15.72	1.88	94.0	2.2	3.8	39.7	42.8
Tongarra	586.37	588.96	9.46	9.53	15.58	1.54	95.9	0.7	3.4	48.4	48.2
Woonona Upper	643.37	644.41	15.00	13.05	16.98	3.48	94.4	1.3	4.3	24.9	29.5
Woonona Middle	650.04	651.23	12.18	11.59	12.45	1.42	94.4	1.8	3.8	16.8	21.9
Woonona Lower	653.00	655.14	9.99	10.01	11.42	1.85	94.7	1.5	3.9	25.6	28.2

Table 2 – EM5 core hole gas composition data – shows high CO₂ in upper seams and trend back to high CH₄

GeoGAS Sample Number	Client Sample Number	Seam	Depth from (m)	Depth to (m)	Measured Gas Content Qm (m ³ /t)		Desorption Rate @ Sample Ash		Ash/Density	
					at Sample Ash	at 15% Ash	GeoGAS DRI	IDR30 (m ³ /t)	RD (g/cc)	Sample Ash (%adb)
Borehole DDH3										
MET-02	DDH3-02	Bulli	432.09	432.84	10.67	10.09	1426	0.58	1.40	10.1
Coal		Balgownie	445.27	445.31	9.01		1263		1.41	11.1
AP-01	DDH3-03	Balgownie	445.31	446.06	8.93	8.54	1287	0.56	1.41	11.1
AP-02	DDH3-04	Balgownie	446.06	446.75	8.33	8.69	1129	0.54	1.48	18.6
Ms		Balgownie	446.75	446.84	2.58		359		2.27	74.6
Coal		Cape Horn	456.25	456.29	10.32		1464		1.44	14.9
AP-03	DDH3-05	Cape Horn	456.29	457.04	10.32	10.31	1484	0.56	1.44	14.9
Coal		Cape Horn	457.04	457.05	10.32		1464		1.44	14.9
AP-04	DDH3-06	Woronora Upper	482.68	483.43	1.78	9.11	218	0.18	2.28	83.4
Ms		Woronora Lower	483.79	483.97	4.82		597		2.08	68.1
AP-05	DDH3-07	Woronora Lower	484.03	484.78	10.52	13.57	1304	0.79	1.62	34.1
Coal		Wongawilli	508.24	508.28	10.65		1373		1.67	41.0
AP-06	DDH3-08	Wongawilli	508.28	509.03	10.68	15.39	1443	0.66	1.67	41.0
Coal/Cs/Ms		Wongawilli	509.03	509.46	3.84		478		2.31	78.8
AP-07	DDH3-09	Wongawilli	509.46	510.21	6.94	15.95	880	0.65	1.98	63.0
AP-08	DDH3-10	Wongawilli	510.21	510.96	7.35	14.81	854	0.69	1.86	57.8
Coal		Wongawilli	510.96	511.16	10.99		1418		1.70	39.1
Cs/Ms		Wongawilli	511.16	511.48	5.08		641		2.14	71.9

Table 3 – EM3 data showing total gas content in upper seams

Gas contained within the coal seams mined and surrounding seams is a safety hazard for coal mines and is traditionally drained for safety enhancement and not commercial gain from gas utilisation. Clearly the opportunity to capture CMG gathered from the south western area by the mines gas drainage crews has now been lost. In addition, the management people of both parties of the JV have changed since the formation of the JV. Apex proposes that it can provide a future commercial opportunity for both parties of the JV from gas exploitation. In previous meetings it has been acknowledged by Peabody that the JV exists but both parties of the JV agree that the terms of the JV are no longer relevant and that the terms of the JV need to be assessed to determine ongoing synergy between Metropolitan Colliery and Apex and to determine the terms of a new agreement for the future.

It has been agreed to focus negotiations on Coal Seam Gas (CSG) from below the Bulli Seam and to initially keep borehole positioning in such a way as to minimize mine interaction. Clearly some interaction between the staff of each company will occur due to legal OH&S requirements and the needs of effective risk management. Apex would like both parties to remain open-minded about the possibility of the drilling of wells into and through sealed-off mine workings in order to exploit methane gas contained within and from seams below the working seam.

It should also be pointed out that Apex had planned to drill three boreholes for the purpose of core sampling on CCL703 but these were removed from Apex's recently approved Part 3A planning process at the request of PP. The reasons for this will be discussed later in this paper.

This paper is intended to describe the issues prevailing regarding the JV and the progress to-date between the JV parties in relation to re-negotiating a JV for the future taking into account future gas and mining conditions.

METROPOLITAN COLLIERY OVERVIEW

Metropolitan Colliery is currently mining longwalls to LW19A (Figure 1) in accordance with SMP approvals obtained from the Department of Primary Industries – Mineral Resources (DPI-MR) in 2006 and 2008. The future of mining at the colliery falls to the north of the mine. The proposed underground mining area would nominally comprise in the order of 25 additional longwall panels.

Metropolitan Colliery has a high gas content (>10 cubic metres/tonne) within the Bulli coal seam presently mined, and as such is a major safety issue requiring reduction to safe levels typically to less than 2 m³/tonne prior to mining. Various methods may be used to remove methane from coal seams, and the system currently used at Metropolitan is in-seam boreholes manifolded to the mine ventilation system. The in seam borehole drilling is conducted ahead of the longwall equipment and roadway construction to ensure the residual gas remaining in the coal panels is at a safe level. Quantities of seam gas enter the mine from disturbed lower seams (in particular the Balgownie Seam which is approximately 20 metres below the Bulli Seam) in similar concentrations (CH₄/CO₂) to the Bulli seam gas. With the mining area for the next 20 years secured, the immediate problem for the mine relates to how it disposes of its mine refuse from the coal preparation plant. Metropolitan Colliery has surface emplacement areas that will only support mine working until 2016 after which the mine plans to place the waste material underground in its goaf areas. This is a project that currently preoccupies mine technical services staff above all others and Apex must be mindful of this. Coal mining is the mine's core business and so Apex success in the future will depend on self management and excellent safety and operation management so as not to require the assistance of mine resources unnecessarily.

PREVIOUSLY PLANNED APEX CORE HOLES ON CCL703

In September 2009 Apex had its Part 3A application for the drilling of a series of core holes and production wells in the Illawarra region approved. When the application for the project was originally submitted, there were 18 hole locations being considered. The original 18 hole locations are shown in Figure 6 below including three locations within the boundaries of CCL703. These holes were intended to be core holes to enable Apex to increase its knowledge of CCL703. It was believed that these well locations may also have been useful as production sites.

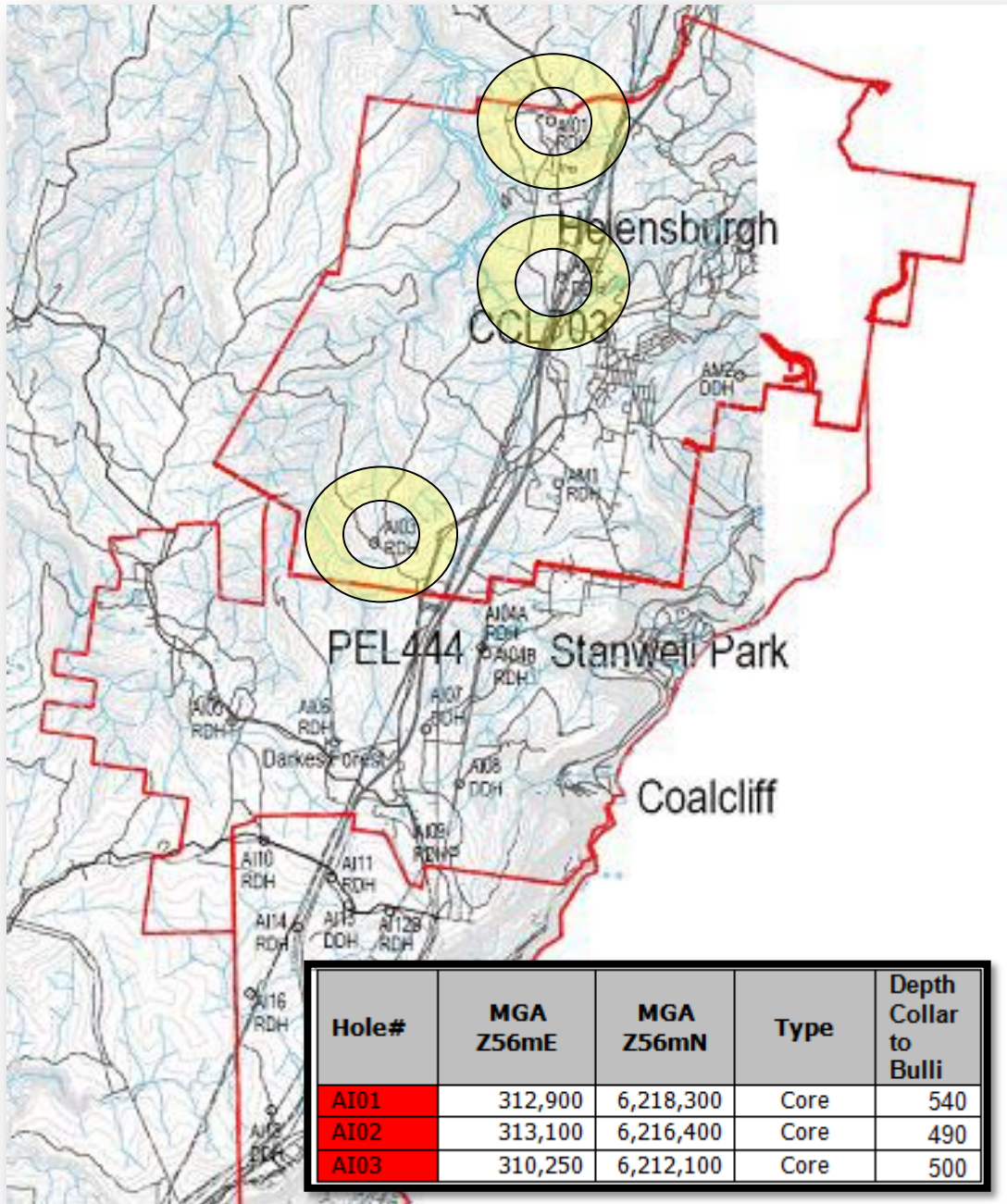


Figure 6 – Plan showing original core hole locations on CCL703

Whilst the Department of Planning was considering Apex's application it was simultaneously considering Metropolitan Colliery's application for the extension of the mine into the new area identified on Figure 4. Metropolitan Colliery's proposal was being opposed enthusiastically by certain members of the public predominantly in relation to the mines potential future impact on the Waratah Rivulet and the Woronora dam. The rivulet feeds the dam and both features exist within Sydney Catchment Authority areas. Subsequently Peabody asked Apex if it would remove the three planned wells on CCL703 from its application so as not to provide added complication for the mine in its planning approval process. Discussions took place between Apex, Peabody and the Department of Planning in relation to the colliery's request and it was agreed to remove the sites from the Apex application. It was also agreed between all three parties that it would be a relatively simple process to add these sites to Apex's approved areas in the future given that the three areas have been assessed in detail by Apex and had been part of its Part 3A submission. Therefore Apex's approved drill sites totalled 15 with AI01, AI02 and AI03 being removed mid-process from the application. The above process was a demonstration of cooperation between Apex and Peabody and acknowledged by Peabody as such.

SUMMARY OF MEETINGS HELD FROM 2008

Several meetings have taken place between Apex and staff from HC and PP in order to work out how the JV can be taken forward to the mutual benefit of both organisations. A brief summary of the meetings is shown below in Table 4

Date	Venue	Purpose	Attendees	Comments
1/9/08	Metrop Col	Having recently joined Apex, CR wanted to meet with NM to establish the status of the JV	Neville McAlary (PP) Chris Rogers (Apex) Chris Lawrence (Apex) Allen Thomas (Apex)	It was agreed that the next step was for Apex and PP to determine its JV status and agree on a way forward. NM did not want his staff at the mine being absorbed in JV matters at this time.
26/11/08	PP Brisbane	Discuss JV	Chris Rogers (Apex) Chris Lawrence (Apex) Allen Thomas (Apex) Peter Brisbane (PP) Julie Bebie (PP)	It was agreed that Apex would supply the relevant JV documentation and CR would liaise directly with PB on the matter.
23/1/09	PP Brisbane	Discuss JV	Chris Rogers (Apex) Peter Brisbane (PP)	It was agreed that the utilization of mine gas was not practical at this stage. For this reason discussion would relate to the seams below seams intended to be mined.
26/3/09	PP Brisbane	Higher level meeting	Chris Rogers (Apex) Chris Lawrence (Apex) Allen Thomas (Apex) Steve Hedges (PP) Legal advisor (PP)	It was agreed without prejudice that a JV could be mutually beneficial and that talks should continue with regard to whether a new JV could be formed being relevant to today's operations. A letter of comfort was requested by Apex.
17/2/10	Metrop Col	Progress meeting	Chris Rogers (Apex) Chris Lawrence (Apex) Steve Hedges (PP) Peter Baker (PP) Greg Tarrant (PP) Tony McFadden (PP)	Apex brought PP up to date with Apex's business. It was agreed to look at potential wells and stick to wells that do not interact with the mine workings at this stage. It was also agreed the utilization of mine gas was not practical at this stage. A meeting action was for CR and GT to work on a preliminary development plan.
12/7/10	PP Brisbane	Progress Meeting	Stephen O'Keefe (Apex) Chris Rogers (Apex) Chris Lawrence (Apex) Steve Hedges (PP) Simon Cobb (PP)	Meeting initiated by Steve Hedges, COO of Peabody Pacific. The meeting looked at the report provided by CR in relation to potential drill sites. It was agreed that discussions should continue in relation to moving the JV forward.
20/8/10	Metrop Col	Technical Meeting	TBA	Meeting initiated by Steve Hedges, COO of Peabody Pacific. Next scheduled meeting to discuss future JV terms

Table 4 – Summary of meetings between Apex and Peabody

During the meeting of 26/3/09 Apex requested a letter of comfort from Peabody in order to reassure Apex shareholders that JV discussion will continue to the mutual benefit of both Apex and Peabody. Peabody furnished Apex with the letter of comfort on 1/4/09. During the meeting held on 17/2/10 at Metropolitan Colliery (see table 1) it was agreed that Chris Rogers would make a preliminary investigation into potential drill sites within CCL703 and CL379 and that this investigations findings would form the basis of ongoing discussion. This report (Rogers, 2010) has been completed and submitted and formed part of the discussion at the meeting held on 12/7/10. The report is a high level preliminary desktop investigation into potential CSG sites on CCL 703 and CL379. Possible well locations and pipe installations are identified to reticulate the gas back to the site of the Darques Forest substation where Apex proposes to place gas utilisation facilities. Figure 7 summarises potential drill sites and gas reticulation pipelines although it must be stressed that the sites and facilities identified were only assessed as a desk top exercise and environmental factors and potential landowner issues were not assessed.

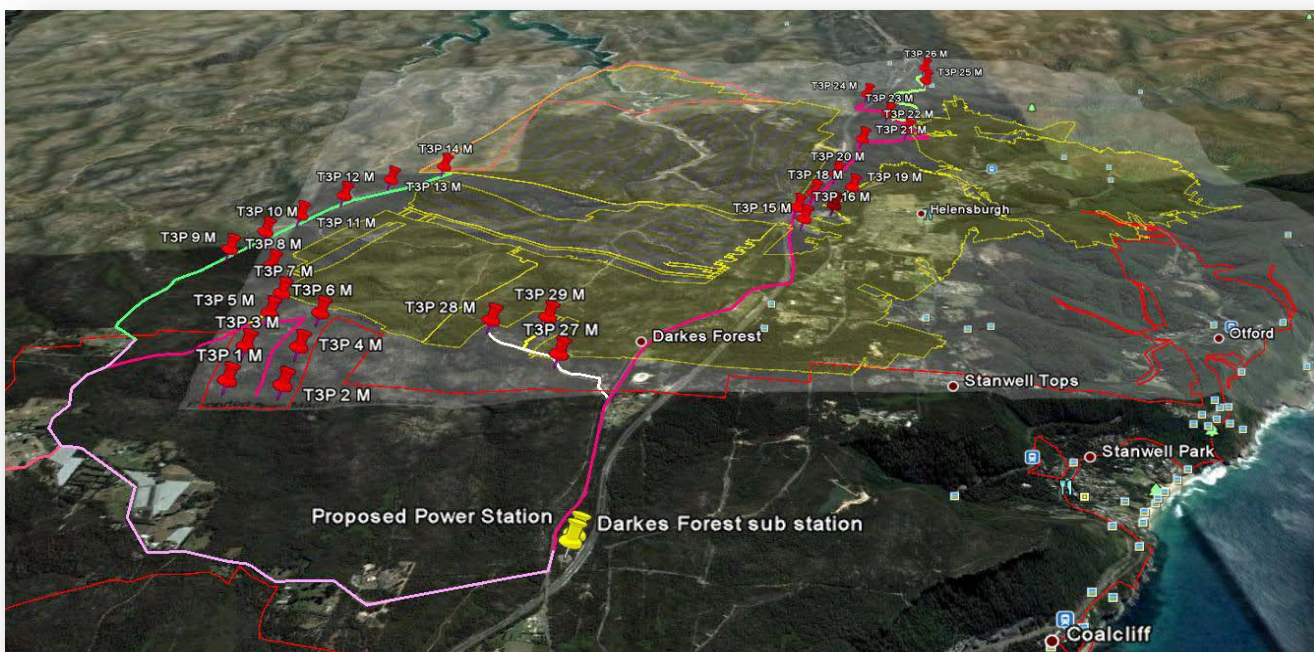


Figure 7 – Potential CCL703 drill sites and reticulation pipes

It had previously been established that whereas the current JV concentrates on the exploitation of Coal Mine Gas (CMG) being drained by the mine and exhausted into its main upcast shaft, ongoing discussion would focus on the exploitation of Coal Seam Gas (CSG) and therefore not interact unnecessarily with the operations of the Colliery. There is potential in the future for the exploitation utilisation of CMG.

PROCESS LOOKING FORWARD

Both parties have agreed to proceed with the process of assessing the feasibility of negotiating a commercial agreement based on the following assumptions;

1. The JV exists
2. The JV terms are not relevant and need to be re-addressed
3. Both parties will move forward in a feasibility process without prejudice

A meeting is planned for the 20th of August 2010 where the potential drill sites and future synergy will be discussed. Apex hopes to commence the process of drafting a new commercial agreement either at this meeting or at a subsequent meeting. Technical staff from Metropolitan Colliery will attend the meeting on the 20th when potential drill sites within the boundaries of the mine as shown on Figure 8 and Figure 9.

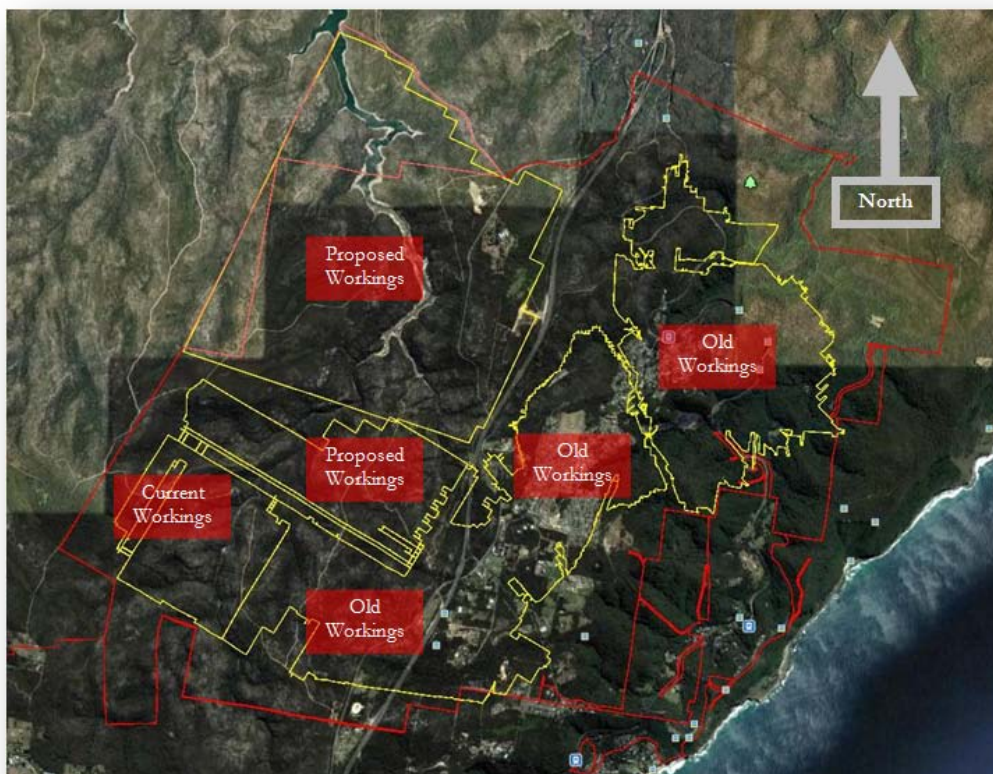


Figure 8 – Metropolitan Colliery mining areas and boundaries



Figure 9 – Potential drilling zones avoiding mine workings

FUTURE POTENTIAL SYNERGY

The author is not expert in the working of Metropolitan Colliery. In order to detail a way forward in synergy then technical meetings must be arranged in order to define and understand any mutual benefit. The statements below are based on general principals and assumptions and must be viewed as such.

Potential synergy

- Improved mine safety by environmental gas reduction

Metropolitan Colliery has always been a very gassy mine by any standards. The mine practises extensive gas drainage in order to reduce gas levels (figure 3) in the ventilation circuit and thereby improving safety, reducing risk and thus improving production. Gas drainage also reduces the risk of gas outburst by identifying potential outburst hazards, reducing gas content in the coal thereby remediating the hazard. Given the gassy nature of the mine how can Apex assist the mine to improve mine safety? Some answers to this question are as follows;

- Reduce goaf gas emissions into the ventilating circuit of the mine

Gas emissions into a mine atmosphere come from desorption from rib sides, the mine roof and the mine floor. These emissions may be from the surrounding coal itself or other gas sources through geological pathways such as cleats and joints. Another man-made source of ventilation gas load is from active and non active goafs. In any goaf there is a flow of gas within the goaf driven by ventilation pressure difference across different points around the goaf. The only way to stop the emission of gas from a goaf into the mines ventilation system is by eliminating that pressure difference. This can be done to some extent though it is not an easy process. A borehole drilled from the surface or placed into the goaf from a point underground and then placed on suction can redistribute the pressure differences around the goaf and reduce gas emission. In theory, one would remove the same amount of gas as the goaf will produce and therefore equilibrium is reached. Apex is aware that the new area of coal planned to be mined by the mine heads towards higher CO₂ contents but the current goaf and early new area LW goafs can produce good quality flammable gas and as the mine heads towards higher CO₂ levels then this gas can be sweetened by other gas sources developed by Apex.

- Remove flammable gas from the upcast shaft ventilating air

Any gas utilisation system would require a surface-to-seam borehole connected into the mine gas reticulation system. This borehole would then be hooked into a liquid ring gas pump plant prior to being utilised in a gas-fired power generator. This system by default removes the need to dispense the mine gas directly into the upcast shaft as at present. By dispensing the gas into the upcast shaft then the gas ceases to be under control. A gas generation system will allow control to be achieved.

- Utilise the mines pre-drainage gas

Gas evacuated from the mines reticulation systems can be utilised with gas from other sources for power generation.

- Offsetting Metropolitan Colliery's carbon footprint

As previously mentioned, the carbon footprint of Metropolitan Colliery must now be assessed and this footprint will generate a financial burden to the mine in the future. This will be the case for all coal mines and mining companies. With all things being equal, gas-fired power will have a clear advantage over coal as a cleaner fuel source. Furthermore, Apex will have the ability to “top up” any Metropolitan gas deficit by linking the mines gas supply to Apex's other gas sources particularly in its PEL 444 (figure 1).

- Revenue generation for both companies that otherwise would not occur

- Power generation or other gas utilisation method (LNG etc)

Traditionally gas is viewed a nuisance to coal companies. Carbon trading and the greenhouse issue are serving to refocus coal companies in this matter. There is increasing incentive to utilise any gas produced by a mine. If managed correctly this can be a means of generating revenue for a mine that it would not previously have had.

- Exploitation of lower un-mineable seams

Consolidated Coal Leases (CCL's) extend beyond the mined coal seams so if these coal seams are not exploited then they are lost opportunities. Clearly, if Metropolitan Colliery was to work with Apex to exploit the gas from these lower unmined seams, then this presents a further revenue generating possibility for the coal mine. This could then further offset the effect of any carbon trading scheme.

CONCLUSION

Apex would like to continue discussions with Peabody Pacific and ultimately develop its relationship to the mutual benefit of both companies. Pre-feasibility work identifies wells drilled on Metropolitan Colliery leases as worthy of further studies. The development of gas resources is strategically important to NSW and a lack of available gas tenures makes JV's between gas and coal companies important to NSW's goal of developing its gas generation capability. NSW needs to increase its power generation capability by 300 to 400 MW per annum in order to keep up with growth. In addition, the harvesting of gas from coal leases is strategically important to coal companies for commercial and environmental reasons.

Appendix 1

Metropolitan Colliery/Apex JV