Wallarah 2
COAL PROJECT

Response to EA Submissions

Report to Department of Planning

17 November 2010

Project Application 07_0160

www.wallarah.com.au

Update to Submissions Report

This report represents the fourth edition of the submissions report and includes the following additional information.

Previous updates have included submissions from:

G&U Lardner, V Lockerbie-Smith, L Suthers, R Gale, C Fitzgerald, S Small, G Fitzgerald, K Torr, D&N Williams, M Willemsen (name corrected from M Williamson), C Arral, L McDonald, R Leeto, S Dullard & S Cuthbertson, J Allen, D Bagot, G & J Ogilvie, D Suthers, R Fowle, A Finneran, G Phelan, G Keegan, L Marsden, A Mullard, E Flanagan, A McCarthy, L Denton (Transnational Pastoral P/L), J Thomson, David Harris MP and Gosford Wyong Councils Water Authority as well as five submissions included but the names were not legible and have been indicated as such. Issues raised in the public submissions have been addressed in Table 4.

The submission from David Harris MP has been addressed in Section 3.8, and the submission from the Gosford Wyong Council Water Authority has been addressed in Section 4.10.

This fourth edition contains submissions from:

L Andrew, L O'Keefe, S Davis, D Davis, S Salmi, R Shields, the Hon. Jodi McKay MP, Total Environment Centre and the Newcastle Greens. Issues raised in the public submissions have been addressed in Table 4, while the submissions from The Hon. Jodi McKay, the Newcastle Greens and TEC have been addressed in Section 3.10.

This version of the Submissions Report has also been reconciled with the submission list provided by the Department of Planning. As the Department combine multiple submissions from the same individuals we have likewise listed multiple submissions with the same submission number.

Contents

1. Introduction

This report provides responses to submissions made during the public display of the Environmental Assessment document and supporting material. The public display occurred from Wednesday 31st March 2010 to Wednesday 2nd June 2010. The Department of Planning advised that it would accept submission up until the final decision by the Minister for Planning. Submissions contained in this document are current as of 17th November 2010, however if further submissions are received, a revised or supplementary report may be produced.

1.1 Wallarah 2 Coal Project in Brief

The Wyong Areas Coal Joint Venture (WACJV) proposes to develop an underground coal mine known as the Wallarah 2 Coal Project (W2CP) to the west of the F3 Freeway northwest of Wyong as shown on Figure 1. Supporting the proposed underground mine will be two surface facility sites located in industrial areas and a separate air intake shaft located in the Wyong State Forest which will be required after the tenth year of operation. The coal handling and rail loading facility, referred to as the Tooheys Road site, is proposed to be located on the northeast corner of the F3 Freeway and the Motorway Link Road intersection while the ventilation shafts, office and employee facilities will be located to the south of the Council's Buttonderry Waste Disposal Facility off Hue Hue Road.

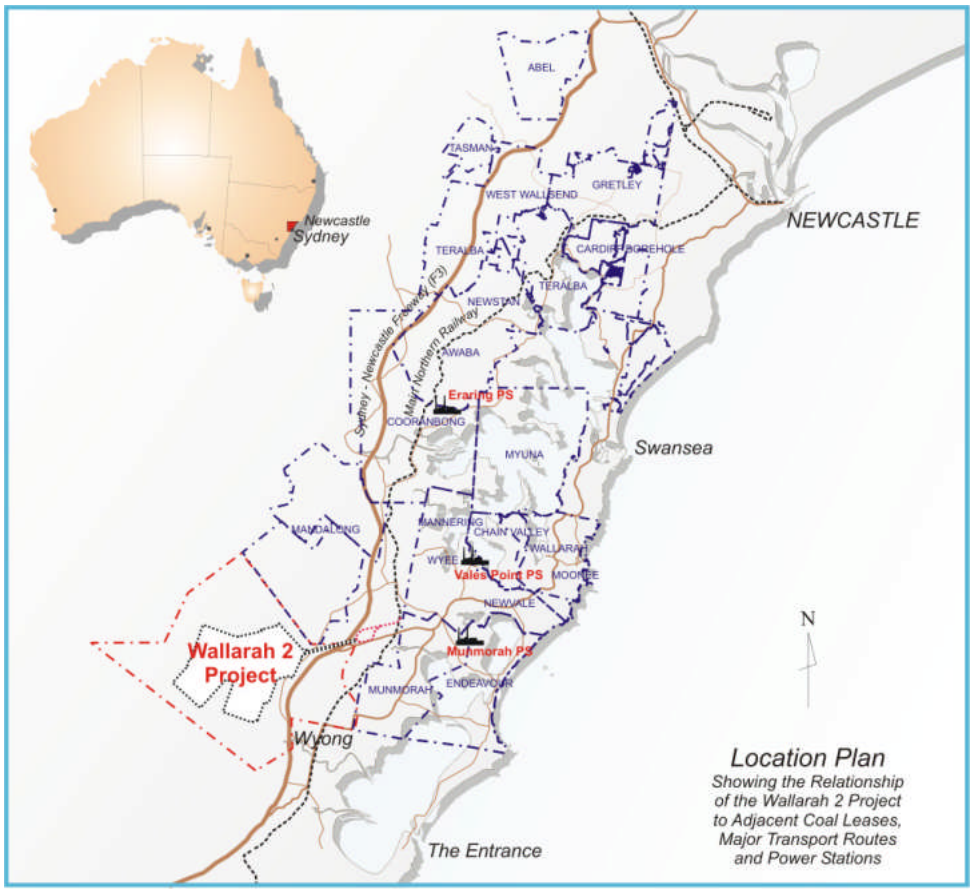


Figure 1 Location Plan

The project will involve the extraction of up to 5 million tonnes per annum of export quality thermal coal by underground longwall mining methods. The coal resource is suitable for use in electricity generation. As a key environmental initiative, there will be no coal washing plant because coal quality is suitable for both the export and local thermal markets without the need for additional processing. All coal produced will be railed off site, generally to Newcastle for export although some local power station use is envisaged.

The key elements of the project are:

- An underground longwall coal mine;
- Coal handling and stockpiling facilities;
- Rail loop and coal loading infrastructure;
- An underground drift entry;
- Offices, bathhouses and workshops;
- Ventilation and access shafts; and
- Gas and water management facilities.

1.2 Planning Approval Process

The planning legislation controlling developments likely to have a significant effect on the environment in NSW is the *Environmental Planning and Assessment Act 1979* (EP&A Act). The W2CP is a mining project as defined in Schedule 1 of *State Environmental Planning Policy (Major Development) 2005* (Major Development SEPP). As such, the Minister for Planning will determine the Project.

The Part 3A approval is the most significant approval required for the Project. If this approval is obtained, it is expected that all other statutory approvals necessary for the Project will be able to be procured.

An Environmental Assessment report (EA) was prepared to accompany the project application, and lodged with the NSW Department of Planning (DoP) on 25th February 2010. The aim of the EA is to enable members of the public, the determining authority and DOP to properly understand the environmental consequences of the proposal. The EA was placed on public exhibition from 31st March 2010 to 2nd June 2010.

The Minister for Planning has advised that the approval process will involve an independent review of the project including public hearings conducted by the Planning Assessment Commission (PAC). The PAC hearings were held in Wyong on 28th October 2010. The PAC will also be informed by the Wyong Water Review report released in August 2010 which was prepared by an independent water expert who reviewed the adequacy of the surface and groundwater data in the subcatchments. This Water Review report has been peer reviewed by an international expert appointed by the Department of Planning. Both reports are available for review on the Department of Planning website.

Following the PAC public hearings and review of independent expert reports, the PAC will report to the Minister for Planning who will then determine the project.

1.3 Purpose of this Report

The Department of Planning advised during the exhibition period that submissions would be received and considered throughout the approval process up until the Minister determines the project. The majority of submissions were received in June following the EA public exhibition with a few received between July and September and later submissions were also provided to the proponent in October and November, requiring progressive revisions to this Response to Submissions report. Many of the submissions received are similar in nature and content, and can therefore be summarised to facilitate an efficient response without undue repetition.

Many specific issues from submissions from community individuals are briefly addressed in the summary table in Chapter 2. Responses to community (non-government) organisations and other key stakeholders such as elected representatives are provided in Chapter 3 and those to Government agencies in Chapter 4. To avoid unnecessary duplication, responses given in these Chapters include references to the fuller responses to key substantive issues from the submissions which are provided in Chapter 5 under themed headings. For convenience of readers, responses in that Chapter address the matters raised in submissions under headings that reflect the topic rather than those parties who raised them.

While each submission is specifically addressed in Chapters 2 to 4, often with references to the EA documents to assist, Chapter 5 has been especially created to provide additional clarification of matters raised in submissions. New illustrations, graphics and diagrams have also been included to assist in this process. Topics covered are, in order:

- subsidence
- groundwater
- the water supply scheme
- flooding
- surface water management
- air quality
- noise
- traffic and transportation
- ecology
- social
- health
- location
- greenhouse gas emissions
- project justification
- EA document
- archaeology and heritage.

To further address certain issues raised in submissions, additional studies have been undertaken. These studies include:

- Test Excavation Report, Tooheys Road Site. This archaeological heritage report relates to work brought forward from the pre-construction phase and involved additional archaeological investigations alongside Wallarah Creek as well as selected landforms within the Tooheys Road site. The work was undertaken by OzArk Environmental and Heritage Management Consultants with representatives from Darkinjung Local Aboriginal Land Council and the Guringai Tribal Link Aboriginal Corporation participating. The test excavation confirmed that there is very low archaeological potential within the area investigated.

- Updated Traffic Impact Assessment undertaken by Parsons Brinckerhoff Australia Pty Limited. This work was undertaken at the request of Wyong Shire Council in its submission to the EA and used more recent traffic projections from the proposed Wyong Employment Zone. The study confirmed that the W2CP is only a minor contributor to the current and future traffic management issues of the area which will arise from planned growth.

- A Rail Capacity Study prepared by Rail Management Consultants Australia Pty Ltd (RMCA). This report extends the previous EA coverage of this issue and was made possible by the recent availability of the latest train schedule projections and rail model for the Northern Sydney Freight Corridor. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can comfortably run between the mine and the port, which can be executed by two conventional train consists of the Coal Schedule 2 configuration. Given that the project may only need six (6) out of the 260 available daily train paths, the rail system will comfortably cater for the expected production output of the W2CP.

None of the above reports has resulted in the need for any project changes, additional mitigation or management provisions other than those outlined in the Environmental Assessment. The reports are all available on the project web page: www.wallarah.com.au

.

2. Summary of Submissions

This Chapter provides a list of the submissions made in response to the EA, a summary of the issues raised in public submissions and a brief response. More detailed responses are provided in Chapter 5 and where necessary, these have been cross-referenced.

2.1 Submissions Received

There were a total of 247 submissions made to DOP regarding the W2CP as at 17th November 2010. These were made by a variety of stakeholders:

- 222 public submissions including form letters and Wyong Council Forum submissions. Multiple submissions were received from some respondents and these have been identified separately but in accordance with DOP protocol, have been treated as combined submissions.

- 12 submissions from organisations and other key stakeholders including elected representatives.

- 13 submissions from government agencies.

Submissions made by the public are listed in Table 1, while those from non-government organisations (NGOs) and other key stakeholders such as elected representatives are listed in Table 2 and government agency submissions are listed in Table 3.

The issues raised in public submissions are summarised in Table 4. Substantive and technical issues from across all submissions (public, NGOs and government agencies) are considered in much greater detail in Chapter 5 on the basis of issues or themes only.

In order to avoid undue repetition, Table 1 provides a numbered list of the issues raised in the public submissions, which have been sorted into topic groups in Table 4. Table 4 notes the number of submissions that raised the topic, provides a summary of the concern and a brief response and, where necessary, identifies the section of the EA or this report where the issue has been addressed. Full details of individuals who made submissions on the W2CP and the details of their respective issues raised have been omitted from this interim submissions report to protect personal privacy. However, the topic category raised in each respondent's submission is indicated.

It is important to note that many of the submissions received raised multiple issues regarding the project. Therefore, a sum of the number of times the issues were raised is greater than the number of submissions received. Furthermore, despite the submissions being made by separate individuals, there were five templates used for a large number of the submissions. Multiple submissions made by the same individuals have been grouped in the table and given the same submission number where appropriate.

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	**Issues Raised** (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
1	B Barnes	Objection	19 (2)
2	I Wilson	Objection	8, 11
3	J Des Champs	Objection	1, 2, 4, 8, 10, 18
4	C Des Champs	Objection	1, 2, 8, 18, 19, 20, 27(2)
4	C Des Champs	Objection	1, 2, 4, 5, 7, 8, 9, 11, 18, 27
5	J Pniewski	Objection	1, 5, 7, 11, 14, 20
6	L Wynn	Objection	5 (3)
7	N Wynn	Objection	7 (3), 5
8	S & K Wynn	Objection	2 (3), 4 (5), 5 (2), 6, 7, 8 (3), 12 (2), 14, 18, 23, 26, 27(2)
9	K McIntyre	Objection	2, 7 (2), 11, 12 (4), 16, 18, 23
10	J & T Chandler	Objection	5, 7, 19,
11	J Caldwell	Objection	2, 7 (2), 11, 12 (4), 16, 18, 23
12	G Stevens	Objection	2, 7 (2), 11, 12 (6), 16, 18 (2), 23 (2), 19
13	W Austin	Objection	Statement of objection
14	E McVie	Concerns Raised	5 (2)
15	G Mather-Hives	Objection	3, 5, 14, 15, 19 (2), 24 (2)
16	B Futter	Objection	Statement of Objection
16	B Futter	Objection	1, 2, 3, 4, 6, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
17	G Merrett	Objection	1, 2, 3, 7, 9, 11 (2), 12, 13
18	D Jinks	Objection	1,5 (2), 8, 11,12, 14
19	B Jewson & H&K Doughty	Objection	2, 3, 4, 7, 11, 18, 20
20	S Ragen	Objection	1, 2, 3, 7, 9, 11, 12, 13
21	K Armstrong	Objection	1, 2, 4, 6, 8, 9, 12 (3), 13 (3), 14, 17, 18, 19, 22, 26
22	S Gauci	Objection	1, 2, 3, 4, 6, 8, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
23	J Cassar	Objection	1, 2, 3, 4, 6, 8, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
24	T Simpson	Objection	5 (2), 6, 9, 11, 14 (2), 23
25	H Harvey	Objection	5 (2), 6, 9, 11, 14 (2), 23
26	J Jackson	Objection	5 (2), 6, 9, 11, 14 (2), 23
27	S Graham	Objection	5 (2), 6, 9, 11, 14 (2), 23
28	J Bosch	Objection	5 (2), 6, 9, 11, 14 (2), 23
29	J Schofield	Objection	5 (2), 6, 9, 11, 14 (2), 23
30	B Doyle	Objection	5 (2), 6, 9, 11, 14 (2), 23
31	S Cogoi	Objection	5 (2), 6, 9, 11, 14 (2), 23
32	M Flynn	Objection	5 (2), 6, 9, 11, 14 (2), 23
33	S Mills	Objection	5 (2), 6, 9, 11, 14 (2), 23
34	J Garth	Objection	5 (2), 6, 9, 11, 14 (2), 23

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	Issues Raised (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
35	B Lucas	Objection	5 (2), 6, 9, 11, 14 (2), 23
36	K Crutcher	Objection	11
37	P Hopwood	Objection	5 (2), 6, 9, 11, 14 (2), 23
38	T Young	Objection	5 (2), 6, 9, 11, 14 (2), 23
39	J Williams & A Jenkins	Objection	5 (2), 6, 9, 11, 14 (2), 23
40	C Miskell & A Peel	Objection	5, 11, 14, 27
41	L Maxwell	Objection	5 (2), 6, 9, 11, 14 (2), 23
42	J Isaac &J Liddle	Objection	5, 11, 19, 27
43	A Amey	Objection	1, 2, 3, 7, 9, 12, 13
43	A Amey	Objection	1, 2, 3, 4, 6, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
44	Z, P, A & E Machala	Objection	4, 8, 9, 18 (2), 23
44	P Machala	Objection	1, 5, 7, 8, 11, 18, 19, 27
45	M Thompson	Objection	1, 2, 3, 7, 9, 12, 13
46	J Martin	Objection	7, 12, 18, 20, 23,
47	N&K Begwarchy	Objection	2 (2), 5, 6, 7, 11
48	S&W Caldersmith	Objection	2, 27, 5 (2), 12, 14, 18 (3), 19 (3), 20
49	E Daly	Objection	7, 9, 12
50	K& S Drake	Objection	19, 23
51	S Ferry	Concerns Raised	4, 7
52	T Grant	Concerns Raised	14
53	M Henry	Objection	2, 4 (3), 5, 8 (2), 12 (3), 23
54	J Hicks	Concerns Raised	1 (2), 2 (2), 7, 11, 12 (2), 20, 22 (4), 27
55	D&M Holland	Objection	7(5), 9, 11, 14, 18, 19, 23 (2),
56	A Hughes	Objection	1, 2, 3, 6, 11, 16, 18, 19,
57	B Laverty	Objection	5 (2), 6, 9, 11, 14 (2), 23
58	W McCauley	Objection	5 (2), 6, 7, 11 (2), 14, 20, 25, 26 (3), 27
58	W McCauley	Concerns Raised	25 (2)
59	D Peck	Objection	7, 9, 11, 24
60	S Rather	Objection	1, 2, 3, 4, 6, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
61	K Scales	Objection	5 (2), 7 (7), 8, 11 (2), 12 (4), 18, 19 (2), 23 (3), 27 (9),
61	K Scales	Concerns Raised	27
61	K Scales	Concerns Raised	5 (2), 7 (6), 8, 12, 27 (2)
62	J Smith	Objection	1, 2, 3, 4, 6, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
63	R Sokolowski	Objection	2 (3), 4, 5, 6, 14, 26, 27
64	J Stone	Objection	5, 11, 24
65	D Dixon & S Wise	Concerns Raised	5 (3), 6, 14
66	H Zinkel	Objection	7 (2), 9, 12
67	L Eyes	Objection	1, 2, 3 (2), 5, 8, 11 (2), 26, 27 (3

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	Issues Raised (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
68	D Greentree	Objection	1, 3, 5 (2), 8, 11, 26, 27 (2)
69	C Hewitt	Objection	1, 2, 3, 4, 6, 9, 11, 12 (2), 13 (2), 14, 17, 18 (2), 19, 22, 26
70	J Kent	Objection	1, 3, 5 (2), 8, 11, 26, 27 (2)
71	C Manuel & J Deshon	Objection	3, 4, 6, 9, 11, 27 (4)
72	R Martyr	Objection	1, 2, 5, 11, 12, 14, 18, 19, 23
72	R Martyr	Objection	2, 5, 11, 12 (2)
73	M Willemsen* *[*corrected from M Williamson]*	Objection	1, 3, 5 (2), 8, 11, 26, 27 (2)
74	H Morris	Objection	5(2), 7, 11, 27
75	P & G Silk	Objection	2, 4, 5, 7, 8, 9, 11, 19
76	P Silk	Objection	5, 7, 9, 11, 19
77	G Silk	Objection	5(2), 7, 8, 9, 18, 19(3),
78	M & N Anderson	Objection	5, 9, 23, 25
79	K Raymond	Objection	2, 4, 5, 7, 11, 19, 23
80	A Baynham	Objection	5, 12, 14, 15, 18
81	A Thompson	Objection	2, 5, 11
82	N Smyth	Objection	2, 5, 6, 7 (2), 8, 11, 25
83	J Fung	Objection	2 (2), 3, 6, 7 (2), 9, 11, 12 (3), 14 (2), 18, 19 (2), 27 (2)
84	R Gessey	Objection	2, 7 (2), 12, 18 (2), 19, 24, 27 (2)
85	Paula	Objection	2, 4, 5, 18 (2)
86	L Lambeth	Objection	26
87	M Walter	Objection	5 (2), 27
88	B & J House	Objection	5, 11, 19, 26
89	R Mace	Objection	5, 8
90	B Mace	Objection	4, 11, 18, 19 (2), 24, 27
91	P Hodge	Objection	6 (2)
92	T Nott	Objection	1, 2, 5 (2), 19 (2), 25, 26, 27
93	R Ackermans	Objection	7, 24, 27 (5)
94	A Fookes	Objection	2 (2), 5 (2,) 7 (3), 18, 19 (2), 23, 25 (2), 26 (2), 27 (3)
95	I Playford	Objection	2, 5, 8, 12 (3), 13, 17, 19
96	E Alipalo	Objection	5 (2), 6, 9, 11, 14 (2), 23
97	H Ingram	Objection	5, 7
98	R Ingram	Objection	5, 11
98	R Ingram	Objection	5, 3, 7 (2), 8
99	A & L Bywater	Objection	9, 12 (2), 27 (2),
100	D Systermans-Powers	Objection	5 (2), 7 (2), 9, 11 (2), 12 (2), 14, 12, 17, 18 (2), 19, 25, 27(2),
101	T Lentfer	Objection	1, 5, 19
102	P F Hopkins	Objection	2, 5 (2), 11, 19

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	Issues Raised (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
103	S Norman	Objection	2 (3), 5 (3), 7, 11, 24, 27
104	B Hardwick	Objection	2 (2), 4, 5 (2), 11, 14(2), 19, 23
105	J Turner	Support	Statement of Support
106	D Willard	Objection	5 (2), 6, 8, 9, 11, 14,19, 25
107	L Shearman	Objection	5, 6, 7, 8, 11, 25
108	G Prince	Objection	5, 7(2)
109	M Peter	Objection	7, 11, 19
110	G Gehan	Objection	4, 7, 8, 20
111	S Littler	Objection	7, 8(2),
112	K Peter	Objection	4, 7, 27
113	J Hancock	Objection	2, 6, 8, 11, 12, 19
114	T & S Hope	Objection	2, 6, 7, 11, 18, 19, 20, 27
114	T & S Hope	Objection	7, 11, 23
115	L Arbolino	Objection	2, 4, 5, 8, 11, 16, 19,
116	J Lewis	Objection	2, 11
117	A Hegarty	Support	Statement of Support
118	P Lewis	Objection	2, 23(2),
119	B Cross	Objection	5, 16
119	B Cross	Objection	6, 7(3), 8, 9, 12, 14, 18(2),
120	B & J Cross	Objection	7, 9, 11, 12 (4), 14, 19 (2), 23
121	J Cross	Objection	6, 7, 9, 11, 12
122	M Kirk	Objection	2, 5, 11, 20
123	A Kirk	Objection	5(2), 23(2),
124	J Edwards	Support	Statement of Support
125	P Davidson	Objection	4, 11, 12, 16, 23(2), 27
126	A & J Crane	Objection	2, 4, 6, 7, 8, 11, 23, 26
127	J Higginson	Objection	1, 2, 4, 5, 7, 9, 12(2), 16, 18, 20, 27(3)
127	J Higginson	Objection	2 (2), 15, 20, 23,
128	R Inchley	Objection	13, 19, 23, 24, 27
129	D Johnston	Objection	4
130	S & J Eglon	Objection	5, 6, 7, 11, 19, 20, 23, 27
131	L Clayton	Objection	2, 4, 7
132	S Clayton	Objection	2, 5, 6
133	DF Blaxell	Objection	2, 5, 12, 23
134	D Blaxell	Objection	6, 7, 13, 19, 22. 23
135	B Donaldson	Objection	1, 2, 5, 6, 11, 14, 19
135	B & C Donaldson	Objection	1, 5, 6, 11, 14, 19, 23
136	J Verity	Objection	2, 5(2), 7, 18, 20(2),
137	S&G van Kerkhoff	Objection	2, 5, 11, 23, 26
137	S&G van Kerkhoff	Objection	5, 11, 18, 23
138	J Adam	Support	Statement of Support
139	M & H Campbell	Objection	5, 7, 12, 14, 23(2)

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	Issues Raised (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
140	M & L Campbell	Objection	5, 6, 7, 8, 9, 11, 12 (2), 18, 25, 26
141	M Green	Objection	2(2), 3, 5, 19
142	R Sarjent	Objection	2, 5, 8, 19, 25, 27
143	R Jones	Objection	11, 12(2), 13, 23,
144	R Miller	Objection	1,3, 5(2), 8, 11, 26, 27
145	G Holmstrom	Objection	1,3, 5(2), 8, 11, 26, 27
146	J Pritchard	Objection	1,3, 5(2), 8, 11, 26, 27
147	J Tute	Objection	1,3, 5(2), 8, 11, 26, 27
148	J Pack	Objection	1,3, 5(2), 8, 11, 26, 27
149	M Pattern	Objection	1,3, 5(2), 8, 11, 26, 27
150	H Thory	Objection	1,3, 5(2), 8, 11, 26, 27
151	A Faye	Objection	1,3, 5(2), 8, 11, 26, 27
152	C Bailey	Objection	1,3, 5(2), 8, 11, 26, 27
153	M Phillips	Objection	1,3, 5(2), 8, 11, 26, 27
154	M Smith	Objection	2, 5,19, 25
155	S Ceerman	Objection	2, 7, 9, 19
156	R Thompson	Objection	2, 5
157	N Thompson	Objection	2, 5
158	E McLoughlin	Objection	5, 6, 7, 11
159	D McLoughlin	Objection	5, 6, 7, 11
160	W&S Barrett	Objection	11
161	M Stephenson	Objection	Statement of Objection
162	D Binning	Objection	4, 5, 7, 14, 19
163	F Stuart	Objection	2, 7, 9, 14, 15, 19, 23, 26
164	J C Scholberg	Objection	1,3, 5(2), 8, 11, 26, 27
165	J Hill	Objection	1,3, 5(2), 8, 11, 26, 27
166	A Butter	Objection	1,3, 5(2), 8, 11, 26, 27
167	Illegible	Objection	1,3, 5(2), 8, 11, 26, 27
168	Illegible	Objection	1,3, 5(2), 8, 11, 26, 27
169	S Watson	Objection	1,3, 5(2), 8, 11, 26, 27
170	J Buckley	Objection	1,3, 5(2), 8, 11, 26, 27
171	S Nicole	Objection	1,3, 5(2), 8, 11, 26, 27
172	W O'Rourke	Objection	2(3), 5, 26(2)
173	B Rowe	Objection	2(3), 4(2), 5, 6(2), 7, 8, 9, 11, 12(2), 14(2), 15, 20, 23
174	G&U Lardner	Objection	2, 23
175	V Lockerbie-Smith	Objection	3, 5, 6, 7(2), 8, 11, 25
176	L Suthers	Objection	5(2), 6, 9, 11, 14(2), 23
177	D Suthers	Objection	2, 5, 6, 11, 27
178	R Gale	Objection	5(2), 6, 9, 11, 14(2), 23
179	C Fitzgerald	Objection	5(2), 6, 9, 11, 14(2), 23
180	S Small	Objection	5(2), 6, 9, 11, 14(2), 23

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	Issues Raised (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
181	G Fitzgerald	Objection	5(2), 6, 9, 11, 14(2), 23
182	K Torr	Objection	5(2), 6, 9, 11, 14(2), 23
183	D&N Williams	Objection	5(2), 6, 9, 11, 14(2), 23
184	C Arral	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
185	L McDonald	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
186	R Leeto	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
187	R Jensen	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
188	J English	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
189	Illegible	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
190	Illegible	Objection	1, 3, 5(2), 8, 11, 26, 27(2)
191	S Dullard & S Cuthbertson	Objection	2, 6, 7(2), 8(2), 9, 18, 23, 25, 26
192	J Allen	Objection	2, 5, 6, 11
193	D Bagot	Objection	5, 7
194	G & J Ogilvie	Objection	2, 5, 7, 23
195	R Fowle	Objection	2(2), 5, 23
196	A Finneran	Objection	2, 5, 8, 11, 23
197	G Phelan	Objection	5, 11
198	G Keegan	Objection	2, 5, 6, 7(2), 12, 19(2)
199	L Marsden	Objection	5, 6, 26
200	A Mullard	Objection	5, 6, 26
201	E Flanagan	Objection	5, 6, 26
202	Illegible	Objection	5, 6, 26
203	A McCarthy	Objection	1, 2, 3, 7, 9, 12, 13
204	L Denton (Transnational Pastoral P/L)	Concerns Raised	27
205	J Thomson	Objection	2, 5, 6 (2), 18 (2), 23, 24
206	L Andrew	Objection	1, 3, 6, 7, 9, 11, 16, 18, 19
207	L O'Keefe	Objection	1 (2), 3, 5 (2), 8, 11, 26, 27 (2)
208	S Davis	Objection	Statement of Objection
209	D Davis	Objection	2, 5, 7, 9, 12
210	R Shields	Objection	2, 4, 8, 9, 11, 14,19
211	S Salmi	Objection	2, 5, 11(2), 14, 18(2), 23(3), 25(2), 27
212	Anonymous	Support	Statement of Support
213	Anonymous	Support	Statement of Support
214	Anonymous	Objection	2, 7, 8, 9, 12
215	Anonymous	Objection	2, 6, 7, 14
216	Anonymous	Objection	6
217	Anonymous	Objection	4, 18, 19
218	Anonymous	Objection	2, 5, 7
219	Anonymous	Support	Statement of Support plus issue 27

Table 1. Public Submissions Reconciliation Table

Submitter Number	Name	Nature of Submission	Issues Raised (refer Table 4 for list of Issues. Numbers in brackets refers to multiple issues within the same category)
220	Confidential	-	Contents of submission not known
221	Confidential	-	Contents of submission not known
222	Confidential	-	Contents of submission not known

Table 2 lists the submissions lodged by community organisations and elected representatives.

Table 2. Organisations & Elected Representatives

Submission Number	Organisation
223	Australian Coal Alliance
224	Stop Korean Coal Mining
225	Jilliby Stage 2 Land Owners Action Group
226	Rivers SOS Alliance
227	Climate Action Group Central Coast
228	Wyong Regional Chamber of Commerce
229	Greg Piper MP (Member for Lake Macquarie)
230	David Harris MP (Member for Wyong)
231	Construction Forestry Mining and Energy Union
232	Newcastle Greens
233	Total Environment Centre Inc.
234	The Hon. Jodi McKay MP

Table 3. Government Agency Submissions	
Submission Number	**Agency**
235	NSW Health
236	NSW Transport
237	Catchment Authority – Hunter River Catchment Management Authority
238	NSW Roads and Traffic Authority
239	NSW Office of Water
240	Department of Industry and Investment
241	Department of Environment, Climate Change and Water
242	Lake Macquarie City Council
243	Gosford City Council (plus email attachment from P McCann)
244	Wyong Shire Council
245	RailCorp
246	Gosford Wyong Water Supply Authority
247	C'th Department of Environment, Water, Heritage and Arts

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1. Greenhouse Gases and Climate Change		
44	Perception that coal is a major contributor to greenhouse gases and climate change.	Greenhouse gases from coal (mining and power generation) globally contribute around 25% to the anthropological greenhouse gas emissions responsible for the enhanced greenhouse effect. Coal is just one of many sources of greenhouse gases generated by human activity. Others include oil and natural gas, agriculture, industrial processes including cement manufacture, land clearing and waste disposal. Refer to Section 5.13.
1	Australians exceed the world in the consumption of energy from coal and now encouraging South Korea to be accomplices	Australia sources a high proportion of its electricity generation from the use of coal but is a relatively minor national emitter in terms of total greenhouse gas tonnage. South Korea and many other countries throughout the world are substantial consumers of coal, often imported, and this will continue whether or not supplies from W2CP are internationally marketed.
2	Impact of rising sea levels due to climate change has not been included in the risk assessment.	The project's mining area surface lands and surface facilities are well above current and future sea level influence. However, the flood study has assessed the incremental change (both positive and negative) as a result of subsidence and this incremental change is not affected by changes in sea level. The mining area is located to the west of the main rail line and F3 Freeway. Accordingly, concerns regarding land use management in relation to sea level are a far greater priority in residential areas and for infrastructure in coastal waterfront areas in the region.
12	The EA does not consider the latest data available on global warming.	The EA utilizes the latest available Australian Government emissions accounting protocols. Refer Section 12.7 of the EA.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The idea of creating a flow of high carbon production products for 28 years in a carbon constrained economy is abhorrent	Should the world economy become carbon constrained, exports of high quality Australian coal that produces lower GHG emissions will likely increase.
1	It is not responsible for Australia to keep supplying the world with coal, and should instead help wean the world off its addiction.	Although Australia is a major coal exporter, its total exports amount to less than 5% of world coal production. This is well within the coal production capability of other coal producing countries. Australia is the largest seaborne exporter of total coal but since 2005 Indonesia surpassed Australia as the largest exporter of thermal coal for power stations. The higher quality of Australian coal produces significantly less GHG emissions and its mining operations involve reduced levels of emissions due to a focus on mining efficiency and responsible greenhouse accountability.
2. Subsidence		
39	Longwall mines like the proposed W2CP cause subsidence. (General comment)	W2CP agrees with this statement. The EA addresses this matter comprehensively (refer Section 6).
2	We cannot be sure exactly what the extent of the subsidence will be and how this will affect biodiversity and watercourses in the area. There is much uncertainty both due to lack of comprehension of the complexities involved in the water courses, as well as lack of ability to predict how the collapse of the cavity left by the mining will impact on the layers of rock above.	The level of knowledge required to accurately assess the impacts on the water supply scheme, individual water courses and their ecology is available and has been used in the assessment of the W2CP. The data has been provided in the EA and has been made available for independent peer review and assessment.
1	The current way that the subsidence is accounted for in the cost benefit analysis through being 'offset' by the Levy paid to the Mine Subsidence Board reduces the damage to a compensation cost. However, this reduces potential irreversible damage on the environment and fundamental community services to a mere one-off payment.	The Mine Subsidence Board is funded by an industry wide levy and fully funds the cost of subsidence damage to land improvements including housing, shedding, fencing, roads and other structures. The Board does not cover any damage to the environment unrelated to these improvements. For this reason, the EA has provided a robust assessment on the potential impacts on the environment.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
11	Subsidence threatens watercourses, groundwater levels and quality, native flora and fauna, infrastructure and property.	The design of the longwall mine incorporates measures to protect sensitive natural and built features and to ensure impacts are mitigated and managed. Refer to Section 5.1.
3	Damage to water, land and property (and/or livestock)	The Mine Subsidence Board is funded by an industry wide levy and fully funds the cost of repairing subsidence damage to land improvements including housing, shedding, fencing, roads and other structures.
1	Obtaining compensation for damage due to subsidence is a lengthy process which puts financial and emotional stress on families	Rectification to properties as a result of subsidence, including obtaining quotes, valuations and any design work is all covered by the Mine Subsidence Board and at no cost to the land owner.
11	Subsidence and its impacts on the water catchment, flood levels, roads, and dwellings.	These issues are covered in detail in the EA as well as Section 5.1 and Section 5.3 in this report.
1	Will the Government repair roads that have been damaged by subsidence and compensate people who are affected by this?	Repairs to any subsidence damage to any roads either public or private will be undertaken at no cost to the owner. The company and the Mine Subsidence Board are responsible for the cost of any repairs required due to subsidence impacts. The Mine Subsidence Board and other coal companies have undertaken road repairs in other mining areas affected by subsidence.
1	Risk of uncontrolled subsidence is too high	Risks of higher than expected subsidence movements have been addressed in the EA and further explored in Section 5.1.4.
2	Subsidence has the potential to destroy the aquifers and river systems that provide water to the catchment for the Central Coast.	This is not correct and is further explored in Section 5.2 and 5.3.
1	The exact nature and scale of subsidence impacts need to be ascertained before appropriate management initiatives can be incorporated.	The degree of subsidence expected has been conservatively modeled and the resultant impacts have been assessed. There is sufficient knowledge of subsidence related impacts to enable appropriate management initiatives to be incorporated into the project.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Subsidence has the potential to create new wetlands, acidic water and changes to the water chemistry.	The design of the longwall mine incorporates measures to protect sensitive features and through subsidence management no new wetlands will be created. Acidic risk associated with the project is demonstrably negligible. Refer also to Section 5.1.
2	Inconvenience of moving whilst works are being done to repair housing – disabled person asking how will she be compensated.	The EA assessment (Section 6) showed that damage to housing, should it occur, will be minor and will not of itself require relocation of residents. The Mine Subsidence Board, funded through a levy imposed on the coal industry, is required to pay for all subsidence-related structural damage including specific features of a property such as disabled access or facilities. The subsidence assessment provided in the EA documented the anticipated effects on all residences within the mine subsidence area. These results will be monitored and verified during the course of mining.
2	Subsidence affects dams	All dam structures have been identified in the EA report and an assessment provided on these structures. It is not anticipated that subsidence will have an adverse impact on any surface dams. The SMP process requires assessment of individual structures and should damage occur then it will be rectified with no cost to the land owner. Refer to Section 5.1.
6	Subsidence damage to housing	Houses located within the mine subsidence districts (MSDs) that have been built in accordance with the construction limitations set for the MSD should not suffer any structural damage. Houses that are located outside of these zones and have not been constructed specifically to withstand ground movements may experience some damage. In all cases, damage that results from mining subsidence will be rectified by the Mine Subsidence Board.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Mining subsidence will lead to the interception of contaminated coal seam waters and fugitive drainage into estuarine areas arising form uncontrolled discharge flow.	The coal seam is located between 350m and 690 m below the surface. As discussed in Sections 6 and 8 of the EA, there will be no direct connectivity between the coal seam and the surface drainage system. Water contained within the coal seam will be brought to the surface and treated for use at mine and possible offsite purposes. There will be no fugitive or uncontrolled water discharges off site.
1	The mine may cause sinkholes as recently happened in America.	This would not occur. Sinkholes are a local depression usually caused by the removal of underground soil or rock by water. Usually, these naturally formed sinkholes occur when the substrate is formed by limestone, carbonate rock, salt beds or any other rock that is easily eroded by water streams. Mine subsidence induced sinkholes have been formed where the depth of cover is very shallow, i.e. less than 50 metres. However, this type of mining induced sinkhole would not occur at the W2CP where the depths of cover are greater than 350 metres. Sinkholes of the kind that were recently observed in Guatemala, America are not associated with coal mining.
1	It is not legal to subside property into the 1:100 year flood as this mine intends to do.	Properties that become adversely affected by the 1:100 year flood event as a direct result of the mine will be subject to mitigation measures or outright purchase as described in the EA.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Longwall mining is proposed to take place within 154 m of the Wyong River. This means that with the angle of draw it will be within the vertical subsidence zone. The land will tilt and the claystone/mudstone layer will sag and crack. Studies in the Southern Coalfield have proven that horizontal subsidence has been found up to 1.5 km from the mine workings. The mines in the Southern Coalfields are an average depth of 420 m. Wallarah 2 average depth is 393 m with less than 1% at 517 m. If this occurs it will affect Porters Creek Weir, Mardi Weir and associated pump stations and water storage facilities.	The issue of far field affects is well known and has been assessed in the EA. The impacts on water supply infrastructure has been specifically assessed and with reference to studies undertaken in the Southern Coalfield. The stated average depth of the W2CP is incorrect however the context of the statement is not relevant given that far field effects is governed more by geology and surface topography. These factors have been fully addressed in the EA and Section 5.1.2.
2	EA criticised as not adequately addressing the determination by the scientific committee Alteration of habitat following subsidence due to longwall mining – key threatening process declaration (The Scientific Committee).	Section 13.2.11 of the EA provides an assessment of the Scientific Committee's determination. This is further explored in the Ecology Study that is contained in Volume 4 of the EA. The key finding is that longwall mining in some circumstances can impact on drainage sensitive ecosystems such as swamps when undermined, however the project will not undermine any swamps or significant drainage sensitive ecosystems.
2	Subsidence is not controllable or predictable	This is not correct. Subsidence modelling has become an accurate tool in determining subsidence and its effects. The modelling process has determined a range of mitigation strategies to control subsidence and these have been incorporated into the project.
1	Mining is proposed under Jilliby Jilliby Creek, when it is cracked will Kores be able to repair the damage. BHP's efforts to do so south of Sydney suggest it is a futile exercise.	This issue is dealt with in detail in Section 5.1.3.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	No reliance can be placed on the optimistic predictions put forward by the proponent, notwithstanding pages of learned discussion and reassuring diagrams and graphs.	Subsidence modelling has become an accurate tool in determining subsidence and its effects. The degree of subsidence expected has been conservatively modelled and the resultant impacts have been assessed.
1	At page 6-10 of the EA the unique geometry of the proposed mine compared to the geometry of mines in the Southern Coalfield and the unique geology of the Central Coast compared to the Southern Coalfield and the Newcastle Coalfield are both highlighted. What the EA then says was done was to develop a model that would satisfactorily predict surface subsidence associated with the extraction of Southern Coalfield geometries within a Newcastle Coalfield geological environment. Having highlighted the uniqueness of the Wallarah 2 Coal Project the application of a model that is concerned with the extraction of different geometries in a different geological environment can have no credibility. Consequently, absolutely no reliance can be placed on the subsidence predictions put forward by the proponent. Indeed, having regard to the discrepancy between subsidence predictions in both the Southern and Newcastle Coalfields and the actuality no reliance can be placed on subsidence predictions at all. It is an exercise in smoke and mirrors.	As further discussed in Section 5.1.4, verification studies were undertaken to confirm that the model was satisfactorily simulating the deformation mechanics of the strata, and to also determine the sensitivity of various parameters in the modelling process. The capability of the model to realistically predict the fracturing and deformation that strata above longwall panels would experience, is supported by its capacity to realistically predict the associated subsidence. Once it was confirmed that the model was capable to realistic predictions of strata behaviour and associated surface subsidence, a detailed back analysis was undertaken on data gathered at Ellalong Colliery some years ago. This back analysis clearly confirms the model accurately predicted subsidence and strata behaviour for this case, and indicates its capability for predictions at a greenfields site such as W2CP.
2	How can the limit of subsidence be absolutely definite, how can a predicted minimum subsidence depth of nil, or a predicted maximum of 2.5 m be absolutely definite? They cannot.	See above, it should also be noted that the maximum and minimum predictions relate to specific areas above the mine workings. The range mentioned in the submission is the total throughout the mine area not the variance at any one place.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Referring to Dr Young a hydrologist who has studied subsidence across the Southern Coal Fields stated that she did not believe that long term remediation of mine damage relating to subsidence is possible.	The areas referred to are steep narrow gorges where there are a series of rockbars and rock pools, such as Cataract Gorge. In these situations, the combined effects of upsidence and closure can result in cracking. The streams in the W2CP area are within wide alluvial-filled valleys with deep unconsolidated sediments rather than narrow sandstone cliffs with rock lined creeks, refer Section 5.1.3.
1	No matter how much the mining company claims that subsidence will not occur, it cannot be accepted, as this is untrue.	The W2CP has never stated that subsidence would not occur and has described in detail the potential subsidence related impacts in the EA.
1	With predicted subsidence of up to 2.5 m in parts of the Dooralong Valley there is the very real possibility of the valley becoming a stagnant lake. Subsidence in Hue Hue Creek could make it into a stagnant pool and a breeding ground for mosquitoes	Subsidence levels within the creek system will be relatively minor however two additional ponds would be created. The first will be created upstream of the confluence with Little Jilliby Jilliby Creek and will have a depth of 68 cm. This pool will essentially migrate from further up the system where the first longwall panel crosses the creek down to the main roadways running up Little Jilliby Jilliby Creek which will not be locally subsided near the confluence area. The second pond will occur below the last longwall panel beneath the creek. The depth of this pond will be 32 cm and will potentially extend for a distance of up to 1 km. Given the creekline is essentially a series of small pools with dry sections and tends to only flow following rainfall, increased ponding is considered to have a positive impact on aquatic fauna.
1	It is admitted that the miner does not have experience of how the ground in this area will behave therefore the actual movement could be greater than the predicted movement.	The projects statements that this is a greenfield project does not detract from the validity of the assessment provided. The veracity of the subsidence and groundwater models are described in detail in Sections 5.1.4 and 5.2.
3. Flooding		

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
18	The W2CP will increase the risk of flooding in the area.	At some locations the risk of flooding will be increased, while other areas will benefit from a reduced risk of flooding. Mitigation and management approaches were set out in the EA in Section 9. Refer to Section 5.4 of this report.
1	The flood study completed over 10 years ago is now out of date and modeling will be inaccurate due to more intense cyclonic storm events and increased sea levels due to global warming	Initial flood modeling for the project did commence over 10 years ago. Since that time, the flood model has been updated several times to take into account new software and recent storm and flood events as well as changes to the project design. The latest revision of the flood model in 2007 included the latest Bureau of Meteorology estimates of Probable Maximum Precipitation and considered extreme conditions of tailwater level increases that could result from global warming or any other causes. No significant increase to flood impacts was found to result from these changes.
30	The latest global warming data renders the flood studies obsolete.	The flood study shows an incremental change as a result of mining. This increment is not altered by any changes in global warming or sea level rises or the like. If in the future, rainfall patterns alter, the incremental change in flood levels as a result of the project will be the same.
1	Increased risk to human and animal life due to increase in flood levels and frequency	At some locations the risk of heightened flood levels will be increased, while other areas will benefit from a reduced risk of flooding. Mitigation measures will be in place to minimize risk to human and animal life and these measures will be undertaken in consultation and agreement with the landowner.
1	Increased time that people are cut off during floods	Flood modelling indicated that at some locations access may be cut for longer periods. Upgrade of roads as part of the project will not only reduce cut off periods but in some cases will make some roads that are currently at risk in extreme floods, flood free.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Course of flood flow will change	There will be a very small change to overall flood extents as the valley is quite flat and the subsidence profile relatively consistent. The project will result in some changes to flood extent and these have been documented in the EA (refer Figure 9.3). Properties that will experience an increase in flood risk as a result of the project will be subject to either mitigation or compensation following consultation and agreement with the landowners. Creek systems are dynamic and their courses change over time. The project will not affect this process.
4. Surface Water Management and/or water quality issues		
4	The W2CP will impact on the health of the water catchments.	Detailed assessment by qualified experts considers that the mining can occur without significant impact on the water catchments. Mitigation and management measures have been proposed to ensure effective adaptive responses if required to address risks and impacts. Refer to Section 5.3.
1	Damage to the water catchment cannot be quantified prior to mining taking place.	Complex models are used to quantify the effect that longwall mining will have on the water catchment. These models are described in Section 5.1.5 in this report as well as in Sections 6,7 & 8 of the EA.
1	It is a distinct contradiction to the policy of preserving catchment and water to allow this W2CP to go past proposal stages of development consideration.	The assumption that the project will impact on the water catchment is not supported by the results of the EA assessment. The project was determined as being sufficiently justified on the weight of evidence, including the Wyong Coal Mining Inquiry to proceed to development assessment process.
1	The manufactured 'hypothetical modeling results' for the hydrology of the catchment are flawed.	The models have been developed in accordance with current best practice and the data used has been determined as adequate by the independent engineer engaged by the Department of Planning. Refer Section 5.2.1.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	The mine will result in contamination of water	The underground mine design has been demonstrated in the EA to avoid significant impacts on the water regime. The surface facilities have been designed in accordance with current best practice which includes the containment of all runoff emanating from the 1 in 100 year, 72 hour storm event without discharge. A key feature of the project is the provision of a reverse osmosis plant capable of treating the deep hardrock seepage into the workings. This water will be treated to a standard that can be reused for other purposes external to the mine's needs which will assist the overall regional water supply scheme. The project also includes a Riparian Zone Enhancement program which will include works within Jilliby Jilliby Creek catchment which will provide an overall improvement to water quality.
1	Damage to Jilliby Jilliby Creek and the water table	Jilliby Jilliby Creek will be subsided which will result in potential for additional ponding in two locations. The grade change at the steepest point in the river profile will be a grade of 1.48 m fall over 509 m. This is considered minor and will not result in damage or increased risk of erosion. Issues of the impacts on the water table are described in Section 5.2.
1	There is a significant risk of acid metalliferous damage from metalliferous leachate and salinity.	This statement is not supported but the issue does not pose a risk to the project or its environmental consequences. No acid forming materials have been identified by the extensive geological investigations. Also, mine water will be brought to the surface via the mine pumping system whereby it is transferred into the water treatment process. It should also be noted that the adjacent Mandalong Mine which has the same geological sequences above the coal seam does not form acid or metalliferous leachate.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Not enough information on pollution leaching into Upper Spring Creek and the tributaries of the catchment, with no scenario for disaster.	The planning and assessment of water management outlined in the EA has shown there is little if any risk of water quality contamination to Upper Spring Creek.
1	There are inadequate studies of the effect of longwall mining along the Wyong River or other tributaries.	Subsidence predictions in the EA demonstrate that the maximum subsidence under the main channel of the Wyong River will be up to 0.15 m over a very short section. It was found that negligible changes will occur to flood extents and depths in the Yarramalong Valley (Wyong River) as a result of predicted mine subsidence. The EA has comprehensively addressed the mine design approach for protection of all key streams, the planning for controlled subsidence, as well as the monitoring and adaptive management measures to mitigate and manage potential impacts.
11	Impact on water quality and quantity	This was a relatively common and non-specific comment in submissions. The issue has been dealt with in the EA with further explanations contained in Section 5.2.
3	Fracturing and/or draining of rivers/riverbeds	There will be no fracturing of riverbeds due to the nature of the underlying geology. The valley floors comprise of deep alluvium as further discussed in Section 5.2
1	The predicted impacts on surface water flows are inconsistent with actual impacts of longwall mining found elsewhere in the Sydney Basin.	This is correct. Due to different near-surface geological and topographic features, as well as the conservative extraction plan, subsidence impacts will indeed be inconsistent with other mining areas in the Sydney Basin and the Southern Coalfields. The streams in the W2CP area are within wide alluvial-filled valleys with deep unconsolidated sediments rather than narrow sandstone cliffs with rock lined creeks.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	There are no micro studies of the effect of longwall mining along Wyong River or other tributaries, only broad scale data effects.	The Hydrogeomorphic Study of the creek systems within the mining area used aerial laser imagery that was orthorectified to produce a seamless mosaic with a pixel resolution of 0.15 m (15 cm). Airborne Laser Scanning.was also undertaken of the mining areas to aid in interpretation and assessment work for a variety of studies. The resolution of the imagery is such that detailed assessment could be performed on surface features. The imagery was provided to all relevant specialist consultants including those engaged in the hydrogeomorphic, ecology, archaeology, flooding, subsidence and groundwater studies. The impacts on river systems also included input from the subsidence and groundwater studies. In recognition of the importance of protecting the water supply system and in response to existing water quality data which shows the creek systems to be currently under extreme stress, the W2CP has included a Riparian Zone Enhancement Program which will be designed to improve existing water quality.
1	Deficiency of baseline data references of the hydrology of the catchment.	The independent review undertaken by Sinclair Knight Merz and commissioned by the Department of Planning has determined that there is sufficient baseline data available to adequately assess the project impacts.
1	Pollution of springs	The assessment has shown there is little if any risk of water quality contamination from metals such as iron and manganese. This is in contrast to other areas due to differing geology, mining depth and configuration, near-surface stratigraphy, lack of continuous cracking and the retained integrity of the deep surface alluvials.
2	There is no water management plan.	The Site Water Management Strategy can be found in Section 2.12 of the EA. This work was undertaken by a specialist consultant and is considered to meet current best practice in pollution control.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
9	Water pollution (general comment)	This was a common though non-specific comment. The issue of water pollution generally has been dealt with in the EA and further explored in Chapter 5 of this report.
5. Water Supply		
86	Threatens the regional water supply.	This is a common though non-specific comment. WACJV is committed to protect the region's water supply, refer to Section 5.3.
2	The EA fails to prove that there will be no impact on the Central Coast Water Catchment	This is disputed. The assessment provided in the EA is considered robust and capable of withstanding detailed scrutiny by independent experts.
30	Assurances from Kores that the water supply will not be affected are purely based on theory and do not assess the risks appropriately.	The risks to the water supply scheme have been assessed in detail. The commitment to protect the water supply scheme was made on the basis of extensive technical information and thorough assessment by renowned experts.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
39	The project has the potential to affect 50% (some state 53%) of the Gosford Wyong Water Supply catchment which currently supplies 300,000 residents	It is a common misconception that the project will put at risk 50% of the water supply to the Gosford-Wyong region. This is incorrect both in terms of the level of risk associated with the project and in terms of the contributions of water flows in the mining area to regional water supplies. The water extracted from the Lower Wyong River Weir and pumped 2 km to Mardi Dam constitutes approximately 30% of the combined Central Coast Water Supply. The average annual Central Coast usage in 2005 was approximately 28,000 ML with restrictions. The 10-year average is about 30,000 ML. The average river flow contribution from the Jilliby Jilliby Creek system to the Lower Wyong River Weir is approximately 37%. The remaining 63% contribution is from the Wyong River system. That is, the Jilliby Jilliby Creek contribution equates to about 11% of the total Central Coast water supply. This contribution primarily occurs during periods of wet weather. At other times the creek is characterised by a series of ponds with low to nil flow. A combination of its low flow characteristics and catchment land uses has resulted in frequently degraded water quality within Jilliby Jilliby Creek, in terms of elevated faecal coliforms and nutrients particularly at low flows. Further, the Independent Strategic Inquiry Into Potential Coal Mining within the Wyong LGA, including the Dooralong and Yarramalong Valleys reported in December 2008 that: *"based on the available data, while groundwater sourced from the Wyong River and Jilliby Jilliby Creek alluvial systems does make a significant contribution to the water supply of the Central Coast (estimated to be between 3.5 and 6%), any mining activity would not significantly impact on the existing groundwater levels or groundwater availability."*

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	The 5% of the water catchment the longwall mine covers includes the confluence of two rivers and floodplain.	The extent of the coal extraction area of the mine plan excludes any extraction beneath the Wyong River. The extraction in the area of the confluence of Jilliby Jilliby Creek and Little Jilliby Jilliby Creek has been designed to minimise subsidence and risks to this fluvial feature. Longwall panels have been shortened, narrowed, reduced in extraction height, and aligned accordingly to achieve a demonstrably negligible risk to the river system.
1	The loss of 5% of water supply will have a major impact on the community.	The project has been designed to protect the water supply catchment. The assumption that 5% will be lost is incorrect.
1	5% of the water catchment is being undermined, how many square kilometres is that?	The total underground mine area covers 37.3 square kilometres. The percent of the water supply catchment for the Central Coast comprises numerous subcatchments as outlined in information by the water supply authority.
1	Any impact on the water supply will decrease the quality of life of all residents of the Central Coast and impose undue hardship on them through ongoing water restrictions.	This statement cannot be supported by available data provided in the EA and the previous Independent Inquiry.
1	There is enough hydro-geological evidence to indicate that there is a significant risk that the water will either suffer substantially in quality or disappear altogether.	No evidence to this effect was provided in this submission and the conclusion reached is refuted by W2CP. Further information on the validity of the models used is provided in Section 5.2.
1	The project is at variance with the NSW Water Management Act 2000 and the Commonwealth National Water Initiative 2004 under the National Water Commission.	This is not correct and it is also not supported by the NSW Office of Water. The Office of Water submission however indicated in its proposed conditions of consent that the principles of the Water Management Act 2000, the Water Sharing Plan for the Jilliby Jilliby Water Source 2003 [since revised in 2009], the Water Sharing Plan for the Central Coast Unregulated Water Sources 2009 and State policy requirements will apply so that protection is provided to rivers and connected alluvium within the project area.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
3	The proponent has not adequately demonstrated that there will be no impact on the water supply.	The W2CP considers that there is adequate and demonstrable evidence that the water supply scheme can, and will be, protected. This is an undertaking of the project and forms part of the Statement of Commitments. Further details justifying this position are provided in Chapter 5.
1	There is no easily recognizable data on the assessment to indicate how much water will be sourced from the town water supply to actually run the mine.	The water management plan provided in the EA assumes that the surface facilities will not be connected to the town drinking water system. This provided a very conservative case for planning and environmental assessment. However, it is likely that sewer and town water connection will occur at an early stage of the project life if not at the outset of development. Water conservation, including reuse and treatment of mine water and use of recycled treated effluent is outlined in the EA and has been a key focus of environmental planning for the project.
1	Unless the mine builds large catchment facilities or uses water pumped from the mine so it can become self sufficient it will have adverse effect on availability of water for local residents.	The water management plan provided in the EA assumes that the surface facilities will not be connected to the town drinking water system. This provided a very conservative case for planning and environmental assessment. However, it is likely that sewer and town water connection will occur during the project life if not at the outset of development. Water conservation, including reuse and treatment of mine water and use of recycled treated effluent is outlined in the EA and has been a key focus of environmental planning for the project.
7	The mine will interfere with a major water catchment area for the Central Coast	The potential for impacts on the water supply scheme has been adequately dealt with in the EA and has been supplemented by information contained in Chapter 3.
31	The W2CP has the potential to destroy the catchment river systems.	Detailed assessment by qualified experts considers that the mining can occur without significant impact on the river system and water supply regime. Further details have been provided in Section 5.3.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Will the Government spend money on infrastructure to ensure that families receive clean drinking water once their water supply is polluted with coal dust?	No water supply system will be polluted with coal dust.
1	Computer simulations are precariously imprecise when modeling around and under streams due to geological nature of these areas	The geology is taken into account in the modelling process and was extensively described in the EA. There have even been some suggestions in submissions that there are unknown faults that exist which have caused the formation of the Jilliby Jilliby Creek (Dooralong) valley. This issue is further addressed in Section 5.3.1
1	There will be longwall mining beneath the water catchment valleys of Wyong.	Mining will only occur beneath 5% of the Central Coast's total water supply catchment area, as documented in the EA.
2	No contingencies for loss of water to dams and rivers, tanks	The modelling undertaken has been conservative and includes an assessment of the potential for loss of surface water and groundwater. These studies demonstrate that losses will be negligible to the point of not being measurable.
1	Destruction of riverbeds due to adjacent longwall mining	This statement is incorrect. The valley creeks are located in deep alluvium and will not suffer from cracking as can occur when the streambed is on rock.
2	The Central Coast cannot sustain an industry such as this which will deplete the water	The mine will be a net water producer. At full production, it will be generate sufficient water through recycling to meet the operating requirements of the mine. Surplus water will be treated for discharge to the surrounding waterways, or to adjacent industries thereby providing additional water to the region. Refer to Section 5.5
1	No buffer zone is mandated around rivers, creeks and aquifers in the SMP, and remediation techniques for any changes are unproven.	The project is not at the stage of Subsidence Management Plan preparation or approval. The studies undertaken to date do not support the need for any buffer zones or other subsidence exclusion zones.
1	If mining goes ahead a minimum of 1 km buffer should protect all water sources.	This is not supported by the project or the studies undertaken to date.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Any damage to the water supply caused by Kores would be irreparable and beyond financial compensation.	The EA comprehensively deals with the issue of risk to water supply regimes. The mine plan has been carefully designed to avoid such impacts as well as to ensure continual protection is maintained by appropriate adaptive management. The Strategic Inquiry report 2008 considered the full worst case extent of the water regime impacts and showed that even the scale of these extreme impact scenarios were small.
1	Where would they take the water from to supply the mine and where would the dirty water end up?	There will be two principal sources of water. The first will be treated recycled effluent from the local sewage treatment plant required during early project years while the second will be generated on site through recycling of water contained with surface collection dams and pollution control ponds together with treated water generated from the coal seam.
5	Concern about what will happen to the Mardi-Mangrove link.	The water supply pipeline has been separately assessed and documented with the Gosford Wyong Water Supply Scheme and their engineers. There will be no impact on the pipeline. This is clearly outlined in Section 5.1.2.
3	Water used to suppress dust will become heavily polluted and increase toxicity in the adjacent waterways and estuarine areas destroying aquatic organisms	Mitigation measures will be implemented to prevent polluted water from entering adjacent waterways, as described in the Site Water Management Strategy which can be found in Section 2.12 of the EA.
1	Concern that Jilliby Jilliby and Little Jilliby Jilliby Creeks will dry up	There will be no measurable loss of water from the creek system as a result of the project. It should be noted that Jilliby Jilliby Creek is normally a series of ponds connected by dry channels which only flow during rainfall events.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The project is under the Jilliby Jilliby Creek – this river system flows into the Wyong River and is part of the total water catchment. It cannot be considered unimportant simply because this project is not under the whole of the water catchment.	Neither the project proponents nor the EA underplays the importance of the Jilliby Jilliby creek system. Despite the fact that the project will not impact on the water supply scheme, the project has committed to the implementation of a Riparian Zone Enhancement Program. This program will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks, stabilising the channel by removal of debris that does not provide habitat value and improving water quality by assisting landowners with appropriate land management practices.
1	Water studies in the EA indicate the water regime of the catchment area is at risk of being destroyed and once this happens the water has gone forever	This is not correct. The risk assessment process identified the importance of the water supply system and responded by incorporating protection measures to ensure the functions of the system are not impacted.
1	There is no easily recognizable data in the assessment to indicate how much water will be sourced	A water balance is provided in Section 2.12.7 of the EA. This indicates that the mine will have a water deficit in early years which will need to be supplemented, while in later years there will be a small surplus which will be treated and available for other beneficial uses offsite. The deficit is proposed to be made up by importing treated sewage effluent.
6. Groundwater		
44	Potential destruction of underground aquifers.	Detailed assessment by groundwater specialist concludes there will be no significant impact on the groundwater system. Refer to Section 5.2
2	Loss of groundwater, once the groundwater is lost it never comes back	This is not a correct statement. The groundwater studies assessed both the near surface aquifers and the deep hardrock system. The assessment showed that the near surface alluvials will be protected while the deep hard rock system (referred to as aquitards and aquicludes and located above the coal seam) although impacted, will not connect to the surface alluvials. The storage capacity of the surface alluvials above the mine will in fact increase.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Only 3 cores drilled across the grid system so impossible to interpolate across the mining area, all other holes are to assess coal reserves, should be a core drilled in each grid section to check the geology for strata, faults, dykes, transient pathways etc.	All drill holes within the exploration area (over 350) were cored and logged.
3	Disturbance to groundwater	The main groundwater disturbance will occur within the deep hardrock system which includes the coal seam. These are referred to as aquitards and aquicludes. Both descriptors indicate that there is very little water available within this deep system. The shallow alluvial aquifer, as well as the surface streams, have been targeted for protection.
3	Water tables levels will be disrupted	In some locations it is expected that local aquifers and contained water tables will undergo a fall in elevation as areas subside, particularly in the Dooralong and Hue Hue valley sediments (Section 8.3.2 of the EA). However a rebound in the water table would then occur as subsided areas re-equilibrate with adjacent unsubsided areas. Calculations indicate between 55 and 75% of rebound could be expected within about 6 months of subsidence occurring (in the absence of significant rainfall events). The subsided alluvial areas would actually acquire an increase in overall groundwater storage as a result of the increased saturated thickness. Also, the depth to the water table would reduce by an amount equivalent to or less than the average subsidence in a given area.
1	Effects on groundwater cannot be determined, for example cracks may develop and the water may disappear into the never never	The effects on the groundwater system can be determined with a high level of accuracy and confidence. The subsidence model and groundwater models are further described in Sections 5.1.4 and 5.2.1

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
9	The destruction of the aquifers and depressurisation over the catchment area will destroy water regimes and the hydrological dynamic balance within the valleys. Repressurisation will extend over 200 years.	The 200 year recovery relates to the deep hardrock aquitards which will be disturbed by removal of the coal seam. This groundwater zone has no economic or environmental significance in terms of water supply potential or ecological relevance. The surface aquifers will remain functional and will in fact increase their storage capacity.
1	Insufficient geological data available to support the claim that there will be no loss of water from either the subsurface aquifers or surface water.	The EA states that the impacts of mining on groundwater and surface water are judged to be low and unlikely to measurably deplete the water resources of the alluvial lands situated within the Dooralong and Yarramalong Valleys. Any changes will be transient in nature. Geological data is sufficient to undertake the detailed modelling required to support this conclusion, as was the finding of the independent Wyong Water Review report (August 2010).

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
9	Impact on water quality and quantity.	As Section 8.3.4 of the EA states, it is unlikely that any measurable change in the groundwater quality will be observed in hardrock strata as pressures decline, nor the shallow unconsolidated alluvial aquifers. Localised change in salinity may be observed in deep caved zones as groundwaters contained within different stratigraphic horizons of hardrock units mix with fragmented materials in the goaf. This mine water will be treated within the mine water management system. Hydrochemical processes following surface cracking of hardrock strata in elevated areas were shown in the EA to have only a low potential for water quality effects given the geological characteristics of the area. Existing water quality within Jilliby Jilliby Creek is poor as a result of current land management practices. For this reason, the project includes a commitment to implement a Riparian Zone Enhancement Program designed to improve the health of the creek by replanting denuded creek banks, stabilising the channel by removal of debris that does not provide habitat value and improving water quality by assisting landowners with appropriate land management practices.
1	Limited baseline data collected for groundwater monitoring, modeling and assessment.	The independent expert engaged by the Department of Planning has determined that there is sufficient baseline groundwater data to undertake the necessary groundwater impact assessments.
1	If longwall mining is allowed to proceed the aquifer would certainly drain into the lower, saline polluted aquifer and even if recoverable, would be of no further use to the Gosford Wyong Water Supply Scheme.	This is not the case. The assessment showed that the near surface alluvials will be protected while the deep hard rock system (referred to as aquitards and aquicludes and located above the coal seam) although impacted, will not connect to the surface alluvials. The storage capacity of the surface alluvials above the mine will in fact increase.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Faults within the centre of the mining area is most concerning, somewhere in this mix the "precautionary principle" must apply.	The assertion that Jilliby Jilliby Creek is fault controlled is incorrect. As discussed in detail in Section 5.3.1, comments in a report prepared by Northern Geoscience for Australian Gas Alliance that "a major geological feature of the Jilliby Jilliby Creek is that it follows a fault zone" which "provides a significant transient pathway to groundwater movement and discharge" are unsupported and in conflict with the extensive geological investigations undertaken within the W2CP resource area. The W2CP has adopted a very conservative approach to the assessment of impacts and risk management. An assessment of ESD principles is provided in Section 3.7 of the EA which has been prepared in accordance with the National Strategy for Ecologically Sustainable Development (1993) and also satisfies the requirements the Director General of the Department of Planning.
7. Dust		
41	The W2CP will increase dust pollution in the area.	Detailed assessment by air quality specialist concludes there will be no significant impact on the local air quality. The project will meet all current dust emission criteria. The assessment has included cumulative impacts from other dust sources in the region. The very conservative modelling used for the assessment adopted a worst case assumption that there would be no dust suppression spraying of the coal stockpiles at any time, yet emission criteria will still be met. Refer to Section 5.6.6.
1	Solar panels on roofs of houses will be less effective due to coal dust settling on them	The project will meet all current dust emission criteria. Deposition rates at the property boundary of the surface facilities have been conservatively estimated at 0.2 grams per square metre per month. This assumes the worst case scenario that no dust suppression at the coal stockpiles is operating.
2	Dust would affect the large population of children in the area.	The Health Risk Assessment contained in the EA does not support this generalised statement.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	There is no accurate data as to how far dust will be carried at different wind speeds.	There is in fact a significant database of actual measurements used to develop and verify dispersion models. The model used in the EA Air Quality Assessment was AUSPLUM which is recognised by the Department of Environment, Climate Change and Water
1	There is no strategy to control dust from dozers which generate most of the dust.	The modelled scenarios contained in the EA took into account the use of dozers on coal stockpiles. This equipment is responsible for a large component of the dust emissions from any site but this has been included in the assessment.
1	Drinking water will be used to for dust suppression	This is not correct. Water used for dust suppression will be recycled mine water.
4	The assessment fails to actually provide measurements of proper data showing which residents will be affected by the dust and what the levels of dust which actually reach these residents will be.	The plans contained in the EA which depict dust emissions show the nearest affected residents. Residents located further away from the mine are not individually noted on the plans. The assumption that residents further away from those modelled will receive even less dust exposure is a valid assessment method.
1	Any assurance from the applicant that dust levels will be monitored closely or that the dust emanating from their mine will be dealt with on site is farcical.	Monitoring programs will be approved by the DECCW and DOP and subject to independent audit. The audit process is a standard component of the development consent. The site will also require a Pollution Control Licence from the EPA. Licenses require annual returns to be lodged which indicate the compliance status of the operation. Non-compliances are detailed in the EPA web page.
1	Increase in dust will result in higher use of air conditioning to stop dust entering house	This assertion is not supported.
6	Health effects from coal dust will add extreme pressure to the already overburdened hospitals and health system	The Health Risk Assessment detailed the extremely low risk of increased health issues as a result of the project.
1	Coal dust may effect residential areas nearby	Dust modelling contained in the EA demonstrates that the mine will meet all existing EPA (DECCW) dust emission criteria.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
4	Kores have not done comprehensive studies on the injurious effect of life threatening fine coal dust	This issue was discussed in the Health Risk Assessment.
1	Coal dust is toxic and poisonous. In an area such as this the Minister cannot approve this type and volume of mining and comply with Section 237 of the Mining Act.	This is not correct; coal is not toxic nor poisonous. It is not listed as a hazardous subsidence under any environmental legislation. However particulate matter of any kind in air is subject to regulatory control and the project has demonstrated that it will readily comply with such regulatory requirements. The factors listed in s237 of the Mining Act are requirements for the Minister for Mineral Resources to take into account, and the findings of the EA and the PAC inquiry are relevant.
1	Scenarios for dust emissions cannot be accurately determined as the effects of climate change and more intense weather events may cause the dust to travel further than the reports have indicated.	Known weather patterns based on years of validated data were used in the dust modelling. Should there be modified climate conditions in the future which result in changes to the regulatory requirements, the project's adaptive management approach will ensure compliance with the operating conditions under the environmental protection licence.
1	Dust will contaminate water.	Modeling of dust emissions in the EA predicts that dust levels will meet DECCW guidelines and do not indicate any risk to waters or residential water systems. Refer to Section 5.6.8.
12	Pollute drinking water tanks	Modeling of emissions predicts that dust levels will meet DECC guidelines at all private residences. Refer to Section 5.6.8.
2	Coal dust levels generated by the movement of coal from conveyors, trucks, and trains have not been adequately assessed.	These aspects have been specifically included in the dust modelling contained in the EA.
1	Unknown impact of coal dust on the natural environment.	Dust modeling carried out for the project has been undertaken in accordance with current NSW EPA methodology which shows that the vast majority of emissions from both surface infrastructure sites will not leave the property boundary

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Coal dust will emanate from uncovered coal trains transporting coal to Newcastle.	Train movements can generate some very minor dust emissions. This can be reduced even further by insuring that the coal is suitably watered prior to train loading.
1	Dust may have a negative impact by settling on surfaces and possibly vegetation/crops.	The criteria for dust fallout levels are set to protect against nuisance and amenity impacts (DEC, 2005)
3	Water suppression of dust will be insufficient	Water spray suppression for control of stockpile dust emissions is an internationally proven and reliable control measure. Although water is generally used for dust suppression there are other additive products available which increase the dust suppression ability of water. These are generally mineral or polymer binders and are often used on haul roads in open cut operations. Unfortunately, these products tend to block water sprays as used for coal stockpiles. Their use in other dust suppression activities, and in particular during construction, will be considered.
1	Where will they get water to suppress the dust once the stream beds have cracked and the water has drained away	The majority of water used by the mine will sourced from the mine workings. The river beds will not dry up as a result of mining.
1	What impact would fine dust have on insects other larger fauna in bushland adjacent to the proposed facility?	None.
1	The W2CP EA does not assess the impact of dust on residents to the south.	The modeling assessed the impact of dust in all directions from the mine, and under a variety of weather conditions, this includes all residents surrounding the surface facilities. Refer to Section 5.6.9.
2	Coal dust will be blown into Wallarah and Spring Creeks which flow into Tuggerah Lake.	The modeling included in the EA demonstrates that dust emissions will readily be in compliance with regulatory requirements. Effective dust control measures are proposed to mitigate coal dust generated by the surface operations. Pollution control ponds are located at the surface operations which will assist in containing deposited fugitive dust from being exported into waterways.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
6	Kores have not dealt with the effect of dust on suburbs along the rail corridor to Newcastle.	This aspect was not dealt with in any detail in the EA as it is primarily a matter under the environmental licensing of the rail track owner and rail operators. Large tonnages of coal are railed annually throughout NSW and into Newcastle without this issue being classified as a high priority impact risk. It is considered that dust emissions from this source are likely to be negligible, especially given the relatively short haul of water-sprayed coal from W2CP to the port. Nevertheless, it is contended that such issues are of industry-wide policy relevance and as such W2CP would more appropriately participate in any further consideration of this issue if required on an industry-wide basis with Government. It is noted that the operation of the railway is outside the management responsibility of the W2CP.
1	Dust from railway line and loader in proximity to homes	The surface facilities are well located being remote from residential receptors with a large company owned land buffer. The amount of dust leaving the property will be negligible. Dust emissions from offsite rail haulage operation are expected to be negligible (refer above).
2	Coal dust associated with rail transport of coal is an issue of deep concern to the communities that live near the rail lines between the mine and Newcastle, as well as workers.	It is considered that dust emissions from this source are likely to be negligible, especially given the relatively short haul of water-sprayed coal from W2CP to the port. Refer above.
1	Coal dust will fall on outdoor surfaces including clothes that have been hung out to dry which may cause people to buy electric dryers which will increase the cost of the power bill.	Although the project will contribute to regional dust levels, the incremental increase as a direct result of the project will be negligible. The dust levels from the W2CP at residential locations are shown in the EA to be demonstrably low.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Kores have not done comprehensive studies on the effect of fine coal dust particulates.	Dust modeling carried out for the project has been undertaken in accordance with current NSW EPA (DECCW) methodology which shows that the vast majority of emissions from both surface infrastructure sites will not leave the property boundary. The Health Risk Assessment detailed the extremely low risk of increased health issues as a result of the project.
1	Dust will also affect the future development of the Warnervale Town Centre and Wyee.	This is not correct and is clearly not supported by the modelling and assessment contained in the EA.
1	Often strong winds will blow the coal dust on the opposite direction to Blue Haven and deposit the coal dust in the much more densely populated Warnervale residential area.	The dust modelling has included local weather patterns. Dominant wind directions were modelled separately and the results provided in the EA.
1	The crushing facility needs to be elaborated on in terms of dust	The crushing plant will be located at the Tooheys Road site. It will be part of the raw coal reclaim and stacking system which will be capable of handling 2,000 t/h to allow for surges in the coal delivery system and adequate train loading times.
1	The assessment does not indicate accurate dust levels for precincts surrounding the Tooheys Road site.	Dust modelling has included all areas surrounding the surface facilities sites. Most of the development precincts in the Wyong area are well outside the impact zone of the operation and do not appear on the scale of plans necessary to describe and document the impacts of the W2CP operation.
1	Effect of coal dust from the Tooheys Road surface facility (coal handling and loading point) on the new communities	Dust modelling has included all areas surrounding the surface facilities sites. Most of the development precincts in the Wyong area are well outside the impact zone of the operation and do not appear on the scale of plans necessary to describe and document the impacts of the operation.
1	No baseline data available for levels or types of dust emissions	Baseline data is included in the monitoring that has occurred for the W2CP sites over many years. This data has also been provided to Wyong Council for information.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Coal dust will affect horse studs	There are no horse studs within the impact zone around the development sites. The EA outlines the predicted dust levels from the project and these will not present significant impacts on residences or local land uses, including grazing animals such as horses.
8. General Air quality		
1	Air quality not currently monitored properly or consistently, therefore effects of mining are unknown.	Air quality assessments carried out in line with current industry standards and methodology, which have been proven to be accurate and reliable in the past. Refer to Section 5.6.7. Atmospheric monitoring has occurred at the W2CP properties for many years. Despite some periods when the equipment was not operational, there is more than sufficient data to undertake the assessment with confidence.
4	Concern that air pollution including toxic coal dust will affect children at schools within the locality (such as Blue Haven Public and Lakes Grammar School)	Blue Haven is outside the zone of any potential significant impact of the mine. As outlined above, coal is not toxic or poisonous and is not listed as a hazardous subsidence under any environmental legislation. However, while particulate matter of any kind in the air is subject to regulatory control, the EA demonstrates that there is no concern or risk of elevated dust levels at any schools in the region.
1	Air pollution towers need to be erected at schools	This is not required.
1	The air quality study is flawed	The air quality study was conducted In accordance with regulatory guidelines and methodologies, as outlined in the EA. Detailed assessment by air quality specialist concludes that there will be no significant impact on the local air quality. The project will meet all relevant dust emission criteria. The assessment has included cumulative impacts from other dust sources in the region. Refer to Section 5.6.6.
20	General air pollution	There were a number of submissions which just listed air pollution as a general concern. The assessment contained in the EA has been undertaken in accordance with current best practice and the project will meet current air quality criteria and goals.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Project will threaten local air quality	Detailed assessment by air quality specialist concludes that there will be no significant impact on the local air quality. The project will meet all current dust emission criteria. The assessment has included cumulative impacts from other dust sources in the region. Refer to Section 5.6.6
1	Release of dangerous minerals into the air will be irreparable.	This is not correct. Emissions of coal dust and mineral dust has been modelled and reported in the EA as well as assessed in the Health Risk Assessment. Both studies concluded that the implications, including cumulative impacts, would easily meet current NSW government assessment criteria.
38	There has been no cumulative study on air quality in combination with other coal mines and three adjacent power stations.	Cumulative impacts have been included in the Air Quality Assessment in the EA.
1	There is no specific study on the dangerous <2.5 micron particulate matter.	2.5 micron (PM2.5) dust emissions were considered in the Health Risk Assessment.
1	The <10 micron study relies on data for 2 months although there is data available for the last 15 years which shows a dramatic rise in the < 10 micron particulate matter.	This assumption of data collection status and air quality trends is incorrect. Data on dust concentration and deposition rate in the project area have been collected by ERM on behalf of the project since 1996. These data were used to estimate existing background levels in the project area. All air monitoring data were considered and summarised in the air quality report. No separate PM2.5 data were collected for the project, but data recorded by Delta at Wyee have been previously included in the Wyong Shire Council State of the Environment reports. The data did not show any particular trend (a slight decrease was noted) but had been collected over a 2.5 year period only. The maximum daily recorded data was below the NEPM advisory reporting guideline of 25 μg/m3 with a maximum recorded level of 19 μg/m3. The annual average was marginally above the guideline of 8 μg/m3 as it is in many regions of Australia. Refer Section 5.6.1.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The consultants have not been able to adequately deal with the deposition of fine dust particles (2.5-5 microns) and the distance they will travel on the wind. It has been reported that salt spray of approximately 2.5 micron has been found to have blown from the Great Australian Bight into the Hunter Valley.	As discussed in Section 5.6.2, the particle size distribution of the emission was discussed in detail in the EA Air Quality report and has been included in the modelling. The fine fraction of the dust will be transported further than the coarser material. While it is the case that fine particles can be transported over a large distance, the size of the source is also an important factor. The W2CP dust source will be relatively small and will also contain a relatively small fraction of fine particles (about 4%). By the time the particles reach any nearby sensitive receptors, they will be at low concentrations. Modelling of PM2.5 was undertaken for the EA, and predictions at sensitive receptors presented in the Health Risk Assessment section. Predicted concentrations are all very low.
1	Dust particles, pollution and emissions from the Western Shaft will exacerbate allergies.	The western shaft is an air intake facility only, that is, air will be drawn into the mine at this location. There will be no fan or exhaust emissions.
9. Noise		
27	The W2CP will increase noise pollution in the area.	Noise emissions will be within DECC criteria. Refer to Section 5.7.
1	Noise will impact people and racehorses	There are no racehorse studs within the noise impact zone of the surface facilities. Noise has been considered in the Health Risk Assessment in the EA which concluded there would be minimal impact as a result of increased noise.
1	Excessive noise may be detrimental to the quality of life and health of local residents.	Noise has been considered in the Health Risk Assessment in the EA which concluded there would be minimal impact as a result of increased noise.
34	Unacceptable levels of noise from rail line and coal loader operating 24 hours, 7 days a week	The main surface infrastructure site at Tooheys Road is ideally located being remote from residential areas such as Blue Haven.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Noise problem caused by air intake shaft due to the size of the fans.	The fans located at the Buttonderry Site have been included in the noise model. Among the proposed noise mitigation measures, the fan evase has been designed to point away from residential receptors.
1	The constant humming noise from the Western Shaft will cause great discomfort.	The western shaft is an air intake facility only, that is, air will be drawn into the mine at this location. There will be no fan or other noise generating activities once established.
1	Resident concern regarding EA noise report which shows that the noise during construction will exceed the noise assessment goal at their property and will approach the criteria during operations. Also concerned that not all wind directions were analysed and that the project will affect their property's zoning or other classification. Requested more detailed briefing on the project.	Consultation has previously been undertaken with this respondent and further liaison will be undertaken, including provision of any further information as may be requested.
10. Bushfire		
1	Release of methane during bushfire season is too dangerous.	Controls will be in place to ensure that gas disposal can be carried out safely.
11. Health		
6	Increased dust and/or noise will have health impacts on local population and flora and fauna.	Detailed assessment of the potential health impacts has concluded that there will be no significant impact. Refer to Section 5.11.
91	Coal dust will have health impacts on the local population (lung disease, heart disease, asthma, rashes, increased incidence of cancer)	This was a common issue raised in submissions. It has been further explored in Section 5.6.
1	Any impact from the dust on the health of residents is unacceptable.	Although the level of increased health risk is extremely low, the view of the respondent is noted.
1	Coal mining and transport is contaminating.	The W2CP will be operated with mitigation measures and safeguards to ensure that the operation is not polluting.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Increased dust in rainwater tanks will necessitate more frequent clean outs of the tanks, in turn causing new risks to the health of the cleaners.	This will not occur, refer to Section 5.6.8.
1	Coal dust in water causing health implications (human and animal)	This will not occur, refer to Section 5.6.8.
1	The Health Risk Assessment does not consider health effects related to increased dust in the rural water supplies for the households to the west of the Freeway.	This will not occur, refer to Section 5.6.8.
2	The EA fails to prove that there will be no impact on the health of Central Coast residents	Heath Risks have been documented in Volume 3 of the EA. This study has been undertaken in accordance with current standards and assessment practices.
2	Independent studies need to be carried out to ascertain health issues surrounding further emissions from coal dust to add to existing emissions from Power Stations.	This is a matter for government to determine. W2CP is happy to accept any independent peer review of any of the studies contained in the EA. The air quality assessment contained in the EA included cumulative dust from other sources including the local power stations.
1	The mortality risk of 1 in 16.3 million is not acceptable.	The health risk assessment undertaken for the project used recognized statistically valid data and assessment procedures. The view of the respondent is noted.
31	The risk assessment does not consider the impact of stress on the community and those affected by increased flooding, vibration, and subsidence, nor the effect that this will have on the mental health of the residents of the Dooralong Valley. Hospitalization may occur due to mental stress and suicides.	This is an issue that is considered in the Social Assessment. It is true that any new development proposal of this nature could increase stress in the community and it is a recognized potential impact that will require appropriate management and mitigation commensurate with the scale of the risk and impact. The project has committed to communicating with the community through a range of methods including direct consultation, newsletters and information available through its web page.
1	The cumulative impact of pollution on health has not been considered in the risk assessment	Cumulative impacts were addressed in both the EA and the Health Risk Assessment.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Who will pay for loss of health including cancer, skin complaints, respiratory problems. Cost will be crippling for the government.	The assessments provided do not show that there will be an increase in cancer or skin complaints as there is no link with coal dust. Respiratory problems have been addressed in the Health Risk Assessment using recognised methods of determining health impacts on the community. The location of the surface facilities remotely from residential communities is a key control for the project.
1	Effects of very small particles of coal dust on the deep lung tissue are well known and similar to asbestos. Despite the assertion that Kores will comply with government air quality guidelines this would not solve the problem.	Coal dust and asbestos fibers are completely different in both shape and behavior in the lung tissue. Despite this, the project has ensured that dust controls have been incorporated in accordance with current best practice and the modelling of dust impacts has been conservative.
12. Traffic and Transport		
9	The W2CP will increase traffic congestion.	Some increase in traffic will occur, as with all new developments. However, the surface facilities have been located in the area ear-marked for employment generating land, which will inevitably increase traffic movements in the area. All coal will be transported by rail, any increase in traffic relates to employees and supplies. Refer to Section 5.8.1.
1	Trucks associated with the W2CP will affect road safety.	All product coal will be transported by rail. Any trucks associated with the delivery of construction materials and deliveries to the operating mine will be required to obey all road rules that pertain to all vehicles for the safe use of roads. Refer to Section 5.8.2.
1	The EA does not assess safety issues surrounding the increased danger of fast moving passenger and container freight trains colliding with loaded slow moving northbound coal trains. This has been brought up at previous inquiry and by multiple submissions to the Transport Minister which increases NSW taxpayer liability were a fatal collision to occur.	W2CP has undertaken rail movement modelling in consultation with RailCorp and rail operators. There is sufficient capacity in the existing rail network to cater for the project with the necessary safety guidelines. Train speeds are taken into account in the modeling when determining the appropriate schedules.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Trucks generate dust as they travel.	All transport of coal will occur by rail. Deliveries of goods and materials will generate no more dust than any other delivery trucks on the roads.
3	Trucks on the F3 a concern.	All transport of coal will occur by rail. No coal trucks are proposed on the F3 Freeway. There has been a misconception, seemingly widely circulated, that the project involves coal haulage on the public road network. This is incorrect.
3	Passenger trains may experience delays due to extra freight movements.	Passenger trains have priority on all NSW rail networks. Freight trains (general industrial and coal) do not impact on passenger service schedules.
15	Increased train movements a concern.	The use of trains for the movement of coal presents the lowest possible impact on the environment and the community. In general, W2CP would require only about 6 out of the 260 available daily train paths. The northern rail line is the subject of proposed upgrading in the future which would improve its capacity to cater for other developments in the region as well as increase passenger movements. Refer to Section 5.8.3.
14	Increased traffic movements a concern.	The W2CP is located in an area of industrial growth. This will result in additional background traffic movements as well as those movements directly related to the project. The W2CP has assessed its impacts along with additional traffic increases due to other developments and general population growth. There would need to be some road intersection upgrading even if W2CP did not proceed.
3	Concern that increased use of transport infrastructure will lead to increased taxes for local residents.	This is not correct. The use of the public infrastructure by projects such as the W2CP assists with provision of government revenue which in turn should alleviate taxes and charges on the people of NSW. W2CP will be charged a rail access fee by RailCorp for each train path that it uses.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Increased heavy vehicle movements.	All transport of coal will occur by rail. There has been a misconception that the project involves coal haulage on the public road network. This is incorrect.
1	Traffic assessment assumed that Bushells Ridge Road has a speed limit of 60 km per hour however this is not correct.	The data we have suggests this to be the case however it does not alter the assessment provided in that this road is only used as a minor access road to the site for employees who live locally.
2	Additional trains would add to the traffic congestion in Newcastle at rail crossings.	W2CP would require only 6 of the approximately 260 available daily train paths. The W2CP will be an additional user of the rail network along with many other industries and the community.
3	Further congestion of railway line to Newcastle.	W2CP would require only 6 of the approximately 260 available daily train paths. The modeling undertaken and supported by RailCorp shows this demand can be readily met without impacting on the rail network.. The W2CP will be a user of the rail network along with many other industries and the community.
1	Will Newcastle port cope with the increase in shipping?	Yes, the project will commence export around the time that further expansions of the coal terminals have been commissioned. It is anticipated that port congestion will be alleviated in the next 2 years.
4	Trucks will be used to transport coal to rail lines.	This statement is false. A rail loop and coal loading station will be constructed, which will see the coal placed directly on the rail network without the need for coal trucks on public roads.
3	Do not want to see more “ugly” coal tankers parked off the coastline – they pollute the beaches.	The recently introduced vessel arrival system (VAS) has already reduced the number of ships at anchor off the coast. There will however always be some coal ships visible from the shore line.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Traffic implications include road widening, safety, transport, signage.	Although the project will increase light vehicle traffic in the area it will not, by itself, require any additional road or intersection upgrading apart from the specific works at the surface facilities sites as outlined in the EA. Other general upgrading as referred to by the respondent is either required already or will be necessary in the future with the development of other industrial and employment precincts in the area.
1	More traffic than the Central Coast can handle.	This is not the case with just the W2CP but there needs to be a program of road and intersection upgrading to accommodate future development as proposed by local and state governments.
2	There is no detailed assessment of transport.	The EA provided a traffic assessment which is currently being updated and will be made available for public and government review when completed.
3	Increased and constant movement of heavy vehicles will cause severe damage to local roads not designed for such traffic.	Local and regional offsite roads will be able to accommodate the transport and road infrastructure needs of the project, however cars and delivery trucks servicing the project will add to the road maintenance requirements. Damage to roads as a result of normal truck deliveries is taken into account in the higher road taxes payable by heavy vehicle operators. Infrastructure contributions, typically negotiated as part of project approval, are designed to address such requirements. It should be noted that transport of coal will occur by rail.
2	Damage to roads	Refer above.
1	Transportation of coal creates noise, dust and other forms of pollution.	All transport of coal will occur by rail. Rail delivery of coal to the port has been assessed in the EA and shown to result in negligible increase in dust levels and acceptable noise conditions.
1	Roads cannot sustain the increase in vehicles without improvement.	Improvements to the road networks will be required irrespective of the development of the W2CP as there are proposals to increase traffic generation from the development of the Wyong Employment Zone.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Increased accidents due to increased traffic.	Safety aspects of increases in transport have now been assessed in the revised traffic assessment that will be publicly available prior to the PAC.
2	Idling ships waiting to enter the port will cause pollution off Newcastle.	This is an issue that is outside the management control of W2CP.
1	Rail line to port has only two tracks while the tracks between the Hunter Valley coal mines and the port has 4 tracks enabling coal trains to be separate from other trains.	Rail capacity studies undertaken by W2CP and supported by RailCorp indicate that there is existing capacity within the current line however upgrading projects as required will increase rail capacity in future to meet any increased rail demands.
1	Would like confirmation from State Rail that it will be possible to send the coal to Newcastle by rail not road.	All transport of coal will occur by rail. W2CP has undertaken detailed consultation with RailCorp and service providers to ensure that proposed rail transport of W2CP coal to Newcastle is feasible.
1	Slow moving coal trains limit the ability to handle extra traffic	Coal train speeds are not that dissimilar from passenger services. The speed differences have been taken into account in the modeling of rail movements from the project. There is sufficient capacity to cater for the additional trains from the W2CP.
1	Chances of a rail accident will increase	W2CP would require only 6 of the approximately 260 available daily train paths. Additional train movements are taken into account with train operation safety systems and this risk is not unique to the W2CP.
1	Increased cost of rail maintenance	This is taken into account with the rail charges for coal haulage. There will not be an increase in rail maintenance burden on the people of NSW or the Central Coast.
1	The traffic assessment is considered wrong as it has inaccurate traffic model. There has been increased traffic due to Hunter pipeline, RailCorp, Gemma contractors.	An updated Traffic Impact Assessment has been undertaken by Parsons Brinckerhoff Australia Pty Limited which is available on the project web page and on Dept of Planning website. This work was undertaken at the request of Wyong City Council and used more recent traffic projections from the proposed Wyong Employment Zone. The study confirmed that the W2CP is only a minor contributor to the current and future traffic management issues of the area which will arise from planned growth.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Respondent believes that concern has been expressed by RailCorp as to the effect the proposed 5 daily movement of coal trains from the Warnervale area to Newcastle will have on current passenger and freight services.	A Rail Capacity Study prepared by Rail Management Consultants Australia Pty Ltd (RMCA) which is available on the project web page. This report was prepared in response to a request from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can comfortably run between the mine and the port, which can be executed by 2 conventional train consists of the coal schedule 2 makeup. This rail capacity will readily cater for the expected production output of the W2CP. In general, W2CP would require only about 6 out of the 260 available daily train paths. RailCorp supports the findings of the completed rail impact assessment.
1	There appears to be confusion with RailCorp as to incorporating this proposal into the northern rail line program. Public meetings will be required along the corridor and also direct explanation by Kores and RailCorp as to the ramifications of this mine designed for the next 42 years.	RailCorp has supported the findings of the Rail Capacity Study prepared by Rail Management Consultants Australia, referred to above. W2CP would require only about 6 out of the 260 available daily train paths. Any upgrade of the Northern Rail Line will be subject to the normal approval process and involve public participation. This is a matter beyond the scope of the W2CP EA process.
13. Alternative Energy Sources		
16	There are more sustainable, alternatives which have less impact on the environment, eg solar, wind, water.	Technological advances in alternative energy sources are not yet far enough advanced to alleviate the need for coal in large scale electricity production required to fuel major cities.
1	The coal should be left in the ground until we can extract its energy without polluting the environment.	This is a personal opinion and is noted.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
8	The EA indicates there is no alternative to coal-fired power.	The EA acknowledges that there are currently no viable alternatives that can be used to replace coal in the production of electricity at the present time. The quality of the W2CP resource makes it attractive for use by countries required to reduce their carbon emissions. In a carbon constrained world economy, it is anticipated that the demand for higher quality coal such as that of the W2CP, will increase.
1	The project would lead to further use of coal resources before a safer technology is discovered.	Coal is in fact a very safe form of electricity generation.
1	Australia should seek to reduce not increase its reliance on coal/coal fired generation.	This is a matter for government policy. The coal industry provides a fuel product that meets the demand requirements for power generation in the Australian economy.
14. Ecology		
9	Potential impact from vegetation clearing, introduced species.	The impact of clearing native vegetation has been detailed in the EA. The disturbances and clearing will be suitable offset by the Ecological Offset Strategy.
2	The ecology of the land and river systems will be permanently damaged affecting the native flora and fauna forever.	This is not a supportable statement and conflicts with current expert advice.
1	Native Christmas Bells have been seen in flower on the properties that Kores has acquired. This mine will destroy endangered species and wildlife.	Native Christmas Bells are not rare nor endangered. The impact of clearing native vegetation has been detailed in the EA. The disturbances and clearing will be suitably offset by the Ecological Offset Strategy.
1	Potential loss of platypus habitat. To avoid this stringent mitigation measures and management controls must be implemented and maintained.	Concerns raised in this submission have been included in the Statement of Commitment for the project. As a result of the management initiatives proposed there will be potential for overall improvement in habitat value within the creek systems.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
32	Disrupt estuarine habitat and/or migration pattern of migratory birds protected by treaty with China and Japan (species number varies from 11 to 19 in submissions).	No migratory birds or their habitat will be disturbed by the W2CP. Refer Section 13 of the EA.
1	The valleys and catchment areas contain some 33 species protected under NSW Threatened Species Conservation Act 1995, a further 27 species are protected under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 which include 19 avian migratory waders recorded in the catchment wetlands and estuarine areas of Tuggerah Lakes which are subject to treaty agreements. A further 8 terrestrial and aquatic species protected under the EPBC Act include arboreal mammals, bats, birds, Giant Barred Frog and Stuttering Frog.	No migratory birds or their habitat will be disturbed by the W2CP. Refer to Section 13 of the EA.
3	Mining will kill wild life.	This is an unsupported statement which is refuted by the information and assessment provided in the EA. Underground mining as proposed will not increase the risk of death to wildlife.
9	Mining is a threat to habitat and disturbs wildlife and/or endangered species.	The key risk of any underground mining proposal is the potential for micro impacts on drainage sensitive ecosystems which are undermined. There are no swamps located within the mining area. The EA studies have shown that the water quality in the Jilliby Jilliby Creek catchment is currently very poor. However, through adopting a “neutral of beneficial effect” philosophy the W2CP has proposed a Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Any new coal mine will be directly responsible for the extinction of many species.	Detailed assessment has concluded that there will be no significant impact on any threatened species, and will certainly not cause any species to become extinct.
28	The mine will disrupt the ecological balance of bird, animal and plant life.	No migratory birds or their habitat will be disturbed by the W2CP. Refer Section 13 of the EA.
1	There is no baseline date for aquatic fauna or groundwater dependent systems.	Several methods of assessing surface hydrology were discussed in the EA, these included the AusRivAS method, USEPA Rapid Bioassessment Protocols or HABSCORE, Index of Stream Condition (ISC), and the River Styles® system. The parameters and methodology employed in the above three assessment schemes were combined and implemented as far as practicable in the assessment of creek conditions contained in the EA. Other ecological indices such as fish, macroinvertebrates or periphyton were not used however the availability of extensive water quality data from a total of 28 sample sites taken since late 2006 provided sufficient data on stream health. This data showed that the Jilliby Jilliby Creek catchment is under stress from existing land uses. In response, the W2CP has adopted the "neutral of beneficial effect" philosophy and created the Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment. The specialist consultants were also aware of other local studies such as that done for the Mardi-Mangrove Creek Dam Pipeline EA.
1	Mining will disrupt the hydrological balance of the Water Supply Catchment which will imperil the water that sustains both natural systems and human populations.	This is incorrect. The mine plan put forward is one which protects the water supply system. This has been paramount in the design of the project from the outset.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Loss of fertility of grass.	This will not occur as a result of the project. Water quality data indicates high levels of fertiliser currently being used by many agricultural activities. The Riparian Zone Enhancement Program which forms part of the project commitments will assist farmers in determining the appropriate level of fertiliser to support their agricultural pursuits.
1	Impact of dust on insects, flora and fauna etc	There is no evidence to suggest that dust from the surface facilities will impact on insects or ecological processes within the sites or in the surrounding areas.
15. Landforms		
3	The W2CP will disturb the landform and result in land contamination.	The surface facilities for the W2CP will be operated in accordance with current best practice in the mining industry. Such systems have proven effective in the past at other mines, and the W2CP team is confident that the mine can operate with minimal risk of contamination.
2	The W2CP will cause erosion and pastoral land will suffer environmental impact	Section 6.7.3 of the EA details the potential for erosion to result from subsidence. This is not an uncommon issue with underground coal mines. Regular inspection for cracking on the surface will be carried out to ensure that any areas that have the potential to result in erosion are quickly repaired. Coal mines have been operating for many years without having any impact on agricultural land.
16. Rehabilitation		
3	Rehabilitation will not be able to undo the impacts of mining.	Rehabilitation activities have been proven in the past by other mining operations to repair damage caused by mining.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Rehabilitation of the site after the mine's contract is inadequate as restoration activities rarely if ever restore the environment to its natural state.	This is not correct. Rehabilitation of mine sites is tightly controlled by the Department of Industry and Investment. Part of this process is the requirement to lodge rehabilitation bonds to the NSW government. These bonds are reviewed each year in light of the physical disturbance and ongoing monitoring and rehabilitation requirements of the operation. The basis of the calculation is a "premature closure now" scenario and assumes catastrophic failure of the proponent or the mine itself.
1	What will be left behind when the mine is finished.	The EA provides a range of final land use options. This will range from complete removal of the infrastructure to alternative beneficial usage of the infrastructure.
3	Concern that mine site damage won't be restored.	This concern is unfounded. Rehabilitation of mine sites is tightly controlled by the Department of Industry and Investment. Part of this process is the requirement to lodge rehabilitation bonds to the NSW government. These bonds are reviewed each year in light of the physical disturbance and ongoing monitoring and rehabilitation requirements of the operation. The basis of the calculation is a "premature closure now" scenario that covers the worst-case rehabilitation liability scenario.
17. Visual Impact		
8	Concerned about visual impacts.	Visual impacts will be minor and mitigated by tree planting and careful design of infrastructure.
1	Unsightly, huge coal stockpiles, rail loop and coal loader.	The landscape plan provided in the EA included tree screen planting to reduce the impacts of the surface facilities when viewed from publicly accessible vantage points.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Environmental degradation including visual.	The landscape plan provided in the EA included tree screen planting to reduce the impacts of the surface facilities when viewed from publicly accessible vantage points. The project will not cause environmental degradation as mitigation and rehabilitation proposals will safeguard the long term ecology of the sites.
18. Social		
14	Concerned about impacts on tourism.	The W2CP will have no negative impact on tourism. The surface facilities locations were chosen because the area is appropriate for industrial use. Any tourism activities in the immediate vicinity of the Buttonderry and Tooheys Road sites would already be marred by the industrial zoning of the area. Tourism in the area above which coal extraction is to occur will not be impacted.
1	Social impact on communities.	The Social Impact Assessment and Economic Assessment documented the impacts of the project and concluded that the significant economic benefits and increased employment opportunities far outweighed the perceived negative impacts. These issues form part of the approval process and will be considered by independent specialists.
1	The project is not in the community's interest.	The EA's assessment concludes that on balance the project will benefit the local and regional economy and will provide an overall positive impact on NSW. These issues form part of the approval process and will be considered by independent specialists.
8	Impact on people who may have to have houses moved, raised or relocated.	The W2CP acknowledges that such mitigation measures would be a disruption in the lives of people affected. Such actions will only be taken under agreement from the affected landowner if it is the mutually preferred alternative to mitigate against an increased risk of flooding.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	There will be a reduction in population growth.	This statement is not consistent with State, regional and local planning strategies. Population growth is being planned by the NSW Government regardless of the W2CP. Over the next twenty years Wyong Shire is expected to continue to be a growth area and become home to an additional 63,000 people, reaching a population of some 208,000, regardless of the W2CP.
1	Crime may increase, as well as violent behavior.	This is not a supported statement and is disputed.
1	Central Coast residents will be stuck with this mine in future decades.	It is believed that the project will provide a positive impact on the local region and that negative impacts can be controlled to acceptable levels throughout the life of the project.
10	The mine will affect the charm/amenity/ambience/atmosphere of the area particularly for those people who left the city for a better lifestyle.	The surface facilities are located within a proposed industrial area surrounded by proposed future commercial and industrial precincts. The project is in line with current planning provisions for employment generating development. These areas are remote from lifestyle areas such as coastal or lake precincts.
1	There was no coal mine proposal when I purchased my property in Blue Haven.	Coal mining has been operating in the north of Wyong LGA for decades as has the Munmorah and Vales Point power stations. Blue Haven and adjacent areas were proclaimed as a Mine Subsidence District (Swansea North Entrance MSD) in November 1966. The coal resource of the Wyong Coal Development Areas, although known for many years, was only released for tender by the NSW Government in 1995. The WACJV has been exploring this resource since being awarded the tender in 1995 and the concept of the W2CP has emerged as the preferred and feasible development within that time.
1	Respondent inquired from Landcom and Mine Subsidence Board before purchasing property in Blue Haven and was assured that mining south of Roper Road would not be an issue.	The W2CP does not propose any mining in the Blue Haven area or any mining east of the F3 Freeway.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	People will need to move out of their homes to maintain their living standards and/or lifestyle if the mine goes ahead. Would the State Government compensate people who had to do this?	It is not considered that there will be any lifestyle changes required by any resident within the footprint of the mine or outside the company owned buffer surrounding the surface facilities. However, should there be any mitigation works, property modifications or property acquisition required to effectively manage predicted impacts, then these would only occur by agreement with and at no cost to the landowner.
1	Sacrifice to lifestyle and/or well being.	It is not considered that there will be any lifestyle changes required by any resident within the footprint of the mine or outside the company owned buffer surrounding the surface facilities.
2	The project will not improve the standard of living (therefore should not be allowed to go ahead).	This is disputed. The economic assessment documented the increase in economic activity caused directly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.
2	No authority has been given to the proponent by the Darkinjung Land Council to access their land.	This is not correct. Access agreements have been in place for many years to enable access to monitoring equipment.
1	The mine shows a rail loop across Darkinjung Land Council Land yet no authority has been given to the proponent by the Darkinjung Land Council or its State body to use the site.	This information is incorrect. Discussions have been held with the Darkinjung Aboriginal Land Council representatives throughout the planning and development process in relation to land access and other matters. Finalisation of lease arrangements for the rail access corridor can only occur once project approval has been secured.
1	Argument that landholders should have the right to say what is done to it.	Input from local residents and community groups forms an integral part of the assessment process and may also inform the approval conditions issued for the project.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	If the mine goes ahead would the State Government buy all the properties affected?	No, there is no requirement nor need for this to occur. Any property that is found to be adversely affected by the mine will initiate detailed discussion with the landowner to determine agreed mitigation measures. This could involve mitigation works, compensation or even property purchase by the proponent. In the case of subsidence impacts to improvements, the mitigation and remediation measures will be undertaken under the Mine Subsidence Board's standard process.
2	Compensation to landowners, schools, Council, etc.	The Mine Subsidence Board is responsible for repairing any damage to property improvements caused by mining induced subsidence. Compensation for financial or other loss is provided through other mechanisms such as development levies, taxes and other commitments made in the EA or approval conditions. These are determined by the Department of Planning in consultation with other stakeholders. However, while these secure safeguards are in place to protect landowners, it is not expected that there will be any impacts on schools or school property.
2	Implications to the quality of life on the Central Coast.	The project has been designed to minimise adverse impacts on the quality of life of residents on the Central Coast and it will improve employment and economic opportunities in the region.
1	The mine will cause loss of community spirit.	This statement is not supported by evidence from other mining developments.
1	Even if compensation payments (for damage due to subsidence) are forthcoming all affected residents will still be out of pocket, their lifestyles disrupted, and severely inconvenienced.	This is not true. The Mine Subsidence Board process and project approval conditions provide for satisfactory remediation work and compensation arrangements and such actions are undertaken at no cost to the landowner.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Perception that money comes before health and well being– respondent argues that production will not stop on a day when gales blow dust towards residential areas to the east.	W2CP refutes this perception. The environmental performance of the operation will be monitored in accordance with the conditions of approval, the EA commitments and Environment Protection Licence issued for the project. Adherence to these conditions is subject to independent audit.
1	The Central Coast may need employment but it is not this type of employment that the Central Coast is looking for. It will cause a bitter divide between unskilled mine workers and those desiring to promote a fresher greener image of the Coast.	The vast majority of mine workers are classed as professional, skilled or semi-skilled. Their incomes are well above the average weekly earnings. In 2006, the construction, mining and manufacturing sector employed 11,969 people in the Wyong Shire (22% of all workers in the Shire). There is no evidence to suggest that an increase in local employment within this sector will cause a bitter divide within the community.
1	Have not addressed a Social Licence to Operate within the Wyong Water Catchment.	The social licence to operate is associated not only with project approval and its consent conditions, it also encompasses the environmental management and performance contract as outlined in the EA generally and the Draft Statement of Commitments. These commitments include the protection of the Wyong Water Supply catchment as well as continuing community and stakeholder engagement throughout the project life, ensuring that the W2CP community enhancement plan is implemented and that local recruitment is a priority during the employment of the project's workforce.
1	The social surveys in the EA are invalid and don't meet the DG's requirements. Insufficient survey forms were returned	This is disputed. The survey work was undertaken by the Central Coast Research Foundation which is an independent body employed by government to undertake similar work for a wide range of issues within the region. The work was used as the basis for the Social Impact Assessment which supplemented the data by use of the surveys referred to. The data obtained was sufficient to complete the necessary assessment in accordance with the requirement of the Director General of Planning.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
	Have not addressed a Social Licence to Operate and have not addressed why there has been no attempt to address the conflict between the project and the Regional Strategy. Large clean food industries that have established in northern Wyong are not happy that a long term coal mine is to be established on their doorstep.	The social licence to operate is associated not only with project approval and its consent conditions, it also encompasses the environmental management and performance contract as outlined in the EA generally and the Draft Statement of Commitments. These commitments include key items such as continuing community and stakeholder engagement throughout the project life, ensuring that the W2CP community enhancement plan is implemented and that local recruitment is a priority during the employment of the project's workforce. There is no conflict between the project and the Central Coast Regional Strategy. In reality, the W2CP will assist in meeting the employment generating goals of the CCRS. This matter is discussed in Section 4.7 of the EA. W2CP refutes the inference that the project will adversely affect nearby business communities. The EA outlines the well located and designed surface facilities and the limited potential for any offsite impacts upon other nearby land uses and users, including those of the WEZ. The assertion that dust generated will keep other industries such as food processing away from the area is unsupported by the facts. The existing food warehouse is located immediately next door to a concrete batching plant and heavy transport terminal.
19. Economics		

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
28	Believe the W2CP will reduce property values.	An issue commonly raised in submissions opposing major developments is the potential negative impact on property values. NSW has a long history of coal mining, and there has been no conclusive evidence that properties located above an underground mine have been devalued as a result of the mine. In the case of properties located in close proximity to the surface facility sites, it is expected that the property values will not change, since they are already situated near land zoned as industrial, and the W2CP surface facilities have been carefully located within appropriate industrial development areas.
1	Who will pay compensation for the decline in land values to residents, NSW Government or Kores?	This presumption of decline in land values is not supported by evidence within other areas near coal mining developments. In fact the opposite has been the case in many mining districts as the price of nearby properties increases due to increase in demand for housing as a result of increased employment relating to the mine.
2	Nil or limited benefit to region.	This is strongly refuted. The economic assessment for the project documented the increase in economic activity and employment generated directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.
1	The economic benefits of the proposal have been exaggerated.	This is disputed. The economic assessment documented the increase in economic activity caused directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Concern that residents will not be compensated appropriately for decreased land value.	This is not supported by evidence within other areas near coal mining developments. In fact the opposite has been the case in many mining districts as the price of nearby properties increases due to increase in demand for housing corresponding with increased employment as a result of the mine.
2	We don't need foreign-owned resource investment.	W2CP will not comment on this personal statement.
1	Respondent believes the mine is causing the delay in finalizing local zoning. Project has therefore reduced property values and salability due to present uncertainty of zoning.	W2CP is aware of the zoning status of lands near to its project sites. The zoning matter is being addressed as part of the ongoing North Wyong Structure Plan. W2CP understands that the zoning question and its timing for resolution for the respondent remains in the hands primarily of Wyong Council based on the outcome of the relevant planning strategies.
3	The short term economic gain is not a reason to put the local environment or community at risk.	The EA details the significant economic benefits that will flow on to the entire community and the state of New South Wales (refer to EA Section 10.6), which will continue for the life of the project. The EA has clearly assessed the impact of the proposal on both the environment and the community, and it is considered that the impacts can be adequately managed with informed and adaptive responses.
1	Who will compensate the next generation for the loss of their inheritance (in terms of property values).	The perception of loss of land values is not supported by evidence within other areas near coal mining developments. In fact the opposite has been the case in many mining districts as the price of nearby properties increases due to increase in demand for housing corresponding with increased employment as a result of the mine.
2	The only positives are financial and/or project is all about money.	This is a personal statement and is not supported by the W2CP.
2	Kores don't care about any of the residents' concerns.	This is incorrect. The mine plan and project design has been modified many times to ensure residents' concerns have been addressed.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The EA does not recognize that Korea and the government benefit financially.	Section 10.6.5 of the EA clearly identifies the payment of royalties to be made to the government. Kores Australia Pty Ltd will share in the profits from its very significant project investment as one of five shareholders of the WACJV, the proponent for the project, as stated in Section 1.4.1 of the EA. All JV shareholders will be subject to Australian taxation requirements in addition to being responsible for other local, State and Federal taxes and charges.
2	Project will only benefit the Koreans, with all profit going overseas.	Section 10.6.5 of the EA clearly identifies the payment of royalties to be made to the government. Kores Australia Pty Ltd will share in the profits from its very significant project investment as one of five shareholders of the WACJV, the proponent for the project, as stated in Section 1.4.1 of the EA. All JV shareholders will be subject to Australian taxation requirements in addition to being responsible for other local, State and Federal taxes and charges. The Central Coast will receive increased revenue, increased economic activity and increased employment as result of the project.
2	Project will only benefit Kores a Korean Company while the Central Coast will only receive limited revenue.	Section 10.6.5 of the EA clearly identifies the payment of royalties to be made to the government. Kores Australia Pty Ltd will share in the profits from its very significant project investment as one of five shareholders of the WACJV, the proponent for the project, as stated in Section 1.4.1 of the EA. All JV shareholders will be subject to Australian taxation requirements in addition to being responsible for other local, State and Federal taxes and charges. The Central Coast will receive increased revenue, increased economic activity and increased employment as result of the project.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
5	Loss of income to local businesses and farmers.	This is disputed. The economic assessment documented the increase in economic activity caused directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.
2	The mine will have a negative impact on small industries already established in the local area.	This is disputed. The economic benefits have been documented and support the conclusion that small industries will either directly benefit or at worse have no negative impacts.
2	The mine will affect the growing business community within two and a half kilometres of the Coal Head, with the Wyong Employment Zone considered to lend itself to food processing and packaging.	W2CP refutes the inference that the project will adversely affect nearby business communities. The EA outlines the well located and designed surface facilities and the limited potential for any offsite impacts upon other nearby land uses and users, including those of the WEZ. The assertion that dust generated will keep other industries such as food processing away from the area is unsupported by the facts. The existing food warehouse is located immediately next door to a concrete batching plant and heavy transport terminal. The assertion of a two and a half kilometer buffer is unsupported by the facts.
4	The mine will impinge on the new Warnervale City and the Wyong Employment Zone and may force large companies such as Woolworths to relocate to other regions which will impact heavily on the area in terms of economics and employment.	This is strongly refuted. Discussions have been held with Woolworths management and other business stakeholders. It is noted that the existing state-of-the-art Woolworths facility is located adjacent to a concrete batching plant and heavy vehicle transport terminal.
1	Concern that farmers with certified organic will lose their license and business.	This concern is unjustified.
1	Concern that ratepayers will have to cover the cost of road repairs etc.	This concern is unjustified.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Only concern of Kores is profit.	This is clearly refuted. The W2CP coal resource has attributes which are highly attractive to the export market, particularly those countries which have mandated reductions in Greenhouse Gas Emissions as this coal will offer some assistance in meeting those targets as well as meeting national energy demands. Although the project is financially viable, the motivation of the proponent is not just financial.
2	The government has a vested interest in the project because of the royalties it will receive from the coal.	This statement is not supported by the current independent assessment process.
1	Impact on regional development.	The project is compatible with regional and local planning and development strategies. The economic assessment documented the increase in economic activity and employment caused directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.
1	Homes will not be able to be sold due to dust and polluted water.	The studies undertaken demonstrate these environmental impacts will not occur as a result of the project.
1	2,200 homes in Blue Haven will drop an average of $50,000 if the mine is built. If this were extended to the surrounding 25,000 homes that would be less affected for a drop of $30,000 a class action against the government for compensation would cost the state $750 Million.	This presumption of decline in land values is not supported by evidence within other areas near coal mining developments. In fact the opposite has been the case in many mining districts as the price of nearby properties increases due to increased employment caused by the mine results in a corresponding increase in demand for housing.
2	The proposal is all about money.	The W2CP coal resource has attributes which are highly attractive to the export market, particularly those countries which have mandated reductions in Greenhouse Gas Emissions as this coal will offer some assistance in meeting those targets as well as meeting national energy demands. Although the project is financially viable, the motivation of the proponent is not just financial.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	It is unconscionable that a foreign government can take from us our coal for their benefit and leave us with a legacy of subsidence, water degradation, health issues and destroyed lifestyle. The project is sustaining energy for South Korea's future not ours.	The Australian economy has significantly benefited from its resource industry irrespective of the ownership structure of the mining company. Section 10.6.5 of the EA clearly identifies the payment of royalties to be made to the government. Kores Australia Pty Ltd will share in the profits from its very significant project investment as one of five shareholders of the WACJV, the proponent for the project, as stated in Section 1.4.1 of the EA. All JV shareholders will be subject to Australian taxation requirements in addition to being responsible for other local, State and Federal taxes and charges. The Central Coast will receive increased revenue, increased economic activity and increased employment as result of the project. W2CP product coal will be exported as well as used in Australian power stations. Australia has a long history of exporting a range of commodities which benefit Australians through a stronger economy.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
20. Employment		
4	Jobs generated will be small in number and go to experienced miners from outside the area.	There will be a substantial number of jobs created. The WACJV is committed to sourcing jobs locally wherever possible. W2CP has expected that some 30% of the workforce will need to be recruited from outside the local region so that highly experienced managers and team leaders can contribute to a high quality, balanced workforce to ensure safe, efficient and sustainable production.
3	Limited local employment.	The project will provide significant direct and indirect economic benefits to the Central Coast Region. The project employment policy has set a target to source 70% of its 300 strong workforce from the local region (Central Coast and Lake Macquarie area). The Central Coast Research Foundation has estimated that 2,989 jobs (totaling 5,125 'job-years') are expected to be created on the Central Coast as a result of the mine's three year construction phase. Over 1,800 jobs will be created in the first year of construction alone. In the mine's first year of operation it is expected to generate an additional 428 jobs in the Central Coast economy which will rise to 726 jobs at full production. A further 336 jobs in the Hunter Region will be sustained by the project during operations.
1	It is mentioned that there will be 300 jobs for the locals, well not exactly 300, only 70% which comes back to 210 jobs for the locals.	As above. W2CP has expected that some 30% of the workforce will need to be recruited from outside the local region so that highly experienced managers and team leaders can contribute to a high quality, balanced workforce to ensure safe, efficient and sustainable production.
1	The proponent says they will employ 1,000 people which is not required for a 5 Million ton per annum longwall mine.	The mine will employ 300 directly with the remainder being flow on employment in the region (see also response above).

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The promise of jobs is misleading, as there are very few jobs in long wall mining these days.	This is disputed. The economic assessment documented the increase in direct and indirect employment generated by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.
1	Employment is created, but the deterioration of the quality of life for the people employed and the risks they face should be accounted for.	The Australian mining industry has a focus on safety and occupational health and is characterized by an efficient, well trained, well-remunerated and productive workforce. This is not at the expense of the quality of life, but it is part of it. In addition, the project has clearly been designed to minimise its impacts on the physical and social environment and to protect and enhance quality of life. The project has developed a Community Enhancement Program (CEP) that will be funded by the project owners and which involves specific works and actions to benefit the local community directly. The main component in the CEP is the development of a Community Trust which will be engaged in local community projects within, and immediately surrounding, the project site and mining area. While a Community Trust Advisory Group has been established, the final details of the Trust program and the broader CEP remain to be negotiated.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Proximity to road and rail services would brand the area as a coal mining district resulting in negative consequences for local jobs in the tourism Industry.	The northern part of Wyong Shire which encompasses the proposed W2CP contains other coal mining and power generating industries. These industries already benefit from existing road and rail infrastructure and the current industrial zoning and proposed future industrial and commercial development will benefit from the presence of the W2CP. It is considered unlikely that negative consequences for tourism employment will occur as a result of the project. (Refer Central Coast Research Foundation study contained in full in the EA which quantifies expected flow economic benefit to regional industrial sectors including areas relevant to tourism such as cafes, accommodation, etc).
2	Flow on employment will be in the medical profession.	Flow on employment is expected in all industries and occupations.
1	No job opportunities for Central Coast residents if the mine goes ahead.	This is disputed. The economic assessment documented the increase in economic activity caused directly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA. The project will provide significant direct and indirect economic benefits to the Central Coast Region. The project employment policy has set a target to source 70% of its 300 strong workforce from the local region (Central Coast and Lake Macquarie area). The Central Coast Research Foundation has estimated that 2,989 jobs (totalling 5,125 'job-years') are expected to be created on the Central Coast as a result of the mine's three year construction phase. Over 1,800 jobs will be created in the first year of construction alone. In the mine's first year of operation it is expected to generate an additional 428 jobs in the Central Coast economy which will rise to 726 jobs at full production. A further 336 jobs in the Hunter Region will be sustained by the project during operations.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	No additional jobs will be created, and if any, only short term employment relating to the construction phase.	This is disputed. The economic assessment documented the increase in economic activity and employment caused directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.
21. Coal Markets		
1	Australian coal should not be going to Korea.	W2CP product coal will be exported as well as used in Australian power stations. Australia has a long history of exporting a range of commodities which benefit Australians through a stronger economy.
1	EA does not mention where the coal will be used.	EA clearly states the domestic and export markets for the coal.
22. Project Justification		
6	The statement made in the EA that if the W2CP does not proceed, the shortfall in coal supply would be supplemented by other mines is nonsense.	The reliance of Australia and other developed nations on coal is clearly defined. Regardless of which mine is the producer, the supply volumes will be met to maintain current standards of living via power generation demand for coal in Australia and overseas. Refer to Section 5.14.
1	No studies show a positive effect from the mine other than financial.	Positive effects arise from the supply of coal in that it will facilitate the production of electricity that is necessary for the current standard of living. Other benefits stated in the EA are the commitments made by the WACJV to improve local waterways (which are currently degraded by existing land use practices), water treatment and reuse, increased employment and community enhancement programs will provide security / training / benefits for the local community, and the Ecological Offset Strategy will assist in local and regional conservation. Refer to Section 5.14.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Flexibility as a project justification – whilst it's true that coal can be used in several applications, this is normal for most resources extracted through mining, and is therefore not a special feature of coal. The EA states 'the discussion centers on steaming coal rather than alternatives for steel and cement manufacture which utilizes different types of coal'. This implies that the coal which will be extracted from the mine will not be useful for steel or cement manufacture, and is therefore false to justify increased coal production on the basis of the 'flexibility' of coal.	The discussion of coal's flexibility and its usage in steel and cement manufacture was not used as part of the project's justification but rather to simply inform readers of the EA that coal is not just used for power generation, a common misconception.
1	With regards to justification, the safety of the transport of coal is mentioned relative to the transport of other fossil fuels, which is an arbitrary and misguided reference, as it is well known that the transportation of all fossil fuels engenders a high degree of risk. It should also be noted that the 'safety' associated with the coal in this document was only limited to transport, storage and use, and did not account for any other potentially safe or unsafe features of coal.	Coal is not toxic or poisonous. It is not listed as a hazardous subsidence under any environmental legislation and there are no special requirements for its transport either by road or rail. The burning of coal has proven throughout the world to be a safe form of electricity generation. Coal handling, transport and storage is well known to be much lower risk compared to oil and gas.
1	While the perception that coal is cost-effective, the true cost of coal-use in power generation has not been realized. These costs include subsidies which amount to $53 Billion worldwide.	The Australian black coal industry is highly efficient and is not subject to subsidies such as those that apply to some European and other jurisdictions. Therefore the claim of coal subsidies is strongly refuted in terms of the Australian industry. Such claims have been used but never quantified or adequately justified, and are likely to derive from unjustified extrapolation from some European industry support programs. The Australian economy has demonstrably benefited from the mining industry and continues to supply wealth, as evidenced by the recent mining profits "super- tax" proposals.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	It is important to take into account all stakeholders and values associated with the final decision. There are many flaws in the arguments put forward in the EA. Although the interests of the proponent shareholders should be considered, the loss of $60 Million from the initial project costs is minimal compared with to the potential devastation that could result as a consequence of the project proceeding.	It is considered that the EA does not have flaws nor has it misrepresented the facts in anyway. The decision making process is inherently an independent process and takes into account a range of expert advice.
1	Cannot use the creation of jobs as a justification as other non-polluting jobs can be created.	The notion that mining jobs are polluting jobs is strongly refuted. Job generation is considered an important economic and social outcome associated with this soundly designed and thoroughly assessed proposal.
23. Location		
5	Project located too close to residents causing noise and dust concerns.	The surface development sites are considered ideally located being adjacent to main road and rail infrastructure, other existing and proposed industries and remote from residential areas. The project's EA clearly demonstrates compliance with regulatory requirements for noise and dust.
39	Infrastructure to be located next to densely populated area and planned urban growth areas. This will impinge on the planned new Warnervale City area and the Wyong Employment Zone.	The infrastructure locations were selected in consultation with Council and are situated in areas marked for future industrial and employment growth. They are not located adjacent to densely populated areas. The claim that the project would adversely affect WTC and the WEZ is a misconception and is not supported by the facts. W2CP is compatible with regional and local planning and development strategies.
2	The W2CP will be located in close proximity to schools.	The project is not located in close proximity to any schools. The Jilliby Public School is located within the mine footprint but will not be adversely affected. The closest school to the project's coal handling facilities is 3.5km away and will not be impacted.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The proximity to road and rail services would brand the area as a coal mining district.	The area has already been identified for future industrial and employment lands. The close proximity to roads and rail services benefits the community and environment by reducing the requirement to construct such infrastructure.
3	The coal mine is under prime agricultural land in the valley and threatens to damage it or render it unusable.	This will not occur as a result of the project. The land classification and land use status in the valley is addressed in the EA.
13	The coal loader and rail spur, stockpiles, ventilation shafts and gas drainage systems are too close to residential areas and potential public transport infrastructure due to health risks of increased airborne particulate matter and/or noise.	The infrastructure locations for W2CP were selected in consultation with Council and are situated in areas marked for future industrial and employment growth. They are not located adjacent to existing or future densely populated areas. This is a misconception and is not supported by the facts.
3	The coal loader rail spur junction is too close to residences in the western end of Blue Haven due to increased noise levels.	The surface development sites are considered ideally located being adjacent to main road and rail infrastructure, other existing and proposed industries and remote from residential areas. Noise and dust levels at Blue Haven are predicted to be well within regulatory goals.
1	Air intake shaft in proximity to an individual's property.	The air intake shaft will be a benign and passive component of the operation and is located within the Wyong State Forest. It will not be equipped with a fan installation and will simply draw air down into the mine. It will be a non-noise and dust generating facility.
3	Stockpile will be 700 m from nearest residents.	These residents are located on the western (opposite) side of the F3 Freeway and north of the Tooheys Road site which is on the east of the freeway. It is correct that the nearest residence is 700 m from the closest part of the facility. Noise and dust studies have indicated that the required noise and dust levels will meet current assessment criteria. It is also discussed in the EA that the criteria at these properties is higher as a result of the freeway.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Infrastructure generally too close to properties.	The main residential areas are located well away from the infrastructure sites. However there are some properties as detailed in the EA which are in closer in proximity but these properties are still effectively separated from the surface facility sites by timbered ridges and/or freeways. These have been the subject of the main impact assessment and modelling work covering air and noise emissions. Appropriate controls and mitigation strategies with adaptive management features have been designed specifically for these properties.
2	The location of the mine jeopardizes too many sensitive features such as waterways, ecology, health etc.	The mine surface infrastructure sites are ideally located. The infrastructure locations were selected in consultation with Council and are situated in areas marked for future industrial and employment growth. They are not located adjacent to densely populated areas. This is a misconception and is not supported by the facts.
1	Concerned about the negative environmental impact that the project will have on the Wyong State Forest area, referring specifically to the proposed Western Shaft Site, that borders respondent's property on Brothers Road.	The Western Shaft will be located adjacent to an existing forestry road but will require some vegetation clearing. This is detailed and assessed in the EA. Once constructed the site will consist of a fenced compound with secure hatch over the shaft. Being an air intake only, there will be no noise or other emissions from the facility.
1	Project should not be compared with an underground mine in Newcastle which has a mining culture. The mines on the central coast were small and the pit heads were not located in strategic locations which would cause problems.	The W2CP will be assessed on its merits. There is no value in assuming direct or undiscerning comparability to any other mines in Newcastle or other mining districts. Similar sized mines and two major power stations and their facilities have existed in close proximity to residential areas in the north of the Wyong Shire for decades. There are several existing (and former) cases of mining or power station sites located within 0.5 km of residential areas in the Wyong LGA.
1	The project will be located 3 km from the Blue Haven sports fields	The coal stockpile will be approximately 4.2 km from the sports fields.
24. Politics		

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
	Politicians will be immoral to approve the W2CP.	No comment.
1	Politicians don't care.	No comment.
1	The public cannot trust either governments nor can it trust mining companies or environmental reports.	No comment.
1	It is a grab for money by the governments.	No comment
1	Will the owners, once established, start dictating terms to the stare government and local councils?	No comment
2	The state government is putting money before the lives and health of the people.	No comment
1	How can the Australian Government allow the South-Korean Government owned company the rights to mine our pristine valleys.	No comment
1	Why should we trust Kores, we don't even trust our own State Government.	No comment
1	The State Government is extremely greedy	No comment
1	Including Professor Jim Galvin on the PAC is a conflict of interest in that he was a member of the earlier regional inquiry into mining in the Wyong LGA.	No comment

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
25. Community Consultation		
4	Lack of public consultation and/or information, and access to documents.	The EA's Section 10 outlined the extensive and comprehensive efforts in community consultation by the project. Fourteen (14) newsletters have been distributed to date through the region and all were available on the website (www.wallarah.com.au). A comprehensive website for W2CP was established in 2006 and is a dynamic presence, superseding the former website developed in 1999. The website includes copies of the EA and supporting documents as well as submissions to the Wyong Inquiry, media releases, minutes and presentations made to the Community Liaison Committee, and general information regarding the project.
2	Lack of consultation with landholders regarding work and infrastructure in proximity to their property.	The consultation program is described in Section 5.10.1.
1	Community has not been kept properly informed (e.g. supposed newsletter not available).	The project web page includes copies of the EA and supporting documents as well as submissions to the Wyong Inquiry, media releases, 14 newsletters, minutes and presentations made to the Community Liaison Committee and general information regarding the project.
1	Did not make entire document available for community examination.	This is not true. The complete document was available to the community both in hard copy and downloadable from the W2CP website.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Issues with website including inability to access minutes and newsletters.	There have been no complaints received regarding the website not being accessible at any time. As with all internet sites, there are short periods where some pages may be unavailable when new material is being uploaded. As the site was updated regularly, it is possible that this may have occurred when the respondent was trying to access certain material. It is possible that with the wealth of information and documents available on the website that the respondent had difficulty finding the relevant information they were seeking. All newsletters and minutes of the Community Liaison Committee are on the website as well as all presentations made to the CLC.
1	The website which contains information is almost impossible to find unless the name of the project is known and very few people know it.	The project has been promoted in the media using the name Wallarah 2 Coal Project for over 5 years.
1	Landholders not given long enough to respond to the EA (respondent received DVD 3 days before submission closed) making it impossible to do anything.	The DVD was an insert in a newsletter and was an initiative in addition to the normal advertising procedures for the EA. The Dept of Planning provided a 60 day exhibition period (double the normal duration) which was widely advertised and covered in local radio, TV and press. As stated publicly by the Dept of Planning at the Council's public forum in May 2010, submissions were able to be lodged after the close of the exhibition period, right up to the time of determination. The community and NGO representatives on the Community Liaison Committee also have a responsibility to inform their constituents and the community in general in relation to the project.
1	Lack of community engagement and consultation.	The consultation program is described in Section 5.10.1. It is considered that the program was extensive and enabled the community to understand the main elements of the project.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The advertisement for the lease and the mine D.A. in the papers did not fulfill the requirements of requesting and suggesting interested parties take part and comment because government contact officer was on holidays.	This process is one that is separate to the EA and the proponent and instead is organised by the Department of Industry and Investment (in relation to the mining lease application) and the Dept of Planning (in relation to the project application and EA exhibition).
5	The Environmental Assessment has failed to consult one to one with any affected landowner.	Consultation activities have been extensive as described in Section 5.10.1. There has been 14 newsletters distributed to date through the region and all were available on the web page. A comprehensive website for W2CP was established in 2006 and is a dynamic presence, superseding the former web page developed in 1999. The web page includes copies of the EA and supporting documents as well as submissions to the Wyong Inquiry, media releases and general information regarding the project. There have also been open days and individual briefings with a large number of community members. The web page has had an open invitation to any interested landowner to visit our offices for a full briefing on the project and numerous stakeholders/landowners have availed themselves of the opportunity for direct consultations.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
26. EA Document		
6	Media reports that large parts of the Assessment haven't been made available to the public.	Reports in the media suggested that information relevant to the Environmental Assessment for the W2CP had been withheld from the public were completely unfounded. The EA document met all of the requirements of the Environmental Assessment Requirements (EARs) issued by the DoP, and was subject to an Adequacy Review by the DoP before it was approved for public display. The process of Adequacy Review provided confidence for both the proponent and the general public that the EA document contained all of the information necessary for the project to be assessed. The entire content of the EA document, and all of the specialist reports appended to the main EA document have been made freely available to the public in the following ways: ❒ electronically at the DoP website; ❒ electronically at the W2CP website; ❒ electronically on an interactive DVD from the W2CP team on request; ❒ in hard copy on display at Wyong Council Chambers; ❒ in hard copy at the Nature Conservation Council, Sydney ❒ in hard copy at the offices of the Dept of Planning in Sydney; ❒ by direct distribution on demand, including to the Community Liaison Committee and other stakeholders who requested a copy.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The proponent has failed to comply with a number of the Director General Requirements as identified in detail by the Australian Coal Alliance. In particular, the Director-General's Requirements called for "a detailed assessment of the project on the capacity, safety and efficiency of the: - surrounding rail network, having regard to the strategic objectives for passenger and freight rail network (such as the Northern Sydney Freight Rail Corridor project)"	A Rail Capacity Study prepared by Rail Management Consultants Australia Pty Ltd (RMCA) which is available on the project web page. This report was prepared in response to a request from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can comfortably run between the mine and the port, which can be executed by 2 conventional train consists of the coal schedule 2 makeup. This rail capacity will readily cater for the expected production output of the W2CP. W2CP would require only about 6 out of the 260 available daily train paths. RailCorp support the findings of the completed rail impact assessment.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
2	Question the independence and knowledge of EA studies / authors.	The author of the Environmental Assessment document and manager of the assessment process has been preparing such documentation for large scale mining projects for over twenty six years, with a proven track record and excellent reputation. All of the specialist sub-consultants employed to assess various aspects of the project were employed because they are experts in their field. While they do receive remuneration directly from the proponent for their work, it is paramount that they conduct their assessments with independence and professionalism at all times to ensure they maintain an excellent reputation within the industry, which is the primary reason why they enjoy long term, stable and successful careers and businesses within their specialist fields. In addition, the EA document and specialist studies will undergo thorough scrutiny by the DoP, other government departments, other industry experts and an independent panel of experts, all of which are independent and removed from the proponent and will not receive any compensation from the proponent for such reviews. This check of the accuracy of information presented, assessments and recommendations made for the project provide the general public with assurance that the W2CP is assessed on its merits and has the ability to carry out the proposal with minimal harm to the environment and community.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The publicly announced process provided for a review of the adequacy of the EA by the PAC and the DOP before exhibition.	The EA was subject to intensive review by several government agencies including the Department of Planning, Department of Environment Climate Change and Water, NSW Office of Water, NSW Department of Health, Department of Industry and Investment. Matters raised in the review process were incorporated into the final EA document.
1	Notified that the EA was on public exhibition three days before the display period ended.	The responsibility to advertise the EA display period rests with the DoP. Notification of the display period for the W2CP EA was in accordance with the statutory requirements of Part 3A of the EP&A Act. In addition, DoP has advised that submissions will be received until the time of determination. In a proactive step taken by the proponent to further enhance community consultation associated with the W2CP, a newsletter advising of the progress of the W2CP through the planning process was sent to all residents within the mining area, Blue Haven and residents surrounding the surface facilities. An interactive DVD was also provided as a means of giving easy access to the EA documentation. Media coverage in local radio, TV and press was undertaken by the W2CP.
2	EA is one sided and does not address the negative impacts on the community.	The EA (Section 10) clearly assessed the impacts on the community. Refer to Section 5.15.1 of this report.
1	The assessment doesn't deal adequately with the issue of contrary hydro-geological advice that says that the mine will devastate the water supply, or scientific and medical advice that says that the coal dust will create major air pollution and health issues for miles and miles around the coal loading facility. It does not deal with issues related to traffic and effects on road surfaces, safety and congestion nor with industrial noise and traffic noise.	The EA dealt comprehensively with all of these issues listed. These issues are further discussed in Sections 5.1; 5.2; 5.3.1; 5.6; 5.7; 5.8; 5.10; and 5.11.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The EA does not deal adequately with the issues of coal dust water pollution and its ramifications for the fishing industry.	The issue of coal dust emissions was addressed comprehensively in the EA in Section 12 and water pollution mainly in Section 9. No ramifications were noted for the fishing industry from alleged coal dust water pollution. Specific assessment of the fishing industry was not included in the EA as there is no credible potential for impact that coal dust from the W2CP would have on the local fishing industry.
1	The EA does not assess the implications for employment of clean-industry facilities in the region being unable to continue operations in a dirty environment.	The inference is that the dust generated will keep other industries such as food processing away from the area. This is unsupported by the facts. The existing food warehouse (Woolworths complex in the WEZ) is located immediately next door to a concrete batching plant and heavy transport terminal. The EA (Section 15.2) indicates that impacts on other industrial lands and land use opportunities are not significant.
1	The EA needs to be done again, properly this time and with community consultation.	This is strongly refuted as there has been comprehensive assessment by experts and sufficient consultation with community members.
1	There is no comment about the effects of long wall mining around the world.	The W2CP has been assessed on its merits and in relation to the particular environmental issues of the proposed mining area in the Central Coast.
1	The EA does not address what is to be done with the non-coal material that is mined.	Material generated from the drift construction will be used at the Tooheys Road site as construction fill. There may be some inert igneous geological intrusion material encountered during mining which will be disposed of off site in an approved landfill. This aspect was included in the EA and assessed in Section 2.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	EA does not state how and where gas flaring will occur, nor does it state what quantity of gas is commercially viable, to indicate when flaring will cease.	This is discussed in Section 2.11 of the EA. Collected gas from the underground workings will be brought to the surface at the Tooheys Road site for processing as shown on Figure 2.23 of in the EA. In the initial years of operation it is unlikely that sufficient quantities of gas will be produced to allow commercialisation of the resource. The collected gas will be flared during this time. Flaring will occur as early as practicable during this interim period and this will provide a major greenhouse emissions reduction as will the longer term beneficial use of the gas such as for direct gas distribution or use in power generation.
29	The EA does not consider all the impacts of the development.	This is disputed. The EA has considered the impacts of the W2CP within the context of its surrounding environment and through a comprehensive risk assessment process that has dealt with key environmental considerations. The project has been adapted to conservatively meet existing assessment criteria as well as current best practice in environmental management.
2	The EA should not have gone to public exhibition before scrutiny by a Planning Assessment Commission.	This is a matter for the Department of Planning to determine as it is outside the control of theW2CP.
1	Just a glossy report which was incorrect in every point that it dealt with and did not address any truthful concerns.	This is an unsupported statement that is strongly refuted. The EA was prepared by experienced professionals in accordance with relevant guidelines.
1	The Resident Survey report is flawed and should be rejected as applicable to the EA.	This is an unsupported statement that is strongly refuted. Normal professional methodologies were applied to the Resident Survey and other social impact assessment work.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The EA is a flawed document due to limited groundwater baseline data, doesn't account for rock fractures in the Patonga Claystone and exacerbation of existing transient pathways.	This is refuted. The EA dealt comprehensively with geological and groundwater issues in Sections 2.7, Section 6 and Section 8. Further discussions on these issues are provided in Section 3 of this report. There is sufficient baseline data as confirmed by the independent expert (Sinclair Knight Merz) which was commissioned by the Department of Planning to undertake the Wyong Water Review.
1	The EA document has been written so that the reader is deceived into thinking that the proposal has been assessed and approved.	This is not true. The EA is clear that the project is at the assessment phase and was written by experienced professionals in accordance with relevant guidelines.
4	Kores has not studied the region well enough and the EA is not thorough in exploring problems relating to water and air pollution.	This is disputed. The EA contains several years of data covering air and water quality in the region and this was used to establish existing background data for use in the assessment of impacts of the W2CP.
1	The four volume structure of the EA was pieced together unprofessionally, was not sequenced, lacked logical page numbering and was therefore difficult to address. Most readers were likely to miss information that was pertinent to their response.	This is disputed. The EA Table of Contents shows a logical progression from development description through to the key environmental issues of subsidence, regional water supply, groundwater and flooding. The EA then describes social issues which lead into the main emission type impacts of noise, dust and traffic. The EA then describes separately the issues of ecology and archaeology and finally the draft Statement of Commitments and a summary of the document. The other separate volumes contain all the specialist reports with each volume containing a contents page for easy reference.
27. Miscellaneous		

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
12	The impact of vibration, subsidence and flooding from mining on learning and the stress on the school children from their homes and farms being subsided, along with the increased flood levels has not been considered.	It is agreed that the process of mining approvals and the perception that the impacts will be greater than reality can cause stress on the community. A large component of this stress relates to the extended approval process and the misinformation provided by opponents to the project. Vibration impacts are not likely to be associated with the project. In physical terms, impacts on school children from subsidence or locally enhanced flooding risk are expected to be negligible.
1	There is no historical perspective, or comparison with other areas.	The point being made is unclear. The W2CP has been assessed in terms of its current situation, surrounding environment and matters of relevance to the local community. Some assessment elements that have been developed for other mines have been used in the assessment but only to the extent they are relevant. Mining and other land use history and context is provided in Section 15.2 of the EA and technical studies such as subsidence (Section 6) make reference to other areas as part of model calibration and development.
1	Appears to be a lack of desire to commit to a truly independent inquiry into the effects of this type of mining so close to a community.	This is not the case. The W2CP has been subject to an independent Strategic Inquiry, public review, expert scrutiny, and will be subject to an independent expert panel inquiry by the Planning Assessment Commission (PAC). W2CP welcomes any independent assessment of the project.
1	There does not appear to be any evidence to indicate that any underground mine anywhere on our planet has caused anything but damage and destruction to virtually all features and conditions of value which existed prior to mining.	This perception is refuted.
1	Neither the proponents nor the State Government has identified how or how much will be available for claims for damage done to infrastructure. Is it to be paid for by the local residents?	Any damage to land improvements, be they private or public, is rectified by the Mine Subsidence Board at no cost to the landowner.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	There has not been enough media coverage to the entire Central Coast. People are not fully aware of the impact of the mine on the environment.	W2CP has been an active media participant throughout the project. All media releases and newsletters have been made freely available on the company's website.
1	Where are the mine boundaries?	The mine boundaries are shown on Figure 1.4 of the EA. The figure is entitled Project Application Area and shows the entire mine footprint and surface facility sites.
1	The battle over this mine will be fought in the courts if it goes past the current assessment point. The Kores application contains a complete list of every act or standard it must comply with under the Director General's Requirements. Most of this can be opposed in court and injunctions to stop the project can be granted under Acts which do not contain the restrictions imposed by the Environmental Planning an Assessment Act on projects of State Significance.	No comment.
1	The DVD does not mention where the coal goes and who will benefit the most (a Korean company and the Australian Government).	The DVD is an overview presentation on the project and in particular tries to depict the underground mining environment as this was considered necessary in the consultation process. The DVD refers to coal transport by rail to the port. The EA (e.g. Section 2.12) outlines that the product coal will be used in domestic and overseas power stations.
1	If water is pumped from the mine for dust suppression it may be highly saline and or carry pollutants which will seriously damage the environment.	All water pumped from the mine will be treated in a Reverse Osmosis Plant and reused.
1	The need for increase in council services.	Should this be substantiated then it will form part of a negotiated package as normally occurs with project approval conditions.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Resident claims to have not been informed of the depth of the workings.	This has been provided in the EA. Depth of overburden cover above the coal seam over most of the proposed mining area ranges from approximately 350 m to 550 m, increasing to a maximum of 690 m below some heavily timbered, steep sided hills separating the Yarramalong and Dooralong Valleys.
1	Perception that the public is being lied to in terms of the amount of damage that the mine will cause to the environment. Argument that shiny brochures, glossy documents and well presented DVDs hides the fact that everything will be ruined.	It is unfortunate that the information provided has been perceived in this way. The information provided to the community has been accurate and provided in good faith. It is considered that there is nothing in the EA that could be conceived as misleading.
1	The sheer quantity of shipping required to move coal in its raw form is huge, as its value per volume is low. This increases the risks associated with shipping in ratio to the economic gains from its exportation.	The coal quality is such that further processing is not required to meet export market specifications. This in fact improves the value of the coal as it reduces its costs of production. Coal is a routinely traded and transported commodity at prevailing international market prices.
1	The DVD is one-sided and suggests that noise and air pollution will not exist.	The DVD does not suggest this but rather that the mine can meet the targets and goals necessary for the project to obtain approval.
1	Kores does not have a good track record regarding following best practice within their mines. The area they want to place their long wall mine is fragile.	This assertion is strongly refuted.
1	AS 4360 recommends that representatives of all stakeholders be involved in the risk assessment process, this has not been done and thus the risk assessment should be rejected.	The risk assessment included members of the entire study team where every environmental discipline employed on the project was represented. The respondent's interpretation of the use of the risk assessment for the purposes of the EA is refuted. The EA's risk review is actually subject to public exhibition and potential comment by any stakeholder.
1	Fissures will occur as a result of extraction.	This statement is not supported by the extensive geological and geotechnical assessments provide the EA.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The applicant fails to indicate that this particular application does not cover the whole of the proclaimed mine subsidence area. The application needs to be considered as a whole, not just as a part.	The project application covers the proposed mining area. It is correct that this does not cover the entire mine subsidence district as there are geological, economic and environmental constraints to the mine plan which imposed barriers to future extraction feasibility in some areas.
1	Coal seam methane oxidation and venting into the valleys will create severe environmental degradation endangering terrestrial and aquatic habitats, destruction of potable water resources and soil poisoning.	No venting of methane into the valleys is proposed however trace amounts of methane will occur in the release of mine ventilation air that circulates throughout the mine for safe working conditions. No impacts on habitats or water quality will arise from this activity. Mine planning and scheduling have taken account of gas drainage methods that propose both pre-mining and post-mining operations. Pre-mining gas drainage will include drilling of boreholes underground within the coal seam ahead of mining and post-mining gas drainage will involve the capture of gas from sealed mining areas via underground pipelines. The gas drainage will be undertaken within the mine without the need for surface to seam boreholes. Any gas migration to the surface is extremely unlikely due to the very tight and impermeable geological conditions prevailing as well as the negative pressures imposed by the deep gas drainage system.
1	The coal is sulphurous, watering down the stockpile will create sulphuric acid which in turn will create heat which could ignite the coal in the stockpile.	The Wallarah Seam is inherently low in sulfur and will not cause acid formation during dust suppression. The issue of spontaneous combustion has been discussed in the EA and management practices will be employed to minimise the risk in line with current best practice.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The risk assessment analysis is flawed as it is based on the fact that all the controls measures that are put in place operate successfully.	The risk assessment process does assume that mitigation measures, if required, are employed. The assessment includes the risk of abnormal events, such as mitigation measures failing. In this case, if considered warranted, additional back up provisions are included. However, the work for assessing the impacts stemming from the priority listing of the risk analysis was able to apply particular conservative conditions for the purposes of understanding the resultant range of impacts and consequences. For example, the dust emission modelling in the EA assumed that there was no dust suppression in operation on the coal stockpiles, thus providing a very conservative estimate of air quality impacts from the project.
29	The EA does not consider the impact of vibration.	There will be no blasting required for the project or construction phase however vibration from earthmoving plant has been assessed and shown to comply with relevant goals. If blasting is required the assessment has shown that the ground vibration goal and air blast over pressure can be satisfied with the employment of controlled Maximum Instantaneous Charge weights.
1	Land loss and degradation.	The project will not lead to land loss or degradation of agricultural land.
1	No amount of risk management will prevent catastrophes from occurring. The mine will go for 40 years which is a long time to jeopardise the community. Refers to recent damage to Great Barrier Reef caused by tanker and the Pasha Bulka grounding near Newcastle.	All industrial activities carry risk, however with effective risk management as is carried out in the mining industry, the risk of catastrophic events is significantly reduced and subject to stringent management measures. The residual risk is considered low but with any development proposal, the approval process takes this into account in the final decision and any conditions that may be attached to the approval.
1	Disruption to expensive/sensitive racehorses.	There are no horse studs in the impact zone around the surface facilities. Nevertheless, the project assessment demonstrates that the potential for adverse impacts on nearby land uses is very low and relevant management and mitigation measures will apply.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Salt levels will rise leading to degradation of grazing land.	No elevation in soil salt levels is forecast or any degradation of grazing land. This is not considered possible given that the deep valley alluvials do not have high salt concentration. Elevated salt levels occur within the hardock at depths within the mining zone and there is no potential for this material to rise to the surface.
1	Concern that decisions are being made by people who do not live in the area and don't have concern for the people of the region only money from the project.	Planning review and independent technical expertise will be used to inform decision-makers. No other comment can be made.
1	The whole process is flawed.	This is an unsupported statement and is refuted.
2	Is there adequate infrastructure to cope with increased people and workforce.	This is largely a matter for State planning. There are several proposals involving increased employment lands in the district. Strategic planning work has directed that industrial and residential development areas be located in suitable areas and supported by appropriate infrastructure upgrading. The EA outlines that a major training and education program will be required to help meet the project's 70% local recruitment target and local educational resources and infrastructure will be engaged to assist in this program.
1	Unsuitable infrastructure to support this mine.	The W2CP has been designed to minimise its impacts on the existing infrastructure. The mine will be self sufficient in many regards and will be required to construct its own power line feeders, recycle water rather than connect to the existing town water system and bring in all remaining services such as telecommunications. These services once established will provide benefits to other industries which will develop in the future.
1	What benefits will the people of the central coast receive as a result of the project?	The economic assessment documented the increase in economic activity and employment caused directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Will sacred sites, and areas of ecological sensitivity and environmental importance be protected from coal mining?	Ecological endangered communities and Aboriginal Heritage are protected under both State and Federal legislation. The project is required to satisfy this legislation.
1	Risk mitigation – the want for everyone involved in the proposal to be accountable to the people of the central coast.	Accountability is an integral component in development approvals as well as other legislation relating to the operation. This includes personal liabilities in the event of breaching pollution control legislation.
1	Lack of information – 'packages' from Coal & Allied not received.	The comment is unclear but W2CP understands that it relates to another mine development proposal in the north of Wyong LGA.
1	Longwall mining will negatively impact on the ability of the landscape to provide (water especially) services 'forever' for short term gain.	This is disputed, as further discussed in Section 5.1.3 and 5.2.
1	Jilliby residential precinct will become an industrial zone.	This will not occur as a result of this project.
2	EA is misleading regarding zoning issues by using significantly outdated information from 1991. This in effect hides Wyong Shire Council's decade long issue of undecided zoning classification along Bushel's Ridge Road.	There is an issue with zoning along Bushel's Ridge Road that has resulted in some local residents not having a clear understanding of their future zoning. It is hoped that this matter can be resolved with Wyong Shire Council however it is outside the control of the W2CP.
1	If we mine coal we will ruin all the trees which leads to no timber or paper and no animals which leads to the end of the human race.	Coal mining has been undertaken for centuries and has facilitated advancements in the human race and improved our way of life. No further discussion is provided.
1	Australia has a very large export of beef and if we mine too much we will end up killing all our cattle and Australia will lose all our money. Then we may become a third world country which will create disease and death to many people. Starvation will start and our continent will become a giant graveyard.	Coal mining has been undertaken for centuries in Australia, during which time the export beef industry has developed and expanded. No further discussion is provided.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	The project will cause animals to lose homes, trees to die and the environment wont recover fully for at least another 200 years.	The 200 year recovery discussed in the EA refers to the deep hardrock aquifer system not the shallow alluvial system which forms part of the water supply system or any other environmental aspect. The EA demonstrates that flora and fauna are well protected in the proposal.
1	The unincorporated effect of global warming renders the flood studies useless, therefore the flood studies must be redone and the flooding/subsidence section of the EA rewritten	The flood studies take account of the incremental change caused by the project. Climate change or increased rainfall, rising sea levels and the like do not alter the outcome of the flood study. The scale of the incremental change to flood conditions resulting from the mining development is independent of and will not be affected by climate change.
1	Who is going to compensate us, our roads etc.	The project will be required to enter into an agreement with Wyong Shire Council regarding contributions to be made to local infrastructure and services. This process is controlled by legislation.
1	Lack of transparency from the mining company and State Government.	This is disputed as the project assessment process is comprehensive, rigorous and transparent.
1	Why, if you have so-called experts from Australia, do we have to have more experts from overseas undertake a 'peer' assessment?	No comment.
1	The history of coal mining in NSW in particular indicates that they (W2CP) will devote the absolute minimum of money and effort in implementing mitigation measures.	This is not correct. Mitigation strategies outlined in the EA will form part of the project approval and must be implemented.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Want to hear that the risk assessment is pessimistic one, with the issues of water and air quality at least being mitigated at the level of worst case scenario.	The risk assessment was undertaken in accordance with NZS 4360:2004, the Australian/ New Zealand Standard for Risk Management and HB 203: 203:2006 Environmental Risk Management – Principles and Process (Standards Australia). The work for assessing the impacts stemming from the priority listing of the risk analysis was able to apply particular conservative conditions for the purposes of understanding the resultant range of impacts and consequences. For example, the dust emission modelling in the EA assumed that there was no dust suppression in operation on the coal stockpiles, thus providing a very conservative estimate of air quality impacts from the project.
1	Lodged a submission to the Inquiry into mining in the Wyong LGA and many of the issues raised have still not been fully addressed and are still relevant.	The Wyong LGA Inquiry made a number of recommendations. Those recommendations involving actions by the W2CP have been undertaken.
1	The mine is still a legal nightmare, any efforts to force this through will do unrepairable damage to the reputation of mining and any government that backs this proposal.	This is strongly refuted.
1	NSW is not directly entitled to royalties on coal under the Australian Constitution.	No comment.
1	Vesting of the ownership of coal in NSW by the NSW State Government is based on legislation which is not on “just terms”.	No comment.
2	A Class Action by Landowners whose properties lie over the proposed W2CP and have land titles that do not exclude coal would stand a good chance of success. The case would focus on actual ownership of the coal by land holders being lost to a foreign company without compensation.	No comment.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Respondent has designed a system to keep dust out of residential properties and believes the NSW government could be forced to pay for the installation of such devises.	The dust studies have shown that the level of dust at the nearest residential receptors will meet current assessment goals.
1	The Minister has a clear statutory responsibility to protect Flora, Fauna, Fish and scenic attractions under Section 237 of the Mining Act 1992. In this environment the Minister cannot approve this scale of mining in this location and still comply with the Mining Act.	This is an unsupported statement and is refuted.
1	Although the EP&A Act has been amended to allow projects to proceed without the normal planning processes it has not been amended to protect the state against compensations claims.	No comment.
1	The mine is an immoral act committed against a community for money. It breaks down the ethics on which western society is based and right and wrong become merged.	No comment.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Three major transmission lines which transport power to Sydney run right through the middle of the area to be mined. This is a huge mine and a major subsidence event could affect an area up to 2 km in diameter. At some points all three sets of towers are just over a kilometer apart. If the surface on which these towers rests was disturbed in a major way, these transmission lines would become inoperable. This could have devastating effects on Sydney.	Two transmission lines operated by TransGrid cross the proposed mine area. Calculations of subsidence, tilt and strain at each tower and bay length changes between the towers were issued to and discussed with TransGrid in 2006, 2007 and 2008. The proposed mine layout and the predicted levels of mine subsidence movements at the transmission lines and towers has not changed significantly since January 2007. Preliminary investigations indicated that all but two of these towers can be managed using strategies, such as the installation of cruciform footings and adjustments to cable, etc. that have been successfully applied elsewhere, with the remaining two tension towers requiring special consideration. Neither of these towers however is affected until up to some 20 years into the project life, so it would be premature to develop a detailed management plan at this stage. Further consultations and detailed investigations will be undertaken during the Subsidence Management Plan process which allows for sufficient time to undertake any necessary mitigation works to tower structures well in advance of mining.
1	Aboriginals have an interest in the land on which the coal is to be dumped for loading on to rail. They have not been consulted. The proposal may not go ahead without their consent.	This information is incorrect. Discussions have been held with the Darkinjung Aboriginal Land Council representatives throughout the planning and development process in relation to land access and other matters. Finalisation of lease arrangements for the rail access corridor can only occur once project approval has been secured.
1	The area for the building of the rail loop to meet the main northern line has to cross land owned by the local Aboriginal people who have, as yet, not agreed to such a rail line.	See above.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Lack of carbon offset for 28 to 42 years.	There is currently no requirement for carbon offsets for the project. It should be noted that the Wallarah seam is important to countries in the meeting of greenhouse gas emission targets as it produces less carbon dioxide per energy output compared with many other coal types. The W2CP is also targeting greenhouse gas management through methane capture and utilisation and other initiatives such as energy efficiency measures .
1	Lack of comprehensive risk assessment.	The risk assessment contained in the EA is considered comprehensive and meets the requirements of NZS 4360:2004, the Australian/ New Zealand Standard for Risk Management and HB 203: 203:2006 Environmental Risk Management – Principles and Process (Standards Australia). Refer Attachment 3 to the EA.
1	Although supporting the project, the respondent wanted to remain anonymous for fear of retribution from the Australian Coal Alliance. Responded noted that others in the area feel the same but are too worried to speak out against the ACA.	Noted.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	Respondent owns a 552 acre property which: ❒ adjoins Mardi Dam; ❒ is within the Dam Safety Committee control area ❒ is included in the Mines Investigation Lease area; ❒ falls outside the area designated in the Mines Plan area ❒ is South of Wyong River; ❒ is presently included in the new Settlement Strategy being prepared for the Shire by Wyong Shire Council. Respondent then refers to the recommendations of the Independent Panel of Review into the Wallarah 2 Mine which states "it is unlikely that coal south of the Wyong River will ever be mined (as a consequence of its location, depth, and distance from mine head) and that those areas should be removed from the Mines Subsidence Affected Areas. It is urged that this recommendation be adopted to enable more flexibility for current and future land uses, as well as more economically productive outcomes in the event of land use changes under the new WSC LEP presently being prepared.	This submission and supporting documentation involves a property located well outside the proposed mining area but still within the Wyong Mine Subsidence District. Should the W2CP gain approval and secure a Mining Lease the boundaries of the lease will not affect the subject property. An application to modify the Mine Subsidence District boundary to remove building restrictions on this land should be made to the Mine Subsidence Board for consideration by the land owner. This is not a matter which W2CP would be involved with.

Table 4. Summary of Public Submissions made on the W2CP

Number of times raised in Submissions	Summary of Issue Raised in Submissions	Brief Response and Where the Issue is Addressed in this Submissions Report or EA
1	There are no members from the Blue Haven area on the Coal Liaison Committee and this oversight needs to be remedied as the issues there are very different to those of the valley people and they need to be looked into.	The Community Liaison Committee (CLC) was formed in the early exploration period as required by a condition of the grant of exploration licences by the then Department of Mineral Resources. The issue of representation from Blue Haven was raised in previous meetings of the CLC (from September 2007) by the Wyong Shire Council's Ward Councillor for the area, Mr Greg Best. The CLC Chairman advised at the CLC meeting of October 2007 that the representation on the Committee was not needed to be changed at this stage as there had already been additional community representation on the CLC from those who already purported to represent the community including in the Blue Haven area. One community representative on the CLC also volunteered to join the Blue Haven objector group so as to offer to act to be the group's representative on the CLC. It is understood that this constructive offer was not taken up by the group from Blue Haven. In terms of the project's future committee arrangements for community liaison, upon project approval the CLC will be superseded by a formally established Community Consultative Committee (CCC) as required under the project approval conditions and in accordance with relevant guidelines by the Department of Planning.

3. Responses from Organisations and Elected Representatives

This section provides detailed responses to the following community (non government) organisations and elected representatives:

- Australian Coal Alliance
- Stop Korean Mining
- Jilliby Stage 2 Land Owners Action Group
- Rivers SOS Alliance
- Wyong Regional Chamber of Commerce
- Climate Action Group Central Coast
- Greg Piper MP (Member for Lake Macquarie)
- David Harris MP (Member for Wyong)
- Construction Forestry Mining and Energy Union
- Newcastle Greens
- Total Environment Centre
- The Hon. Jodi McKay MP.

The W2CP responses are highlighted in blue and are generally summaries of the main responses found in Chapter 5. The responses have been cross-referenced to Chapter 5 to avoid unnecessary repetition.

3.1 Australian Coal Alliance

The Australian Coal Alliance (ACA) is the incorporated body representing the Central Coast community in opposing the Wallarah 2 Coal Project. The ACA is concerned about impacts that coal extraction from beneath the water catchment valleys could have environmental, health, economic and social conditions on the Central Coast

The key issues raised in the submission from the ACA are:

- There is no evidence of any recognition in the EA of maintaining the clearly laid down Charter for A New Approach to Natural Resource Management, and the project presents unacceptable environmental damage in contradiction to this Charter, associated NSW Acts and Regulatory conditions and is contrary to the provisions as set out in the Commonwealth National Water Initiative 2004.

Response:

The W2CP meets the provisions of NSW Acts and Regulations as well as the Commonwealth National Water Initiative which states "In Australia, water is vested in governments that allow other parties to access and use water for a variety of purposes – whether irrigation, industrial use, mining, servicing rural and urban communities, or for amenity values. Decisions about water management involve balancing sets of economic, environmental and other interests. The framework within which water is allocated attaches both rights and responsibilities to water users – a

right to a share of the water made available for extraction at any particular time, and a responsibility to use this water in accordance with usage conditions set by government. Likewise, governments have a responsibility to ensure that water is allocated and used to achieve socially and economically beneficial outcomes in a manner that is environmentally sustainable."

The project has sought and achieved its stated objectives that it would not put forward a proposal which would impact on the functions and operation of the Gosford Wyong Water Supply Scheme. These issues are further discussed in Section 5.2 and Section 5.3.

- Concern that fugitive coal seam gas venting throughout mining zones will generate anoxic conditions through migrating methane oxidation heating the soil and consuming oxygen.

Response:
Coal seam gas drainage will be undertaken within the underground mining area. The gas drainage system will capture the majority of the methane contained within the coal seam insuring that "fugitive gas" in the mining zones is restricted to low background levels. This is an essential requirement for the provision of safe mine operating conditions and is required under the mining legislation. The residual methane gas at these low background levels is not capable of producing anoxic conditions.

The methane gas will be piped to the surface where it will be initially flared until such time as commercially viable quantities are available for alternative uses.

- There are many significant areas of the EA where technical investigation is incomplete or does not address or comply with the Director-General's requirements.

Response:
This generalised statement is disputed.

- The EA went on public exhibition prior to PAC review, contrary to advice to WACJV from the Department of Planning.

Response:
This relates to Government processes and is a matter outside of W2CP control. However, W2CP notes that the EA was subject to intensive review by several government agencies including the Department of Planning, Department of Environment Climate Change and Water, NSW Office of Water, NSW Department of Health, Department of Industry and Investment. Matters raised in the review process were incorporated into the final EA document.

- W2CP modelling has failed to demonstrate any evidence of comprehensive risk assessment of key issues - the overall impacts from physical subsidence damage to unconfined and coal seam aquifers, shallow groundwater aquifers, depressurisation and associated water regimes, high conductivity of water flow, fugitive drainage and connectivity flow.

Response:
The EA fully documented the many risk assessments undertaken for the project. The results of the modelling and assessment for a variety of environmental factors and for proposed construction and operational conditions have also been provided in full as part of the EA.

- W2CP have not presented any definable proposals that will satisfy the net benefit test, ecological sustainable development and public interest.

Response:
This is not correct.

The economic assessment documented the increase in economic activity and employment caused directly and indirectly by the proposed development. This work was undertaken independently by the Central Coast Research Foundation and is contained in full in the EA. Other benefits stated in the EA are the commitments made by the WACJV to improve water recycling, treatment and reuse, increased employment and community enhancement programs that will provide security / training / benefits for the local community, and the Ecological Offset Strategy that will assist in local and regional conservation.

The EA provides a range of proposals which are designed to improve the environmental condition of Jilliby Jilliby Creek including a Riparian Zone Enhancement Program. This program will be designed specifically to reduce the current weed infestation and bank erosion problems evident in many sections of the creeks. These programs will be developed in close consultation with individual landowners. Advice will be sought from the Hunter-Central Rivers Catchment Management Authority, Wyong Shire Council and Department of Environment, Climate Change and Water. Landowner privacy will be maintained at all times.

The W2CP sought input from the ACA into the proposed Community Trust to be set up and funded by the W2CP. The ACA elected not to provide any input.

- The EA has not considered the development of the Wyong Employment Zone, in particular the impact of fine wind-blown dust particulates in the clean-food industries.

Response:
This is not correct. The EA has considered the WEZ development in particular in Section 15.2 and has taken the fundamental requirements of this zone into account in the project design. The EA has also

comprehensively assessed the potential dust emissions from the project and compliance with regulatory criteria for surrounding was demonstrated. The W2CP will not detract from the future development of the WEZ and if anything will provide a positive element to many businesses as has occurred with other coal mining developments. Liaison has been undertaken with Woolworths management and other business stakeholders associated with the WEZ. It is noted that the existing state-of-the-art Woolworths facility is located adjacent to a concrete batching plant and heavy vehicle transport terminal.

- The EA does not adequately assess Land Capability as it assesses Agricultural Suitability but not Rural Land Capability.

Response:
The Environmental Assessment (Section 15.3) used the approved method as used by the NSW Department of Agriculture to determine the suitability of land to support agricultural activity. The classification system considers climate, topography, soil characteristics, erosion, cultural and physical requirements for various crops and pastures and existing socio-economic factors such as infrastructure.

- There is no assessment of the post-mining agriculture and rural capability – i.e. what is the risk of the pre-mining classifications being changed by the project?

Response:
No changes to land capability will occur as a result of the project other than for that land used directly for the surface infrastructure.

- It is unclear as to who the author of the Land Management Section of the EA is, and therefore transparency is not evident.

Response:
This component of the EA was prepared by International Environmental Consultants Pty Limited. It also includes input by relevant experts in land zoning, land use, and visual assessment.

- The full Land Management report is not contained in the appendix, and there is no reference in the abridged version to the full report.

Response:
All data and information necessary for this component of the EA are provided in Section 15 of the EA, covering visual assessment, land use and regional planning context, soils and land capability, bushfire risk and airport planning constraints. Appendices J and K are full reports that are summarised in this section of the EA.

- The project is detrimental to the future of the Central Coast region.

Response:
This is strongly refuted and is an unsupported statement.

- PAE Holmes have clearly not taken into account the Requirements of the Department of Environment and Climate Change contained in a letter from Mr. Peter Jamieson, which states that the Air Quality Impact Assessment 'should take into account cumulative impacts associated with existing developments.'

Response:
This statement is not correct. The assessment has included cumulative impacts from other dust sources in the region. Detailed assessment by air quality specialist PAE Holmes concludes there will be no significant impact on the local air quality. The project will meet all current dust emission criteria. The assessment has included cumulative impacts from other dust sources in the region. Refer to Section 5.6.

- The risk to human and animal life due to the increase in flood levels and frequency due to subsidence and in light of the rising sea level has not been included in the risk assessment.

Response:
The project's mining area surface lands and surface facilities are well above current and future sea level influence. However, the flood study has assessed the incremental change (both positive and negative) as a result of subsidence and this incremental change is not affected by changes in sea level. The mining area is located to the west of the main rail line and F3 Freeway. Accordingly, concerns regarding land use management in relation to sea level change present a far greater priority in residential areas and for public infrastructure in coastal waterfront areas in the region.

- Location of venting facilities in State Forestry areas is an unseen public danger in remote bush forested areas.

Response:
The ventilation shaft located in the Wyong State Forest will be secured by man proof fencing and capped with mesh removing the risk to public safety. Similar facilities are located in many areas throughout NSW.

- The Benefit Cost Analysis Results of W2CP are pure conjecture and of little if any value whatsoever.

Response:
The Benefit Cost Analysis was undertaken by Gillespie Economics based on data provided by the independent Central Coast Research Foundation and the W2CP. The study methodology adopted current assessment practices.

- The strong argument that an extractive industry will bring benefits to the State and local economy is highly questionable when put into perspective with the potential negative impacts on families, health, environment, tourism, local industry and small business.

Response:
This is strongly refuted and is an unsupported statement.

- ❒ Adequacy of EA

Response:
The EA document met all of the requirements of the Environmental Assessment Requirements (EARs) issued by the DoP, and was subject to an Adequacy Review by the DoP before it was approved for public display. The process of Adequacy Review provided confidence for both the proponent and the general public that the EA document contained all of the information necessary for the project to be assessed.

The above issues of the ACA submission are further outlined in the following sections.

3.1.1 Water

- ❒ Longwall mining beneath the Dooralong and Yarramalong Valleys threatens the regional water supply catchment, including surface water and groundwater systems.

Response:
The mine will not compromise the regional water supply cathment or surface and groundwater systems. The design of the longwall mine layout incorporates numerous measures to protect sensitive natural and built features and to ensure impacts are mitigated and managed. Refer to Section 5.1.

- ❒ Effects of longwall mining, including subsidence and depressurisation of the aquifers throughout the water catchment valleys will compromise the integrity of the major water resource for some 310,000 people, and the future needs for a growing population.

Response:
The project will not compromise the integrity of the water supply regime. The extent of the coal extraction area of the mine plan excludes any extraction beneath the Wyong River. The extraction in the area of the confluence of Jilliby Jilliby Creek and Little Jilliby Jilliby Creek has been designed to minimise subsidence and risks to this fluvial feature. Longwall panels have been shortened, narrowed, reduced in extraction height, and aligned accordingly to achieve a demonstrably negligible risk to the river system.

Longwall mining will generate a pressure loss regime within the deep rock strata. Depressurisation will migrate upwards through overburden strata via subsidence induced cracking or bedding parting and via pore spaces in the hard rock matrix. Zero pore pressures are predicted to migrate above extracted panels, to the lower part of the Tuggerah

Formation about 220 m above the coal seam. This will in turn generate pressure loss gradients within the remaining part of the Tuggerah Formation and in parts of the overlying Patonga Claystone. Since the hard rocks are basically stratified aquicludes or aquitards, there are no identifiable adverse impacts within the hard rock system. The functions and integrity of the shallow alluvial systems will be maintained, refer Section 5.2.8 and Section 5.2.16.

- W2CP failed to present a comprehensive plan for the protection of environmental flow and regimes throughout the Wyong Water Catchment. It failed to identify that depressurisation and general dewatering will result in destruction of environmental flow necessary to maintain ecological integrity, biodiversity and ecosystems.

Response:
The assessment presented in the EA demonstrates that this concern is unwarranted. Subsidence will result in an increase in water storage capacity of the shallow alluvial aquifer system and locally provide additional baseflow contributions and instream storage capacity. To further ensure that the project will not adversely affect the functions of the water supply catchment, the W2CP proposal includes a catchment environmental enhancement program designed to improve the water supply catchment condition. What has become clearly evident during the EA studies is that the current water quality and catchment yield within Jilliby Jilliby Creek is commonly poor. This is also confirmed by Wyong Shire Council monitoring data which highlighted the occurrence of elevated faecal micro-organisms (*E. coli*) in both Jilliby Jilliby Creek and the Wyong River.

Should the project receive project approval, a catchment environmental enhancement program will be developed in consultation with the Gosford Wyong Water Supply Authority, Hunter-Central Rivers Catchment Management Authority Department of Environment, Climate Change and Water, and relevant landowners.

- Water study review ordered by the Government examined existing data only and within a two-month period.

Response:
The report by SKM is comprehensive and available on the DOP web page. The report's conclusion in regard to the W2CP that there are sufficient data to assess the potential impacts of the project on the region's water supply system is supported.

- The regional/local geology seems not to have been considered or if it has, it is not reflected within the report. The Dooralong Valley is incised by major faulting. These faults along with other major features such as sandstone crushes on the valley sides provide transient pathways for surface water to enter the deep saline aquifers surrounding the coal measures and become degraded and toxic and lost as a water source.

Response:
This is not correct, refer Section 5.3.1. The EA provided a comprehensive evaluation of regional/local geology, particularly in Section 2.7of the EA.

- Concerned that there is not yet enough detailed hydrogeological data and lack of baseline data references to ensure that the potential impact of longwall mining on the groundwater resource has been adequately assessed.

Response:
This is not supported by the independent review by SKM or the international peer review of that report. The EA provides detailed hydrogeological assessment (refer EA Section 8) as well as extensive geological and hydrological data in other sections.

- Hydrological assessment inadequate due to lack of monitoring data

Response:
This is not correct, refer Section 5.2. The EA provides detailed hydrological and flooding assessment (refer EA Section 9).

- Longwall panels in the south west sector of the Yarramalong Valley terminate within 154m of Wyong River which is well within the boundary area of horizontal subsidence which will seriously threaten the Wyong River

Response:
Subsidence will not threaten the Wyong River or the nearby water supply pipeline from Mardi to Mangrove Creek Dam, refer Section 5.1.2.

- The Scientific Committee 2002 established that 'alteration to the natural flow regimes of rivers, floodplains and wetlands – a key threatening process declaration due to longwall and coal mining'. This serious outcome has not been adequately addressed.

Response:
This is not correct. The requirements of the Scientific Committee's Determination have been addressed in the EA which concluded that the project will not adversely impact on water flow, floodplain function or wetlands.

3.1.2 Subsidence

- Subsidence threatens the new major water pipeline

- Effect of subsidence on infrastructure

- W2CP presented no clear interpretation of major impacts upon the Catchment's ecological integrity, biodiversity and in-stream biota arising from uncontrollable subsidence.

Response:
The proposed pipeline route is more than 370 metres from the nearest edge of any longwall block, as discussed in Section 5.1.2. Therefore the predicted ground movements will be relatively small compared to the predicted subsidence ground movements over the longwall panels themselves. Effects on other infrastructure in the subsidence area are fully documented in Volume 2 of the EA. W2CP disputes the notion that uncontrollable subsidence will occur.

3.1.3 Flood

- The Wyong Valley flood study completed over ten years ago is now out of date, in light of the latest information available on the impacts of global warming. Also the impact of cyclonic storm events has not been taken into account in the EA.

Response:
Initial flood modelling for the project did commence over 10 years ago and represented the first and only flood study of the upper valley areas. Since that time, the flood model has been updated several times to take into account new software and recent storm and flood events as well as changes to the project design. The most recent revision of the flood model was completed in 2007 and included the final subsidence information, refinements to allowance for vegetation cover, improvements to modelling of anabranches and provision for the latest estimates of Probable Maximum Precipitation (PMP) issued by the Bureau of Meteorology. The results are reported in full in Volume 2 of the EA. The flood study shows an incremental change to flood levels as a result of mining. This increment is not altered by any changes in global warming or sea level rises. The model was based on the standard procedures outlined in Australian Rainfall and Runoff for all storm events up to the 1 in 100-year (1% AEP) event. If future design rainfall patterns alter, the incremental change in flood levels as a result of the project will not change.

3.1.4 Air Quality

- The statement that the 'concentration of dust deposition rates are predicted well within the DECCW air quality criteria' relating to Atmospheric emissions is flawed.

- Concern that fugitive emissions from over-burden mining subsidence will cause serious problems in terms of greenhouse gas emissions and that the proponent has not addressed this issue.

- Air quality monitoring in the EA was noted as partial for most years with a gap in data collection between 2003 and 2006 yet it was confirmed by Mr. Peter Smith at the Wyong Shire Council forum in May 2010 that data had been collected for the whole period mentioned.

- The statement in the EA that 'the measured dust deposition and suspended particulate levels in the Project area are considered typical of a rural area remote form industrial emission sources' does not take into account future developments nor existing industrial emissions.

- There is no study of the effects of dust deposition along the rail corridor from the loading facility to Newcastle

- The cumulative effect of the three power stations on air quality has not been assessed

- Dust suppression used in coal stockpiling fails to contain the easily transported PM10

- Airborne dust and its effects in the populations

Response:

The conclusions of the EA Air Quality Study are fully supportable and defensible. As stated by DECCW in their review of the EA: "*DECCW has reviewed the report Air Quality Assessment: Wallarah 2 Coal Project. The report appears to have been conducted in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*". The ACA assertion that the study is flawed is unsupported.

The ACA is also concerned that the travel characteristics of fine dust particles have not been included in the modelling. The particle size distribution of the emission was discussed in detail in the EA Air Quality report and has been included in the modelling. The fine fraction of the dust will be transported further than the coarser material. While it is the case that fine particles can be transported over a large distance, the size of the source is also an important factor. The W2CP dust source will be relatively small and will also contain a relatively small fraction of fine particles (about 4%). By the time any such particles would reach any nearby sensitive receptors, they will be at low concentrations, refer Section 5.6.

Comments regarding rail transport are answered in Section 5.6.5. In particular, it is considered that dust emissions from rail transport will be negligible, especially given the relatively short haul of water-sprayed coal from W2CP to the port. Coal and general freight rail transportation volumes on the Main Northern Line are already substantial (there are potentially up to 100 general freight and coal movements available on any given day).

The assertion that only selected monitoring data was used is answered in Section 5.6.1 while our response to the issue of emissions from power stations is provided in Section 5.6.4.

3.1.5 Traffic

- Kores have failed to undertake an updated study that reflects current traffic conditions and road infrastructure (traffic lights, round-a-bouts etc.)

- Concerned about the increase in traffic congestion at rail crossings in Newcastle due to increased coal trains and the lack of consultation with Newcastle City Council and Lake Macquarie City Council despite this impact.

Response:
An updated Traffic Impact Assessment has been undertaken by Parsons Brinckerhoff Australia Pty Limited. This work was undertaken at the request of Wyong City Council and used more recent traffic projections from the proposed Wyong Employment Zone. The study confirmed that the W2CP is only a minor contributor to the current and future traffic management issues of the area which will arise from planned growth. The updated report has been made available on the W2CP web page.

It is expected that W2CP would require only six of the approximately 260 available daily train paths on the Main Northern Line and would therefore not materially impact on traffic congestion at rail crossings on the Main Northern Line.

3.1.6 Health

- The project will increase the incidence of asthma and other respiratory illnesses particularly in children and the elderly, as well as increased risk of cancer.

- The health risk study has not assessed local information from the medical professionals and has predicated its study upon poor guidance from NSW Health.

Response:
The EA addressed health risks associated with air quality in Section 12. These issues are further addressed in Section 5.11 of this report.

3.1.7 Ecology

- Subsidence and the resulting degradation of the river systems will have a negative impact on the habitat of many endangered and threatened species, populations and ecological communities of State and National and in some cases International significance. Many of these species are protected by conservation acts and/or international treaty agreements.

- Fugitive venting of coal seam gases from subsidence cracking presents an immediate threat to arboreal mammals, avian species, and raptors, in terrestrial habitats. As a result a high mortality rate is envisaged to occur within these contaminated pristine riparian areas.

- W2CP have not presented any plausible determinations to deal with the serious situation (arising) for maintaining protection of Riparian Vegetation corridors

which currently provide critical habitats, refuge areas, food and forage areas for terrestrial and aquatic wildlife species.

Response:

These concerns are unwarranted. The EA comprehensively analysed subsidence effects and demonstrated that the ecological consequences are not significant. The ACA erroneously maintains that stream bed cracking as found in some situations in the Southern Coalfields will occur in the Yarramalong and Dooralong Valleys. This is disputed and is discussed in detail in Section 5.1.3 and Section 5.1.5.

In addition, methane gas drainage will occur within the underground mining area. The gas drainage system will capture the majority of the methane contained within the coal seam ensuring that "fugitive gas" in the mining zones is restricted to low background levels. This is an essential requirement for the provision of safe mine operating conditions and is required under the mining legislation. The residual methane gas at these low background levels is not capable of producing a threat to wildlife in these habitats.

3.1.8 Community Consultation

- Kores have failed to inform one-to-one the people who live in the close suburbs of Blue Haven or Warnervale of what to expect from the proposal, not the people near the Buttonderry complex who will experience exhaust gases and particulates from the main ventilation shaft.

- There appears to be no consultation with the local community in regards to the construction of the Western Shaft site which is to be located in the Wyong State Forest

Response:

This is disputed. Details of the consultation process extending over the past 10 years are outlined in Section 5.10.1. This has included one-to-one discussions with residents, distribution of 14 newsletters to all residents in the mining area as well as the surrounding the surface facilities and a web page containing all minutes of the Community Liaison Committee, press releases, and project details. Company representatives have presented on more than 50 occasions to local groups including precinct committees, environmental groups, special interest groups and business groups.

3.1.9 Areas of Non-Compliance Asserted by the ACA

- Have not considered the impact of the mine on groundwater dependent ecosystems

Response:

The EA describes the groundwater dependent ecosystems within the mining area. The primary vegetation unit which can be considered to be groundwater dependent is Riverine Alluvial Gallery Rainforest-Moist

Forest which occurs in sections of the Jilliby Jilliby Creek and Little Jilliby Jilliby Creek riparian zone. Section 13.2.6 of the EA sates that there is potential that a portion of Riverine Alluvial Gallery Rainforest-Moist Forest will be affected within the proposed mining area. The effect will not be in changing the inundation frequency of this community during the range of flooding regimes, but rather that there would be a slightly increased depth of flooding during the major flood events. The ACA has for some time erroneously maintained that the project would impact on wetlands such as Porters Creek Swamp which is located on the eastern side of the F3 Freeway and well outside the impact zone of the W2CP. Jilliby Jilliby Creek does not flow into the swamp nor does the Wyong River. The coal handling surface facility site at Tooheys Road is not within the catchment of the Porters Creek Swamp. W2CP's Buttonderry office site, Council's waste tip, the Warner Industrial Park and the rest of the Wyong Employment Zone and airport, are all within the Porters Creek Swamp catchment. However, this swamp is not at risk from any impacts of the W2CP.

Although there are no swamps located within the mining area, the EA studies have shown that the water quality in the Jilliby Jilliby Creek catchment is frequently very poor. However, through adopting a "neutral or beneficial effect" philosophy the W2CP has proposed a Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment.

- Waste management and water from the mine.

Response:
The W2CP will not generate the normal quantities of mine wastes due to the fact that no Coal Preparation Plant is proposed. There will however be some waste rock generated from the underground workings. As stated in Section 2.8.7 of the EA, "Trucks will transport the stone to the Buttonderry Waste Management facility or similar approved facility on an "as needs" basis. Typically, this will involve around one truck load per day."

Compared with typical underground mines in NSW, W2CP will be classed as a relatively dry mine as it will generate limited quantities of minewater due to the nature of the strata which have limited storage capacity and transmissivity. There will be limited groundwater seepage from the workings and this will be treated in a reverse osmosis plant. The reverse osmosis plant will be capable of around 80% recovery, that is, 80% of the water will be considered non-saline and suitable for re-use.

Any discharge of water offsite will be in compliance with volumes and quality requirements set by licence conditions.

- Have not carried out a comprehensive soil impact study as required

Response:
A detailed soil study was not considered necessary as the agricultural capability of the study area will not be altered as a result of the project. However, the EA contained a review of land capability and soils in Sections 15.3 and 15.4,

- Scientific Committees determination: have not developed an offset strategy in accordance with NSW and Federal policies

Response:
An offset strategy has been put forward which meets current government guidelines. Although it is proposed to provide an offset area of 50 ha comprising existing native vegetation on lands owned by the WACJV, it is also proposed to develop a more comprehensive biodiversity land management strategy. This strategy will take into account other aspects of the project in order to provide real benefits to the wider environment, consistent with the philosophies of the DECCW Biobanking and Offsets Policy. The package proposed is described in Section 3.1.17 of the EA while the overall offset package is detailed in Chapter 16 of the EA.

- Inadequate Air study – no cumulative study, have ignored available background data, have used selective data only with no attempt to include travel characteristics of fine particles 2.5-5 microns.

Response:
This is disputed refer Section 5.6.2.

- Have not adequately addressed intergenerational equity with regards to Greenhouse Gas effects

Response:
Greenhouse matters were raised in a number of submissions. While it is generally accepted that burning of fossil fuels such as coal is a contributing factor, the greenhouse gases produced from coal globally (mining and power generation) contribute around 25% to the enhanced greenhouse effect. Coal is just one of many sources of greenhouse gases generated by human activity. Others include oil and natural gas, agriculture, land clearing and waste disposal. Although this is a political issue for determination on a national scale, some additional information is provided in Section 5.13. The broad intergenerational equity considerations for the project are addressed in the EA in Section 3.7.2

- Have not carried out a comprehensive study of the impact of coal freight on the main northern line or the impact upon communities of consultation with those communities

Response:

The impacts of both noise and dust caused by the loading of coal at the site as well as an outline of noise and dust implications from coal train transport through to the port has been undertaken and contained in the EA (Sections 11 and 12). This work has been accepted by DECCW as being appropriate. A Rail Capacity Study prepared by Rail Management Consultants Australia Pty Ltd (RMCA) has been recently prepared and is available on the project web page. This report was prepared in response to a request from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling undertaken by RMCA on the RailSys model provided by RailCorp has indicated that six return services can comfortably run daily between the mine and the port, which can be executed by two conventional train consists of the Coal Schedule 2 configuration. However, W2CP is likely to only require three return daily services that would utilise only six of the approximately 260 available daily train paths. The outcome of this modelling is supported by RailCorp.

- Haven't addressed where overburden and construction material is going to be dumped

Response:

This issue is covered in Section 2.8.7 of the EA where it is stated that "Clean excavated waste rock will also be created during the construction of the drift and shafts. This amounts to approximately 156,000 m3 for the Tooheys Road site and approximately 20,000 m3 for the Buttonderry site. These figures assume a 25% swell factor for the recompacted material. It is intended to use this material for the creation of perimeter bunding and landscaping features on the two sites. For the Buttonderry site in particular, there will then be no requirement to import fill material to fill the shafts at the completion of mining, as the material could be reclaimed from the bunding."

- Haven't addressed disposal and treatment of water – slimes and solids

Response:

A key benefit of the project will be the ability to treat saline groundwater which would otherwise not be available and use this water for both onsite and offsite uses. The volume of brine to be pumped back into the mined workings is a small portion of the volume of treated water to be pumped back underground for use in mine equipment. The brine will be separated from the working area and allowed to seep through the goaf where there is sufficient void space and surface area to contain the material. The return water will be a mixture of new infiltration water and treated water used by the mining equipment. The salinity content of the return water is expected to remain within the range of groundwater inflow or less.

- No cumulative health impact study

Response:

This is beyond the scope of the environmental assessment and instead is a matter for government to address.

- Have not addressed a Social Licence to Operate and have not addressed why there has been no attempt to address the conflict between the project and the Regional Strategy.

Response:
The ACA suggest that there is a potential conflict with the Central Coast Regional Strategy when in reality, the W2CP will assist in meeting the employment generating goals of the CCRS. This matter is discussed in Section 4.7 of the EA. W2CP refutes the inference that the project will adversely affect nearby business communities. The EA outlines the well located and designed surface facilities and the limited potential for any offsite impacts upon other nearby land uses and users, including those of the WEZ. The assertion that dust generated will keep other industries such as food processing away from the area is unsupported by the facts. The existing food warehouse is located immediately next door to a concrete batching plant and heavy transport terminal.

The social licence to operate is associated not only with project approval and its consent conditions, it also encompasses the environmental management and performance contract as outlined in the EA generally and the Draft Statement of Commitments. These commitments include key items such as continuing community and stakeholder engagement throughout the project life, ensuring that the W2CP community enhancement plan is implemented and that local recruitment is a priority during the employment of the project's workforce.

- Have not addressed the State Government guidelines, policies and plans such as ARMCANZ, ANZECC, National Water Initiative, and the water-sharing plan for Jilliby Creek

Response:
This is refuted. The information and assessment contained in the EA has conformed to current industry standards and demonstrates that the project will have an overall positive impact on the water quality of Jilliby Jilliby Creek.

- No one-on-one consultation with landholders directly affected by the proposed mine.

Response:
This is not correct, as detailed in Section 5.10.1.

3.2 Stop Korean Coal Mining

This group was originally composed of residents from Blue Haven but now includes additional neighboring suburbs. Their submission contains the following key concerns:

- Perception that community is disadvantaged in fighting to prevent the project from going ahead due to lack of resources and specialist knowledge to provide scientific responses.
- 40% of breadwinners work in Sydney and although the community wants more local jobs they don't want coal based industries in the region. Mining is considered to be a "dirty, toxic, unsightly Neanderthal low-rent industry discouraging the kind of logistical park scenario for which our location makes us so suitable".
- We realise there are coal mines to the north of us and we are not, as a community, against the idea that coal will continue to play a part in the immediate and intermediate future. We also know, however, that the local mines were closed some years ago and that the Munmorah Power Station is past its use-by date and cannot continue for long. We moved into this area with the knowledge that dirty industry is on the wane here. In addition, since the last phase of fabric filtering at Vales Point and Munmorah power stations the emissions have reached new lows and anecdotally the incidence of child asthma is appreciably down.
- It is true that this beautiful area has been neglected and poorly planned in the past, but with the realisation of the importance of the Warnervale area as a growth centre, we have seen amends being made by all levels of government; committing to making good the damage to our lakes, designing the Warnervale Town Centre, putting in place restoration of our creek systems etc. All in all we have in the making an enviable place to live and work
- So the idea that you can contemplate allowing a 5-million tonnes-per-year coal mine with a 250,000-tonne unwashed coal dump as well as raw coal storage into our suburbs takes our breath away. We know what happens to the coal-producing towns, and we do not under any circumstances intend to let this happen to us. Historically, people went to live under the shadow of slag-heaps in order to get work, but this proposal is the reverse of that – we are already here in our paradise and this abhorrent mine is to be imposed on us.

Response:

W2CP refutes these assertions that the project will significantly affect the environment, amenity and lifestyle of residents and workforce in the Blue Haven, Wyee or future Warnervale Town Centre areas. The EA discusses many relevant points above, such as in Section 15.2 Land Use and Regional Context Analysis and in Section 10 Community and Social Issues.

- We know that the miners will not come from among us (we have less than a handful here, left over from the old low-volume mines); they will drive down from Ashtonfield or somewhere to go to work. We know the industry that serves the coal mines is only thirty minutes away at Beresfield; we don't see them relocating so as to fit into Nicki Williams's fantasy multiplier effect.

Response:

The EA clearly outlines the project's commitment to encourage local recruitment for operational employees.

- What we do see is this foreign-owned mine being run on a shoestring, and as coal becomes less important to Korea so our area will become more and more a pit-head slum.

Response:
The W2CP will be a high quality, modern, state-of-the-art underground mining project with an initial development cost of the order of $700Million and a long term mine production is envisaged. The Joint Venture has already spent around $83 Million to date on the project and the project and its coal will important to the international owners and future international and Australian coal customers.

- The Department of Planning should not give the proponent the benefit of any doubt where they make any assertion that is not backed up by solid technical reasons and authorities. There are dozens of such unsupported assertions in the EA such as section 3.5 National and International expert agencies which are flippantly mentioned as authorities for the assertion that other fuel sources do not have the potential to reduce the dependence on coal. As to the IEA, the latest published predictions are from their 2009 document, produced before the Copenhagen conference and at a time of high spot prices and prodigious growth in the Chinese economy. The 2010 version, not available until late in the year, takes a new look at the world as shown in the following excerpt from the IEA Publications and Papers webpage at: www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2259. The data provided in the 2010 IEA document will tell a story quite different from the 2009 version which was produced at a time of growing spot prices and the belief in the future of the Asian economies
- We further ask that you undertake this process in a transparent way, so that the community is informed of all dealings, correspondence etc between your office and the other players. If we lose this fight we want to know it was on the merits of the Wallarah 2 (W2) case, not because of some rite of secrecy accorded to dealings with proponents under the guise of 'confidential in confidence' or some other such mechanism.
- The submission at Chapter 2 pays lip service to the D-G's requirement that the proponent demonstrate that the project is needed. In fact there is nothing in the submission that shows this particular project is needed at all. The submission talks about the world need for coal, the Asian need for coal and the Australian ability to deliver coal.
- There is nothing in the submission that shows that this particular project is needed, nor demonstrated that any need would counter any opposing needs of the growing residential and business community.
- The proponent says 'the suitability of the site is also consistent with the importance placed on resource extraction in the 2008 Central Coast Regional Strategy'. Now here does that document advocate coal mining as an activity.

Response:

The Central Coast Regional Strategy includes references to industry, extractive industry, mining and other employment generating activities and developments. The Tooheys Road site is industrial zoned land that has been recognized for future industrial development.

- The proponent suggests that it will sell some coal to Australian power stations. The idea that a corporation wholly owned by the South Korean government whose stated aim is 'Korea will become a resource wealthy country worldwide'(http://eng.kores.or.kr/), whose ships are lined up off our coast for weeks at a time waiting their turn to load coal to power the Korean economic miracle, is interested in pulling coal out of the ground in order to provide it to our local power stations would be laughable except that it is a dishonest ploy designed to give you the ability to tick it off as a 'need for the project'.
- The EA does not attempt a rational analysis of alternatives, it simply gives a rote cut and paste from the Minerals Council material so that it can be said that the subject has been addressed as required. The armchair tour of fuel types does not provide any rigorous analysis nor follow any lucid strain of argument
- The coal is going to Korea yet according to the World Nuclear Association South Korea gets almost 40% of its electricity from nuclear reactors right now, and this figure is set to increase by 56% by 2020. That will mean over 60% of Korea's electricity power will then be generated by nuclear reactors.
- The only reason that Korea Resources Corporation is involved here is that as coal becomes less important in the future, the more expensive sources such as purchase from other miners, will be jettisoned and only projects like this one will be kept on because they are wholly owned and dirt cheap.

Response:
W2CP sets out on the public record that it finds such statements abhorrent.

- We were expecting to see a technical exposition of the rationale behind locating the coal dump alongside three existing and soon to be built residential suburbs, Warnervale, Wyee South, Blue Haven, and a major soon to be built industrial park, Wyong Employment Zone. We are not told where the two previous locations for the coal dump are, neither was it explained why they were rejected. Nor were we told what the strategic planning studies and engineering assessments were. And it would be interesting to hear what advice the proponent received from Wyong Council, who are avowed opponents of the mine

Response:
The EA discusses these land use compatibility issues in Section 15.2.

- Wallarah Creek is dealt with in detail in the ecological report, but its location is confused in parts of that document. Spring Creek is not mentioned, yet together with Wallarah Creek it supports a myriad of species and they are the only significant feeder streams for Budgewoi Lake and Lake Munmorah and they run right through the Toohey's Road site. Spring Creek is treated as insignificant.

- There is no mention in Appendix E Site Water Management Strategy of any method that is planned to prevent pollutants from entering Wallarah Creek, which runs through the middle of the dump site

Response:
Section 2.12 and Section 9.6 in the EA address the impact control measures associated with water and watercourse management and pollution control.

- It is odd that the only monitoring results shown are from May 2006 to May 2007, one month before the June 2007 flood.
- There is nothing in the whole submission that gives any clue as to measures the proponent intends to put in place to address construction pollution risks.
- One of the major problems with the EPA rules for monitoring existing pollutant enterprises is that the regime only requires data about one undertaking at a time, and the cumulative effect is not considered
- In terms of air pollution and noise pollution, the only effect that is worth talking about is the cumulative effect, and this proponent has not even given it lip service. How did the fact that this requirement was not addressed, let alone satisfactorily answered, go undetected in the Department of Planning, when this is the only test as to breathable air that counts? Should this *'environmental assessment'* not have been sent back for further work?

Response:
Monitoring has been undertaken discontinuously since 1996. Monitoring information has informed numerous studies reported in the EA. Summary presentations on the monitoring information have periodically been given to the Community Liaison Committee and these presentations are posted on the W2CP website along with all meeting minutes of the CLC. Monitoring and impact assessment for noise and air quality take into account existing background emissions from all other sources.

- The risk assessment does not appear to deal with subsidence issues in Tuggerah Lake at all, although plainly the Korea Resources Corporation intends that mining will go ahead under the lake.
- There needs to be an estimate for the volume of run-off water which apparently the consultants think is not a matter of concern, because there will be an offset deal in which some land upstream will have a diversified ecology maintained so the downstream effects do not matter. A strategy would then have to be developed to keep this water out of the creeks.
- We are told in the ecology assessment that because there are signs of human impact around the creeks, including tyre tracks and erosion as well as land clearing and previous grazing use, that the creeks downstream from the coal dump are degraded and do not deserve to be saved
- there is no modelling, detailed or otherwise, in the submission on the disc that was provided to us.
- One of the major threats to our community from this coal dump is dust, and the proponent knows that but has merely said that the dust will be within EPA guidelines, although we are not told how this will be achieved. We seem that despite the D-G's requirement no credible work has been done by the proponent

on the range and health effects of >2.5 µm particles which evidently remain in suspension in air for an extended period.

- The proponent is trying to establish the idea that the mine will not be a heavy water user, so the submission authors say the coal will be so good it will not need washing
- We ask that you require the proponent to explain how it will sell coal to a power station that already has long-term local contracts in place, or if it is another local power station that is to be the customer, how the proponent intends to transport the coal. We want assurance by way of data and calculations that coal transport from this mine will not add to the loads at our traffic junctions (e.g. Sparks Road and F3) already under stress from coal transport trucks to Munmorah and from Chain Valley Bay.
- Traffic study uses survey data from 2006, which does not take into account the increased traffic due to new developments and urban growth.
- There is no mention in the document of the type of locomotive to be used on the six coal trains per day.

Response:

Section 12 of the EA provides a comprehensive assessment of air quality issues while health risks are addressed in Sections 10.8 to 10.11.

The EA clearly outlines that all product coal is proposed to be transported by rail. W2CP has undertaken an updated and expanded traffic report, which is available on the W2CP webpage and Department of Planning website. Further information about likely train consist features including locomotives and train load capacity can be found in the report by Rail Management Consultants of Australia (RMCA). New generation locomotives are anticipated to be available for transport of W2CP product coal,

- There will be increased noise due to transport of coal.
- Severity of noise pollution comes from a variety and cumulative range of factors. The noise assessment does not take into account the new residential areas on three sides of the coal dump and less than two kilometers from the site. Blue Haven is not even mentioned, yet the existing night goods train noise is easily audible there. Will the coal locomotive noise somehow bypass us?
- There is no air quality monitoring at Blue Haven.

Response:

Operational noise levels at Blue Haven are predicted to be less than 35 dBA even under adverse westerly wind and temperature inversion conditions. All current air quality goals will be met at Blue Haven. W2CP undertakes air quality monitoring at Tooheys Road, Bushells Ridge, Buttonderry, and Tuggerah however there are monitoring points between the Tooheys Road stockpile and train loading area and Blue Haven.

- We are concerned about the permanent source of pollution at Toohey's Road, releasing noxious material every minute of every day for forty-two years.
- The EA does not mention that the transported coal is unwashed, therefore creating more coal dust.

Response:
W2CP refutes the assertion that the unwashed coal will create more dust. The decision to avoid the need for a washplant will result in vastly reduced coal handling and rehandling and associated mechanical attrition of the coal particles. There will be no tailings dam necessary to contain fine tailings/slimes nor will there be any need to continuously establish major emplacements of coarse rejects. These project design factors are important in that they will significantly reduce dust emission opportunities. The unwashed coal will be moist from the mining operation and will be sprayed at various points during the coal handling chain from the mining face to sizing, conveying, stockpiling and train loading.

- There are other issues to do with air pollution that the consultant does not touch, such as the nuisance of coal dust coming in the windows of thousands of homes, on our carpets, in our water tanks, turning everything black.
- The visual impact assessment at Appendix M does not mention Warnervale Town Centre, or the Wyong Employment Zone. Both of these form part of the D-G's requirements, but no idea of the view of the coal dump from these neighbours is given.

Response:
These locations are discussed in the EA within the visual impact assessment (Section 15.1) and regional planning context (Section 15.2). The visual assessment demonstrated that view opportunities from WTC are limited and strongly mitigated by viewing distance. The W2CP 's Tooheys Road property is over 2.5 km from the WTC and the product coal stockpile and train loading facility is over 3 km from the WTC.

- The proponent's promotional video says the nearest residential area is 3 kilometres away. That is a lie even now, let alone when the new suburbs come to fruition.

Response:
W2CP stands by its locational descriptions in the EA report and in the DVD.

- The real truth that emerges from this charade is that everyone is desperate to hide the site from view. Why would that be, when we are told it will be landscaped along the creek (singular, because Spring Creek does not rate a mention, even as a drain), landscaped around the site, and generally have the appearance of a holiday camp?
- Statements in the EA regarding consultation are misleading
- At the public meeting held recently at Wyong Shire Council, in response to a question from one of our spokespeople the proponent's representative said that the statement contained in '*Table 10.1 – Groups Consulted on the W2CP*' that STOP KOREAN COAL MINING Incorporated has been consulted by the proponent was a true statement. He went on to say that the consultation was carried out *'at arm's length'* by the proponent's consultant responsible for the survey that went to 500 homes in the valleys, Kiar and Bushells Ridge. This is deliberate deceptive conduct. The truth is that our spokesperson was informed

of the survey by a member who had received a copy. The spokesperson contacted the consultant, Mr Martin, to find out why the people in Blue Haven had not received the survey. Mr Martin replied that he was told to survey only those people in areas that would be affected by the mine, and that the proponent informed him which areas were the ones to be targeted. Blue Haven was not included because he was informed Blue Haven would not be affected. Mr Martin offered to provide a copy of the survey but was told that a copy was already in our possession. That was the extent of the dialogue with Mr Martin.

Response:
Blue Haven was not originally covered in the survey as the survey was intended to apply only to residents and groups with a direct interaction with the project. However the views of the group were ascertained through the survey.

3.3 Jilliby Stage 2 Land Owners Action Group

This group represents 30 landowners who have been working with the Wyong Shire Council for more than 10 years to bring about the rezoning of approximately 1000 acres of land north of Sandra Street Jilliby. The project is proposed to produce approximately 280 separate 1 ha rural residential blocks.

The subdivision was proposed to be undertaken in two stages, the first has been completed and represents the Hue Hue Rural Residential estate which was incorporated into a Mine Subsidence District.

Response:
The submission received from this group details discussions held with the W2CP team and resolution of the issues of subsidence on future residential subdivision in the area, and in particular, the Stage 2 proposal. W2CP will continue to liaise with this group and the Mines Subsidence Board with a view to facilitating the future release of rural residential land.

3.4 Rivers SOS Alliance

Rivers SOS is a coalition of environment/community groups formed as a result of the destruction of rivers in NSW as a result of mining operations. Rivers SOS campaigns for a buffer zone of at least 1km around all rivers to protect them from ongoing damage.

Issues raised in their submission include:

- The mine will threaten river systems and groundwater sources feeding the Mardi Dam, which was already down to 14% during the recent drought.
- The EA suggests that mining will depressurise the aquifers which feed the catchment, and which cannot be replenished in an acceptable timeframe.
- As the Southern Coalfield Inquiry Report (July 2008) made clear, research into the environmental impacts of longwall mining is sadly lacking at present.

- Underground fracturing and extraction of the coal seam will pollute and deplete vital areas of the drinking water catchment.
- Rivers SOS does not oppose mining but actively campaigns for a more appropriate balance between the long term need to protect water resources and the short term goal of jobs and profits.

Response:
There is a misunderstanding since the depressurisation and 200 year recovery relates only to the deep hardrock aquitards which will be disturbed by removal of the coal seam. This groundwater zone has no economic or environmental significance in terms of water supply potential or ecological relevance. The surface aquifers will remain functional and will in fact increase their storage capacity. Additional information on these issues is provided in Sections 5.1.3, 5.2.1, 5.2.7, 5.2.8 and 5.2.10.

3.5 Wyong Regional Chamber of Commerce

The Wyong Regional Chamber of Commerce consists of over 220 members including W2CP.

There are two issues raised in their submission:

- It is considered that the Wyong Employment Zone lends itself to processing and packaging with the Woolworths Distribution Centre and the Blue Tongue Brewery being two of the major businesses already established in the area. The nature of the coal mine and associated infrastructure would therefore not be in line with this type of industry; and

- The project puts at risk the water catchment areas of the valleys and it is believed that the water supply should be protected at all costs.

Response:
This is strongly refuted. Liaison has been undertaken with Woolworths management and other business stakeholders. It is noted that the existing state-of-the-art Woolworths facility is located adjacent to a concrete batching plant and heavy vehicle transport terminal. The W2CP will provide positive benefits to the future development of the Wyong Employment Zone. The project has been designed so that it does not put at risk the water catchment.

3.6 Climate Action Group Central Coast

Climate Action Group Central Coast is a group of over 100 Central Coast Residents who are concerned about climate change and committed to taking action and increasing public awareness on the issue.

Climate Action Group Central Coast objects to the Project because of the following issues:

3.6.1 Climate Change

- The project will contribute significantly to global greenhouse gas emissions and climate change.
- Australians continue to lead the world on emissions from burning coal, pumping the equivalent of 10 tonnes of carbon dioxide a year per person into the atmosphere.
- It would make no sense for Australia to cut its domestic emissions without making commensurate reductions in our coal exports.
- There is no mention in the EA of renewable technology alternatives, and the assessment rests on the assumption that there are currently no viable alternatives to coal fired power. It is therefore believed that the project should be rejected on the grounds that it has not been established that it is necessary.
- The EA claims that if the mine does not go ahead, the shortfall in supply would readily be addressed by some other coal producer, and therefore in effect not increase greenhouse gas emissions. This would only be true if there were no viable alternatives to thermal coal which is clearly not true.
- With or without the new mining tax, Australia is still a more attractive place to mine thermal coal than other countries such as Colombia and South Africa due to the provision of a suite of subsidies and free infrastructure.
- There are viable renewable alternatives for electricity generation such as a combination of concentrating solar thermal with molten salt heat storage and wind power. Solar thermal power can replace 'baseload' power currently generated by burning coal or gas, and will not run out, fluctuate in price, or contribute to global warming. Also, Australia has an abundance of consistently windy locations within a short distance of the existing electricity grid. There is potential to vastly increase our use of wind power and reduce our reliance on ineffectual, polluting, coal burning plants.
- There is no mention in the EA of mitigation for the end use of coal which will be 86% of emissions.
- The EA states that 'as the relationship between global warming and greenhouse gas emissions is not linear, there is no accepted method to determine the contribution that a given emission of greenhouse gases might have to global warming (so there is) no measurable environmental effect due to the emission of greenhouse gases from the Project even when the customers use of the coal is taken into account'. This statement does not negate the fact that the project will contribute to global warming and climate change.
- It is impossible for the W2CP to demonstrate that the environmental effects of the GHG emissions which will be produced by the mine 'do not exist or are negligible' given that they themselves have stated that they can't be accurately measured.
- The EA states that the total emissions from the project would lead to an increase in global temperature of 0.000328 degrees Celsius. That might sound small but each amount contributes to the whole. Stopping the equivalent of 3000 such projects globally would stop the global temperature from rising by 1 degree. This is the difference between some Pacific Island nations and the Great Barrier Reef surviving.
- The W2CP fails to take into account ESD principles, particularly the precautionary principle and the principle of intergenerational equity.

- The project does not comply with the recommendations from the Garnaut Report, which focuses on the need to transition from greenhouse gas polluting fossil fuels to renewable energies as soon as possible.
- The statement in the EA that 'development of the W2CP and the subsequent domestic use of its product coal in Korea forms part of the project owner's commitment to reduce GHG emissions and assist in meeting its target under the Kyoto Protocol' to justify a new coal mine is nonsensical and a 'green-wash'

Response:
The emissions from the use of coal, and for that matter, any issues arising from the transport and handling of the coal by the end users, are the responsibility of the purchasers. It is worth noting that South Korea, which will be one of the market destinations for W2CP coal, will be assisted in meeting its GHG reduction targets by replacing lower grade coal with the higher grade W2CP coal.

An assessment of ESD principles is provided in Section 3.7 of the EA which has been prepared in accordance with the National Strategy for Ecologically Sustainable Development (1993) and also satisfies the requirements the Director General of the Department of Planning.

Greenhouse gas emissions covering Scope 1, 2 and 3 emissions for the life of the project have been documented in Section 12.9 of the EA. The assessment of the significance of these emissions have been addressed in Section 12.10 of the EA where is calculated that the total emissions would represent 0.031% of global CO2-equivalent annual emissions. The EA does not state that the GHG emissions do not exist or are negligible but rather that there are unlikely to be any measurable environmental effects due to the emissions from the project.

3.6.2 Subsidence and Flooding

- 29 dwellings and 34 properties will be adversely affected by the mine.
- The mine will significantly increase the effects of flooding in terms of flooding of dwellings and properties, and increase the length of time that people are cut off during floods.
- The Flooding document outlines various measures to mitigate these flood effects, which include protecting, raising or moving of houses, or buying them out. We believe that this involves a substantial disruption to the local community and to residents' lives and livelihoods.
- The Environmental Risk Assessment for the mine acknowledges that there will be: damage to local roads due to mine subsidence including buckling, cracking and flooding; the potential for far field effects on the F3 bridges; potential damage to culverts; damage to Aboriginal heritage sites; and potential damage to a silo, a house, and a school.

Response:
This section of the submission essentially repeats sections of the EA. These matters will be considered in the determination process.

3.6.3 Impacts on Surface and Groundwater Quality and Supply

- ❒ Reduction in regional hard rock aquifer pressure.

Response:
Longwall mining will generate a pressure loss regime within the deep rock strata. Depressurisation will migrate upwards through overburden strata via subsidence induced cracking or bedding parting and via pore spaces in the hard rock matrix. Zero pore pressures are predicted to migrate above extracted panels, to the lower part of the Tuggerah Formation about 220 m above the coal seam. This will in turn generate pressure loss gradients within the remaining part of the Tuggerah Formation and in parts of the overlying Patonga Claystone. Since the hard rocks are basically stratified aquicludes or aquitards, there are no identifiable adverse impacts within the hard rock system.

- ❒ Leakage of groundwater from shallow alluvial aquifer systems to deeper systems.

Response:
Section 8.2.3 of the EA states that there is potential for groundwater exchange between strata via fractures and micro cracks which introduce secondary permeability if they are connected, however core inspections and borehole permeability testing undertaken as part of the study suggests that the hardrock strata are infrequently fractured and therefore likely to exhibit low secondary permeability. Where observed in core, the fractures are often clean and without alteration or secondary mineralisation implying negligible movement of groundwater along these features. As discussed in 5.2.6, rainfall recharge will be at least 20 times higher than any leakage from surface aquifers.

- ❒ Change in shallow aquifer system storage induced by subsidence.

Response:
Loss of pressure within hardrock strata has the potential to induce leakage from the shallower alluvial systems in the long term. This leakage could occur via vertical fracturing arising from subsidence. SCT (1999) have conducted simulations of the failure regime and determined that cracking above goafed zones would not exhibit continuity to surface. Instead, a significant zone of 100 to 400 m thickness would remain devoid of connected cracking and tend to isolate any shallow and surficial subsidence cracking from the deeper cracked and caved zones. Loss of storage attributed to connective cracking as a result of subsidence is therefore expected to be negligible. As stated in the EA, any downwards leakage from the alluvium will be sourced from groundwater storage within the alluvium which in turn is sustained by rainfall recharge. For

estimation of impacts on the stored alluvium groundwaters MER assumed an average long term rainfall recharge rate of 4% of mean annual rainfall or the equivalent of about 130 ml/day per square metre of land surface, in the MER calculations. This is believed to be a very conservative estimate of recharge in the absence of measured water table responses to rainfall events, but it is much greater than the predicted leakage induced by mining (at least 20 times higher).

- Loss of groundwater yield at existing bore locations.

Response:
Section 8.3.3 of the EA states that loss of pressure induced by mining within the deep hardrock strata is not predicted to affect any existing bores due to the very low leakage fluxes that are estimated by numerical modeling of the aquifer system. There are 12 bores within the subsidence zone that may exhibit an initial minor loss of yield as groundwater levels initially fall then rebound as a result of subsidence induced strata displacement. Displacement of groundwater levels is unlikely to affect borehole yield in a measurable way.

- Change in groundwater quality.

Response:
The quality of the groundwater expected to enter the mine from the deep hardrock aquitards will be moderately to highly saline and will require treatment prior to reuse. The project includes appropriate treatment systems which will enable this otherwise unusable resource to be used. However, it is possible that some bores located within the subsidence zone may be physically damaged. W2CP will repair/replace any bore water supply where loss of yield attributed to mining, is determined.

- Impact on groundwater dependent ecosystems.

Response:
The EA describes the groundwater dependent ecosystems within the mining area. The primary vegetation unit which can be considered to be groundwater dependent is Riverine Alluvial Gallery Rainforest-Moist Forest which occurs in sections of the Jilliby Jilliby and Little Jilliby Jilliby Creek riparian zone. Section 13.2.6 of the EA states that there is potential that a portion of the extant distribution of Riverine Alluvial Gallery Rainforest-Moist Forest will be affected within the proposed mining area. The main effect will not be in changing the inundation frequency of this community during the range of flooding regimes, but rather as a result of slightly increased depth of flooding during the major flood events. Some objectors have for some time maintained that the project would impact on wetlands such as Porters Creek Swamp which is located on the eastern side of the F3 Freeway and well outside the impact zone of the W2CP. Jilliby Jilliby Creek does not flow into the swamp nor does the Wyong River. The coal handling surface facility site at Tooheys Road is not within the catchment of the Porters Creek Swamp. W2CP's Buttonderry office

site, Council's waste tip, the Warner Industrial Park and the rest of the Wyong Employment Zone and airport, are all within the Porters Creek Swamp catchment. However, this swamp is not at risk from any impacts of the W2CP. Although there are no swamps located within the mining area, the EA studies have shown that the water quality in the Jilliby Jilliby Creek catchment is currently very poor. However, through adopting a "neutral or beneficial effect" philosophy the W2CP has proposed a Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment.

3.6.4 Ecology

- There are three threatened species of flora in the subsidence area and six threatened fauna species.
- The EA states that there will be 'a direct impact on a limited number of rare species (including) part of the local population of *Angophora inopina* which represents in important population at the limit of its distribution, and part of the subpopulations of *Tetratheca juncea*.
- There are potential impacts on the Powerful Owl and the Wallum Froglet, and potential local extinction of the Squirrel Glider.

Response:
These matters are not in dispute and mitigation strategies have been provided in the EA including offsets.

3.6.5 Air Quality

- Dust will be generated from dozers working on stockpiles, loading of material, truck contents, truck movements, coal trains and wind erosion from stockpiles. Dust and odour will be emitted from the upcast ventilation shaft.
- There will be emissions from vehicles and underground equipment.
- Dust emissions will arise both during construction and during operation of the mine.
- Airborne dust will cause nuisance impacts by depositing on surfaces and possibly vegetation/crops.

Response:
These matters are discussed at length the EA which has demonstrated that the project can meet current noise and dust emission goals. The results of these studies have not been criticised by the DECCW.

3.6.6 Health

- Health impacts including increased risk and incidences of cancer, asthma, bronchitis, sinusitis, respiratory problems, allergies and eye problems, dermatitis and psoriasis.
- Increased hospital admissions.

- There is not enough known about the health effects of dust and particulate matter from coal mines and coal-fired power stations.

Response:
These matters are dealt with in Section 5.11.

3.6.7 Other Issues

- Increased traffic congestion
- Increased noise during construction and operation of the mine
- The EA states that construction noise impacts have the potential to exceed the noise assessment objectives, and considering the transient nature of the construction works the short-term impacts would normally be considered to be acceptable. However the construction phase has been estimated to last at least a year which we do not consider to be transient.
- There is also predicted to be excessive noise during the operational phase of the mine – 'a marginal exceedance of project assessment goals predicted due to Tooheys Road site operations at two locations during adverse weather conditions'.
- Noise will be detrimental to the quality of life and potentially the health of local residents.
- Increased train movements
- Visual impacts
- Impacts on tourism
- Reduced property values
- Effects on the community from people having to have houses moved, raised or relocated
- Lack of adequate public consultation and access to documents, and lack of weight that has been given to the public opinion that has been expressed.
- Concerns about media reports that large parts of the Assessment haven't been made available to the public, which was confirmed at the Public Forum held at Wyong Council on the 18th May.
- The detrimental effects of the project far outweigh any benefits, since these are mostly financial short term benefits for a private company.

Response:
An updated Traffic Impact Assessment undertaken by Parsons Brinckerhoff Australia Pty Limited has been prepared and is available on the project web page. This work was undertaken at the request of Wyong Shire Council and used more recent traffic projections from the proposed Wyong Employment Zone. The study confirmed that the W2CP is only a minor contributor to the current and future traffic management issues of the area which will arise from planned growth.

Detailed assessment of the potential health impacts, which has included both noise and dust emissions concluded that there will be no significant impact, refer to Section 5.11. The assessment included increased train movements to the port of Newcastle.

The W2CP will have no negative impact on tourism. The surface facilities locations were chosen because the area is appropriate for industrial use. Any tourism activities in the immediate vicinity of the Buttonderry and Tooheys Road sites would already be marred by the industrial zoning of the area. Tourism in the area above which coal extraction is to occur will not be impacted.

An issue commonly raised in submissions opposing major developments is the potential negative impact on property values. NSW has a long history of coal mining, and there has been no conclusive evidence that properties located above an underground mine have been devalued as a result of the mine. In the case of properties located in close proximity to the surface facility sites, it is expected that the property values will not change, since they are already situated near land zoned as industrial, and the W2CP surface facilities have been carefully located within appropriate industrial development areas.

Consultation activities undertaken for the project, including the prompt release of information on the company's web page, are detailed in Section 5.10.1.

3.7 Greg Piper MP (Member for Lake Macquarie)

3.7.1 Subsidence

- The EA has not addressed the Director General's requirement to assess non-conventional subsidence impacts.

Response:
This is not correct. The subsidence assessment contained in Volume 2 of the EA covered the full range of potential subsidence impacts.

- It is of concern that traditional subsidence parameters have been used in an attempt to justify the proposed development, yet these would introduce an element of risk that should be unacceptable in such an important water catchment.

Response:
This is not correct. The method used to prepare these subsidence predictions was developed from a combination of the Incremental Profile Method (IPM) and numerical modelling based on actual geotechnical data gathered during the exploration program for the W2CP. The work was undertaken by the two leading subsidence experts in Australia, namely Mine Subsidence Engineering Consultants (MSEC) and Strata Control Technology (SCT).

The IPM is an empirical method that is based on extensive measurement of mine subsidence that has taken place over mined areas for more than fifty years, and has been continually refined to suit a wide variety of mine

layouts with differing geological conditions in NSW and Queensland coalfields. The IPM has the capacity to provide detailed site specific "empirical" predictions of subsidence, tilt and strain over a series of mined panels with differing panel and pillar widths, depths of cover and extracted seam thicknesses. It has been exhaustively reviewed during a number of inquiries and reviews and is regarded as the best method available for the empirical prediction of subsidence parameters. Strata Control Technology Pty Ltd (SCT) was engaged to undertake numerical modelling to compare against the differences, if any, which may have resulted from the use of empirical data from the Southern Coalfield to predict subsidence in the Newcastle Coalfield.

The preliminary layout assessments provided a clear insight into the speed and the detail with which the IPM could evaluate various combinations of panel geometry and extraction height to enable planners to quickly review the impacts of a complex matrix of design options. Consequently, a number of iterative changes to the mine design were made to enable the subsidence parameters relevant to particular structures and features to be controlled.

The W2CP achieved this by incorporating advanced computer modelling techniques developed by Strata Control Technology Pty Ltd, with current empirical modelling methods developed by Mine Subsidence Engineering Consultants Pty Ltd through an exhaustive process of validation and back analysis.

3.7.2 Water

- The EA was prepared without access to factual baseline data on water and therefore provides no certainty in its predictions.

Response:
This is incorrect. The data available to W2CP has been verified as sufficient by the independent review undertaken by Sinclair Knight Merz on behalf of the Department of Planning. Further, the SKM report noted the numerous additional groundwater monitoring stations established by the project from March 2010 that continues to extend baseline data.

- It is stated in the EA that the aquifers provide limited contribution to surface flows, but does not acknowledge the increased risk of loss of surface water due to cracking of the valley floor.

Response:
The issue of cracking of the valleys is discussed further in Section 5.1.3.

- The EA states that a significant portion of the water supply comes from upstream of the proposed mine, but does not acknowledge the increased risk that this brings.

Response:

The importance of the water supply scheme has never been underestimated and the imperative to reduce any and all risks to the water supply scheme has been a primary objective of the project. The project as put forward will protect the water supply scheme from the impacts of mining.

- The EA presents the view that existing rural practices may compromise water quality without acknowledging the project's own threat to the availability of water.

Response:
It is without doubt that existing rural practices have compromised the quality of the water within Jilliby Jilliby Creek. Neither the project proponents nor the EA underplays the importance of the Jilliby Jilliby creek system. Despite the fact that the project will not impact on the water supply scheme, the project has committed to the implementation of a Riparian Zone Enhancement Program which will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value as well as improving water quality by assisting landowners with appropriate land management practices.

- Depressurisation of aquifers will occur with effects lasting 200 years after cessation of mining.

Response:
There is a misunderstanding that the depressurisation and 200 year recovery relates to the deep hardrock aquitards which will be disturbed by removal of the coal seam. This groundwater zone has no economic or environmental significance in terms of water supply potential or ecological relevance. The surface alluvial aquifers will remain functional and will in fact increase their storage capacity.

- The EA provides a confused assessment in which groundwater impacts are understated by considering them across a large area, followed by a contextually irrelevant description of how farming practices impact on the quality of surface water. There should be a clear distinction between the two flow regimes.

Response:
The groundwater impacts are discussed in two levels, within the mine impact zone as well as on a regional basis. This is a necessity in any groundwater assessment and does not detract from the conclusions drawn.

3.7.3 Ecological Effects

Key threatening processes will inevitably result from any failure in the predicted pattern of subsidence and a range of habitats would thus either be affected or under

an unquantifiable risk if the project was to proceed. Two key threatening processes declared by the NSW Scientific Committee that are likely to occur are:

- alteration of habitat following subsidence due to longwall mining; and
- alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands.

Response:
Both points raised above have been addressed in detail in the EA. Section 13.2.11 of the EA provides an assessment of the Scientific Committee's determination. This is further explored in the Ecology Study which is contained in Volume 4 of the EA. The key finding is that longwall mining in some circumstances can impact on drainage sensitive ecosystems such as swamps when undermined. The project will not undermine any swamps or significant drainage sensitive ecosystems. The EA describes the groundwater dependent ecosystems within the mining area. The primary vegetation unit which can be considered to be groundwater dependent is Riverine Alluvial Gallery Rainforest-Moist Forest which occurs in sections of the Jilliby Jilliby and Little Jilliby Jilliby Creek riparian zone. Section 13.2.6 of the EA states that there is potential that a portion of the extant distribution of Riverine Alluvial Gallery Rainforest-Moist Forest will be affected within the proposed mining area. The effect will not be in changing the inundation frequency of this community during the range of flooding regimes, but rather as a result of slightly increased depth of flooding during the major flood events.

The only significant swamp near the project area is the Porters Creek Swamp which is located on the eastern side of the F3 Freeway and well outside the impact zone of the W2CP. Jilliby Jilliby Creek does not flow into the swamp nor does the Wyong River. The coal handling surface facility site at Tooheys Road is not within the catchment of the Porters Creek Swamp. W2CP's Buttonderry office site, Council's waste tip, the Warner Industrial Park and the rest of the Wyong Employment Zone and airport, are all within the Porters Creek Swamp catchment. However, this swamp is not at risk from any impacts of the W2CP. Although there are no swamps located within the mining area, the EA studies have shown that the water quality in the Jilliby Jilliby Creek catchment is currently very poor. However, through adopting a "neutral or beneficial effect" philosophy the W2CP has proposed a Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment.

3.8 David Harris MP (Member for Wyong)

As the State Member for Wyong, I have had representations from a large number of local residents voicing their concerns about proposed mining in the Wyong Valleys and the associated coal loading facility to be located near Tooheys Road.

The concern shown by the local community is not restricted to any specific environmental movement; rather it is reflected by a wide range of residents and business people who have serious concerns about:-

- Possible effects on our critical water catchments
- Possible effects of subsidence on property and natural environments
- Possible health problems caused by noise and dust
- Possible conflict with desired employment and population directions
- Possible negative impacts, both Social and Economic, on employment and residential lands earmarked for future development

There has been an independent inquiry and the Director General of Planning has issued very strong requirements that need to be met if the project is to proceed. These requirements are possibly the strongest ever issued for a mining development in NSW and it is incumbent on the Planning Assessment Committee to ensure that the Wallarah 2 application meets the standard and intent of those requirements.

As the elected Member of Parliament in an electorate, which could be adversely impacted by potential mining development and associated activities, I feel a strong responsibility to make known the view and concerns of the community.

3.8.1 Director General Requirements

Does the Wallarah 2 Application include enough information to meet the standard of proof for the project to proceed?

Although the submission from the Wallarah 2 Coal Project contains a large amount of information, there are a number of areas where I believe it has failed to adequately provide information to meet the standard of proof required by the intent of the Requirements. Some of these significant areas are:

- Detailed assessment of the project on the capacity, safety and efficiency of the surrounding rail network, having regard to the strategic objectives for passenger and freight rail networks (such as the Northern Sydney Freight Rail Corridor project)

Response:

A Rail Capacity Study has been prepared by Rail Management Consultants Australia Pty Ltd (RMCA). This study was not available at the time of publication of the EA as the baseline network demand model was not available from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling since undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can

comfortably run daily between the mine and the port. This can be comfortably achieved by two conventional train consists of the Coal Schedule 2 configuration. This current rail capacity will readily cater for the maximum expected production output of W2CP. However, it is expected that W2CP would normally require only 6 of the approximately 260 available daily train paths on the Main Northern Line. RailCorp supports the findings of the completed RMCA rail impact assessment which is available on the W2CP web page.

- Greenhouse Gas – Including a quantitative assessment of the potential scope 1, 2 and 3 greenhouse gas emissions of the project, including fugitive emissions. The report states it would be impossible to calculate the potential greenhouse gas emissions including those produced by the customer. This DR has been clearly placed in the too hard basket. The EA has failed to adequately address this important issue. Greenhouse Gas emissions and Climate Change are squarely on the National and International agenda, so no approval should be given until this issue is properly addressed. Nowhere in the EA was there consideration of the economic implications of the Commonwealth's proposed Carbon Pollution Reduction Scheme.

Response:
These statements are incorrect. Section 12.7 of the EA describes Greenhouse Gas Emissions in terms of diesel use, electricity consumption, extraction of coal and transport of coal. Section 12.8 of the EA provides data on emissions from the end use of the coal. Table 12.11 of the EA provides a summary of the GHG emissions for the life of mine covering Scope 1, Scope 2 and Scope 3 emissions. An assessment of these emissions in terms of global warming based on the IPCC assessment reporting is provided in Section 12.10. The implications of the Carbon Pollution Reduction Scheme are addressed in Section 4.11 of the EA. Under the CPRS as then proposed, the following are relevant to the W2CP:

Policy position 6.2 - In general, direct Scheme obligations will apply to W2CP since its emissions are predicted to exceed the threshold of 25 000 tonnes of CO2-e a year of direct (Scope 1) emissions.

Policy position 6.4 - Transport emissions will be covered from Scheme commencement and obligations will be applied to upstream suppliers of transport fuels. While emissions from the transport of coal generated by the W2CP will be covered by the Scheme, obligations for these emissions will rest with the upstream supplier of transport fuels.

Policy position 6.12 - The Government will apply Scheme obligations to entities that first supply coal and coal byproducts for use in the domestic market.

Policy position 6.14 - Scheme obligations will not apply to emissions from combustion of biofuels and biomass for energy, including CO2-e

emissions from combustion of methane from waste landfill facilities; they will receive a 'zero rating'.

During the initial years of mining where insufficient volumes of gas will be generated to warrant offsite transfer or power generation, the gas will be flared as a means of reducing greenhouse emissions. It is currently uncertain what scale of obligation might apply to W2CP from this emission source.

Policy position 7.13 - Entities reporting fugitive emissions from underground coal mines will be required to use National Greenhouse and Energy Reporting System Methods 2–4 for the estimation of emissions under the Scheme.

The W2CP will be subject to the CPRS or similar future scheme and therefore accountable for the greenhouse gases generated by the mine.

- Health Risk – including a detailed Human Health Risk Assessment addressing how the project's environmental impacts (particularly in relation to air quality, noise and drinking water quality) may impact the health of the local community. The assessment should include both impacts directly created by the project and impacts indirectly created by the project, such as additional rail and road movement in the local area. Whilst the report does go into some detail around this issue, it fails to address the cumulative effect when combined with three nearby power stations, as well as dust particles created by the existing quarry and F3 roadway. This project won't stand in isolation from these other activities, which already impact on the community. No approval should be given until a detailed analysis is carried out on the cumulative data.

Response:
Both the Air Quality Impact Assessment and the Health Risk Assessment contained in the EA took account of other developments surrounding the W2CP. The basis of these assessments is to determine the existing air quality in the area and then assess the incremental change as a result of the project. The assessments took a conservative approach to estimating a background level of dust concentration and deposition rate, as follows:

- **Annual average TSP of 42 $\mu g/m^3$ (maximum measured in years not affected by bushfires)**
- **Annual average PM10 of 21 $\mu g/m^3$ (maximum measured in years not affected by bushfires)**
- **Annual average dust deposition of 2 g/m^2/month**

The TSP and PM10 levels adopted were similar to those recorded respectively at Wyee by Delta Electricity and the Central Coast Public Health Unit and reported in the Wyong Shire Council State of the Shire Report 2008-2009.

No PM2.5 data were collected for the project, but data recorded by Delta at Wyee have been previously included in the Wyong Shire Council State of

the Environment reports. The data did not show any particular trend (a slight decrease was noted) but had been collected over a 2.5 year period only. The maximum daily recorded levels were below the NEPM advisory reporting guideline of 25 µg/m^3 with a maximum recorded level of 19 µg/m^3. The annual average was marginally above the guideline of 8 µg/m^3 as it is in many regions of Australia.

The recorded levels of pollutants take account of local sources so would include contributions from the power station in the area. It is noted that the Vales Point Power Station installed fabric filters in 2007 to reduce particulate emissions.

According to the 2008/2009 National Pollutant Inventory (NPI), Eraring emitted 1,100 tonnes of PM10 and 590 tonnes on PM2.5. However the majority of these emissions were from point sources, specifically tall stacks rather than fugitive sources, and the emissions are therefore well dispersed. Dispersion modelling for the Eraring Power Station upgrade in 2008 predicted maximum 24-hour PM10 concentrations of 0.6 µg/m^3 which would not be perceptible above existing background concentrations.

At present the air quality data collected at the project monitoring sites are largely influenced by local factors such as the road (i.e. traffic on the F3 Freeway, traffic on the unpaved Tooheys Road, etc) as well as regional sources such as dust storms and bushfires, rather than major emissive industries.

Further residential development in the area will affect local air quality, however from the modelling results the contributions from the typical operations of the W2CP project are very minor at any nearby sensitive receptor.

- Possible effects on water systems. When dealing with a sensitive water catchment area such as this, precautionary practice should be foremost in decision-making. The report agrees that there will be subsidence that will result in effects on the natural water systems, but it will not be significant and will be in most cases, self repairing. There is a wealth of evidence in the public domain that this is not necessarily the case. DECC recognises that previous longwall mining has had significant impacts on river health, water dependent ecosystems and aboriginal culture and heritage. Therefore improvement through consultation is necessary to improve environmental assessment and management approaches to longwall mining. The department highlights clear, agreed water quality and river–flow objectives made between government and community. Longwall mining has an impact on the achievement of these agreed objectives.

Response:
The W2CP has adopted a conservative approach to the potential implications on the water supply scheme. However, reference to certain other river systems and the impacts of longwall mining is not valid. There have been extensive reviews undertaken of previous experiences of subsidence ground movements and subsidence impacts after longwall

mining under or near the Cataract, Georges, Nepean and Bargo Rivers and the Waratah Rivulet.

In steep narrow gorges where there are a series of rockbars and rock pools, such as Cataract Gorge, the combined effects of upsidence and closure can result in cracking, buckling and shearing of the rock layers in the floor of these valleys. These movements can result in the surface water flows being lost to view as some of these flows can be diverted downstream through a shallow fracture zone that has been created beneath the floor of the gorge section that has been undermined. The nett flow of water along these gorges however remains unchanged.

In broader "flooded river" valleys such as the Nepean River Valley, Tower Colliery has mined longwall panels near and beneath the Nepean River with no reported or observed loss of surface water. In these cases the potential for subterranean flow diversion is very low as the river beds are already fully saturated and the bedrock is submerged and covered by alluvial deposits. Consequently, any fractures that develop in the bedrock in that location as a result of mining are immediately filled by water or sediment and they do not provide a pathway for flow diversions. The volume occupied by the water and rock does not change. Similarly the nett flow of water along this valley will remain unchanged.

The W2CP's geologic and geomorphic conditions are unique. While there is some similarity to the case of longwall mining in the area of the Nepean River, the W2CP conditions are vastly different to those at Cataract River and Georges River. It needs to be acknowledged that the Wyong River, Little Jilliby Jilliby Creek and Jilliby Jilliby Creek are essentially flooded valleys with fully saturated alluvial deposits up to 30 metres in depth.

It is true that DECCW has reported issues relating to longwall mining and swamps and other water sensitive ecosystems. DECCW has been involved in extensive studies in both the Western and Southern Coalfields on this issue. Those hanging swamps encountered in those regions are specific and unique ecosystems which are essentially perched high in a plateau environment. They do not occur within the mining area of the W2CP.

- The Wyong LGA has had significant floods in the past. Increased flooding may result from disruption to wetlands as wetlands help to regulate the flow of floodwaters. Also, disruption of the wetlands will result in the quality of water flowing into the Tuggerah Lake being compromised.

Response:
The W2CP will not affect flood waters within the Porters Creek Wetland which is the only significant wetland near the project mining area and is located on the eastern side of the F3 Freeway.

- Mining subsidence results in surface cracking and can, in turn impact on stream/river features which may result in loss of surface flow, loss of in-stream

habitats, loss of connectivity between pools, changes to water quality, reduced diversity in in-stream habitats and increased methane release.

Response:
The statement that mine subsidence results in surface cracking is a generalisation as surface cracking is in fact a rare occurrence. There is a risk of surface cracking in steep rocky terrain which increases in steep sided valleys where upsidence can occur. The Dooralong Valley is a broad flat floodplain with the creek system underlain by deep unconsolidated alluvial sediments. This is not a landscape system which would be conducive to surface cracking and such surface impact would be extremely rare. Jilliby Jilliby Creek currently consists of a series of pools with nil to low flow outside rain periods. These pools exist within the unconsolidated alluvium where subsidence will not change the permeability between pools.

Coal seam gas drainage will be undertaken within the underground mining area. The gas drainage system will capture the majority of the methane contained within the coal seam ensuring that "fugitive gas" in the mining zones is restricted to low background levels. This is an essential requirement for the provision of safe mine operating conditions and is required under the mining legislation. The residual methane gas at these low background levels is not capable of producing anoxic conditions.

The captured methane gas will be piped to the surface where it will be initially flared for greenhouse mitigation reasons until such time as commercial quantities are available for alternative uses.

In a comparison between Wallarah 2 Mining Project and the longwall mining under the Cataract River in the Hawkesbury / Nepean System the submission notes that:

- Both projects have similar mining depths and geological basins
- Cataract River water flows suffered. Gases that had negative impacts on vegetation were also released. Neither of these impacts were predicted

Longwall mining in the Wyong LGA will potentially have an even worse impact, as the project includes wider longwall panels (up to 250m) and thicker coal seams (averaging 6m). Because of this, there is an increased likelihood of greater fracturing occurring, which could result in saline groundwater not being contained. *ie* saline water leaking into the water flow.

Response:
Comparisons between the Cataract River and Jilliby Jilliby Creek have been discussed in detail in Section 5.1.3 as well as generally in earlier responses to this submission (refer above). Longwall panel width and extraction heights have been detailed in the EA and shown graphically in Figure 2.7. Panels have been narrowed and extraction height reduced within the Dooralong Valley floodplain and Hue Hue rural residential area. The maximum seam extraction height is 4.5 m while the maximum panel

width of 250 m occurs within the Wyong State Forest in the west of the mining area.

In the Environment Protection Authority's (EPA) submission to the same inquiry, there were clear concerns about current assessment processes. Its submission stresses that there is insufficient assessment of underground mining impact at the approval stage to enable proper practices to be built into conditions of approval, so that adverse impacts are less likely to occur. The Subsidence Management Plan (SMP) occurs AFTER the mining strategy has been planned and is therefore too late to properly address impacts and influence the mine plan. It believes that the SMP does not adequately address environmental matters, which need to be identified and resolved prior to approval of the plan. The EPA advocates caution and the need to avoid the "patch up" mentality. The EPA also believes that to date, monitoring of the impacts of longwall mining has been inadequate.

Response:
Unlike many of the mining operations in the Southern Coalfield, the W2CP is a greenfield project and will continue to be under a much greater scrutiny through the current Part 3A process. It should be noted that the comments made by the EPA relate to coal mines which commenced many years prior to the introduction of the Environmental Planning and Assessment Act in 1979. For the W2CP the SMP process has yet not yet begun and will be governed by the outcomes of the Part 3A approval process and conditions. The EPA is involved in the setting of SMP conditions including monitoring and reporting through representation on the Interagency Panel.

In its submission the Central Coast Joint Water authority outlines a number of concerns, which have not been adequately allayed in the Environmental Assessment. The Authority highlights the fact that water resources on the Central Coast are extremely limited and therefore, MUST be protected. Mine subsidence could impact on the riparian environments and stream bank stability, leading to reduced water quality, especially in Jilliby Jilliby Creek and Little Jilliby Creek.

Response:
Issues raised by the Gosford-Wyong Council's Water Authority have been addressed in Section 4.10. The W2CP has gone to great lengths to demonstrate that the water supply system can and will be protected. The EA makes a commitment to monitor the river for any increases in erosion or bank instability and has also committed to establishing a Riparian Zone Enhancement Program will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value as well as improving water quality by assisting landowners with appropriate land management practices.

The Wyong River and Jilliby Jilliby Creek catchments provide approx 50% of the current Central Coast water demands. The Central Coast is a growth centre for Sydney – population is predicted to be 480,000 by 2050.

Response:
Mining will not take place beneath the Wyong River. The discussion of potential impacts on the water supply scheme is focused on the Jilliby Jilliby Creek catchment. The contribution from this catchment primarily occurs during periods of wet weather. At other times the creek is characterised by a series of ponds with low to nil flow. A combination of its low flow characteristics and catchment land uses has resulted in frequently degraded water quality within Jilliby Jilliby Creek, in terms of elevated faecal coliforms and nutrients particularly at low flows. Further, the Independent Strategic Inquiry Into Potential Coal Mining within the Wyong LGA, including the Dooralong and Yarramalong Valleys reported in December 2008 that:

> ***"based on the available data, while groundwater sourced from the Wyong River and Jilliby Jilliby Creek alluvial systems does make a significant contribution to the water supply of the Central Coast (estimated to be between 3.5 and 6%), any mining activity would not significantly impact on the existing groundwater levels or groundwater availability."***

Mine subsidence could impact on the frequency and nature of flooding; also the course of streams, therefore impacting on water quality and quantity.

Response:
There will be a very small change to overall flood extents in the Dooralong Valley floodplain as the subsidence profile will be relatively consistent throughout this area. The project will result in some changes to flood extent and these have been documented in the EA (refer Figure 9.3). Properties that will experience an increase in flood risk as a result of the project will be subject to either mitigation or compensation following consultation and agreement with the landowners. Creek systems are dynamic and their courses change over time. The project will not affect this process nor have any effect on the quantity and quality of floodwaters.

The NSW Scientific committee has also declared that longwall mining is a key threatening activity.

Response:
Section 13.2.11 of the EA provides an assessment of the Scientific Committee's determination. This is further explored in the Ecology Study that is contained in Volume 4 of the EA. The key finding is that longwall mining in some circumstances can impact on drainage sensitive ecosystems such as swamps when undermined, however the project will not undermine any swamps or significant drainage sensitive ecosystems.

3.8.2 Independent Water Study

For the public to have any confidence in the process an independent method of assessment, which relies on research and is not carried out exclusively by the mining industry itself, must be in place. The Wyong LGA Strategic Report consistently makes reference to the fact that it bases its conclusions on the

'information available" most of which was supplied exclusively from the Wallarah 2 Project.

The focus should be on ensuring that the water catchment will not be put at risk by such a project. Extensive studies, no matter how time consuming, must be undertaken. There is an independent water study to be completed, followed by a peer review. Until that detailed study is complete it is very difficult to carry out a comparison with the figures and assumptions made in the Wallarah 2 Coal Project Environmental Assessment.

I would also like to put on the record that I do not believe that a thorough and detailed study can be completed in the time permitted under this assessment process. Water flows are seasonal and studies need to be undertaken in normal rainfall periods. This area is recovering from long years of drought and the Shire is still on level 3 water restrictions.

Response:
The Department of Planning engaged Sinclair Knight Merz to undertake the independent review of the adequacy of data as recommended by the Independent Inquiry into mining in the Wyong LGA ("Chikarovski Inquiry"). The final report was published 13th August 2010 and is available on the DOP web page. The report stated in Section 10.2 that:

> ***The number of groundwater monitoring bores in the Wyong area is considered to be much greater than monitoring networks in other similar agricultural, natural and water supply catchments. The spatial distribution and density of groundwater monitoring bores in the Wyong LGA is considered sufficient in terms of its ability to provide baseline information and to provide an indication of any impacts at the site due to proposed changes. Furthermore the location of monitoring bores to the north of the proposed mine area and to the west of the study area, will provide information regarding fluctuations due to natural variability, given they are up-gradient and a considerable distance away from the proposed mining activity.***

Recommendations for additional monitoring to assess the ongoing performance of the mine during operations are supported by the W2CP.

A comprehensive study of at least three years should be developed to establish baseline data.

Response:
The independent review concluded that there was sufficient data to undertake the necessary impact assessment. Groundwater and surface water quality monitoring will continue on a significantly enhanced basis and by the time mining reaches the Jilliby Jilliby Creek floodplain there will be nearly 10 years of additional monitoring data available.

3.8.3 Recommendations

This submission recommends that there be a three (3) year Moratorium on mining in the Wyong Catchment to allow an independent research project to be conducted. The submission provides extracts from the Independent Inquiry into Mining in the Wyong LGA. The submission states that these comments leave no certainty as to the Panel's ability to judge these issues in a scientifically informed way. A three-year study is requested as a minimum, as it would allow for variations in climate and conditions to be taken into account. It would also take into account seasonal variations. The argument for a moratorium to allow for specific research to take place is backed by the Panel's recommendations in Section 4.2.2. – Wallarah Coal Project Recommendations.

Part a) consideration should be given to an independent review of the final Wallarah 2 proposal as part of the Department of Planning's assessment process, and

Part f) Wyong Shire Council and the community should be encouraged to allow water monitoring stations to be installed and accessed to allow for better collection of baseline and monitoring data.

Response:
The W2CP commenced its environmental investigations in 1996. The current water quality monitoring program commenced in May 2006. The previous program ran between 1996 and 2002. The W2CP hydrogeology model is based on more than 260 exploration boreholes which have been wireline logged, cored (more than 50 fully cored holes), and the rock types carefully recorded. This density of exploration boreholes for a new coal mine at the depths envisaged is exceptional and provides a high level of confidence in the geological model. Groundwater monitoring within the Dooralong Valley will continue throughout the project life and by the time the Jilliby Jilliby Creek floodplain is reached there will be nearly 10 years of monitoring data available. Additional groundwater monitoring stations are supported and with the approval of Wyong Shire Council will be installed at least three years prior to mining within the Dooralong Valley. Although the independent review undertaken by Sinclair Knight Merz confirmed that there is sufficient baseline data available already, W2CP supports the installation of additional monitoring stations to extend the data collection system during mining operations..

The second recommendation is that a full economic and social study to be conducted in terms of the potential impact on economic growth strategy outlined in the Central Coast Regional Strategy (CCRS). The Wyong Shire has attracted a number of "clean" industries to the area including Woolworth's Distribution Centre, BlueTongue

Brewery and Primo Foods. Any potential "dirty" industry must be assessed against possible impacts on these "clean" industries. For example, Woolworth's Distribution Centre at Warnervale employs more workers, both directly and indirectly than the estimated employment associated with the Wallarah 2 proposal.

Response:
The economic and social assessments have been done as part of the EA and contained in Volume 3. W2CP refutes the inference that the project will adversely affect nearby business communities. The EA outlines the well located and designed surface facilities and the limited potential for any offsite impacts upon other nearby land uses and users, including those of the WEZ. The assertion that dust generated will keep other industries such as food processing away from the area is unsupported by the facts. The existing food warehouse is located immediately next door to a concrete batching plant and heavy transport terminal.

The third recommendation is that a full and independent study of current dust levels be conducted in the Northern Wyong Shire with particular attention to impacts on residential areas. The presence of fine particulates needs to be monitored and studied.

Response:
The W2CP would support such a study.

The Wallarah 2 project should not be allowed to proceed until there is a thorough, independent study into the hydrology, dust and economic impacts on the important designated Wyong Catchment area and effected residential areas. For the public to have any confidence that mining would not impact their important water supply or their health, anything less that a full independent study would not be acceptable.

Response:
W2CP has always maintained that the findings of the EA will withstand independent scrutiny and welcomes any external independent review. The EIA process for the W2CP has involved the preparation of an EA which is required to pass adequacy prior to release, an independent strategic inquiry, review by several government agencies, an independent water study and international peer review and a Planning Assessment Commission inquiry. W2CP considers that full and thorough independent study of the proposal has been demonstrated by the stringent and exhaustive assessment and approval process.

3.9 Construction Forestry Mining and Energy Union

The Union recognise and support:

- The value of the current Part 3A process under the Environmental Planning and Assessment Act for comprehensively dealing with major projects that are important for NSW;

- The importance of ensuring that a case by case approach be taken to enable each and any mining project to be considered and assessed on its merits under the current approvals regime;
- The spirit and intent of the Mining SEPP to resolve real or perceived land use conflicts; and
- The environmental planning and assessment merits of the stringent Subsidence Management Planning process administered by DPI for addressing a variety of key issues across a number of government departments and for dealing effectively with important landowner matters and views of community stakeholders.

The Union therefore on balance strongly supports the W2CP as proposed by Wyong Areas Coal Joint Venture.

3.10 Newcastle Greens

- The proponents have presented documentation that assumes current coal demand conditions will continue into the foreseeable future but that assumes that there are no practical alternative energy sources to coal.

Response
The EA acknowledges that there are currently no viable alternatives that can be used to replace coal in the production of electricity at the present time. The quality of the W2CP resource makes it attractive for use by countries required to reduce their carbon emissions. In a carbon constrained world economy, it is anticipated that the demand for higher quality coal such as that of the W2CP, will increase.

- Many government and non-government organisations have indicated that the community simply does not want to see the development of another polluting and environmentally threatening coal-mining project.
- Contrary to the assertions made by the proponents there are a wide range of low emissions resources within reach including geothermal power, wind, solar, wave and tidal power.

Response:
The EA acknowledges that there is a wide range of low emission technologies available and many countries that are more advanced than Australia in reducing GHG emissions currently demand higher quality coal resources as part of their GHG reduction strategies. Technological advances in alternative energy sources are not yet far enough advanced to alleviate the need for coal in large scale electricity production required to power major cities. Demand for W2CP coal will be high particularly from countries making the transition to a lower carbon economy.

- The bipartisan organisation, Zero Emissions, maintains that the technology and expertise to run a 'renewable economy' is already operating in Germany, Spain, and Denmark and what our economy requires is the political will to instigate

change. Until this happens Australia will continue to fall behind other countries that are building low pollution economies.

Response:
Despite the increasing growth in the use of renewable power generation, the demand for high quality coal resources worldwide is increasing and will continue to do so. For example, as reported by Reuters on 2 September 2010, Germany will increase coal imports to 138 million tonnes by 2015 from 129 million tonnes in 2009. Growth in coal consumption will be far greater in Asian economies.

- The W2CP proposal fails to address its impact on greenhouse gas emissions resulting from mine operations.

Response:
This is not correct. Greenhouse gas emissions covering Scope 1, 2 and 3 emissions for the life of the project have been documented in Section 12.9 of the EA. The assessment of the significance of these emissions have been addressed in Section 12.10 of the EA where is calculated that the total emissions would represent 0.031% of global CO2-equivalent annual emissions. The EA does not state that the GHG emissions do not exist or are negligible.

- DECC's recommendation regarding methane capture is totally ignored (i.e. that mining proponents comprehensively assess fugitive methane emissions that result from long wall mining activity and identify and undertake all practical measures to capture and beneficially use or prevent methane being released to the atmosphere).

Response:
This is not correct. Section 2.11 of the EA deals with gas capture and utilisation.

- The proponents are more than willing to let the community bear the long term economic, social and environmental impacts for short term economic return.

Response:
The EA details the significant economic benefits that will flow on to the entire community and the state of New South Wales which will continue for the life of the project (refer to EA Section 10.6). The EA has clearly assessed the impact of the proposal on both the environment and the community, and it is considered that the impacts can be adequately managed with informed and adaptive responses.

- The 'Business and Resident Attitudes towards the Proposed Wallarah 2 Coal Mine' surveys did not present a question regarding feasible alternative industries that residents in Wyong and the Central Coast may prefer to see developed. The surveys showed that more than 60% of respondents were concerned about or opposed to the proposal.

Response:
The Executive Summary of the Business and Community Survey independently conducted by the Central Coast Research Foundation stated that: "Just over half of business managers/owners felt that the proposed mine would have a positive (48%) or very positive (8%) impact on the Central Coast economy. A further 25% indicated that they believed the economic impact would be neither negative or positive." Only 14% indicated that the economic impacts would be negative.

- Business support for the proposal was polarized which is not surprising as the EA notes that only a small proportion of workers will have any need to used community facilities and that 'modern construction forces have been found to be highly mobile and prepared to commute relatively long distances'.

Response:
The W2CP has made a commitment to target 70% of its permanent workforce to be sourced from the local region and to meet this target it will provide assistance to local training and education programs. In a region where a high percentage of workers commute to other regions, this commitment is considered significant. Although some construction workers will no doubt come from outside the region, it is anticipated that a large proportion will be locally derived which will alleviate pressure on community facilities.

- The EA feebly asserts that new mines such as the W2CP will dominate fuelling electricity power generation into the foreseeable future. Offering as their terms of reference, international agency advice such as The International Energy Agency (EIA) provides, but failing to note that even the EIA concedes that solar will make up 25% of the world's energy by 2050.

Response:
Despite the growth in power generated using renewable resources, the worldwide demand for coal is increasing and the demand for high quality coal which produces less GHG emissions per energy output will be in even greater demand. An elaboration on this energy demand issue is provided below.

International Energy & Electricity Demand

IEA's World Energy Outlook 2009 predicted that by 2030, in the reference scenario which assumes similar energy policies among governments as currently exists, the world energy demand will be 47% higher than in 2007. IEA expected that electricity demand will grow by an even greater amount. It predicts a rise in electricity demand to 2030 by 77% over 2007 levels, requiring 4,800 Gigawatts (GW) of capacity additions which is around 100 times the entire grid-connected electricity generating capacity currently in Australia (48.5 GW). This equates to adding Australia's entire electricity system less than every four months for over thirty years.

In the World Energy Outlook 2010 (WEO 2010), a new central scenario called the New Policies Scenario was introduced to reflect he broad policy commitments and plans that been announced by countries around the world, including greenhouse pledges and targets whose measures to implement them are yet to be identified or announced. This scenario shows that world energy demand will rise by only 36% to 2035, or about 1.2% per year. However electricity demand will increase at a much faster rate (2.2%) and coal will continue to be the largest source of electricity generation.

International Coal Use

Coal will remain the dominant fuel of the power sector, however, total coal use (tonnage) will increase, particularly in non-OECD countries. Higher fossil fuel prices, as well as increasing concerns over energy security and climate change, will boost the share of renewables-based electricity generation (mainly hydropower) to near that of coal in 2035. The share of nuclear power increases only marginally (but expands considerably in real terms) while gas-fired generation will significantly increase in non-OECD countries to represent about 21% of world electricity generation n 2035.

The forward projections for coal use and opportunities for renewables will vary in different countries according to a variety of factors, but growth of coal consumption will be greatest in developing countries and among many of Australia's trading partners.

Korean Energy Policy and Coal Use

South Korea, like other countries including Australia, has recently announced a target to increase its share of renewable in its energy mix. It is estimated that the proportion of coal fuel in the electricity mix will decrease as a proportional share of total electricity generated, thus reducing the *relative* reliance on coal fuel. However, given the continuing steep growth in electricity demand it is likely that the overall tonnage of coal used in electricity consumption will plateau or even continue to increase in real terms. This is likely to be the case in Australia as well in coming decades toward the middle of this century.

It is noteworthy that important coal importing countries such as Korea will increasingly focus on the use of cleaner (low sulphur, low to moderate ash, etc), higher energy coals to meet general environmental, greenhouse and efficiency. Indeed, South Korea will not only progressively reduced its relative reliance on coal but has upgraded its remaining coal fired power stations to accept only high volatile low ash coal, as will future power stations. The W2CP is integral to this program as it will result in the progressive reduction of lower quality coal being imported into South Korea which in turn will allow South Korea to meet its aggressive CO2 reduction targets.

Australia had been the world's largest seaborne exporter of thermal coals for power generation until 2005 when Indonesia's rapid growth in coal production exceeded Australia's thermal coal export volumes. Nevertheless, Australia's production and export of thermal coals will continue to significantly increase in coming decades to meet world demand, as evidenced by the current and programmed expansions of coal mine production and transport and port handling capacities.

- The EA is biased in favour of the W2CP and states that 'there are no base-load alternatives to coal which is (sic) expected to continue to meet or substantially supplement the power demands of developed nations.' This does not justify the establishment of a new high risk long wall mine.

Response:
The W2CP will produce high quality thermal coal to meet current demands in worldwide coal markets. W2CP is not considered a high risk mine, either environmentally or economically.

- The proposal does not address whether existing area mines can be expected to continue to service the market demands of both the local and export market for black coal.

Response:
The W2CP will not compete to the detriment of any other operating mine in Australia.

- It has been demonstrated that NSW could have surplus electricity generation capacity by 2020.

Response:
This statement is unsupported. Nevertheless, the W2CP is principally an export mine so the comment has limited relevance.

- The EA states that a proportion of the coal is likely to be used in local power stations on the Central Coast. The Cost Benefit Analysis states that 'W2CP coal will be sold to both export and domestic markets. However, in the first 10 years of mining it is anticipated that the majority of coal will be sold on the export market'. The life of the plant is around 25 years. For around half of its life at best, it will not benefit the local community. The proponents recognise this but try to explain it away. Social and Economic Issues states 'it is recognised that recipients of (these) benefits are not those who will be directly or indirectly affected by the mine. This includes those effects that are only perceptions since it is recognised that these are real to those who perceive them'.

Response:
The economic benefits are not discounted by market destination. The primary economic benefits are realised through employment and goods and services purchased by the operation throughout its operating life.

- The report states that the proponents have created a 'Community Trust Advisory Group' but gives no details of the participants, its aims or functions. How realistic is the proposition that a 'Community Trust Advisory Group' will actually address community 'perceptions' that it will be established to offset and compensate for real community concerns?

Response:
The Community Trust is a commitment made by the W2CP as one means of ensuring that real benefits are provided to the local community. This is current best practice and will form part of the project approval conditions. The details of the Community Trust, its participants and functions will be determined by government.

- Will the trust be in the long term position to offset and financially compensate the potential and anticipated impacts of the mine?

Response:
Yes.

- The proposal affects the Lake Macquarie and Hunter regions, both in terms of reliance on the surrounding areas' historical association with coal production (i.e. supply of experienced workforce and specialist supporting industries) and through transportation links.
- The transport of coal for export will involve significant impacts on the area through which it is transported. Impacts include road safety issues, air and noise pollution, vibration damage to buildings along transport corridors, and damage to public infrastructure (especially roads).

Response:
As with all projects requiring transportation of raw materials or finished products, there will be impacts experienced in areas beyond the development site. Any development project which results in employment opportunities necessarily causes an increase in transport on public roads. These issues have been fully addressed in the EA.

- The burning of coal exports will contribute to the global greenhouse has emissions and will counteract the relative effectiveness of the efforts made by the local community to combat climate change.

Response:
The use of W2CP high quality coal will in fact assist user countries to reduce greenhouse gas emissions.

- Support Greg Piper's view that 'the major benefit from this project accrues not to the people of NSW but to a foreign government that does not share the risk'.

Response:
Section 10.6.5 of the EA clearly identifies the payment of royalties to be made to the NSW Government. Kores Australia Pty Ltd will share in the profits from its very significant project investment as one of five

shareholders of the WACJV, the proponent for the project, as stated in Section 1.4.1 of the EA. All JV shareholders will be subject to Australian taxation requirements in addition to being responsible for other local, State and Federal taxes and charges. The Central Coast will receive increased revenue, increased economic activity and increased employment as result of the project.

- Documentation in the EA has failed to present reasonable, adequate baseline date and thorough conclusive evidence (including achievable mitigation measures) to address the major concerns related to the long term economic, social, and environmental consequences which the project will impose on the community. The proposal does not meet the 'reasonable expectations' of the community.

Response:
This is strongly refuted. The quality and extent of background data available for the environmental assessment has enabled detailed and justifiable conclusions to be made regarding the level of potential impact of the project. The independent expert Sinclair Knight Merz engaged by the Department of Planning has also determined that there is sufficient baseline groundwater data to undertake the necessary groundwater impact assessments.

- The proposal should be rejected as not being in the best interest of the community.

3.11 Total Environment Centre

- The mine will cause significant subsidence damage to Jilliby Jilliby Creek, and insufficient setbacks from the Wyong River leave a very strong probability pf riverbed fracturing.

Response:
This is not correct and assumes that Jilliby Jilliby Creek and the Wyong River flow directly on bedrock streambeds. Both valleys comprise saturated alluvial deposits up to 30 m in depth.

- The Project poses an unacceptable risk to the underground aquifers of the Yarramalong and Dooralong valleys.

Response:
Detailed assessment by groundwater specialist concludes there will be no significant impact on the groundwater system. Refer to Section 5.2.

- Numerous aquatic ecosystems from the affected valleys downstream to the Tuggerah Lakes, including the habitat of migratory bird species, will also suffer impacts should coal mining take place in the area.

Response:

No migratory birds or their habitat will be disturbed by the W2CP. Refer to Section 13 of the EA. W2CP has proposed a Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment.

- The NSW Government protected the headwaters of Jilliby Jilliby Creek in 2003 under the tenure of State Conservation Area to a depth of 50m. The rational at the time was that the area was the water catchment of the rapidly growing urban centres of the Central Coast, situated in the Watagan Mountains, northwest of The Entrance. It is home to 40 threatened and significant fauna species, including forest owls, yellow-bellied and squirrel gliders, koalas, bush-tailed rock wallaby and long-nosed potoroo. This has not changed.

Response:
This has been recognised in the EA and fully addressed.

- Environment groups have recommended that the NSW Government impose a moratorium on new coal-fired power stations and new coal mines. The TEC opposes the Kores proposal in Wyong on this basis alone. However, any longwall mine should, at a minimum, avoid the impacts of subsidence on rivers, creeks and wetlands over remediation. Maintaining the continuity of stream flow should be set as a minimum standard. Mandatory buffer zones to protect the Wyong River, Jilliby Jilliby Creek and aquifers in the Dooralong and Yarramalong valleys should be enforced.

Response:
The current approval process in NSW allows for assessment of projects on an individual merits basis. Mandatory set backs from rivers and the like do not take into account the potential impacts of individual projects. The W2CP has been designed to avoid adverse impacts on groundwater, surface water flows and river systems.

- The recent history of subsidence damage to rivers across the NSW coalfields suggests that the Wyong mine proposal cannot meet the protective statutes for catchments contained within the Local Government Act.

Response:
The W2CP has adopted a conservative planning approach to manage the potential implications on river systems. However, comparison to certain other river systems and the impacts of longwall mining is not valid. There have been extensive reviews undertaken of previous experiences of subsidence ground movements and subsidence impacts after longwall mining under or near the Cataract, Georges, Nepean and Bargo Rivers and the Waratah Rivulet.

In steep narrow gorges where there are a series of rockbars and rock pools, such as Cataract Gorge, the combined effects of upsidence and

closure can result in cracking, buckling and shearing of the rock layers in the floor of these valleys. These movements can result in the surface water flows being lost to view as some of these flows can be diverted downstream through a shallow fracture zone that has been created beneath the floor of the gorge section that has been undermined. The nett flow of water along these gorges however remains unchanged.

In broader "flooded river" valleys such as the Nepean River Valley, Tower Colliery has mined longwall panels near and beneath the Nepean River with no reported or observed loss of surface water. In these cases the potential for subterranean flow diversion is very low as the river beds are already flooded and the bedrock is submerged and covered by alluvial deposits. Consequently, any shallow surface fractures that develop in the bedrock in that location as a result of mining are immediately filled by water or sediment and they do not provide a pathway for flow diversions. The volume occupied by the water and rock does not change. Similarly the nett flow of water along this valley will remain unchanged.

The W2CP's geologic and geomorphic conditions are unique. While there is some similarity to the case of longwall mining in the area of the Nepean River, the W2CP conditions are vastly different to those at Cataract River and Georges River. It needs to be acknowledged that the Wyong River, Little Jilliby Jilliby Creek and Jilliby Jilliby Creek are essentially flooded valleys with fully saturated alluvial deposits up to 30 metres in depth.

- The EA for the W2CP lacks site-specific strategies and action plans. In some areas of concern, such as groundwater, the EA directly contradicts the findings of its own consultant and fails to meet the Director General's Requirements for the project. Unsubstantiated statements such as 'W2CP will not adversely affect the functions of the supply catchment' are made consistently throughout the document.

Response:
These are unsupported statements that are unreferenced, thus not enabling a specific response by W2CP. However, in relation to the TEC's remark in the final sentence, please refer to the previous response above.

- Where the DGRs require the proponent to investigate an alternative mine layout, the proponent nonsensically states "Evaluation of alternative layouts indicates that the proposed mine plan is the preferred layout". It also appears to be claimed that an as yet unspecified Catchment Enhancement Program will leave the Central Coast water supply catchment in a better state after mining than before. This would appear to contradict the opinions of NSW Government agencies

Response:
The EA describes the various alternatives that were considered. There have been several alternative mine plans assessed during the EA process, however detailed evaluation and reporting of these alternatives

was not considered relevant to the assessment of the preferred alternative. The Riparian Zone Enhancement Program will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value as well as improving water quality by assisting landowners with appropriate land management practices.

- Given the history of environmental damage in other NSW coalfields, it is not possible to conclude that catchment values of the Central Coast will not suffer as a result of longwall mining. Approval of the proposal would represent a serious and reckless departure from the precautionary approach and other principles outlined in the Ecologically Sustainable Development framework.

Response:
The assumption that there is a history of damage caused by other underground mines in NSW is not supported. There are in fact only a few examples of where damage has occurred which has required remediation by the operators. The remediation work has been done at no cost to the NSW taxpayers or community and the results have been considered successful. Given the vastly different geological and topographic conditions between those mines and the W2CP mining area, the statement that approving this project would be a reckless departure from the precautionary approach or the principles of ESD is strongly disputed.

- Coal is the most greenhouse polluting form of electricity generation. The Wyong proposal is part of a continuing coal industry expansion that will make the meeting of NSW emissions targets impossible. This expansion puts the environment, investment in future technologies and future jobs in the renewable sector at risk.

Response:
The W2CP will negligibly affect NSW emission targets, however it will assist other customer countries that are progressively moving to higher quality fuels to help in meeting their energy efficiency and GHG targets.

- Should approval be granted, a 1km buffer zone should be enforced around rivers and streams underlain by proposed longwall mining in the Wyong LGA and Central Coast water supply catchment. A 1km protection zone should be established around the Wyong River and Jilliby Jilliby Creek.

Response:
This statement is unsupported by any evidence, substantiation or justification. Even the Sydney Catchment Authority in its submission to the Southern Longwall Inquiry stated "The SCA does not oppose mining in Special Areas. The SCA does not suggest the banning of all mining under rivers or mandatory buffer zones."

- A strong onus of proof must be placed on Kores to ensure that underground aquifers in the Yarramalong and Dooralong Valleys are not damaged by longwall mining subsidence.

Response:
Detailed assessment by groundwater specialist concludes there will be no significant impact on the groundwater system. Stringent monitoring and adaptive management approaches are proposed. Refer to Section 5.2

- The long-term economic value of the parts of the Central Coast water supply that stand to be affected by the Wyong mine proposal should be stated. An estimate of the social and economic costs of potential damage to the catchment, leakages and loss of flow must also be made with various scenarios of water loss, including a 50% loss scenario based on the history of damage to the Lower Cataract River.

Response:
There will be no economic loss to any parts of the Central Coast Water supply. Should any particular bore be damaged by subsidence, it will be replaced at no cost to the owner. The 50% loss of water from the Lower Cataract River refers to horizontal flow through cracks in the bedrock of the stream, not total loss from the system. This water resurfaces downstream. The Sydney Catchment Authority confirmed this in their submission to the Southern Longwall Inquiry and stated that there is "no comprehensive evidence of mining activity causing significant water loss".

3.12 The Hon. Jodi McKay MP

- The existing rail line will become choked with additional coal transport which will further jeopardise the quality of passenger services and limit expansion of these services.

Response:
The project will require only about 6 out of the 260 available daily train paths. The northern rail line is the subject of proposed upgrading in the future which would improve its capacity to cater for other developments in the region as well as increase passenger movements. This issue is discussed further in Section 5.8.3.

- The absence of an assessment of the impact that this proposal will have on the community of Newcastle and Lake Macquarie, is a deficiency of the environmental assessment and one that should be remedied through your considerations.

Response:
It is believed that there will minimal impact on the community of Newcastle and the Lake Macquarie area, however this will still form part of the assessment process for the project.

- The implications of an estimated 25-40% increase in the movement of freight trains within the inner city must be considered (such as at Adamstown level crossing).

Response:
This comment refers to the overall increase in freight movements rather than just coal from the W2CP. This is a matter for government infrastructure planning.

- The already high noise impacts of rail on adjoining properties that was identified within the assessment and potential for this proposal to add to this impact is of concern.

Response:
As previously stated, the northern rail line is the subject of proposed upgrading in the future which would improve its capacity to cater for other developments in the region as well as increase passenger movements. This matter is beyond the scope of the assessment of the W2CP alone but needs to be considered by Government in light of the overall growth in rail freight.

- The noise levels for building within 50m of the line are projected to exceed current guidelines by as much as 11.5dbA. Although this proposal will contribute only 3dbA of this impact, the need to have the cumulative impacts of increased freight movement considered as part of development assessment is crucial.

Response:
This is a matter for RailCorp to address as part of any future upgrading proposals.

- The need to identify and preserve a corridor for a freight rail bypass of suburban Newcastle and Lake Macquarie has been repeatedly identified as a priority within the region. The importance of such a bypass has again arisen in the assessment of the proposed W2CP. It is increasingly urgent to secure a corridor for the bypass before further urban expansion and development renders it impossible.

Response:
This is a matter for the State Government and RailCorp to address as part of any future upgrading proposals.

- Jodi McKay MP, seeking support for the identification of a corridor, also approached the Hon Anthony Albanese MP, Minister for Infrastructure, Transport, Regional Development and Local Government, who indicated in a letter that it was a matter for the NSW Government to identify a corridor. This letter was forwarded to the Hon John Robertson MLC, Minister for Transport to ensure the consideration of the freight bypass within the Hunter Transport Strategy.

Response:
Noted.

- How will this issue be addressed in the review of the Lower Hunter Regional Strategy, and in the interim, how the broader coal transport impacts of the W2CP will be managed?

Response:
The W2CP has undertaken a Rail Capacity Study for the purposes of assessing the potential impacts of the project on the existing rail infrastructure. The study identified that there is currently 260 available daily train paths of which the W2CP is expected to generally require only 6. This indicates that the existing rail infrastructure can comfortably accommodate the rail transport requirements of the project. The need to plan for additional rail freight in future and how this will be addressed in any future regional planning strategies is a matter for the State Government to determine.

4. Government Agency Responses

This section provides responses to the following government agency submissions:

- Department of Environment, Climate Change and Water
- NSW Office of Water
- Catchment Management Authority – Hunter Central Rivers
- Wyong Shire Council and supporting consultant's reports
- NSW Health Department
- Lake Macquarie City Council
- Department of Industry and Investment
- Department of Transport
- Rail Corporation NSW
- Gosford-Wyong Councils Water Authority

The W2CP responses are highlighted in blue and are generally summaries of the main responses found in Chapter 5. The responses have been cross-referenced to Chapter 5 to avoid unnecessary repetition.

4.1 Department of Environment, Climate Change and Water

4.1.1 Water

- The EA has not adequately addressed the issues previously raised by DECCW including the risk of subsidence impacting upon surface watercourses and the associated impacts on groundwater and surface water flows and aquatic ecology.
- Concern that post mining cracking of bedrock under watercourses like Jilliby Jilliby Creek could result in surface water diversion from the creek bed into shallow sub-strata.
- For some of the smaller creeks little information is provided on their characteristics and the effect of directly undermining them
- The EA predicts very little impact in shallow groundwater resources yet other mining ventures in NSW have similarly predicted minimal impacts when in fact there have been significant adverse impacts post mining.
- A more detailed assessment of subsidence on aquifers and the potential for a fault zone under the alluvium is needed before firm conclusions can be made that mining will not significantly adversely impact on local groundwater resources.
- The EA does not adequately assess the impacts on the environment of the disposal of treated mine water and associated brine, which will be produced as a result of mining.

Response:
All issues raised by DECCW in the adequacy review process were included in the final EA. The main issue in dispute is DECCW's assertion that Jilliby Jilliby Creek is fault controlled and flows over bedrock. Both assertions are incorrect. As discussed in detail in Section 5.3.1, comments in a report prepared by Northern Geoscience for Australian

Gas Alliance that "a major geological feature of the Jilliby Creek is that it follows a fault zone" which "provides a significant transient pathway to groundwater movement and discharge" are unsupported and in conflict with the extensive geological investigations undertaken within the W2CP resource area.

As the issue of stream bed cracking is a common misconception, a more detailed explanation is provided in Section 5.1.3.

The main creek lines and smaller tributaries have been appropriately assessed. Wyong River, Jilliby Jilliby Creek, Little Jilliby Jilliby Creek, Hue Hue Creek and other smaller tributaries were assessed in the hydrogeomorphic study and the flood study which included the entire flood plain.

It is true that the groundwater studies predicted that there would be very little loss from the shallow groundwater aquifers. The comparison of the W2CP with other mines has been discussed in detail through the subsidence and groundwater assessments, refer Sections 5.1.4, 5.1.5, 5.2.1, 5.2.2, 5.2.3, 5.2.8 and 5.2.9.

There will be limited groundwater seepage from the workings which will be treated in a reverse osmosis plant. The RO plant will be capable of around 80% recovery, that is, 80% of the water will be considered non-saline and suitable for re-use, and the remaining 20% will be brine. Therefore there will be initially up to 0.02 ML/day per day of brine with a maximum of up to 0.5 ML/day of brine. The brine will be initially regarded as a waste product and will be pumped back into the underground workings within extracted sections behind the longwall. However, following the initial years of the project it is proposed to investigate the potential for further processing and possible commercial recovery of the dissolved salts or other beneficial uses.

4.1.2 Floodplain Management

- The proponent has not adequately demonstrated that the hydrologic and hydraulic models developed for the Dooralong/Yarramalong catchments have been suitably calibrated or are adequate to confidently predict the flood impacts due to predicted mining subsidence.

Response:
Section 5.2.2 to Section 5.2.5 deals with model calibration.

- The EA indicates that the models developed for the Hue Hue catchment could not be calibrated due to lack of calibration data. In circumstances where there is insufficient data to calibrate a model more rigorous sensitivity testing of the model should be considered.

Response:

The Hue Hue catchment is a minor catchment which drains the Hue Hue residential estate and largely cleared grazing land. The creek is intermittent and there is no available flood data to calibrate the flood model. Despite this, the overall flood model has been verified for the adjacent Jilliby Jilliby and Wyong River flood plains and is considered sufficiently accurate to predict resultant flood levels. The creek includes a number of hydraulic controls formed by roads, culverts and choke points that can be modelled accurately. Upper bound values of model parameters were adopted so that estimates of flood levels are considered to be "worst case" estimates.

- DECCW considers that additional information is required before an assessment of the validity of the model calibration and the suitability of the models to predict mining impacts can be assessed.

Response:
No details of the required additional information were provided in the submission but the W2CP will respond to any specific information requests.

4.1.3 Threatened Species and Biodiversity

- The EA has not substantially or adequately addressed a number of issues which restricts DECCW's capacity to adequately consider the impact of the project on flora, fauna and subsidence impacts. More detailed information or clarification is required on the survey effort conducted for the proposal, specific targeted surveys, the area that will be impacted and offset requirements for a loss of significant impact, due to clearing or subsidence, on threatened species, ecological communities and their habitat.

Response:
Section 5.9.6 details the survey effort for the project.

- DECCW would if requested review its assessment should the proponent provide additional information or clarification to address the above issues.

Response:
The W2CP anticipates that there will be ongoing discussions with DECCW during the approval process as well as complying with any approval conditions.

4.2 NSW Office of Water

- The EA has failed to assess the potential impacts to groundwater within the alluvial blanket associated with Jilliby Jilliby Creek and the Wyong River, and the surface water sources they sustain in a robust or verifiable manner.

Response:
This is strongly refuted and the statement is not backed up by any specific or substantive data. Mackie Environmental Research (MER) has

employed robust, verifiable and widely used groundwater model code to address the likely impacts on the alluvial lands. That code predicted leakage losses to the alluvial lands of the order of 2.5 ml/day/m^2 of land surface. MER's simple one dimensional calculations suggest the range is between 1 and 6 ml/day/m^2 depending upon the adopted permeability of claystone strata. This issue is addressed in Sections 5.2.6 and 5.2.7.

NOW also asserts that there are 'significant reservations as to the adequacy of the model as it is uncalibrated to its transient and steady-state model outputs and is based on a simplified conceptual framework of groundwater interactions between the alluviums connected to the Wyong River and Jilliby Jilliby Creek'. These issues are addressed in Sections 5.2.4 and 5.2.5.

- Both the Wyong River and Jilliby Jilliby Creek are governed by water sharing plans, which regulate access to and protection of these surface water sources. It is critical that the EA demonstrates that mining subsidence will not interrupt surface flows in either Jilliby Jilliby Creek or Wyong River, not lead to impacts upon Available Water Determinations or local impact triggers, including cease to pump triggers on either river system.

Response:
This has been achieved. To understand the implications of worst case post-mining infiltration conditions on a whole of catchment basis, W2CP has undertaken follow up hydrological modelling using altered (high) infiltration parameters. This demonstrated that there would be negligible effects on low flow hydrograph characteristics in Jilliby Jilliby Creek and confirmed that there would be no measureable change to the surface flows or impacts on cease to pump triggers in local waterways.

- NOW has assessed the groundwater impact model and considers the MODFLOW-SURFACT model to be deficient for robust predictions of groundwater interactions in post –subsidence conditions. It is uncalibrated to its transient and steady state modeled outputs, and is based on a simplified conceptual framework of groundwater interactions between the alluviums connected to the Wyong River and Jilliby Jilliby Creek and tributaries.

Response:
Refer detailed response in Sections 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6 and 5.2.7.

- The EA does not provide sensitivity assessment of model outputs to the steady state model runs, which is inadequate for a sensitive environment.

Response:
The sensitivity analysis for the model is provide in Section 5.2.7

- The EA does not provide a robust risk assessment as to the potential impacts upon available waters, nor upon protection levels to minimum flows in the river systems governed under either water sharing plan.

Response:
This is strongly refuted and is an unsupported statement. The EA has gone to great lengths to design and then demonstrate that the project can protect the river systems, including flows. NOW's proposed conditions of consent require that the principles of the Water Management Act 2000, the Water Sharing Plan for the Jilliby Jilliby Water Source 2004 and the Water Sharing Plan for the Central Coast Unregulated Water Sources 2009 and State policy requirements will apply so that protection is provided to rivers and connected alluvium within the project area. These protective measures are agreed. W2CP will seek to further consult with NOW about the most appropriate methods proposed to achieve the desired outcomes.

- In relation to baseflow the assessment by MER that such flow suggests the contributing reservoir has moderate storage and transmission potential is questioned. NOW notes that baseflow is a significant component of total flow in Jilliby Jilliby Creek

Response:
NOW contends that MER consideration of baseflow in Jilliby Jilliby Creek contrasts with outcomes generated by CSIRO and NOW. While this aspect of the MER study was conducted to simply understand the likely characteristics of baseflow (for steady state groundwater model outcomes) MER note that the baseflow index was 20%. MER do not have CSIRO and NOW estimates but note that the index is slightly higher than the baseflow index of 17% reported in the independent review undertaken by SKM (2010). That report gives a range of 10 to 15% which is 'inferred ... from a single estimate of baseflow index provided by the Department of Water and Energy'. MER cannot identify the contrast in indices to which NOW refers.

- Although the risk of subsidence-induced interconnectivity between alluvial groundwater systems and the mine workings may be regarded as minimal, redirection of alluvial groundwaters either to basal tensile fracture networks, and/or re-activation of regional geological structures remains a risk, against which NOW has insufficient evidence to determine minimal harm will occur under various coal operation scenarios.

Response:
A basal fracture network has been assumed to evolve as areas are subsided. This network will develop storage which will fill from groundwater contained in the alluvium. The volume of water migrating (progressively) to this network was estimated by MER to be 0.9kL/m which represented about 0.05% of storage within the alluvium at most locations. This would rise where the alluvium thins on the valley sides but rainfall recharge would be expected to replenish lost storage.

- NOW regards the potential water quality changes as a consequence of surface cracking causing soluble oxidised metals to be released as inadequately assessed.

Response:
This is an issue in the Southern Coalfield where there have been instances of cracking in rock lined creeks and other rock areas. Iron staining comes from the cracking where water runoff flows through new mining induced fracture zone pathways within iron rich rock laminations which have parted. As the main drainage lines at W2CP run through deep alluvial sediments, the potential for surface cracking at these major drainage lines is minimal. Combined with the lack of rock outcrops within the alluvial floodplain and the limited surface expression of outcrop in elevated areas, the risk of soluble oxidized metals being released is considered to be minimal. Further, W2CP has found no geochemical evidence to indicate that there is potential for significant contribution from or catchment impacts due to soluble oxidized metals in the steep, short drainage lines in the western forested hills in the latter years of mining.

W2CP proposes an adaptive management approach for addressing this issue. This would involve ongoing geochemical characterization of the near-surface strata in these future areas to be mined. This information would be reviewed in the light of the subsidence monitoring information including fracture status and extensometer results.

- NOW considers a precautionary approach to subsurface mining in the Wyong and Jilliby catchments is warranted. This does not prohibit coal extraction under all areas in the application, but requires limitation as to how coal extraction proceeds, and potential exclusion zones surrounding the alluvial groundwater resources of rivers governed under the two water sharing plans. It is recommended that a precautionary exclusion zone be established surrounding the alluvium of the Wyong River, Jillliby Jilliby Creek and Little Jilliby Creek and tributaries until it is certain that the above impacts will be avoided.

Response:
This is not justified given the conservative approach adopted by the W2CP which has already demonstrated that there will be no significant impacts to the alluvial system or the key streams.

- NOW recommends that an adaptive management approach should be included in any approval granted to the proposal.

Response:
This is accepted and conforms to the proposed approach as outlined in the EA.

- NOW recommends a Planning Assessment Commission be convened, which includes expertise related to surface hydrology under extractive stress and surface-groundwater connectivity and interdependence.

Response:
A Planning Assessment Commission was always planned as part of the approval process and is supported by W2CP. Additional comprehensive documentation, including on stream characterisation throughout the mining area, the predicted subsidence effects on water systems, and elaborations on the surface water management have been recently provided to the Planning Assessment Commission.

- NOW recommends an external review of the adequacy of the MODFLOW-SURFACT groundwater model.

Response:
W2CP has always maintained that the findings of the EA will withstand independent scrutiny and welcomes any external independent review.

4.3 Catchment Management Authority – Hunter Central Rivers

The Hunter-Central Rivers Catchment Action Plan (CAP) is a whole of government approach to natural resource management and is managed by the Catchment Management Authority. The CMA noted that the EA documented "policy statements from the HCR CAP", however, believes the report has omitted some significant 'policies' (guiding principles), or not adequately addressed others. These are outlined below.

4.3.1 Native Vegetation Offsets

CAP guiding principle; "Where mining activities significantly impact natural resources, offsets should be considered with the intention of improving or maintaining environmental outcome".

The CMA acknowledges the effort by the proponent to find offsets for the loss of native vegetation. Unfortunately, the proposed offsets are not considered adequate to improve or maintain environmental value.

As per the Director General Environmental Assessment Requirements, the offset strategy needs to demonstrate that it will improve or maintain biodiversity conservation value. It is the CMA's position that appropriate offsets for the loss of native vegetation is best determined by using methodology that has been developed for use in assessing native vegetation clearing proposals, that is, either the Environmental Outcomes Assessment Methodology (EOAM) under the Native Vegetation Regulation, 2005 or the BioBanking calculator.

Response:
The W2CP has offered in the EA that the vegetation offset can be calculated using the BioBanking calculator tool. The problem with this method is that at the time of the assessment there were no properties (credits) available within the DECCW Biobanking system to be purchased. The offset package for the project however is more comprehensive than allowed under the Biobanking method. The offset package includes 50 ha

of vegetation to be preserved, a nominated 12 ha of conservation land along Wallarah Creek within the Tooheys Road site which will be subject to active management to increase its habitat value and a further 6 ha area nominated for specific revegetation works for *Angophora inopina*. The project has committed to the implementation of a Riparian Zone Enhancement Program which will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value. Other measures such as improving water quality by assisting landowners with appropriate land management practices will be implemented.

4.3.2 Surface Water

The CAP guiding principle regarding mining operations and surface water is that, "Every precaution should be taken to ensure that surface water flows are not lost or diverted due to subsidence or geological cracking caused by extraction. Where surface water is lost or diverted, offsets or mitigating actions should be provided."

The report indicates that several places along Jilliby Jilliby Creek will deepen due to subsidence and flow will increase. It is then proposed that any impact associated with this will be addressed through rehabilitation. However, the rehabilitation proposed appears to only suggest measures for the banks. Bed lowering has a high risk of causing head cuts and on going bed erosion. This risk has not been adequately addressed in the proposal.

Response:
There will be two ponds created in Jilliby Jilliby Creek. The first will be created upstream of the confluence with Little Jilliby Jilliby Creek and will have a depth of 68 cm. This pool will essentially migrate from further up the system where the first longwall panel crosses the creek down to the main roadways running up Little Jilliby Jilliby Creek which will not be subsided.

The second pond will occur below the last longwall panel beneath the creek. The depth of this pond will be 32 cm and will extend for a distance of 1 km. Given the creekline is essentially a series of small pools with dry sections and tends to only flow following rainfall, increased ponding is considered to have a potentially positive impact on aquatic fauna.

The creek flows through deep alluvial deposits and the channel depth varies from 2 m up to 5 m but is typically around 3 to 4 m. There are a large number of obstructions in the creek line such as fallen timber which provide a greater depth restriction than will be caused by subsidence. The ponding can be removed by excavating a channel over the unsubsided section of the creek (approximately 600 m in length) if considered appropriate, however diversion of creek flows is likely to have a far greater impact. It is considered more beneficial to undertake a wider Riparian Zone Enhancement Program which would involve removal of

obstructions, improvements to water quality and riverbank stabilisation through tree planting.

The section of Jilliby Jilliby Creek which will suffer the greatest effect of steepening as a result of subsidence will have a resultant profile with a grade of 1.48 m fall over 509 m.

When constructing erosion control works, a channel with a 1% fall (1 m over 100 m) is considered stable and does not require any specific erosion controls. Shallower channels are generally not preferred as there is insufficient grade to allow free flow of water within the channel.

The EA does make a commitment to monitor the river for any increases in erosion or bank instability but as previously discussed, the overall Riparian Zone Enhancement Program will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value as well as improving water quality by assisting landowners with appropriate land management practices.

4.3.3 Groundwater

The CAP guiding principle for groundwater is that "an aquifer's highest beneficial use or an interconnected GW dependent ecosystem's requirements should not be significantly reduced". The Report states that the shallow groundwater aquifers will be reduced, but up to 75% rebound will likely occur within 6 months. The report does not state if the shallow aquifers will ever rebound to 100% - the inference being that the shallow groundwater resources will be decreased by 25%. This could be considered a significant reduction and could result in associated decrease in groundwater dependent ecosystems. The CMA does not support a reduction in the groundwater aquifer of this magnitude

Response:
The groundwater will not only return to its pre-existing levels but the depth to the water table may be reduced by an amount equivalent to or less than the predicted subsidence at some locations. This means that the subsided areas would exhibit an increase in overall groundwater storage due to increased saturated thickness. The contribution to additional groundwater storage created by the subsidence process is estimated to be about 2,100 ML over the mine life.

4.3.4 Unacceptable risk

The CMA is concerned that this proposal, as currently outlined in the environmental assessment, would give rise to unacceptable long-term environmental consequences. The CMA recommends that additional information and assessment be provided in response to the issues raised and urges that stringent environmental conditions and monitoring are considered by the Expert Panel and regulators during the assessment process.

In summary, given the significance of native vegetation and ecosystems in the subject area, the CMA objects to the proposed Wallarah Coal Project unless the 'improve or maintain' principle for environmental outcomes is able to be demonstrated using an appropriate and endorsed methodology.

Response
The approval process involving underground mining in NSW involves ongoing assessments for each stage of mining. Subsidence Management Plans are prepared for each stage of mining and provide updated analysis on environmental issues. This is a risk based approach and provides for adaptive management principles covering the operation.

The "improve or maintain" principle has been adopted by the project and is the basis on which the Riparian Zone Enhancement Program has been developed.

4.4 Wyong Shire Council

Wyong Shire Council engaged the services of Earth Systems to undertake a critical review of the adequacy of the EA. Pells Sullivan Meynink (PSM) was separately engaged to provide advice on the potential groundwater, subsidence and hydrology issues related to the project. The report provided the following as the key findings.

1. The review of the groundwater assessment by PSM raises concerns regarding the methodology and findings of this study. The groundwater modelling conducted uses permeability values that are likely to be much lower than the reality. Only limited baseline groundwater monitoring data has been collected and the modelling does not adequately account for rock fractures that could be generated during subsidence and this fails to provide confidence in the findings. The assessment does not appear to accurately identify the potential impacts of the proposed longwall mine on groundwater resources and groundwater that feeds surface flows in the Dooralong and Yarramalong Valleys. The review concludes that the groundwater assessment is flawed and does not provide a credible assessment of the risk to the water resources of the Central Coast region.

Response:
The independent expert Sinclair Knight Merz engaged by the Department of Planning has determined that there is sufficient baseline groundwater data to undertake the necessary groundwater impact assessments. Sections 5.2.1 to 5.2.17 provide a full response to the Pells Sullivan Meynink submission.

2. The predicted impacts of the proposed mining on surface water flows do not appear to be consistent with the impacts of longwall coal mining that have occurred elsewhere in the Sydney Basin. The arguments used in the EA to establish that the Project would not cause the type of surface water impacts that have materialised in other coalfields are not convincing. Convincing evidence that the fracturing of rock from unavoidable subsidence would have

no impact on surface waters within and near the subsidence zone is lacking. Hence the potential loss of water supply cannot be discounted.

Response:
As the issue of stream bed cracking is a common misconception, a more detailed explanation is provided in Section 5.1.3.

3. The ecological assessment has been undertaken without the establishment of an adequate baseline. Only limited field surveys were conducted for the proposed mining area, which is particularly significant given the potential presence of Commonwealth threatened species in the area. Detailed field information on these species was not able to be provided in the EA. Furthermore, no current field baseline has been established for aquatic fauna.

Response:
This is incorrect. Survey effort is detailed in Section 5.9.6 and is sufficient to assess the potential impacts of the project. Several methods of assessing surface hydrology were discussed in the EA. These included the AusRivAS method, USEPA Rapid Bioassessment Protocols or HABSCORE, Index of Stream Condition (ISC), and the River Styles® system. The parameters and methodology employed in the above three assessment schemes were combined and implemented as far as practicable in the assessment of creek conditions contained in the EA. The results of water quality monitoring from a total of 28 sample sites taken since late 2006 provided sufficient data on stream health within the valleys to obviate the need for other ecological indices such as fish, macroinvertebrates or periphyton.

4. The potential impacts of the Project on surface water quality water have not been adequately assessed. Water quality impacts from erosion during construction, potential fuel spills and water discharges from mine operations are not adequately considered in the EA.

Response:
W2CP will engage responsible operators that would not allow water quality impacts from erosion to occur during construction. This can be enforced not only by routine conditions of approvals and operating licences but through appropriate contract provisions. As with any development project, simple management provisions will be incorporated into the construction program to avoid such impacts as suggested. Controls will be employed for prevention of fuel spills in accordance with relevant standards. Any discharges or beneficial transfers of water from the project sites will only be in accordance with any allowance under consents and licences.

5. An adequate environmental baseline for the Project has not been fully established. If the Project proceeds, there would be insufficient scientific baseline information to quantify the significance of the Project's impacts on

groundwater, surface water flows and the local ecology, including groundwater dependent ecosystems.

Response:
This statement is not supported by the independent review of the baseline data requirements necessary to assess the W2CP. As stated in the SKM review: "*The current status of groundwater and surface water information for the western part of the Wyong LGA area (the Study Area) is sufficient for the identification of baseline conditions within the context of the range of general development assessment and land use decisions required by Government. The amount and quality of data is equal to or greater than for similar areas of agricultural, natural or water supply catchments, albeit that individual data sets vary in their density according to the reason or reasons for which they have been gathered (eg water supply activities, which are unevenly distributed across the study area in respect of both groundwater and surface water sources).*"

6. The mined materials and wallrock of the deposit have not been assessed in terms of their ability to leach acid and metalliferous drainage (AMD). This is a significant risk as AMD is one of the most long-lived environmental impacts from coal mining.

Response:
The risk of AMD occurring or otherwise being an issue for the W2CP was assessed as being low. The Wallarah coal seam has been extracted for nearly 100 years in the region and AMD issues have not arisen. The coal characteristics at W2CP differ significantly from those higher sulfur coal seams such as the Greta Seam within the Hunter and Newcastle coalfields where the main risk of AMD arises from surface emplacement of acid forming materials such as coal reject. Further, the W2CP will not be beneficiating the coal in a washery or emplacing reject material and AMD risks are accordingly low.

7. The EA does not adequately consider the potential impacts of waste that would be generated by the Project. There is also limited discussion of proposed waste management strategies.

Response:
This is a disappointing statement as it ignores the fact that the proponent has put forward a proposal which does not require a coal preparation plant thereby avoiding the need to produce what would have amounted to millions of tonnes of fine and coarse coal waste. The EA provided only limited details of recycling for normal office and domestic wastes as these issues were considered low risk and readily managed as in any business enterprise.

8. The EA does not adequately consider the potential impacts of the Project on the capacity, safety and efficiency of the surrounding rail network.

Response:

A Rail Capacity Study has been prepared by Rail Management Consultants Australia Pty Ltd (RMCA). This advanced study was not available at the time of publication of the EA as the baseline network demand model was not available from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling since undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can comfortably run daily between the mine and the port. This can be comfortably achieved by two conventional train consists of the Coal Schedule 2 configuration. This current rail capacity will readily cater for the maximum expected production output of W2CP. However, it is expected that W2CP would normally require only 6 of the approximately 260 available daily train paths on the Main Northern Line. RailCorp supports the findings of the completed RMCA rail impact assessment which is available on the W2CP web page.

9. The EA does not provide detailed consideration of the Project's cumulative impacts in relation to other proposed projects within the Council area or region or in relation to the synergistic and antagonistic effects of the Project's individual impacts.

Response:
This is clearly not correct. The project has made every effort to accommodate future planning initiatives by both Wyong Shire Council and the NSW State Government. The selection process for the location of the surface facilities was exhaustive and took into account regional environmental and planning strategies by complementing proposed future industrial and commercial development and conservation initiatives. These matters are further described in Section 5.12.

10. Project design alternatives are only cursorily discussed, hence justification for the "preferred option" is lacking.

Response:
The EA describes the various alternatives that were considered. Further details of alternative mine plans were provided to the Community Liaison Committee and Wyong Shire Council. Wyong Council is well aware of its involvement in the selection of the preferred surface facility sites. It was not considered necessary to describe each alternative in any more detail but we are happy to provide this information to Council again if requested.

11. The Proponent's risk assessment is based on the results of the EA. It fails to adequately consider some potential key failures and public risks commonly associated with longwall mining (e.g. water loss, changes to aquifer levels, water quality impacts, gas release, landslides and underground rock fractures). The risks associated with the Project need to be re-rated based on the knowledge gaps and uncertainties that remain and the findings of further assessments.

Response:

As stated in Section 5.1 of the EA, there have been a number of risk assessments undertaken for the project since 1996. Each risk assessment included additional data and information about project implications and resulted in appropriate rankings. The latest assessment was undertaken prior to the finalisation of the EA and was based on the EA studies. The next risk assessment will be carried out prior to detailed design and will include project approval conditions. Risk assessments will then be carried out prior to and during construction, prior to commissioning and prior to and during operations. Risk assessments are required each year to be included in the Annual Environmental Management Report, Mining Operations Plan and the Subsidence Management Plan. Each risk assessment includes the current knowledge base at the time and identifies gaps. This is the very foundation of the risk assessment process, to suggest otherwise shows a lack of understanding of the risk assessment process. The Issue/Hazard tables used in the Risk Assessment contained in the EA were based on the Subsidence Management Plan tables as this was considered appropriate at this stage of the project planning phase.

12. The Proponent's benefit cost analysis is dependent on the environmental and social impacts predicted in the EA. The costs and benefits of the Project need to be reassessed in light of the findings of further assessments.

Response:
It is entirely appropriate to base the assessments on the predicted impacts contained in the various studies undertaken for the EA. Council is assuming that further assessments will find deficiencies in the original assessments. This has not occurred to date.

13. Best practice requires an Environmental Management and Monitoring Plan to be prepared as part of the EA process. Ideally this should be accompanied by a budget indicating that the Project is sufficiently resourced to undertake this work. It is not possible to properly assess the impacts of the Project without an adequately articulated management and monitoring plan.

Response:
The EA contains a list of environmental management and monitoring initiatives. It is contained in Chapter 16 Draft Statement of Commitments. W2CP is not aware of any project at EA stage which provides the full cost analysis associated with these commitments.

14. Best practice requires site rehabilitation and mine closure to be planned and costed in the initial planning phase of a mining project. The EA provides limited details regarding the proposed rehabilitation strategies to be implemented for the Project. The EA does not adequately consider closure planning and no assessment of potential closure impacts has been undertaken.

Response:
This comment fails to recognise the current process in the NSW planning and approvals regime. Planning and undertaking rehabilitation of mine

sites on Mining Leases is tightly controlled by the Department of Industry and Investment. Part of this process is the requirement to lodge rehabilitation bonds to the NSW government in conjunction with the initial granting of a Mining Lease. These bonds are reviewed each year in light of the physical disturbance and ongoing monitoring and rehabilitation requirements of the operation. The basis of the calculation is a "premature closure now" scenario and fully covers the remote possibility of unforeseen and immediate closure at any time during the project life. This is the process in NSW and is widely regarded as best practice.

The rehabilitation strategy outlined in the EA provides a range of final land use options. This will range from complete removal of the infrastructure to alternative beneficial usage of the infrastructure. The information contained in the EA is entirely consistent with the information requested by the Department of Industry and Investment.

15. The EA does not fully address the recommendations and the conclusions of the NSW Government's Strategic Reviews on Impacts of Potential Underground Coal Mining in the Wyong Local Government Area and Impacts of Underground Coal Mining on Natural Features in the Southern Coalfields. In particular, the failure to establish an adequate baseline of natural features and the inability to constructively engage local stakeholders can be considered as shortcomings of the EA based on these Strategic Reviews.

Response:
This is incorrect and is not supported by the facts. All aspects of the Strategic Review that required actions by W2CP have been undertaken.

16. The Proponent has failed to adequately engage with the community during the EA process and consequently limited consultation has been conducted. The EA does not provide sufficient information on the concerns raised by the community during the consultation process, therefore the EA lacks transparency.

Response:
This is incorrect and is based on erroneous information provided by others. Details of the consultation process extending over the past 10 years are outlined in Section 5.10.1. This has included one-to-one discussions with residents, distribution of 14 newsletters to all residents in the mining area as well as the surrounding surface facilities and a web page containing all minutes of the Community Liaison Committee, press releases, and project details. Company representatives have presented on more than 50 occasions to local groups including precinct committees, environmental groups, special interest groups and business groups.

17. The EA does not adequately meet all of the Director General's Environmental Assessment Requirements. In particular, inadequate attention has been paid to the requirements for groundwater and surface water protection, biodiversity protection, greenhouse gas management, transport impacts,

waste management, risk assessment, cumulative impact assessment, rehabilitation and closure planning and community consultation.

Response:
These issues are discussed in further detail in responses contained in Section 4.4.1.

18. The EA has not been prepared in a manner consistent with the fundamental principles of EIA. EIA should be an independent, objective, transparent, participative and impartial process.

Response:
The EIA process for the W2CP has involved the preparation of an EA which is required to pass adequacy prior to release, an independent strategic inquiry, review by several government agencies, an independent water study and international peer review and a Planning Assessment Commission. The suggestion that the EIA process should be an independent, objective, transparent, participative and impartial process is supported and W2CP considers that this has been demonstrated by the stringent and exhaustive assessment and approval process.

Additional matters were also raised in the main document and these have also been summarised in the following sections.

4.4.1 Pells Sullivan Meynink (PSM) Supporting Document to Wyong Council

PSM notes that the predicted environmental impacts depend almost entirely on the validity of MER hydrogeological modelling and therefore this modelling warrants careful consideration.

PSM has highlighted issues regarding the 'Precedent' component of the MER hydrogeological models which include:

- Data used for the model have been selectively chosen from available studies
- Omission from the model of relevant publicly available data and case studies such as Ulan; and
- The quantification of the zone of increased permeability might not reflect a conservative value, as indicated by MER.

Response
Refer Section 5.2.12

The only precedent used in the MER specialist report is a study by Pacific Power for the Cooranbong Colliery Life Extension Project (Pacific Power, 1997 and Forster, 1995).

Response:
These issues are specifically answered in Section 5.2.

PSM have highlighted issues regarding the validity of the 'Numerical' component of the MER hydrogeological models:

- The computer code used for the modelling is not a true three dimensional model; and
- Inadequate range of permeability values were chosen to describe the hydrological properties the geological units

Response:
These issues relate to input parameters and other details of the groundwater model and are further explained in 5.2.13.

The findings from the model generated by MER for the Project are almost completely dictated by two input parameters:

- The assumed permeabilities for the natural strata prior to mine extraction, and in the Confined Zone that is deemed not affected by mining; and
- The thickness of the two zones whose permeabilities are increased by mining, namely, the zone directly above extraction (220 m assumed by MER) and the Surface Zone where there is increased vertical permeability.

Response:
These issues relate to input parameters for the groundwater model and are further explained in Section 5.2.15.

MER has adopted permeability values in the Confined Zone that are 10 to 100 times lower than data measured in field studies. The difference in permeability values between field measurement and those used by MER are mainly due to assumption by MER that there are no significant fractures (joints, faults, dykes) in the Confined Zone.

Response:
Refer Section 5.2.15.

Calculations conducted by MER to estimate the impact of mining to the shallow groundwater regime are inadequate for the following reasons:

- There is no data to support the claim that the surface zone likely to experience tensile fracture associated with subsidence will be contained within 10 to 20m;
- Data used to define the nature of the cracks and the rates at which they may be filled by alluvium material are speculative;
- Continuous alluvium cover is assumed everywhere above the cracked zone. This is in contradiction with the observation contained in the Subsidence Assessment (Appendix A) indicating that the Hue Hue Creek has "no significant occurrence of Quaternary unconsolidated sediments", and that there are areas of exposed bedrock and associated rock bars within smaller tributaries of the major water courses.

Response:
Refer Sections 5.2.3, 5.2.4, 5.2.5 and Table 5.

The review identified that the Hue Hue Landslide along the western side of the F3 has not been considered in the EA. While this structure is at about 2.5 km distant from the nearest longwall panel (LW2S), there remains a low probability that far field movements may allow the landslide to reactivate. While the likelihood for the Hue Hue landslide of becoming activated is considered low risk, if the Project is approved it would be prudent to undertake some form of monitoring/survey prior to mining commencing, to ensure the ongoing stability of the landslide is not compromised or misunderstood.

Response:
The Hue Hue landslide is outside the impact zone of the mine and it is agreed that there is a low risk of any reactivation as a result of the project.

The review undertaken by PSM indicates that the Director-General's Environmental Assessment Requirements in relation to subsidence have mostly been met by the EA, although some limitations to the assessment were identified. The Subsidence Assessment covers the essential components of a reasonable management strategy for houses. PSM makes the following recommendations to improve upon the management strategy:

- Mitigation measures regarding risks to public safety should be listed
- Mitigation measures to minimise transfer of ground deformations to houses should be listed;
- Undertake detailed monitoring around selected houses and other structures during the early phases of mining to calibrate predictions and assess how much ground movement is transferred to the structure; and
- Only suitably qualified building inspectors should identify structures and construction types

Response:
Agreed, with the exception of those matters which lie within the responsibility of the Mine Subsidence Board. It should be noted that the Mine Subsidence Board only uses qualified building inspectors and the pre-mining inspections are more comprehensive than suggested by PSM.

The impact of mining on stream flows in "normal" conditions has been considered by the EA for the Wyong River, Jilliby Jilliby Creek and Little Jilliby Jilliby Creek. Creek profiles for these waterways have been presented in a graphical format showing pre and post mining profiles along the stream. However, a similar plot showing the impact of subsidence on the Hue Hue Creek was not provided in the EA.

There is a lack of data relating to areas affected by ponding for Hue Hue Creek. Hue Hue Creek feeds into the Porters Swamp and alterations to the downstream flow regime of the creek could impact the swamp. The EA states that based on the flooding study, no impacts are expected for the swamp. However, potential impacts on the swamp cannot be accurately predicted until an assessment has been undertaken which considers the impact of mining on Hue Hue Creek's stream flows.

Response:
Hue Hue Creek is actually an unnamed water course which was simply designated the name Hue Hue Creek as it passes through the Hue Hue residential estate. The creek line within the mining area consists of a series of small, poorly defined, ephemeral watercourses draining to the south east. Within the proposed mining area, the Hue Hue catchment has been predominantly cleared and mainly consists of small rural and rural-residential land holdings. Residential development is concentrated in the area around Sandra Street and Hue Hue Road. There is a smaller residential subdivision at Cottesloe Road higher in the catchment. The lack of a defined channel makes the presentation of the data as requested somewhat difficult. The conclusions drawn from the flood study are valid as these took the entire catchment boundaries rather than nomination of the creek line itself. Since the extent of impacts was found to be small and all results are fully assessed, it was not considered necessary to include a graphical presentation of the pre and post mining profiles along the stream. However, these profiles can be provided if necessary. Culverts under Hue Hue Road and under the F3 form hydraulic controls. As a consequence, it is impossible for any changes in flood flows or levels to occur downstream of the F3 and in Porters Swamp.

Loss of water into the near surface zone is critical to stream flows and the ecology of the streams. Notwithstanding the validity of the groundwater modelling undertaken for the Groundwater Assessment, it is expected that groundwater may not recover for more than 200 days. Therefore streams can be expected to be drained dry or stagnant for at least a corresponding number of days. PSM notes that the EA does not appear to have considered changes in surface water regime related to a short-term loss of water and its potential ecological impacts.

Response:
The fall in the water table elevation relates to the localised subsidence wave which migrates along a particular panel. Since panel widths are a maximum 250m, the impact zone at any time is quite narrow with one (long) side of the panel being undisturbed and the other side being at least 55% recovered and probably nearer fully recovered if average rainfall is exceeded. For the stated PSM situation to occur, there is the assumption that there would be absolutely no rain whatsoever within the entire catchment for a period of 200 days. This is a highly unlikely event but if it were to occur then the creek would be dry without the effects of subsidence.

The EA provides limited details of the proposed stabilisation or erosion protection works during construction for the section of Wallarah Creek located through the Tooheys Road Site.

Response:
This will be subject to detailed design and subsequent approvals.

Chapter 9 states that a "total of 28 sites were sampled for water quality on a monthly basis *during* late 2006". However, Appendix D states that a "total of 28 sites were

sampled for water quality on a monthly basis *since* late 2006". The duration and frequency of water quality monitoring conducted to establish baseline water quality needs to be clarified and provided in the EA

Response:
The current water quality monitoring program commenced in May 2006. The previous program ran between 1996 and 2002.

The EA has failed to identify and describe any other sources of water pollution and does not assess potential water quality impacts from the construction, operation and closure of the Project. Sources of pollution could include increased turbidity and sedimentation due to erosion from construction, stockpiles, haul roads and other disturbed areas and workshops, vehicle wash facilities, plant and equipment and fuel storage.

Response:
This comment assumes that the project will breach its Environmental Protection Licence and cause measurable harm to the environment. The pollution control systems for the surface facilities sites have been designed to contain all runoff from a 1 in 100 year, 72 hour storm event. The site under normal operating conditions will be nil discharge. Both surface sites will be required to hold an Environmental Protection Licence which will contain conditions for the quality of any discharges should this be considered desirable. As stated in the EA, the project will eventually be in a position to provide recycled, treated water for other users. These may include the natural environment or other industrial users. Such discharges or transfers will be controlled by the conditions imposed by the EPA.

The EA briefly discusses that surplus treated saline water from the mine operations would be discharged to surrounding waterways to enhance environmental flows or directly to the water supply system or other industrial users. The Proponent should provide further details of the water quality standards that would need to be achieved to ensure that discharges would not adversely affect water quality.

Response:
The RO plant would be capable of meeting drinking water standards. However, this may not be appropriate for discharge to the surrounding waterways or would not be necessary for some non-potable uses. This is explained in the EA as using the appropriate guidelines (ANZECC), the background quality of the waterways would not be impacted.

The concept plan in the EA for the Western Shaft Site indicates a surface drainage pond. Further details should be provided in the EA regarding the proposed location of the outlet, the waterway or drainage corridor it would discharge to and the quality of the outflow water.

Response:
The shaft site will not produce water or otherwise be a source of water from the mine. The pond is only required during construction to contain sediment from the site. Once completed, the pond can be removed.

There has been no consideration of the potential impacts of acid and metalliferous drainage (AMD) as a result of the construction and operation of the Project. Discussions with the Proponent confirm that no investigations have been undertaken to confirm the sulphide content of the rock. The EA has not considered of potential impacts of AMD as a result of oxidation of the wallrock in the dewatered zone above the underground mining area. Geochemical data needs to be collected for the Project to identify the acid base accounting characteristics of the rock in this unsaturated fractured zone.

Response:
The risk of AMD occurring or otherwise being an issue for the W2CP was assessed as being low. The Wallarah coal seam has been extracted for nearly 100 years in the region and AMD issues have not arisen. There are higher sulfur coal seams such as the Greta Seam within the Hunter and Newcastle coalfields and the main risks of AMD with these materials results from surface emplacement of acid forming materials such as coal reject. Not only is the coal to be mined in the proposal of much lower sulfur content, the W2CP will not be processing coal nor emplacing reject coal material.

The Project would be a net water user during the initial years of operation due to water demand for underground mining operations. It is proposed to source water from the WSC managed recycled water supply. Chapter 7 of the EA does not provide an estimate of the quantity of water to be sourced from WSC and no reference has been made to the water balance assessment undertaken for the Project (Section 2.12.7 of the EA and Appendix E).

Response:
This is incorrect, the water balance table has a note explaining that numbers in italics means water deficit: "Total Demand numbers in italics represents a deficit in the water balance". It's the deficit amount that would be sought from others, such as the Charmhaven Sewage Treatment Plant. This matter has been raised in general terms and will be discussed further with Wyong Shire Council.

The EA emphasises that the Project extraction area covers only 5% of the Gosford-Wyong Water Supply Scheme catchment area; however it is important to note that average river flow contributions from the Jilliby Jilliby Creek and Wyong River systems to the Lower Wyong River Weir (which feeds Mardi Dam) equate to 30% of the combined Central Coast Water Supply.

Response:
The EA states that "the Jilliby Jilliby Creek contribution equates to about 11% of the total Central Coast water supply. This contribution primarily occurs during periods of wet weather". This is a true and factual

statement and is consistent with the findings of the Strategic Inquiry report. It is also noted that Council's submission has not used the erroneous 53% figure that it has used in the past.

While overall impacts are discussed, specific impacts of the Project for each phase of the project cycle (construction, operations and closure) have not been clearly identified. The residual impacts of the Project following management and mitigation are also not clearly specified. It is therefore unclear what the residual impacts of the Project will be following the implementation of management measures and the provision of offsets.

Response:
The EA has separated the discussion of construction and operational impacts. The overall impacts, such as final subsidence profiles is the same as the final closure issues. This is the final, ultimate and end impact regime of the mine. The mitigation measures therefore cover this aspect. The impacts for the closure of the surface facilities will dependent on the final use of these facilities. The EA discusses the option of removal of all infrastructure and rehabilitating the site back to its pre-existing condition or re-use of the infrastructure for ongoing industrial purposes. This issue is not relevant to the assessment of the project's impacts over the next 42 years.

Many of the management and mitigation measures outlined in the EA do not specify a specific timeline for implementation.

Response:
It is assumed in the EA that the mitigation measures are required prior to the impact occurring. Mitigation measures employed after the impact occurs would render the mitigation measure worthless.

Very few details are provided in the EA regarding the proposed biodiversity monitoring regime for the Project. A detailed monitoring program for flora and fauna has not been outlined in the current EA. There is very little discussion of the cumulative impacts on biodiversity resulting from the Project.

Response:
Ecological monitoring regimes post planning approval are dominated by the Subsidence Management Plan process. This is recognised in the EA as normally part of the ongoing approval regime. Being too prescriptive within an EA limits the ability for adaptive management of an ongoing operation.

The ecological studies conducted for the EA note that the offset area is less disturbed than the proposed direct impact areas and is of higher conservation value. While the ecological values of the offset area are identified, a detailed methodology is not provided as to how the appropriateness of the offset area has been assessed in relation to State and Federal legislation. Details regarding ongoing management, monitoring and auditing of proposed offsets also do not appear to have been provided. Additionally, no details are provided regarding any alternative offset areas considered in the planning process. There is also very limited discussion of whether the proposed offsets meet the requirements of the DECCW Biobanking scheme.

Response:
An offset strategy has been put forward which meets current government guidelines. It is proposed to provide an offset area of 50 ha comprising existing native vegetation on lands owned by the WACJV. It is also proposed to develop a more comprehensive biodiversity land management strategy that takes into account other aspects of the project in order to provide real benefits to the wider environment, consistent with the philosophies of the DECCW Biobanking and Offsets Policy. The package proposed is described in Section 3.1.17 of the EA while the overall offset package is detailed in Chapter 16 of the EA. The W2CP has offered in the EA that the vegetation offset can be calculated using the BioBanking calculator tool. The problem with this method is that at the time of the assessment there were no properties (credits) available within the DECCW Biobanking system to be purchased. The offset package for the project however is more comprehensive than allowed under the Biobanking method. The offset package includes 50 ha of vegetation to be preserved, a nominated 12 ha of conservation land along Wallarah Creek within the Tooheys Road site which will be subject to active management to increase its habitat value and a further 6 ha area nominated for specific revegetation works for *Angophora inopina*. The project has committed to the implementation of a Riparian Zone Enhancement Program which will be designed to improve the health of the creek by including other wider

issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value as well as improving water quality by assisting landowners with appropriate land management practices.

Only two days of field surveys of fauna in the proposed mining area were conducted in the current study, which means that the assessment is unable to provide a robust baseline of the fauna currently present in the proposed mining area.

Response:
This is incorrect, refer Section 5.9.6.

No specific surveys of aquatic fauna (e.g. fish) appear to have been undertaken to provide a baseline within the Project area or downstream of the Project. This is despite the fact that the aquatic flora and fauna review (ERM, 2002b) discussed in Appendix R stated that "additional aquatic surveys are required for fish species in both surface facility and subsidence areas and more information was required regarding macro invertebrates at these locations." It is assumed that aquatic surveys were not conducted as the EA states that there are expected to be "no significant impacts on water quality or quantity as a result of subsidence". However it should be noted.

Response:
As discussed in Section 5.9.1 OzArk's interpretation of the results of the groundwater and flooding studies was that effects to habitat values of waterways and water bodies (from subsidence and changes in hydrology) would be negligible. This interpretation translates to a 'no change from the current situation' for the ecology assessment i.e. subsidence / change in hydrology would not 'affect' species, communities or populations dependant on this habitat niche (refer to EA Section 7.2.1 re mining area assessment). The availability of extensive water quality data from a total of 28 sample sites taken since May 2006 provided sufficient data on stream health. This data showed that the creeks draining the area are in extreme stress. As discussed in Section 5.3, development and funding of riparian vegetation improvement programs within the Jilliby Jilliby Creek and Little Jilliby Jilliby Creek systems. The programs will be designed specifically to reduce the current weed infestation and bank erosion problems evident in many sections of the creeks. These programs will be developed in close consultation with individual landowners. Consultation will also be undertaken with the Hunter-Central Rivers Catchment Management Authority, Wyong Shire Council and Department of Environment, Climate Change and Water as part of this program. Landowner privacy will be maintained at all times

The conclusions of the ecology specialist study (Appendix Q, Chapter 8) recommended that further studies should be conducted for threatened species including the Squirrel Glider and Wallum Froglet to properly assess the potential impact of the Project on these threatened species. These additional studies do not appear to have been conducted, and therefore potential impacts of the Project on these species remain uncertain.

Response:
The additional studies would be required prior to mining within the vegetated areas of Wyong State Forest. This mining does not occur in the first 15 years of the project life.

No specific field assessment was conducted of frogs in the study area for the current ecological assessment. The study of amphibians was based on previous surveys and database searches.

Response:
Refer Section 5.9.7.

There is very limited discussion on potential impacts on migratory birds. Potential impacts on CAMBA, JAMBA, and ROKAMBA migratory bird species are not specifically discussed, as requested by the Director-General's Environmental Assessment Requirements. The conclusions of the specialist study state that "it is unlikely that the potential for migratory birds to utilize available habitat will be affected by subsidence."

Response:
No migratory birds or their habitat will be disturbed by the W2CP. The EA describes the groundwater dependent ecosystems within the mining area. The primary vegetation unit which can be considered to be groundwater dependent is Riverine Alluvial Gallery Rainforest-Moist Forest which occurs in sections of the Jilliby Jilliby and Little Jilliby Jilliby Creek riparian zone. Section 13.2.6 of the EA sates that there is potential that between 66% and 72% of the extant distribution of Riverine Alluvial Gallery Rainforest-Moist Forest will be affected within the proposed mining area. The main effect will not be in changing the inundation frequency of this community during the range of flooding regimes, but rather as a result of slightly increased depth of flooding during the major flood events. Some objectors have maintained that the project would impact on wetlands such as Porters Creek Swamp which is located on the eastern side of the F3 Freeway and well outside the impact zone of the W2CP. Jilliby Jilliby Creek does not flow into the swamp nor does the Wyong River. The coal handling surface facility site at Tooheys Road is not within the catchment of the Porters Creek Swamp. W2CP's Buttonderry office site, Council's waste tip, the Warner Industrial Park and the rest of the Wyong Employment Zone and airport, are all within the Porters Creek Swamp catchment. However, this swamp is not at risk from any impacts of the W2CP. Although there are no swamps located within the mining area, the EA studies have shown that the water quality in the Jilliby Jilliby Creek catchment is currently very poor. However, through adopting a "neutral or beneficial effect" philosophy the W2CP has proposed a Riparian Zone Enhancement Program which forms part of the project commitments. The intended outcome of this program would be clear improvements to water quality as a result of improved riverbank stability, reduction in nutrient load, reduction in weed infestation and increase in native vegetation establishment.

Evaluation of the biodiversity impacts of Project alternatives with reference to the baseline situation is recommended by the guidelines. This evaluation is not provided in the EA (including Chapter 3 – Project Justification and Alternatives).

Response:
Further information relating to the assessment of the many alternatives considered is available but not considered relevant to the assessment of the preferred option.

During the community surveys undertaken for the Project there were major issues with the Proponent engaging with the local community. Accordingly, the surveys had an extremely low response rate and only 65 out of 500 local households were consulted. Consultation with the potentially directly affected community has been limited as a result of the Proponent not being able to adequately engage with the local community. The issues raised by the community during the consultation process were not clearly identified and described in the EA.

Response:
The figure mentioned was for one component of the community consultation process, that being responses to a letter box drop. The response rate was actually 63 households or 12.65 % which was slightly better than normally expected for a letter box drop survey of this kind. The survey implementation was hampered by a public notice placed in all respondents' letter boxes by the main opposition group to the proposal - the Australian Coal Alliance (ACA) recommending that the community not respond to the survey. The ACA has been very active in its attempt to stop the project and one avenue used is frustrating the consultation process.

The description of the changes in the community perceptions of the impacts associated with the Project over time (from 1995 to 2009) is misleading. Chapter 10 of the EA states that Table 10.2 (which is a chart, not a table) shows the number of people in Wyong who agreed that benefits of coal mining outweighed the negatives. However, the lack of scale on the chart makes it difficult to interpret and changes in community attitude are not clearly illustrated, as issues perceived as beneficial or negative are not identified.

Response:
This chart comes directly from the Central Coast Research Foundation report. The chart has not been rescaled or modified in any way. The CCRF is an independent body currently engaged by Wyong Council and other government agencies seeking the views of the Central Coast Community on a range of matters.

Chapter 10 of the EA refers to a Social Management and Mitigation Program, however the EA does not identify any specific management and mitigation measures to minimise the potential socio-economic impacts of the Project.

Response:
This program is described in Chapter 16.3 of the EA.

The socio-economic impacts of mine closure and relevant mitigation measures have not been considered in the assessment, nor have the Project's cumulative socio-economic impacts in relation to other proposed projects within the region or Council area

Response:
Cumulative social impacts are described in Section 5.2.6 of the Social Impact Assessment but were not summarised in the main EA document. Cumulative economic impacts indicated that the total net quantified benefit to the community of the W2CP is likely to be in the order of $1,519 Million.

The Director-General's Environmental Assessment Requirements specifically requires the EA to describe both the consultation process and the issues raised during this consultation process. The EA described the consultation strategy implemented for the Project, but it did not adequately identify and describe the issues raised by the community during the consultation process. Therefore the Director-General's Environmental Assessment Requirements in relation to community consultation have not been met by the EA.

Response:
The basis of this comment is difficult to understand in that the main issues addressed in the EA were those which came from the consultation process. W2CP also engaged the Central Coast Research Foundation to independently undertake both community and business attitude surveys which were added to the results of other consultation activities. The results of this work were used to identify issues of concern to both the local business sector, and the local community. As listed in Section 5.1 of the EA, issues that were commonly reported by the community as being of concern included:

- **Impacts on groundwater;**
- **Impacts on surface water supply;**
- **Subsidence impacts on houses and structures;**
- **Changes to flooding;**
- **Noise;**
- **Increased vehicle movements;**
- **Increased number of trains; and**
- **The visual appearance.**

These issues were then addressed in the EA.

Chapter 12 of the EA does not provide any information about sensitive receptors, which is an important omission from the EA. Figure 9 of the specialist study shows the location of sensitive receptors surrounding the Project. No further information is provided about these receptors and no reference is made to this figure in the report.

Figure 12.1 in EA (Figure 8 in Appendix L) shows meteorological stations located at the proposed Tooheys Road Site and the Buttonderry Site; however the specialist study stated that data collected from stations located at the Buttonderry Waste Management Facility and Charmhaven Sewage Treatment Plant was used in the assessment. This should be clarified.

Response:
This is correct. The figure from the specialist report identifying the sensitive receptors was not replicated in the main report. Further details of the use of monitoring data are provided in Section 5.6.1.

It appears that no dust monitoring was undertaken in the location around the sensitive receptors along Bushells Ridge Road. The assessment should explain the rationale for the number and location of the dust deposition gauges installed for Project.

Response:
The project currently maintains 6 static dust gauges and two high volume air samplers. The most conservative approach to estimating a background level of dust concentration and deposition rate was used in the EA as follows:

- **Annual average TSP of 42 $\mu g/m^3$ (maximum measured in years not affected by bushfires)**
- **Annual average PM10 of 21 $\mu g/m^3$ (maximum measured in years not affected by bushfires)**
- **Annual average dust deposition of 2 g/m^2/month**

The TSP and PM10 levels assumed were similar to those recorded respectively at Wyee by Delta Electricity and the Central Coast Public Health Unit and reported in the Wyong Shire Council Sate of the Shire Report 2008-2009.

Air quality monitoring was discontinued in early 2004 and recommenced in late 2006. The assessment stated that for the years it was collected, most years it was incomplete. Further details should be provided regarding the 'completeness' of data used to establish baseline air quality for the assessment.

Response:
Data was collected from 1997 to 2004 then from May 2006 to present and continuing. This total of 10 years of monitoring data is considered to represent an entirely adequate baseline data set.

The impact assessment section in Chapter 12 of the EA provides no explanation of predicted dust concentrations and deposition rates as a result of construction or during surface operations at the Tooheys Road Site. Only figures showing predicted dust concentrations and deposition rates are provided. Therefore it is not clear that the predicted air quality impacts are within the air quality criteria.

Response:

The predictions are well within the air quality criteria. Results are provided in Tables 12.6 and 12.7 of the Air Quality Impact Assessment and the discussion around these tables.

The EA does not describe the likely smell of the predicted odour emissions at the sensitive receptors or predict the likelihood of the odour emissions being offensive or unacceptable.

Response:
The odour criteria set by DECCW is based on any odour whether inherently unpleasant or not. The proposal is predicted to comply with the most stringent odour goal of 2 odour units at the 99th percentile.

Chapter 10 of the EA does not provide any information about sensitive receptors, which is an important omission from the EA. Figure 1 of the specialist study is meant to show the location of sensitive receptors surrounding the Project, however they have been omitted.

Response:
There are adequate figures in the EA, both topographic and air photos of the sensitive receptors surrounding the project.

The assessment stated that due to PM2.5 being a relatively new aspect of air quality assessment, it does not yet form part of the NSW DECC's Assessment Criteria. The assessment did identify various Australian and International PM2.5 criteria in the literature review. However, it is not clear which criteria, if any, apply to the assessment, as the predicted PM2.5 concentrations due to the Project are not compared against any criteria. The assessment should clearly state whether the predicted PM2.5 concentrations at the sensitive receptors due to the Project would all be within the criteria. It is also noted that Chapter 10 of the EA does not include all of the criteria identified by the specialist study.

Response:
The approach to the HRA was based on incremental levels of PM2.5 rather than absolute goals. However the most relevant goals for comparison would be the NEPM advisory standards of:

- **25 $\mu g/m^3$ 24-hour average**
- **8 $\mu g/m^3$ annual average**

This issue is further discussed in Section 5.6.

The assessment should explain why the estimation of risks associated with PM2.5 emissions from the Project used an average annual exposure of 0.7 µg/m3, instead of using the highest predicted concentration of 0.11 µg/m3.

There is no discussion of likely background levels of PM2.5 in the vicinity of the Project. The assessment should explain why background levels of PM2.5 were not considered in estimating predicted PM2.5 concentrations at the sensitive receptors

Response:
The health risk review in the EA notes that a value of 0.7 $\mu g/m^3$ was used for calculation of risk associated with the predicted long-term increment of $PM_{2.5}$ rather than the correct value of 0.11 $\mu g/m^3$. The correct value gives a lower risk of 3.80E-06 rather than 2.42E-05 as reported.

The maximum predicted 24-hour increment of $PM_{2.5}$ is 4.3 $\mu g/m^3$ at the most affected receptor. Adding this to the background of 19 $\mu g/m^3$, would result in compliance with the 24-hour advisory standard. The annual average standard for $PM_{2.5}$ is noted in the EA to be already exceeded on occasions, but the predicted annual average $PM_{2.5}$ increment of 0.11 $\mu g/m^3$ due to W2CP operations would not cause a perceptible change in air quality. It is also to be noted that the air emissions calculations in the modelling used a worst case assumption that no stockpile spray dust mitigation measures were operating.

No PM2.5 data were separately collected for the project, but data recorded by Delta at Wyee have been previously included in the Wyong Shire Council State of the Environment reports. The data did not show any particular trend (a slight decrease was noted) but had been collected over a 2.5 year period only. The maximum daily recorded data was below the NEPM advisory reporting guideline of 25 $\mu g/m^3$ with a maximum recorded level of 19 $\mu g/m^3$. The annual average was marginally above the guideline of 8 $\mu g/m^3$ as it is in many regions of Australia.

The value of 0.7 $\mu g/m^3$ was used for calculation of risk associated with the predicted long-term increment of $PM_{2.5}$ rather than the value of 0.11 $\mu g/m^3$. The suggested value gives a lower risk of 3.80E-06 rather than 2.42E-05 as reported.

According to the assessment, underground mine workers are the most exposed populations for diesel exhaust. It is unclear as to whether a health risk assessment been undertaken to estimate health risks to the Project's mine workers.

Response:
The health of mine workers at both an industry level and a mine site level is covered by occupational health and safety regulations. The mine site risk assessment will be undertaken prior to detailed design. This process involves the CFMEU, mine owners and others.

Neither Chapter 10 of the EA or the specialist study discuss mitigation and management measures to minimise PM2.5 and silica emissions from the Project.

Response:
This is covered in the stated overall dust mitigation measures.

Assessment of likely impact on regional air quality from emissions of air pollutants from transport both to and from the end user of the coal, as well as emissions from diesel-powered equipment on site, was not considered in the EA.

Response:
This is correct. Impacts on regional air quality were assessed however the detailed air quality implications of transporting the coal to export market destinations were not. This was however considered in the assessment of Greenhouse Gas Emissions which included transport and burning of the coal.

Description of the proposed monitoring program to determine the effectiveness of mitigation and to verify predictions, including reactive management strategies for PM10 and provision for investigations in response to complaints was not discussed in the EA.

Response:
The project has proposed real time monitoring which is the basis for reactive management, however it is stressed that reactive management, including monitoring, is a "soft" control. The project has been designed

with "hard" controls as a primary objective in impact mitigation wherever practicable which is then even further enhanced with "soft" controls.

The calculation of emission from coal combustion in a power plant only takes into account the carbon content of the coal (not the total mass of the coal), although the emission factor used (from NGA Factors) requires the total mass of the coal to be multiplied with the emission factor.

Response:
The specific energy of the coal used in the assessment was 26.21 MJ/kg. This is on an as-received basis rather than on the dry ash-free basis assumed in the calculation. The assessment of greenhouse gas emissions has been undertaken in accordance with current reporting standards.

The use of NSW stationary power plant emission factors to represent end-use of coal in North Asia requires justification.

Response:
The NGA factor used was 88.43 kg CO2-e/GJ based on the burning of black coal other than for coking. In previous versions of the NGA factors (2008) the EF for black coal combustion for electricity generation ranges from 89.3 kg CO2-e/GJ in NSW to 95.9 kg CO2-e/GJ in South Australia. There will be differences in the way power stations burn coal in other countries and therefore some uncertainty in this calculation. From Australian data this variation is less than 10%. The value of 88.43 kg CO2-e/GJ was used as a default value in the absence of other information. This is likely to be a conservative approach as the Wallarah Coal Seam is of export quality and will yield a higher energy output per CO2 equivalent.

The figure of litres of diesel consumption per tonne of ROM coal mine and kWh of electricity usage per tonne of coal mined need to be substantiated.

Response:
The estimates have been based on current National Pollutant Inventory (NPI) reporting standards.

Methods of estimating rail and transport distances should be explained in more detail.

Response:
The distance to port by rail is a known distance which can be obtained from rail industry publications.

The local impact of the Project's emissions will be far better perceived by the public if the Scope 1 and 2 emissions associated with extraction and rail transport are compared to the WSC region's baseline emissions. The estimation of the Project's emissions should also be expressed in an everyday equivalency unit that the public can understand, such as terms of equivalent number of cars added to the road.

Response:
This is not a useful suggestion as it assumes that the residents of Wyong Shire are directly responsible for emissions from an export industry.

The reference used to estimate the temperature increase that the yearly Project's emission would cause is an IPCC document which is 20 years old, and is probably out of date. Also, given the uncertain nature of climate science and the prediction of global temperature rise based on atmospheric greenhouse gas concentration, the

validity of the simple estimation undertaken in the EA is uncertain. If the prediction is to be in any way meaningful, an error analysis should be presented indicating the upper and lower bounds for this prediction.

Response:
Although the IPCC has released annual reports on global temperatures and trends, it is the 1996 Second Assessment Report which explains the relationship between the concentration of greenhouse gases and global temperature and provides the standardised global warming potentials for relevant gases that are still in use worldwide today. This is the report referenced which is 14 years old. The IPCC Fourth Assessment Report, Climate Change 2007, discusses the uncertainties in the estimated Equilibrium Climate Sensitivity (ECS) that is the change in global temperature arising from a doubling in CO2-eq emissions.

The greenhouse gas emission reduction benefit of using a minimum 5% biodiesel in the mining fleet should be estimated and presented to indicate whether such usage actually represents a significant emission reduction.

Response:
It would provide only a minor benefit and its calculation would not provide the decision makers with any useful information.

There is discrepancy between Section 12.10.3 that states: "*Prior to the development and implementation of a long term methane utilisation strategy, W2CP will commit to flaring to the initial production of methane, if required by the terms of project approval*", and Section 4.11.2 that states: "*During the initial years of mining where insufficient volumes of gas will be generated to warrant offsite transfer or power generation, the gas will be flared*". Thus there is ambiguity regarding the commitment the Proponent would make to managing methane production during the Project's initial years.

Response:
Gas will be flared in the initial years until commercially viable alternative uses are available.

Conducting an "options study" for coal mine methane capture and utilisation does not imply that any form of methane capture would actually occur for the Project.

Response:
This is not correct. Coal mine methane must be captured in order to provide a safe underground working environment. This requirement in regulated by the Mining legislation.

Based on Earth Systems internal calculations, a different value of greenhouse gas externality cost is obtained when carbon price is at AU$30/tCO2e at 7% discount rate and 51 million tonnes of coal mined over 40 years as compared to the greenhouse gas externality cost value in Section 3.8.5 of the EA. The details of the calculation carried out in the EA should be made available to provide clarity.

Response:
At $30 per tonne of CO2e the viability of coal mining would be in doubt in some if not many instances. It is not a meaningful exercise using dollar amounts until a carbon tax or trading system has been legislated.

The noise assessment provides details (street addresses) of the reference measurement locations, however no details of the reference assessment locations are provided, apart from their approximate location shown in Figure 3, which is barely legible. Further details should be provided for the reference assessment locations with respect to their location, as well as justification for selection of the reference measurement and assessment locations.

Response:
The location of each receptor is provided in the EA. It is agreed that the figure is difficult to read.

The assessment does not explain why reference measurement locations were used to develop Project specific construction noise goals, whilst reference assessment locations were used to develop Project specific operational noise goals. Further details should be provided relating to the development of noise goals for the Project

Response:
The noise goals have been developed in accordance with the Industrial Noise Policy. DECCW has reviewed the report and has found no fault with the assessment procedure.

The noise assessment does not clearly identify whether the predicted operational noise levels for the Buttonderry Site satisfy the Project specific noise goals for all time periods under all meteorological conditions, as the assessment only provides noise contour plots for the daytime under calm conditions.

Response:
The noise goals have been developed in accordance with the Industrial Noise Policy. DECCW has reviewed the report and has found no fault with the assessment procedure.

There is a discrepancy between the predicted operational noise impacts for the Tooheys Road Site presented in the noise assessment and those discussed in the main EA report. The noise assessment states that Project specific noise goals are marginally satisfied during adverse weather conditions. The use of the words "marginally satisfied" is slightly ambiguous and our review confirms that there would be no exceedances of noise goals. However, Section 3.8.4 (Benefit Cost Analysis) and Section 17.2.5 (Summary and Conclusions) of the EA states that some marginal exceedances of noise goals may occur at two properties under certain meteorological conditions. It is important that the potential noise impacts predicted in the noise assessment and the EA are the same and this should be clarified by the Proponent

Response:
The fact that the EA uses the term "marginally satisfied" is simply to recognise that the predicted noise levels were only just within the specified goals.

The noise assessment needs to clearly state that if operational noise goals were exceeded once the Project has commenced operation, mitigation strategies for the "Noise Management Zones" and "Noise Affected Zones" would be implemented

Response:
Yes, mitigation strategies would be implemented.

The noise assessment does not adequately identify and assess the potential construction noise impacts from the surface facility works.

Response:
The construction noise impacts are clearly and separately identified in Section 11.3 of the EA.

Section 2.5 of the noise assessment states normal construction activities would be undertaken between 7am and 1pm on Saturday; however the construction noise goals for the Project in Table 28 are based on construction hours of 7am to 6pm on Saturday. DECCW's recommended hours are 8am to 1pm on Saturday. The Proponent should clarify proposed construction hours on Saturdays and confirm whether construction would be undertaken in accordance with DECCW's recommended standard construction hours.

Response:
As stated in Section 11.4 of the EA "Restrictions to construction hours may apply to activities that generate noise at residences above the "highly noise affected" noise management level." The construction noise levels are more restrictive on Saturdays where noise generating activities area limited to 8am to 1pm. This does not mean that no activities can occur outside these hours. During construction it is likely that there will be some employees and security personnel on site 24 hours per day, 7 days per week. Maintenance activities will also occur so long as the noise criteria are met. The drift construction will for example occur well below the surface yielding minimal noise emissions.

For modelling and assessment purposes, the construction noise assessment considered four phases of construction for the Tooheys Road Site. One of these phases was the construction of the administration buildings and facilities, however no details of the proposed construction activities or the major plant and equipment to be used during this phase were provided

Response:
The same equipment will be used as is used for other infrastructure.

The noise assessment undertaken has not considered the potential vibration impacts as a result of the operation of the Project

Response:
No blasting is proposed for routine underground mining operations, however it is possible that minor blasting may need to be employed in the construction phases for efficient excavation. If blasting is required the assessment has shown that the ground vibration goal and air blast over pressure can be satisfied with the employment of controlled maximum instantaneous charge weights.

Vibration from earthmoving equipment has been considered in Section 11.4.1 to 11.4.5 and was shown to meet current assessment goals.

The noise assessment does not identify and consider future changes in land uses such as the proposed Warnervale Town Centre and the Wyong Employment Zone when determining the land zoning and noise amenity goals in accordance with the NSW Industrial Noise Policy

Response:
This is not entirely correct. The assessment goals have used the current residential criteria as this is more stringent than any future industrial land use. The approach used is considered appropriate.

Specific requirements in the DUAP guidelines which were not considered in the noise assessment include:

- description of any geographic or topographic features of the Project sites and surrounding area that may influence noise and vibration impacts;
- site characteristics for key years of each mining development stage, including rehabilitation and closure. Information to be provided includes site topography and plan and elevation views of the site;
- site characteristics for key years of each mining development stage, including rehabilitation and closure. Information to be provided includes site topography and plan and elevation views of the site;
- noise emission characteristics of the locomotives to be used
- proposed mitigation and management measures to control the generation of blasting impacts, ensure compliance with relevant vibration goals and address safety issues

Response:
The above matters were included in the assessment with the exception of the noise generated during final closure rehabilitation and blasting, neither of which are relevant to the assessment of the noise impacts from the development. However, if blasting is required during construction the assessment has shown that the ground vibration goal and air blast over pressure can be satisfied with the employment of controlled maximum instantaneous charge weights. Safety issues will be appropriately addressed for these and all other operational and construction matters.

None of the figures used in the visual assessment have a scale reference, which makes it difficult to estimate distances and contextualise the Project within its surroundings.

Response:
These figures were provided by the consultant, scales are provided on other figures from which these were based.

A viewpoint and viewshed analysis for the Warnervale Town Centre needs to be undertaken to adequately assess the potential visual impact of the Project on the Warnervale Town Centre and confirm that no significant visual impacts would occur.

Response:
A viewpoint and viewshed analysis is discussed in the EA in Section 15.1 and related specialist report in Appendix K. The surface facilities cannot be readily viewed from the Warnervale Town Centre and are significantly distant. The proposed Warnervale Town Centre development site occurs well to the south of the Tooheys Road site and over two and a half kilometres beyond the Motorway Link Road.

The specialist study and the main EA report contain photomontages for all views of the Tooheys Road Site; however no photomontages have been prepared for views to the Buttonderry Site.

Response:
An Artist Impression was provided instead. An Artist impression from ground level was not provided for the Tooheys Road site as it has very limited view points.

The Social Impact Assessment (Appendix F) states there are residential properties on Bushells Ridge Road which would have partial views of the Tooheys Road Site. It is noted that these residences are not considered in the visual assessment.

Response:
Section 15.1.5 of the EA states that some residents along Bushells Ridge Road can view the Tooheys Road site. This matter is considered in the visual assessment.

The EA provides limited information on the appearance of the surface facility infrastructure and buildings, particularly at the Tooheys Road Site.

Response:
Visual access to the sites is limited and will be further managed by visual bunding and landscape screen planting, as discussed in Section 15.1 of the EA. A DVD has been widely distributed in the community which provides additional graphical depictions of the surface development proposals.

It is noted that the EA does not consider the potential visual impacts of dust emissions generated during the construction and operation of the Project.

Response:
Noted

The EA does not provide any details of proposed mitigation measures to minimise the signage impacts of the surface facilities, as required by the Director-General's Environmental Assessment Requirements.

Response:
While this issue will be a factor for detailed design of the surface facilities and subject to regulatory requirements, no internal signs are expected be visible from publicly accessible vantage points.

Landscape Concept Masterplans should consider WSC's Draft Sparks Road Urban Design Framework and provide more details regarding the endemic vegetation proposed to be planted

Response:
Noted

Proponent should conduct a more detailed assessment of the Project's potential impact on the surrounding rail network

Response:
A Rail Capacity Study has been prepared by Rail Management Consultants Australia Pty Ltd (RMCA). This advanced study was not available at the time of publication of the EA as the baseline network demand model was not available from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling since undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can comfortably run daily between the mine and the port. This can be comfortably achieved by two conventional train consists of the Coal Schedule 2 configuration. This current rail capacity will readily cater for the maximum expected production output of W2CP. However, it is expected that W2CP would normally require only six of the approximately 260 available daily train paths on the Main Northern Line. RailCorp supports the findings of the completed RMCA rail impact assessment which is available on the W2CP web page.

The traffic assessment undertaken for the EA should be revised to take into account the traffic generated by the Warner Industrial Park.

Response:
Updated Traffic Impact Assessment undertaken by Parsons Brinckerhoff Australia Pty Limited. This work was undertaken at the request of Wyong City Council and used more recent traffic projections from the proposed Wyong Employment Zone. The study confirmed that the W2CP is only a minor contributor to the current and future traffic management issues of

the area which will arise from planned growth. The report is available on the W2CP web page.

Further details regarding proposed spoil haulage routes and associated traffic for both construction and operation need to be provided to adequately assess the Project's potential traffic impacts on the local road network.

Response:
This has been provided in the updated traffic assessment.

Heritage field surveys were not undertaken within a large part of the eastern portion of the proposed mining area due to lack of access to privately owned land. While OzArk made good use of available resources to assess the heritage significance of this area, it is noted that the lack of field surveys in this area adds considerable uncertainty to the findings of the assessment.

There is a lack of detail regarding the Chance Find Procedure and monitoring program. Further details regarding these aspects should be provided in the EMP.

Response:
Noted

The BCA undertaken provides a rapid and pragmatic assessment of the economic costs and benefits of the proposed Project. In doing so, it does not attempt to deal with the individual value of external costs and benefits and the risks and residual impacts associated with external impacts. It does not provide an assessment of the other Project implementation alternatives.

The BCA lacks sufficient detail. A number of key assumptions have been made in the quantification and valuation of costs and benefits. These decisions and assumptions need to be made more explicit in order for the reader to understand the limitations of the BCA tool. Similarly the report needs to provide more information on the calculations, techniques applied and sources of information used to quantify and value the Project's benefits and costs.

Response:
These comments are too general and non-specific making a meaningful response not possible. The BCA for a greenfield project by its very nature has to make assumptions based on industry standards and currently available data.

Due to the limitations to the risk assessment and the knowledge gaps and uncertainties remaining in relation to groundwater, surface water and ecology studies undertaken for the EA, it has not been possible for the Proponent to adequately assess, and therefore demonstrate avoidance of potential serious or irreversible damage to the environment as a result of the Project.

Response:
This emotive comment is based on an assumption that the project will result in impacts far greater than those predicted.

Additional environmental approvals and licensing requirements that were not identified in the EA include Commonwealth EPBC Approval, and Environmental Protection Licence under the Protection of the Environment Operations Act 1997 (POEA Act).

Response:
Section 4.4 of the EA discusses the EPBC Act including the Referral that was made, Section 4.5 discusses the POEO Act, while the POEO Regulation is discussed in Section 4.5.1.

It is unclear how the roles of the MSB and the W2CP will be integrated to carry out the six management strategies outlined in the EA.

It is unclear if the EA's classification system for evaluation of the damage and repairs required to buildings will be the basis on which the MSB will assess any damage to buildings.

Response:
The Mine Subsidence Board is a service organisation operating for the community in coal mining areas of New South Wales, and is responsible for administering the Mine Subsidence Compensation Act. The Act provides for compensation or repair services where improvements are damaged by mine subsidence resulting from the extraction of coal. The Act also makes the Board responsible for reducing the risk of mine subsidence damage to properties by assessing and controlling the types of buildings and improvements which can be erected in Mine Subsidence Districts.

The Mine Subsidence Board is responsible for initial property inspections and assessment of any damage caused by mine subsidence to any land improvement. The W2CP has limited involvement in this process.

4.5 NSW Department of Health

4.5.1 Air Quality

- A major concern is the level of increased particulate pollution experienced well beyond the boundaries of the land owned by the proponents at both Buttonderry and Tooheys Road sites, and this relates to increased adverse health outcomes.

Response:
Although some contours are shown to extend beyond the boundaries of the surface facility sites, the assessment criteria are met at the nearest residential receptors and indeed, in the vast majority of cases, at the property boundary. The dust modeling used uses very conservative assumptions, including that the water spray dust suppression proposed on the coal stockpiles is not operative.

- Modeling is presented for the busiest day scenario. There is no quantification of what level of activity this represents, and how frequently this level or levels just below it will occur throughout a year. Further information is required.

Response:
The busiest day simply represents the time when everything on each site is operational and at full theoretical maximum capacity (or even greater). That is, all conveyors are operating, trains are being loaded, stockpiles are being both loaded and unloaded and all surface equipment is operational – all of these are operating at least at full capacity. In addition, the anaylsis also assumes that no water spraying activity occurs on the coal stockpiles at that time. The busiest day activities are approximately 3 times the average activity and these assumptions are simply used to define an extreme case for impact assessment purposes rather than reflecting typical operations.

- Figure 12.10 of the EA shows the extent of increased exposure to particulate pollution, affecting far greater numbers of residents than suggested in the table where 2 of 10 (or 15) receptors show higher PM10 readings. This may see even greater numbers of people exposed if the Warnervale development proceeds.

Response:
The figure shows low level contours which are well below the assessment criteria.

- It is not clear how Table 12.8, with relatively high background 24hr PM10 was produced. In general, data for background PM10 levels are not well presented.

Response:
Data used in the assessment is described in Section 5.6.1.

- The section of the Health Risk Assessment dealing with particulate pollution provides a selective summary of the evidence showing health effects of air pollution, and the increasing evidence demonstrating the biological mechanisms for the adverse effects seen. Assessment focuses on deaths and hospitalizations, ignoring the more commonly seen increase in respiratory symptoms such as children having more chest colds and more trips to the doctor. Dust, while a nuisance issue, can become pervasive and adversely affect quality of life.

Response:
As discussed in Section 5.11.1, The Health Risk Assessment contained in the EA relied on published data from Australia and overseas on the health effects of air pollutants and published data from the Department of Health on mortality and hospitalisation rates. There have also been studies undertaken which provide a Population Health Profile of the Central Coast NSW Division of General Practice. These studies currently show a slightly higher rate of asthma (about 3%) and a slightly lower rate of respiratory

disease than the national average. The primary safeguard against adverse health effects is the project being designed to meet air quality goals.

4.5.2 Noise

- The project noise goals cannot be met at the Tooheys Road site during the construction phase. While the EA discusses actions relating to noise affectation zones, it is unclear where these properties are located and how excessive sound levels are predicted to be.

Response:
The assessment showed that there is the potential for construction noise to exceed the noise assessment goals, particularly in adverse wind conditions and all expected plant and equipment operating simultaneously. For this reason, it is proposed to prepare and implement a Construction Noise Management Plan which will be designed to both ensure that the goals are met and also to provide the monitoring data to verify compliance.

- Noise modeling predicts compliance with the project specific noise goals at both surface sites during the operational phase. The PHU would encourage licensing conditions for monitoring to ensure ongoing compliance.
- Increase in trains will increase the 24 hour noise level. Although it is a small increase there may still be potential for intrusive noise to create a nuisance and lead to adverse health effects
- Residents must have a contact point for complaints if noise nuisances do arise. The proponent should guarantee a prompt and genuine response to any complaint regardless of the issue.

Response:
The above points are noted. W2CP can confirm that a telephone and email based point of contact will be provided for noise nuisance or other complaints.

4.5.3 On Site Water Management

- The proposed recycled water options have potential public health implications and must comply with comprehensive National Guidelines. Direct potable reuse schemes must meet standards of risk assessment and comply with appropriate performance targets to avoid risk to health.
- The proponent will be required to consult with the NSW Office of Water and the Independent Pricing and Regulatory Tribunal to ascertain precisely what assessment and approvals are needed for all aspects of the proposed water infrastructure. The proponent's attention is also directed to the NSW Health '*Private Water Supply Guidelines'*. Consultation will also be required with NSW Health via the Public Health Unit, with regard to these aspects, and in particular the potable water supply.

Response:
The above points are noted.

4.5.4 Climate Change

- Projects of this scale must be considered in the context of the whole region, not as a stand alone development. Such consideration may result in increased requirements for approval or determine the health and environmental burden this development poses on the region is not sustainable.

Response:
Noted, however this is a point of policy for Government consideration and is beyond the scope of the assessment of the project alone.

4.6 Lake Macquarie City Council

Lake Macquarie City Council does not object to the proposed development. However it is recommended that should the Department countenance approval of the project, conditions of consent should include:

- Measures to manage and maintain the acoustic and air quality amenity or residents of the City, from both the operation of the mine and the transport of coal, via the rail network, to the Port of Newcastle.
- Prior to granting an approval, Lake Macquarie City Council is provided with the opportunity to comment and make recommendations on any proposed conditions of consent, relating to the transport of coal through the City's boundaries.

Response:
The above points are noted.

4.7 Department of Industry and Investment

The Department of Industry and Investment submission was divided into each departmental division, which are summarised separately in the following sections.

4.7.1 Mineral Resources

- I&I NSW MR were unable to locate a diagram in the EA showing the MLA areas in relation to the project area. If the MLAs are not wholly within the project area, the proponent should discuss this matter further with I&I NSW MR.

Response:
The EA contained the original Authorisation and Exploration Licences boundaries. Since the publication of the EA, the MLAs have been lodged with I&I NSW and advertised. The MLA boundaries are within the project application and proposed development areas as described in the EA.

- The process followed by the proponent to develop subsidence predictions is considered to be the current best practice in NSW. To overcome difficulties associated with the prediction uncertainty it is important that the proponent be

required to develop and implement an ongoing robust process to ensure 'adaptive management' should subsidence deviate from predictions.

- Mining induced flood impacts are largely permanent and are difficult to manage, irrespective of the accuracy of predictions and flood studies so there is a need for the proponent to pay close attention to the flood fringes where deviations form the predicted subsidence have the potential to affect additional properties. In this situation adaptive management should be considered as one of the primary management measures.

Response:

The W2CP agrees with the need to ensure adaptive management approaches are employed to, among other things, address and respond to any variations from predicted impacts such as subsidence. Adaptive management measures are proposed throughout the EA, particularly in relation to subsidence, groundwater and flooding management.

- In addition to flood impacts it is expected that subsidence arising from the proposed mining will affect residential structures.
- The proponent has designed the mine layout in an attempt to limit subsidence movements in the Hue Hue MSD to within the limits ascribed to this MSD. No such design limits have been ascribed to the Wyong MSD.
- The proponent's subsidence consultant has adopted a new method for predicting subsidence impacts on the residential structures within the application area which is yet to be tested.

Response:

Noted. However, W2CP is confident that its conservative modelling for impact assessment allied with sound adaptive management approaches will provide a high degree of confidence in the ability to manage impacts as described in the conclusions set out in the EA.

- Two 330kV powerlines owned by TransGrid traverse the project site, which include a number of suspension and tension towers. Of particular concern are two high angled turn towers. Any decisions made in relation to management of transmission lines should provide for adequate time to allow for consultation, feasibility studies and implementation of the selected management option.

Response

Two transmission lines operated by TransGrid cross the proposed mine area. Calculations of subsidence, tilt and strain at each tower and bay length changes between the towers were issued to and discussed with TransGrid in 2006, 2007 and 2008. The proposed mine layout and the predicted levels of mine subsidence movements at the transmission lines and towers has not changed significantly since January 2007. Preliminary investigations indicated that all but two of these towers can be managed using strategies, such as the installation of cruciform footings and adjustments to cable, etc. that have been successfully applied elsewhere, with the remaining two tension towers requiring special consideration. Neither of these towers however is affected until up to some 20 years into the project life, so it would be premature to

develop a detailed management plan at this stage. Further consultations and detailed investigations will be undertaken during the Subsidence Management Plan process which allows for sufficient time to undertake any necessary mitigation works to tower structures well in advance of mining.

- In summary, I&I NSW MR is supportive of the proposed Wallarah 2 Coal Project as an appropriate use of the State's coal resources and for the economic benefits it will bring to the Central Coast Region in terms of job creation and investment.

Response:
Noted.

- It is recommended that consultation between the proponent and Boral be maintained to maximize recovery of both coal and clay resources in the area.

Response:
W2CP is committed to ongoing consultation with Boral in order to pursue negotiated outcomes to promote orderly and optimal recovery of coal and clay resources in the area.

4.7.2 Forests

- The *Mine Subsidence Compensation Act 1961 – Compensation Fund* does not mention compensation for repairing damage to roads. Forests NSW is concerned that if subsidence should occur in Wyong State Forest due to the mining, considerable cost may be involved in repairing the roads. Forests NSW would expect that these costs would be covered by this compensation fund of from the proponent.

Response:
Repairs to any subsidence damage to any roads owned by NSW Forests will be undertaken at no cost to the owner. The company and the Mine Subsidence Board are responsible for the cost of any repairs required due to subsidence impacts. The Mine Subsidence Board and other coal companies have undertaken road repairs in other mining areas affected by subsidence.

- The methods of revegetation that may be required in the Wyong State Forest will require consultation with Forests NSW as to the tree species and method of rehabilitation.
- Consultation and negotiation with Forests NSW, for use of this area of Wyong State Forest, will need to be undertaken prior to final approval.

Response:
The W2CP will consult and negotiate with NSW Forests in relation to any works, use of lands or potential revegetation strategies within the Wyong State Forest during project construction and operations.

4.7.3 Fisheries

- Jilliby Jilliby Creek and Little Jilliby Creek are both considered as Key Fish Habitat. It should be noted that I&I NSW Fisheries does not support longwall mining underneath creeks and rivers as maintains its objection to mining under Key Fish Habitat.

Response:
The position of NSW Fisheries is noted. However the project will not adversely affect key fish habitat within the mining area.

- Significant concerns in relation to the potential erosive effect on the relatively unconsolidated sediment of the Jilliby Creek floodplain due to slope changes from subsidence.

Response:
The section of Jilliby Jilliby Creek which will register the greatest effect of localised steepening as a result of subsidence will have a resultant profile with a grade of 1.48 m fall over 509 m (approximately 0.3% grade).

When constructing erosion control works, a channel with a 1% fall (1 m over 100 m) is considered stable and does not require any specific erosion controls. Shallower channels are generally not preferred as there is insufficient grade to allow free flow of water within the channel.

Localised reduction in stream gradient will occur at two locations in Jilliby Jilliby Creek above the mining area. These locations will be immediately upstream of the southern extraction limit of panels where the edge of the associated subsidence occurs. The restricted total subsidence amounts and the minimal difference in subsidence between the troughs and crests across mining panels have been specifically managed according to mine design, mining height, panel orientation and panel width, etc. This subsidence management approach has limited the subsidence variation across the alluvial area to mainly of the order of 0.3 m which is well within the range of topographic variation across the floodplain. As well as being visually imperceptible, it will also limit the length and degree of slope changes throughout the area, thus considerably reducing the erosion risks to the alluvial lands and stream morphology.

As well as increases in saturated thickness of the alluvial areas following mining subsidence, there will be additional ponding in the creek during very low flow and no-flow periods at the two localised areas of reduced stream bed gradient in Jilliby Jilliby Creek, at least until stream bed readjustments occur naturally over time. While ponding effects could add up to around 0.7 m in depth at its maximum extent in the south, the ponding effect will only extend a few hundred metres upstream and will provide aquatic ecology enhancement. However, this bed slope and ponding condition will be transient and will not become a barrier to even low flows because the creek banks in these locations are some 4 to 5 metres high.

The EA does make a commitment to monitor the river for any increases in erosion or bank instability but as previously discussed, the overall Riparian Zone Enhancement Program will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks and stabilising the channel by removal of debris that does not provide habitat value as well as improving water quality by assisting landowners with appropriate land management practices.

- Concerns about change in groundwater levels and potential impact on pools water levels in the creeks and their tributaries.

Response:
As described above, there will be two potential ponding areas created in Jilliby Jilliby Creek. The first will be created upstream of the confluence with Little Jilliby Jilliby Creek and will have a depth of 68 cm. This pool will essentially migrate from further up the system where the first longwall panel crosses the creek down to the main roadways running up Little Jilliby Jilliby Creek which will not be locally subsided near the confluence area.

The second pond will occur below the last longwall panel beneath the creek. The depth of this pond will be 32 cm and will potentially extend for a distance of up to 1 km. Given the creekline is essentially a series of small pools with dry sections and tends to only flow following rainfall, increased ponding is considered to have a positive impact on aquatic fauna.

The creek flows through deep alluvial deposits and the channel depth varies from 2 m up to 5 m but is typically around 3 m. There are a large number of obstructions in the creek line such as fallen timber which provide a greater depth restriction than will be caused by subsidence. The ponding can be removed by modest and carefully managed excavation along the channel bed over the unsubsided section of the creek if considered necessary. However, it is likely that the bed gradient will be self-adjusted to a new equilibrium gradient over a period of up to several months of normal creek flow regimes. It may be more beneficial to undertake a wider Riparian Zone Enhancement Program which would involve removal of obstructions, improvements to water quality and riverbank stabilisation through tree planting.

- There is risk of sediment movement, slumping and infilling of creek habitats and their potential impact on the fish populations.

Response:
This risk of accelerated sediment movement or slumping beyond existing conditions as a result of subsidence within Jilliby Jilliby Creek will be extremely minor and all sections of the creek within the mining area will be monitored over the life of the mine for any changes in erosion or bank stability.

- If approval is granted it would be expected that a monitoring program be in place to assess changes in bed slope due to subsidence and any erosion impacts. The development of as rehabilitation strategy that would be implemented to control any bed instability as well as an assessment of the rehabilitation of development of wetland habitats in areas that subside and fill with water, would be expected to be expressed in the draft Statement of Commitments.

Response:
This is agreed. W2CP will commit to a comprehensive monitoring and adaptive management strategy addressing these issues.

4.8 Department of Transport

- In order to support the proposal, Transport NSW requires further assessment of the impacts of the development on the Main North Rail Line:
    1. The Main North Rail Line caters for Country Link passenger services, trains traversing the strategic North-South freight corridor between Melbourne, Sydney and Brisbane, as well as local freight movements. This line is critical to the Sydney, Newcastle and the Central Coast passenger rail service, and is also of national importance as it provides a key (and already constrained) section of the only East Coast North-South rail freight corridor. Transportation of coal from the site by rail would require additional rail services on the Main North Rail Line.
    2. The NSW Government's legislated provision in the Transport Administration Act (1988) requires passenger rail services to be given priority over other rail services. The EA assumes that the current level of passenger rail operations and volume of other freight services will remain unchanged which is unlikely to be the case as increases in both interstate freight and commuter passenger services are expected to occur in the future.
    3. Transport NSW requests that the proponent undertake further analysis of the rail transport task required by the mine. In particular there is need for a whole of corridor assessment of the capacity requirements of the corridor, taking into account the needs of the proposed development, future passenger tail growth, additional freight rail services from other local users of the line and freight rail services traversing the North-South interstate freight corridor.

Response:
A Rail Capacity Study has been prepared by Rail Management Consultants Australia Pty Ltd (RMCA). This advanced study was not available at the time of publication of the EA as the baseline network demand model was not available from RailCorp. RailCorp and W2CP have been in discussions on the impact of the project's additional coal movement on the rail network since late 2009. The modelling since undertaken by RMCA on the RailSys model provided by RailCorp has indicated that 6 return services can comfortably run between the mine and the port. This can be

comfortably achieved by two conventional train consists of the Coal Schedule 2 configuration. The current rail capacity will readily cater for the maximum expected production output of W2CP. It is expected that W2CP would normally require only six of the approximately 260 available daily train paths on the Main Northern Line. RailCorp supports the findings of the completed RMCA rail impact assessment which is available on the W2CP web page.

- The transport component of the EA should consider how future employees and visitors can be encouraged to access the site by means other than the private car, such as public transport, walking, cycling, and the merit of a car-share scheme of shuttle bus service for local shift workers. The preparation of a workplace travel plan is requested.

Response:
This is agreed.

- Potential transport impacts on the Wyong Employment Zone should be addressed

Response:
An updated Traffic Impact Assessment undertaken by Parsons Brinckerhoff Australia Pty Limited has been prepared and is available on the project web page. This work was undertaken at the request of Wyong Shire Council and used more recent traffic projections from the proposed Wyong Employment Zone. The study confirmed that the W2CP is only a minor contributor to the current and future traffic management conditions of the area which will arise from planned growth.

- The proponent should be aware of the following strategies which are of relevance to the proposal:

    1. The NSW State Plan (2010) commits the Government to developing a number of new regional transport strategies, including the Central Coast. The Central Coast Strategy is now being developed by Transport NSW and will now encompass specific measures and actions to respond to transport needs and support future growth of the region.
    2. The recently released NSW Bike Plan (2010) provides guidance on improving cycling access and use over time. It is recommended that the proponent explore opportunities to connect the subject sites to the wider bicycle networks and facilities.
    3. The Government is also currently developing the draft NSW Freight Strategy during 2010 to manage the growing freight task. This strategy aims to facilitate the efficient movement of freight throughout NSW and will provide the policy and planning framework to guide future NSW Government activities in freight, while informing private sector decision-making.

Response:
Noted.

4.9 Rail Corporation NSW (RailCorp)

RailCorp has reviewed the Rail Study for the Wallarah 2 Coal Project and advised that it acknowledges the findings which indicate sufficient capacity exists on the RailCorp network to accommodate up to 6 return coal services between the proposed Wallarah 2 Coal Mine and the ARTC boundary at Islington Junction, near Broadmeadow.

RailCorp will continue to examine changes in rail demand and manage future capacity needs on the Main Northern rail corridor. RailCorp reserves the right to review train paths and future infrastructure requirements with the proponent over the lifecycle of the Wallarah 2 Coal Mine. Freight access agreements will be managed through the RailCorp Network Access Division.

Response:
Noted.

4.10 Gosford-Wyong Councils Water Authority

The Central Coast water supply is provided by Gosford City Council and Wyong Shire Council. The Councils have jointly invested in the water supply headworks which include major water storages, treatment facilities and transfer systems. The Gosford Wyong Councils Water Authority was established to undertake the long term planning for the joint headworks.

The main issues raised by the Authority are concern over stream flows and water quality in the Wyong River and its tributary Jilliby Jilliby Creek. The submission refers to concerns raised by the Pells Sullivan Meyninck technical review of the W2CP EA. These issues are summarised below.

Section 7.6 of the EA states that no impacts are predicted for the proposed Mardi to Mangrove pipeline. Section 5.12.2 of the Assessment of Mine Subsidence Impacts on the Natural Features and Surface Infrastructure for the Wallarah 2 Coal Project in Support of the Part 3A Application, contained in Appendix A of the EA outlines the movement impacts in the pipeline. It is noted that the pipeline is currently under construction and that ground movements in excess of those provided for in the design of the pipeline could affect the integrity of the pipeline.

Response:
The proposed pipeline route is more than 370 metres from the nearest edge of any longwall block and therefore the predicted ground movements are relatively small compared to the predicted subsidence ground movements over the longwall panels themselves.

Strictly speaking the predicted movements apply at the bedrock which is some 30 metres below the alluvials in this valley and hence only a small proportion of these predicted movements are likely to be felt by the

pipeline which is to be laid near the surface of these alluvials. However, in assessing the potential impacts, it was conservatively assumed that all these movements are transferred from the bedrock to the surface and onto the pipeline itself. Additionally it was conservatively assumed that the worst possible valley upsidence and closure movements would occur at the position of the pipeline.

Consequently, the predictions are very conservative in that they represent an extreme worst case. Even so the maximum predicted ground strains are well less than the tolerable limit of 1.5mm/m of the pipeline that was nominated by the Mardi-Mangove Link Project Team. In reality, the dissipating effect of the alluvium should reduce the ground movements to a fraction of those predicted.

It should also be noted that mining in this area is not scheduled for some 15-20 years during which period these predictions will have been subjected to a rigorous validation process and the ground movements will develop incrementally with the extraction of each successive longwall block. Systematic monitoring that will be undertaken by the mine will readily identify any excessive incremental movements thus allowing for mitigation strategies to be adopted well in advance of any critical limits being reached.

The flows entering the Lower Wyong weir constitute approximately 48 % of the total stream flows available for extraction for the water supply. Of these flows, approximately 28 % is contributed by the Jilliby Jilliby Creek sub catchment. Therefore, 13 % of the total flows available to the water supply are from the Jilliby Jilliby Creek sub catchment and 35 % of total flows available are from the Wyong River Catchment (excluding Jilliby Jilliby flows). As such, a significant proportion of the water available to the Central Coast is potentially at risk to changes in groundwater and associated streamflows from the Wallarah 2 Coal Project.

Response:
It is noted that the Authority states that Jilliby Jilliby Creek sub catchment represents 13% of the total flows available to the water supply system. This contribution primarily occurs during periods of wet weather. At other times the creek is characterised by a series of ponds with low to nil flow. A combination of its low flow characteristics and catchment land uses has resulted in frequently degraded water quality within Jilliby Jilliby Creek, in terms of elevated faecal coliforms and nutrients particularly at low flows. Despite the fact that the project will not impact on the water supply scheme, the project has committed to the implementation of a Riparian Zone Enhancement Program. This program will be designed to improve the health of the creek by including other wider issues such as replanting denuded creek banks, stabilising the channel by removal of debris that does not provide habitat value and improving water quality by assisting landowners with appropriate land management practices.

The introduction of the Water Sharing Plan for the Central Coast Unregulated Water Sources will result in the water supply needing to extract a greater proportion of its

water during higher flows than has historically been the case. To improve the yield of the water supply system and to be able to comply with the environmental flow requirements in the Water Sharing Plan the GWCWA is implementing WaterPlan 2050.

WaterPlan 2050 includes a major upgrading of water infrastructure in the Mardi Wyong area. The key infrastructure is the Mardi to Mangrove Link Project which places a greater emphasis on sourcing water from Wyong River, Jilliby Jilliby Creek and Ourimbah Creek than has been historically the case.

Response:
This issue has been addressed. To understand the implications of worst case post-mining infiltration conditions on a whole of catchment basis, W2CP has undertaken follow up hydrological modelling using altered (high) infiltration parameters. This demonstrated that there would be negligible effects on low flow hydrograph characteristics in Jilliby Jilliby Creek and confirmed that there would be no measureable change to the surface flows or impacts on cease to pump triggers in local waterways. The extraction of water during high flow events will equally be unaffected by the W2CP.

The second paragraph in Section 7.7 notes that the coal extraction area covers only 5% of the water supply catchment area. This statement is extremely misleading in that it infers that only 5 % of the water supply catchment is potentially affected by the proposal. This is not the case. The proposal is located under Jilliby Jilliby Creek near its confluence with Wyong River potentially impacting all streamflows above that point (13% of available streamflows for the water supply). It is also adjacent to the lower reaches of Wyong River which represents another 35% of the total available streamflows for the water supply. Impacts on the groundwater and associated streamflows could have a significant impact on the water supply given that Wyong River and Jilliby Jilliby Creek constitute a significant proportion of the available streamflows (approximately 48 %).

Response:
The statement regarding the area of the underground mine is a matter of fact. The EA does not understate the importance of the water supply catchment, as evidenced by the level of assessment on this issue. The extraction area does not extend beneath the Wyong River.

Pells Sullivan Meynink report raises serious concerns regarding the input parameters to the numerical modelling undertaken in the Mackie study which underpins the groundwater and surface water assessments contained in the environmental assessment report. Section 5.7 of the Pells Sullivan Meynink report states "*On this basis, the findings from the Mackie study should be rejected. This means that at present it is not known what impacts of the Wallarah 2 longwalls will be on groundwater resources, and on groundwater that feeds into the streams of the Dooralong and Yarramolong Valleys*."

Response:
The PSM review has been discussed in detail in Section 5.2. The technical responses provided and the additional work undertaken further supports

the commitment made by the W2CP that the water supply system will be protected.

Associated with the concerns regarding the impacts on the groundwater levels is the potential for altered groundwater chemistry resulting from oxidation of rock and soil minerals. This issue has not been adequately addressed in the environmental assessment report.

Response:
The PSM review discussed the risk of Acid Mine Drainage occurring or otherwise being an issue for the deep hardrock aquitards. The Wallarah coal seam has been extracted for nearly 100 years in the region and AMD issues have not arisen. There are higher sulfur coal seams in other coal measures such as the Greta Seam within the Hunter and Newcastle coalfields and the main risks of AMD with these materials results from surface emplacement of acid forming materials such as coal reject. Not only is the coal to be mined in the proposal of much lower sulfur content, the W2CP will not be processing coal nor emplacing reject coal material.

Whilst there is environmental merit in the eradication of weeds, this is primarily a terrestrial ecology issue of little benefit to the water supply. Riparian zone plantings can assist in stabilising the river banks if maintained and undertaken as part of an overall package including fencing stock out of the riparian zone. The EA should advise what level of riparian planting is proposed and what associated ongoing maintenance is proposed to be a meaningful commitment.

Environmental and education programs have been undertaken over many years in the Wyong River and Jilliby Jilliby Creek catchments. Council has undertaken education programs associated with sewage treatment and agricultural activities in the water supply catchments. Though additional effort in this area could be advantageous it could not be considered a significant offset.

Response:
The suggested lack of value of the proposed Riparian Zone Enhancement Plan is not supported. The Authorities own water quality data suggests that current education programs within the Jilliby Jilliby Creek catchment are not effective. Based on the information obtained by the W2CP during the EA studies, it is considered that a significant improvement in water quality can be achieved through targeted improvements. These target areas can be discussed directly with the Authority.

The GWCWA is unaware of any detailed proposals for the provision of treated mine water that could contribute to the water supply scheme. Any of these proposals would require significant investigation and approvals prior to implementation. Given the nature of the mine water (contaminated), the lack of consultation and lack of details, these proposed disposal methods for the mine water cannot at this stage be considered advantageous to the water supply. Given the significant potential for detrimental impacts to the available water supply sources in Wyong River and Jilliby Jilliby Creek and the very minor proposed offsets, the GWCWA would not consider that the proposal represents a positive impact to the water supply scheme.

Response:
The EA clearly states that water extracted from the underground workings will be treated in a Reverse Osmosis Treatment Plant, often referred to as a desalination plant. This technology routinely treats sea water to drinking water standards. The EA discusses a range of supply alternatives which would require the approval of the Authority before implementing. As also discussed in the EA, options also exist to supply water to neighbouring industries as they develop or return the water to environmental flows. Each option would require different qualities to be determined.

There are a number of commitments are made for protecting the water supply catchment in Section 7.9 of the EA however there are no specific monitoring and evaluation proposals to determine if those commitments have been met in the future. Correspondingly, if those commitments are not met the environmental assessment is silent on commitments to offset any losses. This is of particular concern to the GWCWA in relation to the yield of the water supply catchment and water quality.

Response:
Proposed monitoring provisions are provided in Chapter 16 of the EA. In Section 16.21.4 the proponent has made a commitment to be subject to an Independent Environmental Audit commencing two years after commencement of development, and every three years thereafter. As is usually the case, the auditors are appointed by the Department of Planning with the proponent paying the full costs. The EA is also clear on roles and responsibilities in relation to the project. Although the Mine Subsidence Board is liable for the correction of subsidence impacts on land improvements, the mine owners are responsible for any loss of water or environmental impacts. Whether impacts should be mitigated through compensation, physical works or offsets is a matter for the Department of Planning to determine in the event of any dispute.

The specialist technical advice provided by Pells Sullivan Meynink has identified significant shortcomings in the proponent's groundwater and surface water assessments which support the Environmental Assessment. These shortcomings invalidate the Environmental Assessment conclusions in relation to the groundwater and stream flow impacts and result in significant uncertainty as to the potential impacts of the proposed mine. Given the significant contributions that Wyong River and Jilliby Jilliby Creek makes to the water supply and the level of uncertainty surrounding the impacts of the proposal on the groundwater and streamflows, this presents an unacceptably high level of risk to the Central Coast Water Supply system and the GWCWA calls for the proposal to be rejected.

Response:
The PSM review has been adequately dealt with in Sections 5.1, 5.2 and 5.3. The W2CP strongly disputes the assertion that there is uncertainty surrounding the impacts of the proposal on groundwater and streamflows.

4.11 Department of Environment, Water, Heritage and Arts

DEWHA provided a submission on the draft EA during the adequacy stage prior to finalisation and display. The main comments raised included:

- All threatened species tables and discussion throughout the document should clearly indicate whether relevant species are listed under Commonwealth, State legislation or both.

Response:
This was done as part of the EA finalisation and is included in the EA.

- No information on whether the EEC White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is present in the project area is if so what actions are proposed to protect it.

Response:
This EEC is not present within the impact footprint of the project.

- Further clarification on which species identified are State or Nationally listed.

Response:
This was done as part of the EA finalisation and is included in the EA.

- It is not clear on what mitigation measures or strategies will be employed to minimise impacts on *Angophora inopina, Acacia bynoeana, Tetratheca juncea* in the direct impact areas and Stuttering Frog, Giant Barred Frog and Littlejohn's tree frog within the mining area.

Response:
Although *Acacia bynoeana* will not be affected by the proposed development some individual *Angophora inopina* and *Tetratheca juncea* will be cleared during the construction phase for the Tooheys Road Site. The area that will be cleared represents regrowth from a previously cleared and operating a dairy farm. Given the existence of extensive populations to the immediate west and north, the local population of plants is unlikely to be placed at risk of extinction through the proposed development. As described in Section 13.1.16 of the EA, the project will involve establishing a specific *Angophora inopina* Revegetation Area at the Tooheys Road site as part of a Vegetation Management Plan (VMP). The outcomes of the VMP will be to establish the methodology for enhancing *Angophora inopina* and *Tetratheca juncea* populations within the nominated 6 ha area as shown on Figure 16.1 of the EA. The principles of Landscape Function Analysis (LFA) will be implemented to provide a predictive understanding of how well the rehabilitation and habitat enhancement activities are working.

Some listed frog species are known to occur in the proposed mining area at the headwaters to Little Jilliby Jilliby Creek in Narrabeen Warm Temperate-Subtropical Rainforest predominantly on Patonga Claystones

in the lower gully sections of the hilly landform. Due to their life cycle, they generally require shallow, flowing rocky streams.

All upland streams are ephemeral and steep and are not conducive to the formation of resistant rock bar and pool systems. Accordingly, there are no specific riverine or riparian Ecosystems that rely on pools in streams in the W2CP upland areas. Upland valley areas with their frequent boulder and alluvial-filled, narrow drainage lines provide moister microclimates.

In the W2CP area, subsidence related fractures will have no significant impact on the nett water flow behaviour of these very steep ephemeral drainage systems which are already adapted to a more stress relieved condition in interbedded bedrock units of varied but relatively lesser strength.

- There is currently no discussion about the impacts of subsidence on the nationally listed *Callistemon shiressii*, *Eucalyptus fergusonii* and *Macrozamia flexuosa*.

Response:
Discussion of these species was included in the final EA document. The species were recorded in the vicinity of the Western Shaft and the assessment contained in the EA showed that the Project will not have a significant impact on them.

- There is a need to take into account DEWHA's Draft Policy Statement: use of environmental offsets under the EPBC Act.

Response:
This policy statement was taken into account in the development of the proposed offset strategy as described in the EA.

- There is currently no discussion about the impacts of the project on the Hunter Estuary Wetlands Ramsar site.

Response:
This wetland is located near Newcastle and will be unaffected by the W2CP.

5. Discussion of the Issues

This section provides further detail in response to the issues raised in the submissions for the W2CP EA. In particular, technical issues raised by government agencies and non-government organisations are answered. The discussion is based on topics (issues) and not on the source of the submission.

5.1 Subsidence

Submissions received expressed a concern of the effect that subsidence from the project will have on watercourses, groundwater levels and quality, native flora and fauna, infrastructure and properties. The EA clearly assess the level of impact on each of these issues, and details the mitigation strategies and options proposed to rectify damage. The role of the Mine Subsidence Board in the repair of properties is also clearly outlined. Set out below are responses to specific subsidence-related issues raised in the submissions.

5.1.1 Subsidence vs Extraction Thickness

Based on many years of subsidence monitoring over large super-critical extraction areas in NSW, the maximum observed subsidence is typically 35% to 65% of the extracted seam thickness, depending on the geology of the overburden strata. Remnant chain pillars that are left between longwall panels can however provide some long term support to the overburden, and, hence, over a series of longwall panels this maximum possible subsidence of up to 65% of the extracted seam thickness is rarely observed.

As an initial working hypothesis, a maximum possible subsidence of 65% of the proposed extracted seam thickness was conservatively adopted for this project for supercritical panels.

Within the Wallarah 2 Coal Project area the individual widths of the areas to be extracted are sub-critical, that is, they are not wide enough to be supercritical or to develop the maximum possible subsidence of 65% of the extracted seam thickness.

The detailed subsidence study and interactive longwall design that was undertaken for the W2CP has taken a conservative view of the subsidence reduction capability of the chain pillars at W2CP and has subsequently predicted a maximum of up to 57% of the extracted seam thickness.

5.1.2 Impact on the Mardi-Mangrove Creek Pipeline

The proposed pipeline route is more than 370 metres from the nearest edge of any longwall block and therefore the predicted ground movements are relatively small compared to the predicted subsidence ground movements over the longwall panels themselves.

Strictly speaking the predicted movements apply at the bedrock which is some 30 metres below the alluvials in this valley and hence only a small proportion of these predicted movements are likely to be felt by the pipeline which is to be laid near the surface of these alluvials. However, in assessing the potential impacts, it was conservatively assumed that all these movements are transferred from the bedrock to the surface and onto the pipeline itself. Additionally it was conservatively assumed that the worst possible valley upsidence and closure movements would occur at the position of the pipeline.

Consequently, the predictions are very conservative in that they represent an extreme worst case. Even so the maximum predicted ground strains are well less than the tolerable limit of 1.5mm/m of the pipeline that was nominated by the Mardi-Mangove Link Project Team. In reality, the dissipating effect of the alluvium should reduce the ground movements to a fraction of those predicted.

It should also be noted that mining in this area is not scheduled for some 15-20 years during which period these predictions will have been subjected to a rigorous validation process and the ground movements will develop incrementally with the extraction of each successive longwall block. Systematic monitoring that will be undertaken by the mine will readily identify any excessive incremental movements thus allowing for mitigation strategies to be adopted well in advance of any critical limits being reached.

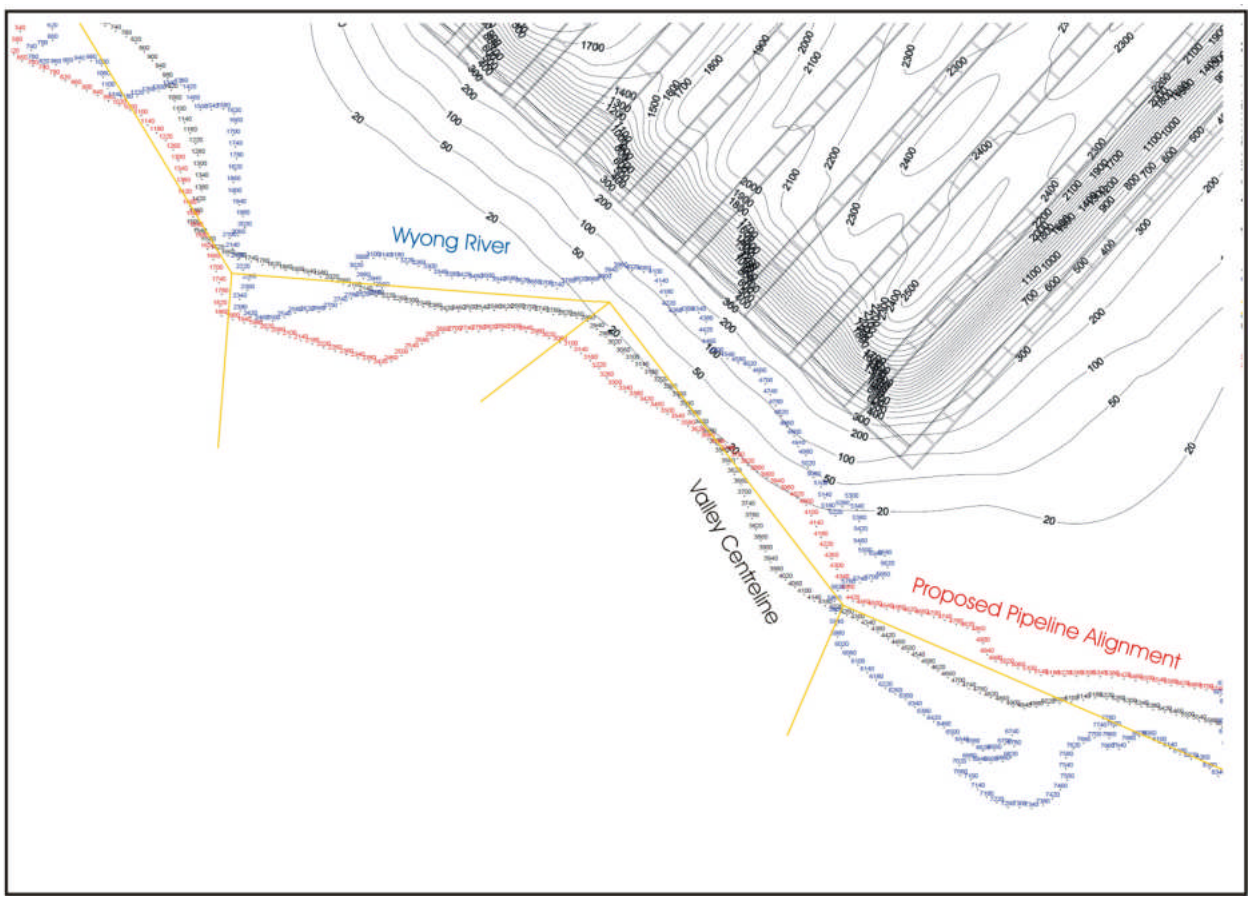


Figure 2 Detail of Mardi-Mangrove Creek Dam Pipeline

Note: Blue line is the creek
Red line is the pipeline route

Black line is the centreline of the valley

5.1.3 Stream Bed Cracking

Reviews have been undertaken of previous experiences of subsidence ground movements and subsidence impacts after longwall mining under or near the Cataract, Georges, Nepean and Bargo Rivers and the Waratah Rivulet.

In steep narrow gorges where there are a series of rockbars and rock pools, such as Cataract Gorge, the combined effects of upsidence and closure can result in cracking, buckling and shearing of the rock layers in the floor of these valleys. These movements can result in the surface water flows being lost to view as some of these flows can now flow downstream through a fracture zone that has been created beneath the floor of the gorge. The nett flow of water along these gorges however remains unchanged.

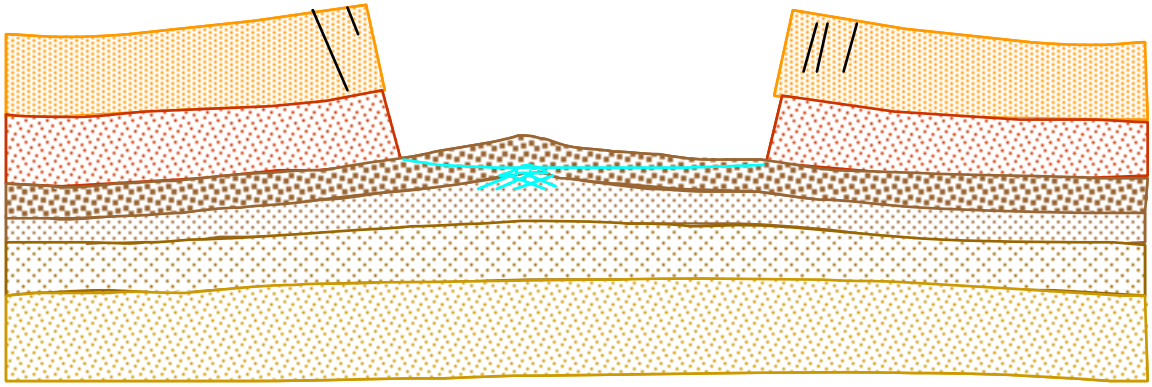


Figure 3 Illustration Showing Water Flowing Through Fractures Beneath Uplifted Rock Layers

In broader "flooded river" valleys such as the Nepean River Valley, Tower Colliery has mined longwall panels near and beneath the Nepean River with no reported or observed loss of surface water. In these cases the potential for subterranean flow diversion is very low as the river beds are already flooded and the bedrock is submerged and covered by alluvial deposits. Consequently, any fractures that develop in the bedrock as a result of mining are immediately filled by water or sediment and they do not provide a pathway for flow diversions. The volume occupied by the water and rock does not change. Similarly the nett flow of water along this valley will remain unchanged.

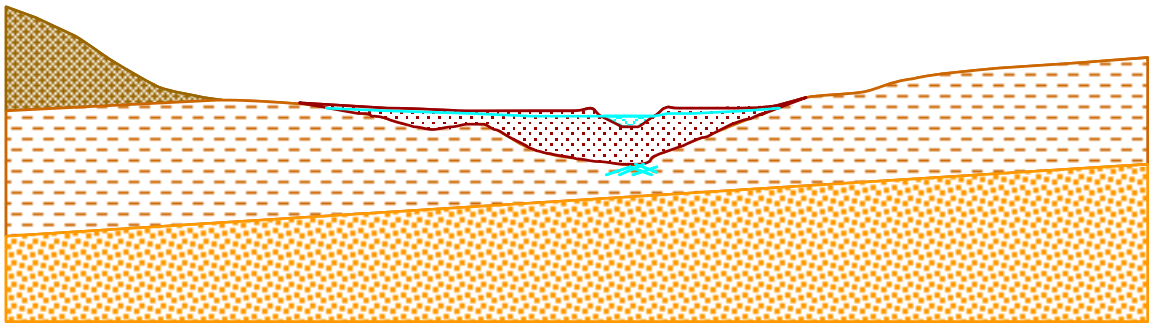


Figure 4 Illustration Showing Flow Paths Through Fractures Beneath Saturated Alluvium

The impacts from longwall mining in the area of the Nepean River are more applicable to the W2CP than the rock bar and rock pool type of valleys since the Wyong River, Little Jilliby Creek and Jilliby Creek are essentially flooded valleys with fully saturated alluvial deposits up to 30 metres in depth as shown in the above sketch.

It is also worthwhile noting that longwalls were mined directly beneath the Cataract, Georges, Nepean and Bargo Rivers and the Waratah Rivulet, while the proposed longwalls at W2CP will not mine directly beneath the Wyong River or Little Jilliby Creek.

5.1.4 Confidence in the Model

The numerical model used in this study incorporates a coupled rock failure and fluid flow system to simulate the behaviour of the strata as well as the fluid pressure/flow effects as it models the behaviour of a representative cross section through the central zone of the series of longwall panels. The rock failure and permeability routines have been developed by SCT Operations and provide a more realistic representation of the rock fracture mechanics than is available in the standard codes.

The model simulates rock fracture and stores the orientation of the fractures. Shear fracture, tension fracture of the rock, bedding plane shear and tension fracture of bedding are also determined in the simulation, and the stability of pre-existing jointing, faults or cleats are also addressed where appropriate.

Firstly, verification studies were undertaken to confirm that the model was satisfactorily simulating the deformation mechanics of the strata, and to also determine the sensitivity of various parameters in the modelling process.

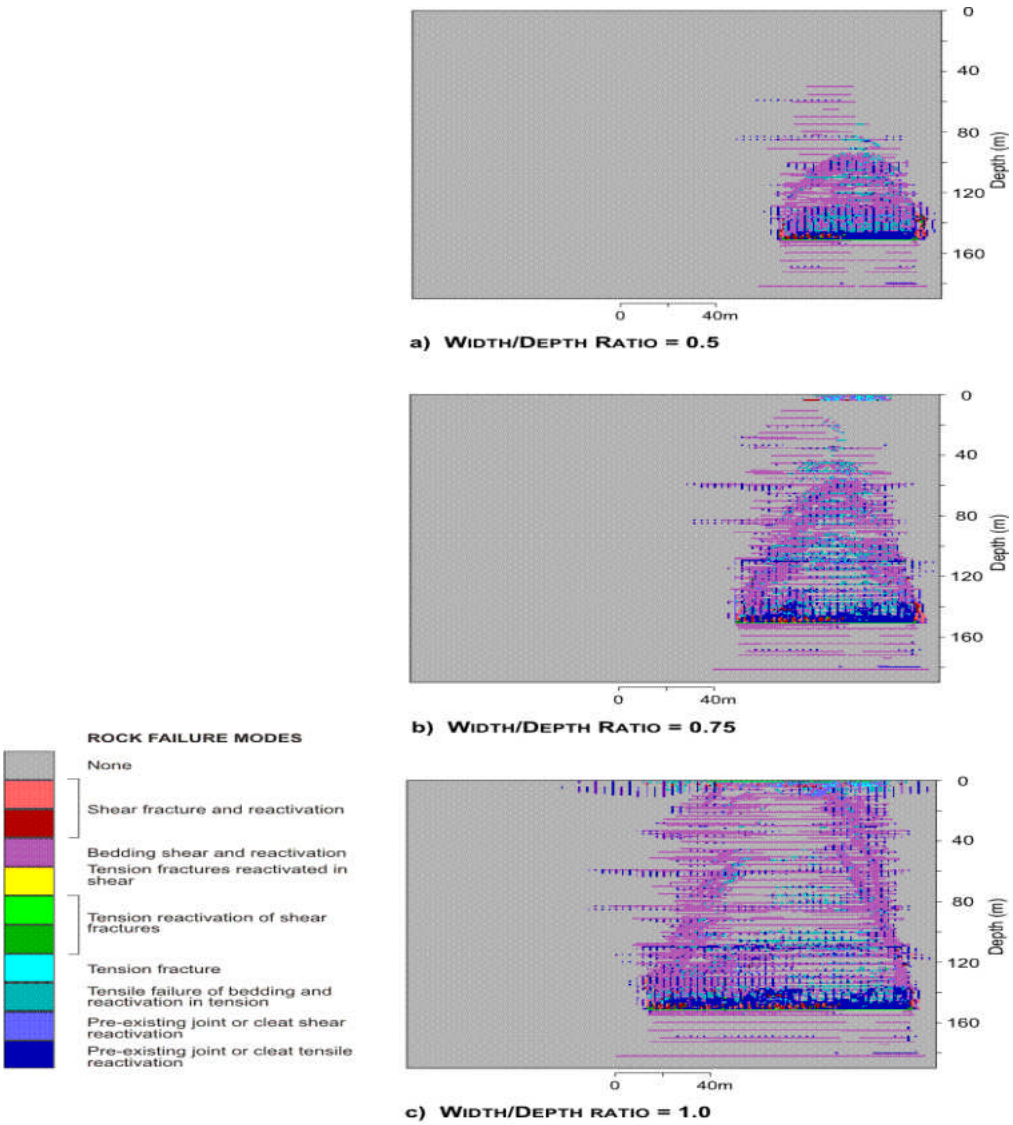


Figure 5 Modelled Fracture Patterns for Various Width/Depth Ratios

The capability of the model to realistically predict the fracturing and deformation that strata above longwall panels would experience, is supported by its capacity to realistically predict the associated subsidence.

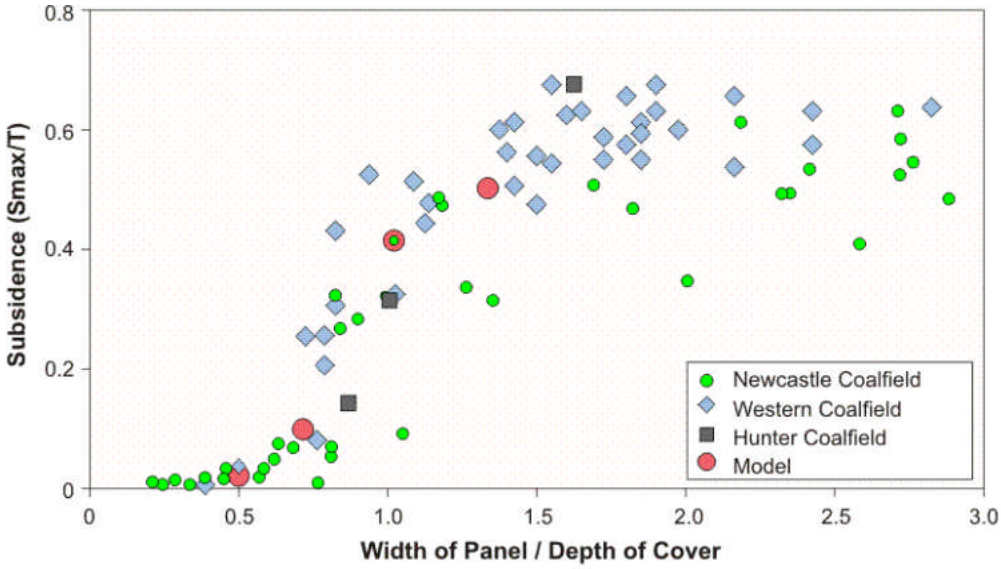


Figure 6 Modelled Subsidence Predictions for Various Width/Depth Ratios

Once it was confirmed that the model was capable to realistic predictions of strata behavior and associated surface subsidence, a detailed back analysis was undertaken on data gathered at Ellalong Colliery some years ago.

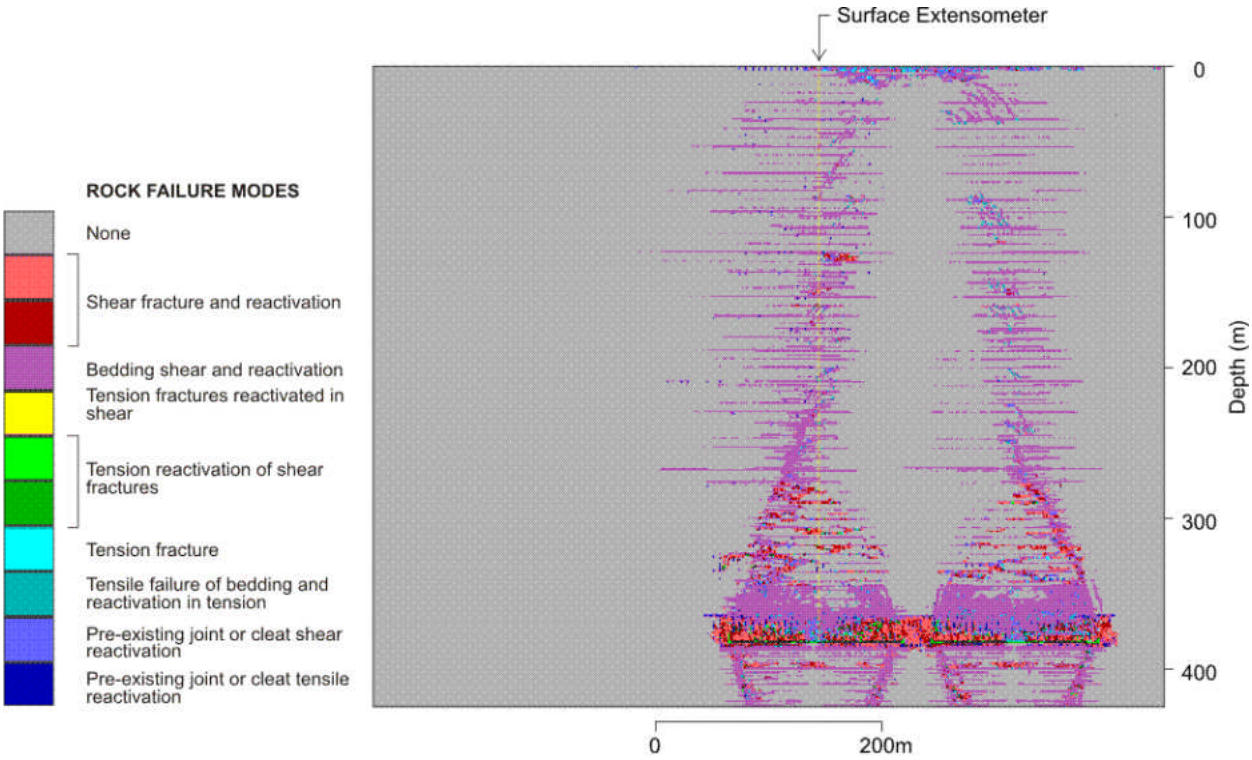


Figure 7 Modelled Fracture Patterns above Ellalong Longwalls 1 and 2

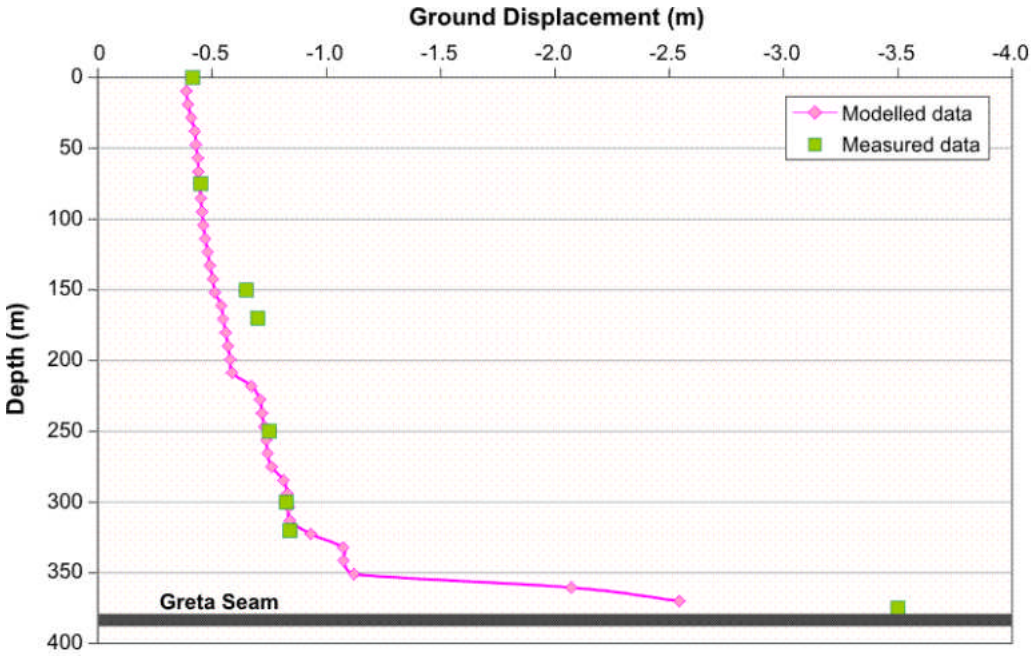


Figure 8 **Modelled vs Actual Extensometer Data above Ellalong Longwall 2**

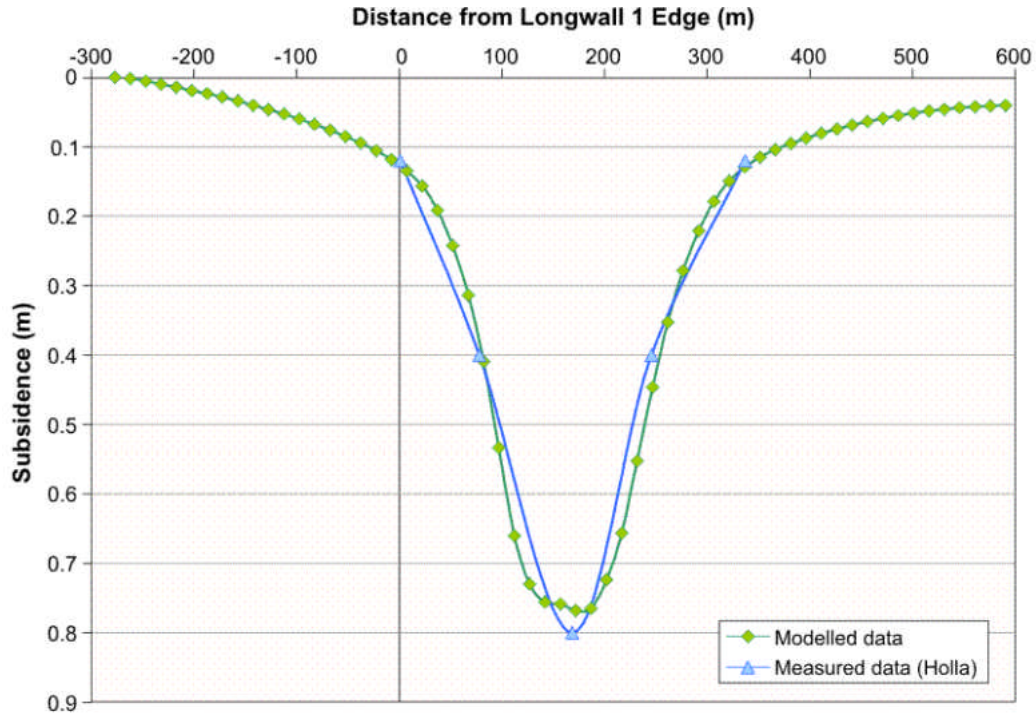


Figure 9 **Modelled vs Actual Subsidence Data above Ellalong Longwall 2**

This back analysis clearly confirms the model accurately predicted subsidence and strata behaviour for this case, and indicates its capability for predictions at a greenfields site such as W2CP.

5.1.5 Impact of Mining Induced Fracturing

Numerical modelling has been used to assess the mining induced fracturing that would result from various longwall extraction options for the W2CP.

Having firstly been validated through back analysis of data from other sites, the model was loaded with the geological and geotechnical data from the W2CP and then run on a series of longwall layouts and for a number of extraction heights.

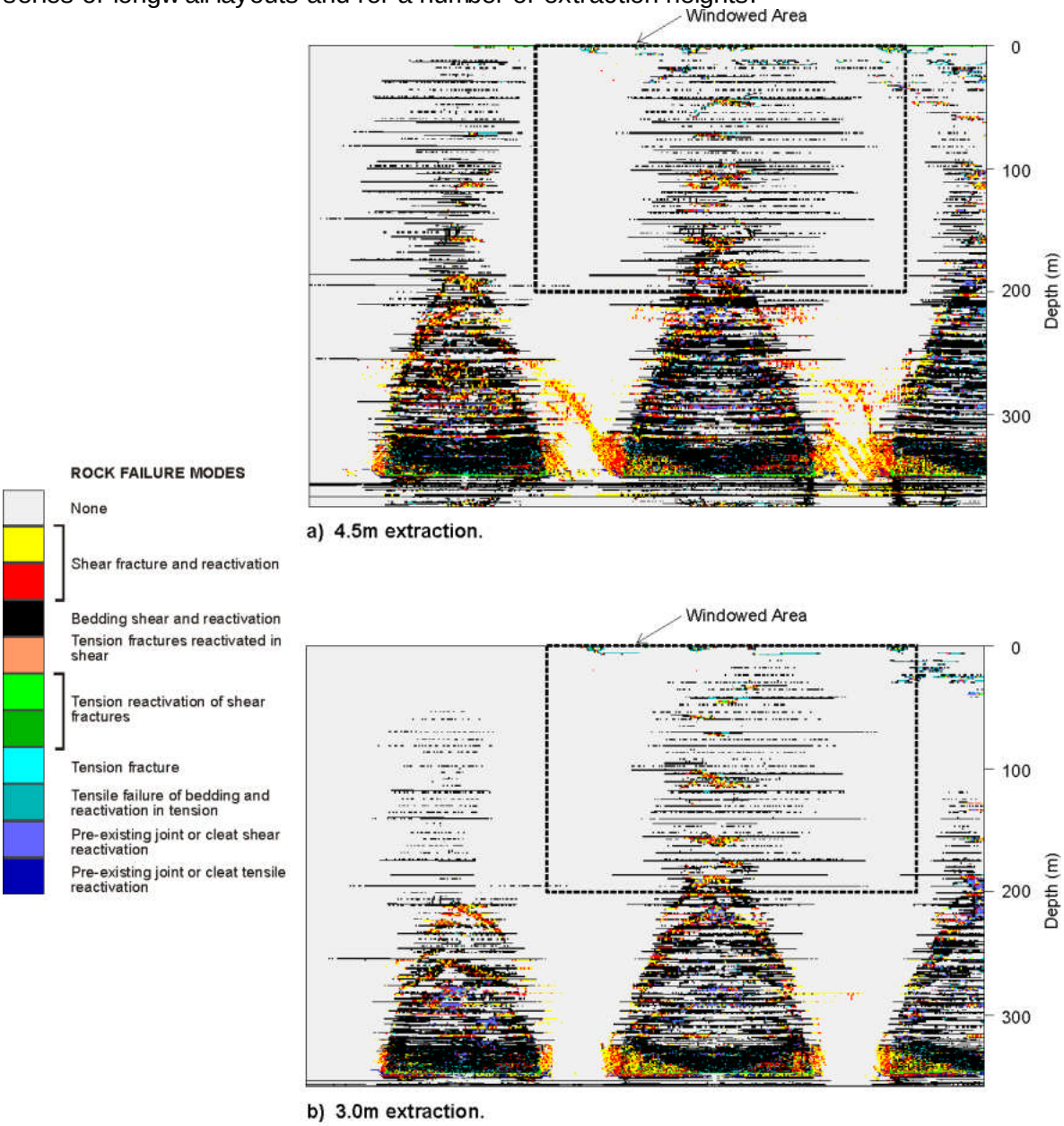


Figure 10 Fracture Distribution for 3m and 4.5m Extraction Case

This diagram shows how the height of caving and mining induced fracturing increases with the height of extraction. It also shows that the fracture systems are broadly confined to areas above each goaf rather than above the chain pillars

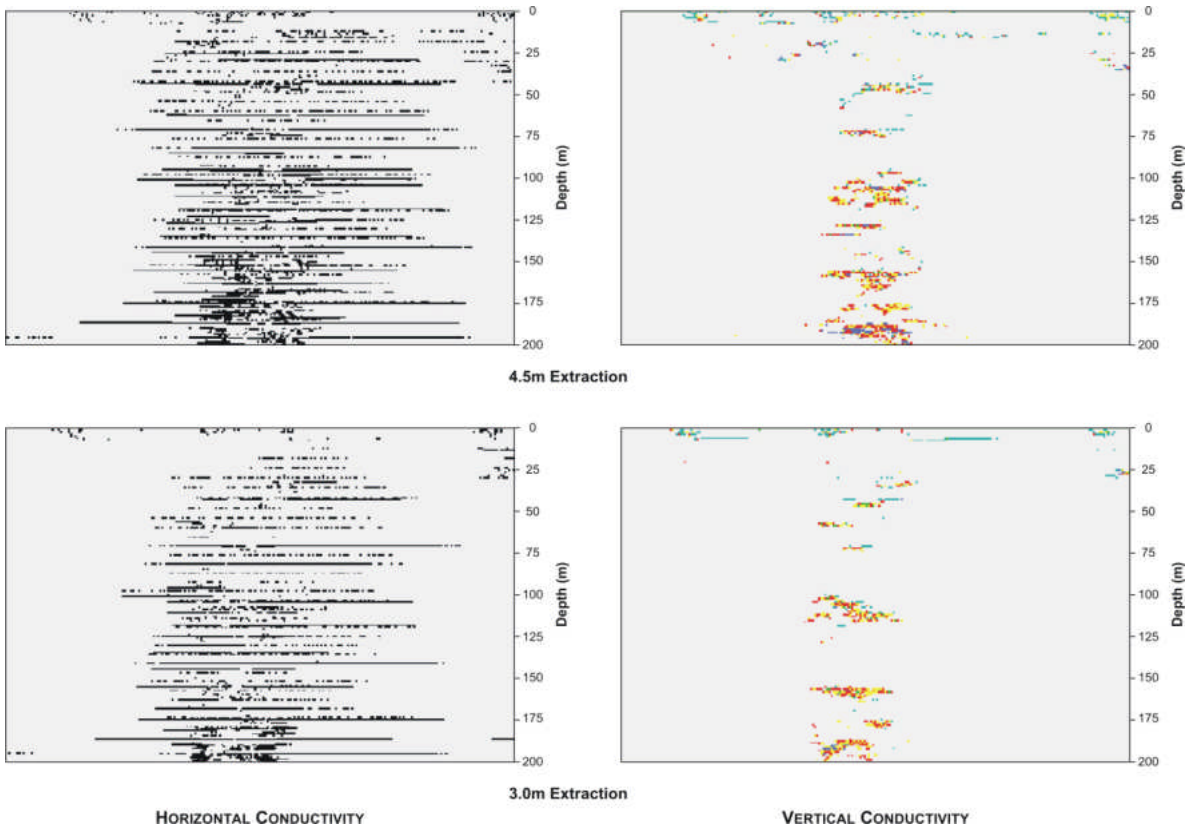


Figure 11 Horizontal and Vertical Conductivities

These diagrams show the zones of horizontal and vertical fracturing in the upper 200m of the strata. This zoning clearly indicates that there are no continuous pathways by which water can flow from the surface to the mine workings.

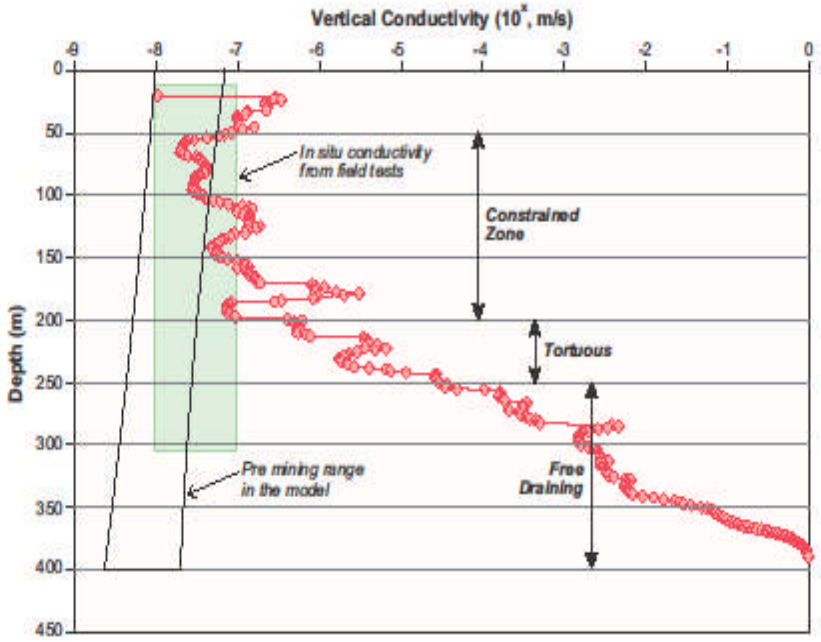


Figure 12 Vertical Conductivity Profile for Valley Case

This diagram shows that vertical water flow is constrained in the upper 200m, then able to flow in a tortuous manner until it reaches the free draining zone in the 150m or so immediately above the goaf.

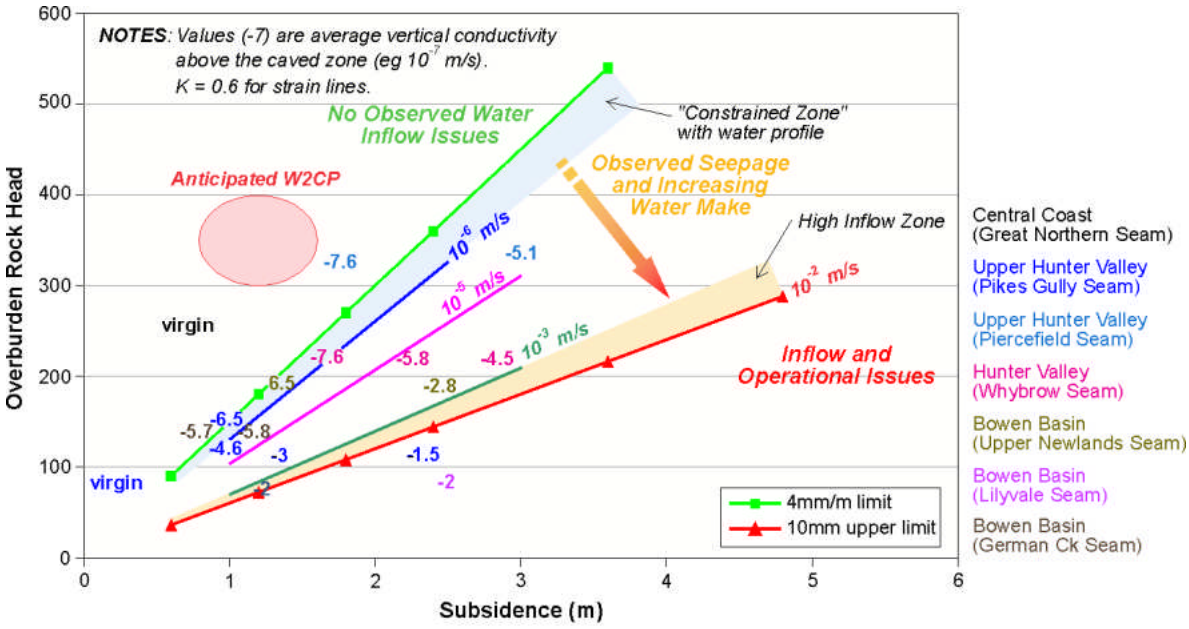


Figure 13 Average Overburden Conductivity Characteristics Relative to Subsidence and Depth Criteria (after ACARP Project C13013)

Results from recent research (ACARP Project C13013) reinforce the concept that water inflow from surface to workings is a function of overburden thickness and magnitude of subsidence (as controlled by appropriate planning of longwall panel widths, pillar widths and extraction height). It further indicates that water inflow is likely when surface strains exceed 10mm/m, with no recorded cases when surface strains are less then 4mm/m.

The anticipated subsidence/depth range for the W2CP is well beyond any zone where water flow has been observed.

5.2 Groundwater

Groundwater impacts were a common issue raised in individual, NGO and government submissions. The issues raised included general non-specific concerns to very complex questions raised by Wyong Council's consultants and the NSW Office of Water (NOW). The effects on water supply scheme overlapped groundwater concerns as well as surface water issues. The following responses deal firstly with the technical issues raised and then more general issues. The technical responses provided and the additional work undertaken further supports the commitment made by the W2CP that the water supply system will be protected.

5.2.1 Model Design

The numerical model design, calibration and prediction of impacts in the EA has drawn criticism from both NOW and Wyong Council. W2CP believes this criticism is largely based on misinterpretation, or lack of understanding with respect to model processes and limitations.

In addressing the criticism W2CP notes that the principle of parsimony has been applied during the development of the regional groundwater flow model. That is the model has been constructed with simplicity as a foundation and with added complexity where appropriate and where such complexity can be supported by observational data (or precedents). This is universally recognised as standard practice[1].

Central to the design and development of the model has been the conceptualisation of groundwater flow systems in their virgin (un-mined) state, and the changed flow systems likely to be associated with longwall mining operations. With respect to the latter, our experience in other longwall mining areas were key drivers - contrary to the opinion offered by Pells. In particular W2CP has drawn on experiences reported by others throughout the Southern Coalfields, and our team's own experiences in the Upper Hunter and the Western coalfields.

Figures E1 and E6 in Appendix E of the EA (MER 2009) provide a conceptualisation of the expected flow systems. Fundamentally, MER identified three systems – the hardrock strata that dip gently to the southwest, the shallow weathered hardrock and regolith, and the unconsolidated alluvial materials that fill the valleys and coastal plains. The MER

[1] Hill, M,C, and C.R. Tiedeman, 2006. Effective Groundwater Model Calibration

model incorporates the hardrock system and the alluvium system but excludes the shallow weathered hardrock and regolith system largely because it may be perched or unsaturated (no water table), and is subject to localised variability and joint enhancement at a scale that cannot be sensibly included in a regional scale model. The shallow hardrock-regolith system does however, act to transmit moisture to the deeper saturated systems where conditions are more favourable for representation by numerical modelling.

5.2.2 Model Calibration

It is important to note that the W2CP is a greenfield site with the nearest operations at Mandalong some 10 km to the north. There are no underground mines in close proximity to the proposed operations and as such, there are no significant stressors in the groundwater system. Instead the existing flow system can be regarded as a quasi steady state system where observed water table movements occur over a relatively narrow range based on prevailing climate. For example, the water table geometry and elevations in the Dooralong Valley alluvium and the pore pressures in the underlying hardrock system that prevailed 20 years ago are likely to be very similar to elevations and pore pressures that prevail today. Recent measurements of water levels lend support to relatively minor or negligible change in this regard.

Groundwater flow modelling for impact assessment of an underground mine, is based on a well established pathway which comprises:

- ❒ development of a conceptual flow model that considers pre-mining, mining and post mining conditions;
- ❒ representation of the pre-mining conditions by computer simulation using a steady state flow model (if no major stressors pre-date mining);
- ❒ development of a transient flow model which accommodates the mining process in the course of time.

These three stages are considered in the context of W2CP.

5.2.3 Hydrogeological Model

The W2CP conceptual model is based on the geological model prepared by the project geologists and is described in the EA. The stratigraphy is based on more than 260 exploration boreholes which have been wireline logged, cored (more than 50 fully cored holes), and the rock types carefully recorded. This density of exploration boreholes for a new coal mine at the depths envisaged is exceptional and provides a high level of confidence in the geological model.

The conceptual model frames a domain where rainfall has generated a groundwater flow system over the course of geologic time. That flow system is defined by the weathering of hardrock strata and the deposition of unconsolidated alluvial materials within the valleys. Because the hardrock strata are consolidated and exhibit much lower permeabilities than the unconsolidated alluvium, the groundwater flow rates in the hardrock system are much lower than in the alluvial system. As a result, water tables in the hardrock system are higher and hydraulic gradients are steeper when compared to the alluvial lands. Hence groundwater is able to flow from elevated hardrock areas (mainly Terrigal Formation in the project area) through the strata to emerge near the

valley floors and beneath the valley alluvium. An 'overprinted' flow system while not observed or measured, is also assumed to prevail in some parts of the elevated Terrigal Formation (hilly terrain) where joints occur and undoubtedly act to conduit shallow localised groundwater flows in a down hill direction. These features and their transmission capacity are related to the unconfined nature of the strata (de-stressing)[2]. Within the alluvium along the valley floors, a more dynamic system prevails. Since the material permeabilities of the alluvium are relatively high, rainfall recharge to these lands is also high. Hence the alluvial system is more 'active' than the hardrock system. This conceptual model is generally undisputed by the stakeholders.

The stratigraphic succession on which the conceptual model is based, is represented as Figure 14. Elements of this succession are described in the EA but in order to more fully illustrate the nature of the different formations, MER prepared a number of lithological logs pertaining to a number of exploration boreholes within the project area (Figure 15). These logs highlight the relatively low permeability strata including laminites, claystones, shales and finely bedded strata dominated by claystones (in orange), from conglomerates, sandstones and siltstones (in blue). They also illustrate the variability in lithologies and the relatively high frequency of claystones and shales within the Tuggerah formation, the Munmorah conglomerate and the Dooralong Shale, than might otherwise be conveyed from Figure 14. The frequent occurrence of these claystone layers which are essentially impermeable in their undisturbed state, will necessarily inhibit groundwater flow across them.

5.2.4 Model Assembly and Steady State Calibration

The key elements of the steady state (pre-mining) model are the strata geometry, the strata permeabilities, the rainfall distribution, and the surface drainage systems distributed throughout the model domain. Storage properties (elastic and inelastic) do not play a role in this model.

Strata geometry: In creating a simplified flow model MER has adopted the stratigraphic boundaries illustrated in Figure 14 and interpolated these boundaries regionally using the extensive W2CP geological database. Specific formations have then been further subdivided for modelling purposes in order to improve the representation of calculated pore pressures in the vertical direction (see Table E2 in Appendix B, MER 2009).

Strata permeabilities: In order to generate representative permeabilities for each formation in both the horizontal and vertical directions (required for modelling), MER has condensed the regionally logged lithologies and their assigned permeabilities, into representative model layer permeabilities using established formulae[3]. The assigned permeabilities have been informed by core and packer tests obtaining to numerous exploration boreholes (see below for permeability discussion). Fundamental to this assignment is the assumption that the deep (hardrock) groundwater flow system is dominated by matrix permeabilities; fracture flow is considered to have negligible influence except in parts of the exposed Terrigal strata (hilly terrain in the project area). Packer testing and extensive core inspections together with opinions provided by the project geologist and geotechnical engineer support these assumptions.

[2] Based on stress relief that has evolved from weathering to the current landform
[3] Freeze & Cherry page 34

Rainfall: The applied rainfall distribution across the model is entirely a function of the calibration process. That is, rainfall was adjusted in the model until the calculated water table elevation at a number of monitoring bore locations, generally agreed with the measured water table elevation. In this regard it is important to stress that the model is founded on measured strata permeabilities and as such, model permeabilities were not adjusted to some alternate value during the calibration process.

The results of the steady state calibration are provided in the EA in the form of a predicted regional water table and a comparison scatter plot for calculated versus measured head conditions (Appendix B Figure E7, MER 2009). A normalised root mean square error of 7.4% was determined for the calibration. This value is generally considered to be acceptable but it could have been improved (reduced) simply by adjusting rainfall at a localised scale throughout the model. However, to do so would have involved additional speculation relating to rainfall recharge.

MER note that with the exception of layer 1, uniform permeability values apply to each model layer. This reflects the parsimonious approach to model development. The suitability of adopting uniform hardock layer properties has been tested by considering 3 type holes where both vertical and horizontal permeabilities were calculated using the lithofacies *look up table* approach. The results are reflected in Figure E3 of Appendix E (MER 2009) which clearly demonstrates that differences in the upper and lower bounds of the permeability profiles are not great. Model permeabilities for the different formations were assigned on the basis of the mean of these 3 boreholes assuming a log normal distribution. Here it is important to distinguish the effects of horizontal and vertical permeabilities on this flow domain. Horizontal flows within a stratigraphic section (e.g. Tuggerah Formation) are governed by the higher permeability strata like conglomerates and sandstones while vertical flows are constrained by the lower permeability strata like claystones.

Importantly, the look-up table has used a moderately low permeability for claystones which is more consistent with a siltstone lithofacies. The reason for this rests with the difficulty in physically testing for the permeability of claystones (using core); failure of the core is common due to the finely bedded nature of the facies and the long time frame that the core has been exposed to drying in the W2CP core shed. Hence the look-up table used in generating representative model (layer) permeabilities has a higher value for claystones than is likely to be the case. It is an inbuilt conservatism.

5.2.5 Transient State Calibration

Transient calibration of the groundwater model has not been undertaken. Normally a transient calibration is conducted in order to confirm or improve the steady state calibration through the adjustment of model parameters that influence the flow domain. However, in order to undertake such a calibration in a meaningful way, there needs to be significant stressors in the system like sustained pumping in the hardrock system or other mining operations that may have generated measurable changes in the water table or the hardrock strata pore pressures. Since the project area is a greenfield location without significant stressors in the hardrock system, the exercise is meaningless.

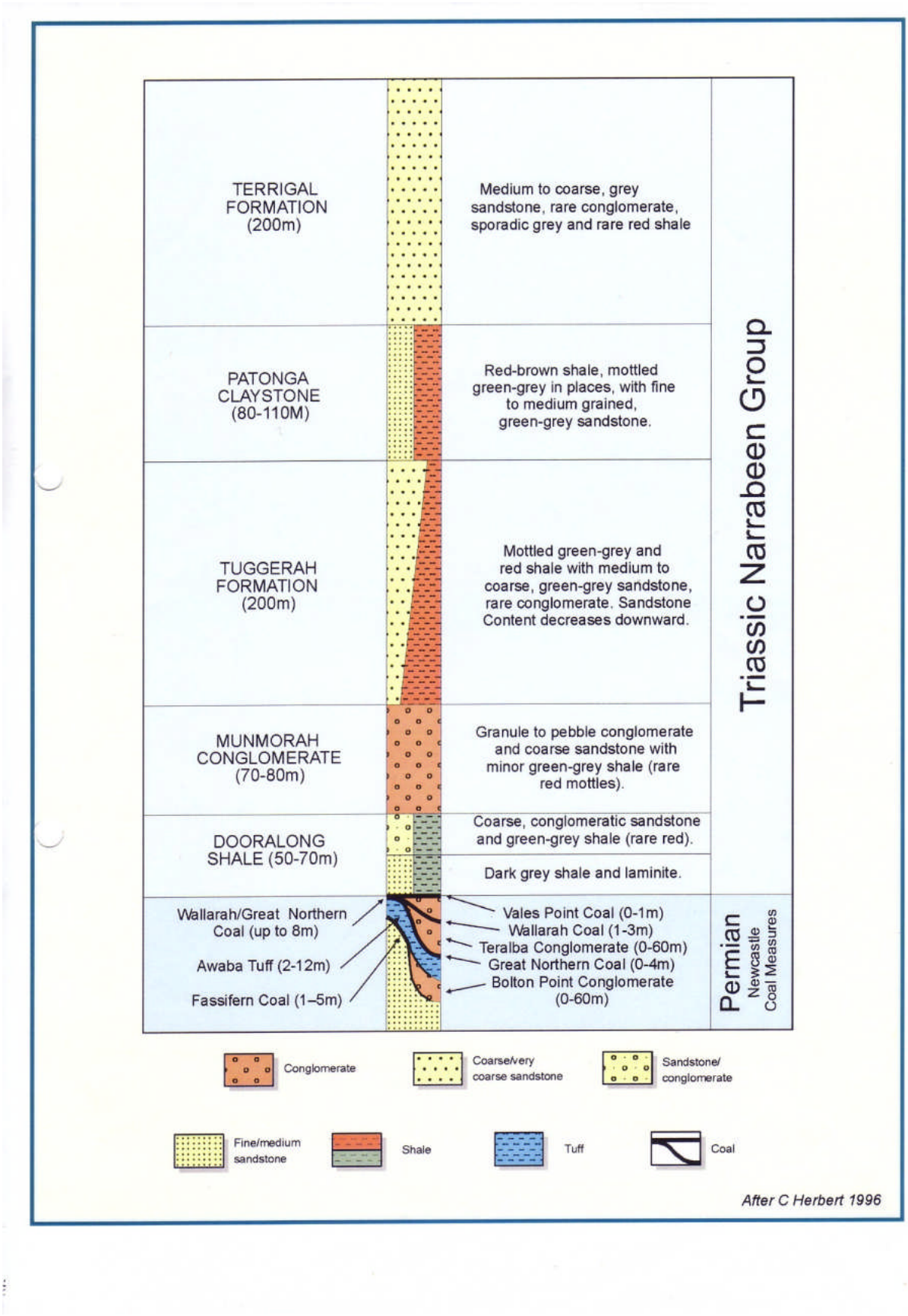


Figure 14 Generalised Stratigraphic Section

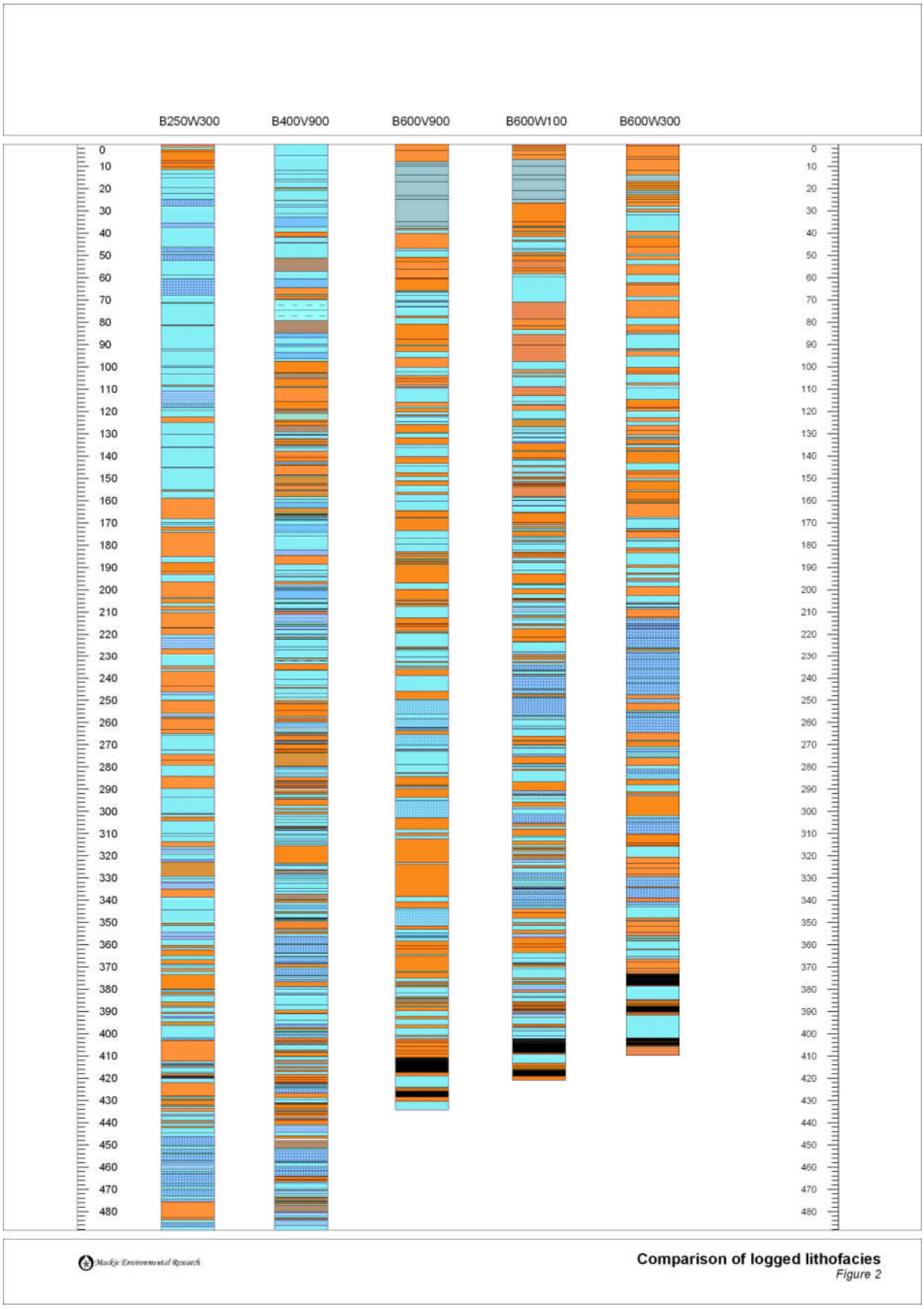


Figure 15 Comparison of Geological Logs – Low Permeability Claystones highlighted in orange

5.2.6 Overview of Key Elements of the Model

The regional groundwater model has been used as a tool to resolve two key issues:

- the pore pressure changes induced by longwall mining and whether these changes invoke unacceptable leakage from the shallow alluvial and hardrock groundwater systems;

- the likely mine water seepage (and water management issues) arising from the above.

Outcomes for both issues are dependent upon the hydraulic properties of the strata and the changes in those properties that might occur as a result of mining. Changes in properties relate to the evolution of a crack-fracture network that promotes accelerated drainage and depressurisation of the rock head. Characteristics of that regime are illustrated in Figure 16 below and include a caved goaf zone, a highly connected fracture zone, a disconnected crack regime or constrained zone, and a surface zone as described in the EA. The disconnected zone is characterised by bedding shear and parting (diminishing with height), has infrequent fracture connectivity and is expected to exhibit relatively poor draining characteristics.

The identified zones are consistent with findings at other mine sites on the Central Coast[4] and in the southern coalfield and elsewhere.

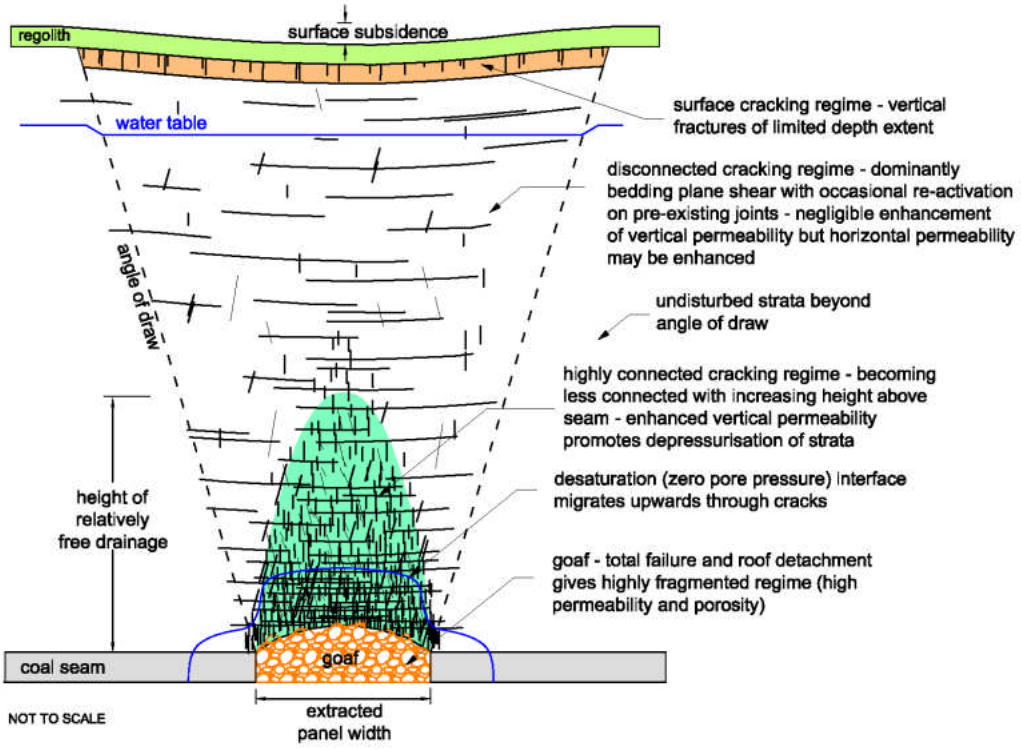


Figure 16 Subsidence failure regime

[4] see Forster, I, B. 1995. Impact of underground mining on the hydrogeological regime, Central Coast NSW. *AGS, 1995*

In defining the enhanced drainage zones (Figure 16) within the groundwater model, MER has relied upon the prediction of fracturing within the subsidence zone generated by Strata Control Technologies (SCT)[5]. MER has assumed that groundwater will not migrate downwards through strata at an accelerated rate unless this fracture network exhibits connectivity. That is, horizontal fracturing has to connect with vertical fracturing which then has to connect with horizontal fracturing at a greater depth and so on. The flow rate through this fracture pathway is governed by the density of connected fractures and the apertures. Where widespread connectivity prevails, the strata are assumed to have the potential to 'free drain' downwards under the influence of gravity.

SCT modelling for a coal seam extraction height of 4.5 m supports connected (vertical to horizontal) fracturing extending to a height of 150 to 200 m above the coal seam[6] (diminishing connectivity with height). Negligible vertical connectivity is predicted above 220 m. Hence the constrained zone is considered to prevail above 220 m. Figure 17 below illustrates SCT model output where horizontal and vertical fractures have identified by colours according to the type of failure.

Within the constrained zone the potential for vertical leakage from the shallow alluvial groundwater system is governed by the vertical permeability of the strata which in turn is governed by the undisturbed permeability of the claystone layers. In determining the undisturbed permeability of claystone(s) MER has been conservative in adopting a value that is more consistent with measured values for siltstone or fine grained sandstone (see below).

In the southern coalfields where mining depths are comparable to proposed depths at W2CP, there is increasing evidence that the constrained zone characteristics are identified at heights of just 60m to 80m above the coal seam where the presence of a claystone bed (Stanwell Park Claystone) appears to act as a partial barrier to groundwater flow. A shallower claystone known as the Bald Hill Claystone also retards pore pressure losses at heights of 200 m above the mined seam.

Irrespective of conditions in the Southern Coalfield, the constrained zone in the SCT model is comprised of Patonga Claystone in the uppermost part underlain by Tuggerah Formation strata. In the Dooralong Valley this zone is calculated to be of the order of 120 to +170 m thick beneath areas hosting alluvium. In elevated areas, the thickness rapidly increases to 300 m or more.

The rate of vertical leakage through the constrained zone can be simply approximated from Darcy's Law assuming the alluvium acts as a constant source of water. Hence if a mixed sequence of claystones, siltstones and sandstones has an equivalent (bulk) vertical permeability in the range 1E-06 m/day to say 5E-06 m/day which is typical of the sections shown on Figure 15, and the total thickness is greater than 100m, then the vertical leakage rate will be of the order of 1 to about 6 ml/day per square metre of land surface. As stated in the EA, any downwards leakage from the alluvium will be sourced from groundwater storage within the alluvium which in turn is sustained by

[5] see Appendix A of the EA
[6] Figure 2.25 of the Subsidence Impact Assessment

rainfall recharge. For estimation of impacts on the stored alluvium groundwaters MER assumed an average long term rainfall recharge rate of 4% of mean annual rainfall or the equivalent of about 130 ml/day per square metre of land surface, in the MER calculations. This is believed to be a very conservative estimate of recharge in the absence of measured water table responses to rainfall events, but it is much greater than the predicted leakage induced by mining (at least 20 times higher). MER calculate about 9.2 km^2 of alluvial lands overlying the mine footprint (longwalls and development), yielding a total leakage rate over this area of about 27 kL/day based on an average 3 $ml/day/m^2$ leakage through the constrained zone.

5.2.7 Sensitivity Analyses – Regional Groundwater Systems

Sensitivity analyses are often conducted in order to establish model parameters which are most sensitive in generating change in model outcomes. Here it is important to define 'outcomes' since a multitude of sensitivity calculations could be conducted for no sensible purpose. MER consider the most important part of the model to be the constrained zone as described above, and the potential for downwards leakage from the alluvial lands through this zone. As noted, this leakage is governed by the vertical permeability of these strata.

In order to assess sensitivity MER has not employed the groundwater model but taken a more direct and simplified approach. MER has reviewed the logged lithofacies in 14 exploration bores (locations shown on Figure 18) and generated equivalent 'bulk' vertical permeabilities for the Patonga Claystone and the Tuggerah Formation based on expected permeabilities for separate lithofacies using an updated look-up table, and established formulae[7].

[7] see Freeze, R.A. And J.A. Cherry, 1979. Groundwater. Prentice Hall

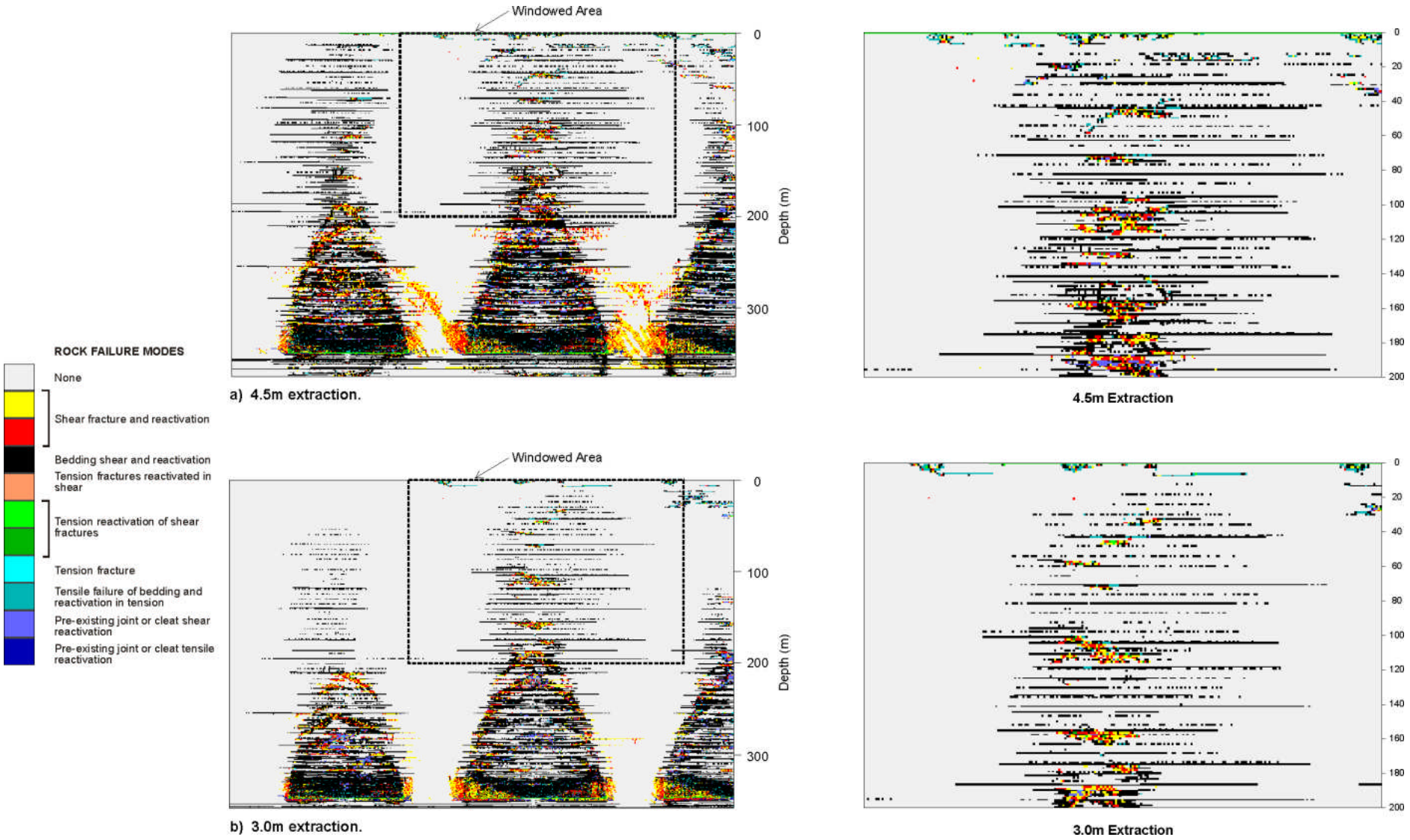


Figure 17 SCT predicted cracking within the subsidence zone (left) and windowed areas (right)

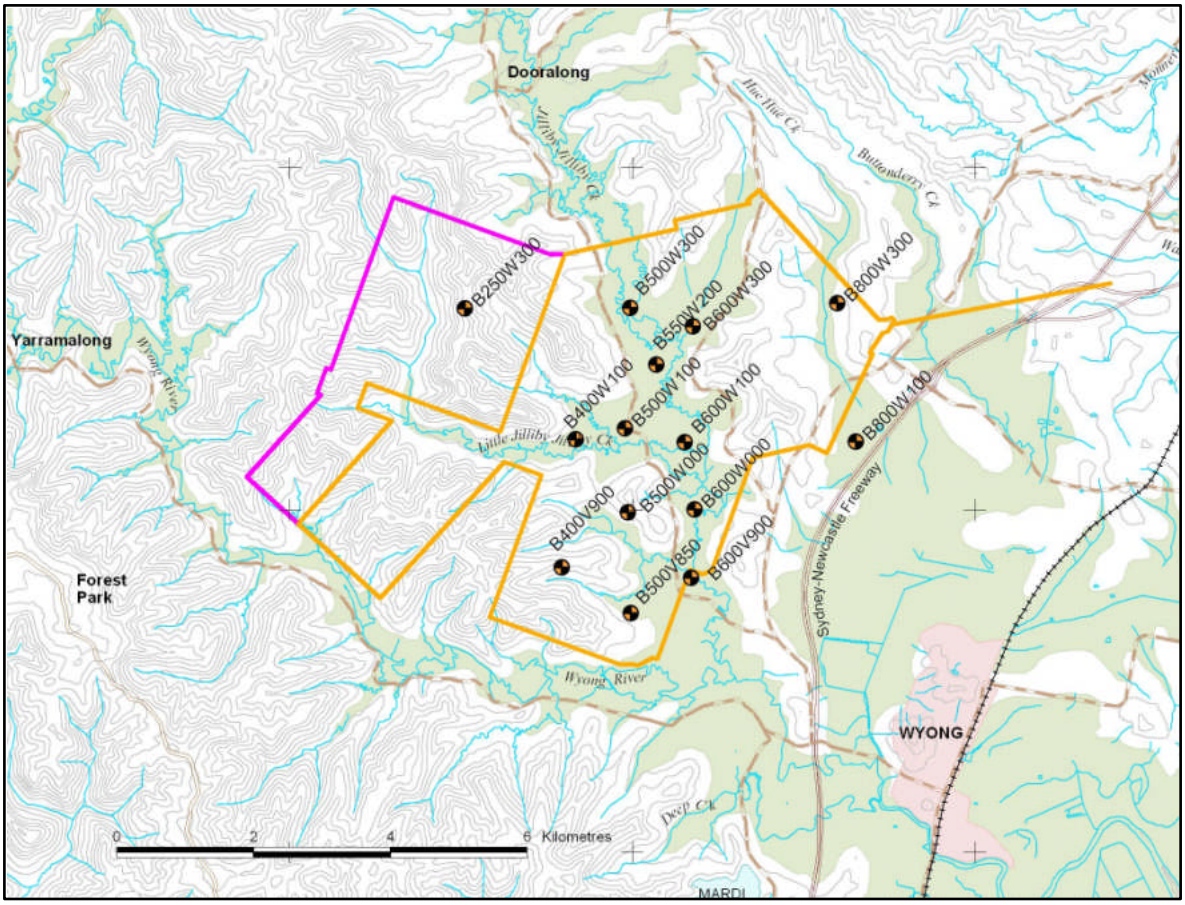


Figure 18 Locations of Boreholes Used to Assess Sensitivity of Vertical Permeability

MER is confident that undisturbed claystones in the region exhibit a permeability lower than 5E-07 m/day since testing of coarser grained rock core (siltstones and sandstones) has already indicated permeabilities of this magnitude or lower. MER has also conducted additional permeability testing on core taken from boreholes beneath the alluvial lands. Results are discussed in Section 3.2.10 below and suggest the adoption of a claystone permeability value of 5.0E-07 m/day is indeed very conservative.

The calculated horizontal (Kh) and vertical (Kv) permeabilities[8] for undisturbed strata using 14 borehole logs, are provided in Table 5 as the 'base case'. These values differ slightly from values used in the groundwater model due to the increased number of boreholes used to generate estimates.

For sensitivity analyses MER has multiplied all non claystone strata in the look up table by factors of 10 and 50 and recalculated the equivalent horizontal and vertical bulk values of permeability. Results clearly demonstrate an increase in horizontal permeability while the vertical permeability increases slightly. This suggests that any errors in sampling and measurement of the permeabilities of strata that are more permeable than claystone, will have minimal effect on the vertical permeability (and potential vertical leakage) within the constrained zone.

[8] calculated mean of 14 boreholes assumes a log normal distribution

For completeness increasing the claystone permeability five fold while leaving all other lithofacies unchanged, increases the vertical permeability significantly but leaves the horizontal permeability relatively unchanged.

The main conclusion drawn from these analyses is that the claystone permeability is the key determinant in vertical leakage through the constrained zone and since claystones are widespread, vertical leakage is predicted to be very low.

Table 5. Calculated Horizontal and Vertical Bulk Permeabilities from 14 Boreholes

	Patonga Claystone		Tuggerah Formation	
	Kh m/day	Kz m/day	Kh m/day	Kz m/day
EA model (3 boreholes)	1.8E-05	3.8E-06	3.1E-05	1.5E-06
Base case Kh and Kv (14 boreholes)	2.2E-05	1.3E-06	2.1E-05	1.4E-06
Analysis with x10 Kh, no change in Kv	2.1E-04	2.0E-06	2.2E-04	1.4E-06
Analysis with x50 Kh, no change in Kv	1.0E-03	2.6E-06	1.1E-03	1.4E-06
Analysis with x5 Kv, no change in Kh	2.6E-05	4.0E-06	2.3E-05	4.7E-06

Kh = horizontal permeability, Kv = vertical permeability

5.2.8 Effect of Disconnected Horizontal Fractures in the Constrained Zone

While not included in the reported groundwater modelling (MER 2009), MER has also undertaken additional model simulations that include up to 100 fold increase in horizontal permeability (Kh) over extracted longwall panels in the constrained zone layers 2 to 7 in order to approximate potential changes induced by bed separations. MER note that this is a conservative approach since close inspection of SCT predicted horizontal bed separations (Figure 17 above) shows that such zones are commonly discontinuous (no enhancement).

Layers 8 to 12 remain as reported (MER, 2009) and effectively free drain to zero pore pressure (unsaturated) following panel extraction.

Drawdown plots at the end of mining for the base case (MER, 2009) and the case of increased horizontal permeability, are provided as Figure 19 and Figure 20. Comparison of responses indicates negligible difference in the alluvial lands but there is an increased loss of pore pressure (drawdown) in deeper layers of the constrained zone. Calculated mine seepage rates and stream baseflows remain essentially unchanged.

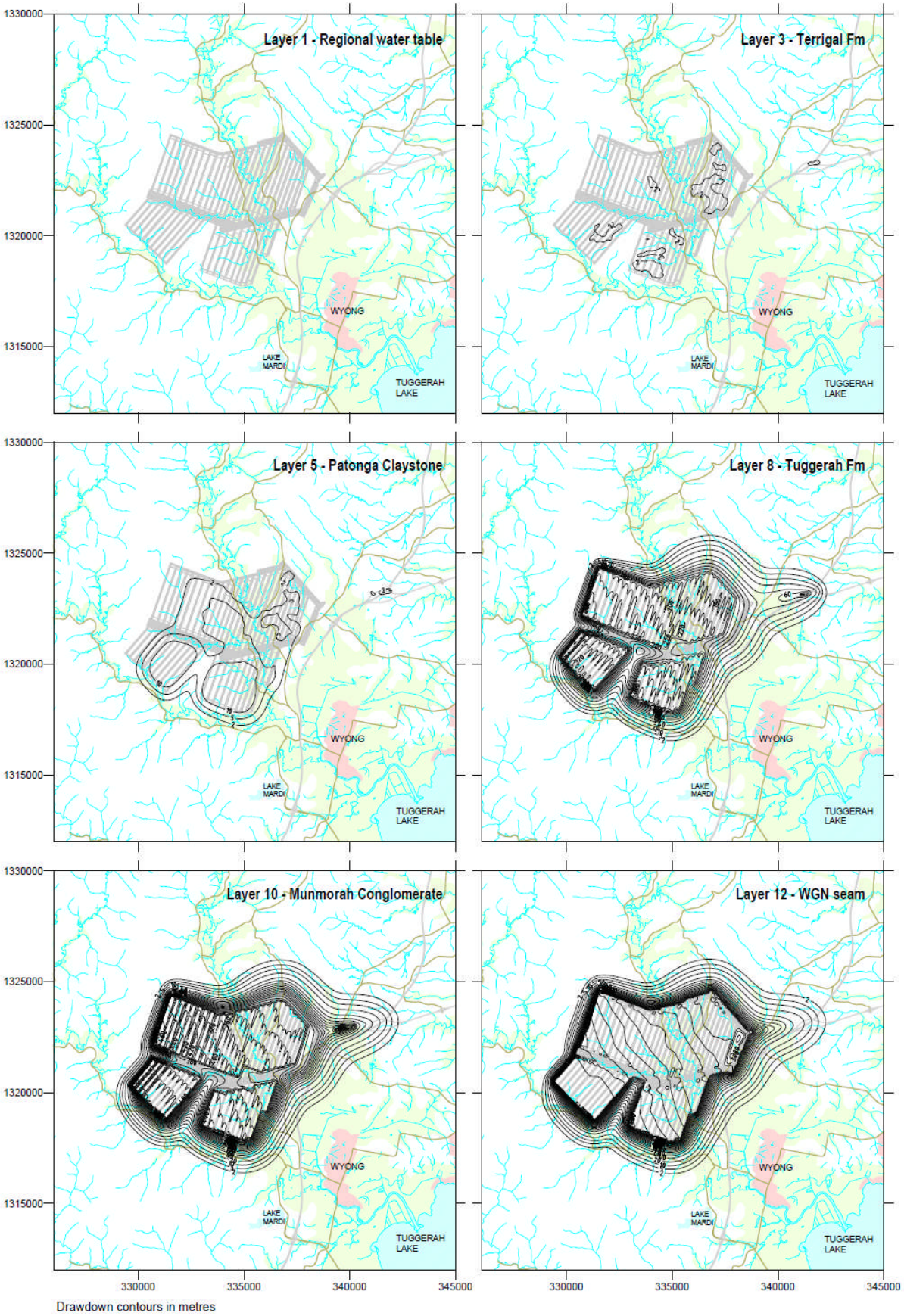
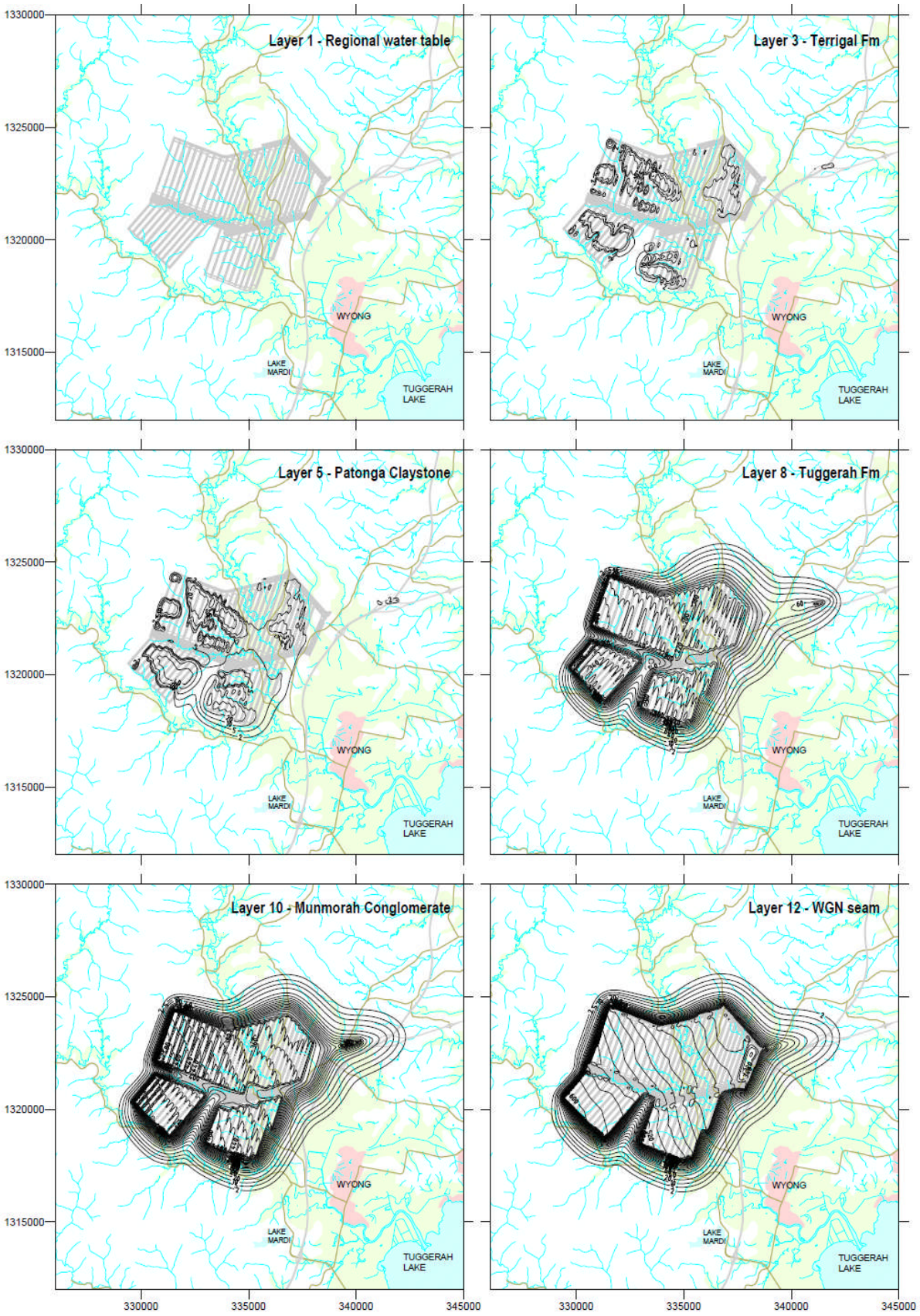


Figure 19 Model W1:Piezometric Drawdown During Panel Extraction Year 38



Drawdown contours in metres
Layers 2 to 7 in the constrained zone have Kh x 100

Figure 20 Model W2: Piezometric Drawdown at Year 38 with Kh x 100

5.2.9 Sensitivity Analyses – Generic Model Of The Alluvial Systems

In considering the likely impacts of subsidence on the alluvial system MER undertook generic modelling (Appendix F of the MER report contained in the EA) which incorporated a sensitivity analysis by adopting a range of permeabilities from 0.1 to 5 m/day for the alluvial aquifers. We believe our calculations are conservative.

5.2.10 Strata Permeabilities for Impact Assessments

Hardrock permeabilities for W2CP groundwater flow modelling assessments have been derived by two widely accepted methods – packer tests and core tests.

Coffey Partners International (CPI) conducted packer injection testing prior to MER involvement in the W2CP project. Those tests were conducted during the exploration drilling program and comprised 171 tests at 31 bore locations. Inspection of individual test results by MER and discussions with the operator in charge at the time, revealed that on many occasions the capacity of the test equipment was exceeded. That is to say the strata test section permeability was so low that the water injection rate could not be accurately measured. Strata dilation and/or leakage around the packer assembly may also have occurred on a number of occasions. MER note that many of the calculated values are therefore generally representative of an upper bound since no sensible strata injection rate could be determined.

In addition, the packer test method only provides an estimate of the horizontal permeability and does not focus on a particular lithofacies like core tests do. Rather an interval of the borehole is isolated and injection preferentially occurs to the section offering the highest permeability (or to a fracture). Accordingly, the lowest permeability can never be determined by this method unless the test section is uniformly low. Examination of CPI test intervals reveals a range from 3 m to 200 m with 92% of the tests being conducted at intervals greater than 5 m, and 67% being conducted over test intervals greater than 10m. Inspection of typical bore lithologies (see Figure 15) clearly illustrates that lithofacies commonly vary from claystones-siltstones to sandstones over this range. Indeed inspection of core samples supports lithofacies change over intervals often less than 0.1 m. Consequently, packer test results should be carefully considered but not over weighted in the determination of 'representative' strata permeabilities.

Core permeabilities have been determined for selected lithofacies. Here the goal has been to establish a representative range of values that could be applied to the geologically logged intervals at exploration bore sites using a look up table. This procedure has been employed by MER at many coal mines throughout the Upper Hunter region and at Ulan near Mudgee. Importantly, this approach can be used to generate estimates of both vertical and horizontal permeability for groundwater modelling purposes.

Additional core testing has been undertaken for samples obtained from boreholes located beneath the alluvial lands associated with Jilliby Jilliby Creek. Depths of sampling were generally within the first 100 m and included the Patonga Claystone and the underlying Tuggerah Formation. These results have been combined with the EA reported results and are summarised on the following histograms in Figure 21.

Fine grained siltstones fall in the range 1E-7 to 1E-6 m/day; claystones would be expected to exhibit a lower range.

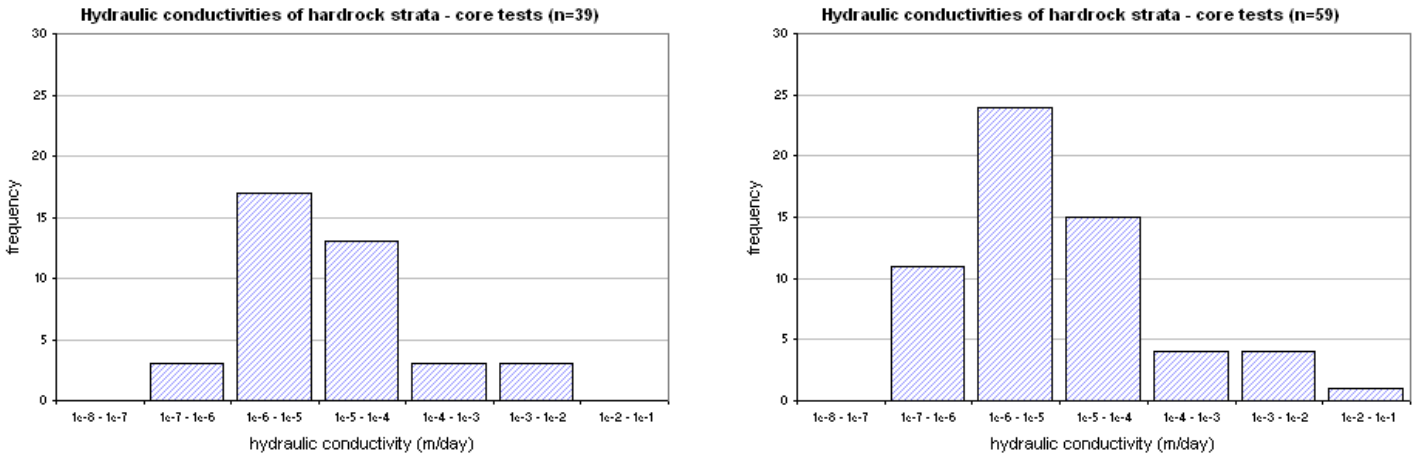


Figure 21 Histograms for Core Permeability Tests - EA (left) and updated (right) distributions

5.2.11 Response to PSM on Packer Tests

PSM questions the applicability of the method MER used to establish representative permeabilities for the different geological formations, claiming that MER failed to consider the results of CPI packer tests described above, and packer tests at the nearby Mandalong Colliery.

In response MER note that CPI packer tests were given careful consideration. MER scrutiny established that many tests poorly defined the strata permeability because test injection rates were so low, they could not be measured. Such tests generally support very low strata permeability. On some occasions packer leakage may have occurred.

Packer test results were compared with core test results in the form of histograms in the MER report (see Figure D2 in Appendix D, MER 2009). These histograms are in reasonably close agreement especially since the packer test results are conducted over large sections of a borehole and reflect preferential flow to more permeable strata within the test section. As stated in Section 5.2.1 above, these tests can only provide horizontal permeability estimates, can never identify the lowest permeability in a test section unless the section is uniform, and may act to dilate strata and generate over estimates of permeability.

MER also carefully considered packer tests conducted at Mandalong[9]. Those results supported low horizontal permeabilities of the order of 1.6E-06 to 4.8E-05 m/day (6 of 7 tests conducted in similar strata to W2CP) for composite sections comprising conglomerate, sandstone and siltstone. This range in permeabilities is very similar to or lower than the (horizontal) values MER adopted for the W2CP groundwater model

[9] see Cooranbong Colliery Life Extension Project – Overburden Strata Groundwater Study, Forster et al. 1997

(1.8e-05 to 3.1E-05 m/day)[10] and seems contrary to PSM understanding. Indeed PSM seems to dismiss the well established concept of strata anisotropy which is clearly evident from borehole logs and core tests.

5.2.12 Precedents at Other Coalfields

PSM suggests that MER has not considered studies and impacts of underground mining in other coalfields including the southern and western coalfields, stating 'the studies in the Southern and Western coalfields are in the same stratigraphic environment, in similar rock conditions and at similar depths to the proposed Wallarah 2 longwalls'[11].

MER has a reasonably high level of knowledge of the southern coalfields having been involved in the Southern Coalfields Strategic Inquiry, the Metropolitan Mine Planning Assessment Commission (PAC) and the Bulli Seam Operations PAC. MER also has a high level of knowledge of the Ulan area of the western coalfields together with knowledge of most mining operations in the Upper Hunter region over a period of more than 35 years. Given this expansive knowledge, MER judged the W2CP area to be broadly similar to the southern coalfields in terms of stratigraphy, mining depth, low permeability strata and subsidence predictions. The main differences relate to the significantly increased presence of claystones and the absence of the Hawkesbury Sandstone at W2CP. Given the remaining broad similarities, MER notes that the generally low or negligible groundwater seepage to existing longwall mining operations in the southern coalfield, might reasonably be expected for the W2CP. Similarly, the increased presence of claystones at W2CP might be expected to retard or mitigate pore pressure losses and downwards leakage from shallow strata when compared to the southern coalfields.

With respect to the western coalfields and more specifically the underground operations at Ulan, PSM notes *'Even if the Ulan situation is not a complete analogy for Wallarah ... it would seem reasonable ... to integrate the findings from Ulan into the Wallarah 2 studies'*. Given MER's extensive knowledge base for Ulan, to have equated this operation to the W2CP would have been highly questionable and perhaps unscientific – they are different areas, with contrasting permeability distributions and different mining depths. MER did however employ almost identical analytical and numerical modelling procedures at both Ulan and W2CP since these procedures have proven to be accurate in forecasting impacts of underground mining at Ulan (and elsewhere).

5.2.13 Use of the Modflow-Surfact Model Code

PSM notes[12] *'Mackie have used the computer program, Modflow …. that is not a true three-dimensional model. It attempts to take three-dimensional factors into account through a "smearing" process in vertical, one-dimensional columns'.*

MER employed the Modflow-Surfact code which is an advanced form of the Modflow code that facilitates variably saturated flow analyses. It is in MER's experience, the

[10] Table E1, Appendix E in MER 2009.
[11] PSM Report Appendix A, page 18
[12] PSM Report Appendix A, page 21

most robust code for simulating regional groundwater impacts of longwall mining. Contrary to PSM understanding, it is a 3D numerical representation insofar as flow is accounted for in 3 dimensions with respect to a discrete model block contained within an array of adjacent blocks (the W2CP model contains 1,480,752 such blocks) in the finite difference model mesh. MER do not understand the term 'smearing'[13] unless it refers to averaging of materials properties for the purposes of solving the 3D equations of flow. As with all groundwater models, Modflow-Surfact has been validated against analytical solutions for certain flow problems in order to provide confidence in its usage. MER has also extensively tested the code for conditions associated with longwall mining.

5.2.14 Narrabeen Group as a Fractured Rock System

With respect to MER's considered view that the flow system cannot be characterised as a fracture flow system (at least in strata below the Terrigal Formation), PSM notes that MER's assumptions contradict *'substantial information gathered as part of the enquiry into mining under stored waters conducted in the early 1980s....the most valuable data being that collected by Mr Pat McGregor'*. PSM indicates the data was obtained by inspection of rock exposures in the cliff lines around Sydney by helicopter, boat and on foot, and supports a fracture flow system. Such observations probably reflect an unconfined state which is unlikely to prevail for strata at depth beneath the Dooralong valley.

MER's observations and assessments are based on extensive core inspections conducted on boreholes located within the W2CP rather than inspections of cliffline conditions at locations remote to the project area. More importantly, MER has relied upon advice provided by the project geologist who best understands the strata characteristics and discontinuities including joints, dykes and faults. That advice supports more open jointing in Terrigal Fm strata above the floodplain (de-stressed conditions), and discrete and tight jointing of limited extent in strata below the floodplain (Patonga Claystone, Tuggerah Fm etc.). CPI packer test results also support a low permeability system more consistent with tight joints and matrix flow at depth. These observations are consistent with MER observations in the Southern Coalfields.

PSM also notes '*The Mackie assumption as to the absence of fractures within the bulk of the Narrabeen sequence is also in contradiction to findings of a paper by Cook (2009)'*. MER held discussions with Cook and can confirm that the reported study specifically targeted regional faulting in the Terrigal Fm and that the underlying Patonga Claystone where penetrated, was assessed to have a low potential for water supply.

5.2.15 Disturbed Strata in the Constrained Zone

PSM notes that the MER modelling is based on two assumptions:

- '*that there are no significant joints faults or other defects in the rock mass that transmit water naturally and,*
- *there will be no disturbance to that rock mass as a result of the longwall extraction*'.

[13] PSM Report Appendix A, page 21

PSM further notes that 'neither of these assumptions is justified on the basis of precedent or field measurements. The assumptions that there will be a constrained zone of unaffected permeability more than 220 m above the level of extraction cannot be justified on the basis of the data from the southern coalfields and at Ulan. Furthermore, this assumption is directly contradicted by the calculations given in the MSEC/SCT report'.

In response MER again note that the conceptual model does not provide for hydraulically connected naturally occurring joints, faults or other defects at depth. MER identified the constrained zone as being a zone of disconnected cracking (post subsidence) as shown in Figure 16 and identified in their report (MER 2009) consistent with advice provided by SCT. While horizontal bed separation is predicted in this zone, extensive vertical fracturing which has the potential to connect the horizontal fractures, is not. This is best illustrated in Figure 17 above (plot generated by SCT) and is contrary to PSM understanding. Simple one dimensional calculation using Darcy's Law can demonstrate that it is the strata with the lowest permeability (claystone) that effectively constrains vertical flow for this scenario. Enhancing horizontal permeability does not significantly enhance the capacity for vertical leakage.

The constrained zone defined by SCT modelling has been adopted-tested in the MER groundwater modelling. MER conducted model simulations with no vertical permeability enhancement in the constrained zone because SCT modelling predicts this situation. With respect to discrete horizontal fractures MER has conducted model simulations which include no enhancement of model horizontal permeabilities, and enhancement by up to 2 orders of magnitude based on predicted dilations and fracture permeabilities provided by SCT. Model results (drawdowns and leakage rates) with respect to alluvial lands are almost identical for these simulations (Figure 19 and Figure 20).

5.2.16 Shallow Storage Changes Attributed To Subsidence

PSM raises concern with respect to the MER calculations of impacts on surficial aquifer storage resulting from subsidence. This zone was not included in the MER regional numerical modelling effort due to the localised nature of cracking and the difficulty in representing changed storage conditions (attributed to surficial fractures) in a fully saturated system.

MER observations in the southern coalfields suggest diverted flows are most likely where valley closure effects dominate. There, the combination of tensile and compressive strains, buckling and shear have generated connected cracking regimes in steeply incised Hawkesbury Sandstone terrain which are generally reported to depths of 15 to 20 m (PAC Metropolitan, 2007). Diverted flows in rock lined stream channels have been noted over distances of 10 to perhaps 100 m. There is no convincing evidence of loss of flow from the stream catchments (PAC Metropolitan, 2007) although MER acknowledge that this possibility should not be discounted.

The influence of cracking beneath the alluvial lands has been accounted for in the MER storage impact calculations [14].

5.2.17 Response to NOW

NOW has assessed the MER 2009 report and provided critical overview. The overview is summarised in NOW letter to DoP dated 17/06/10 (NOW reference ER20882). We address the key issues as follows.

NOW contends that MER consideration of baseflow in Jilliby Jilliby Creek contrasts with outcomes generated by CSIRO and NOW. While this aspect of the MER study was conducted to simply understand the likely characteristics of baseflow (for steady state groundwater model outcomes) MER note that the baseflow index was 20%. MER do not have CSIRO and NOW estimates but further note that the index is slightly higher than the baseflow index of 17% reported in SKM (2010). Indeed that report gives a range of 10 to 15% is 'inferred ... from a single estimate of baseflow index provided by the Department of Water and Energy'. MER cannot identify the contrast in indices to which NOW refers.

NOW asserts that the EA has 'failed to assess the potential impacts... in a robust and verifiable manner' in respect of the 'groundwater within the alluvial blanket associated with Jilliby Jilliby Creek and the Wyong River'[15]. MER has employed robust, verifiable and widely used groundwater model code to address the likely impacts on the alluvial lands. That code predicted baseflow losses induced by leakage losses from the alluvial lands of the order of 2.5 ml/day/m^2 (equivalent land surface). Simple one dimensional calculations suggest the range is between 1 and 6 ml/day/m^2 depending upon the adopted permeability of claystone strata. This issue is addressed in Sections 5.2.6 and 5.2.7above.

NOW also asserts that there are 'significant reservations as to the adequacy of the model as it is uncalibrated to its transient and steady-state model outputs and is based on a simplified conceptual framework of groundwater interactions between the alluviums connected to the Wyong River and Jilliby Jilliby Creek'. A discussion on calibration is provided in Sections 5.2.4 and 5.2.5 above.

The EA *'does not provide a sensitivity assessment of model outputs to the model steady state runs, which is inadequate for a sensitive environment ...*'. Sensitivity analyses for steady state simulations could involve extensive modelling effort with no meaningful outcome. Sensitivity calculations were conducted with recourse to numerical modelling - refer to Section 5.2.4above.

NOW considers the predicted water make over the mine life cycle (26500ML) to be highly questionable since the 'influx assumes no contributions from localised fracture storage that might be intercepted ..'[16]. MER cannot predict localised fracture storage that might be encountered at seam depth based on the available information. To confidently predict this would require drilling and testing at intervals as small as 20 m

[14] MER 2009, pages 22-23
[15] NOW letter to DoP dated 17/06/10, page 1
[16] NOW letter to DoP dated 17/06/10, page 6

across the region. A normal industry approach for prediction of abnormal storage is to use in seam horizontal drilling which facilitates gas drainage and dewatering. Based on MER's experience at other locations it was considered prudent that water management systems should provide for 0.5 ML/day for periods of weeks to months, for such encounters[17]. This means that the predicted water make over the mine life could be higher than 26500ML if localised storage enhancement like increased cleating in the coal seam for example, is intercepted.

5.2.18 Response to Other Submissions

Main elements of the public submissions relate to leakage loss of water from the alluvial lands. These issues have been addressed above.

5.3 Water Supply Scheme

The issues of concern raised relate to the potential damage to the region's water supply, through deterioration of the health of the catchments. The W2CP has made a public commitment to only propose a mine plan that will safeguard the surface and related alluvial underground water regimes. The specialists involved in the assessment of the W2CP are confident that this can be achieved.

To achieve this commitment the proposed mine plan:

- will not adversely impact on the yield of the water supply catchment. Subsidence will not measurably increase or decrease the runoff coefficient of the catchment above the mine plan nor individual drainage lines within the mine plan;
- will not reduce the runoff volume contained within surface drainage lines;
- will not adversely impact on near surface aquifers and their water supply functions;
- will not adversely affect water quality within any watercourse above the mine plan; or,
- will not adversely affect riparian vegetation associated with any watercourse above the mine plan.

To further ensure that the project will not adversely affect the functions of the water supply catchment, the W2CP proposal includes a catchment environmental enhancement program designed to improve the water supply catchment. What has become clearly evident during the EA studies is that the current water quality and catchment yield within Jilliby Jilliby Creek is commonly poor. This is also confirmed by Wyong Shire Council monitoring data which highlighted the occurrence of elevated faecal micro-organisms (*E. coli*) in both Jilliby Jilliby Creek and the Wyong River.

[17] MER, 2009 page 21

Should the project receive project approval, a catchment environmental enhancement program will be developed in consultation with the Gosford Wyong Water Supply Authority, Hunter-Central Rivers Catchment Management Authority Department of Environment, Climate Change and Water, and relevant landowners, including:

- a community education program on the methods to improve domestic effluent treatment and onsite disposal. Particular emphasis will be given to reducing the current poor water quality runoff from existing treatment systems;

- access to specialist advice on appropriate land management practice to reduce the current elevated nutrient levels within the creek systems. This is particularly evident in intense agricultural areas within Jilliby Jilliby Creek catchment;

- development and funding of riparian vegetation improvement programs within the Jilliby Jilliby Creek and Little Jilliby Jilliby Creek systems. The programs will be designed specifically to reduce the current weed infestation and bank erosion problems evident in many sections of the creeks. These programs will be developed in close consultation with individual landowners with advice only provided by the Hunter-Central Rivers Catchment Management Authority, Wyong Shire Council and Department of Environment, Climate Change and Water. Landowner privacy will be maintained at all times; and

- assistance with understanding the government's policy and requirements for water rights, water sharing and licensing requirements. This work will be undertaken exclusively with individual landowners without involvement of any government agency. This work will only be undertaken with the cooperation of individual landowners and at no cost to the landowners. Privacy will be maintained and assured.

Despite the development of the W2CP, the Dooralong Valley is under stress from existing land use pressure. As part of the WACJV's commitment to the environment, the aim of the proposed catchment environmental enhancement program is to reduce some of these stresses on the catchment. The success of the program however, will rely predominantly on the cooperation of individual landowners within the valley.

It must be stressed that this program will not diminish the rights of individual landowners nor will confidential information regarding the status or appropriateness of current land management practices be provided to any external government or non-government organisation or individual unless with the consent of the landowner.

5.3.1 Alleged Faulting in Jilliby Jilliby Creek

DECCW and the ACA submission rely heavily on comments in a report prepared by Northern Geoscience for Australian Gas Alliance that "a major geological feature of the Jilliby Creek is that is follows a fault zone" which "provides a significant transient pathway to groundwater movement and discharge" (Tim Jones 2005, p 17). This report was prepared in January 2005 to support the Australian Gas Alliance's opposition to investigations being carried out in the Dooralong Valley by Sydney Gas. An official response to issues raised by the report was prepared by the NSW

Department of Primary Industries for submission to the Minister in March 2005 (Stephen Barry, March 2005).

The Northern Geoscience report has a number of mentions of "faults", "fracture zones" and "crush zones". It also mentions "geophysical evidence" and "geological mapping". Most of these statements are very generalized in nature and non-specific. On page 23 a very specific mention is made that "a major 45° fault separates the sandstone rock units" above the coal seam in a photograph. This photograph is actually a COAL photograph of the Great Northern Seam outcrop at Catherine Hill Bay which was used in a paper presented at the Australian Geological Convention in 2000 (Lindsay and Herbert 2000). The report by Jones erroneously refers to incorrect stratigraphic units and incorrectly claims the existence of a fault which does not exist.

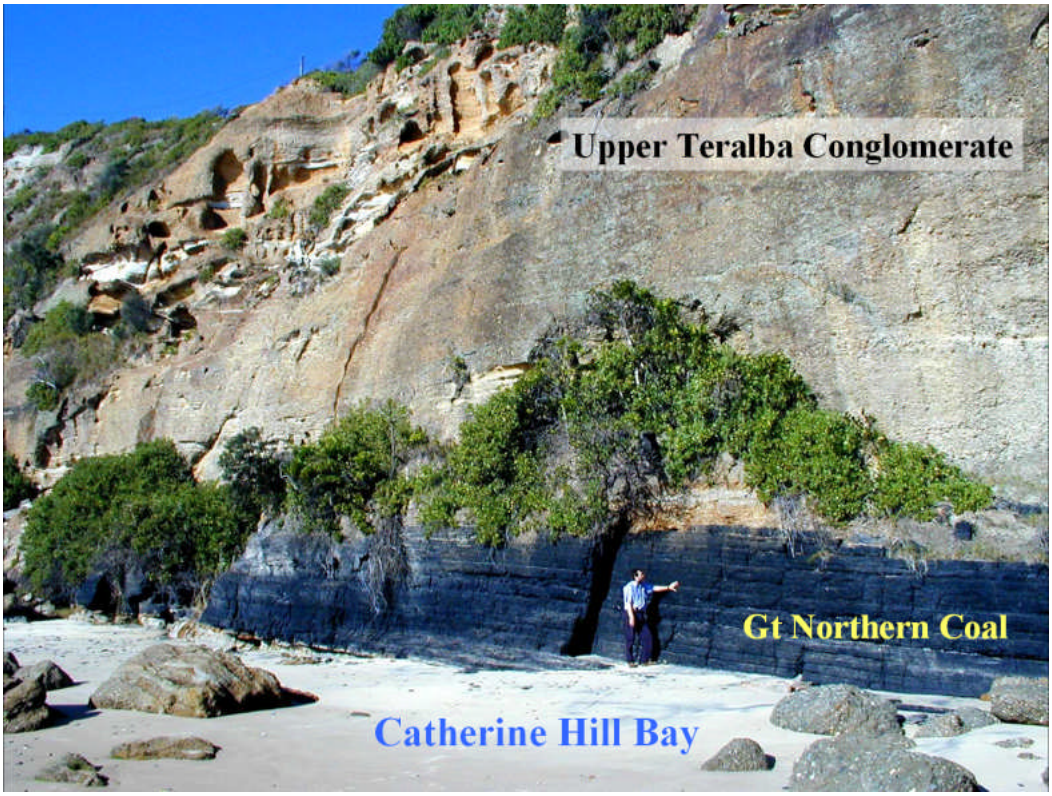


Figure 22 Slide from COAL AGC Presentation 2000 used in Northern Geoscience Report

Unfortunately such generalisations and obvious errors throw doubt on validity of other claims within the report.

Location of Northern Geoscience Alleged Fault

The Northern Geoscience report states that:

> "A major geological feature of Jilliby Jilliby Creek is a fault zone approximately 1.3km west of Mount Alison. The drainage runs along this fault line in almost a direct line south for approximately 1.5km midway along this feature Little Jilliby Creek converges into Jilliby Jilliby Creek. *The whole of the Little Jilliby*

Creek is at right angles from Jilliby Jilliby Creek and is interpreted as a conjugate fault zone."

Northern Geoscience simply states that this fault exists but offers no evidence pointing to its existence.

No official reference can be found to Mount Alison within the Wyong LGA. However, an old topographic map shows a trig station tagged Alison approximately 1.5 km north of the Hue Hue Road and Dickson Road intersection. From the description quoted above the claimed fault is located along a north-south stretch of Jilliby Jilliby Creek to the north and south of its junction with Little Jilliby Creek, as shown on the following figure.

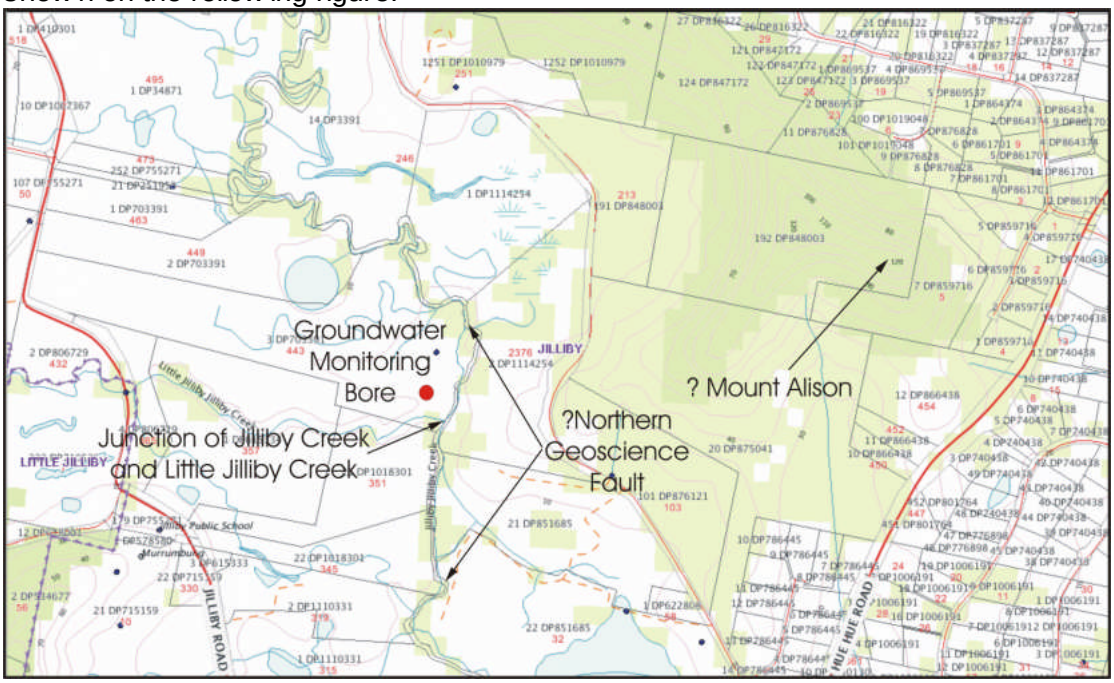


Figure 23 Northern Geosciences' alleged fault at the Jilliby Creek – Little Jilliby Creek confluence

During early 2010 the Wallarah 2 Coal Project installed a ground water monitoring bore approximately 100m west of the stream bed. Bedrock was intersected at a depth of 20 metres. While aerial photographic interpretation of lineaments can indicate the location of faults, such interpretations are only valid in areas of little to no alluvial cover. It is difficult to believe that a fault can be interpreted to exist at this location when the bedrock is covered by such a depth of alluvial fill.

Exploration Evidence for Faulting Along Jilliby Creek

Extensive exploration conducted by COAL in the Dooralong Valley which contains Jilliby Creek between 1996 and 2002 produced no evidence of significant faulting along the valley. A high resolution Mini-SOSIE seismic survey including a number of traverses directly across the valley floor was conducted specifically designed to investigate the possible presence of faulting not able to be identified by vertical boreholes. The location of these traverse lines relative to Jilliby Creek is shown below:

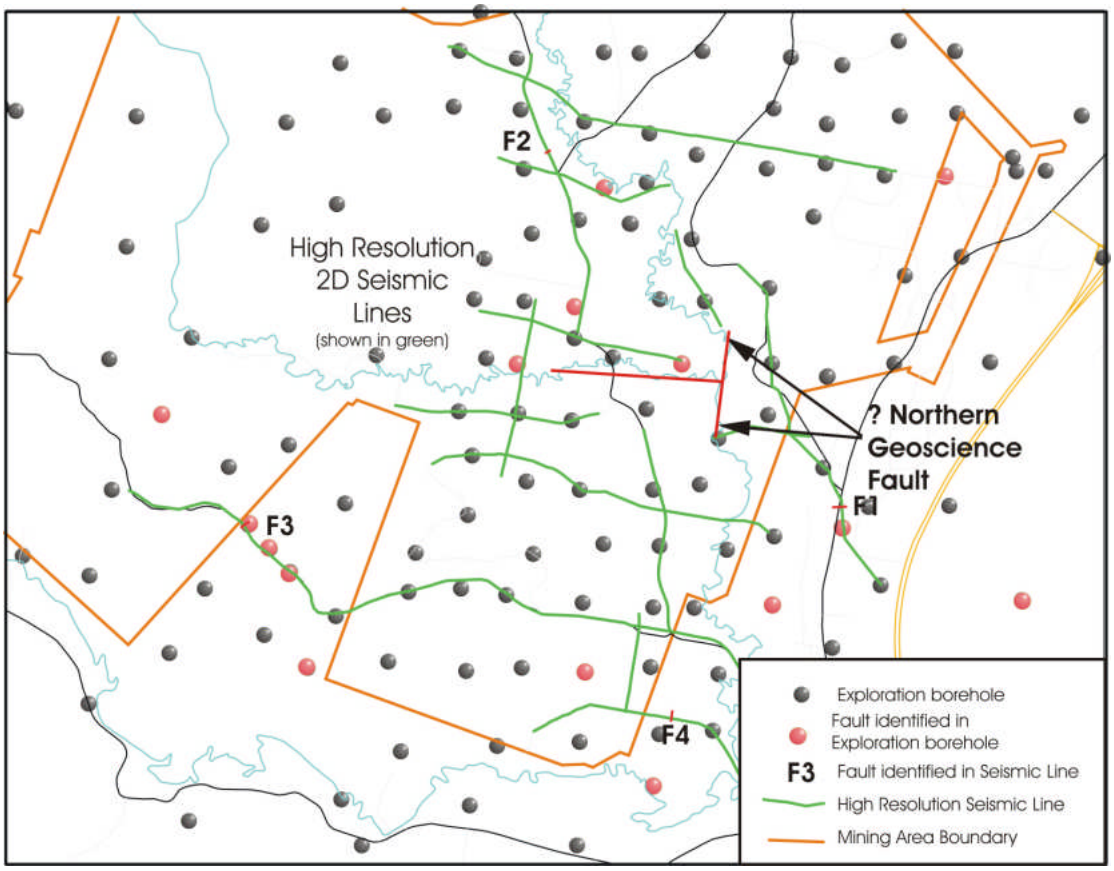


Figure 24 Location of Seismic Lines and Interpreted Structures across Jilliby Creek (Dooralong Valley)

The following is a summary of the interpreted features identified for each E-W line directly from the final interpretation report by Velseis:-

"Line X7

Fault	*S.P*	*X*	*Y*	*Throw*	*Confidence*
F3	*205*	*332247*	*1319642*	*7m*	*High*

In addition to the fault interpreted on this line, borehole data supplied indicated that the seam was intruded in holes B250V950 and B260V930.

The corresponding seismic data between these holes displays a distinct character change in the horizon identified as the roof Wallarah Seam. This character change has been interpreted as a possible sill influencing the seam.

Line X8

Fault	*S.P*	*X*	*Y*	*Throw*	*Confidence*
F4	*250*	*335716*	*1318104*	*4m*	*Low*

Fault F4 has been interpreted with low confidence primarily due to its size. In addition, this structure occurs in close proximity to the Wallarah / Fassifern split line.

Thus the change in time associated with the low confidence fault may be an interference effect relating to the seam split rather than structure.

Line N2

Fault	S.P	X	Y	Throw	Confidence
F2	252	334706	1322670	<4m	Low

Fault F2 has been interpreted with low confidence primarily due to its size.

Line N6

Fault	S.P	X	Y	Throw	Confidence
F1	330	337062	1319773	8m	High

Fault F1 has been interpreted as a Normal fault down thrown to the South East. In addition to this structure, borehole B700V950 indicates that the Wallarah seam has been intruded at this location. An examination of the seismic data displays a zone between the interpreted fault and this location for which the interpreted horizon is absent. Thus it would appear that the seam has been severely affected by the intrusion between this zone.

Note the estimated level change across the intrusion, 8m, has been measured over the entire zone a distance of 74m for which the interpreted horizon is missing."

In summary only two structures were identified in the E-W lines crossing Jilliby Valley and two in the north-south lines. F3 is a possible fault adjacent to an intrusion at least 3 km west of the valley. F4 is a possible fault along the seam split line which is well known from drilling and has an almost NNE-SSW orientation, not parallel to the orientation of Jilliby Valley. F1 is associated with an intrusion near the intersection of Hue Hue Road and Dickson Road. F2 is the only other fault identified in the survey and is of low confidence.

Statistical Analysis of Data for Control of Jilliby Creek

During the exploration phase a significant amount of geological structural data was gathered. This included:

- Faulting exposed in mines to the north
- Faulting identified in Tuggerah Lake by seismic surveys
- Joint orientations
- Igneous dyke orientations
- Sedimentary strata bedding orientation

The following graphs show the distributions of various structural features relative to the orientation of Jilliby Creek.

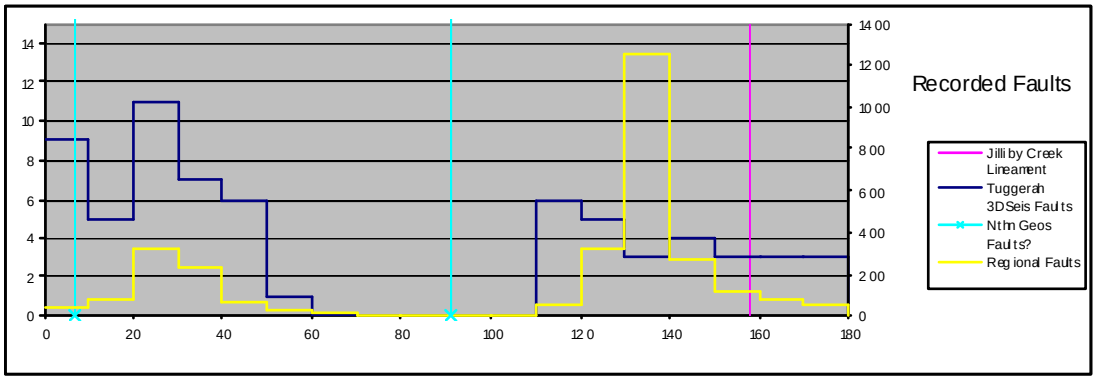


Figure 25 Distribution of Fault Orientations

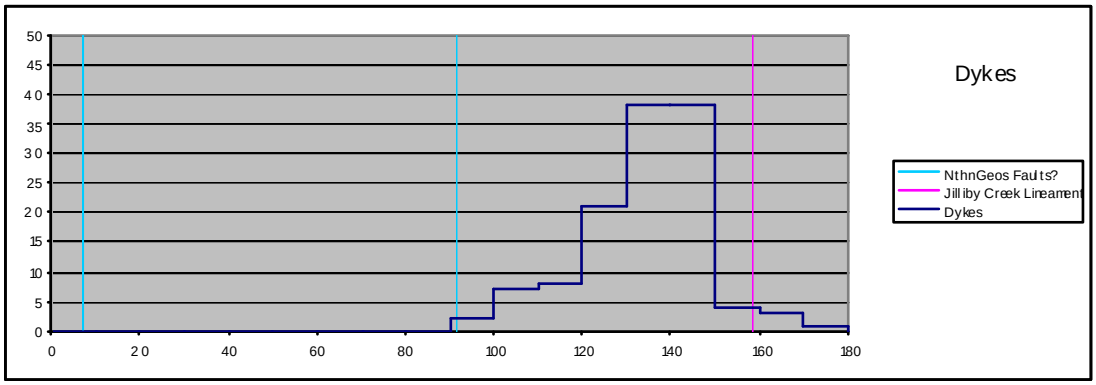


Figure 26 Distribution of Dyke Orientations

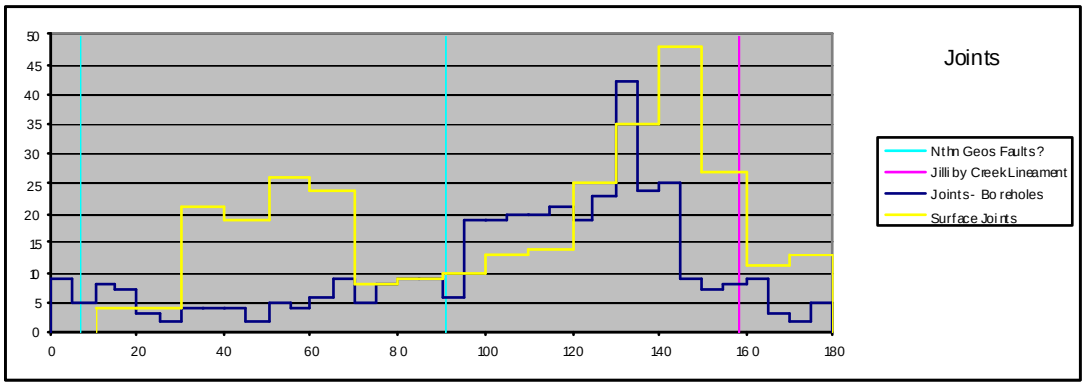


Figure 27 Distribution of Joint Orientations

The orientation of Jilliby Creek (Dooralong Valley) does not correlate well with the orientations of faulting, dykes or jointing, structural features which could be expected to significantly influence its location and orientation. An examination of the surface geology of the area indicates that Jilliby Creek (Dooralong Valley) follows the outcrop of the soft Patonga Claystone between the sandier, more resistant Terrigal and Tuggerah Formations. Bedding of strata in the area dips generally to SW. Jilliby

Creek clearly reflects this by occupying a down-dip position adjacent the more resistant sandier Terrigal Formation. This is supported by the distribution of bedding strike within the Terrigal Formation and Patonga Claystone which shows a much closer correlation with the orientation of Jilliby Creek than any other structural feature.

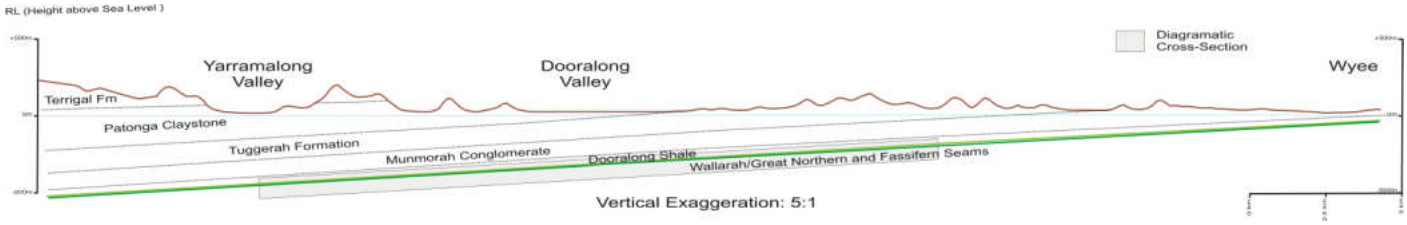


Figure 28 Vertical Section showing Dooralong Valley (Jilliby Creek) Occupying Outcrop of Softer Patonga Claystone

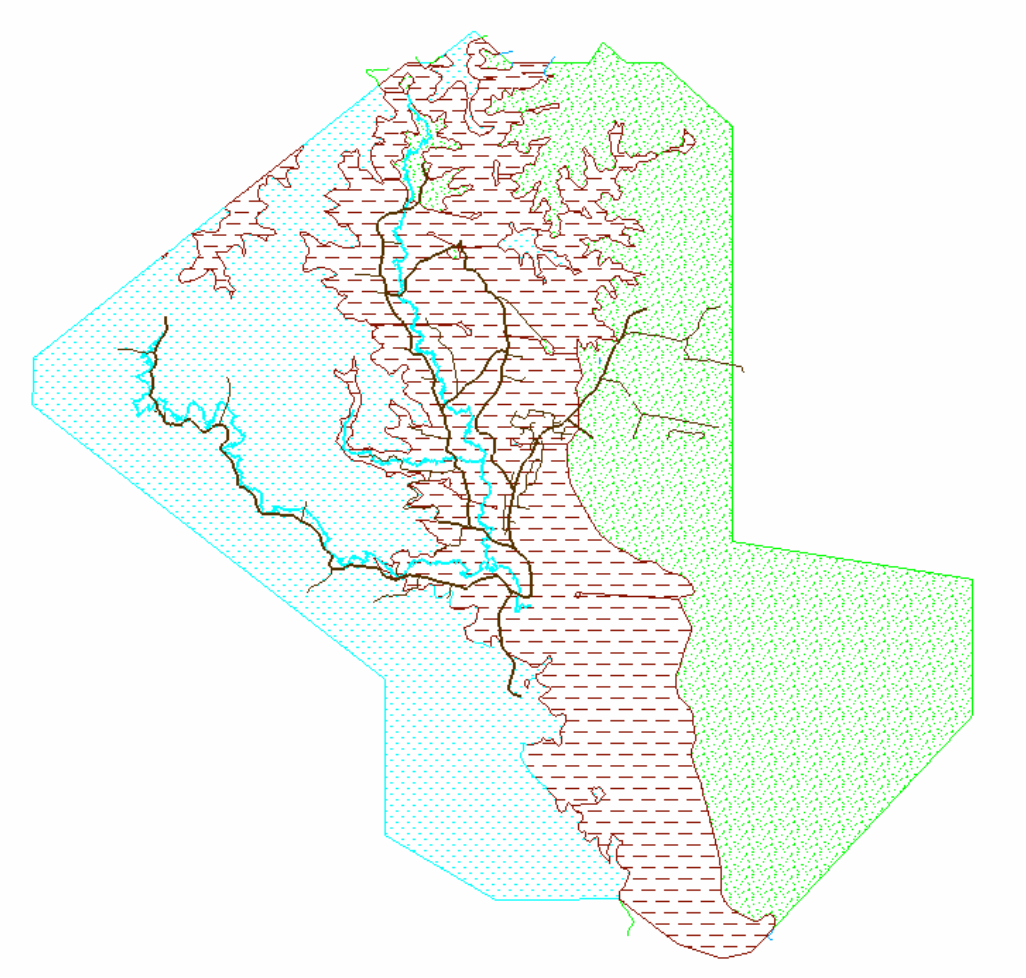


Figure 29 Surface Geology showing Jilliby Creek Occupying Outcrop of Softer Patonga Claystone between the more resistant Terrigal and Tuggerah Formations.

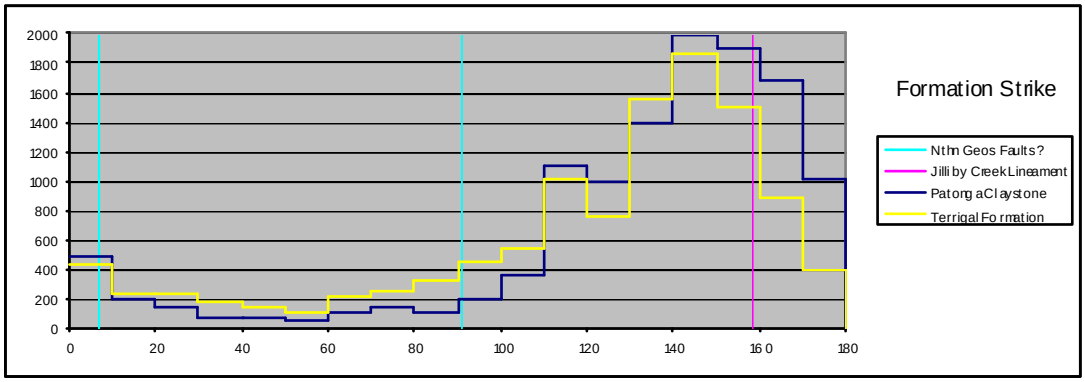


Figure 30 Distribution of Bedding Strike Orientations

On the evidence of extensive geological data obtained from the Jilliby Jilliby Creek floodplain it can only be concluded that the major structural control of the location and orientation of Jilliby Creek (Dooralong Valley) is bedding/outcrop.

As the creek is not fault controlled, the primary arguments of DECCW and the Australian Coal Alliance in relation to loss of surface flow are invalid.

5.4 Flooding

5.4.1 General Issues

Concerns were raised that the subsidence caused by the W2CP will increase the risk of flooding in the area. The EA document (refer to Chapter 9) and specialist study (Appendix C) provide details of the predicted changes in potential flood patterns that will occur. While it is recognized that some properties will become more flood prone, others will in fact have a reduced risk of flooding following mining (refer to EA Tables 9.1 and 9.2 for a summary of effects).

Where there is expected to be a negative impact on flooding potential, mitigation and adaptive management strategies have been proposed (EA Section 9.4), and will be negotiated in consultation with the affected landowner.

5.4.2 Response to Specific Flood Concerns

Department of Industry & Investment

I&I comments relating to flooding are constructive. If, as intended, the model has predicted upper bound values of flood levels, the need to pay close attention to deviations from predicted levels will be less onerous. However, I&I implies that there may be a need to revisit the flood models if actual subsidence is different from predicted. This is a valid approach, even if actual subsidence is less than predicted. It would also allow for intermediate stages to be modelled. The hydraulic model can be rerun (at appropriate points in the mine's development) with actual subsided levels

to date and (re-)predicted final levels to confirm no significant adverse changes to predicted flood impacts will occur.

It should be noted that hydrological models are essentially risk based - giving an estimate of rainfall intensities and patterns for a range of storm durations and AEPs or average recurrence intervals. These may change over long periods of time as empirical data grows.

There is little likelihood of significant erosion either in the channel or on the floodplain. Similarly, the stability of channel banks should not be affected by a maximum tilt of 0.8% and this has already been addressed in the EA.

I&I Fisheries' concern over groundwater level changes and potential impacts on pools is important. Regardless of the expected negligible impact on groundwater flows and RLs, it is expected that average groundwater depths will vary in and adjacent to the subsidence areas. A monitoring program will be put in place and a rehabilitation strategy will be developed to manage any undesirable impacts on fluvial geomorphology or aquatic habitat that may occur.

Australian Coal Alliance

It is anticipated that, as each longwall progresses across the valley, alluvial groundwater will initially drop in level (but not in depth) in line with the amount of subsidence but will then quickly re-establish to original levels (i.e. reducing in depth). In extended dry periods, groundwater would normally be expected to be slightly below adjacent stream bed levels and to rise above stream bed levels following extended wet periods. This means that there could be slightly greater base flow within the subsided reach of the creek but this would dissipate within a very short distance downstream of the edge of subsidence as water infiltrates back out of the creek to the existing groundwater system.

The slope of the "phreatic" surface will depend on soil properties and recharge rates from surrounding hills but it is unlikely the equilibrium levels will be affected significantly by subsidence and alluvial groundwater flows are unlikely to change at all in the long term. This should be treated completely separately to perceived losses through vertical connectivity to the coal seam, which can be shown to be virtually zero.

It is possible ponding may increase near the lower edges of the subsidence areas. Minor scouring and accretion will negate this impact over time as the streambed restabilises. It should be noted, however, that natural changes to stream geometry due to floods and normal sediment movement are likely to have far greater impacts than those resulting from subsidence.

There will not be any significant or long term impact on the overall catchment yield. There may be a very slight increase in infiltration in the hilly areas if surface cracking in the overburden occurs. This would result in a very slight reduction in peak runoff flows with a corresponding increase in groundwater flows. This could be considered a beneficial impact but is likely return to original conditions as cracks fill with silt and surfaces are re-established. Slight changes in slopes at the edges of

subsidence areas may have extremely small impacts on runoff characteristics but these would be virtually impossible to model.

The statement that the flood study was completed over ten years ago is obviously incorrect as the final report is dated March 2009 (following minor revisions) and modelling was completely redone in 2007 including provision for latest changes to PMP estimates. The model was, indeed, first developed in 1999.

Global warming was not directly reported in the Flood Impact report but was considered to be adequately allowed for in the conservative parameters used in the models. It should be remembered that hydrological models are essentially probability related and based on "standard" procedures outlined in Australian Rainfall and Runoff. The primary focus of the study was to assess impacts of subsidence on flood regimes more so than absolute flood levels. The compound effect of conservative hydrological and hydraulic parameters have resulted in upper bound estimates of absolute flood levels. Sensitivity of the relative changes in flood levels between pre and post subsidence conditions was found to be negligible.

The flood model did include consideration of considerable changes in tailwater levels (up to 1m) below Woodbury's Bridge as part of a sensitivity analysis. It was found that such changes would be dissipated within 400m of the bridge and would therefore be well downstream of the areas affected by subsidence. To address the concerns of the ACA submission it can be shown that such impacts dissipate due to flood slopes and it is not the case that a change in depth at the downstream end applies over the full length of the waterway.

The issue of risk to life as a result of changes in flood regime is a valid concern. While it is self evident that an increase in flood level must result in some increase in risk, the nature of the flood behaviour of the valleys is relatively well understood and has extremely low direct risk to human life. A recommendation in the flood study was to improve access roads that are currently inundated during major floods so that they would be flood free or at least significantly less flood prone than existing conditions. This would clearly decrease risk to life.

Wyong Council

It is anticipated that impacts on surface water quality would be negligible. Existing water quality in Jilliby Creek is far less than desirable due mainly to runoff from agricultural properties.

Council should clarify what it means by stating baseflow is a significant contributor to streamflows. Baseflow in Jilliby Jilliby Creek is very small and is regarded as ephemeral.

Almost all of the defined stream is vegetated so consideration of non vegetated reaches is a very minor issue. Also, given maximum tilt is only 0.8% there is unlikely to be any significant increase in erodability. Similarly, for typical stream widths of 7 or 8 metres at top of bank there would be only potentially up to 64mm difference between banks for a limited period as a longwall passed. Even ignoring the extremely

low probability of this coinciding with a flood event, the impact would be extremely localised and would not result in "significant erosion" as suggested by Council.

It is appreciated that Council's consultant, PSM, considers the flood impact assessment to be reasonable and it is agreed that periodic reviews of the model based on measured subsidence would be advisable. Data on Hue Hue Creek profiles can be provided, although it should be noted that the relative steepness of this creek and its well defined hydraulic controls will show that no ponding will occur (i.e. no adverse slopes will result from subsidence)

DECCW

Flood models were calibrated against as many major storm/flood events as possible for which data was available. Calibration is never perfect but was good in this case. To make allowance for discrepancies, upper bound (conservative) parameters were adopted in all models. While some sensitivity testing was done, the strategy of adopting upper bound values would normally negate the need to model for lesser values. Tailwater sensitivity was found to be low and to dissipate within 400m of the downstream end of the model and well downstream of the subsidence area.

W2CP would be pleased to meet with DECCW to discuss the relevance and extent of sensitivity testing and to agree an acceptable range of parameters to adopt for sensitivity to demonstrate that what has been adopted is conservative and appropriate.

NOW

There may be some impacts on runoff due to changes in infiltration parameters in the hilly areas of the catchment. These have been assessed by subsequent hydrological modelling and found to be extremely small (<0.03% change in peak flows). Also, the effects tend to decrease peak flows and extend duration of baseflow. There would be virtually no changes to runoff due to changes in slope at the edges of subsidence areas as effects would be localised and as a proportion of total catchment experiencing a change in slope will be small (less than 1%). The important thing to note is that there will be virtually no impact on nett groundwater flows.

Climate change was not addressed specifically in the flood study. Climate change impacts can be expected to be relatively minor in terms of absolute values of calculated flood levels and to be well within the conservative values of parameters used in the model. Moreover, when considering climate change in relation to relative values of calculated flood levels (i.e. the difference in levels between pre and post subsidence conditions) the impacts would be negligible. Sea level changes, whether as a result of coincident high tides, storm surges and climate change were indirectly considered in the flood study. A number of downstream boundary (tailwater) conditions were modelled and it was found that the impacts of varying the tailwater level above the nominal 1%AEP level derived from PWD rating curves were fully dissipated within 400m of Woodbury's Bridge. This is well downstream of the confluence of the Wyong River and Dooralong Creek and well downstream of the areas impacted by subsidence.

5.5 Surface Water Management

Submissions raised concern that the operation of the mine will take water from the region. Section 2.12.7 of the EA details the water supply to the mine. The basis for planning and assessment in the EA was that the surface facilities would not be connected to the town water supply. However, it is likely that the project will be connected to town water (for potable water uses) and sewerage during the project life and possibly in the early years of the project depending on infrastructure development programs. Accordingly, the following discussion for the purposes of conservative impact assessment is based on there being no connection to the town water supply.

In order to ensure that sufficient water is available for use during the construction phase of the Buttonderry surface facilities, the construction of the 10 ML Entrance Road Dam and local area site stormwater drainage system will be a high priority. The purpose will be to create a water storage facility on site capable of retaining sufficient water to supply the needs for construction and eventually, mining production operations. When the Entrance Road Dam is filled to its normal operating capacity, the site is expected to be self-sufficient in regard to supply of water for both potable and industrial use. The period of self sufficiency is expected to be "ongoing" during normal climatic conditions, however, this may not be the case during a drought period exceeding approximately two months.

Similarly, the Tooheys Road site has been designed with water management structures to ensure that it can become self-sufficient. When the Mine Operations Dam is filled to its normal operating capacity, the site is expected to be self-sufficient in regard to supply of water for both potable and industrial use. The period of self sufficiency is expected to be "on-going" during normal climatic conditions, however, this may not be the case during a drought period exceeding approximately two months.

Assessment of the site water balance requirements indicates the site will be in water deficit during the first production year (refer Table 2.7 of the EA). The deficit is attributable to water requirements for operation of the longwall. This deficit will progressively reduce over the next five production years as mine seepage water make (supply) from underground increases as mining progresses. To make up the initial deficit, a combination of separately imported potable water and sewage treatment plant recycled water will be sourced from external suppliers.

5.6 Air Quality

The impact of the W2CP on the surrounding air quality was raised in a large number of submissions. While each of these issues are discussed below, the specialist consultants responsible for assessing the impact on air quality is confident that with the implementation of standard practices mitigation measures, the project will meet or exceed stringent air quality goals and standards.

5.6.1 Selective Use of Monitoring Data

Data on dust concentration and deposition rate in the project area were collected by ERM on behalf of the project. These data were used to estimate existing background levels in the project area. All air monitoring data were considered and summarised in the air quality report.

The most conservative approach to estimating a background level of dust concentration and deposition rate was used as follows:

- Annual average TSP of 42 $\mu g/m^3$ (maximum measured in years not affected by bushfires)
- Annual average PM10 of 21 $\mu g/m^3$ (maximum measured in years not affected by bushfires)
- Annual average dust deposition of 2 g/m^2/month

The TSP and PM10 levels assumed were similar to those recorded respectively at Wyee by Delta Electricity and the Central Coast Public Health Unit and reported in the Wyong Shire Council State of the Shire Report 2008-2009.

No PM2.5 data were collected for the project, but data recorded by Delta at Wyee have been previously included in the Wyong Shire Council State of the Environment reports. The data did not show any particular trend (a slight decrease was noted) but had been collected over a 2.5 year period only. The maximum daily recorded data was below the NEPM advisory reporting guideline of 25 $\mu g/m^3$ with a maximum recorded level of 19 $\mu g/m^3$. The annual average was marginally above the guideline of 8 $\mu g/m^3$ as it is in many regions of Australia.

The recorded levels of pollutants take account of local sources so would include contributions from the power station in the area. It is noted that the Vales Point Power Station installed fabric filters in 2007 to reduce particulate emissions.

5.6.2 Travel Characteristics of Fine Dust Particles

The ACA are concerned that the travel characteristics of fine dust particles have not been included in the modelling. The particle size distribution of the emission was discussed in detail in the EA Air Quality report and has been included in the modelling. The fine fraction of the dust will be transported further than the coarser material. While it is the case that fine particles can be transported over a large distance, the size of the source is also an important factor. The W2CP dust source will be relatively small and will also contain a relatively small fraction of fine particles (about 4%). By the time the particles reach any nearby sensitive receptors, they will be at low concentrations.

Modelling of PM2.5 was undertaken for the EA, and predictions at sensitive receptors presented in the HRA section. Predicted concentrations are all very low.

5.6.3 Dust Suppression

ACA are concerned that dust suppression will not control emissions from stockpiles.

The dispersion modelling took into account the emissions of particulate matter arising from the stockpiles and coal processing. Dust control measures were not applied in the modelling unless explicitly stated. For example, the modeling assumed that dust suppression spray systems on the cola stockpiles were not operating. Any proposed dust control measures used by W2CP will only lead to a further reduction in the predicted impacts. For example, the modelling did not include the effect of water suppression on ROM and product stockpiles and is therefore conservative. It is agreed that the way in which waters sprays affect airborne particulate matter is complex, but it is intended to keep the stockpiles in a moist state so that the particle do not become airborne.

5.6.4 Power Station Emissions in the Area

ACA note that the power stations in the region are major emitters of a range of pollutants including sulphur dioxide, oxides of nitrogen and volatile organic compounds (VOC). These pollutants will not be emitted by the W2CP to any significant extent and so have not been considered further. The only significant emission in common is particulate matter.

According to the 2008/2009 NPI, Eraring emitted 1,100 tonnes of PM_{10} and 590 tonnes on $PM_{2.5}$. However the majority of these emissions were from point sources, specifically tall stacks rather than fugitive sources, and the emission are therefore well dispersed. Dispersion modelling for the Eraring Power Station upgrade in 2008 predicted maximum 24-hour PM10 concentrations of 0.6 $\mu g/m^3$ which would not be perceptible above existing background concentrations.

At present the air quality data collected at the project monitoring sites, is largely influenced by local factors such as the road (i.e. traffic on the F3 Freeway, traffic on the unpaved Tooheys Road, etc) as well as regional sources such as dust storms and bushfires, rather than major emissive industries.

Further residential development in the area will affect local air quality, however from the modelling results the contributions from the W2CP project (except under worst-case busy day conditions) are very minor at any nearby sensitive receptor.

5.6.5 Rail Transport Emissions

There is currently a Pollution Reduction Program in place for the Australian Rail Track Corporation (ARTC) in relation to fugitive coal dust emissions for the transport of coal on NSW's rail network. At present these mitigation strategies have not yet been released to the public.

However, in 2008 Connell Hatch investigated fugitive coal dust emissions from locomotives transporting coal in central Queensland along the Goonyella, Blackwater and Moura rail corridor (Connell Hatch, 2008). The main sources of the fugitive coal dust emissions were from:

- Coal surface of loaded wagons;
- Coal leakage from the doors of loaded wagons;
- Wind erosion of spilled coal in corridor;

- Residual coal in unloaded wagons and leakage of residual coal from doors; and
- Parasitic load on sill, shear plates and bogies of wagons.

The findings of this study showed that impacts of the coal loaded trains on ambient air quality were measurable at a distance of no more than 15 m from the track and that ground level PM_{10} concentrations were unlikely to exceed the NEPM air quality guidelines 10 m from the tracks in residential areas. Furthermore, the study also concluded that there was minimal risk of adverse impacts on human health due to the coarse nature of the coal particles and relatively low concentrations measured and predicted at the edge of the rail corridor. Impacts on amenity were also determined to be minimal as concentrations were found to be below levels that adversely affect amenity.

On this basis, adverse impacts from rail transport associated with W2CP are likely to be minimal.

5.6.6 W2CP and Dust

Dust emissions will arise from both the construction of the mine (predicted levels provided in Table 12.4 of the EA) and during the operation of the mine (see Table 12.5 of the EA). In terms of dust emissions, the more significant potential dust generating activities would be dozers working on stockpiles, loading of material and wind erosion from stockpiles.

Concentrations of dust and deposition rates of dust from the construction and operational phase of the project are predicted to be well within the Department of Environment, Climate Change and Water's (DECCW) air quality criteria.

5.6.7 Air Quality Monitoring and Effects of Mining

The air quality assessment carried out background monitoring to determine the existing air quality, which allowed the cumulative impact of the W2CP to be assessed. The assessment was based on the use of a computer-based dispersion model to predict ground-level dust concentrations and deposition levels in the vicinity of the surface facilities. To assess the effect that the dust emissions would have on existing air quality, the dispersion model predictions were compared to relevant air quality goals. Dispersion modeling was carried out in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* developed by the NSW DECCW guidelines.

5.6.8 Risk of Dust Contaminating Water

Both of the proposed surface facility sites are located outside the main water supply catchment area. Dust generated from the surface facilities is predicted to be within DECCW criteria. It is considered that there is far greater potential for dust generated by agricultural activities within the catchment to have an impact on the regions water supply. Nevertheless, it is important to note that the drinking water supply that is in part sourced from Wyong River is treated in the Mardi Treatment Plant prior to distribution to the reticulated water supply system.

Although houses within the vast majority of the mine area do not have an available town water supply, most properties surrounding the surface facilities sites are connected to the reticulated town water system. These properties will not be significantly affected by dust generated.

In order to adversely affect the quality of water within a rainwater tank, the concentrations of dust from the facilities must be sufficient to quantifiably increase the level of sediment entering the tank for which no filtration system is installed. The best measure for evaluating this risk would be dust deposition. With a conservative average dust deposition within a rural landscape of between 0.5 to 1 g/m^2/month, it is considered that rates emanating from the W2CP above these levels would have the potential to affect a property which relied solely on rainwater tanks for its water supply.

As shown by PAE Holmes in Appendix M of the EA, expected dust deposition rates both during construction and operation are around 0.2 g/m^2/month at the property boundary. Therefore it is considered that no property relying on rainwater tanks will be adversely affected by dust from the operation.

5.6.9 Impact of Dust on Residents to the South

The air quality assessment carried out considers the amount of dust likely to be generated, and how this will travel under a variety of weather conditions, in all directions around the surface facilities. The assessment figures included in Chapter 12 of the EA clearly show where the dust impacts are likely to occur, and it can be seen that there will be no impact to the south.

5.7 Noise

All construction activities and operation of coal mines generate some noise. However, it is the cumulative impact of the additional noise generated that is of concern for the nearby receptors. The noise assessment contained in the EA (Chapter 11 and Appendix N) details the noise modelling undertaken for each of the surface facilities areas for the various prevailing weather conditions. The modelling has shown that the Buttonderry site will meet all noise assessment goals specified under the *NSW Industrial Noise Policy*.

The Tooheys Road site has incorporated a number of noise controls including partial enclosure of the crushing and screening equipment and acoustic treatment of the mobile plant. The modelling has shown that the project specific noise assessment goals are satisfied under all meteorological conditions. Operational noise levels at Blue Haven are predicted to be less than 35 dBA under adverse westerly wind and temperature inversion conditions.

Noise modelling has shown that the increase in road vehicles generated by employees and development activities satisfies the noise assessment goals. The additional coal trains are predicted to not increase the existing L_{Amax} levels along the Main Northern Rail Lind while and the existing L_{Aeq} 24 hour levels would increase by 1.4dBA. Noise generated from construction activities has the potential to exceed the

project noise assessment objectives. These activities are transient and will be subject to detailed planning and contractual obligations of the construction contractor.

A Noise Management Plan will be prepared for the mine which will cover both construction and operational phases. The Plan will identify and address noise impacts for potentially affected properties and include a monitoring program, noise mitigation measures and noise management practices. Input from the selected construction contractor and specific additional management controls for the construction program will be included when available.

5.8 Traffic and Transportation

A number of different issues relevant to the traffic and transportation associated with the W2CP were raised in the submissions. These are discussed below.

5.8.1 Impact on Traffic Congestion

It is inevitable that any new development will result in the increase in traffic to some degree. An assessment of the likely impact of both the construction and operation of the mine was carried out and presented in Section 11.1 of the EA.

The assessment concluded that the Sydney-Newcastle Freeway/Sparks Road interchange would require upgrading due to the expected population growth for the region, regardless of the approval of the W2CP. However, recent traffic modifications including traffic lights at this location have already been implemented to address this issue. Other works were proposed to mitigate the impact of extra road traffic associated with the mine (predominately workforce movements), which will ensure that there is no significant impact on the local road network.

5.8.2 Trucks and Road Safety

The W2CP is not anticipated to generate a substantial amount of truck movements. They will be largely associated with the construction phase for the mine. All trucks will be required to obey traffic laws as normal, therefore it is presumptuous to assume that they would affect road safety.

5.8.3 Increased Train Movements

The movement of coal by trains is discussed in detail in Section 2.8.6 of the EA. An assessment of the noise associated with the trains is provided in Section 11.2.10, from which it was concluded the predicted levels (summarised in Table 11.22 of the EA) show that the additional coal trains would not increase the existing L_{Amax} levels along the MNRL and the existing $L_{Aeq,\ 24\ hr}$ levels would increase by 1.4 dBA and the DECCW $L_{aeq\ 24\ hour}$ 60 dBA goal is satisfied at approximately 60 m from the rail line. The L_{Amax} 85 dBA level is predicted to be satisfied at a distance of approximately 100 m.

5.8.4 Use of Trucks to Transport Coal

At no stage is it proposed to transport coal by truck to the rail lines. The W2CP will include a substantial investment in building a rail spur and loading facilities to ensure that coal can be taken directly from the Tooheys Road site to the Port of Newcastle without the need to transport coal by road.

5.9 Ecology

Issues raised regarding the impact of the W2CP are discussed in the following sections.

5.9.1 Specific Aquatic Assessments Required in Subsidence Area

DECCW notes that specific aquatic assessments would be required in the subsidence area (Mining Area i.e. Jilliby Jilliby Creek). The OzArk ecological report for the proposed mining area (subsidence area) was written based upon evidence from:

- ERM 2009 Wallarah No 2 Coal Project Flood Impact Assessment. Report to WACJV; and
- Mackie Environmental Research 2009 Wallarah 2 Coal Project Groundwater Management Studies Final Report – Report to WACJV.

OzArk's interpretation of these reports was that effects to habitat values of waterways and water bodies (from subsidence and changes in hydrology) would be negligible. This interpretation translates to a 'no change from the current situation' for the ecology assessment i.e. subsidence / change in hydrology would not 'affect' species, communities or populations dependant on this habitat niche (refer to EA Section 7.2.1 re mining area assessment).

Due to the technical nature of the two reports listed above, additional advice was sought through the W2CP team and at times with the respective authors, which informed the consultant that the assumption was sound. The information provided in the OzArk report for the indirect impact area (subsidence area) represented the level of risk determined.

DECCW's advice in the EA submission was based on comments in a report prepared by Northern Geoscience for Australian Gas Alliance that "a major geological feature of the Jilliby Creek is that is follows a fault zone" which "provides a significant transient pathway to groundwater movement and discharge" rather than an interpretation of the same evidence i.e. ERM 2008 and Mackie Environmental Research 2009 and ERM 2008. In this, DECCW conclude that subsidence presents 'an unacceptably high risk of cracking and water loss from the creek'. DECCW notes that information provided in the OzArk report is not consistent with management of that level of risk. However as discussed in Section 5.3.1 this interpretation is not supported by current more detailed geological data, geotechnical analysis and groundwater modelling.

On this basis the OzArk conclusions presented in the EA are entirely justifiable and defensible and are supported by the additional discussion on subsidence and groundwater issues earlier in Section 3 of this report.

5.9.2 Freshwater Hydrobiid Snail

DECCW refer to Miller et al (1999) who reported the presence of an undescribed species of freshwater hydrobiid snail in Jilliby Jilliby Creek noting that these snails are highly restricted in their distributions and as such potentially susceptible to processes likely to cause significant disturbance to their habitats.

OzArk has accordingly considered this matter and request DECCW provide further instruction as:

- The species (or population) is not listed under the schedules of the TSC, FM or EPBC Acts and as such we are not aware of the species legal status, further the legislative responsibilities of management of this species needs to be documented so we can act on those instructions to determine if the activity would cause a significant impact;

- Hydrobiid snails is not noted on the DECCW sensitive species list or can be located through a search of 'hydrobiid' in the Wildlife Atlas;

- The issue was not documented in the D-G requirements;

- If the 5 year rule is to apply Miller et al. 1999 should not have been considered in this assessment, especially as the species is not recorded within the Wildlife Atlas or I&I threatened and protected species record viewer.

OzArk notes the importance for the protection of all biota however is perplexed by the reference to this freshwater snail. OzArk assumes DECCW is requesting an additional targeted assessment of this species? The principle of the concern is that it is highly probable that many species of biota (bacteria, viruses, protists, fungi, and simple invertebrates) would remain undescribed and similarly unclassified in the area than those known to science. Singling out one such species is inconsistent with the 'normal' threatened species assessment process and it has numerous ramifications in the environmental assessment process. This is an avenue that we as a company do not want to go down without written instruction.

5.9.3 Impact to Shallow Ground Water Resources

As discussed in 'Aquatic Assessments' above, OzArk relied upon Mackie Environmental Research 2008 Wallarah 2 Coal Project Groundwater Management Studies Final Report – July 2008 to determine impacts to ground water. This report noted they have been assessed as negligible.

OzArk can only assess these reports upon merit and are not in a position to contradict the expert advice provided. DECCWs position of tying this proposal to 'other mining ventures having made similar predictions when in fact significant adverse impacts have occurred' is beyond the consultant's project brief as we note

the environmental context of 'other mining ventures' is mutually exclusive to this proposal.

With respect to the above, within the context of the assessment within the subsidence area (Mining Area), the ecology assessment did consider impacts to ground water dependent communities (see Section 6.4.2). Between 66 and 72% of the extant distribution of Riverine Alluvial Gallery Rainforest-Moist Forest will be affected within the study area. It was determined that there are unlikely to be detrimental impacts to this community and no significant potential for any loss of some rainforest species.

5.9.4 Number of Hectares to be Cleared in the Direct Impact Area (Pit Top Facilities)

DECCW notes the use of two apparently inconsistent figures:

- EA Project Description (EA Section 2.13.8) = 23 ha;
- Biodiversity Land Management Strategy (EA Section 13.1.17) = 33 ha.

A review of the source document (OzArk 2010 - assessment of the direct impact areas, Table 14) shows that 22.73 ha was mapped within the Impact Footprint, hence 23 ha is an accurate rounded number. Table 15 and Figures 21 to 24 (OzArk 2010) provide further detail.

The 22.73 ha (rounded up to 23 ha) assumes that the rail loop from the main line results in clearing outside the existing cleared 330 kV power line easement. This is considered a conservative approach given that TransGrid has indicated a willingness to allow a shared easement to minimise clearing. However, the Biodiversity and Land Management Strategy, which represents a Proponent commitment, takes an even more conservative approach by assuming adding an additional 10 ha of land clearing. This takes into account any unforeseen changes to the rail loop alignment during detailed design. As discussed in the EA, negotiations with RailCorp on the exact location of the takeoff point from the main line have yet to be finalised. The point will be governed by future line upgrading works, which have been in the planning phase for many years. Should this point move further north then there is the potential for additional land clearing to be required. A key requirement of an EA is to ensure that decision makers are fully aware of all potential impacts and if any impact cannot be accurately defined, then a conservative approach should be adopted, hence an additional 10 ha (totaling 33 ha) has been included in the offset strategy set out in the EA Section 13.1.17 Biodiversity Land Management Strategy.

5.9.5 Number of Hectares to be Affected in the Indirect Impact Area (Subsidence Area)

Table 4, Figures 13 to 16 in the indirect area report clearly state the hectares affected and map the locations of the potential impacts.

5.9.6 Flora Surveys Effort

DECCW's understanding of methods used in the botanical survey are correct.

Survey effort:

We have updated Table 9 in Appendix Q to reflect additional work undertaken since release of the last draft of the report. Details of these have been summarised in the following points.

Orchid surveys:

2006 - September (4 days general vegetation mapping), this identified the need for additional targeted searches).

2007

- Searches for *Diuris praecox* (flowering July-August) in the Tooheys Road direct impact were completed (cumulatively 2 days).
- Direct impact areas within Spotted Gum forests of the Buttonderry portion for *Thelymitra adorata* (September-October – 2 days).
- September-November 2 days of searches for *Arachnorchis tesselatus* in the Tooheys Road north portion (opportunistic after fires in December 2006), as this species is most prevalent after fires.

2008

As the December 2006 fires at Tooheys road brought a premature halt to *Cryptostylis hunteriana* surveys, additional searches were undertaken in late January to February 2008 (2 days). Final inspections were undertaken in April (1 day) and May (1 day).

Prevailing weather

All surveys undertaken were in 'good' weather however it should be noted that scheduling of field inspection was as a response to favorable climatic and seasonal conditions.

OzArk has included comments from Steven Bell to contextualize his field work planning i.e. opportunity to target particular species after a fire event etc.

Steven Bells project brief was simply to 'do what is necessary, when necessary to undertake an appropriate targeted orchid assessment'.

Presence / absence of *Caladenia tessellata* in the direct impact area:

- *Caladenia tessellata* is a record from the Wildlife Atlas. Steven Bell correctly states' it was not confirmed in the 'current' survey within the Project Site'.
- Note 'current survey' reflects that multiple targeted orchid assessments were undertaken for the OzArk assessment and it was not confirmed in the Project Site.

General botany searches (including general threatened species searches):

- The main body of botanical work was undertaken September 26th to 1st October 2006 at the Tooheys Rd Precinct, 14th to 16th November Buttonderry and the Hue Hue Rd potential conservation offset site.
- Inspection of the indirect impact area (subsidence or mining area) occurred between July and November 2007 (4 days in total – often timing was associated with orchid surveys noted above).

Additional targeted field inspections were required for *Angophora inopina:*

- August 2007 (1 day) determining if the 'local population' within the rail loop extended into on DLALC land and mapping the distribution; and
- April 2008 (2 days) refining the mapped distribution and establishing population size to determine the nature and extent of the impact on the local population.

Population size of *Angophora inopina* and *Tetratheca juncea* at the Tooheys Road site:

- The population of *Angophora inopina* is documented within the report (see Appendix 6 of the direct impact area assessment). The population estimate in number of individuals is 4,340 the mapped extent of the local population is 123 ha. The rail loop would affect (worst case scenario) 10 ha, which can be translated into 10% of the known distribution / population (434 individuals). The distribution map of this species (Figure 25a of the direct impact assessment) shows that only c. 4 ha of *A. inopina* has been mapped within the direct impact footprint (c. 175 individuals).
- *Tetratheca juncea* was not counted in detail as stated by DECCW, however the rest of the statement in the report notes that:
- "the study area is likely to support several hundred plant clumps of *Tetratheca juncea*, principally in the Tooheys Road portion. Many of these will be destroyed through construction of the proposed rail loop and other surface facilities. Given the existence of extensive populations to the immediate west and north, the local population of plants is unlikely to be placed at risk of extinction through the proposed development'.
- As local extinction will not occur and a significant impact was not determined, OzArk in light of DECCWs concerns propose to modify recommendations in the report to provide further information regarding the management of the species in the Vegetation Management Plan (VMP). Mapping the nature and extent of the local population would occur such that long term management of the species could be audited.

Targeted surveys within the indirect impact (subsidence) area:

- Rapid Data Points (RDPs) were utilised within the indirect impact areas (subsidence area) to detect threatened species. Bell notes he built upon his previous work from 2002 but did investigate roadways and public spaces opportunistically during the 2006 / 2007 assessment.
- Steven Bell also noted issues with access to private land, a constraint associated with unpopular activities such as mining this is that access is commonly denied to private property and trespassing is out of the question.
- More specifically the areas at most risk of effect from subsidence or changes in hydrology are in private hands and predominantly cleared (see Figures 13 to 16 and Table 4 in the subsidence area report), as noted in the report private land is inaccessible.
- Notwithstanding, the subsidence report has recommended long term monitoring of vegetation through the SMP.
- DECCW provides a list of threatened species, communities and populations recorded during the assessments and notes *Acacia bynoeana* and *E. parramattensis* subsp. *parramattensis* would require consideration (targeted

assessments etc) as they have been recorded (wildlife atlas records) within 2 km of the Project Site. It is noted that:

i. *Acacia bynoeana* (n=2 individuals) was recorded during the assessment in D-LALC land (proposed rail loop) under the TransGrid ETL and a 7-part test had been provided in the direct impact assessment report.

ii. *E. parramattensis* subsp. *parramattensis* was searched for but not recorded in the Project Site.

iii. All species, populations and communities noted by DECCW will be considered / targeted in the monitoring assessments of the Hue Hue potential offset properties (now commissioned).

5.9.7 Use of Supporting Studies in the Project Site: ERM 1999b, 2002 and Parsons Brinkerhoff 2005

DECCW notes the use of reports older than five years is not considered relevant. In relation to the ERM reports, justification for use included:

- OzArk has revised the tally of hours not to include ERMs (1999b) survey effort in Table 9 of the direct impact areas assessment (reason: older than five years).
- In late 2005 (when commissioned to undertake the assessments) the ERM reports were less than or just over five years of age (ERM 2002, 1999b) and as such appropriate to review and consider.
- Threatened species recorded by ERM were added to the NSW Wildlife Atlas, the consultant does not ignore Wildlife Atlas Data if it is more than five years of age.
- The ERM 1999b report was included as the data was collected in a manner consistent with DEC 2004. It would be ignorant (with respect to failure to inform our fieldwork methods) on Ozark's behalf not utilise this information despite it being six years old when we were commissioned. No significant changes in methods (that can be commercially used) to detect the species in question were pioneered during this period.
- OzArk refers to ERM 1999b as an important document, a rehash of this work became ERM 2002. OzArk can easily change all references from ERM 1999b to ERM 2002 if it is an issue (the 2002 report is simply a shop front for the 1999b document) but felt that it was appropriate to acknowledge the high standard of work of the 1999b team.
- With respect to these studies, at the time ERMs impact footprint for the pit top facilities was the current conservation area on Hue Hue Rd. A significant survey effort was undertaken in this area and it was considered that 'new' information from additional survey in the same or similar vegetation types on the property next door (on both sides) was unlikely to be gleaned. Appropriately the focus of the OzArk assessments was to investigate the current impact footprints, knowing that they were selected to avoid impacting those values recorded by ERM (1999b and 2002).
- Information obtained from these source documents allowed OzArk to targeted certain species previously detected (threatened gliders, frogs, microbats and owls) and build upon strengths and weaknesses in the earlier reports. For

example a very low abundance and diversity of small ground dwelling mammals was evident thus OzArk used this information at the outset to target habitat suited for these species, alternatively we commissioned a frog expert to be on staff to cover off this aspect of the assessment.

- OzArk has burnt a CD and added these reports as requested such that DECCW can establish an independent opinion of their relevance.

5.9.8 Assessment of Offset Areas

DECCW notes throughout the submission it considers that there is inadequate survey of the Hue Hue Rd proposed conservation areas. The following points are relevant:

- The Proponent notes DECCW's comments and has engaged the consultant to undertake further fauna and flora assessments within the Hue Hue Rd potential conservation area as part of an ongoing monitoring programme.
- For reasons stated above, OzArk considered ERMs survey effort for fauna (ERM 1999b and 2002) as a good baseline study, in fact it is rare to be in a position to have such data prior to undertaking assessment of this nature and scale. It is reiterated that the proposed conservation offset areas was originally planned to be the pit top facilities however impacts to the environment in this area were avoided and placed into disturbed environments at Tooheys Rd and Buttonderry, an ecologically desirable outcome.
- Six botanical (20 x 20 m) veg survey plots occurred in or adjoining the Hue Hue proposed conservation area (direct impact assessment report Figure 16).
- The ecologist (fauna) did spend a day within the Hue Hue Rd Study Area ground truthing ERM (1999b) results. This occurred intentionally directly after assessment of the direct impact areas do as to inform the habitat based assessment process.

Fauna –

- DECCW correctly notes (in the direct impact assessment report) 'OzArk 1996' is a typo OzArk 2006 is the correct year of the assessments.
- DECCW requested Table 9 in the direct impact areas assessment (Note: DECCW correspondence refers to this as Table 9 in Appendix Q) should be modified to include effort per vegetation / habitat type. This has been partially done, information regarding stratification unit sampled remains within section 4.3.2. Table 9 becomes too unwieldy when all of the information is included.
- Table 9 has been modified as requested to only count survey effort hours / days 5 years or less at the time of the OzArk survey.
- DECCW acknowledges access to private land was an issue within the subsidence area, but note that the SCA and State Forest are publicly accessible. To place targeted assessments for fauna into context:
- A review of Mackie Environmental Research 2008 and ERM 2008 highlighted areas with the most potential to be affected. These areas were on private property in flood plains and predominately cleared of native vegetation.
- The botanical part of the assessment mapped vegetation within these areas and considered impacts to vegetation communities. The only community noted as having potential to be affected were ground water dependent (Riverine Alluvial Gallery Rainforest-Moist Forest), the botanical assessment concluded that a significant impact to this EEC would not occur. For fauna, the above information

meant that no changes to the existing habitat values of vegetation within the subsidence area would occur and hence targeted assessment for species dependant on these is not requisite.

With respect to significant / special habitat types in the subsidence area, OzArk did access the vegetated hill sides in State Forest using existing tracks to ground truth desktop information for general assessment; approximately ½ a day was spent in the forests reconnoitring. It concluded that the available habitat for the majority of regions threatened species would not change as a result of the activity. Those species with potential to be affected within this environment were identified within the report (Giant Barred Frog and Stuttering Frog).

OzArk has undertaken extensive work over several years on mountains within the western coal fields and is very familiar with subsidence within forest ecosystems so the reconnoitre was not uniformed. The Western Shaft Study Area and surrounds were also assessed by foot on a separate occasion.

A component of the desktop assessment specifically focused on impacts to caves or shelters (as part of the heritage assessment undertaken by the same company this was an important landscape feature to identify and assess), it was concluded that none were in the study area that would be affected. Information from MER 2008 and further advice sought from the W2CP geologist who has extensive knowledge and experience in the area (drilled all the boreholes for the project since its inception) were utilised to identify geological features at risk being affected by the activity. Other points of relevance include:

- Farm dams / man-made freshwater wetland habitat types (wetland migratory species) were identified as having potential to be affected and these areas were considered in greater detail within the report.
- Issues concerning aquatic environments of Jilliby Jilliby Creek have been previously discussed.
- Where 'affected' landforms were identified management of associated fauna was undertaken through a review of the DECCW threatened species database (using Wyong as the keyword for the search) and the EPBC website (using the Wyong LGA as the keyword for the search).

The review concluded that only a few of the many species listed had habitat niches within areas that had potential to have their ecological function altered. In this instance they focused around those areas mapped by ERM as having changes to the 1, 5 and 20% flood inundation levels ('affected landforms').

Species with habitat elements within these areas that have potential to be affected have been noted within the indirect impact area report (subsidence area) and DECCW notes that further work is required for their management, this is not inconsistent with the report.

- OzArk notes that timing of the work required is the issue.
- We state that it should be as a component of the SMP as access to private property would be available in some of these areas for the purpose of monitoring.

- Areas within the Wyong State Forest that host known populations of Giant Barred Frog and Stuttering Frog would not be undermined for 30 years. The recommendation to manage these species through the SMP took into account the timing of the proposed impact. As the population are not to be undermined for such a long time period, research needed is more dependent on mining approvals than an immediate threat to the population i.e. research within the SMP can assist to inform the mine plan such that the significance if the impact can be more accurately determined within a reasonable timeframe prior to the event.

DECCW provides a list of threatened species, communities and populations recorded during the assessments and notes Black Bittern, Eastern Bent-wing Bat, Eastern Freetail Bat, Giant Barred Frog and Grey-headed Flying Fox require further consideration and targeted assessment:

- In the direct impact assessment (pit top facilities) these species were considered but were not detected (AnaBat detection, harp trapping, targeted frog searches and audio recording, general habitat searches and spotlighting).
- In the indirect impact assessment (subsidence area) I refer to 4 c (above).
- All species, populations and communities noted by DECCW will be considered / targeted in the monitoring assessments of the Hue Hue potential offset properties (now commissioned).

5.9.9 Habitat Corridors / North Wyong Structure Plan

DECCW notes that the direct impact area (Tooheys Rd) is centrally located within the Central Coast Regional Corridor. It must be noted that avoidance of the Hue Hue Rd Study Area (originally planned as the pit top faculties) and placing the pit top facilities at Tooheys Rd is a better ecological outcome, more specifically has less connectivity effects than the Hue Hue Road option. A Vegetation Management Plan will ensure retained native vegetation will be managed in a manner consistent with enhancing connectivity of the project site.

5.10 Social

A number of submissions raised concern over the impact that the W2CP will have on the community and the perception that there has been limited consultation. These are discussed below.

5.10.1 Community Consultation Activities

The following table summarises the consultation activities undertaken for the project:

Table 6. Consultation Details

Activity	Status	Comments
Community Liaison Committee	Ongoing; Meetings as agreed by members.	Originally representative of whole LGA – focus on western area as mine plan evolved. Current membership is: The Hon Milton Morris, chairman, David Lee, General Manager, Sam Lee, Peter Smith, Environment and Community Manager Wallarah 2 Coal Project, Margaret MacDonald-Hill, Mining Related Councils, Julie Maloney, NSW Department of Industry and Investment, Cr Bill Symington, Wyong Shire Council, staff representative Wyong Shire Council, Ian Murray, United Mineworkers Federation, Tom Hole, Mine Subsidence Board, Wilma Colbert, Yarramalong, Michael Campbell, Jilliby, Peter Murray, Jilliby. Observers are Alan Hayes, Australian Coal Alliance, Warwick O'Rourke, Australian Coal Alliance. Minute Secretary, Rae Black. The CLC was placed on hold when majority in WCJV changed and when Sydney Gas became involved in region. Minutes of the CLC meetings and copies of presentations appear on www.wallarah.com.au
Physical presence	Ongoing Wyong Tuggerah	Under the banner of Coal Operations Australia Limited (C.O.A.L.) the company established its first offices and public information area in Wyong commercial centre. Kores Australia has been a shareholder in the Joint Venture since its inception. Move to Tuggerah when opportunity arose to combine both office and core shed. It is worth noting here that throughout the life of the project ownership and majority shareholding changed several times and each was explained through newsletter etc to the wider community.
Newsletters	14 editions and ongoing	Early editions focussed on WCJV, licence etc advancing to explanations of explorations processes, early studies including water and flood. As the mine plan began to evolve the focus turned to mining processes.
Media	Ongoing when required News Advertising Access via website	Media statements generated as significant steps in process are completed. Advertising used to support both media statements and newsletters. Radio interviews initiated and invitations accepted. The project website carries all media statements and advertisements placed since early 2006.

Table 6. Consultation Details

Activity	Status	Comments
Community surveys	1999 2006	The first was conducted in 1999 by Key Insights Pty Ltd. Results of the survey were first provided to members of the CLC and then to the wider community through media and newsletters. Topics include awareness of mining; awareness of project; acceptance of mining in region. The second was conducted in 2006 by Hunter Valley Research Foundation with similar focus. Independent attitude surveys are conducted annually by the Central Coast Research Foundation. Some findings from those surveys are reported earlier in this section.
Open Day	2006	This open day at Tuggerah was widely publicised. It attracted about 60 people. Visitors were provided with a broad range of information but the focus of the day was to listen to comments. Most interest and comments centred on the protection of the region's water supply. Many of the visitors explained they were members of the Australia Coal Alliance.
Website	Ongoing	A comprehensive website for W2CP was established in 2006 and is a dynamic presence, superseding the former web page developed in 1999. The site contains detailed information and illustrations of indicative mine plans, surface facilities, environmental studies, all newsletters and media statements, and advertisements, the planning process and invitations to contact the company. The website provides useful links to various Government departments, providers of information and the Mine Subsidence Board. The site includes downloads for the Environmental Assessment and other documents relating to the project and submissions made to the Wyong Inquiry

Table 6. Consultation Details

Activity	Status	Comments
Briefings	Ongoing	Company representatives have presented on more than 50 occasions to local groups including precinct committees, environmental groups, special interest groups and business groups. Specific briefings have been provided to Wyong Shire Council staff and Councillors. Comprehensive briefings and site tours were provided to Council's technical consultants and staff in April 2010. Individual letters were sent to each councillor following the 2007 local government elections offering briefings. No responses seeking presentations or briefings were received. More recent briefings were held in July 2010 with Wyong Shire Council W2CP participated in a public forum on the project in May 2010 hosted by Wyong Council and attended by 120 people. Briefings to industry groups, minerals industry suppliers and conferences has continued, especially thoughout 2009 and 2010. One of these briefings was held at Kooinda Waters in Wyong in June 2010 where over 240 mining industry supplier and services representatives participated.
Personal contact	Ongoing	From the outset, as mine plans began to take shape, representatives of the company established strong relationships with individual landowners. In some cases these were and are owners of land likely to be impacted by a mine but also were owners of properties from which valuable research and investigations could occur. Mostly, these relate to evaluation of water resources. These relationships have faltered somewhat in the aftermath of the very poor relationships between Australian Gas Alliance (the forerunner of Australian Coal Alliance) landowners and Sydney Gas.

Table 6. Consultation Details

Activity	Status	Comments
Community participation	Ongoing	In initial periods the company provided financial and other support for a number of community activities including shade areas in a local school, financial support for various sporting bodies and financial support for a major youth initiative, the Oasis Centre, a music recording studio. The company was active in the earlier period in Wyong Chamber of Commerce. In 1999 the Wyong Regional Chamber awarded the company its award for Outstanding Large Business Contribution. Repeated attempts have been made to brief the Chamber in recent years and they have been rejected or ignored.
Community Trust		Recently, the company has invited from CLC and the wider community comments on its proposal to establish a community trust as part of its on-going involvement in the community. These invitations have been extended at the Community Liaison Committee, in newsletters, in media and at briefings. The ACA declared that it would not contribute. Community member Mr P Murray and Mining Related Councils representative, Margaret MacDonald-Hill provided valuable models. Both have been invited to join company representatives in an Advisory Group to help establish the framework for the Trust.
Information kits		Information kits have been prepared and are used for specific audiences including land owners in the valleys. Residents of neighbouring suburbs, and media Topics covered in such kits include landowners' rights, updates on progress on the project.

5.11 Health

The issue that was raised most frequently in the submission received was the potential impacts of increased dust on the health of the community. As stated previously, there is unlikely to be any significant increase in dust generated by the mine. Regardless of this, an assessment of the potential impact on the community's health was undertaken, and detailed in Section 10.8 of the EA. The analysis provides estimates of the increase in daily mortality due to emissions from the mine at the most affected receptor on the worst day. In addition estimates are provided on the increase in daily hospital admissions that could be expected from the most exposed individual due to emissions from the project on the worst day.

The increase in risk of daily mortality on the worst day in the life of the mine is estimated to be 1 in 16.3 million. This is a small risk. Increase in risk for hospital admission is also low.

The health risk from exposure to silica is also extremely low. Specific issues raised are discussed in more detail below.

5.11.1 Specific Health Investigation in the Area

The Health Risk Assessment contained in the EA relied on published data from Australia and overseas on the health effects of air pollutants and published data from the Department of Health on mortality and hospitalisation rates. As ACA noted there have also been studies undertaken which provide a Population Health Profile of the Central Coast NSW Division of General Practice. These studies currently show a slightly higher rate of asthma (about 3%) and a slightly lower rate of respiratory disease than the national average.

As no specific health studies with respect to dust impacts have been done in the Wong area, it is useful to review a study undertaken by NSW Health in the Hunter valley where dust impacts from open-cut mining would be potentially greater than those likely to be experienced due to W2CP.

Due to concerns that residents of the Hunter Valley, living in an area with a high number of open-cut coal mines and power stations, are at a greater risk of diseases, NSW Health recently completed an analysis of respiratory and cardiovascular diseases and cancer health data for the Hunter New England Health Area Service (NSW Health, 2010).

The statistically-based study covered a wide range of diseases, but focused on diseases and causes of death that are known to be associated with exposure to air pollutants. The study covered areas where the population would clearly be exposed to emissions from mining (e.g. Singleton and Muswellbrook and surrounding areas) and areas too far from mining (e.g. Tamworth, Armidale, etc.) to experience significant exposure from mining emissions. The study is based on a geographical analysis and does not make direct use of air quality data. This is because suitable data do not exist. However it is possible to categorise the geographic areas into areas where air quality is likely to be influenced by mining emissions and those not likely to be influenced by mining. For example Muswellbrook and Singleton are close to large open cut mines and are thus likely to be affected by mining emissions (as well as other emissions). Tamworth is not close to any large open cut mine(s) and therefore is not likely to be affected by mining emissions.

(Note: the report makes recommendations concerning the collection of air quality data that would address this matter and increase the sensitivity of study in its ability to assess the role of air pollution in causing heath effects.)

The study provides very interesting insights into the incidence of various categories of disease and the use of health services. The factors affecting the measures of health that are examined in the study are clearly complicated and it is difficult to

provide a brief summary of these findings, but some observations are pertinent. For example asthma is of concern to the community and the rates of asthma separation for hospitals in the area for the period 2004 to 2009 (see Figure 7 of the NSW Health report) show that the rate for Muswellbrook, which would be expected to be affected by mining emissions, is higher than the NSW average, but is lower than Liverpool Plains which would not be expected to be significantly affected by mining emissions. Singleton, which would be expected to be affected by mining emissions, experiences separation rates lower than Muswellbrook and lower than the NSW average. This is one of many interesting items of statistical information presented in the report. These types of findings undermine a hypothesis that mining emissions and the air pollution levels that exist in the study areas are leading to increased rates of asthma. It would of course still be appropriate to investigate whether mining emissions contribute to increased rates of asthma, but the data suggest that other factors appear to be more important. This single example illustrates the complexity of the issue.

From the information presented in the report it is reasonable to conclude that significant differences in the statistical measures of health are observed in the different areas studied. However, it is also reasonable to conclude that the data do not point to areas where mining takes place as having significantly different health outcomes compared with those where mining does not occur. The data appear to suggest that other factors that influence health (possibly lifestyle and population make up) and other factors including non-lifestyle factors, for example the way the different communities use the available health services, are more important than the presence or absence of open cut mines in determining the health statistics.

The report does not conclude that adverse health effects in this area are directly attributable to air pollutants generated from coal mining or coal-fired power generation. Further investigation is required to determine if there is a link between the air quality in the Hunter Region and increased risk of illness and death associated with this exposure.

The NSW DECCW is in the process of developing an air quality monitoring network in the Hunter Valley which will provide additional air quality monitoring data as input to these investigations to confirm if there is a link.

The Central Coast area also has particulate emissions from power stations which contribute to existing levels of air pollution. These are predominantly from tall stacks and are generally well dispersed. The significant coal mining activity is underground and the area is therefore not affected by fugitive dust sources to the same extent as the Hunter Valley. The ambient monitoring data indicates that levels of particulate matter are within air quality goals apart from occasions where bushfires and dust storms dominate. Limited monitoring data for PM2.5 indicates that long-term levels may be near the NEPM reporting standard, but this is also true of many regions in Australia.

It is important to note that (as discussed in Section 3.1 of the Air Quality Assessment), the health based criteria set by the NSW DECCW are based on studies undertaken in urban areas with large populations where there is higher exposure of air pollutants from combustion sources (that is, emissions from traffic fumes and

industrial sources). Combustion sources release air pollutants which are composed of fine particulates that contain acidic and carcinogenic substances which can be detrimental to a person's health. Particulate releases from mining activities contain a smaller faction of fine particulates and also a relatively less amount of acidic and carcinogenic substances.

During a review of US EPA air quality criteria, there was a general agreement that "*…coarse particulates in urban or industrial areas…tend to be inherently more toxic than the windblown crustal material which typically dominates coarse particle mass in arid rural areas.*" (US EPA, 2009).

It is relevant to note that the creation of fine particles from rocks and crustal materials requires the input of mechanical energy to break the larger material into smaller particles. The energy required is proportional to the surface area created. In practice, it is not possible to create ultrafine[18] particles by mechanical means.

Ultrafine particles and indeed much of the mass in the PM2.5 range is created via chemical processes e.g. combustion or chemical reactions involving the gases or ashes produced in combustion. Thus, mining does not cause the generation of dust in the ultra fine or even the PM2.5 size range. Typically, only 4 to 5% of the particles generated by mining operations are in the PM2.5 size range (SPCC, 1986).

The most recent US EPA Emission Factor equations for surface coal mines (see US EPA, 1998 – Table 11.9-2) recommended the following ratio for PM2.5:TSP emissions:

- Blasting 3%;
- Truck loading 1.9%;
- Bulldozing on coal 2.2%;
- Bulldozers on Overburden 10.5%;
- Dragline operations 1.7%;
- Grading 3.1%;
- Vehicle traffic – variable; and
- Wind erosion - no data.

It can be seen that these ratios are generally lower than those assumed in the current work, which uses the SPCC (1986) data. This suggests that the current study overestimates the PM2.5 concentrations and thus provides a conservative basis for assessing the effects of PM2.5 particles.

5.11.2 Health Risk of Predicted Exposure to Particulate Matter beyond Project Boundaries

NSW Health raised concerns about the extent of the predicted exposure to particulate matter, beyond the boundary of the Tooheys Road and Buttonderry sites and the health risk this could pose for nearby residents. The table of nearby residences is included to represent the closest and most affected residence in all direction. It was not intended to present prediction at all residences in the vicinity of the mine. The contour plots were included to provide that information.

[18] Please note, that technically, the term ultrafine particles refers to particles with equivalent aerodynamic diameters of 0.1 µm

The approach adopted in terms of compliance with DECCW air quality goal, was similar to that adopted for other coal mines as follows:

From the monitoring data available it has been assumed that the following conservative background concentrations would apply at the nearest receptors:

- Annual average TSP of 42 $\mu g/m^3$ (maximum measured in years not affected by bushfires)
- Annual average PM10 of 21 $\mu g/m^3$ (maximum measured in years not affected by bushfires)
- Annual average dust deposition of 2 g/m^2/month

In addition, the DECCW guidelines require an assessment against 24-hour PM10 concentrations. This assessment adopts the approach that the predicted 24-hour average PM10 concentration from the development should be less than 50 $\mu g/m^3$ at the nearest receptors. This approach assumes that best practice will be used to control dust from the mining activities.

In summary for long term averages, background was added to the predictions and for the short-term average, the prediction for the mine alone was used. This takes into account the fact that the PM10 emissions from mining operations are predominantly coarse particles with a low fraction (approximately 12%) of fine particles. A more detailed discussion of the composition of particles from mining dust and their health effects is provided in the response to ACA.

It is important to note that the assessment is conservative for the following reasons:

- The "busiest" day modelled represents about three times the average level of activity. This has been coupled with the worst-case dispersion conditions.

- The dispersion modelling took into account the emissions of particulate matter arising from the stockpiles and coal processing. Dust control measures were not applied in the modelling unless explicitly stated. For example, the modelling did not include the effect of water suppression on ROM and product stockpiles although this will be applied.

Table 12.8 in the EA refers to the predicted PM10 concentrations due to emission from the vent shaft. The values were based on predictions at the specific receptors with and without continuous background PM10 included in the modelling. The background PM10 data was taken from continuous hourly monitoring at Beresfield, contemporaneous with the meteorological data. The time of maximum predictions due to the vent alone can occur on a different day to the maximum predictions due to the vent plus background. The annual average is obtained by simply adding the prediction for the vent to the measured annual average, in this case assumed to be 21 ug/m^3.

The following tables reproduce the EA tables of measured dust concentration and deposition levels in the study area. They include in brackets to number of observations as a ratio of the total possible measurements for a year when a full

year of data was not available. This information was taken from the ERM reports (ERM, 2008, 2009).

Table 7. Measured TSP and PM_{10} concentrations at Tooheys Road and Buttonderry sites ($\mu g/m^3$)

YEAR	HVAS C	HVAS E	HVAS C		HVAS E	
	TSP	TSP	PM_{10}		PM_{10}	
	Annual Average	Annual Average	Annual Average	Maximum 24-hour	Annual Average	Maximum 24-hour
Goal	90 $\mu g/m^3$		30 $\mu g/m^3$	50 $\mu g/m^3$	30 $\mu g/m^3$	50 $\mu g/m^3$
1999	24* (11/61)	21* (9/61)	10* (11/61)	14*	9* (9/61)	14*
2000	20* (36/61)	26* (34/61)	11* (35/61)	30*	12* (31/61)	**66*[1]**
2001	27* (18/61)	30	12* (15/61)	33*	13	32
2002	64* (12/61)	61	**38* (10/61)**	**116*[2]**	24	**85[3]**
2003	29	42	12	44	21	49
2006/2007	16* (47/61)	22* (44/61)	21* (43/61)	48*[1]	31* (43/61)	**73*[4]**
2008	17* (51/61)	32* (55/61)	11* (47/61)	38*	17* (50/61)	**62*[1]**

[1] One exceedance during the annual period
[2] Four exceedances during the annual period
[3] Six exceedances during the annual period
[4] Two exceedances during the annual period
* Less than 12 months of data available

Table 8. Dust Deposition in the Study Area

Insoluble solids (g/m^2/month)										
Gauge	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2006-2007**	**2008**
D1			1.6* (2/12)	1.3	1.1* (2/12)	2.2* (6/12)	2.4* (10/12)	3.5* (1/12)	2.0* (11/12)	1.8* (11/12)
D3	1.2	0.8	0.8	0.9	0.8* (3/12)	1.6* (6/12)	1.5* (10/12)	1.6* (1/12)	2.1* (4/12)	1.0
D4	0.8	0.6	0.8	0.7	0.4				1.3* (1/12)	0.7
D5	1.1	0.5	0.6	0.7	0.9* (9/12)	0.8	1.0* (10/12)	0.8* (1/12)	1.1* (10/12)	0.8
D6	1.5	2.9	2.7	1.9	3.0* (3/12)	2.3* (6/12)	1.9* (10/12)	1.9* (1/12)		
D8			0.2* (2/12)	4.8	3.2* (9/12)	1.2	1.8* (10/12)	2.3* (1/12)	2.9* (10/12)	2.1* (3/12)
D10				1.0* (9/12)	2.3	1.9	0.9* (10/12)	1.7* (1/12)		
D11				1.4	2.3	2.9			2.8	2.2* (9/12)
D20	2.6	0.9	0.9	1.0	0.9* (11/12)	5.2* (6/12)	1.1* (9/12)	1.1* (1/12)		

*less than 12 months of data available

5.11.3 EA Uses Selective Summary of the Health Effects of Fine Particles

NSW Health claims that the Health Risk Assesses in the EA provided a selective summary of evidences showing health effects of fine particles. The range of effects discussed and references used are similar to those presented in the recent NSW Health study in the Hunter New England Health Service (NSW Health 2010). It is noted in this study that some of the risks of hospitalisation drawn from Australian studies (Simpson 2006 and 2006 and referenced in the WC2P HRA) are indicative only. NSW Health has also referenced studies by Moolgavkar et al which presented lower risk rates. To that extent the W2CP assessment is conservative.

As NSW Health notes, there are risks other than death and hospitalisation and these are also referred to in the W2CP HRA report. However these risks relate to exposure to PM_{10} in urban environments where PM2.5 makes up 40-50% of the PM_{10}. In the case of the W2CP, the proportion of $PM_{2.5}$ in the PM10 emission is 12% or less.

It is the case however, that exposure to particulate matter should be minimised and W2CP are committing to real time dust monitoring and a reactive strategy to manage dust to ensure best-practice control.

5.12 Location

The selection process for the location of the surface facilities was exhaustive and took into account regional environmental and planning strategies by complementing proposed future industrial and commercial development and conservation initiatives. A number of localities were considered and assessed in terms of the following important issues before the most appropriate sites were selected:

- Planning issues – including local and state government policies and strategies for the region;
- Conservation values;
- Existing infrastructure;
- Surrounding land uses;
- Location of nearby residences;
- Ability to provide rail access;
- Engineering elements;
- Compatibility with the requirements of the underground mine plan; and
- Economics.

Both the Tooheys Road and Buttonderry sites were selected following detailed consultation with and advice from Wyong Council. Although these locations were not ideal from an operational perspective, they were necessary in order to meet environmental and social requirements for the project. The separated facilities across two separate sites has resulted in the need to build one of the longest mine access tunnels in Australia to link the two sites.

5.13 Greenhouse Gases

Greenhouse gases and the link to climate change is an issue that has received a lot of attention in recent years. Concern was expressed in a number of submissions that coal is a major contributor to greenhouse gases. While it is generally accepted that burning of fossil fuels, such as coal is a contributing factor, the greenhouse gases produced from coal globally (mining and power generation) contribute around 25% to the enhanced greenhouse effect. Coal is just one of many sources of greenhouse gases generated by human activity. Others include oil and natural gas, agriculture, land clearing and waste disposal.

Section 12.10 of the EA discusses the effects of greenhouse gases produced from the W2CP, and concludes that there will be no measurable environmental effect due to the emissions of greenhouse gases from the Project, even when the customer's use of the coal is taken into account. Any environmental assessment would conclude that the effects of the emissions from the Project are unmeasurable.

NSW Health has estimated that the annual emissions will amount to 13.3 Mtpa CO2-e based on a 37 year project (longwall operations only) and a life of mine estimate of combined Scope1, 2 and 3 emissions of 361 Mtpa Co2-e reported in the EA in Table 12.11 in Section 9 (page 12-32).

- NSWH has miscalculated the annual emissions. Instead of dividing the 151 Mt life of mine extraction over 37 (assumed to be selected as years of longwall extraction), it has inadvertently used 27 years in the denominator instead to arrive at the 13.3 Mtpa CO2-e figure. If 37 was used it would amount to 9.77 Mtpa CO2-e instead of 13.3. However, W2CP contends that the appropriate extraction period for the whole of project should be 42 years given that coal extraction and transport will extend over almost that full period, which would provide an annual emission average of 8.61 Mtpa CO2-e.

- By using either 9.77 or 8.61 Mtpa CO2-e figures instead of the erroneous 13.3 figure, the project's annual average total Scope 1, 2 and 3 emissions would reduce from NSWH's figure of 2.4% of Australia's "total net global emissions" to either 1.7% or 1.5%. W2CP considers that NSWH's argument about extrapolating the effect of multiple W2CP projects is meaningless and ill-founded.

- NSWH has used the combined figures for Scope 1, 2 and 3 emissions sources when comparing with "Australia's total net global emissions" of carbon dioxide. However, as described in the EA, the majority of the product coal will be exported through the port of Newcastle to North Asia and other locations. There will be a proportion of product coal that is likely to be used for power generation in domestic power stations. Accordingly, the emissions profile has assumed the "worst case" emissions (Scope 3) by assuming that all coal is transported by rail all the way to Newcastle port and then shipped to North Asia. The assumption in the EA that all coal produced will be railed to Newcastle, shipped offshore transport and used in overseas power stations has provided the maximum total emissions for the assessment purposes. This total would be marginally reduced if coal is used for domestic power, and therefore avoiding international shipping transport and involving short rail haul distances.

- However, W2CP considers that it is incorrect to use the combined Scope 1, 2 and 3 emissions in a comparison with Australian domestic emissions. Using the information in Table 12.11 of the EA and assuming full export of product coal, the only relevant emission components that would be recorded with Australia's emissions inventory would be:

Greenhouse Element	Tonnes CO2-e
Diesel usage (Scope 1)	77,463
Electricity usage (Scope 2)	1,478,290
Coal extraction (Scope 1)	48,169,000
Transport by rail (Scope 2/3)	114,781
TOTAL life of project emissions	49,839,534
ANNUAL EMISSIONS (42 yrs project)	1,186,655.57 t (= 1.18 Mtpa)

- The annual domestic emission of 1.18 Mtpa CO2-e is the most relevant figure to compare against Australia's total net emissions, of which it represents **0.21%** (significantly different to the 2.4% figure used by NSWH).

- The EA report's assessment of emissions is based on "worst case" emission and mitigation assumptions. It does not include any provision for capture and utilisation of coal seam methane, a relatively potent greenhouse gas. However, the project has committed from the outset to seek to manage the waste coal mine methane gas and to develop appropriate capture and utilisation strategies. The EA describes that the project will involve controlled methane flaring in the initial years and then the utilisation of the methane by one of a number of realistic options ranging from onsite electricity production, provision as fuel to adjacent industrial facilities, provision to domestic reticulated gas supply or provision to domestic power stations such as Delta Electricity's Colongra Gas Turbine facility at Munmorah power station. Key gas supply pipeline infrastructure is located within and adjacent to the Tooheys Road surface facilities site to facilitate such gas utilisation options.

- When including the significant mitigation effects especially associated with methane capture and utilisation (including possible offsets due to replacement of higher emission coal-fired electricity generation), the actual emissions profile would be demonstrably reduced from that outlined in the EA report to as low as 0.1% of Australia's net emissions or even lower.

5.14 Project Justification

Submissions received queried the justification for the W2CP. The domestic and international need for a reliable supply of coal has been clearly established in the EA (refer to Sections 3.1 – 3.3).

A submission also suggested that the only benefit from the W2CP would be financial for the mine. While it is true that there would be some financial gain to the owners, it is the case with all developments and business enterprises that monetary benefits are a positive outcome in return for the risk taken. Nonetheless, as stated in the EA, there will be substantial economic injection into the local community through expenditure from the construction and operation of the mine (EA Section 10.6.1), increased local employment (EA Section 10.6.2), community enhancement and training programs (Section 10.13 of the EA), and a commitment from the WACJV to improve the existing waterways and conservation areas (EA Section 16.9).

5.15 EA Document

Objections to the W2CP were received based on the EA document itself, rather than the proposal presented. Responses to these submissions are provided below.

5.15.1 EA Coverage of Impacts on the Community

All aspects of assessment, both on the environment and the community detail the potential impact of the W2CP and how it will be managed to within acceptable levels.

The following Table provides a summary of direct references made in the EA document to specific impacts that are predicted, which may have an effect on members of the community.

Table 9. Summary of EA Document Detailing Impacts on the Community

Issue	Impact Summary	Section of EA
Subsidence impacts on houses	Degree of impact to houses	Table 6.1
	Number of houses expected to experience impact	Table 6.2
Flooding impacts on houses	Number of houses likely to experience a change in flooding risk	Table 9.1
	Degree of flooding impacts to houses	Table 9.2
Impact on Community Infrastructure	The ability of the existing infrastructure to support population growth that may be generated by the W2CP	Section 10.6.4
Impact on the health of the community	Health risk associated with dust particles	Section 10.9.1
	Health risk associated with noise emissions	Section 10.10
	Health risk associated with drinking water	Section 10.11
Noise Impacts	The increase in noise levels associated with the construction and operation	Section 11.3

Table 9. Summary of EA Document Detailing Impacts on the Community

	of the surface facilities	
Traffic	Impact of additional traffic movements	Section 11.1.4
	Impact on intersection performance	Section 11.1.6
Air Quality	Dust associated with the surface facilities construction	Section 12.5.1
	Dust associated with the mine operation	Section 12.5.2
Greenhouse Gas Emissions	GHG emissions associated with the project	Table 12.11
Visual Impact	Visual impact on residences located near the surface facilities	Section 15.1.6
	Passing visual impacts	Section 15.1.7
Tourism	The impact of the W2CP on the area as a tourist destination	Section 15.2.6
Land Use	The impact of the W2CP on existing land uses	Section 15.2.7

5.16 Archaeology and Heritage

The original archaeological investigation recommended that test excavations be carried out on Wallarah Creek which would be impacted by the rail loop at the Tooheys Road Site. DECCW requested details of this further work when available. A final draft report was prepared and reviewed by the Indigenous groups (the Darkingjung LALC and the Guringai Tribal Link Aboriginal Corporation - GTLAC) involved in the excavation work. The only comments received were those from GTLAC requesting revision in the descriptions given in the report to the names of the tribal groups using the Wyong and Gosford areas. This amendment was made to the report.

A summary of the findings of the test excavation program is provided below

5.16.1 Sub-surface Testing Near Wallarah Creek

The results of the sub-surface testing programme were reported in April 2010 and this report has been forwarded to DECCW. In summary:

- 60 pits were excavated exhibiting a very low frequency of artefacts and no pit displayed evidence of the existence of a site — even of low complexity.
- In total, only one tool was recorded, along with five un-retouched flakes and three broken, un-retouched flakes.
- There was, however, evidence of lithic manufacture in the area with one core-trimming element and four flakes identified as debitage recorded. While evidence

of lithic manufacture was present, its distribution was not concentrated and suggests random tool re-sharpening and isolated events rather than an occupational camp.
- All recorded artefacts (tool, flakes and debitage) only totalled 14 across the 60 excavation pits
- No pit displayed archaeological stratigraphy and no features were recorded.

Specifically, the test excavation confirmed that there is very low archaeological potential within the area investigated. While items of Indigenous heritage (i.e. artefacts) are present, the distribution and nature of these items suggest a random 'background' scatter, rather than the nearby presence of a site that would display intactness and complexity.

5.16.2 Spring Creek

No PAD was identified on Spring Creek, but rather it was noted as an area of archaeological sensitivity:

- No relics were located in this 100m wide band along (Spring) Creek, even where sheet and vehicle erosion gave reasonable ground surface exposure. Again this zone is not assessed as a Potential Archaeological Deposit (PAD), and it is noteworthy that at the location where the Rail Loop is to intersect this zone, there has been considerable disturbance and archaeological deposits, if present at all, are considered unlikely to be intact.

With direct reference to the proposed works and the assessed archaeologically sensitive zone along Spring Creek in the Tooheys Road study area:

- It was determined that a test excavation programme was not recommended for the other area of archaeological sensitivity at Spring Creek. This was due to the high degree of disturbance the north-eastern bank of the creek has suffered, where the landform was most conducive to retaining intact subsurface deposits. This disturbance is either from the previous construction of the rail line and bridge, or from the numerous vehicle tracks in the area. In particular, the track along the side of the north-eastern bank is heavily rutted from bogged vehicles. The south-western bank of Spring Creek is heavily eroded, in places quite steep and also criss-crossed with vehicle tracks, mostly from motocross bikes. As such it was assessed that there would be few places on the south-western bank that would have soil depth to preserve intact subsurface deposits.

- As any 'A' deposits of this zone within the impact footprint are unlikely to possess intact deposits, it is considered most appropriate for the Aboriginal community to monitor ground surface disturbing impacts of the construction in this area and collect / salvage artefacts, if indeed any are present.

These recommendations were included in the original heritage report (OzArk 2009 - surface facilities) that was sent to both Aboriginal community groups. Correspondence from the Darkinjung LALC (OzArk 2009, Surface facilities, Appendix 3: 14) specifically concurs with the OzArk recommendation that monitoring is the

most appropriate management for initial ground surface disturbing works at Spring Creek.

During the test excavation programme in March 2010, the monitoring of Spring Creek was again discussed with the DLALC and Guringai Tribal Aboriginal Corporation and both are aware that this will occur only once the project is approved and surface impacts in the area begin.

The need for monitoring of surface disturbance at Spring Creek by a qualified person is accepted as being a likely condition of approval in relation to cultural heritage for the W2CP.