

Clay Preshaw - Fwd: FW: Objection to planned Coal Seam Gas mining in Camden

From: Clay Preshaw
To: ALollbac@agl.com.au
Subject: Fwd: FW: Objection to planned Coal Seam Gas mining in Camden

Dear Mr Hazard and Mr Patterson,

I would like to raise an objection to the planned Coal Seam gas mining for the local Camden area.

I am a new resident in Gregory Hills having moved in September of 2011. Previously I have lived in EagleVale which is also close to these planned wells. When we bought our land in Gregory Hills we were never notified that there would be the possibility of CSG mining in our area. Having overlayed the maps I can see that the planned well CU02 is directly adjacent from Donovan Blvd and will be visible all the way along Gregory Hills Drive. This is less than 500 metres from my property!

You can view the planned wells here: http://scenichills.org.au/doc/V1_MainReport_pt08.pdf

I have grave fears for the resale value of my property and also the local environment should this submission be approved.

I am of the firm opinion that any activity of this nature should be kept as far away from existing and planned residential areas. Is our state not large enough to relocate these activities to a more remote area away from the general public?

Any minister who votes for or approves this kind of activity will certainly lose my vote in the next round of federal and state elections.

Please consider my objection when assessing this application.

Thank you for your time.

Kind Regards,
Andrew Cartledge
4 Lancaster St,
Gregory Hills NSW 2557
0430102508

Rok and Teresa Friscic,
And Jozo and Eva Bernatovic
Lot 3 Raby Road
Catherine Field NSW 2557

3 December 2010

Attention: Mr Clay Preshaw
NSW Department of Planning
23-33 Bridge Street
SYDNEY NSW 2000

plan_comment@planning.nsw.gov.au
cc clay.preshaw@planning.nsw.gov.au

Dear Sir

RE: **Camden Gas Project**
Northern Expansion – Stage 3
and our Property Lot 3 Raby Road, Catherine Field

We wish to submit to the Department that approval of the Environmental assessment currently on display **IS NOT GRANTED**.

As property owners who are directly affected by the proposal, we should have been consulted and the proposal discussed in detail. We refer you to the following quotes throughout the document which are incorrect:

1. Clause 6.4 Table 6-5. Summary of landowner consultation

Landowner		Details of Consultation	Issues Raised
Landowners General	–	Letters sent to directly affected landowners providing project information and updates throughout the process.	Various issues were raised with regard to well surface location resulting in agreed final locations for the environmental assessment.

Neither ourselves nor our neighbours have ever received any communication written or verbal from the Gas Company or its consultants.

2. Clause 8.3 Potential Impacts

This clause states "..... as existing and future planned land use is one of the key considerations in the siting of the infrastructure, well surface locations have been chosen in consultation with landowners and negotiations with landowners are ongoing."

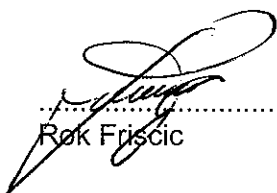
"The potential impacts discussed outline compatibility concerns with future urban (residential, commercial and industrial) development with the Surface Project Area due to the proposed surface infrastructure works within this area. However, given the approach taken to the siting of infrastructure, the extensive consultation undertaken with relevant stakeholders and the success of previous stages of the CGP, these potential impacts are expected to be generally minor and manageable through the implementation of recommended mitigation measures".

As previously stated there has been no communication either written or verbal with ourselves or our neighbours.

As can be seen from our comments, we have not been given the opportunity to assess the impact that the proposed works and infrastructure will have on our property. In particular, if the infrastructure is placed in the wrong location it will have a severe impact on any potential future development of the property.

We, therefore, object to any works being carried out on our property unless we are fully consulted and in agreement with the proposal.

Signed at Catherine Field this 3rd day of December 2010.




.....
Rok Friscic



.....
Teresa Friscic



.....
Jozo Bernatovic



.....
Eva Bernatovic

Frank and Maria Galluzzo,
Samuel Galluzzo and
Vince and Elizabeth Piscineri
C/- PO Box 121
Liverpool BC NSW 1871

3 December 2010

Attention: Mr Clay Preshaw
NSW Department of Planning
23-33 Bridge Street
SYDNEY NSW 2000

plan_comment@planning.nsw.gov.au
cc clay.preshaw@planning.nsw.gov.au

Dear Sir

RE: **Camden Gas Project**
Northern Expansion – Stage 3
and our Property Lots 1/4 SP.36786 Raby Road, Catherine Field

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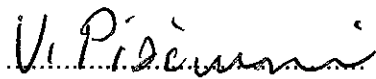
Frank Galluzzo



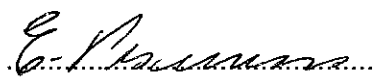
Maria Galluzzo



Samuel Galluzzo



Vincenzo Piscineri



Elizabeth Piscineri

From: "Karen Henry" <karenhenry@iinet.net.au>
To: <clay.preshaw@planning.nsw.gov.au>
Date: 7/12/2010 12:34 pm
Subject: AGL - Varroville - submission

Dear Clay,

I am writing to you about our concerns in regards to the AGL Northern Expansion of the Camden Gas Project to which we must stress our strong OBJECTION!

To begin with being we are adjoining land owners - Lot 2DP 845124 Glensaugh Pty Ltd to the proposed WELL 07 and have not to this stage been contacted in regards to this proposal during the consultative process. We had only just learned of this proposal through other adjoining property owners the nuns.

In Varroville, which is a rural area, we not have the privilege of having local newspapers delivered and generally there are also no local papers left at the newsagency, so we were not even made aware through the media as to what was happening. This is absolutely appalling to think we are an adjoining land owner and not consulted in some way.

We have just been to council today and looked at the full proposal. We note that other adjoining property owners were notified: The Serbian School but we were not.

There are a number of issues we are concerned with that bring us to our total objection of this project within the scenic hills.

We are concerned about the nature of what the impact of this is going to have on our land given it is so close. The concerns about the long-term sterilisation of this land and the impact that implies - decreased land value!

We are also gravely concerned about contamination due to off-runs into the creeks, streams and land. The people around this area rely on the dam's water supply which is where WELL 11 is to be built. So our concerns are doubled in this respect. The impact of possible interrupted supplies, the

possibility of contamination and also the long-term impact on the soil. There is also the concern to do with our livestock that rely on the pastures to graze and also which drink from the creeks, streams, dams and the like which may well become contaminated if AGL's proposal is to go ahead. What impact does or would this have on the cattle: deaths, lower birth rates. What about the meat of these cattle, as these cattle go off to market and end up on our plates. so many unanswered questions in regards to this matter. What impact does it have on us if our drinking water becomes contaminated through run-off from WELL 11 into the water race?

There is also grave concern for other wildlife in the area which consists of koalas and the black wallaby which I believe is endangered!!!

There's also the impact of emission from these wells to be considered. We chose to have a rural lifestyle for a reason, not to be sitting next to something that will create pollution in one form or another.

The Scenic Hills is a protected area, and is so for a reason. It is basically the last truly beautiful natural part of the Campbelltown district. Lush rolling hills which are home to a few lucky people and much flora and fauna - some of which I believe are endangered. We have lived in Varroville since 1972 and wouldn't live anywhere else but now AGL is coming along and proposing to put an eyesore smack bang in the middle of it which is potentially dangerous to flora, fauna and life itself. Chemicals being leached into the groundwater some of which are highly toxic! Further erosion of the land. Noise pollution. Emissions. The total opposite of what this stretch of land is all about. This area is about preservation not destruction.

Also in close proximity we have two schools - one still in the process of being built. One school will be relying on the same water supply as us which is the dam where WELL 11 is to be located. This is just not acceptable!

AGL needs to reconsider its project placement and look for other opportunities outside of this protected zone of the Scenic Hills. Having AGL come in and set up shop will set the precedence for this area to become 'unprotected', therefore destroyed. Having just the proposal in place has already devalued our block of land adjoining.

I would urge that the state government looks into this very carefully and knocks this project for Varroville on the head.

Yours Sincerely

Karen Henry

Helen Henry

06 December 2010

Our Ref: 06015: D&AI

Director General
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Dear Sir,

Proposed Stage 3 Expansion: Camden Gas Project. Application No. 09-0048

I write on behalf of D and A.I. Pty Ltd with regard to the proposed Stage 3 Expansion of the Camden Gas Project currently in exhibition. D and A.I. is the registered owner of property at 1100 – 1150 Camden Valley Way, Leppington (Lot 1 in DP301830, Lot 2 in DP 650698 and Lot B in DP 418632). D and A.I. wishes to make a submission on the proposed development. A Political Donation Disclosure accompanies this submission.

The location of the property is indicated on the attached plan (**Attachment 1**). It adjoins the proposed surface Well "W11" in the proposed Expansion and part of the 200 metre buffer of the well encroaches into the property.

D and A.I. Pty Ltd has reviewed the documentation describing the proposed development, and specifically the Environmental Assessment prepared by Aecom.

D and A.I. Pty Ltd wishes to object to the proposed siting of Well W11 and its buffer zone and requests that Well W11 and its buffer zone be relocated further east and / or north east away from the D and A.I. owned property.

The grounds for the objection and request that Well 'W11' be relocated east are as follows:

1. Insufficient Consideration in Environmental Assessment of Future Use of Property

While the property is currently rural in nature and zoning, this is not expected to be the long term character and use of the land. The property is the only parcel on the east side of Camden Way that is not identified for urban use and its retention for rural use is illogical in this context.

D and A.I. Pty Ltd has commenced steps to, and will be actively pursuing, the rezoning of the property for urban use in the near future. It is highly likely that the property will be rezoned for urban purposes during the proposed 15+ year life of the well.

The Environmental Assessment notes in Chapter 8 that the configuration of the proposed development has considered future urban development. However it is not included or recognised the D and A.I. property in this consideration. The Environmental Assessment does not consider the potential of the property for future urban use. Its future urban potential is obvious from Figure 11 in the Environmental Assessment (reproduced and attached to this submission – **Attachment 2**).

Therefore insufficient consideration has been given to the potential impacts of the siting of the proposed Well W11 and its buffer on environmental values and amenity of future uses within the property.

2. Sterilisation of Land for Future Uses

The location of the 200 metre radius buffer from Well W11 significantly encroaches into the D and A.I. owned property (see plan in **Attachment 1**). In light of the comments above, regarding D and A.I.'s future intentions for the land, it is unreasonable and inappropriate that Well W11 be sited so as to sterilise the future use of the property.

3. No certainty Regarding Minimal Environmental and Amenity Impact of Operation of Well W11

The Directors of D and A.I. Pty Ltd were invited by representatives of the Camden Gas project to inspect a surface well in its existing project area in 2010 as part of the Project's consultation for the Environmental Assessment.

The observations by the Directors of the operation of the well noted significant noise and disturbance by gas flares that characterised the operation.

Furthermore, The Environmental Assessment appears to give only cursory consideration to the impacts of Fracturing on the grounds of the depth of these actions. Only minor discussion is provided on impacts of vibration and subsidence on surface land uses and no details are provided regarding frequency and duration of fracturing.

In light of the potential future residential nature of the property D and A.I. considers that the proposed location of well W11 is inappropriate. Furthermore, impacts of Fracturing on future land uses are unknown.

It is possible that dwellings may be located in close proximity to Well W11 and dwellings may suffer from noise and general amenity impact. The Environmental Assessment does not consider this potential situation. While we note the comments in the Environmental Assessment that wells are located in other areas close to residential development, the comments do not provide any details on measures to address these impacts and it is not known whether such impacts have been addressed in these other situations, or incorporated into the design of Well W11.

Therefore there is no confidence that operation, design or construction measures to protect future amenity from noise and disturbance will be included in the development of W11. It is appropriate that the precautionary principle be therefore adopted.

4. Unnecessary Siting of Well W11 in close proximity to D and A.I. property.

We note the apparent flexibility in location of wells, from our interpretation of the comments in the Environmental Assessment and Environmental Assessment Scoping Report. Therefore, we see no need for the well to be located so close to the D and A.I. property and the buffer zone to encroach into the property.

You will note from the enclosed plans in Attachments 1 and 2 that considerable undeveloped land exists to the north and north east of the property, much of which is treed. It is unlikely that the trees will be removed in their entirety in the future. The trees have the potential to provide an efficient buffer to the impacts generated by the operation of the well. Furthermore, this area is easily accessible via the unmade St Andrews Road (the road reserve for which is cleared and currently trafficable by 4WD).

Summary and Conclusion

In conclusion, while D and A.I. Pty Ltd has no objection to the proposed development per se, it objects to the siting of well W11 in close proximity to its property and objects to the siting of the buffer zone for Well W11 in its property.

It requests that well W11 be relocated further east / north east to a more appropriate location that removes the buffer zone and any potential impacts to its property.

If you have any queries please contact me in the first instance.

Yours faithfully

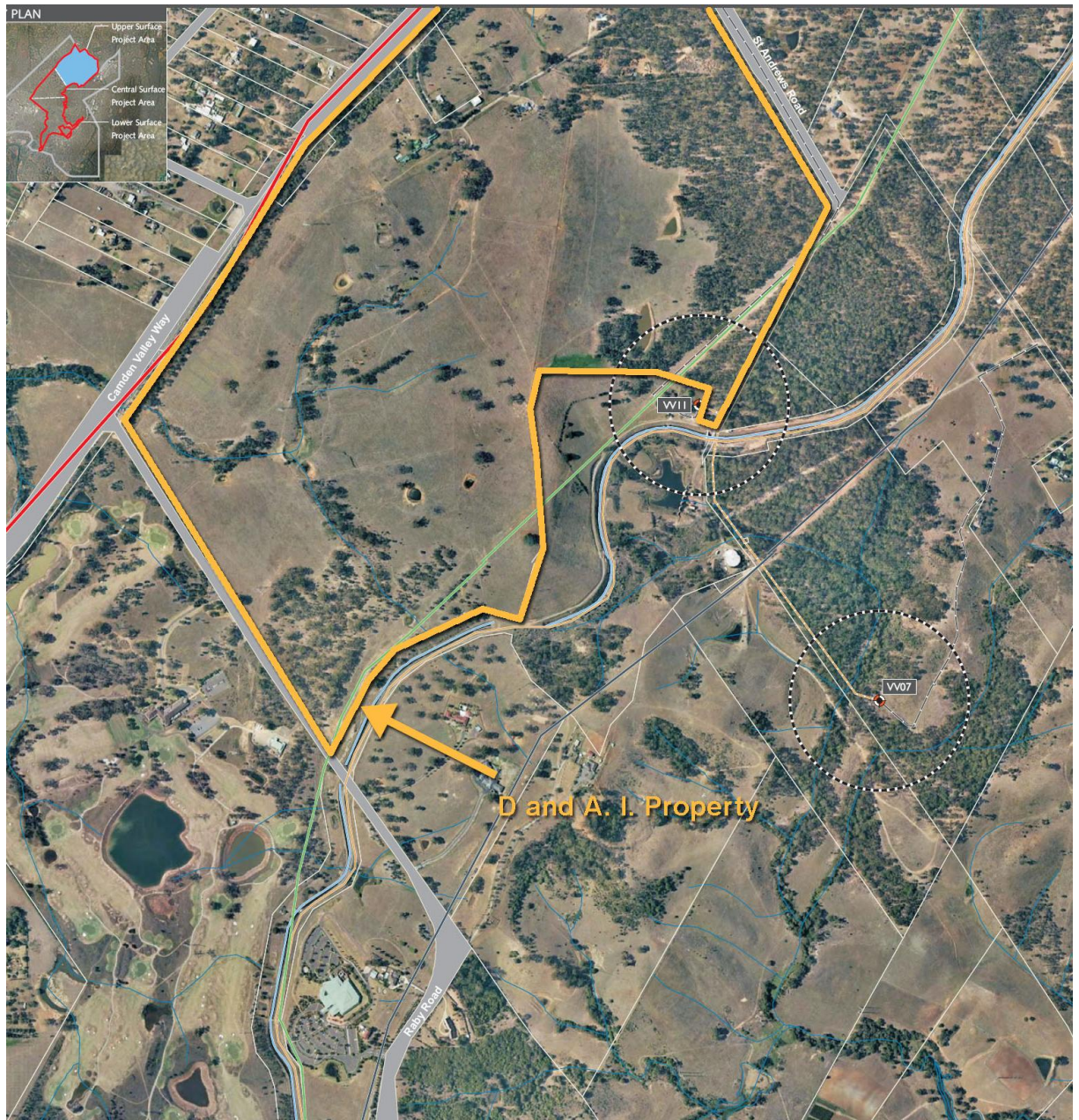
INSPIRE URBAN DESIGN & PLANNING PTY LTD

A handwritten signature in black ink, appearing to read 'S. McMahon', with a long horizontal flourish extending to the right.

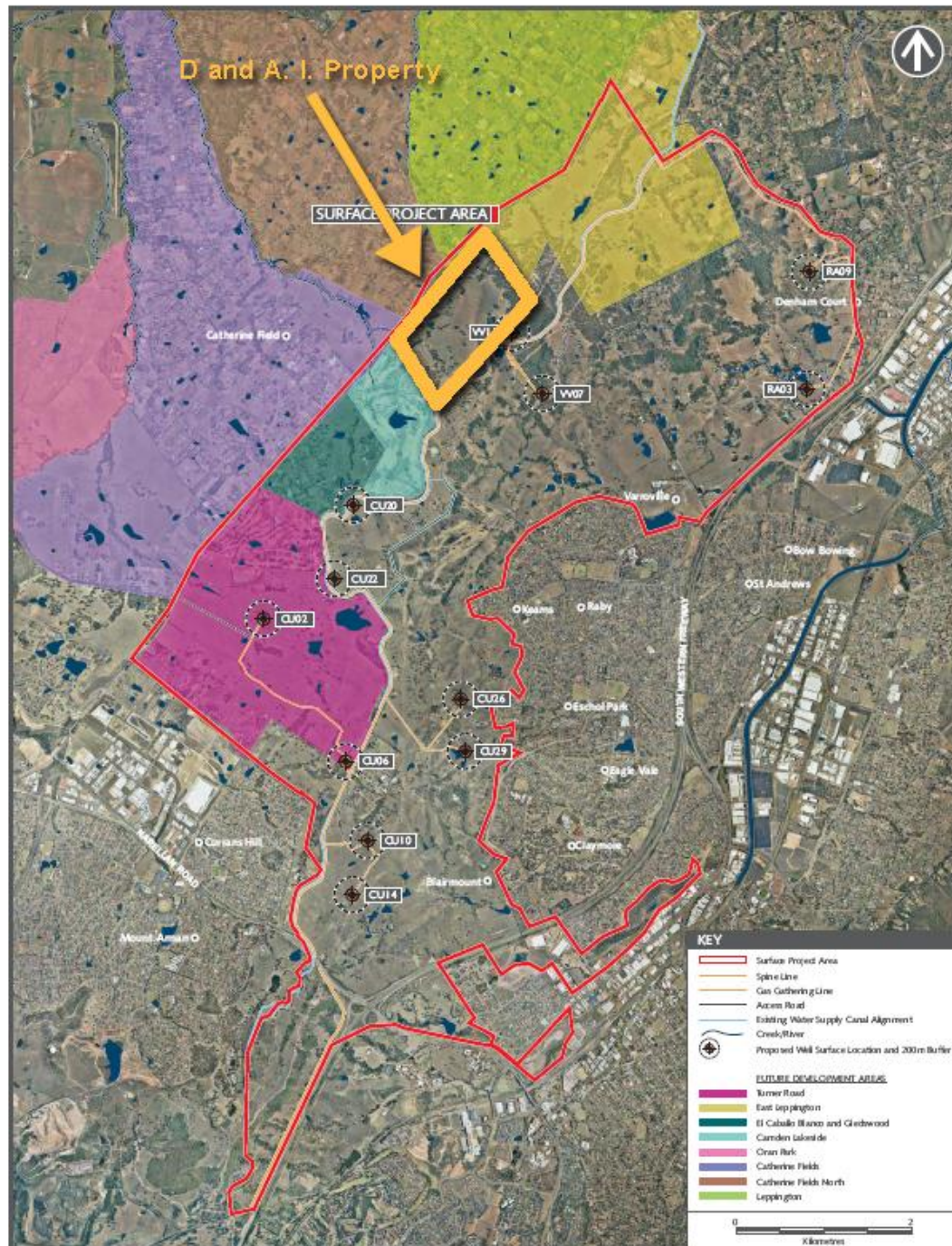
Stephen McMahon
Director

CC: D&AI Pty Ltd

Attachment 1: Location of D and A.I. Pty Ltd property and Proposed Well W11
(adapted from Figure 8 of Environmental Assessment)



**Attachment 2: Location of D and A.I. Pty Ltd property in Figure 11 of
Environmental Assessment**



AECOM

LAND USE CONTEXT
Environmental Assessment
Camden Gas Project Northern Expansion

Figure 11

Political Donations Disclosure Statement to Minister or the Director-General

If you are required under section 147(3) of the Environmental Planning and Assessment Act 1979 to disclose any political donations (see Page 1 for details), please fill in this form and sign below.

Disclosure statement details

Name of person making this disclosure
David Hazlett (Director, Cameron Brae Pty Ltd) & Arnold Vitocco (Director Vaste Develoments Pty Ltd), Joint Directors D and AI Pty Ltd

Planning application reference (e.g. DA number, planning application title or reference, property address or other description)
Camden Gas Project DA 09-0048

Your interest in the planning application (circle relevant option below)

You are the APPLICANT **YES** **NO** **OR** You are a PERSON MAKING A SUBMISSION IN RELATION TO AN APPLICATION **YES** / **NO**

Reportable political donations made by person making this declaration or by other relevant persons

- * State below any reportable political donations **you have made** over the 'relevant period' (see glossary on page 2). If the donation was made by an entity (and not by you as an individual) include the Australian Business Number (ABN).
- * If you are the **applicant** of a relevant planning application state below any reportable political donations that you know, or ought reasonably to know, were made by any persons with a financial interest in the planning application, OR
- * If you are a **person making a submission** in relation to an application, state below any reportable political donations that you know, or ought reasonably to know, were made by an associate.

Name of donor (or ABN if an entity)	Donor's residential address or entity's registered address or other official office of the donor	Name of party or person for whose benefit the donation was made	Date donation made	Amount/ value of donation
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Labor, Nathan Rees ³	29/01/2009 ⁴	\$500.00 ⁵
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Liberals, Barry O'Farrell ³	27/02/2009 ⁴	\$312.50 ⁵
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Labor, Nathan Rees ³	23/03/2009 ⁴	200.00 ⁵
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Liberals, Nick Berman – Hornsby Mayor ³	23/06/2009 ⁴	150.00 ⁵
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Labor, Aaron Rule – Campbelltown Mayor ³	02/07/2009 ⁴	163.64 ⁵
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Labor, Chris Hayes Member for Werrima ³	09/11/2009 ⁴	1000.00 ⁵
Donation ¹	Cameron Brae Pty Ltd, PO Box 373 Narellan NSW 2567 ²	NSW Labor, Macquarie Fields State Election Campaign ³	18/03/2010 ⁴	500.00 ⁵

Vaste Developments Pty Ltd

CHK DRAWN	PAID TO	FOR	AMT	FUNCTION
27/02/2009	LIBERAL PARTY Barry O'Farrell	LIBERAL	\$312.50	DINNER WITH BARRY O'FARRELL 26/03/2009
10/07/2009	LIBERAL PARTY Barry O'Farrell	LIBERAL	\$650.00	B'FAST WITH BARRY O'FARRELL 29/07/2009
17/08/2009	LIBERAL PARTY Barry O'Farrell	LIBERAL	\$1,500.00	KU-RING-GAI BUS B'FAST 3/09/2009

Please list all reportable political donations—additional space is provided overleaf if required

By signing below, I/we hereby declare that all information contained within this statement is accurate at the time of signing.

Signature(s) and Date

Name(s)

DAVID HAZLETT

ARNOLD VITOCO

05 December 2010

Dear Mr. Preshaw

We are writing to you to object to AGL's, Camden Gas Project, Stage 3 of it's Northern Expansion plans and developments (as well as that of Stages 1 and 2). Unfortunately we need to use our daughter's email address as we do not have a computer of our own and we were not able to find another contact address to which we could send a letter.

It has recently come to our attention that our property will fall within the 'Subsurface Project Area' for Stage 3. Our home is located at 25 Gordon Avenue, Ingleburn NSW 2565. There are two clusters of wells at Denham Court which are nearest to us, RA09 and RA03 which are of special concern, however each of the other drill sites and wells, namely W11, W07, CU20; CU22; CU02; CU26; CU29; CU06; CU10; CU14 within the Northern Expansion allocation to date, are also of significant concern and to which we wish to lodge an official objection.

Our concerns relate to the risk of:

- Land subsidence and the resulting damage to the structure of our home, garage, driveway and garden;
- Methane leaks which result from the process of hydraulic fracturing, thus the contamination of our air;
- The fracking process, cracking or breaking our water pipes and thus contaminating our drinking water (as well as aquifers, watercourses and potentially ocean);
- The contamination of our soil;
- The contamination of our food;
- The contaminated water which also results from the processes of hydraulic fracturing and it's required storage;
- All resulting detrimental effects to ill health to humans and animals, caused by all facets of the industry's operations;
- Explosion;
- We object that the AGL gas treatment plant application had been accepted for the Rosalind Park Gas Plant at Menangle despite the fact that that the Department of Planning knew it was not fully specified and we are concerned that AGL may later seek a modification to reinstate its gas treatment plant to the original location in Ingleburn, once the Stage 3 wells have been drilled;
- The reduction in the value of our property and the surrounding area;
- Any other effects caused by all and/or any facets of the industry's operations which have not thus far, been mentioned above.

We also object to the fact that we are being used as 'guinea pigs'.

Yours faithfully

Marta and Izidor Karbic



"VARRO VILLE" CIRCA 1859

12th January 2011

Mr. Clay Preshaw
Major Projects Assessment
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Re: Camden Gas Project (CGP) Stage 3 (Northern Expansion) – submission from Owners of Varro Ville House

Dear Mr Preshaw:

Thank you for granting us an extension of time for making our submission. We note your suggestion by phone and email (December 7th 2010) that, in order to ensure that AGL Energy Limited (AGL) has time to respond to our submission, we get this in as early as possible (preferably by mid January). However we reiterate the statement we made in our letter to you of November 11th 2010 that the unfortunate timing of the public exhibition period has caused us considerable problems in conducting/commissioning the research required to make our case for the potential damage we believe this project may cause to this historically important colonial landscape, the environmental protection zone and our house. We also reiterate that, irrespective of the truth of the matter, we are not alone in the community in regarding with a great deal of scepticism, the timing of the public exhibition period so close to the year's major holiday period and a determination due just before the next NSW election (irrespective of when AGL first lodged an application). We note that the imbalance between serving AGL's needs/interests (as a corporate entity) and those of the community is indicative of a problem that is surfacing all over Australia but particularly in NSW, and that there is unseemly haste being attached to this project given the problems currently being identified by a number of groups, individuals and organisations in the community. We can only hope that the NSW Department of Planning (DoP) will redress this imbalance in its consideration of the issues raised by the community for project determination.

Our submission

My husband and I are the owners of the heritage-listed Varro Ville House situated in the Scenic Hills Environmental Protection (Scenic) zone in the Campbelltown Local Government Area (LGA) where up to 36 of the 72 wells are planned for this stage of the project. The Environmental Assessment (EA) for Stage 3 of the CGP includes Varro Ville House in its "Historic Cultural Heritage Assessment (Appendix J)"¹ providing only a 'potted history' (with mistakes) and arriving at the conclusion that it will not be impacted by the development. **We disagree.** The EA, with its focus on the *Surface Project Area* and its *development envelopes* is, in our

¹ It was apparently excluded from the draft EA and is only included here at the insistence of Campbelltown City Council ("Council").

opinion, limiting and methodologically flawed. While the EA notes the importance of the house in terms of its heritage listings (National, State, Local and the National Trust²), it 'fails to understand the importance of *context* for historic properties and the complex interrelationship of such properties with their environment. We contend that drilling and gas extraction in the *subsurface* as well as the *surface* area, and both inside and beyond the *development envelopes*, risks the long term survival of the house via its potential adverse impact on the agricultural and estate features of the surrounding Varro Ville estate, which in turn relies on the viability of the protected rural heritage landscape of the Scenic Hills Environmental Protection area. We further contend that the property (house and estate) is far more significant than indicated in the EA.

The Importance of Varro Ville and its setting in the Scenic Hills

Varro Ville House sits at the centre of a largely intact 1810 colonial estate originally of 1000 acres (approximately 800 remaining) that is wholly contained within the Environmental Protection zone of the Scenic Hills. Though now unfortunately separated by subdivision, the estate and the Hills provide the context and landscape setting for Varro Ville House, without which it cannot be meaningfully interpreted. The estate was owned by a succession of people important to the establishment of Australia and beyond, including the original grantee Dr. Robert Townson (Doctor of Civil Laws and the colony's most educated man when he arrived in 1807 - today appreciated more in Europe than in Australia), Captain Charles Sturt, the famous Australian explorer who made Varro Ville a model of water conservation (which he continued to tout in his public speeches), Judge Alfred Cheeke (Supreme Court) who, at Varro Ville, trained and bred the horse "Clove" that won the first recorded AJC Derby in 1865, and James Raymond, the first Postmaster General of the Colony of NSW who established a "world first" when he introduced pre-paid postage in 1838. Contrary to what is reported in the EA, the current house is the third house on the property built under the ownership of Judge Cheeke in 1859. Other agricultural and estate features relate to previous owners and are critical to the preservation and interpretation of Varro Ville's historical development. Little would be left of prior owner's role in this were these features to be destroyed or compromised.

Varro Ville House and its surrounding agricultural and estate features have been the subject of/featured in numerous reports and writings, including:

1. Orwell & Peter Phillips Architects, "*Conservation Policy Report: Varroville, St. Andrews Road, Minto*" May 1992 (commission by the National Trust of Australia [NSW]), and
2. Colleen Morris and Geoffrey Britton, "*Colonial Landscapes of the Cumberland Plain and Camden, NSW: A Survey of selected pre-1860 Cultural Landscapes from Wollondilly to Hawkesbury LGA*", National Trust, 2000 (commissioned by the NSW Heritage Council and prepared by the National Trust of Australia, NSW, in 2000);
3. *Landscape Analysis* by Geoffrey Britton for Draft Curtilage Study 2007 commissioned by the current owners of Varro Ville House. This report that has not yet been finalised³.

All these reports agree that the cultural significance of the house is bound up with the agricultural and estate features associated with it but which currently do not form part of the house lot.

² The National Trust has a special relationship with the house. As a former owner, it incorporated covenants into the Sales Contract based on its own heritage reports, obliging future owners to restore and maintain the house to a specified standard. This is additional information to that included in the EA.

³ Geoffrey Britton is also co-author of the study referred to in point 2 (footnote 4, below). The third report identified a deliberate landscape park intention in the surrounding land associated with Varro Ville House.

The importance of preserving the surrounding land also relates to the increasing rarity of rural heritage landscape in the Cow Pastures area - landscape that reminded early settlers of the rolling English downs and fuelled the myths that gave the area its name⁴. In the groundbreaking report jointly commissioned in 2000 by the NSW Heritage Council and the National Trust, the authors stated "An overriding consideration for this entire study is that there remain within the Cumberland Plain and nearby areas, rural landscapes and landscape features of cultural value on account of their ability to demonstrate important aspects of early European occupation – gardens, vineyards, orchards, paddocks, fences, cemeteries, grant areas, windbreaks and accessways... These early colonial landscapes are, collectively of *exceptional significance* [my italics] for their ability to demonstrate the interaction of the early European settlers with the Australian landscape..."⁵ The authors noted about Varro Ville: "[It]...is one of the few estates remaining in the Campbelltown area where the form of the original grant and the former agricultural use of the estate is still appreciable to any great extent."⁶

Many of the historic estates in the area that were included in the Morris & Britton report are being subsumed and lost forever to development in the South West Growth Centre, including many that featured in Hardy Wilson's, *The Cow Pasture Road* (Art in Australia, Sydney, 1920)⁷. Fortunately, and until now, the Varro Ville estate and its Scenic Hills landscape setting have been protected by the Environmental Protection zoning of the Campbelltown Local Environment Plan (LEP) - District 8 (Central Hills Lands) which has limited development, preserved the rural heritage landscape and associated bushland, and banned inappropriate land use including mining.

Previously when this zoning was threatened by attempts to change the land use (most recently 2004 and 2007), the Heritage Office of the NSW Department of Planning (DoP) wrote to Council urging it to retain the zoning to protect Varro Ville. In 2007, when land developers the Cornish Group started proceedings with Council to rezone the Varro Ville estate for a business park, the Executive Director of the Heritage Office (DoP) wrote to Campbelltown Council (April 28th) reiterating the DoP's previously written view (2004) of the superior protective capacity of the Environmental Protection zoning in protecting Varro Ville and its landscape setting. In its meeting of November 13th 2007, Council confirmed the DoP's view and reaffirmed its commitment to the Scenic Hills by rejecting the Cornish proposal in order to preserve the area for future generations to enjoy.

In its meeting of December 14th 2010, Council also rejected AGL's CGP Stage 3 EA and Project Application, noting, amongst other concerns, damage to the cultural and natural values of the Scenic Hills. Were the DoP to override Council's commitment to the zoning and allow AGL to extend its CGP into the Scenic Hills Protection zone, we believe it would represent a significant contradiction of the importance the DoP has previously placed on the preservation of the zoning, ignore the advice it has previously provided to Council, and signal a significant deterioration in its regard for important NSW heritage.

⁴ The Cow Pasture Road takes its name from an incident occurring within the first years of the colony. In 1788, Captain Arthur Phillip had brought with him on the HMS Sirius, a herd of cattle (two bulls and seven cows). Disastrously, these cattle strayed within five months and despite an extensive search were not found until seven years later, grazing contentedly on open pasture near the Nepean River and now numbering sixty one. As it was presumed that the cattle had understood how to choose the best pasture for themselves, they were left to graze there and were protected by future governors. Not surprisingly, early colonists followed their example and set up their early pastoral holdings in the area – of which Varroville is one. (Note: The specific detail of the above incident varies according to the source but is correct in its overall direction.)

⁵ Colleen Morris and Geoffrey Britton, *ibid*, p.4.

⁶ Colleen Morris and Geoffrey Britton, *ibid*, p. 97.

⁷ Varro Ville was featured in this book with reference to the James Raymond era of ownership.

How the CGP Stage 3 risks damaging the agricultural and estate features of the Varro Ville estate, and threatens the survival of the Scenic Hills

A key feature of the Varro Ville estate is the water conservation system established by the explorer Charles Sturt during his ownership of the property over the three years from 1837 to 1839. Sturt later, in his official capacity as Assistant Commissioner of Lands in South Australia, championed the cause of water conservation, referencing Varro Ville as a model of this practice. "On my farm at Varroville, until labour and skill were exerted, one only of many channels held water, and that was brackish. When I passed that farm, every paddock had its proper water-hole. In a severe drought I not only fed 180 head of stock on 1,000 acres (of which 350 were under cultivation), but I permitted nineteen families to supply themselves from my tanks. We must resort to the same means here..."⁸.

Landscape analysis⁹ has established that dams across the Varro Ville estate were likely established by Sturt - some still in their original form, others since widened. Those visible from the house are likely to have been originally established by Sturt (given the natural catchment feeding them) but have since (along with the stands of remnant 19th century Cumberland Plain Woodland) become part of a landscape park around the house that is more probably the work of William Weaver, the Colonial Architect (after Edmund Blackett) who designed the current Varro Ville House in 1859¹⁰. The house was designed as a 'house in landscape' with over-proportioned windows to take in the views. The latter dams are in important view lines from Varro Ville House and are important to birdlife on the property and the Scenic Hills generally. Sturt noted the need for these dams given the 'brackishness' of the natural waterways (probably Bunbury Curran Creek), suggesting that his dams were salt free.

We are deeply concerned that CGP Stage 3 will damage these dams. Concerns about water depletion and contamination are being raised in relation to coal seam gas mining (and the controversial use of hydrofracturing) in other areas but are yet to be fully investigated. The lack of environmental monitoring (with no baseline data being collected at the outset) has allowed mining companies (including AGL) to attribute saltiness (among other pollutants) and water depletion to other factors. We deplore this state of affairs. We especially note the Position Statement published by the National Water Commission on December 10th 2010 warning of the potential for irreparable damage to surface and ground water systems from coal seam gas mining. We further note that Campbelltown Council sought specialist advice in regard to the adequacy of the level of detail and extent of assessment of groundwater related impacts associated with the project application. Council wrote in its submission to the DoP, "The conclusion by AGL in its response [to concerns raised by Council in response to AGL's draft EA] that '*increases in surface salinity are not expected, as impact to shallow aquifers is not anticipated*' is not supported based on the...deficiencies in the EA and its generic nature."¹¹ Similar conclusions were arrived at on other water related issues.

Our own discussions with AGL support Council's view. As a member of the Scenic Hills Association (SHA), I was recently invited to sit on AGL's CGP Community Consultative Committee. My first, and only, attendance was at its meeting of November 25th 2010 where AGL's Head of Gas Operations, Mike Roy gave a presentation on AGL's use of hydrofracturing

⁸ Quoted in Mrs Napier Sturt, *Life of Charles Sturt*, Elder & Co., London, 1899, p.193.

⁹ *Landscape Analysis* by Geoffrey Britton for Draft Curtilage Study 2007 commissioned by the current owners of Varro Ville House.

¹⁰ There is evidence that the estate (outbuildings, drive etc.) had a major make-over at this time.

¹¹ *Submission on the Environmental Assessment for Stage 3 of the Camden Gas Project*, Campbelltown City Council, December 14th 2010.

and related water issues¹². I have also attended two private meetings between representatives of AGL and SHA¹³. During these meetings I requested information relating to potential impacts on the Sturt dams and water storage systems in the Scenic Hills generally. AGL was unable to answer these questions with any specific information as it admitted that it had not yet done an hydrology/hydrogeology study but intended to do so after project approval. This is not acceptable. The community cannot be expected to comment on an EA that does not provide an assessment of potential surface and groundwater impacts and the adequacy of water management. Given that this is a key concern being voiced by environmental engineers elsewhere (and notably the National Water Commission) this deficiency is enough to reject the EA and AGL's project application, since the results of such a study could responsibly and reasonably result in a decision not to proceed with the project (though clearly this is not a consideration of AGL's approach).

As further support for our view, on Friday December 10th 2010 we met with AGL staff, Adam Lollback (Lands & Approvals Manager, Upstream Gas), and John Ross, AGL's recently appointed hydrogeologist. In that discussion I tabled that it was apparently the practice of early settlers to use aboriginal knowledge of natural springs in establishing their 'water holes' (dams). Mr. Ross confirmed that AGL is relying on general knowledge of the Sydney Basin and has not carried out site-specific assessments. He was unaware of the presence or importance of the Sturt dams but, based on the geology of the Sydney Basin, was doubtful that these would be 'spring-fed' since this would depend on the occurrence of basalt soil rather than the shale that appears to be endemic to the area. I indicated that across our 8 acres alone, there appears to be basalt soil (with a ph of 5.5) and that Governor Macquarie, on his visit to Varro Ville and the adjoining property of St Andrews (now occupied by the Carmelite religious community) on November 8th 1810 later wrote in his diaries "This [St Andrews] and Dr Townson's farm are by far the finest soil and best pasturage I have yet seen in the Colony...".¹⁴

Mr. Ross agreed that without a specific study he could not rule out either the presence of basalt soil or natural springs feeding the dams. He also wondered if certain soil/geological formations could retain rainwater that seeps out slowly over time giving the appearance of natural springs.

In summary, AGL either does not know or does not care to tell us how the dams on Varro Ville or any other property in the Scenic Hills are fed. **Without this information issues of possible contamination or water depletion cannot be addressed.** Further, AGL admitted in our December 10th meeting that it had no lessons to bring to Stage 3 from previous stages of the CGP, as it had not carried out any environmental monitoring over the previous ten years of the CGP. However Mr Lollback and Mr Ross stated in that meeting that we were the first to be informed that AGL intended to take a base line study of the Scenic Hills in order to do environmental monitoring for the first time. We do not accept this as a condition for approval. AGL, in this EA and in meetings with us, has not exhibited an understanding of (or perhaps enough regard for) scientific method. Further AGL's past performance and its non-inclusion of this issue in the EA suggest a prior careless disregard for the environment and heritage until community pressure is applied. More importantly such a proposal makes the Scenic Hills Environmental Protection zone the 'guinea pig' for future developments. We cannot accept this. The preciousness of water in this area is demonstrated by a history of severe droughts since

¹² AGL has since refused to provide detail in writing on this issue.

¹³ We have found AGL to be cooperative in responding orally to our requests for further information (albeit belatedly), but note their ongoing refusal to provide anything in writing that could be assessed by an independent expert.

¹⁴ Lachlan Macquarie: *Journals of his Tours in New South Wales and Van Dieman's Land 1810-1822*, Trustees of the Public Library of New South Wales, 1956, p.2.

colonial times¹⁵ which when combined with the small size of current landholdings risks their viability. Damage to essential streams, dams and catchment and/or any reduction in water supply in this fragile area would spell the end of the Hills as we know them. It would irreparably damage the heritage of the area both directly and as a consequence of the dependence of that heritage on the viability of the Hills as rural concern, together with the associated biodiversity of remnant, protected Cumberland Plains Woodland (some of which is part of the landscape park associated with Varro Ville House). Damage from connecting infrastructure and noise from truck movements along St Andrews Road would also degrade the environment for all who live here including Varro Ville House.

Other heritage and their links to Varro Ville House

AGL's treatment of Varro Ville House gives us concerns about how other heritage in the area is treated. We note, for example, that while AGL (or their consultant) acknowledges the importance of views from Varro Ville House¹⁶ to Macquarie Fields House and Denham Court House, the latter's views are discounted because they are "outside the study area" (not because they won't be affected). Further, while AGL acknowledges that the Denham Court well sites (RA03 and RA09) may be visible from Varro Ville House and may obstruct these important viewlines, this is discounted because there are already buildings "dotted around the landscape that are of a greater scale and visual presence than the proposed infrastructure". This is utter nonsense. No sitings could have been taken from Varro Ville House, else the consultant would have observed that there are no buildings currently visible in those viewlines from Varro Ville House. Secondly the presence of other buildings in the area is not necessarily adverse to the context of Varro Ville House if those buildings are consistent with the rural heritage character of the area (noting that AGL's structures do not comply). Thirdly, even if there were buildings that were incompatible with the zoning, this is not a reason to further compromise the area. If that argument were accepted it would set a precedent for every inappropriate development that comes along subsequently until there is nothing left of the environmental protection zone.

Project not sufficiently specified

In our meetings with AGL, AGL acknowledged that it would need in-field compression for its northern well sites (RA03, RA09, VV07 and VV11). AGL also acknowledged that it might need in-field compression for another three of the mid-range well sites (CU20, 22 and 02). In fact the requirement for in-field compression cannot be specified for any well site until the performance of the wells is ascertained. This means that a third of the well sites are not fully specified, and at least 60% are in doubt. As such, AGL is asking for approval to proceed with a project, elements of which are known to be required but whose form and location do not form part of this report. It is further disturbing that comments by AGL and the DoP suggest some complicity in allowing this. This is indicative of the quality of the application as a whole. The community could be forgiven for feeling that AGL is being allowed to pursue a 'foot in the door' strategy.

Conclusion

The quality of the Historic Cultural Heritage Assessment (Appendix J) as it pertains to Varro Ville House, and its use in the Main Report of the EA, is consistent with SHA's (and our)

¹⁵ Local historian Verlie Fowler (former Campbelltown Councillor and former President of the Campbelltown and Airs Historical Society) wondered whether the history of severe droughts in the area was due to a localised 'rainshadow'. I have provided some indicative analysis based on our own monitoring of rain at Varro Ville House over the last five years as Attachment A.

¹⁶ Based on recommendations contained in the report of Colleen Morris and Geoffrey Britton, *ibid*.

assessment of other reports provided as appendices to the main report, which also affect Varro Ville House: the Preliminary Hazard Analysis (Appendix D), Noise and Vibration Impact Assessment (Appendix F), Air Quality Impact Assessment (Appendix G) etc. The generality of the data used (rather than site-specific data) is disturbing, there are many errors, they are vague and there are too many unknowns. In the Main Report, AGL's own language absolves it of commitment - it may "consider" doing things but makes few undertakings - and there are a number of sub reports still outstanding. Additionally we find the methodology underpinning applicable parts of the environmental assessment flawed as it fails to understand the complex interactive nature of the environment (though this is at the forefront of current academic study) and does not take account of emerging evidence about risks from coal seam gas mining. As a consequence we are left with the impression that this application is a request to the DoP for something of a *carte blanche* to 'explore', to 'make it up as it goes along' and to self-monitor. Given the concerns that are being raised about coal seam gas exploration and extraction, this EA and AGL's project application is, in our view, not of an acceptable standard and we are deeply concerned that the DoP would invite such an application. Additionally, while this is concerning for the cultural and natural values of the Scenic Hills, it also sets a dangerous precedent as we understand that the CGP Stage 3 is wholly within the Sydney Metropolitan Area.

We therefore join Campbelltown City Council in objecting to both the EA and AGL's application to proceed with Stage 3 of the CGP. Our objection applies to the whole project and not just to the part located in the Campbelltown LGA, since proceeding inside the adjoining Camden LGA will also impact this area and ultimately Varro Ville House. Further, as members of SHA and more recently the Lock the Gate Alliance, we support the current call for a moratorium on *new approvals* of coal and coal seam gas mining to allow time for independent research to be carried out on the impact of the industry (and its controversial use of hydraulic fracturing) on health (human and animal), the environment, other land use, heritage, communities, land ownership and land values. Until this is done and appropriate legislation put in place to guide and regulate the industry we do not support *approvals* of any new projects - either to explore or develop. This includes the northern expansion of the CGP (Stage 3). As a useful contribution to this process, we support Council's call for the establishment of a Planning Assessment Commission to specifically investigate this project.

Finally we note that, were damage to occur to Varro Ville House as a consequence of this project being approved, a problematic situation would arise with regard to the house's heritage listing at the State level and with the National Trust. Both of these legally oblige us as owners of the property to conserve and maintain the property at our own expense - with access to government funding **not** guaranteed and, in any case, inadequate to cover the actual expense involved. Should the context for the house degrade its liveability and monetary value, such that our obligations become unreasonable, or harsh and unconscionable, this gives rise to issues for public policy and the preservation of heritage in private ownership generally - without which much heritage would disappear. This position is particularly problematic if the government (i.e. the NSW State Government) that places these obligations on us is the same government that is responsible for degrading the context. It is hard to see how any private owners would ever again want to put themselves in such a situation, irrespective of any financial compensation.

Yours sincerely



Jacqui Kirkby (& Peter Gibbs)

Attachment A: Comparison of Annual Rainfall (mm) across Different Locations in the Sydney Metropolitan Area

	2006 (August to Dec.)	% diff.	2007	% diff.	2008	% diff.	2009	% diff.	2010	% diff.	Av. diff. (*07-'10)	Total (*07-'10)	% diff.
Observatory Hill (Sydney CBD)	994.0 (414.0)		1499.2		1082.6		956.2		1153.8			4691.8	
Liverpool (11.5km from Varroville) c/f Sydney	521.3 (220.6)	-48% (-47%)	1044.2	-30%	995.6	-08%	697.7	-27%	865.8*	-25%	-23%	3603.3	-23%
Ingleburn (4.1km from Varroville) c/f Sydney	474.0 (226.4)	-53% (-45%)	1011.2	-32%	923.0	-15%	655.5	-31%	879.2*	-23%	-25%	3468.9	-26%
Varro Ville House (c/f Liverpool and Ingleburn)	N/A (176.0)	(-20%) (-22%)	938.3	-10%	879.5	-12%	612.5	-12%	739.5	-15%	-12%	3169.8	-12%
				-07%		-05%		-07%		-16%	-08%		-09%

* Much of the monthly data collected were not quality controlled, and by comparison with other years may have been overestimated. The Varroville data is consistent with other years when compared with Sydney CBD.

Commentary

As expected Ingleburn and Liverpool (south west of Sydney CBD) get approximately 30% less annual rain than Sydney CBD on average (using the more reliable data), while Varroville gets approximately 7% less rain than its nearest suburb to the north east (similar to the difference between Liverpool and Ingleburn). Notably however, in the drought of 2006, the effects were more severe with the south western suburbs getting only half the annual rainfall of Sydney, and Varroville getting 20% less rain than its nearest suburbs (measured over the last five months of that year) or almost 60% less rain than Sydney. This exaggerated effect is not seen in other drought years of the last decade and appears to be related to specific weather effects in that year (just as in 2008 there was relatively more rain across Sydney). However it supports historical records of severe localised droughts.

Note: Rainfall at Ingleburn, Liverpool and Sydney were taken from Bureau of Meteorology weather stations, while the rainfall at Varroville was recorded at Varro Ville House. Only the last five months of rainfall were recorded at Varro Ville House in 2006.

Dear Mr. Preshaw

We are writing to you to object to AGL's, Camden Gas Project, Stage 3 of it's Northern Expansion plans and developments (as well as that of Stages 1 and 2). Unfortunately we need to use our daughter's email address as we do not have a computer of our own and we were not able to find another contact address to which we could send a letter.

It has recently come to our attention that my property will fall within the 'Subsurface Project Area' for Stage 3. My home is located at 7/66-70 Ingleburn Road, Ingleburn NSW 2565. There are two clusters of wells at Denham Court which are nearest to us, RA09 and RA03 which are of special concern, however each of the other drill sites and wells, namely W11, W07, CU20; CU22; CU02; CU26; CU29; CU06; CU10; CU14 within the Northern Expansion allocation to date, are also of significant concern and to which we wish to lodge an official objection.

Our concerns relate to the risk of:


- Land subsidence and the resulting damage to the structure of our home, garage, driveway and garden;
- Methane leaks which result from the process of hydraulic fracturing, thus the contamination of our air;
- The fracking process, cracking or breaking our water pipes and thus contaminating our drinking water (as well as aquifers, watercourses and potentially ocean);
- The contamination of our soil;
- The contamination of our food;
- The contaminated water which also results from the processes of hydraulic fracturing and it's required storage;
- All resulting detrimental effects to ill health to humans and animals, caused by all facets of the industry's operations;
- Explosion;
- We object that the AGL gas treatment plant application had been accepted for the Rosalind Park Gas Plant at Menangle despite the fact that that the Department of Planning knew it was not fully specified and we are concerned that AGL may later seek a modification to reinstate its gas treatment plant to the original location in Ingleburn, once the Stage 3 wells have been drilled;
- The reduction in the value of our property and the surrounding area;
- Any other effects caused by all and/or any facets of the industry's operations which have not thus far, been mentioned above.

We also object to the fact that we are being used as 'guinea pigs'.

Yours faithfully

Angela Kukic

Monday, May 09, 2011



The Honorable Brad Hazzard
Minister for Planning

Dear Minister,

We are writing to you to express our deepest concerns regarding the proposal of the AGL Energy Limited Camden Gas Project Stage 3, which plans to extend its operations northwards into Sydney, into the Scenic Hills of Campbelltown and Camden

We know that the AGL proposal plans to install 72 gas extraction wells, gas gathering pipelines, access roads and other unspecified "Infrastructure" related to Coal Seam Gas extraction.



AGL should not be allowed to go ahead with this plan because of the following reasons:

- AGL's proposal is 'industrialising' the Scenic Hills – violating the zoning and threaten the survival of the Hills.
- AGL plans to use the controversial 'fracking' process to extract gas, which are proving to have very detrimental environmental and health consequences (Marcellus wells in Pennsylvania) .
- AGL plans to put wells Close to residential properties and on 'sensitive' land (including Schools, churches and Monastery)
- Rich layers of heritage in the Hills are threatened – aboriginal 'places' and artefacts of high sensitivity, "critically endangered" Cumberland Plain Woodland, colonial landscapes and historic states that shaped the beginning of the pastoral industry in NSW and Australia
- AGL plans to run its main gas spine line through the Australian Botanical Garden at Mount Annan (Australia's largest botanical garden), and along Sydney's water canal (Upper Canal), threatening Sydney's water supply and publicly owned state heritage..
- AGL's Environmental Assessment is inadequate leaving too many 'unknowns'.

We are very afraid that should your Office give the green light to AGL to go ahead with its plans, ultimately, we the people living here now (and later our children) in this area are going to suffer all kind of problems namely environmental, health, social and economic.

Therefore, we kindly ask your Office to reject once more and once and for all the intentions of AGL Limited, to inflict irreparable damage to the Scenic Hills including the Mount Annan Botanical Gardens.

Thanking you in anticipation,



Marylou Potts Pty Ltd
ACN 074 696 263
Incorporated Legal Practice

Submission to the NSW Department of Planning

Concerning protection of groundwater in the Project areas constituting AGL Camden Gas Project Stages 1, 2 and its implications for the proposed expansion in Stage 3

“Water water everywhere not a drop to drink”

Date 18 May 2011

Disclaimer

This submission has been prepared for the exclusive use of the Department of Planning.
Marylou Potts Pty Ltd accepts no liability whatsoever for it in respect of any use of or reliance
upon this report by any person other than the Department of Planning.

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Executive summary

"Along with air, water is one of the most fundamental requirements for the survival of living things."¹ Groundwater once polluted or contaminated cannot easily be rehabilitated, and once lost, not quickly recharged. As a public good, water needs to be protected by responsible governments in their allocation of resources to commercial entities whose interests are clearly in conflict.

Groundwater aquifers surrounding coal seam gas aquifers are susceptible to both pollution² and contamination³ from coal seam gas mining. As a consequence, protection of those aquifers must be a fundamental priority in any coal seam gas exploration and production activities.

The Camden Gas Project (CGP) has been in operation since 2002. Stages 1 and 2 include 123 coal seam gas wells and associated gas gathering infrastructure and hydrofracking is authorised. On 23 September 2010, AGL Upstream Investments Pty Ltd (**AGLUI**) applied for the northern expansion of the CGP referred to as Stage 3. The Department of Planning (DoP) is currently considering that application.

The petroleum production leases for Stages 1 and 2 together with applicable NSW legislation contain clear obligations not to pollute or contaminate groundwater and to implement and conduct operations to ensure that such pollution or contamination does not occur. AGLUI has failed to implement or conduct operations so as to ensure there is no pollution or contamination of groundwater aquifers in the PPL's. As a consequence, whether there has been pollution or contamination of groundwater over the last 9 years is yet to be determined. Currently groundwater is not part of its monitoring or compliance program.

AGLUI has admitted that it has carried out no hydrology or hydrogeology study and done no groundwater monitoring for the CGP⁴.

Before any consideration of granting approval to Stage 3 is given, it is our view that a study of the hydrochemistry of and hydraulic connectivity between aquifers in the CGP subsurface area is essential. If no contamination is found in the groundwater aquifers over the CGP subsurface area, all and good. However, if pollution or contamination is found, further production on the PPL's should be suspended immediately. This project is in close vicinity of the Sydney catchment area, pollution or contamination of any groundwater, let alone Sydney's drinking water, is an unacceptable risk which no amount of money can rehabilitate.

Government failure to recognise the failings of the tenement holder to identify and monitor the groundwater for the last 9 years is distressing. It indicates a failure of self monitoring as a means of regulation and requires immediate attention preferably by an independent body and funded by AGL's security. Any failure to determine whether or not pollution or contamination has occurred in the PPL area puts not only AGLUI but also the government into the arena of failing to exercise a duty of care to ensure that those to whom it grants rights to resources are not causing irreparable harm to the environment.

¹ Pigram JJ, 2006 *Australia's Water Resources* CSIRO Publishing p.1

² Pollution from the very salty coal seam gas aquifer. "Pollution " as defined in the PEOA.

³ Contamination from the hydrofracking and BTEX chemicals released from the coal seam. "Contamination" as defined in the CLMA.

⁴ Scenic Hills Association Submission to the DOP dated 24 January 2011 p.9

1 Introduction

1.1 This submission

This submission solely concerns groundwater protection.

The submission reviews AGL's Camden Gas Project groundwater obligations and whether or not it has satisfied those obligations.

The material reviewed includes:

- (a) that submitted by or on behalf of AGL which is located on its website and on the website of the DoP;
- (b) AGL's 5 Petroleum Production Leases (**PPL's**) and petroleum exploration licence (**PEL**) obligations relating to groundwater;
- (c) the legislative regime applicable to AGL and the CGP which concerns protection of groundwater; and
- (d) if damage is found, later submissions may consider whether AGLUI's failure could found an action in negligence, nuisance and or recklessness and or whether there are remedies against the NSW Government Departments to remedy current apparent administrative law failings.

1.2 Coal seam gas mining impacts on groundwater

The potential impacts of coal seam gas mining on the surrounding groundwater include:

- (a) pollution of groundwater from the heavily salinated coal seam gas water;
- (b) pollution and potential contamination of groundwater from BTEX chemicals found in the coal seam⁵;
- (c) pollution and potential contamination of groundwater from hydrofracking chemicals;
- (d) pollution and potential contamination of groundwater with methane; and
- (e) dewatering of the coal seam aquifers resulting in a lowering of the water table and dewatering of overlying aquifers.

This pollution and potential contamination occurs when a coal seam is depressurised by drilling into it. The reduction of hydrostatic pressure within the coal seam can result in subsidence, faulting and consequent hydraulic connectivity between aquifers that overlie or underlie the coal seam aquifer.

⁵ Lloyd-Smith Dr M., Senjen Dr R., 2011 Briefing paper Hydraulic Fracturing in Coal Seam Gas Mining: Risks to our health, Communities, Environment and Climate April 2011 , National Toxins Network, <http://ntn.org.au/wp-content/uploads/2011/04/NTN-Fracking-Briefing-Paper-April-2011.pdf> It is important to note that BTEX chemicals are part of the volatile chemicals found in coal seams. Even if BTEX do not form part of the hydraulic fracturing fluid, they may be released from the coal seam in the fracturing or drilling process. "BTEX stands for benzene, toluene, ethylbenzene, xylene. BTEX compounds can contaminate soil and groundwater. BTEX are commonly found in the products used in the drilling stage of hydraulic fracturing. BTEX are also components of the volatile compounds found in the coal gas seams. The fracturing process itself can release BTEX from the natural-gas reservoirs, which may allow them to penetrate into the groundwater aquifers or volatilise into air. As a consequence people may be exposed to BTEX by drinking contaminated water, breathing contaminated air or from spills on their skin.¹⁵ BTEX chemicals are hazardous in the short term causing skin irritation, central nervous system problems (tiredness, dizziness, headache, loss of coordination) and effects on the respiratory system (eye and nose irritation). Prolonged exposure to these compounds can also negatively affect the functioning of the kidneys, liver and blood system. Long-term exposure to high levels of benzene in the air can lead to leukemia and cancers of the blood.¹⁶"

It is worth noting there may be little difference between petroleum exploration drilling of boreholes and petroleum production in the effect on surrounding aquifers. Both activities will result in depressurisation of the coal seam aquifer and the potential resultant faulting and hydraulic interconnectivity.

At present there appears to have been no studies undertaken by AGL in the PEL or the PPL's to directly assess hydraulic connectivity between aquifers that overlie or underlie the coal seams that have been drilled in the CGP subsurface project area. As a consequence, whether or not there has been pollution or contamination of those aquifers is yet to be determined.

1.3 AGL's CGP

The Camden Gas Project began in 2002. Initially PPL1 and PPL2 were held by Sydney Gas (Camden) Operations Pty Ltd. Stage 1 began in 2002 and covered PPL's 1 and 2. Stage 2 began in 2004 and covered PPL4. Stages 1 and 2 now consist of 123 coal seam gas (CSG) wells and associated gas gathering infrastructure in PPL1, PPL2 and PPL4. On 23 September 2011 AGL Gas Production (Camden) Pty Ltd (**now known as AGLUI**) submitted a Major Project Application for Part 3A of the Environmental Planning and Assessment Act to apply to Stage 3 of the CGP. On 11 November 2010 AGLUI became the holder of PPL1, PPL2, PPL4, PPL5 & PPL6 and PEL2. The Stage 3 expansion is a continuation of AGL's CGP Stages 1 and 2.

Stage 3 is described in the application as including "construction and operation of twelve well surface locations, with up to six wells⁶ at each. Associated gas gathering and water lines, including interconnection with the existing Camden Gas Project network, along with central water storage points where required. Access roads including ancillary infrastructure, including storage yards where required, and subsurface drilling of lateral well paths within the boundaries of the sub-surface project area."

2 Legislative requirements

2.1 Petroleum (Onshore) Act (NSW) 1991 (POA)

(a) Petroleum tenement conditions

AGLUI has 5 petroleum production leases (PPL1, PPL2, PPL4, PPL5, PPL6) and a petroleum exploration licence (PEL2) which has expired. All of the leases and the exploration licence were transferred to AGLUI on 11 November 2010. The transfer of the leases was subject to compliance with Schedule A. PEL2 was also transferred subject to Schedule A. PEL 2 expired on 28 March 2011.

(i) Petroleum Exploration Licence 2 (**PEL2**)

On 24 February 2011, AGLUI submitted an application for renewal of PEL2. As at May 5, 2011 that application had not been approved.

Schedule 2 clause 2 Operations provides that "operations must be carried out so as not to cause or aggravate ... water pollution."

We note, as a consequence of the expiration of PEL2 and that PPL5 does not cover all of the Part 3A stage 3 application area, it is arguable that AGLUI no longer has standing for a Part 3A application for that area not covered by a PPL. AGLUI requires a PPL to make the Part 3A application, without a PEL it cannot apply for a PPL. Given the expiration of PEL2, AGLUI now has no standing to apply for a PPL for the remainder of the northern expansion not covered by PPL5.

⁶ Meaning a further 72 wells.

Further, any borehole drilling in the PEL area into coal seams would require obtaining a Bore Licence under the Water Act or an Aquifer Access Licence under the Water Management Act, depending upon which Act has jurisdiction. Query did AGLUI obtain those licences?

It is our view that a renewal should not be granted until AGLUI undertakes a study in the PEL to directly assess the hydrochemical⁷ and hydraulic connectivity between aquifers that surround the coal seams in the PEL subsurface project area. If there is already connectivity between the exploratory boreholes and surrounding aquifers, pollution and or contamination may already be occurring and further drilling and fracking should not be permitted in such coal seams. For those seams with no connectivity with other aquifers, interconnectivity should be monitored on a very regular basis. Any subsequent connectivity and resultant increase in salinity, BTEX chemicals, methane content or contamination with hydrofracking chemicals of the surrounding aquifers should result in a halt in further drilling of that seam as a breach of the PEL2, the PEOA and the CLMA (referred to below).

(ii) *Petroleum Production Lease 1 (PPL1)*

On 2 September 2002, pursuant to s9 POA the NSW Minister of Mineral Resources granted to Sydney Gas (Camden) Operations Pty Ltd, Petroleum Production Lease 1 for a period of 21 years over 48 square kilometres SW of Camden. On 11 November 2010 pursuant to s96A (3) POA the Director General registered AGL Upstream investments Pty Ltd as the holder of PPL1. That transfer was subject to the conditions in Schedule A.

PPL 1 provides the holder holds the land subject to the POA, and such conditions as are contained in the Schedule of Conditions and the Schedule of Special conditions of approval. If the lease holder contravenes any conditions of the lease, the lease may be cancelled or suspended by the Minister.

The Schedule of conditions of PPL1 provides operations must be conducted in accordance with a Petroleum Production Operation Plan (**PPOP**) which must contain **diagrams** of the areas proposed to be disturbed under the PPOP. One would expect this would include geophysical and geological diagrams of the PPL1 area setting out the groundwater aquifers in relation to the wells proposed to be drilled as these may or will be disturbed. No such diagrams are contained in the PPOP.

Clause 5 of the Schedule provides in paragraph (a) "Operations must be carried out in such a way as not to cause any pollution of the catchment area". Query how one could tell if AGL's operations caused pollution in the catchment area if no monitoring is done.

Clause 6(b) of the Schedule concerns **water** and provides (b) "Operations must be carried out in a manner **that avoids the pollution .. of any waterbody**". Once again, it would be necessary to map the geological, geochemical and geophysical characteristics of the aquifers in the PPL subsurface area before operations began and then monitor those aquifers to determine if pollution or contamination had occurred. We would argue if this has not been done, it must be done now. It is not a difficult or even expensive task.

Clause 6(c) provides "The lease holder must not interfere with the flow of water in any ... watercourse". Causing connectivity between aquifers is interfering with the flow of water in a watercourse, groundwater feeds watercourses, surface-ground ecology is interdependent⁸. Once again, without having the complete geological and geophysical characteristics of the area to establish the existing connectivity, one cannot determine whether or not the csg mining is interfering with any ground water course.

Clause 13(a) of the Schedule provides that "all production activity must be carried out in conformity with the Schedule of Onshore Petroleum Exploration and Production Safety Requirements (**Requirements**). Clause 518 of those Requirements provides "The title holder must ensure that all reasonable steps are taken during operations on a well **to prevent**

⁷ By the industrial chemicals regulator, the National Industrial Chemical Notification and Assessment Scheme (NICNAS)

⁸ Ferguson P. Geologist, comments on draft submission.

leakage or the pollution of aquifers.⁹ It would be reasonable to expect that baseline data and regular monitoring of aquifers would be undertaken to fulfil this condition. Failure to do so is in breach of this condition. Requirements paragraph 725 Waste or contamination provides (1) where there is a reasonable possibility that ... (b) .. water is being contaminated, the Director General may require the title holder to carry out specified tests to determine if waste or contamination is occurring.” There is sufficient scientific data to establish that there is a reasonable possibility the water may be contaminated by coal seam gas mining. In our view the DG should require that a determination be made if waste or contamination is occurring, preferably by an independent entity.^{10 11}

On 11 November 2010 pursuant to s96A (3) POA, the Director General registered AGLUI as the holder of PPL1. That transfer was subject to the conditions in **Schedule A**. Schedule A condition 2(b)(iv) requires that the PPOP must identify “how operations will be carried out on site in order to prevent and or minimise harm to the environment, including **groundwater**.” The PPOP does not identify how operations will be carried out so as to prevent and or minimise harm to the groundwater. This is in breach of the PPL conditions.

(ii) *Petroleum Production Lease 2 (PPL2)*

On 10 October 2002, pursuant to s9 POA, the NSW Minister of Mineral Resources granted to Sydney Gas (Camden) Operations Pty Ltd, Petroleum Production Lease 2 for a period of 21 years over 93.92 hectares adjacent to PPL1 SW of Camden. On 11 November 2010 pursuant to s96A (3) POA the Director General registered AGL Upstream investments Pty Ltd as the holder of PPL2. That transfer was subject to the conditions in Schedule A.

The provisions of PPL2 are almost identical to those in PPL1. As such the same breaches are occurring due to AGLUI's failure to identify and implement operations so as to ensure no pollution or contamination of the groundwater.

(iii) *Petroleum Production Lease 4 (PPL4)*

On 6 October 2004, pursuant to s9 POA the NSW Minister of Mineral Resources granted to Sydney Gas (Camden) Operations Pty Ltd Petroleum Production Lease 4 for a period of 21 years over 5530 hectares of land covering parts of Camden, Menangle, Campbelltown. On 11 November 2010 pursuant to s96A (3) POA, the Director General registered AGL Upstream investments Pty Ltd as the holder of PPL4. That transfer was subject to the conditions in **Schedule A**.

As with PPL1 and PPL2, PPL4 was granted subject to compliance with its Schedule of Conditions (**Conditions**). Breach of those conditions allows the Minister to cancel or suspend the PPL.

The Conditions are different from those in PPL1 and PPL2 however Condition A. provides “The leaseholder must conduct its operations in accordance with a Petroleum Production

⁹ Reasonable steps would include the determination of all aquifers in the PPL4 subsurface area. The taking of baseline data from all those aquifers before production began and the frequent and regular monitoring of those aquifers to determine if such contamination or pollution was occurring.

¹⁰ Osborne S, Vengosh A, Warner N, Jackson R, 2011 “Methane contamination of drinking water accompanying gas well drilling and hydraulic fracturing” Duke University Durham NC USA. Findings that methane concentrations in drinking water wells were 17 times higher close to cs gas wells.

¹¹ Given the actual and anecdotal evidence of well leakage in SE Queensland as found by the Queensland Government's Inspection Report, one would reasonably expect that baseline data and regular monitoring by an independent body would be a fundamental aspect of the grant or continuance of any PPL. Particularly given the toxic nature of fracking fluid and the proximity of the Sydney Catchment area.

Operations Plan (**PPOP**) which forms the basis of ... (c) ongoing environmental monitoring of the project.”¹²

As with PPL1 and PPL2, PPL4 Condition 3 Safety requires compliance with the Requirements. That is “The title holder must ensure that all reasonable steps are taken during operations on a well **to prevent leakage or the pollution of aquifers.**”¹³ and “(1) where there is a reasonable possibility that ... (b) .. water is being contaminated, the Director General may require the title holder to carry out specified tests to determine if waste or contamination is occurring.” Given the actual and anecdotal evidence of leakage in wells in SE Queensland as found by the Queensland Government’s Inspection Report¹⁴, one would reasonably expect that baseline data and regular monitoring by an independent body would be a fundamental aspect of the grant or continuance of any PPL, particularly given the toxic nature of BTEX chemicals, fracking chemicals and the proximity of the Sydney Catchment area.

Condition 3(vi) requires that the “gas gathering system be maintained free of leaks while in operation and a program implemented to confirm this.” On 1 June 2010 the Queensland Government released an “Investigation Report of Leakage Testing of Coal seam gas wells in Tara” rural residential estates vicinity and found that 48% of the wells were leaking in some way. Clearly any leakage of methane is a fire hazard regardless of how small and given the extent of the leakages one would expect that all CSG wells are regularly checked as well as streams, bores, dams, and any other ground water body.

Condition 5 ii Well surveying and logging. “All wells must be downhole geophysically logged **prior to installation of the production casing with a logging suite which can accurately determine the location and properties of all ... aquifers**”. Query has this been done?

As with PPL1 and PPL2, on 11 November 2010, PPL4 was transferred to AGL Upstream Investments Pty Ltd subject to the conditions set out in **Schedule A**. Schedule A condition 2(b)(iv) requires the PPOP must identify “how operations will be carried out on site in order to prevent and or minimise harm to the environment, including **groundwater.**” The PPOP does not identify how operations will be carried out so as to minimise harm to the groundwater. This is in breach of PPL4.

(iv) *Petroleum Production Lease 5 and 6 (**PPL5 and PPL6**)*

On 28 February 2007, pursuant to s9 POA the NSW Minister of Mineral Resources granted to AGL Gas Production (Camden) Pty Ltd and Sydney Gas (Camden) Operations Pty Ltd Petroleum Production Lease 5 for a period of 21 years over 102.4 square kilometres of land covering parts of Narellan, Cook, Minto, Camden, Menangle, Campbelltown in the vicinity of the Sydney Catchment area. On 11 November 2010 pursuant to s96A (3) POA the Director

¹² One would expect that groundwater is to be monitored given it is the most likely to be disturbed and the least able to be rehabilitated. In order to do this presumably leaseholder is required to undertake a thorough base line study of the whole subsurface area geophysical, hydrogeological and geochemical area which can then be regularly monitored. There is now also technology which can show inter aquifer connectivity which should be utilised for all of stages 1 and 2 PPL subsurface areas to ensure that there is not aquifer contamination with hydraulic fracking fluids or pollution by salination from the coal seam salinated water. Such a study has been proposed by GEO9 in the attached “Proposal for Pilot Study of CSG Aquifer Connectivity and Groundwater impacts”.

The anecdotal evidence in Queensland is that the depressurisation of the coal seam causes fracturing of the surrounding rock structure which results in the coal seam water contaminating the surrounding aquifer water. A monitoring program which takes baseline data before exploration (because the interference with the coal seam aquifer by exploratory drilling will result in depressurisation of that coal seam aquifer) and then regular and frequent monitoring throughout the term of the project. The impact of depressurisation and fracking in a coal seam on the surrounding rock structures would depend upon the geology of those structures. Without a thorough geological and geophysical study of the entire PPL area (subsurface area) how can one monitor the effects of production?

¹³ Reasonable steps would include the determination of all aquifers in the PPL4 subsurface area. The taking of baseline data from all those aquifers before production began and then the frequent and regular monitoring of those aquifers to determine if such contamination or pollution was occurring.

¹⁴ Queensland Government released an “Investigation Report of Leakage Testing of Coal seam gas wells in Tara”

General registered AGLUI as the holder of PPL5. That transfer was subject to the conditions in **Schedule A**.

On 30 May 2009, pursuant to s9 POA the NSW Minister of Mineral Resources granted to AGL Gas Production (Camden) Pty Ltd and Sydney Gas (Camden) Operations Pty Ltd Petroleum Production Lease 6 for a period of 21 years over 725.8 hectares of land covering parts of Picton. On 11 November 2010 pursuant to s96A (3) POA the Director General registered AGLUI as the holder of PPL6. That transfer was subject to the conditions in **Schedule A**.

We understand that production has not yet commenced on PPL5 or PPL6.

PPL5 and PPL6 are almost identical and contain many of the same groundwater provisions as found in PPL1, 2 and 4. Breach of those conditions allows the Minister to cancel or suspend the lease.

The Conditions are set out in Schedule 2 (**Conditions**). Condition 1 provides that the "leaseholder must implement all practicable measures to prevent and or minimise any harm to the environment that may result from the construction, operation or rehabilitation of this development."¹⁵

Condition 2(b)(iv) of Schedule 2 requires the PPOP to "identify how operations will be carried out on site in order to prevent and minimise harm to the environment, including groundwater."¹⁶ The PPOP does not do this. This is a breach.

Condition 6 of Schedule 2 requires the leaseholder to comply with the Requirements. Clauses 518 and 725 of the requirements are also then applicable to PPL5 and PPL6. That is "The title holder must ensure that all reasonable steps are taken during operations on a well **to prevent leakage or the pollution of aquifers**."¹⁷ and "(1) where there is a reasonable possibility that ... (b) .. water is being contaminated, the Director General may require the title holder to carry out specified tests to determine if waste or contamination is occurring."

Condition 7 (e) requires that "the gas gathering system must be maintained free of leaks while in operation and a program implemented to confirm this. Records to be maintained and made available to an inspector on request.

Subject to testing done on the Stage 1 and 2 areas showing no pollution or contamination, we would recommend that a precondition of any subsequent approval be the undertaking of a thorough baseline study of the chemical, positioning and connectivity of aquifers in PPL areas 5 and 6¹⁸ with which subsequent results of monitoring can be compared.

(v) *Summary of PPL requirements with respect to groundwater pollution and or contamination*

PPL	Provision	Obligation	Steps	Breach
PEL 2	Second Schedule	2 Operations must be carried out so as not to cause or aggravate ... water pollution.	PEL expired No steps taken to ensure no water pollution as no studies	

¹⁵ Concerning groundwater the only way to comply with this provision is to undertake the base line study and then regularly monitor the groundwater.

¹⁶ See footnote 6

¹⁷ Reasonable steps would include the determination of all aquifers in the PPL4 subsurface area. The taking of baseline data from all those aquifers before production began and then the frequent and regular monitoring of those aquifers to determine if such contamination or pollution was occurring.

¹⁸ We note that PPL6 is not within the Stage 3 Northern Expansion area.

			done. Query whether AGLUI obtained bore licences for any Petroleum Exploration bore holes, if any, drilled?	Query breach
PEL 2	Second Schedule	8 Catchment Areas (a) Operations must be carried out in a manner which avoids pollution of any Catchment Area. (b) if the licence holder is using or about to use any process which the DG believes is likely to pollute the waters of any catchment area the licence holder must refrain from using or cease using such process within 24 hours of the DG giving notice to do so	PEL Expired Drilling exploratory boreholes has the potential to release BTEX chemicals into the groundwater system which may affect the catchment area. Without testing of hydraulic connectivity one cannot confirm either way whether contamination is occurring.	Query breach
PPLs 1,2,4,5,6	Schedule A	1 The lease holder must implement all practicable measures to prevent and or minimise any harm to the environment that may result from the construction, operation or rehabilitation of the development.	No practicable measures undertaken to prevent harm to groundwater. One would expect an assessment of the hydraulic connectivity between cs aquifer and surrounding aquifers to determine if contamination/pollution is occurring of those surrounding aquifers when fracing or drilling.	Breach
PPLs 1,2,4,5,6	Schedule A	2(a) The leaseholder must have a Petroleum Production Operations Plan (PPOP). (b)(iv) The PPOP must identify how operations will be carried out on site in order to prevent or minimise harm to the ... groundwater.	The POP does not identify how operations will be carried out to prevent harm to groundwater.	Breach
PPLs 1,2,4,5,6	Schedule A	6 Industry Codes and Standards (a) All operations must be carried out in conformity with the Schedule of Onshore Petroleum Exploration and Production Safety Requirements.	See below	
	Schedule A	Requirement 518 The Leaseholder must take all reasonable steps during operation on a well to prevent leakage or the pollution of aquifers.	No steps taken to determine if pollution of aquifers.	Breach

PPL s 1,2,4 ,5,6	Schedule A	Requirement 725 Where there is a reasonable possibility that (b) oil, gas or water is being contaminated, the DG may require the title holder to carry out specified tests to determine if waste or contamination is occurring.	There is a reasonable possibility that contamination is occurring to water in surrounding aquifers. In our view the DG should require that the titleholder, or preferably an independent body, test the wells and the surrounding aquifers for contamination from fracking fluid, or methane or salination.	DG should act.
PPL s 1,2,4 ,5,6	Schedule A	7 Gathering Pipelines (e) The gas gathering system must be maintained free of leaks while in operation and a program implemented to ensure this.	Methane leakage into surrounding aquifers can be from the well. Determination and testing of those aquifers would reveal whether the wells or the seams were leaking.	No action taken
PPL s 1,2	Schedule of Conditions	6 Water (b) Operations must be carried out in a manner that avoids the pollution or siltation of any .. waterbody.	Determination and testing of water bodies necessary to determine if this provision is breached. No such determination has been done.	No testing conducted
PPL s 1, 2	Schedule of Conditions	5 Catchment Areas (a) Operations must be carried out in such a way as not to cause any pollution of any Catchment Area.	Determination and testing of water bodies necessary to determine if this provision is breached. No such determination has been done.	No testing conducted

As set out, none of the Conditions concerning protection of the groundwater have been complied with.

As PPL1, PPL2 and PPL4 are to continue for a further 12 and 14 years respectively, we would argue that **tests must now be done of all aquifers in the subsurface area of PEL2, PPL1, PPL2 and PPL4 for methane content, BTEX chemicals and hydrofracking chemicals.** If there is any contamination of aquifers with hydraulic fracking fluid or BTEX chemicals in the subsurface areas of the PPLs or PEL¹⁹, in our view the CGP PPL's should be suspended or cancelled until those aquifers have been properly rehabilitated and CGP stage 3 must not be granted Major Project Status under Part 3A of the EP&A Act until this has been done and a method devised which will not cause such pollution or contamination of surrounding aquifers.

(b) Obligations on tenement holders under the Petroleum (Onshore) Act 1991 (NSW)

Section 132 of the Petroleum (Onshore) Act concern "Samples of strata, petroleum and Water". That section provides "Every holder of a petroleum title must as soon as practicable cause to be made water samples." Query whether AGLUI has taken samples of water as required under this section on the drilling of each of its 123 wells. These samples can provide baseline data of the water characteristics from the well to other aquifers.

2.2 Protection of Environment Operations Act (NSW) 1997 (PEOA)

¹⁹ A very simple, but by no means thorough, starting point for of determining whether there is contamination would be to test each of the 35 bores in PPL1 and the 26 bores in PPL4 for each of the 596 chemicals which form part of the fracking fluid. As production has not yet commenced in PPL5, baseline data could be taken for that PPL from the 14 bores in PPL5 firstly for those fracking fluid chemicals and secondly for salinity, and thirdly for the presence of methane. Thereafter monitoring must be for these same things.

Parts 5.2 and 5.3 of Chapter 5 of the *Protection of the Environment Operations Act 1997* (NSW) set out the tier 1 and tier 2 offences in relation to water pollution.

Part 5.2 Tier 1 Offences provides in section 116 that if “a person wilfully or negligently causes any substance to leak, spill or otherwise escape (whether or not from a container) in a manner that harms or is likely to harm the environment, the person is guilty of an offence”. The granting of the PPL does not excuse AGLUI from leaks, spillages or escapes of petroleum (methane gas), BTEX chemicals or hydraulic fracturing chemicals. Arguably if damage is found, AGL’s failure to identify and implement actions to protect the groundwater is negligent if not reckless. Further, the defences provided in part 5.2 would not be available to AGLUI for pollution or contamination of the groundwater. AGLUI has neither exercised due diligence in relation to the protection of the groundwater, nor has it taken reasonable precautions to ensure that there is no pollution of the groundwater, it has done nothing at all with respect to protection of the groundwater. Nor does it have lawful authority to pollute the groundwater and its Protection of Environment Operations licences do not allow breaches of s120 of the PEOA.

Part 5.3 Water pollution provides in section 120, a person who pollutes waters is guilty of an offence. Water pollution is defined in the Dictionary of the PEOA to mean “placing in or otherwise introducing into or onto waters (whether through an act of omission) any matter, whether solid, liquid or gaseous, so that the physical, chemical or biological condition of the waters is changed.”

As previously mentioned, CSG mining activities could cause pollution of groundwater:

- (a) from the heavily salinated coal seam gas water;
- (b) from BTEX chemicals released from the coal seam itself;
- (c) from the hydrofracking chemicals; and
- (d) with methane.

A contamination breach is a tier 1 breach with very serious penalties including gaol time.

2.3 Contaminated Land Management Act 1997 (NSW) (CLMA)

The object of the Contaminated Land Management Act 1997 (NSW) is to establish a process for investigating and where appropriate remediating, land the EPA considers contaminated. In this Act land is defined to include water. Contamination means the presence of a substance at a concentration above which the substance is normally present in, on or under the land in the same locality being a presence that presents a risk of harm to human health or any aspect of the environment. Many hydrofracking chemicals are toxic and known to cause harm to human health and the environment, and BTEX chemicals, contained in the coal seam, if released from it, are highly toxic.²⁰

Breaches or apprehended breaches of the CLMA can be the subject of restraint orders of the Land and Environment Court under Part 10 of the CLMA.

2.4 Water Act 1912 (NSW)

Currently the CGP falls within the jurisdiction of the Water Act 1912 (NSW). Under the Water Act 1912, s112 requires that bores be licensed. The sinking of a bore shall not be commenced unless pursuant to a licence issued under Part 5. A “bore” is defined as “any bore or well or any excavation or other work connected or proposed to be connected with sources of subsurface water”. A coal seam is an aquifer or contains subsurface water, and methane is only extractable if the coal seam contains water²¹.

²⁰ See Schedule 1 of the fracturing chemicals known to be used in Australia and their toxicity.

²¹ Ferguson P. Geologist comment on draft submission.

Contravention of s112 of the Water Act 1912 is an offence liable for conviction.

The 123 CSG wells which have been constructed in Stages 1 & 2 of the CGP fall within the definition of bores and should be licensed under the Water Act 1912. AGLUI claims to have bore licences for its existing wellfield. We note that the NSW Office of Water in its submission has stated that it has not yet approved the licence applications made by AGLUI. As such the taking of water without those licences from the existing 123 wells is in a breach of the Water Act 1912.

2.5 Water Management Act 2000 (NSW) (WMA)

From 1 July 2011, the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011 (**Groundwater WSP**) under the Water Management Act 2000 (NSW) will come into force. This plan will bring AGL's CGP under the jurisdiction of the Water Management Act 2000 (NSW).

The WMA provides that it is a Tier 1 offence for a person to take water from a water source other than in accordance with a licence. The WMA provides for various types of licence. AGL must have Aquifer Access Licences for each of its 123 CSG wells. That access licence will regulate the taking of water from the wells.

The Environmental Protection and Assessment Act s75U does not exempt Part 3A Projects from the requirement to obtain an Aquifer Access Licence under Part 2 of the WMA. AGLUI acknowledges that it will require aquifer access licences under the WMA when the Groundwater WSP comes into force.

2.6 Environmental Planning and Assessment Act 1979 (NSW) (EP&A)

(i) Stages 1&2

The groundwater requirements in the Stage 1 and Stage 2 DA's are set out in Schedule 1. The DA for Stage 2 requires there be no water pollution under s120 EPOA.

(ii) Stage 3 CGP - MP 09-0048 (Stage 3 under Application)

Part 3A of the EP&A Act applies to projects identified in the State Environmental Planning Policy (Major Project) 2005. One basis for a project to fall within Part 3A of the EP&A Act is if it satisfies s75B of the EP&A. Section 75B(1)(a) provides that "this part applies to the carrying out of development that is declared under this section to be a project to which this Part applies: (a) by a State environmental Planning policy, or (b) by order of the Minister published in the gazette ...". State Environmental Planning Policy 2005 (SEPP 2005) Part 2 Major Projects and State Significant Sites clause 6 provides "(1) Development that, in the opinion of the Minister, is development of a kind: (a) that is described in Schedule 1 or 2 ... is declared to be a project to which Part 3A applies." SEPP 2005 Schedule 1 Part 3A - Classes of Development provides in Group 2 "clause 6 Petroleum (oil and gas and coal seam methane)". (1) Development for the purpose of drilling and **operation of petroleum wells** ... (c) that is in the local government areas of Camden ... Campbelltown City ... This is interpreted to mean that a PPL is required for a Part 3 A Application to be made under this provision. A PEL is insufficient as it does not provide the tenement holder with rights to operate a petroleum well.

On 23 September 2010, AGL Gas Production (Camden) Pty Ltd²² (**AGLGPC**) submitted Major Project Application No. 09-048 to the NSW Department of Planning (**DoP**) by for the Northern Expansion of the Camden Gas Project (**CGP**).

(A) Director General's Requirements dated 1 October 2010

²² Renamed AGL Upstream Investments Pty Ltd

Pursuant to section 75F of the EP&A Act the applicant must comply with the DG's environmental assessment requirements. Approval or disapproval of an application requires the Minister to take into consideration the report of the DG on the applicant's compliance in its environmental assessment with the DG's requirements.

The DG's requirements set out in its letter dated 1 October 2010 which relate to ground water include:

- (i) General requirements: a detailed assessment of the key issues (which includes surface and **ground water**) which includes: a description of the existing environment using sufficient base line data; an assessment of the ... cumulative impacts.
- (ii) Key Issues: Soil and Water: an assessment of the potential impacts of the project on the quantity and quality (including salinity) of surface and **groundwater**.

The current Environmental Assessment does not include a "detailed assessment" of the key issues concerning groundwater, nor does the Soil and Water management sub plan address ground water. In this respect we refer to the assessment given by Worley Parsons, commissioned by Campbelltown Council for its submission to the DoP, on the AGL's Environmental Assessment's compliance with the DG's requirements as providing either a "low level of compliance" or "insufficient information to assess compliance".

3. Summary

AGL has obligations to protect groundwater:

- (a) under it's PPL's,
- (b) under it's PEL,
- (c) as part of the DG requirements,
- (d) under the Protection of Environment Operations Act 1997 (NSW),
- (e) under its Protection of Environment Operations Licences,
- (f) under the Contaminated Land Management Act (NSW),

yet it has ignored those obligations in Stages 1 and 2 of the CGP.

Further, AGLUI is currently in breach of the Water Act 1912 for failing to have licences for each of its 123 wells.

No consideration should be given to its stage 3 application until it has remedied these breaches within the stages 1 and 2 project area and it is found there is no pollution or contamination of groundwater in the subsurface Camden Gas project area.

To fulfil those obligations of identifying and implementing operations to ensure no pollution or contamination of groundwater, testing of the chemistry, positioning and connectivity between the coal seam aquifers and surrounding aquifers is essential, and regular monitoring thereafter should be mandatory. This should be done by an independent body whose fees should be drawn from the AGLUI's security under its PPL's which AGLUI should then top up. This study must be conducted by a totally independent body, not one which is instructed or paid for directly by AGL, and the results of the testing and monitoring should be made available to the public immediately on production.

Attachments

Fraccing fluid chemical constitution sheet

Bore licences held over CGP PPL's 1, 4, and 5

Example of the type of information and monitoring needed Helmuth M 2008 *Scoping Study: Groundwater Impacts of Coal Seam Gas Development – Assessment and Monitoring*, Centre for Water in Minerals Industry Sustainable Minerals Institute University of Queensland, Doc reference P08-010-002.doc

References

Helmuth M 2008 *Scoping Study: Groundwater Impacts of Coal Seam Gas Development – Assessment and Monitoring*, Centre for Water in Minerals Industry Sustainable Minerals Institute University of Queensland, Doc reference P08-010-002.doc

Pigram JJ, 2006 *Australia's Water Resources* CSIRO Publishing p.1

URS 2009 *Gladstone Environmental Impact Statement Section 6.5.1.6 Potential impacts and mitigation measures*

Schedule 1

Stage	Instrument	AGL Entity	Rights granted
Stage 1	PPL1	AGL Upstream Investments Pty Ltd	
	Development consent		
	PEO Licence 12003	AGL Gas Production (Camden) Pty Ltd	
	PEO Licence 117134	AGL Gas Production (Camden) Pty Ltd	
Stage 2	PPL4	AGL Upstream Investments Pty Ltd	
	DA 75 – 4-2005	Sydney Gas (Camden) Operations Pty Ltd	<p>Construction and development of 9 wells including 2 Surface to inseam wells (SL08 and SL09) at SL03. Construction of gas gathering system and access roads Connection of wells to the Stage 2 Camden Gas Project – Gas treatment plant Production of methane gas</p> <p>[as at October 2011 this had been expanded to 123 wells and associated gas gathering systems]</p>
	DA 75-4-2005	Sydney Gas (Camden) Operations Pty Ltd	<p>Has this been transferred to AGL?</p> <p>Water Condition 24 “Except as may be expressly provided by a licence, the applicant shall comply with s120 of the Protection of Environment Operations Act 1997 (NSW) during the carrying out of the development.”</p> <p>Condition 33 + 34 Redrilling and fracing management Plan – 33. “The applicant shall obtain prior approval to the DG for the redrilling and or additional fracing of a gas well.” 34. “ The applicant shall prepare a redrilling and fracing management Plan ... The plan shall include (b) details of how the environmental performance of the work will be monitored and what actions shall be taken to address adverse environmental impacts</p>
	DA 75-4-2005		<p>58 Independent Environmental Audit - “within 2 years of the date of this consent and every 2 years thereafter , unless the DG directs otherwise, the applicant (in this case Sydney Gas Project (Camden) Pty Ltd (I have not yet seen the transfer of this consent to AGL so do not know the AGL entity that is responsible) shall commission and pay the full costs of an independent Environmental Audit. The independent Environmental Audit shall : (a)...approved by the DG ..; (e) review the adequacy of the EMP; (f) recommend measures... .. so not so independent</p>
Stage 3	PPL5	AGL Upstream Investments Pty Ltd	
	Part 3 A Application	AGL Gas Production (Camden) Pty Ltd	



Proposal for Pilot Study

CSG Aquifer Connectivity and Groundwater Impacts

v2

17 May 2011

Presented to: Marylou Potts Pty Ltd for attachment to submission to the NSW Department of Planning concerning protection of groundwater in the project areas constituting AGL Camden Gas Project Stages 1, 2 and its proposed expansion in Stage 3

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Background

Geo9 is an independent geological and geophysical consulting company specialising in groundwater exploration. We are the only Australian representative of two proven ground based geophysical techniques - the AquaTrack™ method from Willowstick Technologies from the US, and an electro-kinetic seismic method known as EKS, formerly known as Groundflow, from the UK. We are also uniquely positioned as the only company worldwide that is trained in the use of both of these systems.

Together with conventional hydrogeological investigations, Geo9's proposed approach to studying the impact of CSG mining on connected groundwater resources using geophysics will provide an unprecedented level of information to inform the mapping and characterisation of aquifers.

This document outlines the scope of a pilot study to prove the interconnectivity of aquifers and the impact of CSG extraction on the overlying aquifers to the highest standards of scientific rigour. Geo9's approach combines a number of ground-based geophysical techniques with traditional data collection methods including geological mapping, geochemical sampling and borehole analysis.

Geo9 would seek independent review by an academic institution and/ or independent consultant throughout the study, and peer review of the results for publication in scientific journals and presentations to the International Association of Hydrogeologists and other professional bodies.

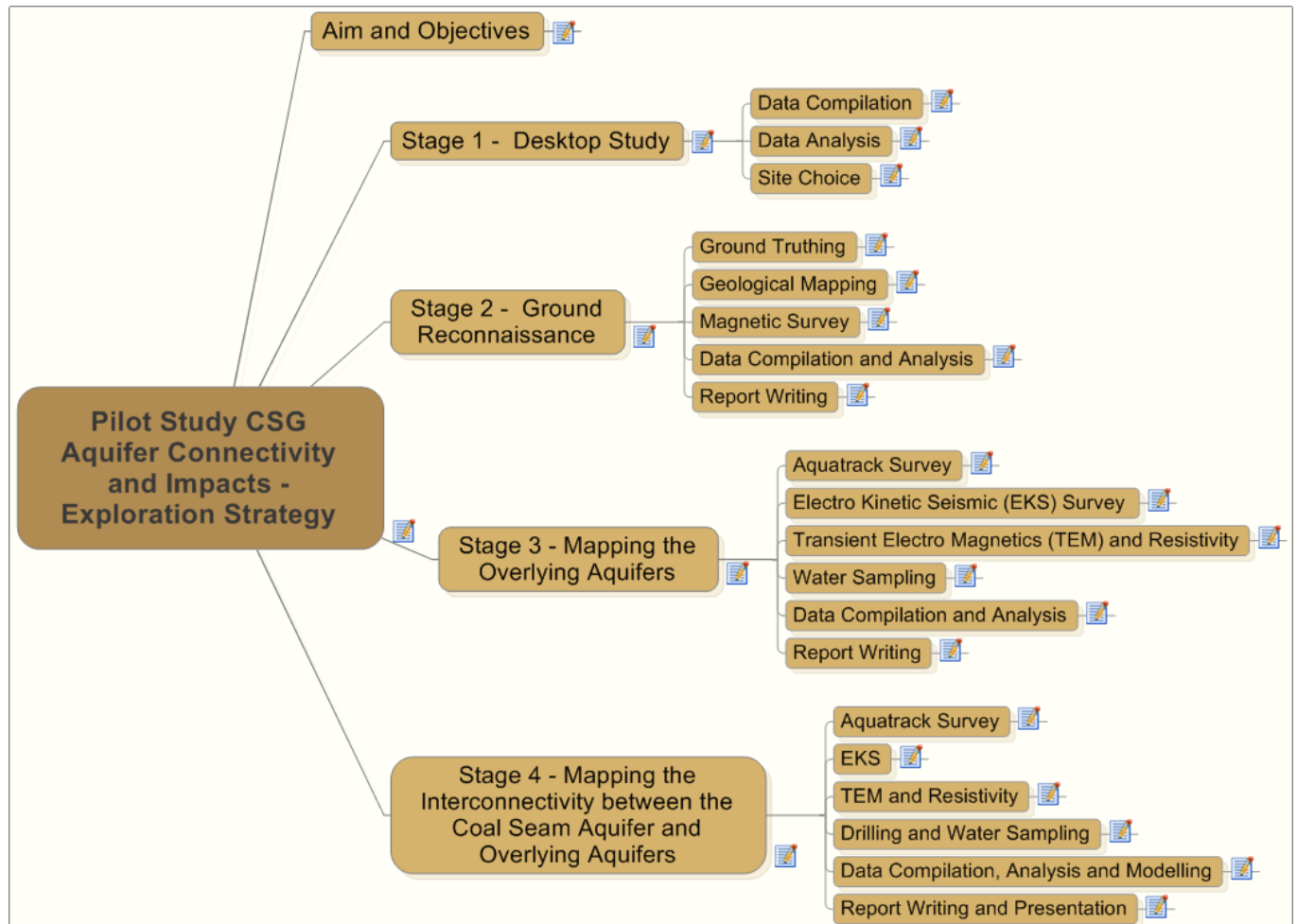
Aim and Objectives

The aim of the pilot study is to identify and assess both qualitatively and quantitatively the degree of interconnection between coal seam aquifers currently being utilised for coal seam gas extraction, and overlying aquifers in areas perceived by the community as being threatened either by contamination or depletion from such activities.

Geo9's objective is to provide an independent scientific assessment of the risk to groundwater supplies co-existing with CSG production by using geological mapping, geophysics and groundwater geochemistry.

Further Geo9's seeks to prove and establish a methodology that is recognised by the scientific community as a means to improve the precision and accuracy of hydrogeological models used for environmental impact assessment of CSG extraction.

Exploration Strategy





Stage 1 - Desktop Study

The first stage is identifying a location with the geological characteristics deemed most likely to provide evidence of seepage between the aquifers in question. The areas need to be chosen through geological considerations. This research needs to take an initial broad scale view to find areas most relevant to the study. The choice of location for the pilot study will also depend on the proximity of active CSG wells and overlying bores used for agricultural production and human use. Further, it will be important to identify locations where there is negligible interference from surrounding metal sources to the proposed ground based geophysical techniques.

Data Compilation

Geo9 will analyse areas where CSG exploration and production activity is occurring and review previous geological reports and surveys that are on the public record. This will include an analysis of agricultural and domestic bore logs from State Government records. Geo9 will then source a wide range of publicly available data on geology, geomorphology, geography, hydrology and groundwater chemistry in those areas. We will also research satellite imagery and airborne geophysics which includes magnetic, gravity and radiometric data. The data will be compiled as separate overlays in a Geographical Information System (GIS) software package for analysis.

Data Analysis

The purpose of this step is to identify geological features most likely to host seepage between aquifers in areas where active CSG and agricultural and domestic bores exist. For the purposes of this study, the bores must be located within 3 km of each other to be within the limitations of the geophysical surveying. The data analysis will identify the location of regional scaled fault zones, fracture zones, intrusive dykes and pipes that intersect rock layers. These geological features would act as seepage zones interconnecting the aquifers of interest and Geo9 is seeking to find them for closer investigation.

Site Choice

Once the data analysis is complete, target areas for exploration would be identified at sites judged most suitable for geophysical surveying. During this step, Geo9 also conduct an initial assessment of potential survey interference factors such as power lines and fences, roads and railways.



Stage 2 - Ground Reconnaissance

During this stage, Geo9 commences fieldwork. The objective is to rank targets in order of suitability for ground-based geophysical surveys based on the on-site conditions. Geo9 will conduct an initial assessment of the any built infrastructure that could interfere with the proposed geophysical surveys including communication cables, irrigation pipes and fences.

Ground Truthing

Ground truthing verifies the data collected in the office faithfully represents features that are expressed on the ground. This includes checking that geological mapping is correct and that features identified from aerial geophysical maps correlate to a certain rock type or landscape. The effectiveness of ground truthing the geological data will be dependent on the degree of rock outcrop and the geomorphology on site. Geo9 will also verify the location and condition of the agricultural and domestic bores and the location of CSG wells. Further detail including the types of well head design, pipelines, fences, roads and the location of evaporative dams that may be used, will be collected to confirm the suitability of the site for later geophysical surveying.

Geological Mapping

Geo9 will need to gather detailed geological evidence to prove the existence of faults, fractures and dykes. In order to achieve this, Geo9 will make observations on rock outcrops, the landscape and the processes that control drainage and recharge in the areas of interest. Geological maps available in the public domain are based on a large scale of 1:250 000 and fine structural details are not incorporated into these maps. Observations from this step will lead to a higher level of mapping detail and a better understanding of the controlling influence the lithologies and structure have on the groundwater flow paths. It will also be useful in assessing hydrogeological characteristics of the subsurface such as porosity and hydraulic conductivity. Results from this step will determine the areas of interest for the next step of ground based magnetic surveying.

Magnetic Survey

The first layer of ground-based geophysical data Geo9 would collect is a ground based magnetic survey. This is needed to identify the locations of faults, fracture zones, dykes and intrusive pipes with precision.

Data Compilation and Analysis

The last step of the reconnaissance is to compile and analyse the field data. In this step, Geo9 incorporates the new data into the existing GIS database. Overnight processing of field data will provide various efficiencies including the ability for our field geologist to tweak the exploration strategy if required.

Report Writing

A plain English report will present the key data, analysis and conclusions from the desktop and reconnaissance work conducted to date. This report will identify the most suitable targets areas for the next phases of ground-based geophysical surveying.



Stage 3 - Mapping the Overlying Aquifers

The objective of this stage is to use ground based geophysics to provide a high resolution map of the aquifer(s) used in agricultural production overlying the coal seam, and to determine the connectivity between bores drawing from these aquifer(s). Geo9 would use multiple geophysical techniques and geochemistry to develop a detailed understanding of the groundwater systems.

Aquatrack™ Survey

The AquaTrack groundwater mapping technology will map the connection between bores in high resolution. This technique requires electrodes to be placed in two productive bores that intersect the aquifer or aquifers of interest and are no greater than 3 km apart. An alternating current is produced in the groundwater and induces a magnetic field that is measured at multiple points on the surface. Data would initially be collected in a grid of 50m spacing that can be upgraded to a higher resolution of 25 m or 10 m spacing grids over specific points of interest. In order to establish connectivity this procedure would be repeated between more than 2 bores, using one bore as a base or central point, and mapping the connectivity to other bores in a radius around it.

Electro Kinetic Seismic (EKS)

An important part of Geo9's geophysical toolkit is an electro-kinetic seismic technique (EKS) that identifies permeability in water filled strata at selected locations. The EKS uses a sonic pulse to establish a vibration between water molecules and the surface of mineral grains, resulting in an electromagnetic field that can be measured. This method enables the accurate determination of depth to the water table and groundwater flow rates in specific aquifers without the need for drilling and pump testing. The EKS system can be used in locations where no wells or bores exist, or in close proximity to existing ones. The EKS provides an effective and cost efficient alternative to standard methods used to assess the impact of groundwater extraction on the water table and aquifer system.



Transient Electro Magnetics (TEM) and Resistivity

Transient Electromagnetics (TEM) and Resistivity are two further ground-based geophysical techniques that can map the conductivity, and its inverse, resistivity, of the subsurface. These techniques provide a way of identifying stratigraphy, layering, groundwater and the interconnection between aquifers to shallow depths of between 60 m - 250 m. These techniques are especially useful for detecting the depths to boundaries and remotely estimating relative groundwater salinity. The results are useful for the calibration of the EKS surveys and would also be correlated with the AquaTrack survey results to elucidate the geological controls on groundwater flow paths, identify recharge zones and establish the connection between groundwater, surface run off and groundwater dependant ecosystems.

Water Sampling

The collection of water samples for chemical analysis would determine water composition and age. Further samples could be collected for the analysis of methane, fracking fluids and other organic contaminants derived from coal and other hydrocarbons. These geochemical analyses establish the baseline chemical characteristics of the groundwater water and would provide another indication of the connection between CSG aquifers and the overlying aquifers independently of the geophysical studies.

Data Compilation and Analysis

The results from the AquaTrack survey are processed in Utah in the US. An initial plan view in 2D is likely to be sufficient to prove the electrical connectionity of bores that draw from the same aquifer. If several overlying aquifers are present and they are interconnected, then 3D modelling would be beneficial. The results from the EKS system are produced directly on site. Initial results from the TEM and resistivity surveys are also available in the field, but further processing in the office will optimise the results. Once the fieldwork is completed, survey results from all of the different geophysical techniques and geochemical analysis will be correlated and added to the GIS database. A groundwater model would then be created to present the results of work to date.

Report Writing

The findings from Stage 3 will be presented in a report with extensive use of graphics to illustrate the interaction between the aquifers and the geological controls therein.



Stage 4 - Mapping the Interconnectivity between the Coal Seam Aquifer and Overlying Aquifers

This goal of this stage is to explore for, and map any interconnectivity between the coal seam aquifer(s) and the overlying aquifers mapped in Stage 3. This stage requires access to CSG wells and will depend on the cooperation of several landholders and access to CSG wells.

Aquatrack™ Survey

For the AquaTrack survey in this stage, access to an active CSG well on or near the property will be required to establish whether there is any interconnectivity between the aquifers that host the CSG well and the overlying aquifer systems. The AquaTrack system will map any flow paths between the aquifers and identify the salinity or freshwater plumes around these structures, which will indicate whether water of one aquifer is flowing into another and the direction of that flow. The AquaTrack survey can also determine the integrity of any leaking CSG wells. If there is puddling around the well head, the interconnectivity of the coal seam to the surface can be mapped by locating one electrode in the CSG well and another in the wet area around the CSG well. The surveying programme would commence with broad measurements located at estimated 50m spacings, with high density measurement at 5m spacings in areas of greatest interest. These measurement points map the position and orientation of the connection path and any cross contamination plumes. Modelling of AquaTrack results from this stage are required in 3D to inform the next stages of the study.

Electro Kinetic Seismic (EKS)

The EKS measurements will enable the permeability and groundwater flowrates to be determined both within the coal seam and along any interconnection found between the coal seam and the overlying aquifers. The locations and depths of the EKS survey will be determined by the 3D model based on the preceeding Aquatrack results. The results of this step and the AquaTrack survey data will provide inputs for modelling of the aquifer systems at an unprecedented high level of resolution.

Transient Electro Magnetism (TEM) and Resistivity

TEM and resistivity would be useful in mapping the upper parts of the interconnecting groundwater conduits if they are within 250m of the surface. These additional sources of subsurface data would add rigour to the groundwater model as they would provide an additional image of the connection between aquifers. Survey results from this step would be correlated with AquaTrack and EKS survey data.



Drilling and Water Sampling

Drilling of test holes for geophysical surveying using AquaTrack could be required if a site is selected where the CSG aquifer under review does not have a nearby agricultural bore drawing from the overlying aquifers within a 3km radius. The option for drilling test holes will also be required for the chemical analysis of water samples to establish the interconnection between the aquifers independently of geophysics. The analysis would determine water composition, age, and establish the degree of contamination of methane, fracking fluids and other organics derived from the coal seams. Drilling would intercept seepage structures at various depths to provide information on the dilution of organic contaminants, salts and isotopic chemical species. Since the chemical characteristic of groundwater is unique to each aquifer, the chemical analysis of water within the seepage conduits would characterise the degree of the interconnection.

Data Compilation, Analysis and Modelling

The results from the AquaTrack survey are processed in Utah in the US. All information from the study would be combined into a model that includes high resolution data to identify and predict the impact of CSG extraction on the surrounding aquifers.

Report Writing and Presentation

The findings from the pilot study will be presented with extensive use of graphics to illustrate the interaction between the aquifers, the geological controls therein, aquifer reaction and predictions of CSG extraction. The results of the groundwater modelling would be submitted for publication and presented in talks to the Australian chapter of the International Association of Hydrogeologists and other professional bodies.



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Fracking chemicals, their uses and hazards

This is a list of *some* of the chemicals used in fracking fluids in Australia. (Source: APPEA, 1 November 2010)

The full list can be seen at

http://www.appea.com.au/images/stories/mb_files/APPEA_fracking_chemicals.pdf

Fracking fluid mixes vary according to the nature of each task. Not all of these substances are used in all fracking jobs.

Chemical, fracking use.

Common use example

Hazards, safety notes

1-Propanol. Complexor.

Used as a solvent in the pharmaceutical industry.

Hazardous chemical class 3 [1]. Highly flammable. Harmful by inhalation and if swallowed.

Irritating to eyes and skin.

2-Butoxyethanol. Surfactant (used to reduce surface tension).

Used in whiteboard cleaners, liquid soaps, cosmetics and lacquers.

Poison. Causes hemoglobinuria as well as histopathologic changes in the liver and kidney. [2]

Acetic Acid. pH buffer (used to adjust pH).

Gives vinegar its taste.

Extremely corrosive and flammable. It requires special storage and handling considerations.

Glacial acetic acid causes severe chemical burns to eyes and skin. [3]

Acrylic copolymer. Lubricant.

Used as a soil-repellent coating by the building industry.

Includes methyl methacrylate, methacrylic acid, butyl acrylate and buthyl methacrylate, all toxic chemicals used in solvents.[4]

Ammonium persulfate. Breaker. Used to reduce viscosity (turns a gel into water)

Used in hair bleach, blot gels and glass cleaning products.

Oxidizer with moderate oral toxicity. Airborne dust may be irritating to eyes, nose, lungs, throat and skin upon contact.[5]

Boric Acid. Crosslinker to increase viscosity.

Used in antiseptics to treat cuts and fungal infections (athlete's foot).

Poison. Chronic poisoning occurs in those who are repeatedly exposed to boric acid. Once used to disinfect and treat wounds, patients who received such treatment repeatedly got sick, and some died. [6]

Boric Oxide. Crosslinker to increase viscosity.

Used to produce high strength alloys, glasses and ceramics.

Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause kidney injury. [7]

Disodium Octaborate Tetrahydrate. Gelling agent/Crosslinker to increase viscosity.

Used as a fertilizer.

Affects the gastrointestinal tract, skin, vascular system and brain.[8]

Hydrochloric Acid. Cleaning of the wellbore prior to fracking.

Used to clean swimming pool filters.

Extremely corrosive. Inhalation of vapour can cause serious injury. Ingestion may be fatal. Liquid can cause severe damage to skin and eyes. Threshold Limit Value - 5 ppm. Lethal to fish from 25 mg/l or more. Toxic for aquatic organisms due to pH shift [9]

Methanol. Surfactant. Used to aid gas flow.

A type of alcohol, can be used in wastewater treatment and as an alternative fuel.

Swallowing even small amounts has potential to cause blindness or death. Effects of sub lethal doses may be nausea, headache, abdominal pain, vomiting and visual disturbances ranging from blurred vision to light sensitivity. Repeated exposure by inhalation or absorption may cause systemic poisoning, brain disorders, impaired vision and blindness and worsen conditions such as emphysema or bronchitis. [10]

Ethylene Glycol Monobutyl Ether. Mutual solvent.

Used in household cleaners, fire fighting foam, and to degrease bowling pins and lanes.

Liquid and vapour are combustible. Harmful if inhaled, when in contact with skin and if swallowed. It is irritating to respiratory system. Causes eye irritation, affects central nervous system, blood and blood forming organs, kidneys, liver and lymphoid system. [11]

Muriatic Acid. Used for cleaning the well bore.

Leather tanning and for cleaning.

Irritating and corrosive to living tissue. Brief exposure in low levels produces irritation. Exposure to higher levels can cause breathing difficulties, narrowing of the bronchioles, blue colour of the skin, accumulation of fluid in the lungs and death. [12]

Potassium Chloride. Clay inhibitor.

Used in making fertilizer, gas-welding flux, in medicines and for lethal injections.

Large doses cause gastro-intestinal irritation, purging, weakness and circulatory problems. [13]

Polydimethyldiallylammonium chloride. Clay control.

Flocculant in waste water treatment. Wetting agent, shampoo ingredient.

Avoid runoff into storm sewers and ditches. [14]

Quaternary Polyamines. Clay control.

Used in waste water treatment

Corrosive, dangerous for the environment. Risk of serious damage to eyes. Very toxic to aquatic organisms. Vapours may cause drowsiness and dizziness.[15]

Sodium Borate. pH buffer.

A component in glass, pottery, and detergents.

Eye irritation, blurred vision, eye damage. [16]

Sodium Hydroxide. pH buffer.

Used in paper-making, food processing, soap, detergents, drain cleaners.

Causes severe skin and eye burns. May cause blindness; severe and permanent damage to gastro-intestinal tract including burns, perforations[17]. Inhalation may lead to chemical pneumonitis, pulmonary edema. Causes severe irritation of, and possible chemical burns to upper respiratory tract – coughing, burns, breathing difficulty. Possible coma.

Tetrakis (hydroxymethyl) Phosphonium Sulfate. Antiseptic.

Used to eliminate bacteria in water, petroleum.

Prolonged or repeated skin contact may cause dermatitis, liver and kidney damage. [18]

Tetramethyl ammonium chloride. Clay control .

A salt of ammonia. Few common applications.

May be fatal if swallowed. Causes dizziness, nausea, shortness of breath, severe hypotension, shock. A known ganglionic blocking agent, causing vasodilation, and curare-like actions, peripheral nerve damage, cardiac paralysis, dyspnea, effects, hypotension.19

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- 5 http://las.perkinelmer.com/content/ApplicationNotes/FAR_GCMSAcrylicCopolymerPyr.pdf
- 6 <http://www.hillbrothers.com/msds/pdf/n/ammonium-persulfate.pdf>
- 7 <http://www.nlm.nih.gov/medlineplus/ency/article/002485.htm>
- 8 <https://securesearch.acros.com/msds?for=acros&sup=acros&lang=UK&search=206300010>
- 9 http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC35343
- 10 http://msds.chem.ox.ac.uk/HY/hydrochloric_acid.html
- 11 http://www.methanex.com/products/documents/MSDS_USenglish.pdf
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- 13 <http://hubpages.com/hub/What-is-Muriatic-Acid>
- 14 <http://www.flocclants.info/Gmsdsdmdac20.pdf>
- 15 <http://www.broadleyjames.com/PDFs/msds-kcl-h2o.pdf>
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12th February 2011

Mr Clay Preshaw
Major Projects Assessment
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001



Re: Camden Gas Project Stage 3 (Northern Expansion)

Dear Mr Preshaw,

I write to you on behalf of the Board of St. Sava College, (currently building a school facility in Varroville) The Serbian Orthodox Diocese Education and Aged Care Fund, (the owners of the land) and the Serbian Orthodox Diocese of Australia and New Zealand under which the above named bodies operate.

This somewhat belated submission comes to you largely due to the fact that we were only relatively recently made aware of the proposed AGL project and more importantly of the exhibition of the so called, Environmental Assessment Main Report. Given the scope of the proposal and issues arising from the same, it was necessary to familiarise ourselves with the matter in order to make a reasonable and informed response. This is a preliminary submission.

In general terms, we fully uphold the objections raised by Campbelltown Council and the Scenic Hills Association with respect to coal seam mining in the Scenic Hills protection zone for all the reasons given in their submissions. More specifically, we object to the proposal, given that the nature of our own project, which is entirely compatible with current zoning, would not only be severely affected but could be destroyed should the Gas Project be approved.

When submitting our Development Application with Campbelltown Council in 2005, we presented Council with a master plan of the site which includes an aged care facility exactly within the area deemed to be affected by the proposed placement of W07. A determination which would allow the digging of this well would deem the provision of such facilities impossible.

Furthermore, the proposed usage of existing access roads which extend through the middle of our property as indicated in Figure 8 of the EA is objectionable in every respect. Student safety and the inevitable constant disruption caused by trucks and commercial vehicles passing through the school would be sufficiently objectionable. However, the transportation of toxic waste through the very heart of the school and the very real threat of spillage is of much graver concern. The access road runs less than five metres from the Stage 1 school building which is currently under construction, and passes immediately by the residence which graces the crest of the hill.

The EA does not consider the "sensitive" nature of our school project, nor of the planned aged care facility. Preparation of the EA, in this case displays complete ignorance of not only planned and approved developments, documentation of which is available from Campbelltown Council, but also of current building works being undertaken on the property.

The Environmental Assessment is in this case flawed and St. Sava College, The Serbian Orthodox Diocese Education and Aged Care Fund and the Serbian orthodox Diocese of Australia and New Zealand therefore strongly object to its approval.

Yours Faithfully,

Fr.Rade Radan

Project Director St.Sava College