

Energy in
action.®

ASX statement

13 December 2010

Attached is a presentation to be made this afternoon by AGL's Group General Manager Upstream Gas, Mike Moraza, to Citibank.



Paul McWilliams

Company Secretary





Energy in
action.®



The CSG Opportunity

Mike Moraza | December 2010 | AGL External

Coal seam gas in
Australia.



Coal seam gas (CSG)

- › Naturally occurring methane associated with coal
- › Generally 600-1,000m below ground
- › Minimal processing and is sold as natural gas
- › Abundant in eastern Australia:
 - › 81% of 2P gas reserves;
 - › 31% of gas sales, >90% of Queensland sales
- › ~3,000 drilled QLD CSG wells, estimated to grow to 25,000-30,000 wells over the next 20-30 years¹

1: see QLD govt website



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CSG – the economic benefit

- › Industry sources have estimated Australia's total in-ground CSG resources to be 150-250 trillion cubic feet
- › One trillion cubic feet of gas is considered to be enough to power a city of a million people for 20 years¹
- › Size of the resources + ever-increasing global energy demand = proposed development of a number of LNG export plants
- › Projects expected to generate
 - » 18,000 jobs
 - » Around \$1 billion additional state revenues each year²

1 : see appea website

2: see appea website

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CSG and the environment

- > Gas-fired power stations emit 50-70% less greenhouse gas emissions than existing coal-burning plants¹
- > Electricity generated from coal
 - » Australia (85%), China (80%), India (70%) ¹;
 - » LNG exports – a substitute for coal fired generation

1 : see appea website

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AGL's CSG projects

- > Camden
 - » Commenced 2001;
 - » 65 kilometres south-west of Sydney;
 - » Produces 6% of NSW's gas requirement
- > 3 CSG exploration projects:
 - » Hunter region;
 - » Gloucester basin;
 - » Galilee basin



Enclosed Camden Well

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Water management.



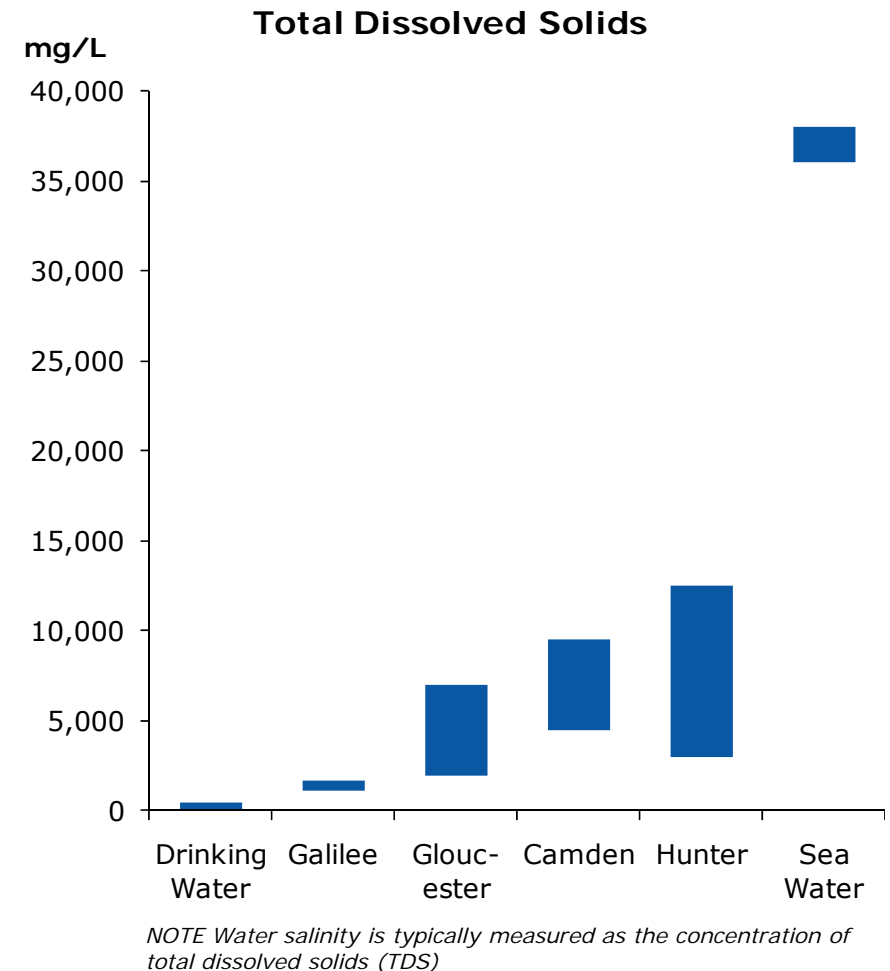
CSG and water

- > Highly regulated industry - at state and federal levels
- > Both the industry and AGL need to take a proactive and precautionary approach
- > AGL's CSG operations are managed so as to:
 - » Protect beneficial uses of shallow aquifers
 - » Minimise our footprint and fit with primary land use
- > AGL is undertaking research and is expanding its monitoring programs



CSG and water

- > Water is an inevitable by-product of CSG production
- > Produced water volumes
 - » Low in the Sydney-Gunnedah basins (NSW);
 - » Higher in the Bowen-Surat-Galilee basins (QLD)
- > Beneficial reuse options being developed
- > Salinity values for:
 - » Good quality drinking water is less than 500 milligrams per litre (mg/L) (eg Sydney is ~80 mg/L);
 - » Sea water is 36,000-38,000 mg/L;
 - » CSG water is highly variable between basins – typically ranges between 1,000-15,000 mg/L

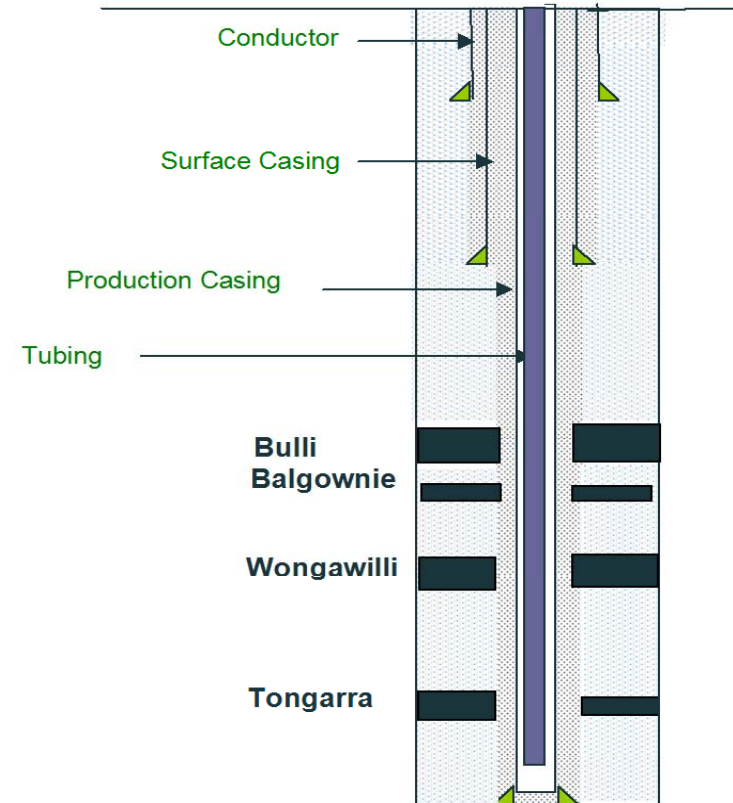


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AGL's CSG operations and water

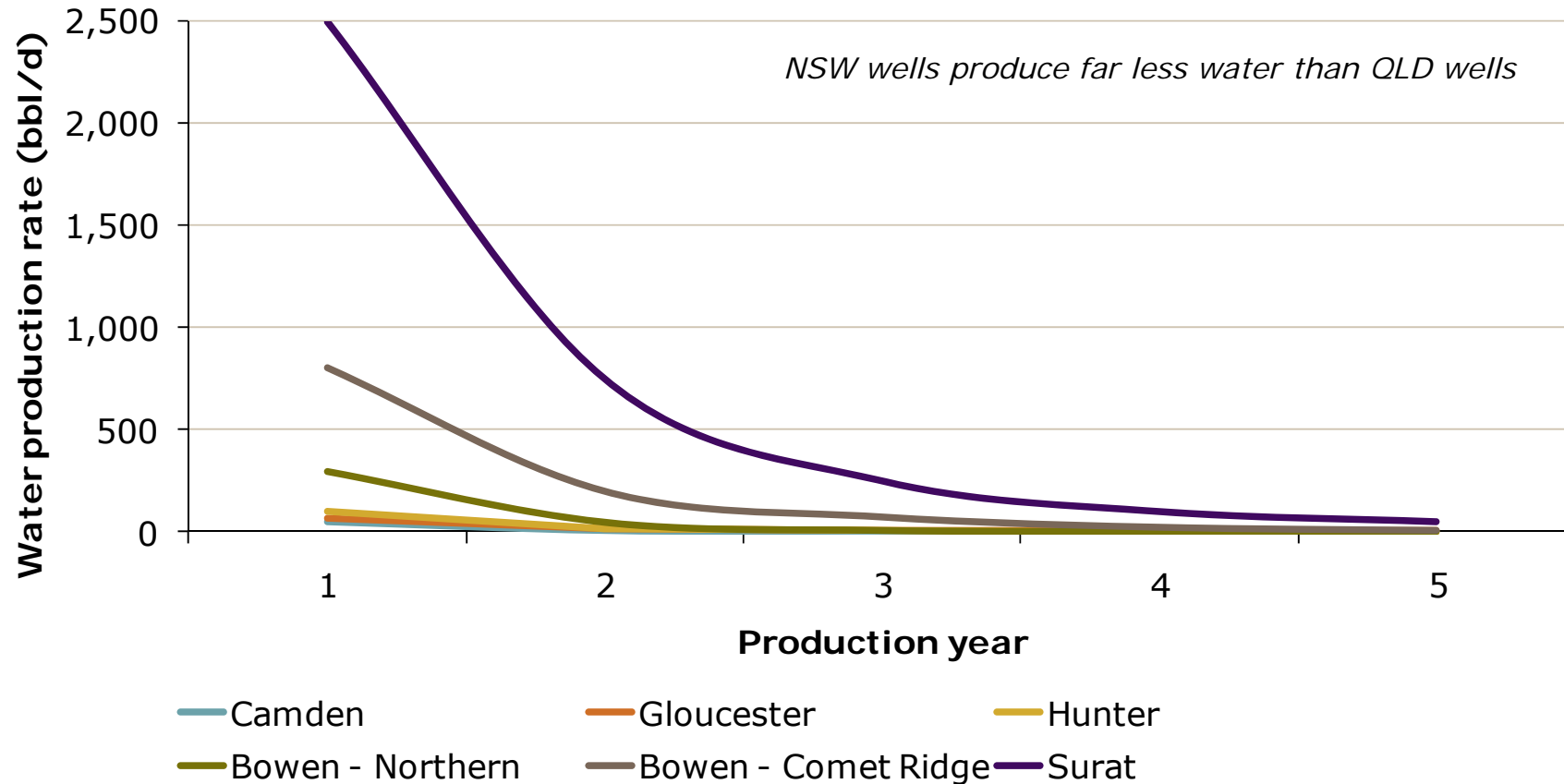
- > Every CSG well drilled by AGL has steel casing cemented in place, sealing it from any possible connectivity between shallow aquifers and water contained in coal seams
- > Typically, there are 100s of metres of impermeable rock between shallow aquifers and coal seams
- > AGL monitors the integrity of well completions to ensure there is no connection between upper aquifers and deep coal seams
- > No compromised gas well completions have been detected



Typical Camden Well

AGL's CSG operations and water

Dewatering type curves



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AGL's groundwater monitoring programs

- › AGL monitors to ensure there are no adverse impacts on water levels/water quality in shallow aquifers that are used by local water users
- › Different basins/geologies require a tailored approach because of the variable groundwater conditions
- › No adverse water impacts have been detected from tests performed



Case Study: AGL Hunter Gas Project groundwater investigation and monitoring report

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Program objectives:

- > Provide more information on groundwater in the Broke area by determining whether the aquifers and deeper coal seams are connected (or not) at various depths;
- > Help the community understand what impacts, if any, there might be on local water supplies and groundwater as a result of gas exploration



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Case Study: AGL Hunter Gas Project groundwater investigation and monitoring report

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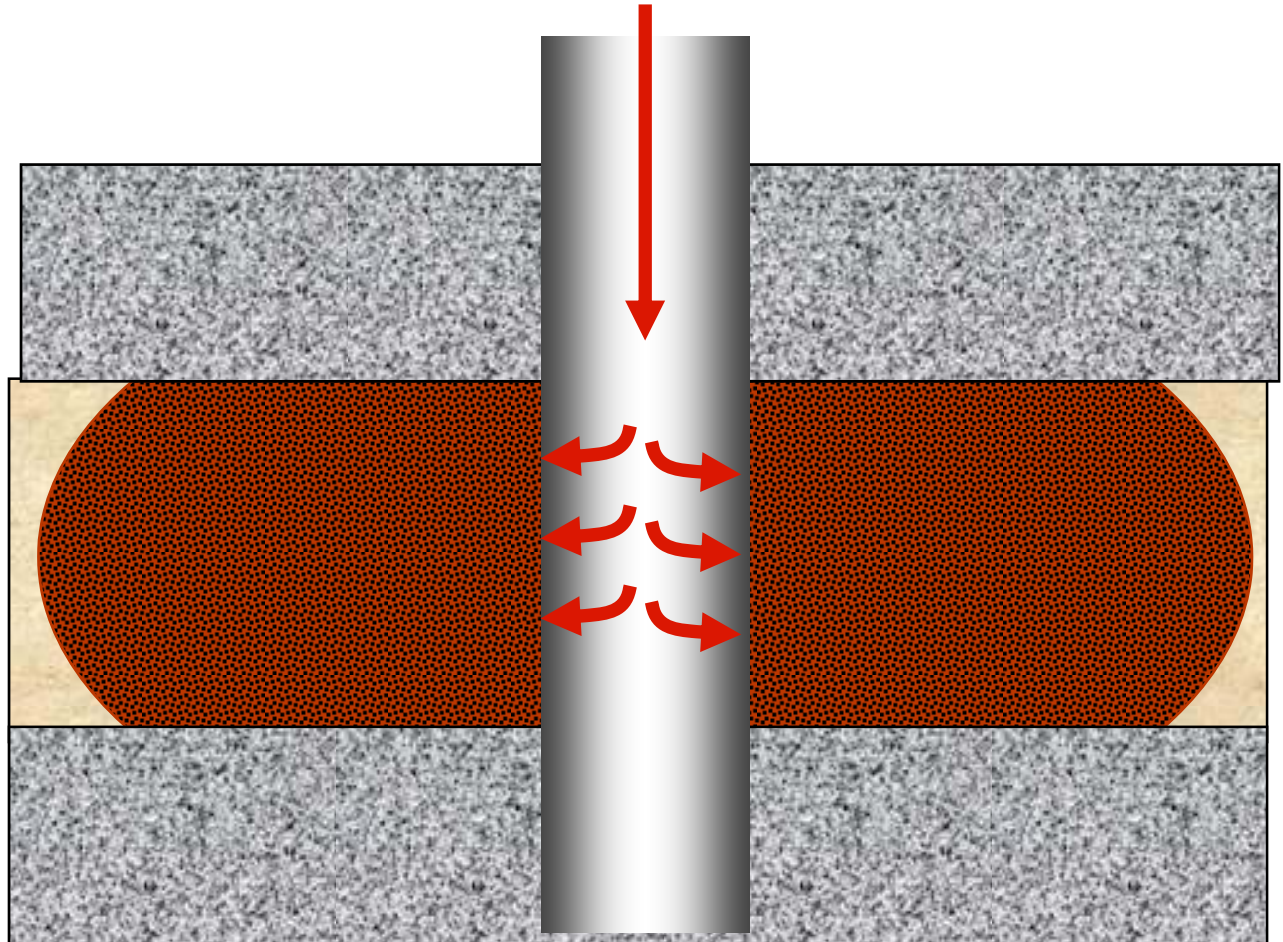
- > Developed in consultation with members of the Bulga Community Consultative Committee;
- > Endorsed by the peer reviewer (Prof Garry Willgoose from Uni of Newcastle);
- > Methodology:
 - » Drilling and installation of water monitoring bores around gas exploration test wells;
 - » Sampling and analysing groundwater (baseline, during a flow test event and then post flow testing);
 - » Testing the permeability of different sediment and rock layers;
 - » Monitoring water levels and water quality;
 - » Age testing of shallow aquifer and coal seam water; and
 - » Reporting and peer review;
- > Conclusion: Gas exploration activities are considered to have negligible effect on the local productive alluvial and shallow bedrock groundwater supplies in the Broke area

Fracture stimulation and
BTEX.



CSG hydraulic fracture stimulation

- > Technology used to increase the flow of gas
- > The process essentially is:
 - » Fluid is pumped into a formation through perforations
 - » Fracturing occurs on either side of the well
 - » Once fracturing is created sand is pumped in to hold open the 'frac'
 - » End result: a highly conductive flow path for CSG



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CSG fracture fluid additives

- › Water
- › Sand
- › Gelling agents (viscosifiers)
- › Crosslinkers
- › Surfactants (option)
- › Buffers
- › Breakers
- › Microbiocides
- › Nitrogen



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The fracture stimulation industry

- › There have been over 1 million treatments worldwide over the past 60 years
- › Zonal isolation is the key objective (cement, steel casing and proper procedures – which are all regulated by proper agencies)
- › Service companies strive to be good stewards of the environment:
 - » Strong HSE culture;
 - » Independent laboratory testing work underway to provide CSG producers a QA statement on full disclosure of chemicals used – No BTEX;
 - » Operating companies need to ensure they use products that are suitable to the reservoir and to the environment



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What is BTEX?

- > BTEX refers to the group of compounds: benzene, toluene, ethylbenzene, and xylene:
 - » Benzene is a volatile organic compound used in plastics, paints, dyes, and cosmetics;
 - » Toluene is used as a solvent for paints, oils;
 - » Ethylbenzene is mostly used in gasoline, pesticides;
 - » Xylene used in gasoline, solvent in printing, rubber
- > Naturally occurring components of hydrocarbons below ground;
- > Exposure to BTEX over sufficiently long periods may result in harmful effects to human health
- > BTEX chemicals are not used as part of the fracture stimulation process for CSG wells
- > At each of AGL's CSG exploration projects, AGL has a program to monitor groundwater for BTEX and no BTEX has been detected

Future industry
challenges.



Future Industry Challenges

- › Education
- › Increased costs of gas production
- › Increased regulation
- › Managing land use conflict
- › Managing by-products



Ensign Rig 67 – ADR 200:
automated and silenced to work in a semi urban area

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