Australian National University
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Government officials’ workshop

Unconventional gas production and water resources: lessons from the US on better governance

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Unconventional gas production and water resources
An Australian perspective on Governance and Regional Strategic Planning

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Potential risks to sustainable water management

• Extracting large volumes of low-quality water will impact on connected surface and groundwater systems, some of which may already be fully or over-allocated, including the Great Artesian Basin and Murray-Darling Basin.

Potential risks to sustainable water management

• Impacts on other water users and the environment may occur due to the dramatic depressurisation of the coal seam, including:
  – changes in pressures of adjacent aquifers with consequential changes in water availability
  – reductions in surface water flows in connected systems and
  – subsidence over large areas, affecting surface water systems, ecosystems, irrigation and grazing lands.
Potential risks to sustainable water management

• The production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and have significant impacts on water quality, and river and wetland health. There is an associated risk that, if the water is overly treated, 'clean water' pollution of naturally turbid systems may occur.

• The practice of hydraulic fracturing, to increase gas output, has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality.

• The reinjection of treated waste water into other aquifers has the potential to change the beneficial use characteristics of those aquifers.

2.2 Environmental Impacts of Shale Gas Development

- Drill Pad Construction and Operation
- Hydraulic Fracturing and Flowback Water Management
- Groundwater Contamination
- Blowouts and House Explosions
- Water Consumption and Supply
- Spill Management and Surface Water Protection
- Atmospheric Emissions
- Health Effects
The most rational path forward is to develop fact-based regulations of shale gas development based on what is currently known about the issues and, at the same time, continue research where needed for information to support controls in the future. Additional or improved controls must not only respond to the issues of controversy, but also address the full scope of shale gas development. Priorities must be set on the most important issues as well as on public perceptions. The path ahead must take advantage of the substantial body of policies and regulations already in place for conventional oil and gas operations. Enforcement of current and future regulations must also be ensured to meet the twin objectives of protection of environment and other resources and gaining public acceptance and support.
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• From any understanding of how the Australian landscape functions it is possible to use principles of Integrated Catchment (Watershed) Management to create a mosaic of appropriate land uses given the underlying capacity of natural systems to support desired set of values.
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- It is possible and desirable to use our knowledge of landscape process to work out upfront where we can safely mine and where mining would compromise agriculture, water resources, biodiversity other land uses and landscape environmental function.
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• It is clear that mining for gas extraction, coal seam or shale gas has the potential to put at risk the function and value of key long term renewable natural resources assets and use such as:
  • Water resources and aquatic ecosystems
  • Agricultural land use thus food and fibre production
  • Biodiversity and landscape function via vegetation and habitat management
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• It is folly to secure one natural resource while putting at risk renewable long term resource use. The need is paramount for:
  • good long term regional land use planning to avoid such perverse outcomes
  • Recognition of limitation of EIS approach…leads to death by 1000 cuts!
  • Need non statutory regional and landscape planning to inform statutory planning
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• Good regional and catchment action planning (CAP) with appropriate spatial definition should be able to identify
  • *no go areas* for mining for gas and coal
  • *go with care areas* in which mining can be conducted without unacceptable perverse outcomes within a regulation framework.
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• The mining Acts for unconventional gas production and CSG in general need reform to bring them in line with ESD principles and the objectives of the State Acts which govern Native Vegetation and Water Resources, Agricultural and Biodiversity (eg In NSW the Native Vegetation and Water Management Acts)

• Integrated Catchment Management is now possible in NSW and mining along with urban development and all land use should sit.
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• It is about putting all development in line with maintain and improve principles directed towards State targets for Natural Resource assets of land, water and biodiversity.

• Impacts of coal and coal seam gas mining should be assessed up front and helped through Regional and CAP planning mechanisms to guide exploration away from areas of high risk to landscape function.

• Actual impacts and remediation need to be managed strategically to avoid large areas of partially remediated sites. It is better to transform some to new function and remediate others to high quality outcomes.
Integrated action, based on sound science, to manage water in the landscape for all users, for now and the future.
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• The planning system does not explicitly support the state-wide goals to improve or maintain landscapes and there is limited alignment between the planning system, and other government initiatives for landscape management.

Planning resources are disproportionally focussed on development assessment rather than strategic planning.
Figure 4  Changing the focus of planning efforts

CURRENT PLANNING EFFORT  GOAL FOR PLANNING EFFORT

- Strategy
- Typical planning system
- Development Assessment

Integrated catchment management

Basic principles:

1. Take a holistic approach to the management of land, biodiversity, water and community resources at the water-catchment (watershed) scale
2. Involve communities in planning and managing their landscapes
3. Find a landscape functional integration between resource use for mining, agriculture, tourism, urban development etc...
Principles for a new planning system

• Planning based on best available information
• Planning at the right scale
• Whole-of-government alignment
• Community engagement
• Risk management
• Independent audit, monitoring and evaluation
• Open access to information

Strategic Planning Principles

• whole-of-government;
• part of a consistent hierarchy of aligned, nested plans;
• integrated across different levels of government
• able to be adjusted in response to changing circumstances
• developed with early and effective community engagement

[Productivity Commission benchmarks]
Not just a recent development
CAPs as a mechanism for aligning plans and values

Catchment Action Plans

- National and state priorities for NRM
- Legislation
- Targets
- Policies
- Community values and priorities
- Science
- Mechanism of aligning plans and values
- Multi-scale adaptive management
- Guides investment at catchment scale
- CMA Investment Programs
- Agency Results and Services Plans
- Third party investment
- On ground delivery
- Regional Strategies
- Regional Conservation Plans
- Water Sharing Plans
- Local Government Community Strategic Plans
- Local Environment Plans
- Links to other CAPs
- Links to other NRM Plans
A new Framework has been built in NSW for Regional Strategic Planning that could can yield Integrated Catchment Management
Figure 3.1: Criteria to assess whether the CAP is a quality, strategic NRM plan

Process

Final Plan

Criterion 1. CAP was developed using a structured, collaborative and adaptable planning process

Attributes
A) Strategic planning process was logical, comprehensive and transparent
B) Planning process meaningfully engaged the community, governments and other stakeholders
C) An adaptive planning process is in place to evaluate effectiveness of the CAP and guide improvements as knowledge improves and/or circumstances change

Criterion 2. CAP uses best available information to develop targets and actions for building resilient landscapes

Attributes
A) CAP describes the social-ecological systems operating in the catchment using best available science and knowledge of community values
B) CAP integrates biophysical and socio-economic information to analyse the systems operating in the catchment and develop strategies for improving landscape function and resilience
C) CAP proposes targets and actions that are logically nested and supported by the available evidence

Criterion 3. CAP is a plan for collaborative action and investment between government, community and industry partners

Attributes
A) Plan aligns with relevant policies and community aspirations
B) Plan can meaningfully guide governments, industry and the community to align effort across the region
C) Plan specifies agreed roles and responsibilities for partners in the catchment
Alignment of water planning and catchment planning

Mark Hamstead

Waterlines Occasional Paper No [no.], [Month Year]
Figure 1: Overlap between water allocation plans and catchment plans
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The current review of NSW planning legislation provides an opportunity to create a more coherent and aligned system for managing landscapes in NSW; a system that manages development while aiming to improve or maintain the essential landscape functions that support the environmental, economic, social and cultural attributes of value to current and future communities.
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“NSW now has institutional arrangements and maturing organizations that are giving us the best chance we have had to truly implement an integrated approach to catchment management.”

NRC 2010 Progress Report