Understanding what’s beneath our feet – the role of the Geological Survey of NSW in strategic land use planning
Acknowledgement

On behalf of the Geological Survey of NSW and the Division of Resources & Geoscience,

I acknowledge that we meet today on Aboriginal land. I acknowledge the traditional custodians of the land and pay respect to elders past, present and emerging.
The rocks beneath our feet provide the mineral and energy resources to:

- sustain our modern lifestyles
- to develop green energy technologies
- provide the raw construction materials required to build roads, housing and other vital infrastructure
- provide the minerals that make up our soils, which are essential for both agriculture and native biodiversity.

**DRG PROMOTES AND SUPPORTS BALANCED LAND USE DECISIONS**
Contents

• The role of the Geological Survey of NSW
• The importance of geological resources
• The relevant legislative frameworks
• Statutory referrals
• Examples of land use referrals
• Inputs to land use assessments
• Information and contact details
The role of the Geological Survey of NSW
In the beginning…

• Establishment of a “Mineral and Geological Survey” was first requested in 1849.

• The Geological Survey of NSW (GSNSW) started in 1875.

• Role and focus have largely remained unchanged through more than 140 years.

• Geoscientific knowledge delivering benefit to the state.

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Dispatch from Governor of NSW Sir Charles Fitzroy to the Home Secretary, the Right Hon. Earl Grey on 1st March 1849:

“I am desirous of bringing under your Lordship’s notice the expediency of causing a Mineral and Geological Survey to be made of the Colony in order to determine the mineral resources which it may possess... if the country were examined by a competent Geologist... valuable metalliferous ores would be discovered... The information thus obtained would, there is little doubt, be found highly valuable both in an economic and scientific point of view.”
The role of the Geological Survey of NSW

GSNSW collects and manages geological, geophysical and geospatial data to inform the government, resource industry and the community about the state's geology, and renewable, mineral, coal and petroleum resources.

GSNSW also collaborates with state, national and international government agencies and scientific bodies to share skills and data, and promote coherent information exchange.
GSNSW activities

• Authoritative source of up to date knowledge about the geology and geological evolution of the state.

• Ongoing program of data acquisition:
  o geological mapping
  o geophysical surveys
  o interpretation of geology in 3D and under cover
  o specialist services - mineral and petroleum systems, resource assessment, palaeontology, geochronology, etc.

• Data collation, management and delivery:
  o online and electronic delivery
  o books, maps, scientific publications, information brochures etc.

• Expert geological advice for land use planning at all levels of government.

• Geological assessment of resource industry activity to ensure that the state’s geological resources are appropriately used.

• Geoscience education and outreach to the community.
Achieving balanced land use

- Agriculture
- Renewable energy
- Pastoral
- Mining
- Conservation
- Community
The importance of geological resources
Resource commodities of NSW

Minerals under the *Mining Act 1992*

- Group 1 – Metallic Minerals
- Group 2 – Non-Metallic Minerals
- Group 3 – Semi-Precious Stones
- Group 4 – Marine Aggregate
- Group 5 – Clay Minerals
- Group 6 – Gems
- Group 7 – Opal
- Group 8 – Geothermal
- Group 9 – Coal
- Group 9A – Oil Shale
- Group 10 – Mineral Sands
- Group 11 – Uranium

Resources under other Legislation

- Petroleum
- Offshore Minerals

**Construction Materials**

- Aggregates
  - for concrete, drainage protection, rail ballast, decorative purposes
- Crushed rock / roadbase
  - for clinker, roadbase, ballast
- Fill material
  - for building foundations
- Sand
  - natural / manufactured sand for cement, concrete & mortar, foundations, specialty purposes
- Clay & clay shale
  - for bricks, pipes, roofing tiles, ceramics, structural purposes, agricultural purposes
- Other quarry materials
  - dust, limestone, bitumen, armour or facing rock, dimension stone, reno or shot rock, etc
Significance of mineral and petroleum resources

<table>
<thead>
<tr>
<th>Total Production FY 2017-18</th>
<th>Annual Royalties paid to NSW Government FY 2017-18</th>
<th>Total Mining Employment as at end June 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Mining Production Value</td>
<td>$1.8B</td>
<td>Number of mining-related Jobs</td>
</tr>
<tr>
<td>$27.3B</td>
<td>$25.3B</td>
<td>Direct Mining Jobs</td>
</tr>
<tr>
<td>Export Value of Minerals &amp; Metals</td>
<td></td>
<td>$29,000</td>
</tr>
<tr>
<td>$25.3B</td>
<td>Coal</td>
<td>Indirect Mining Jobs</td>
</tr>
<tr>
<td>Export Value as a percentage of NSW’s total merchandised export Revenue</td>
<td></td>
<td>$115,000</td>
</tr>
<tr>
<td>$19.7B</td>
<td>Minerals</td>
<td></td>
</tr>
<tr>
<td>Coal is NSW’s largest export earner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$1.7B</td>
<td>Petroleum</td>
<td></td>
</tr>
<tr>
<td>$1.1M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NSW Government
### Significance of Construction Materials

**WE ALL NEED QUARRY PRODUCTS**

Every Australian requires **7 tonnes** of stone, sand and gravel every year to build the roads, houses and other infrastructure we need.

**LOCALLY SOURCED**

Quarrying needs to be carried out close to where these materials will be used. This keeps transportation costs low and helps **keep building costs down** in local communities.

**BUILDING AUSTRALIA**

Quarry products are essential raw materials needed to build new infrastructure projects. **Over 150 million tonnes** of aggregates are used in the construction of homes, workplaces, public buildings and roads every year.

**WHERE WE LIVE**

To build an average new house we use about **110 tonnes** of construction aggregates and **53m³** of concrete.

**THE ROADS WE USE**

To build one kilometre of two-lane highway requires about **14,000 tonnes** (or 400 truckloads) of construction aggregates.

### Infrastructure Costs

Construction materials are typically the single biggest cost component in the infrastructure delivery chain - bigger than labour costs, bigger than equipment costs.

Source: www.ccaa.com.au

* CCAA: Providing the essential materials to build our nation.

* Victorian Department of Economic Development, Jobs, Transport and Resources; Extractive Resources in Victoria Demand & Supply Study 2015-2050
The relevant legislative frameworks
Mining Act 1992 No 29

Environmental Planning and Assessment Act 1979 No 203

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

National Parks and Wildlife Act 1974 No 80

Crown Land Management Act 2016 No 58

Petroleum (Onshore) Act 1991 No 84

Biodiversity Conservation Act 2016 No 63

Petroleum (Offshore) Act 1982 No 23

Aboriginal Land Rights Act 1983 No 42

Forestry Act 2012 No 96

Offshore Minerals Act 1999 No 42

Sydney Regional Environmental Plan No 9—Extractive Industry (No 2—1995)

State Environmental Planning Policy (State and Regional Development) 2011

Sydney Regional Environmental Plan No 8 (Central Coast Plateau Areas)

Coal Mine Subsidence Compensation Act 2017 No 37
Mining SEPP 2007

- Covers all commodities – mining, petroleum production and extractive industry.

- Cl 9A Coal seam gas development prohibited in certain exclusion zones. CSG prohibited in built up areas.

- Cl 10 Exempt development. Clarifies development is exempt only where it has minimal environmental impact.

- Cl 12 Compatibility of proposed mine, petroleum production or extractive industry with other land uses
  When resources development proposals are likely to have an impact on other preferred land uses.

- Cl 13 Compatibility of proposed development with mining, petroleum production or extractive industry
  When non-resource developments are likely to impact resources or resource operations, or access.

- Cl 15 Resource recovery. Ensure resource extraction has optimal recovery, re-use & recycling, and minimal waste.
Environmental Planning & Assessment Act 1979

• **S9.1 Minister’s - Directive 1.3.** Ensure that the future extraction of State or regionally significant reserves of coal, other minerals, petroleum and extractive materials are not compromised by inappropriate development.

• Applies to planning proposals that would have the effect of:
  o (a) prohibiting the mining, production or extraction of resources, or
  o (b) restricting the potential development of resources which are of State or regional significance by permitting a land use that is likely to be incompatible with such development.
Statutory referrals
Land use stakeholders

**COMMUNITY**
- Councils, DPIE – Growth & Programs, Planning Services and Policy & Strategy, Planning Consultants
- Minister, Secretary, GSNSW, DRG Strategic Policy

**INDUSTRY**
- Mining Act Title Holders, Quarry Operators, Renewables Project Proponents, Industry Associations
- Crown Lands, Fisheries, Forestry, NPWS, OEH, Transport

**PLANNERS**

**INTERNAL**

**OTHER AGENCIES**
Council-led planning & development assessments

The Land Use & Titles Advice Unit of GSNSW performs a statutory role as stewards of the mineral, coal, petroleum and extractive resources of NSW.

• We facilitate balanced land use decisions by Planning Authorities through provision of professional and pragmatic advice regarding the utilisation of and access to the State’s geological assets.

• Referrals for planning proposals or considerations for Local Strategic Planning Statements must be directed to the Land Use team when a proposal is coincident with, or in the vicinity of, a State or Regionally Significant Resource
  o Pursuant to Direction 1.3, Section 9.1, *Environmental Planning & Assessment Act 1979*.

• Matters can be referred to the Land Use Team at landuse.minerals@geoscience.nsw.gov.au or contact us on 02 4063 6728
Provision of advice

To support balanced land use decisions, the Land Use Team also provide advice on compatibility with resources for:

- Development proposals (Clause 12 & 13, Mining SEPP 2007) (excluding mining proposals – direct to Assessment Coordination Unit on 02 4063 6601)
- Reserve Estate additions (Section 30D, NP&W Act 1974, and inter-agency MOU’s)
- Road Closures (Section 38B, Roads Act 1993)
- Or other relevant activities including conservation, crown lands, mine subsidence, policy development, et al.
Land use – composition of BAU statutory referrals

2018 statutory referrals

Number of referrals

- Policy & Projects
- Reserve Estate Referrals
- Biobanks
- Mines
- Quarries
- Renewables
- Other Development Applications
- Planning Proposals
- Aboriginal Land Claims
- Road Closures

Distribution of referrals

2017 → n = 2424 referrals
2018 → n = 1537 referrals

Retain access and reduce sterilisation of resources in balanced land use

Stewards of the resource potential of NSW

Figures as at 17 September 2018
Example of land use conflicts

Complex interactions between coal, extractives, Aboriginal claimants, future exploration, and community, e.g.

- **Grey**: Titles issued under the *Mining Act 1992*
- **Dashed outlines**: mining leases for Kores (coal) and Boral (clay)
Example of land use conflicts

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- **Yellow**: Referrals for Crown Road Closures
- **Blue**: other land use referrals e.g. residential
Challenges to balanced land use

• Seeking balanced land use outcomes.
• Objective to preserve access to resources for benefit of people of NSW.
• Agency interaction especially with development, planning and conservation.
• Common overlap of areas of high demonstrable environmental, cultural, mineral, petroleum values.
• Common overlap of high mineral values with higher density population, especially in Sydney Basin & Central West.
Strategic approach to reducing land use conflict

- Collaborative, authentic and win-win engagements with:
  - NSW National Parks & Wildlife Service
  - metropolitan area planning working groups & development coordination committees
  - Subsidence Advisory NSW
  - councils, especially in areas where there’s higher risk to resource viability or accessibility.
Collaboration in land use

• GSNSW actively engages with stakeholders to encourage balanced, equitable and sustainable land use outcomes especially where there is intersect of multiple high values.

• Providing a bridge for mineral/resource sector title holders with other land use proponents.

• Stakeholders can include councils, industry, Traditional Land Owners & ALCs, landholders, NPWS, other government agencies, and other land owners.
Examples of land use referrals
Strategic land use planning

Planning hierarchy

State
Prepared by: NSW Department of Planning and Environment
Approved by: Governor

Regional
Prepared by: Greater Sydney Commission
Approved by: NSW Government

District
Prepared by: Greater Sydney Commission
Approved by: Greater Sydney Commission

State Environmental Planning Policies

Region Plan
- Vision and Directions
- Objectives
- Strategies and actions

District Plans
Planning Priorities and Actions

District Plans
Planning Priorities and Actions

Local Government Area or Neighbourhood

Local Environmental Plans
- Zones
- FSR
- Height

Development Application

NSW Government
Strategic land use planning

35. Protect and support agricultural production and mineral resources (in particular, construction materials) by preventing inappropriately dispersed urban activities in rural areas.

Responsibility: Councils and other planning authorities
Land use advice for planning at different scales

REGION
A Greater Sydney Plan 2056 - Minerals Titles & Resources

DISTRICT

PRIORITY GROWTH AREA
Fig. 1 - South West Sydney Priority Growth Area - Clay/Shale Resources

Legend
- South West Sydney Priority Area
- Identified Resource
- Zoning permits mining
- Zoning permits mining - fragmented land
- Zoning does not permit mining
- Transition Area
- Potential Resource
- Identified & Potential Areas
- ERPS 2015 dataset (may be incomplete)
- Clay Resource Potential Area
- 2017 re-assessment

Source: Planning & Environment, NSW Government
Conservation activity

Examples include:

• coexistence of conservation & mining
• creation of National Parks & SCAs
• NSW Koala Strategy
• state forests transfers
• reserve establishment
• SCA Ministerial concurrences
• 5-yearly SCA Reviews
• advice to OEH / Minister

Actioned under *NP&W Act*, MOUs with OEH & *Forestry Act*. 
Renewable energy applications

• Significant rise in renewable projects:
  o 22 approved solar projects in last 2.5 years
  o 33 in planning system
  o 25 at pre-SEARs.
• Clustered in areas of high mineral potential.
• GSNSW is talking to proponents early to reduce conflict.

Example – Kaiser Porphyry Project:
• polymetallic deposit sterilised by 113MW Bodangora Windfarm
• initial resource of 0.27Mt @ 1.5 g/t Au and 1.1% Cu
• $2 million exploration investment by Alkane Resources.
Construction materials

- Assessment of quarry applications.
- Assessment of incompatible development.
- Protect access to resources.
- 77% of NSW known resources, 13% by area.
- Due diligence service for developers.

Actioned under *Mining SEPP* clause 12, 13, 15; SREP 8 & 9, *EP&A Act* S9.1 Direction 1.3.
Inputs to land use assessments
Advice on resource potential

Inputs to land use assessment of mineral resource potential include:

- MRA map (Mineral Resource Audit)
- Coal Resource assessments
- Petroleum potential assessments
- Mineral Potential Mapping
- Historical drilling data
- Mineral occurrences
- Seamless geology
- Historical title & expenditure analysis
- Content of annual industry reports
- And others
Advice on resource potential

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- And others
Information and contact details
Where can you find information?

- List of policies and guides
- NSW Minerals Strategy
Contact details – GSNSW Land Use Team

• Please contact us for further information and advice on the role of resource advice in balanced land use planning.

• Referrals for planning proposals, quarry development proposals or development proposals in the vicinity of resources:

  landuse.minerals@geoscience.nsw.gov.au

  02 4063 6728
Dr Chris Yeats

chris.yeats@planning.nsw.gov.au