South Australia - Uranium Mining Approvals, Regulation and Key Initiatives

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Overview

• South Australia’s Uranium Resources – Global & Australian Position
• Case Management of Mining Projects – One Window to Government
• Performance Based Framework & Leading Practice Regulation of Uranium Mining
• Mining Governance – South Australia and Commonwealth working together
• South Australian Government Regulators – Collaborative Assessment and Approval
• Mining Act and EPBC approvals and importance of transparency
• Uranium Mine Assessment and Approval – 2 step process (2 primary approvals)
• Key Initiatives with a Global Focus
Minerals

South Australia hosts large quantities of Australia’s economic resources in copper, gold, iron ore, uranium, rare earths and mineral sands.

South Australia is ranked as having one of the world’s best geological databases.
$617.4 million EXPLORATION EXPENDITURE 2014
- Petroleum ($510.7m) and Minerals ($106.7m)

$1.8 billion CAPITAL EXPENDITURE 2013-14
- ~$40 billion of potential capital for Minerals and Energy projects in the Major Developments Directory

$7.5 billion RESOURCES PRODUCTION 2013-14
- Minerals ($5.6 b) and Petroleum ($1.9 b)

$4.5 billion EXPORTS 12mths to January 2015
- Minerals ($4.3 b) and Petroleum ($0.2 b)
- 39% of South Australia’s total exports ($11.7 b)

$291.3 million ROYALTIES 2013-14
- Minerals ($157.4 m) and Petroleum ($133.9 m)

11,908 people EMPLOYED February 2015
- Up from 6,641 ten years ago
Minerals and Petroleum Production

2013-14 - $7.5 billion ($5.6 billion – Minerals and $1.9 billion – Petroleum)
GLOBAL DISTRIBUTION OF IDENTIFIED URANIUM RESOURCES

(<130/kgU)
South Australian Uranium Resources

- Uranium was first discovered in South Australia at Radium Hill in 1906
- For over the last 25 years South Australia has been continuously producing uranium

81% of Australia’s uranium resources

25% of the world’s uranium resources
South Australian Uranium Resources, Mines and Projects

SOUTH AUSTRALIA’S URANIUM MINES
Olympic Dam: BHP Billiton (1988)
Beverley: Heathgate Resources (2001)
Beverley North: Heathgate Resources (2010)
Honeymoon: Uranium One Australia (2011)
Four-Mile: Quasar/Alliance JV (2014)

SA URANIUM PROJECTS
Olympic Dam Expansion: BHP Billiton
Four Mile West: Quasar/Alliance JV
Beverley South: Heathgate Resources
Gould’s Dam: Uranium One
Samphire: Uranium SA
Crocker Well: Sinosteel

SA URANIUM PROSPECTS
Acropolis Oak Dam
Cane Grass Radium Hill
Junction Dam Wirrda Well
South Australian Uranium Project Resources

Total resource and year of Approval of South Australian Uranium Mines and Trial Plant/Field Leach Trials (FLT)

Olympic Dam Mine, 3,857 Mlbs
Beverley Mine, 36 Mlbs
Honeymoon Mine, 1.5 Mlbs
Beverley North Mine, 13 Mlbs
Four Mile East Mine, 20 Mlbs

U3O8 (Mlbs)
Year of Approval

## Current Operating Uranium Mines

<table>
<thead>
<tr>
<th>MINE</th>
<th>OPERATOR</th>
<th>JORC RESOURCE AMOUNT</th>
<th>$U_3O_8$ RESOURCE (tonnes)</th>
<th>URANIUM RECOVERY PROCESSES</th>
<th>DEPOSIT TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olympic Dam</td>
<td>BHP Billiton</td>
<td>9.550Mt at 0.026%</td>
<td>2,488,000</td>
<td>Underground mining, Solvent Extraction</td>
<td>Hematite Breccia</td>
</tr>
<tr>
<td>Beverley</td>
<td>Heathgate Resources</td>
<td>7.7 mt at 0.27%</td>
<td>21,000</td>
<td>Insitu Recovery, Ion Exchange</td>
<td>Sandstone</td>
</tr>
<tr>
<td>Beverley North</td>
<td>Heathgate Resources</td>
<td>2.2 mt at 0.18%</td>
<td>4,000</td>
<td>Insitu Recovery, Ion Exchange</td>
<td>Sandstone</td>
</tr>
<tr>
<td>Four Mile</td>
<td>Quasar Resources</td>
<td>9.8 mt at 0.33%</td>
<td>32,000</td>
<td>Insitu Recovery, Ion Exchange</td>
<td>Sandstone</td>
</tr>
</tbody>
</table>
Number of Separate State and Commonwealth Uranium Project Approvals for ISR Mines

- South Australia is committed to a streamlined assessment and approvals process for all mining developments.

- Uranium In-Situ Recovery mines in South Australia two primary approvals from the State and a number of secondary approvals and licences (approximately 20 separate types of government approvals) from the Mining Lease Application to product export phases (full project).
Discovery to Operations a South Australian Mines Approval Timeframes

DSD Mine Approval Targets

- Mining Lease Determination – 6 Month
- Mining Operational Approvals (PEPR) - 3 Month
- Close State and Commonwealth government collaborations
• South Australia’s one-stop-shop case management approach is widely considered the nation’s best system for supporting new mining projects.

• SA Government case managers are appointed as a single point of contact for all large scale mining projects and all uranium mining developments to guide, coordinate and streamline the engagement of the mine developer with State and Federal regulators.
One of the industry’s peak bodies, the Association of Mining and Exploration Companies, strongly recommended that Victoria adopt “the best practice South Australian mining project development process”.

The dedicated case management system is currently being used on some 20 major mining projects in the pipeline in South Australia involving gold, uranium, copper, iron ore and mineral sands deposits.
South Australia - Lead Agency for Mining

South Australian Government

Department of State Development
- Mineral Resources Division
  - Geological Survey
  - Mineral Tenements
  - Exploration & Mining Environmental Assessment
  - Exploration & Mining Regulation
  - Former Mine Management
  - Land Access Policy
  - Royalties
  - Case Management
  - Investment Attraction

Environment Protection Authority
- Department of Environment Water and Natural Resources
- Safework SA
- Department of Planning, Transport & Infrastructure

Australian Government

Department of Foreign Affairs & Trade
- Department of Industry & Science
- Department of Environment
- Department of Environment Water and Natural Resources
- Safework SA
- Department of Planning, Transport & Infrastructure
- Department of State Development
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  - Geological Survey
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South Australia’s Mining Regulatory Framework

• **Industry needs** – predictable procedures for access to land, security of exploration and/or mining tenure and predictable regulatory processes

• **Community needs** – confidence in the Government’s regulatory processes and environmental controls and also confidence in industry’s environmental performance and commitment to developing mutually acceptable environmental outcomes

Mining regulatory approach based on key principles and features:

• Outcomes based (not prescriptive based)

• Fair and equitable

• Timely decisions

• Transparent

• Predictable

• Practical

• Flexible

• Efficient

• Inclusive
South Australia’s Mining Regulatory Framework

- Application of **recognised industry and national standards**
- A **whole-of-mine-life** approach
- **Balanced assessment** of the economic, social and environmental impacts
- **Risk-based approach** to determine what impacts must be managed
- **Performance-based** criteria focusing on outcomes rather than inputs
- **Minimisation of liability** for both government and the community
- **Clear accountability** for the explorer or miner to achieve community and government expectations
- **Efficient Collaboration** with other government agencies to achieve streamlined approvals, engaging their expertise and authority where required
- Ensuring **compliance** through best practice strategies, which may include enforcement actions, that ensure explorers and miners consistently achieve agreed outcomes
South Australia’s Mining Legislation

**SA Mining Act 1971 and Mining Regulations 2011** – lead mining legislation
- Act substantially amended July 2011
- Primary environmental assessment is integral to the Mining Act

**SA Roxby Downs (Indenture Ratification) Act, 1982 (Amendment 2011)**
- Legislation for the Olympic Dam Mine and future expansions

*State Development is responsible for administering South Australia’s mining legislation and is the lead agency for assessment, approval and regulation of mining*
Mining Act 1971

- Legislation provides rights to explore for, and extract mineral resources including uranium
- Mineral tenure for exploration and mining
- Landholder rights with regard to access to land
- Incorporates South Australia’s own Native Title scheme (parallels Native Title Act)
- Environmental Impact Assessment for exploration & mining
- Approval decisions & conditioning founded on risk-based & rigorous science
- Compliance and enforcement
- Royalties
How the Mining Act views “Environment”

Includes:

• Land, air, water, soil
• Plants & animals
• Social, Cultural and heritage features
• Visual amenity
• Economic and other land uses
Transparent regulation and public reporting

An open and transparent regulatory framework is critical to stakeholder confidence in the uranium mining sector and stakeholder trust in the regulator.

• Mining Lease Proposals, Assessment Reports, Approved Programs, Annual Compliance Reports and Incident Reporting are all made publically available.
Transparency – Building Community Confidence - 2

**Transparent regulation and public reporting**

- Compliance Reporting posted on DSD website
- Relevant Uranium Incidents reported on the DSD website
- Mine operators required to engage with surrounding communities throughout life of mine (including indigenous stakeholders)
Environmental Protection and Biodiversity Conservation Act - EPBC Bilateral with South Australia

• New uranium mines trigger the Commonwealth EPBC Act under the “nuclear action” trigger

• SA EPBC “Assessment” Bilateral commenced 25 Oct 2014

• The SA Mining Lease assessment process has been accredited by the Commonwealth under the EPBC Act

• EPBC Referrals are still made to Commonwealth

• If the action is “Controlled”, then SA Mining Act processes can be used for assessment (including uranium mining proposals)
  
  The Commonwealth Minister will still make the decision to “Approve” or otherwise
Example Best Practice Guidelines – Uranium In-Situ Recovery (ISR)

Australian Government policy - uranium mining, milling and rehabilitation must demonstrate best practice

Best practice is defined in the Guide as:

- A comprehensive understanding of the current environment;
- Justification for the mining techniques proposed, appropriate environmental outcomes and radiation safety standards;
- Demonstration of the capability of the uranium miner to manage the operations on the site; and
- Monitoring of the operation and the environmental and health effects.
Environmental Standards

- Radiation protection - ARPANSA Codes (many based on international IAEA and ICRP guidance)
- Water quality – Australian and NZ Conservation Council WQ Guidelines
- Air quality & soil contamination – National Environment Protection Measure (NEPM)
- Acid Mine Drainage assessment and management - INAP GARD
- Low Level Radioactive Waste Disposal – Near Surface Code
- Tailings Dam construction & operation - ANCOLD
Environmental Outcomes

- Environmental outcomes are established from the **Environmental Impact Assessment** in the Mining Lease Proposal (and also in the Program for Environment Protection and Rehabilitation [PEPR] process) by the company and approved by Government.

- An outcome is a statement of the **expected impact on the environment** caused by the proposed or current mining activities.

- Must cover construction, operation and mine closure

- Outcomes are enforced by demonstrating compliance with measurable assessment criteria

**Outcomes are written in the following form:**

“**impact level** on **receptor** from mine **source**” ... Examples:

- **No impacts** to the **environment** due to **radon release**, nor **radiological aspects of seepages and spills**.

- **No compromise** of potential **pastoral use of the XXXXX aquifer** outside the **mining lease**.
Mining Operation Approvals – The PEPR

Program for Environment Protection and Rehabilitation (PEPR)

Content of PEPR must include:
- Environmental Outcomes including closure
- Strategies (Control Measures) to manage impacts
- for achieving the Outcomes including progressive rehabilitation
- Measurement (Compliance) Criteria
- Leading Indicator criteria
- Monitoring Plans

US Nuclear Regulatory Commission NUREG-1569 guidance used for assessment of ISR proposals

- Submitted PEPR’s must comply with:
  - Part 10A of Mining Act
  - Mining Regulation 65
  - Minister’s Determination under Regulation 65(7)
Mining Operation Approvals – The PEPR

Streamlining operational Documents

- PEPR integrated regulatory document for a uranium operation

- Incorporating relevant regulatory requirements into the PEPR
  - EPA’s Radioactive Waste Management Plan
  - Australian Government Environmental Monitoring Plans

- Occupational Radiation Management Plan is separate
Program for Environmental Protection
• Evidence of capability of lease holder to operate lease
  • Background data
  • Statement of environmental outcomes
  • Management strategies to meet environmental outcomes
  • Environmental monitoring plan
  • Leading indicator criteria
  • Stakeholder consultation information
  • Schedule for compliance reporting

Radiation Waste Management Plan
• Description of mining operations
  • Description of environment and baseline radiological study
  • Statement of environmental outcomes relevant to radiation exposure
  • Waste management strategies including accidental releases and mine decommission
  • Radiation risk assessment incl. critical group dose assessment
  • Radiation monitoring program
  • Schedule for compliance reporting and review of the adequacy and effectiveness of radiation protection measures
Four Mile ISR Mine - MLP and PEPR

Beverley Four Mile Project Public Environment Report and Mining Lease Proposal

Miner: Resources Pty Ltd and Alliance Cote
Explorer Pty Ltd Joint Venture
Mines operator: Heathgate Resources Pty Ltd
Contact person: Richard Phillips - Managing Director, Operations,
Heathgate Resources Pty Ltd
Contact details: Suite 1, Level 4, 25 Grenfell Street, Adelaide SA 5000
Telephones: 08 8243 3000
Fax: 08 8243 3500
Email: info@heathgate.com.au
Tenement details: EL 3666
Name of mining operation: Beverley Four Mile Project
Commencement to be opened: Uranium
MLA application date: 16th May 2009

Prepared for:
Heathgate Resources Pty Ltd
Suite 1, Level 4
25 Grenfell Street
Adelaide SA 5000
7th January 2009
420570560032

FOUR MILE URANIUM MINE

PROGRAM FOR ENVIRONMENT PROTECTION AND REHABILITATION,
AND RADIOACTIVE WASTE MANAGEMENT PLAN

August 2013

Mined owner: Four Mile joint venture between Questor Resources Pty
Limited and Alliance Cote Exploration Pty Ltd, managed by
Questor Resources Pty Ltd
Produced operator: Heathgate Resources Pty Ltd
Contact person: Craig Bannister, President, Heathgate
Contact details: Suite 1, Level 4, 25 Grenfell Street, Adelaide SA 5000
Telephone: 08 8243 3000
Fax: 08 8243 3500
Tenement details: EL 3666
Name of mining operation: Beverley Four Mile Mine
Commencement to be opened: Uranium
Preparation date: 02 August 2014
Approved date: See CERWC WMP
Prepared by: Heathgate Resources Pty Ltd
Suite 1, Level 4
25 Grenfell Street
Adelaide SA 5000

Prepared by: Heathgate Resources Pty Ltd
Suite 1, Level 4
25 Grenfell Street
Adelaide SA 5000

Document Number: MHRW - Version 1.9
No: 0003
02 August 2013
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Operators must maintain ongoing capability to systematically manage achievement of compliance:

• Corporate & operational policies - commitment
• Consistent application of procedures & practices
• Use of comprehensive & effective risk management system
• Application of effective systems to monitor, evaluate, audit & review
• Appropriate allocation of resources and expertise
Compliance – Management Systems - 2

• Mining Regulations provides authorization to request information to assess or verify operator’s capabilities to achieve regulatory requirements

• Independent audits of Management systems carried out in South Australia’s ISR Uranium Mines before and during construction, commissioning and prior to operating

• Outcome:
  • Independent confirmation that Management Systems, expertise and training have been implemented_obtained or completed.
  • Ensure achievement of legal/regulatory requirements
  • To ensure no reportable environmental and radiological incidents.
DSD’s Compliance Approach

Fair but firm regulatory approach

Non-compliances / Incidents - Taking the appropriate action
Compliance and Monitoring

- Site Inspections – State (DSD/EPA)
- Quarterly reporting and presentations – State DSD/EPA/SafeWork SA
- Annual Compliance Reporting – State DSD/EPA (Available on websites)
- Uranium Incident Reporting (public reporting protocols)
- Incident investigations (DSD/EPA)
- 6 monthly Environmental Consultative Committee meetings – State – Aust. Government - Operator
- Teleconferences – State and Australian Government Agencies

An open and transparent regulatory framework is critical to stakeholder confidence in the uranium mining sector.
ISR Mines – Excursion Control Limits (ECLs)

- ECL’s are used as indicators of mining solution at monitoring wells
- Defined using US NRC NUREG 1569 principals
- Compliance wells monitored fortnightly, monthly or quarterly depending on distance from mining zone.
Uranium Incident Reporting

- Specific Uranium Reporting and Recording protocol since 2003
- Joint reporting to DSD, EPA and SafeWork SA

Report Requirements
- Verbal notification
- DSD inform relevant Australian Government departments
- Written report within 24 hours of incident
- Full investigation
- Inspection and verification sampling

Reportable spills publically reported

SA EPA and DSD commenced a review, developed new criteria for discussion at a national level as a potential future national reporting criteria for uranium mines.
Rehabilitation Bonds & Public Liability Insurance

- To cover full liability of 3rd party rehabilitation of the land (Section 62)
- Usually lodged in the form of a Bank guarantee
- Reviewed annually for uranium mines, but may be reviewed at any time.
- Public liability insurance required (Regulation 90)
- Bond and Public Liability Insurance required to be submitted prior to any mining activities commencing
- South Australia is investigating options for alternative financial instruments e.g. environmental insurance.
Uranium Mine Site Security and Product Transport

- Site Security Australian Government responsibility (ASNO)
- ARPANSA Transport Codes
- National uniformity
- Transport Plans
- South Australia’s role in uranium product shipment
- Emergency response
- Incident training
South Australia – Key Initiatives with a Global Focus

• South Australia’s Nuclear Fuel Cycle Royal Commission

• National & International Engagement & Partnerships in Uranium Geoscience and Leading Practice Regulation
  • Australian Government agencies – transport & export regulation/licensing
  • Geoscience Australia, ANSTO and ASNO
  • Saskatchewan Geological Survey, Uranium Mining and Environmental Agencies
  • China National Nuclear Corporation
  • International Atomic Energy Agency
1. Exploration, Extraction and Milling
2. Further Processing and Manufacture
3. Electricity Generation
4. Management, Storage and Disposal of Waste
South Australian Royal Commission looking at:

- Feasibility of expanding current levels of exploration and mining of uranium and other radioactive minerals
- Feasibility of establishing further processing and manufacturing of radioactive/nuclear materials (conversion, enrichment, fabrication or reprocessing)
- Feasibility of establishing facilities to generate electricity from nuclear fuels
- Feasibility of establishing facilities in SA for the management, storage and disposal of nuclear and radioactive waste (beyond SA uranium mining wastes)
- Commission to report to the government on recommendations in early May 2016.
International Engagement & Partnerships

China - South Australia – Saskatchewan Geoscience Partnership established October 2012
International Engagement & Partnerships

South Australia – USA NRC – ANSTO engagement
In Summary – Uranium Mining Approvals in SA

South Australia is constantly working in partnership with industry to deliver new discoveries, best practice regulation and environmental controls and safeguards that build a social licence to operate.

- 81% of Australia’s Known Uranium Resources & host to world class uranium provinces
- Case Management of Mining Projects – One Window to Government
- Mining Act is lead legislation, now accredited for EPBC Assessment
- Lead Agency – efficient project management of integrated approvals
- Performance based regulatory framework + transparent approvals & life of mine
- Mining lease approvals – target 6 months from compliant application
- Uranium Mine Assessment and Approval -> 2 primary State approvals + secondary licencing
- Key Initiatives with a Global Focus – Nuclear Fuel Cycle Royal Commission
Uranium Mining Approvals, Regulation and Key Initiatives in South Australia

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