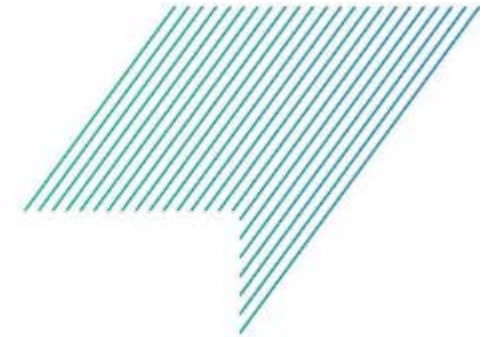


Regulation of uranium mining in South Australia



ARPS 34 Perth 2009
Andrew Johnston
Radiation Protection Division
SA EPA

... or, how we changed the rule book and came to love risk assessment





Outline



- **Regulatory Context**
 - Existing & proposed uranium mines in SA
 - Basic Legislative Framework (SA & Commonwealth)
 - Other issues and factors driving regulatory change
- **Principles underlying the emerging regulatory approach**
 - Best Practice
 - Risk based approach to regulation of uranium mining
 - Improving the Efficiency of the regulatory process
- **Initial focus is on the environment**
- **What does the regulatory approach look like?**
- **Where to from here?**

Context: Existing uranium mines

Olympic Dam

Underground mine

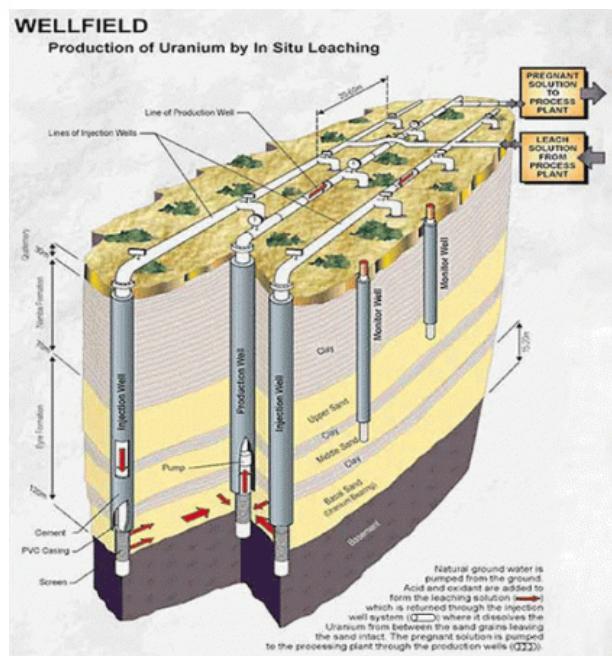
- Occupational exposures



Surface Tailings

- Managing seepage of tails liquor
- Long term storage

Context: Existing uranium mines



Beverley ISL Mine

- Protecting groundwater resources
 - Mining fluids & liquid wastes
 - Natural attenuation

Context: New mines

URANIUM

- Potential for expansion of Olympic Dam (Pit & UG)
- Honeymoon (ISL)
- Beverley Four Mile (ISL)
- Beverley North? (ISL)
- Oban (ISL)
- Crocker Well (Pit)

MINERAL SANDS

- ILUKA

NORM

- PROMINENT HILL (Pit/UG)

Regulator roles: PIRSA

PIRSA: acts as lead agency for mining in SA

- Main contact with Commonwealth
- Coordinates environmental assessments
- Mine meets **EPBC Act requirements**
- Issues **Mineral Lease** to begin mining
- Bond arrangements, etc

- **MARP** (Mining and Rehabilitation Plan)

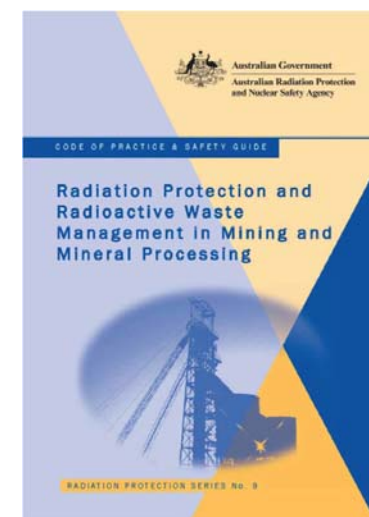
- Agreement on mine operation conditions
- Coordinates State regulatory agency environmental requirements
- Designed to satisfy detail of Commonwealth EMMP
- Commonwealth may endorse the MARP process at PER level



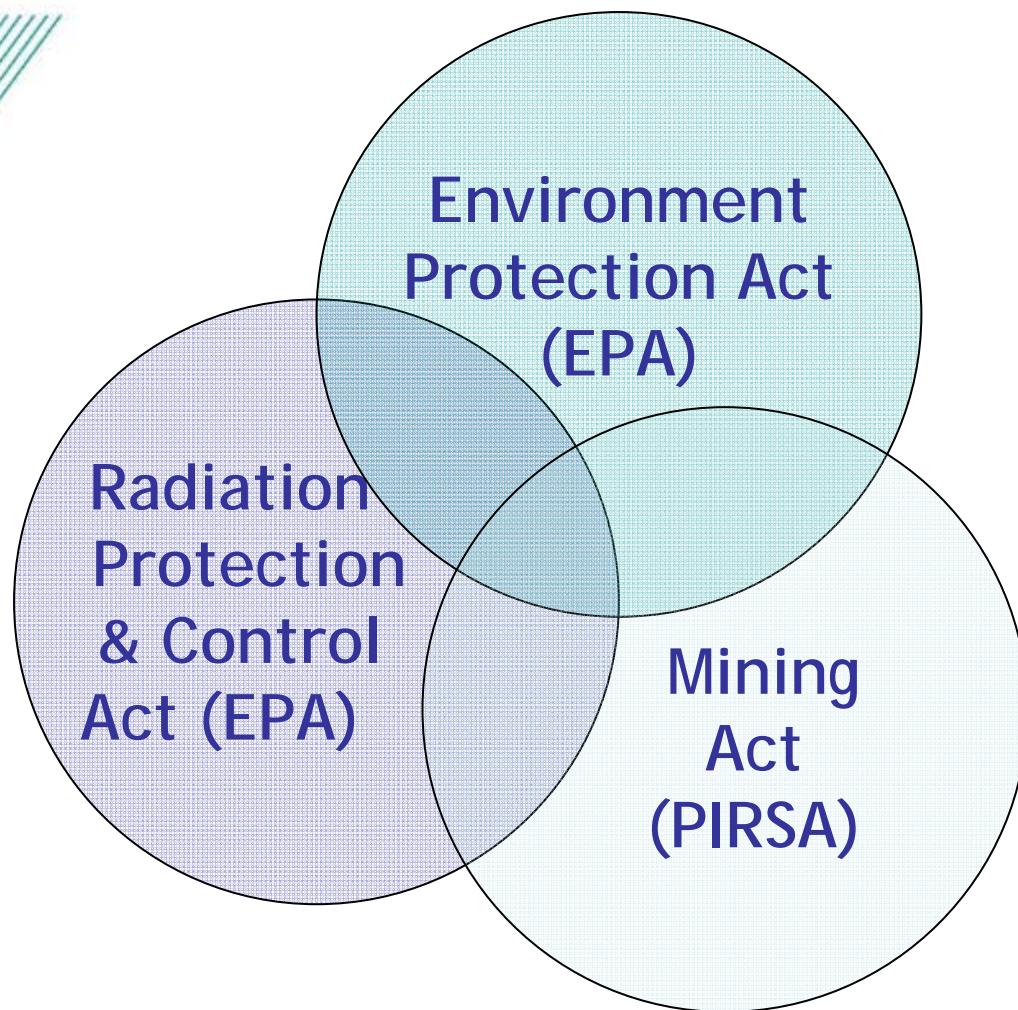
Regulator roles: EPA

EPA:

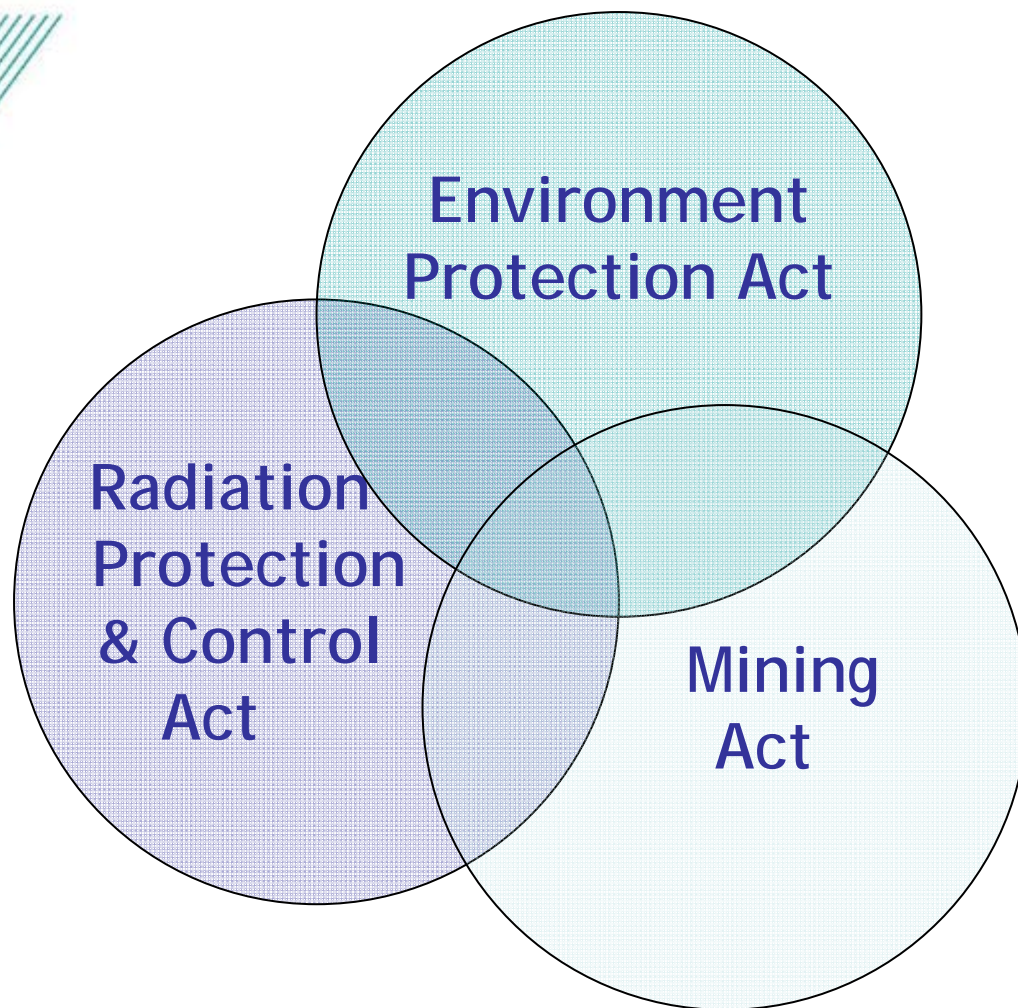
- **RPC Act Licences** for uranium mining operations
 - Compliance with Mining Code
 - RWMP and RMP
 - System of Approvals & Authorisations
-
- **EP Act Licences**
 - 'Works Approvals'
 - Compliance with EP Act and EP Policies



The regulatory framework



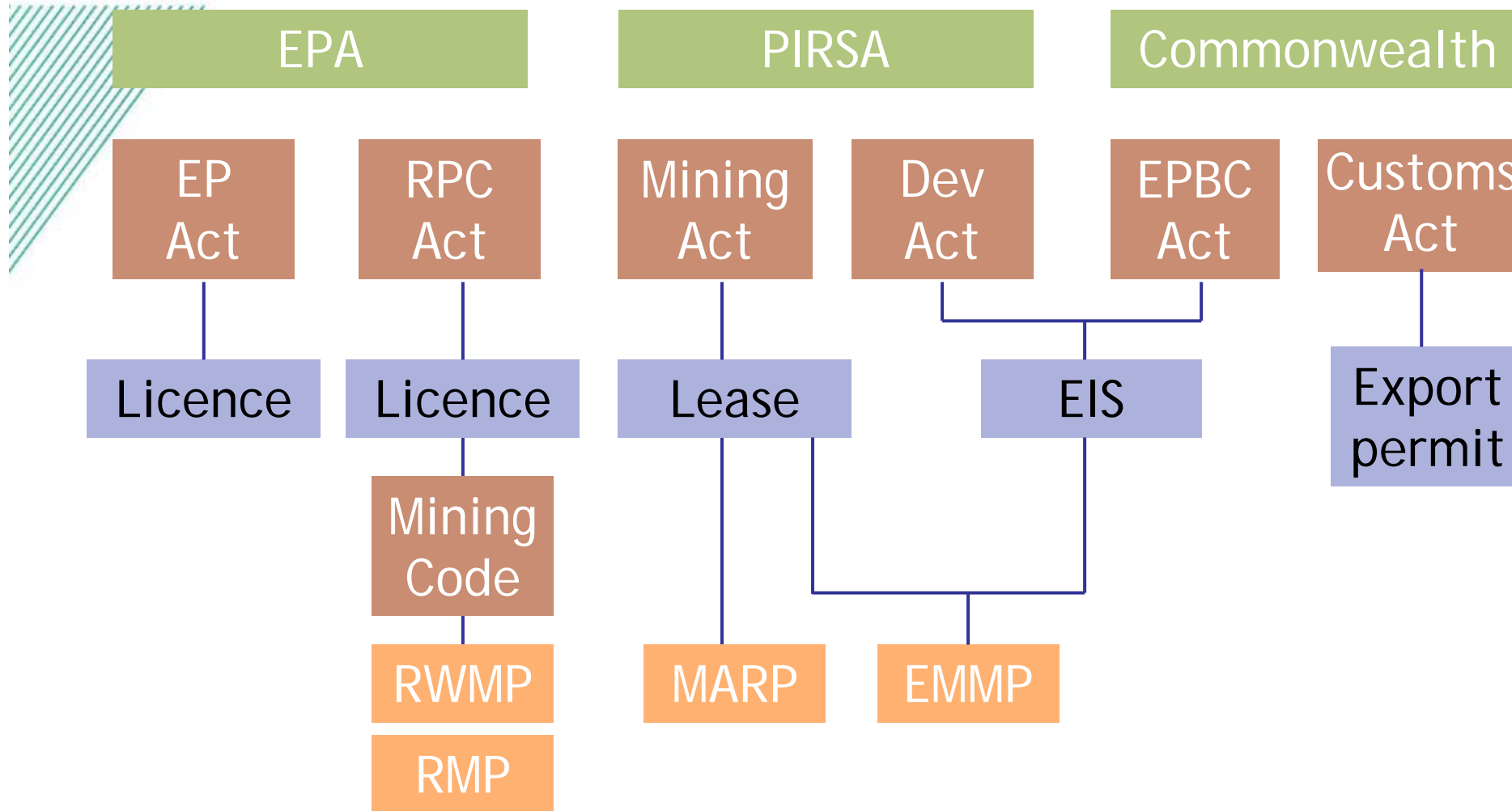
The regulatory framework



Other legislation

- EPBC Act
- Export (ASNO)
- Transport
- Aboriginal heritage
- Native title
- NRM Act
- Water
- Native vegetation
- OH&S

The regulatory framework - Practice



Summary of regulator issues

- Rapid expansion of uranium mining
- Complex regulator interactions requiring streamlining
- Desire for improved regulatory efficiency (e.g. UIF)
- Limited Government resources (GFC)
- EPA: Ensure a predictable, consistent and fair approach to compliance and enforcement
- Maintain the standing of EPA as independent regulator
- Decide what is, and how do you achieve, 'Best Practice'

We need a system that is -

- Outcome focussed & consultative
- Risk based
- Cost efficient to business and government
- Effective in protection of environment and human health,
- Streamlined to minimise unnecessary administrative and regulatory burden

- **Overall, achieves 'Best Practice'**

- **EPA coordinated with PIRSA, but is an independent regulator**

What is 'Best Practice'?

- **Site and context specific**
 - Integrated approach to risk assessments
- **Clearly defined:**
 - Environmental Values
 - Agreed Outcomes and Measurement Criteria
 - BPT/BAT
- **Risk Based**
 - Optimises radiation protection
 - Flexibility of regulation
 - Continuous improvement – 'beyond compliance'
 - Precautionary approach

'Risk Based' MARP & RWMP

- All potential impacts on environment are identified
- Inherent Risks are determined & modified by:
 - Design Controls
 - Operational Management Controls
- Residual Risk is determined
- Desired Outcome
 - Outcome Measurement Criteria
 - Leading Indicators
- Criteria and Indicators define the Monitoring Program

Risk Assessment

Risk Assessment Matrix

			Likelihood of Consequences				
			E	D	C	B	A
			Rare	Unlikely	Possible	Likely	Almost Certain
Severity Of Consequences	5	Insignificant	Low	Low	Low	Moderate	High
	4	Minor	Low	Low	Moderate	High	High
	3	Moderate	Moderate	Moderate	High	High	Extreme
	2	Major	High	High	Extreme	Extreme	Extreme
	1	Catastrophic	High	Extreme	Extreme	Extreme	Extreme

MARP

MARP acts as 'umbrella document' defining broad outcomes, criteria and indicators. Points to the RWMP

ID	Potential Impact	Inherent Risk Level	Design Control Measure	Operational Management Measure	Residual Risk	Outcome	Outcome Criteria	Leading Indicator
6.2	Uranium-bearing dust released from the drier and packaging area increasing radiation doses to workers or public	Likelihood: Rare Consequence: Moderate Risk: Moderate	Dust extraction and filtration system on drier and packaging enclosure Refer: RWMP (RMP)	Maintenance SOP Air sampling conducted in drier and packaging areas Exhaust stack sampling Refer RWMP (RMP)	Likelihood: Rare Consequence: Minor Risk: Low	No adverse impacts to workers, public or environment due to uranium bearing dusts	Estimated radiation doses to workers & public within applicable limits as defined under RPC Act	Trend of uranium dust monitoring in the process plant and accommodation areas remain below investigation levels

RWMP

Drill down into RWMP for control, contingency & monitoring details

RA	Potential Impact	Inherent Risk Level	Design Control Measure	Operational Management Measure	Residual Risk	Contingency	Monitoring Table MR	MARP Table 6.6 ID
16	Airborne uranium dust release within packing room	Likelihood: Almost certain Consequence: Moderate Risk: Extreme	Packing conducted within closed room Negative air pressure Bag house to collect dust Electronic bag leak detection system	Daily/shift inspection by operator Daily/shift wash-down Regular air sampling conducted in packing room Exhaust stack sampling	Likelihood: Rare Consequence: Minor Risk: Low	Any spills washed down immediately to sump (reclaim)	SOP 5 Monitoring Item 8 Monitoring Item 9	6.2

Where are we now?

Pro

- Company responsible for identifying and implementing means for addressing risks,
- Sets priorities for controls and monitoring
- Outcomes enforced by demonstrating compliance with measurable assessment criteria
- Less prescriptive - more flexible

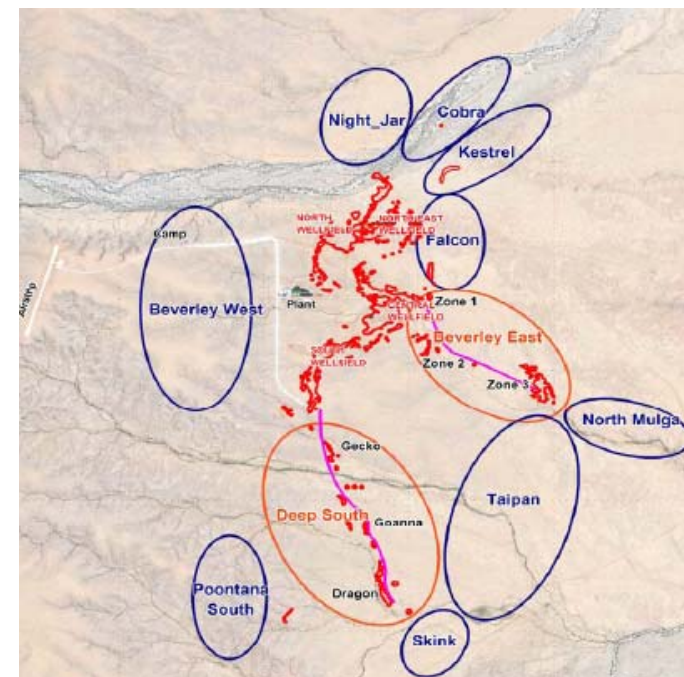
Cons

- Requires extensive work up front by both Operator and Regulator in an often iterative process.

Flexible & Site Specific - example

- **Monitoring to protect groundwater**
 - Originally fixed spacing around active well-fields based on US recommendations.

- **Response to varying aquifer transmissivities**
 - Change in monitor well spacing for ISL operations
 - Proportional to risk of missing excursions



Onwards to Best Practice Guidelines

- Australian Government's policy is that new uranium mines are to be approved subject to world best practice environmental and safety standards
- Joint Commonwealth/State/Territory Guideline:
'Australia's In Situ Recovery Uranium Mining Best Practice Guide: Groundwaters, Residues and Radiation Protection'
- Joint EPA/PIRSA Guideline on Best Practice Tailings Management
- Joint EPA/PIRSA Exploration Guideline

Radiation Protection and Control Act

Currently under review to adopt the National Directory

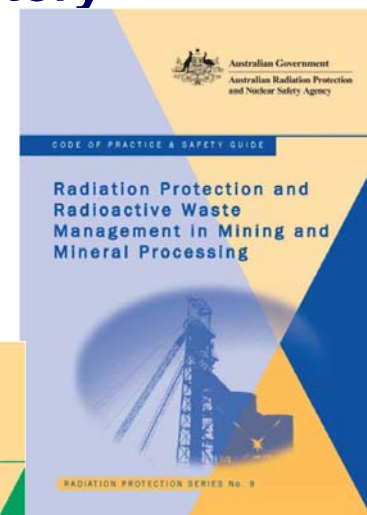
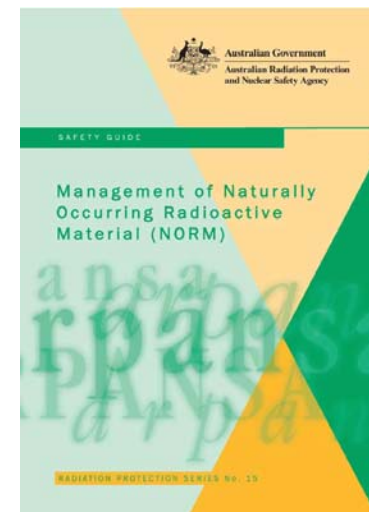
Use same principles for:

Mining and Mineral Processing License

- Uranium & Thorium mining
- Mineral Sand mining
- NORM operations

Guidelines

- Licensing
- RWMP & RMP





Summary



- **SA Developing a Risk based approach:**
 - Fits neatly with EPBC Act approval process
 - Less prescriptive
 - Places onus on operator to achieve clear and agreed outcomes
 - Protects people & defined environmental values
 - Community confidence (& maintains EPA independence)
 - EPA achieves efficient, fair and predictable regulation
 - No unmanaged risk
- **Regulatory approach will continue to evolve**



THANK YOU