Addressing Cumulative Impacts

Dr Daniel Franks
Centre for Social Responsibility in Mining

CQ University Mining and Communities Research Forum
16th June, 2010
Cumulative impacts are the successive, incremental and combined impacts (both positive and negative) of one or more activities on society, the economy and the environment.
What are cumulative impacts?

Actions

- Mine A
- Mine B
- Non-mine activity A
- Non-mine activity B
- ...n

Inputs & extractions

Outputs & additions

Activity specific impacts

Aggregation
(time & space)

Interaction
(triggers & associations)

Feedback

Receiving Environment (town, region, air shed, watershed etc.)

Exogenous factors

Non-mine activity A

Non-mine activity B

...n
What are cumulative impacts?

### Examples of negative impacts
- Price inflation/deflation (e.g. housing and rents) and the disproportionate impacts on residents not employed in the mining industry.
- Unmet demand for social services (e.g. childcare, healthcare and education).
- Reduced visual amenity (especially in high density mining regions).
- Un-controlled in-migration.
- Perceived and real loss of community identity due to demographic change.
- Increased noise and vibration from blasting and hauling.
- Reduced water quality (e.g. saline discharge into rivers).
- Increased dust and associated air quality issues.
- Reduced water quantity (groundwater draw and water table impacts from multiple mines and industries).
- Greenhouse gas emissions, including fugitive emissions.
- Traffic congestion and road degradation.
- Vegetation clearing and biodiversity impacts.

### Examples of positive impacts
- Increased employment and economic investment.
- Regional and community development benefits from mine community investments.
- Local business development from mine procurement.
- Greater royalties and taxes.
- Road and infrastructure upgrades.
- Investment in biodiversity offsets and rehabilitation (on and off lease).
- Increased awareness of health and safety.
- Population increases that create a critical mass for better services and infrastructure (e.g. schools, and sporting teams).
- Development of human capital (skills, employment and training).
Why are CIs sometimes overlooked?

- rapid change
- uncertainty
- multiple contributors
- shared responsibilities
- uncertainty and time lags
- operations managed individually
- operations regulated individually
What can be done?

Assessment:

- ‘shifting’ baseline – historic trends
- forecasting
- regional & strategic assessments
What can be done?

- Proactive management of the timing and location of developments
- Collective management of data
- Regional and strategic planning
- Multi-stakeholder monitoring
- Facilitation of synergies
- Coordination of response to cumulative impacts of high concern to stakeholders
- Pooling of resources to support specific initiatives and programs
- Advocacy on common issues
- Information exchange, forums, networking

Acknowledgements

Aspects of this research have been financially supported by the Australian Coal Association Research Program, the Queensland Department of Employment, Economic Development and Innovation, Isaac Regional Council and the Sustainable Minerals Institute.
1. Determine the key impacts of concern to stakeholders
2. Define the system to be understood
3. Determine how the impacts are accumulating
4. Determine the actions contributing to the generation of impacts and by whom
5. Evaluate and decide strategies depending on circumstances
6. Decide whether to collaborate and with whom
7. Monitor priority receptors of concern
8. Report and communicate information on key cumulative impacts to stakeholders
In the mining context cumulative impacts arise from the:

- compounding activities of a single operation;
- multiple mining and processing operations; and the
- interaction of mining activities with other past, current and future non-mining activities.
Spatial impacts are those which occur over an area. Spatial impacts may vary in both extent and intensity.
Spatial impacts are those which occur over an area. Spatial impacts may vary in both extent and intensity.
**Temporal impacts** are those that vary over time. *Simple temporal impacts* have a specific time of commencement and a measured form over time. *Offset temporal impacts* occur when multiple simple temporal impacts are superimposed upon one another over time.

CIs aggregate and interact in 3 ways:
Linked impacts involve more complex interactions such as where one impact triggers another or where a single activity has multiple (associative) effects.