CIM 2016 – Management and Finance Day

The Need for Integrating Engineering and Environmental and Social Studies

October 15, 2015

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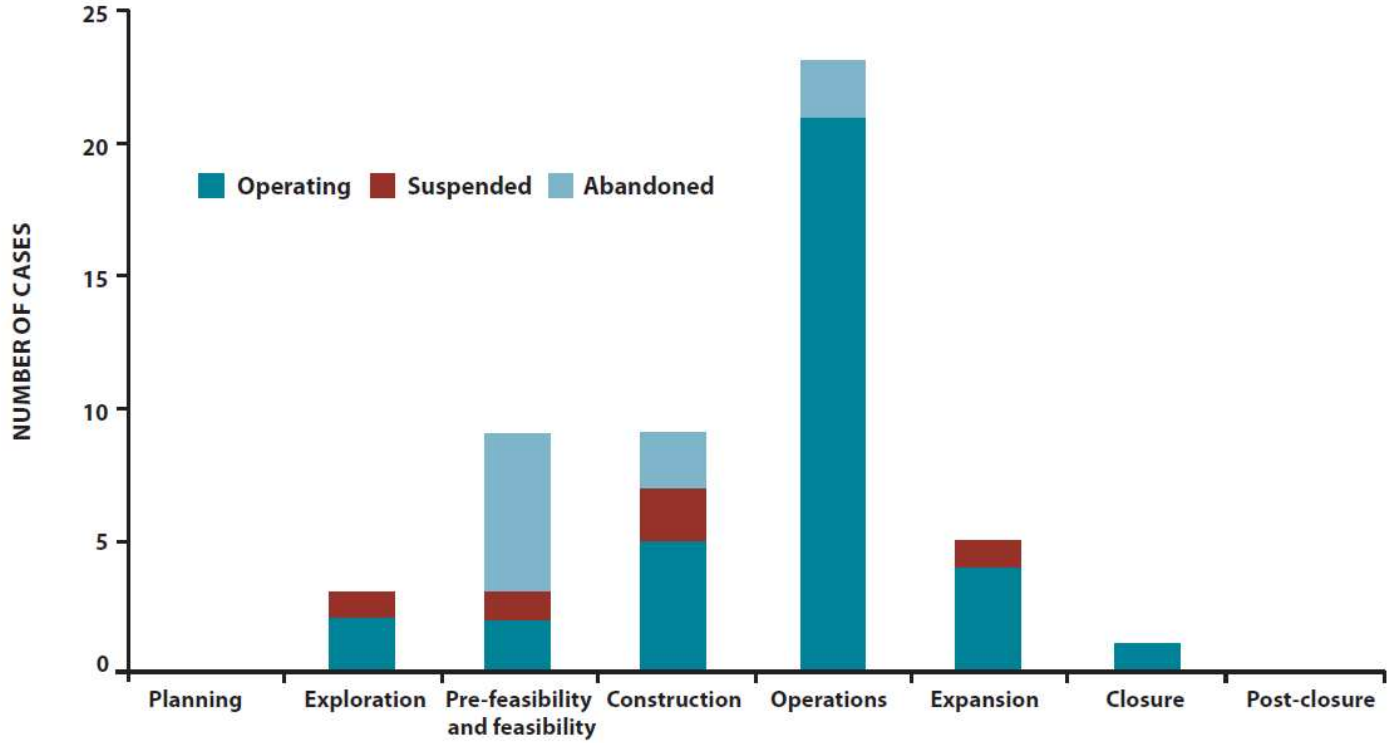
Why Intergradation Is Needed

- Leads to more efficient execution, with less risk of budget overrun and schedule delays
- Early identification of potentially significant environmental issues, and cost effective mitigation measures
- Environmental, social and engineering constraints timelines factored into the overall schedule
- Community engagement forms a critical part of a successful project and must be initiated early, often ahead of environmental and engineering studies.

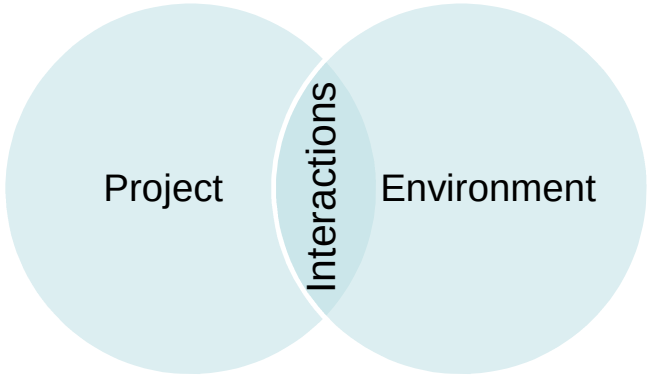
Social Risk and Project Risk



Source: Davis and Franks (2014), Costs of Company-Community Conflict in the Extractive Sector
http://www.hks.harvard.edu/m-rcbg/CSRI/research/Costs%20of%20Conflict_Davis%20%20Franks.pdf

What is an Environmental Assessment?

- Is a forward-looking planning process intended to create a better project
- Thorough step-wise approach:
  - Describe the project and alternative considered
  - Describe the existing environment
  - Predict the effects project interaction with environment
  - Enhance benefits / Develop mitigations
  - Develop monitoring plans
  - Stakeholder engagement



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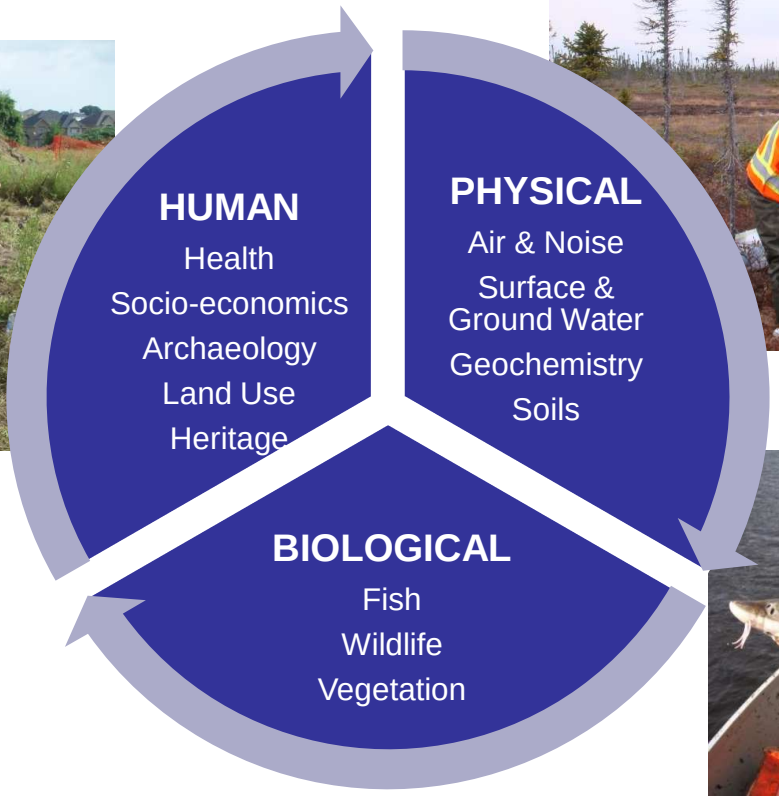
Environmental & Social Studies

- Looks at the environment as a whole



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EA vs. Permitting

- EAs and permits consider many of the same issues but serve different purposes

Assessments…	Permits…

▪ Need to balance the issues, and consider impact significance
▪ Need to identify mitigation measures and alternatives
▪ Help define a project
	▪ Demonstrate the final project complies with specified regulations
	▪ Describe:
	  ▪ what will be constructed and operation limits
	  ▪ specific monitoring requirements
	  ▪ closure requirements and costs

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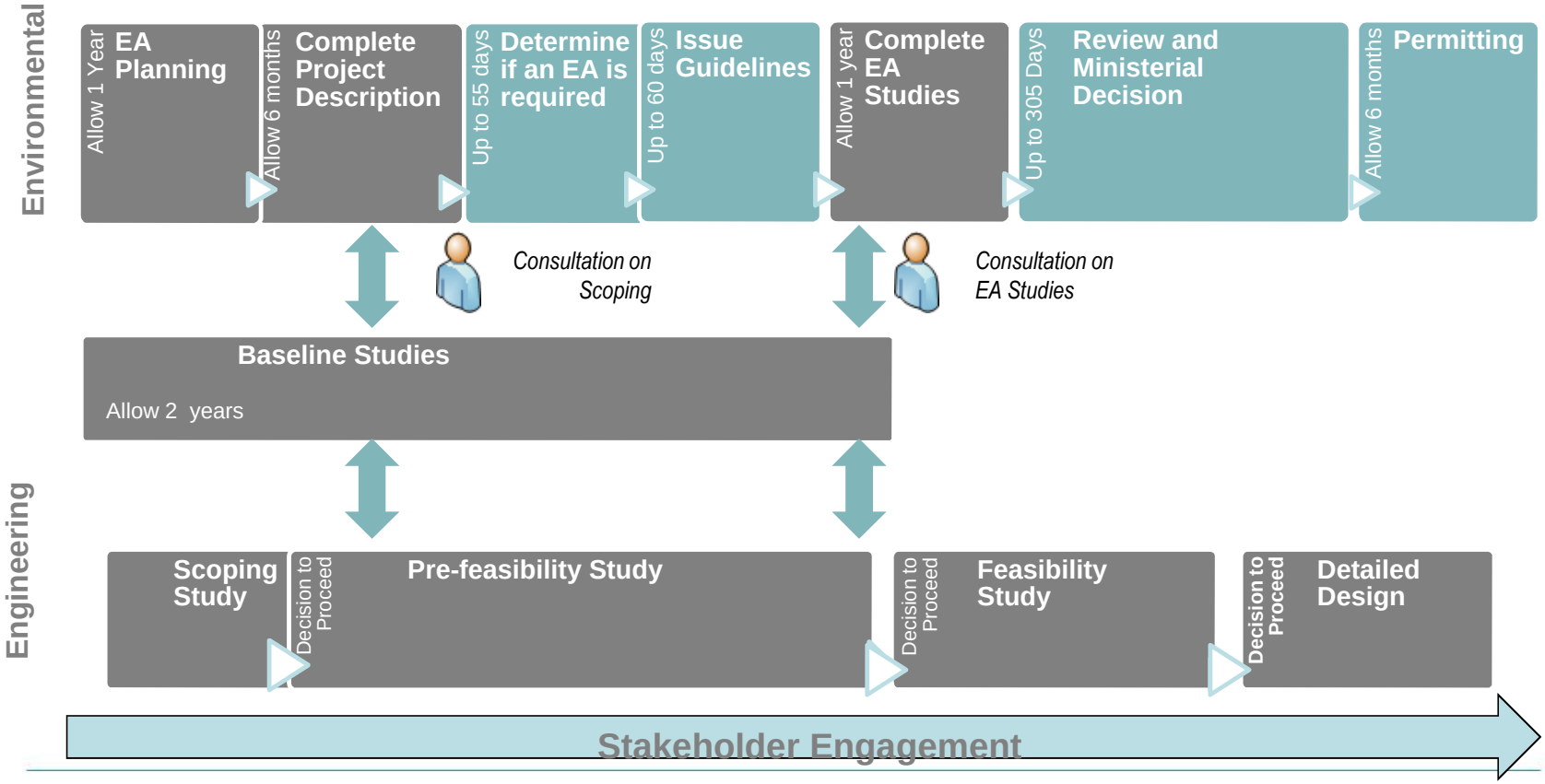
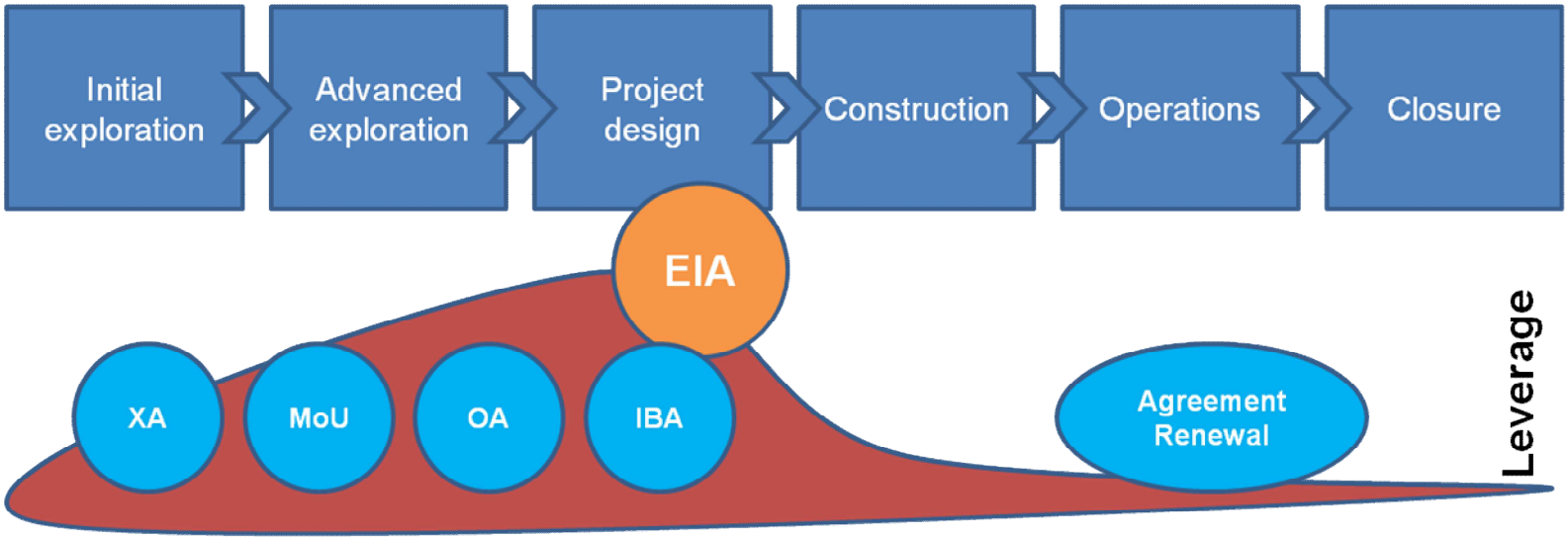
Environmental vs Engineering Schedule

- Engineering and environmental schedules may not align

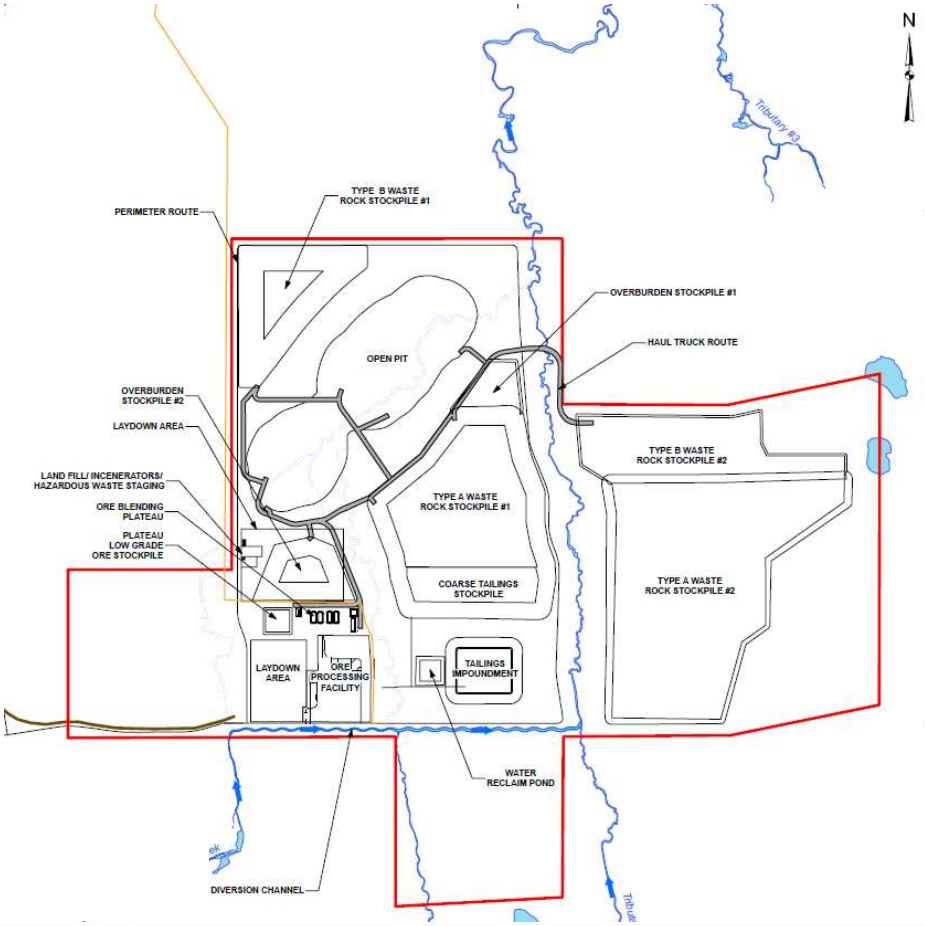


Stakeholder Leverage



Source: Martin (2015), Aboriginal Participation During Exploration, Northwestern Ontario Mines and Minerals Symposium

Integrated Engineering and Environmental Approach



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EA Input Needed Ahead of PFS/FS Designs

- Mine water management details needed for EA typically in advance of PFS/FS, detailed design schedule
  - treatment
  - location and size of ponds (water storage)
  - discharge location
- Risks:
  - Treatment method has to be reconsidered because of commitments made in EA
  - Effluent design / water management redone due to insufficient flows in receiver

Maximizing Benefits

- Multiple Groups
  - Aboriginal communities
  - Non-Aboriginal communities
  - Provincial and federal regulators
- Multiple Alternatives
  - Environmental effects
  - Social economic benefits
  - Project specific requirements
- Mining and non-mining projects (Transportation, Power / Transmission, Forestry)

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What You Can Consider Early

- Start building relationships with potentially affected communities as soon as possible in the planning process and continue this engagement throughout the project life
- Institute information sharing between engineering and environmental teams
- Develop baseline studies to provide information needed for engineering design and EA
- Initiate time-sensitive baselines studies
- Engage agencies in developing an EA strategy

Thank You

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