



Biography:

Dr. David C. Elliott

David C. Elliott, B.Sc, B.Math, Ph.D, F.G.C, F.E.C. (Hon.), F.G.S., P. Geol, started his career in the petroleum industry in 1965 and, in June 2012, retired as the Chief Petroleum Advisor for the Alberta Securities Commission, which is responsible for the regulation of oil and gas securities in Canada. While at the ASC, he established and chaired the Alberta Securities Commission Petroleum Advisory Committee.

He has been involved with the Canadian Oil and Gas Evaluation Handbook (COGEH) since 1998, and to a lesser extent, also in the development of the Petroleum Resources Management System (PRMS). He has been a Vice-Chair of the UNECE Expert Group on Resource Classification for several years and is currently chairing a sub-group that is examining the role of social and environmental factors in resource classification.

Professional affiliations include the SPE, SPEE (Honorary Lifetime Member), Fellow of Geoscientists Canada, Fellow (Honorary) of Engineering Canada, CSPG, AAPG, Geological Society of London, the Association of Professional Engineers, Geologists, and Geophysicists of Alberta and is a founding member of the International Medical Geology Association.

Socio-environmental Aspects of Resource Classification

Outside the workplace he likes to keep in shape in the gym, enjoys outdoor activities, and is a keen amateur artist.



SOCIAL AND ENVIRONMENTAL CONSIDERATIONS IN RESOURCE CLASSIFICATION

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OUTLINE

- ▶ INTRODUCTION: SOCIAL AND ENVIRONMENTAL ISSUES
- ▶ CLASSIFICATION
 - ▶ WHY DO WE DO EVALUATIONS?
 - ▶ Users
 - ▶ Professional Obligations
 - ▶ A CLASSIFICATION PERSPECTIVE
- ▶ SOME TERMINOLOGY
- ▶ THE UNFC SOCIAL AND ENVIRONMENTAL CONSIDERATIONS WORKGROUP
- ▶ CONCLUSIONS

- ▶ Note: much of this talk is based on the work of the UNFC Social And Environmental Considerations Workgroup



SOCIAL AND ENVIRONMENTAL FACTORS

- Our society depends on the supply of natural resources such as oil, gas, and minerals.
- Social and environmental issues can delay or prevent a resource extraction project.
- It behooves us to recognize and deal with these in a constructive manner.



THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- ▶ 35 Canadian projects, worth \$129 billion, stalled or cancelled due to opposition from environmental, aboriginal and/or community groups. (Financial Post, Dec. 2016)
- ▶ Keystone Pipeline, to carry crude oil from Canada to Gulf Coast refineries. Rejected by the Obama administration in 2015, after six years of review. Recently approved by the Trump administration.



THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- ▶ an average U.S. mining project can lose a third of its value due to permit delays, and in some cases, a project's value can be cut in half ... can even become economically unviable.
- ▶ a mine in the United States usually requires in the range of seven to 10 years to get the permits necessary to operate.

NMA Study, Permitting, Economic Value and Mining in the United States, 2015

- ▶ Social conflicts and red tape have caused the delay of \$21.5 billion worth of mining projects in recent years in Peru. (El Economista reports).

THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

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THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- Over 350 green energy projects were delayed or abandoned due to public opposition with the economic impact of these projects estimated at about \$1.1 trillion in GDP and 1.9 million jobs a year. (U.S. Chamber of Commerce, 2011)
- In the UK, 32 out of 66 applications for onshore wind farms were rejected in 2010.

Courtesy Dr. P. Pappas



THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- The Mackenzie Valley Pipeline.
 - Proposed in early 1970's, to carry gas from the Beaufort Sea, through the Mackenzie Valley to Northern Alberta
 - 1974 – 1977 Hearings recommended a 10 year moratorium to deal with social and environmental concerns
 - 1984 – 2003 Discussions and agreement between the Aboriginal Pipeline Group and TransCanada Pipelines
 - 2011, Federal Government approval granted for a pipeline
 - 2017, No start to construction



CLASSIFICATION CRITERIA

- ▶ Described in oil and gas Guidelines and Standards
- ▶ Canadian Oil and Gas Evaluation Handbook (COGEH)
- ▶ Petroleum Resource Management System (PRMS)
- ▶ United Nations Framework Classification (UNFC)
- ▶ Norwegian Petroleum Directorate (NPD)
- ▶ US SEC/FASB
- ▶ NI 51-101
- ▶ Etc.

- ▶ Similar standards for solid minerals (CRIRSCO, NEA/IAEA), Bioenergy, Geothermal, Anthropogenic Resources, etc.
- ▶ COMMON ISSUES



COGEH

➤ 5.3.2. Commercial Status

- ... evidence that legal, contractual, **environmental**, governmental, and **other social** and economic concerns will allow for the actual implementation of the recovery project being evaluated;

➤ Contingent Resource definition

- Contingencies may include factors such as economic, legal, **environmental, political**, and regulatory matters ...



PRMS



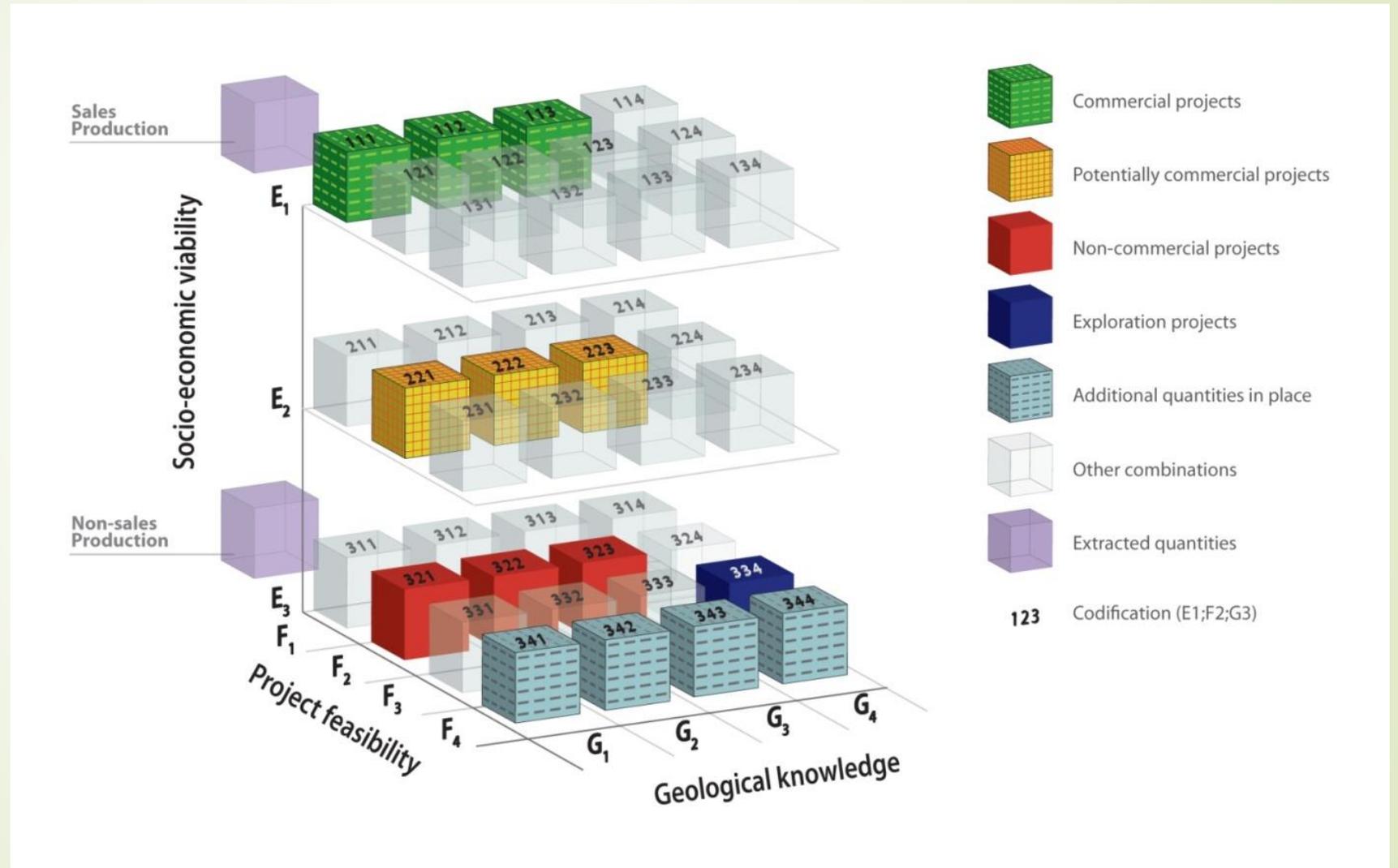
- ▶ **PRMS 2.1.2 Determination of Commerciality**

- ▶ Evidence that legal, contractual, **environmental and other social** and economic concerns will allow for the actual implementation of the recovery project being evaluated.

- ▶ **PRMS Guidelines: Commercial**

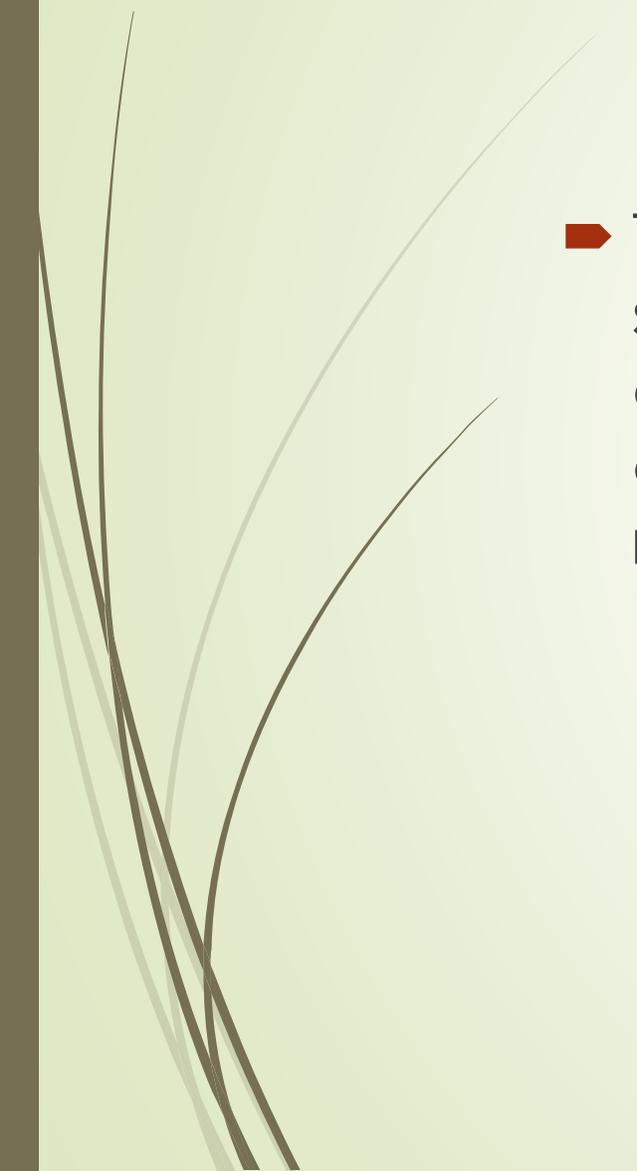
- ▶ When a project is commercial, this implies that the essential **social, environmental**, and economic conditions are met, including **political**, legal, regulatory, and contractual conditions.

THE UNITED NATIONS FRAMEWORK CLASSIFICATION (UNFC)





UNFC E-AXIS

- ▶ The E axis designates the degree of favourability of **social** and economic conditions in establishing the commercial viability of the project, including consideration of market prices and relevant legal, regulatory, **environmental** and contractual conditions.
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CLASSIFICATION GUIDELINES

- Geology, Engineering, Economics Guidelines: Practice and usage well developed.
 - Environmental, Social
 - ISSUES MAY BE IDENTIFIED AND LISTED, BUT CLASSIFICATION GUIDELINES ARE NOT WELL DEVELOPED
- 



FORMAL AND NON-FORMAL CONDITIONS

- ▶ FORMAL legal and regulatory processes:
 - ▶ E.g., environmental approval or a licence to drill, or to mine.
- ▶ NON-FORMAL, outside a formal legal or regulatory process:
 - ▶ Could be a result of concerns of local communities about the impact of a mineral recovery project, or of organisations that would not be directly affected but who have concerns of a more general nature.
 - ▶ Harder to determine how to classify.



WHY DO WE DO EVALUATIONS, WHO USES THEM?

- Many users, different needs
- It is not just to keep the pesky regulators away!

- To provide information for making decisions
- Different types of decision
- But only part of the information



WHO USES RESOURCE EVALUATIONS?

- OPERATORS

- Internal, to run the operation
- External, to provide information to: Customers, Investors

- GOVERNMENTS (Resource owners)

- Revenue forecasts: Lease sales, royalties, taxes
- Product quantity forecasts for energy and other uses
- Administration of resource activity
 - Land sales, drilling, testing and other activity
 - Abandonment, Decommissioning, Reclamation planning, etc.

- FINANCIAL

- Providing information to current and potential investors
- Equity and Debt Financing



PROFESSIONAL OBLIGATIONS

- SPEE: DISCUSSION AND GUIDANCE ON ETHICS
- PROFESSIONAL SOCIETY REQUIREMENTS
- REGULATORY REQUIREMENTS
- OTHER USERS

- **Using PRMS or COGEH implies that due diligence has been carried out on associated Social and Environmental issues.**

- Example the NI 51-101 Form F2 signed by a Qualified Reserves Evaluator

CLASSIFICATION PERSPECTIVE

- ▶ **INTERNALITY:** Factors that are under the control of an operator, and directly affect the commercial viability of a project.
- ▶ **EXTERNALITY:** “The cost or benefit that affects a party who did not choose to incur that cost or benefit.” (Wikipedia)

	COSTS		BENEFITS	
	OPERATOR	SOCIETY	OPERATOR	SOCIETY
INTERNALITY	Capex, Opex	X	Profits from sales	X
EXTERNALITY	X	Social and Environmental	X	Raw material, Revenue from Taxes, Royalties, Jobs

Different perspectives on social and environmental issues could result in differences in classification.



CONTINGENCY

- ▶ A condition that must be satisfied for recovery of a resource:
 - ▶ specific to the project being evaluated; and
 - ▶ expected to be resolved within a reasonable timeframe.
- ▶ Commerciality requires all contingencies to be satisfied, including:
 - ▶ Technical (TUD)
 - ▶ Economic
 - ▶ Non-Economic



NON-ECONOMIC CONTINGENCIES

- ▶ Legal framework. The right to produce and sell or benefit from a resource. Not a contingency unless in dispute.
- ▶ Fiscal framework and Contractual conditions? (taxes, royalties, etc.)?
- ▶ Regulatory approval.
- ▶ Known environmental or social impediments or barriers.
 - ▶ However, even if they are known to exist, there can be significant uncertainty as to the likelihood of their resolution. It is not obvious how the effect of these should be determined for classification, especially for those that fall outside a formal regulatory process.
- ▶ To which could be added:
 - ▶ Civil unrest
 - ▶ War
 - ▶ Political



TERMINOLOGY: SOCIO-ENVIRONMENTAL

Proposed

➤ ENVIRONMENTAL

- The physical or biological impact on, or changes to, the natural environment, not on humans, due to a project, often measurable (e.g., CO₂ emissions, amount of material moved, changes in surface geochemistry, etc.).

➤ SOCIAL

- The impact on humans from a project, such as:
 - Those due to Environmental changes (e.g., health issues due to heavy metal contamination). Some aspects may be measurable, but many others are qualitative or subjective.
 - Changes in social systems and structures (e.g., ownership claims, traditional land usage, land and other value changes, etc.)



SOCIAL LICENCE

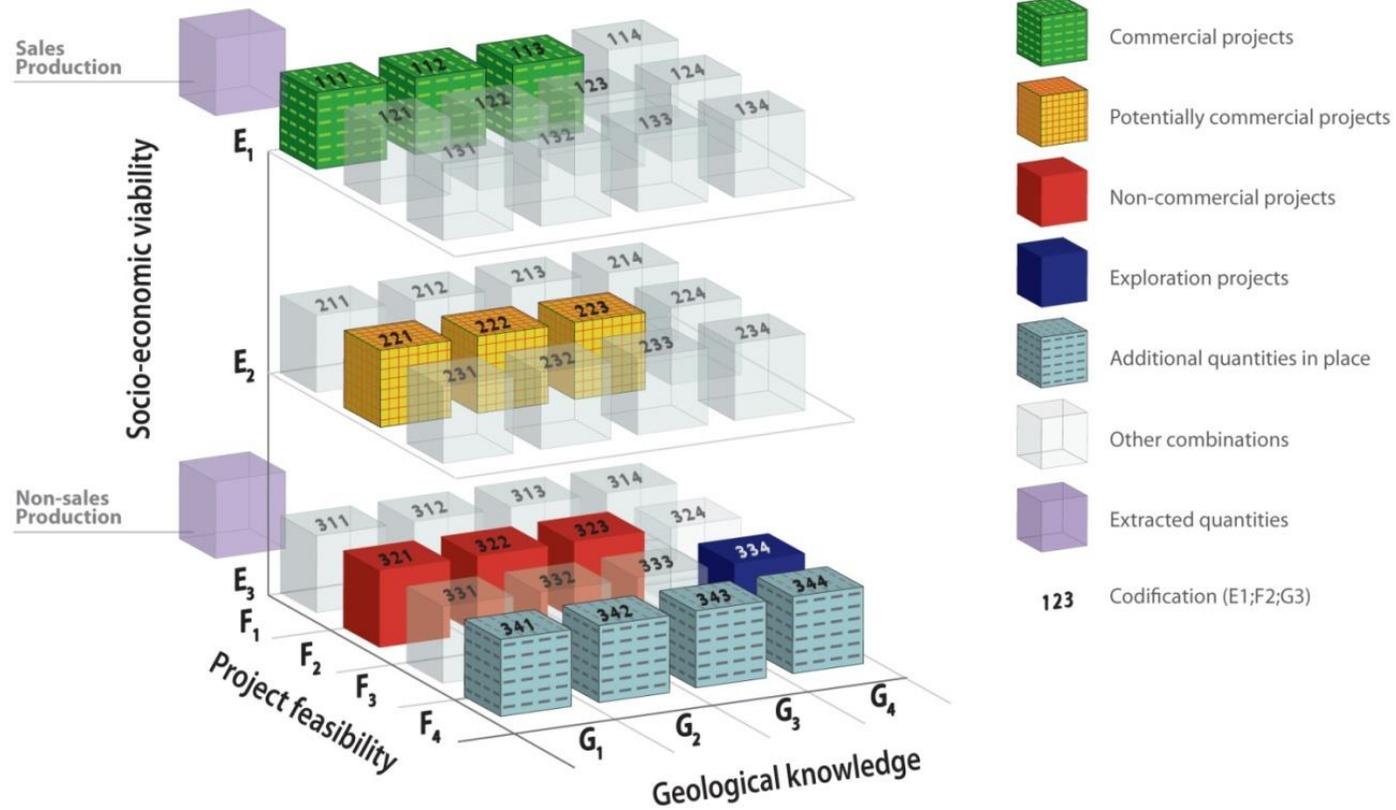
- ▶ Often arises because of concerns about the potential for harm (economic, physical or cultural) to the environment or people
- ▶ Several “definitions”, in summary:
 - ▶ Resolution of activities that could delay or prevent a project, by agencies inside or outside a formal legal and regulatory process.
- ▶ For Classification:
 - ▶ Not recommended as a classification term because it is uncertain as to what it could include.
 - ▶ Use specific criteria (e.g., regulatory approval, etc.)



UNFC SOCIAL AND ENVIRONMENTAL CONSIDERATIONS WORKGROUP

- Reviewed available literature, e.g.:
 - PRMS, COGEH, CRIRSCO, NPD, NI 51-101, SEC/FASB, etc.
 - World Bank System of Environmental-Economic Accounting (SEEA)
 - THE EQUATOR PRINCIPLES A financial industry benchmark for determining, assessing and managing environmental and social risk in projects.
 - Global Reporting Initiative Sector 4, Oil and Gas
 - And more ...
- These provide useful information but more on how to deal with than to classify.

THE UNFC



Categories E, F, G, may be subdivided; E2.1, E2.2, etc.



UNFC E-AXIS SUB-CATEGORIES

- **E1**, Commercial.
- **E2**, Expected to become economically viable in the foreseeable future.
 - Proposed
 - E2.1 High probability of resolution
 - E2.2 Medium probability of resolution
- **E3**, Not expected to become economically viable in the foreseeable future or too early to determine
 - E3.3 Low probability of resolution



UNFC SOCIAL AND ENVIRONMENTAL CONSIDERATIONS WORKGROUP

- Guidance
 - High level guidance has been proposed
 - Detailed guidance yet to be developed
 - Reports 2017
 - Reports due April 2018
 - Draft recommendations on detailed classification, April 2018
 - Paper on Concepts and Terminology, April 2018
 - Information on the UNFC: http://www.unece.org/energy/se/unfc_gen.html.
 - Previous reports at: <http://www.unece.org/index.php?id=44614#/> (Documents and Presentations tabs).
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CONCLUSIONS

- The resolution of social and environmental issues is becoming increasingly important in the ability to carry out resource extraction.
- PRMS and COGEH mention social and environmental factors in classification definitions.
- **Using PRMS or COGEH implies that due diligence has been carried out on associated Social and Environmental issues.**
- Guidelines are under development.