So, you want to be a uranium miner?

THE JOY OF PERMITTING AND LICENSING NEW URANIUM RECOVERY FACILITIES

Michelle Rehmann
Tetra Tech EM, Inc. – USA

With acknowledgements to Katie Sweeney, Esq., and Chris Pugsley, Esq.

An industry with a colorful history……..

Uranium mine near Rod's Valley mined in the mid 1950s.

More than fifty thousand claims were filed in the County Recorder's office between 1950 and 1956.

Old out-house at Uranium mine near Rod's Valley – uranium mine near Rods Valley was mined in the mid 1950s. More than fifty thousand claims were filed in the County recorders office between 1950 and 1956.

As a rule one of the worst things that could happen to a prospector would be to find enough to raise his hopes, his dreams, and encourage his irresponsibility to raise money in any devious way he could. Many men lost everything they owned, including their wife and family." (Owen Mc Clenahanof Castle Dale)

and ready to fuel a bright future

The Planets have Aligned for a Nuclear Renaissance

Driven by

- Concerns over greenhouse emissions
- Exponential growth in global energy demand
- Security concerns (energy and geopolitical)
- Need for balanced energy policy
- New generation of nuclear scientists and engineers

"Nuclear energy is clean, safe, affordable and reliable—and needs to be part of the climate change solution.

This is something that all Americans should embrace on a bipartisan basis."

Patrick Moore
Founder, Greenpeace

Fueling a Global Nuclear Renaissance

- Licensing and permitting processes, requirements and timelines
- What can go wrong
- Current issues/cases

Charlie Steen's Uranium Discovery - July 6, 1952

On July 6, 1952, a geologist from Texas named Charles Steen, down on his luck and about to give up after two years of fruitless searching for uranium deposits in the area, finally struck it rich at his Mi Vida claim in Lisbon Valley southeast of Moab. After breaking his last drill bit, or so the story goes, the frustrated and penniless Steen ran a Geiger counter over the core samples and found that he'd hit a vein of uranium-rich ore at 173 feet. The Mi Vida mine Alone would ultimately be worth more than $100 million, and it put Moab on the map.

By the end of 1956, Moab was dubbed "The Richest Town in the USA" in a national magazine article.

A sign in town proudly proclaimed Moab as "The Uranium Capital of the World."

Industry Meeting the Challenge

- Past two years – 300+ juniors emerged
- NRC estimating more than a dozen licensing requests for new or re-opening facilities
- More in agreement states

Applicants and investors want to know….

- How long until we can be up and running?
- What can we do to expedite the process?

Intro to Permit Process Recommendations

- Major environmental laws related to uranium mining/milling
- NRC licensing process for uranium recovery facilities and strategies for effective license applications
- Case histories on how problems can arise despite an applicant's best efforts; and overview of current issues that may be roadblocks to license or permit completion

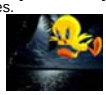
More than 3 dozen major and minor Federal Environmental Laws

- **National Environmental Policy Act**--interdisciplinary approach to environmental decision making.
- **Federal Land Policy and Management Act**--prevents undue and unnecessary degradation of federal lands.
- **Clean Air Act**--sets air quality standards.
- **Federal Water Pollution Control Act (Clean Water Act)**--directs standards to be set for surface water quality and for controlling discharges to surface water.
- **Safe Drinking Water Act**--directs standards to be set for quality of drinking water supplied to the public (states are primary authorities) and regulating underground injection operations.

Continues next slide…

More than 3 dozen major and minor Federal Environmental Laws (cont'd)

- **Solid Waste Disposal Act**--to regulate generation, storage and disposal of hazardous waste and manage solid, non-hazardous waste (states).
- **Comprehensive Environmental Response, Compensation and Liability Act** owners/operators required to report releases of hazardous substances to the environment and inventory chemicals handled; remedial actions established.
- **Toxic Substance Control Act**--requires regulation of chemicals that present risk to health or environment.
- **Endangered Species Act**--plants and animals listed that are threatened; protection plans mandated.
- **Migratory Bird Treaty Act**--prohibits killing of nearly all bird species.



…but wait, there's more!

- the Rivers and Harbors Act
- the Mining Law of 1872
- the National Historic Preservation Act
- the Wilderness Act
- the Wild and Scenic Rivers Act
- Mining in the Parks Act
- the Emergency Planning and Community Right to Know Act
- the Law Authorizing Treasury's Bureau of Alcohol, Tobacco and Firearms to Regulate Sale, Transport and Storage of Explosives
- Federal Mine Safety and Health Act

NRC LICENSING PROCESS

- NRC licenses construction, operation, and decommissioning of commercial reactors and fuel cycle facilities
  - possession, use, processing, exporting, importing, and certain aspects of transporting nuclear materials and waste
  - siting, design, construction, operations, and closure of waste disposal sites
- Process includes approving the initial license, subsequent license modifications, and license renewals.
- To be licensed to use nuclear materials or operate a facility that uses nuclear materials, an entity or individual submits an application to the NRC. The staff reviews this information, using standard review plans, to ensure that the applicant's assumptions are technically correct and that the environment will not be adversely affected by a nuclear operation or facility.

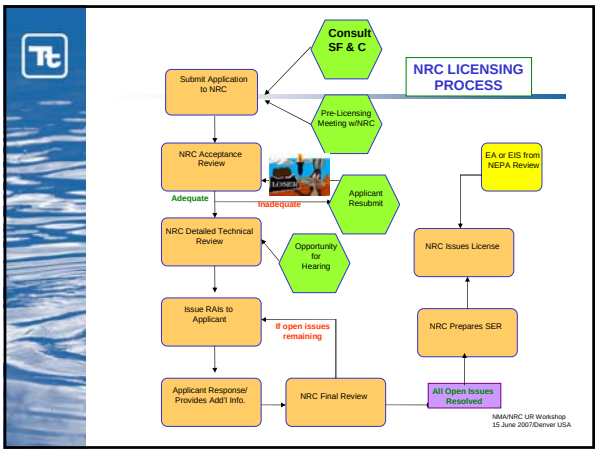
Factoids

- NRC does not regulate uranium mining – but it regulates in-situ recovery (?)

- Until/unless rules change, NRC will be involved in reviewing and licensing operations in the well fields and any satellite operations, as well as the processing plant and dryer(s)

ALARA principal

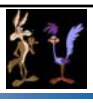
- 'Acronym for "as low as (is) reasonably achievable"
- Making every ***reasonable*** effort to maintain exposures to ionizing radiation as far below the dose limits ***as practical***, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the ***economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest*** (see 10 CFR 20.1003)



APPLICATION STRATEGY

- Pre-application Meetings
- Baseline Studies – KISS and focus
- Prepare Applications – new approaches = more time = more $$$
- Reviews and Approvals

Pre-application Meetings



- Depending on land status (public, private, state, mix) - applicants may meet with BLM, NRC and/or state agencies
- *Also key to:*
  1) get to know regulators
  2) gain understanding of agency expectations
  3) allow the agency to better budget resources
- Build a relationship with the locals

Baseline Studies

- Before any profit can be realized, the application process must be supported by baseline studies.
- Although the tendency is to minimize cost at this crucial time, a more prudent course is – resist this urge. You WILL want these data later, especially for reclamation and closure purposes.
- HOWEVER: Balance the glitz vs. more in reviews and time!

Prepare Applications

- Review applications and licenses issued for similar projects that have been approved to speed permit processes – remember you need both EA **and** SER
- If proposing any new process, technology, etc. discuss first with appropriate regulators and add additional time (and time=$$$) for review

Reviews and Approvals

The regulatory review and approval processes can be lengthy, especially if the applicant has several agencies and permits involved.

To expedite the process for all parties….

- If submitting a plan of operations with the BLM, expect to go through the NEPA EIS process – minimum of an 18 month process
- Build time for appeals into timeline. Uranium mining is, to some, still controversial – in spite of energy needs, there are some special interest groups that attempt to appeal almost all uranium project approvals
- Expect the unexpected

CAUTION – ROADBLOCKS MAY BE AHEAD

- NRC Rulemaking on Groundwater Restoration at In Situ Leach Facilities – need to eliminate dual jurisdiction (Rule due September 2007)
- NEPA requirements for ISR should be consistent with levels of risk
- Moving targets – know what's expected of your industry
- Indian Country Determinations
- Mining Law Reform
- Agency Budgetary Constraints

Focusing NEPA: INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLIST

- Consistent with level of risk posed, ISR's have been licensed without full EIS
- SIMPLE method to identify and review all key NEPA issues; and document reviews (could be part of or substitute for a GEIS)
- Modified approaches should be developed which provide the public with reasonable assurance that NEPA is providing appropriate review; but which is ALARA and appropriate for ISR operations
- Look to sister Agencies and find ways to implement the Interdisciplinary Team Analysis Record Checklist or similar streamlined approaches

A CASE STUDY: The Hydro Resources Inc. Experience

Two important determinations resulted

1. Groundwater Restoration and Financial Assurance

- NRC regulations for financial assurance for uranium recovery licensees (both conventional and ISL) require that licensees post adequate financial assurance to cover all aspects of groundwater restoration and site reclamation *if the work had to be performed by an independent contractor*
- After considerable arguments, the Commission agreed that ISL uranium recovery licensees could apply generally accepted industry practices, which enable them to create reclamation estimated assuming that (1)site employees could perform multiple, unrelated tasks during groundwater restoration and (2) that existing major site equipment may be taken into account when calculating financial assurance cost estimates.

This ruling is crucial to the preparation of accurate financial assurance cost estimates

More from HRI Case Study

2. Radiological Air Emissions Contributing to Site-Specific Dose Assessments

- Proposed recovery site formerly the site of conventional uranium mining operations from a previous site owner - residual ore dust and other ore remnants remained at site.
- Such materials were not licensed and therefore constituted "background radiation" rather than an "increment" above background radiation that would contribute to the applicable assessment
- Both HRI and NRC Staff agreed that the material at the proposed project site more accurately fit the moniker of technologically enhanced naturally occurring radioactive material (TENORM) and not any of the classes of material regulated under the AEA (i.e., source, special nuclear or byproduct material).

As a result of this ruling, licensees with unique site-specific aspects, such as former mining (uranium) sites, may characterize radiological emissions from residual materials as "background radiation."

And - licensees now have sufficient precedent to demonstrate that NRC does not regulate mining or residual materials from such mining.

Wile E. Coyote v ACME

- Learn from practical experience and adapt approaches accordingly
- Emphasize safety culture – not relying solely on manufacturers' claims
- Expect the unexpected in terms of safety and field results

Mr. Coyote states that on occasions too numerous to list…he has suffered mishaps with explosives purchased of Defendant: the Acme "Little Giant" Firecracker, the Acme Self-Guided Aerial Bomb, etc. …Indeed, it is safe to say that not once has an explosive purchased of Defendant by Mr. Coyote performed in an expected manner.

NRC Role in Energy Production – and Uranium Industry Efforts

NRC "will not be the bottleneck" in licensing new uranium recovery facilities…..

Dale Klein, Chairman, US NRC

Excerpted from remarks at:
Plenary, WM2007, Tucson, Arizona, USA;
and Japan Atomic Industrial Forum, Aormori Prefecture, Japan, 2007

CONCLUSIONS

"Peaceful use of nuclear energy is a blessing
which we have a right to enjoy and to share with future generations"
Governor, Aomori Prefecture, Japan; May 2007

- Renewed interest in siting and developing of new uranium recovery facilities (concurrent with numerous plant relicensings) has created new regulatory questions and incited a sense of urgency on the part of potential licensees and regulatory authorities.
- Both potential licensees and regulatory authorities must not just be prepared to submit or accept and review new license applications, but must also be prepared to anticipate and address likely objections raised by opponents and other unforeseen circumstances in a timely manner.
- Given the dramatic increase in the need for energy from commercial nuclear sources, potential licensees and regulatory authorities cannot afford to ignore these likely objections as they can cause the licensing process to grind to a halt.
- It is crucial to the development of new uranium production that all aspects of the siting and development of new uranium recovery projects are done correctly the first time.
- The planets have aligned to support our global nuclear renaissance – and the uranium recovery industry has stepped up. All entities need to pull together to meet US and global societal needs for nuclear power.