

# **The Process and Requirements for Large Mine Permit Applications in Alaska**

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**House Resources Standing Committee**

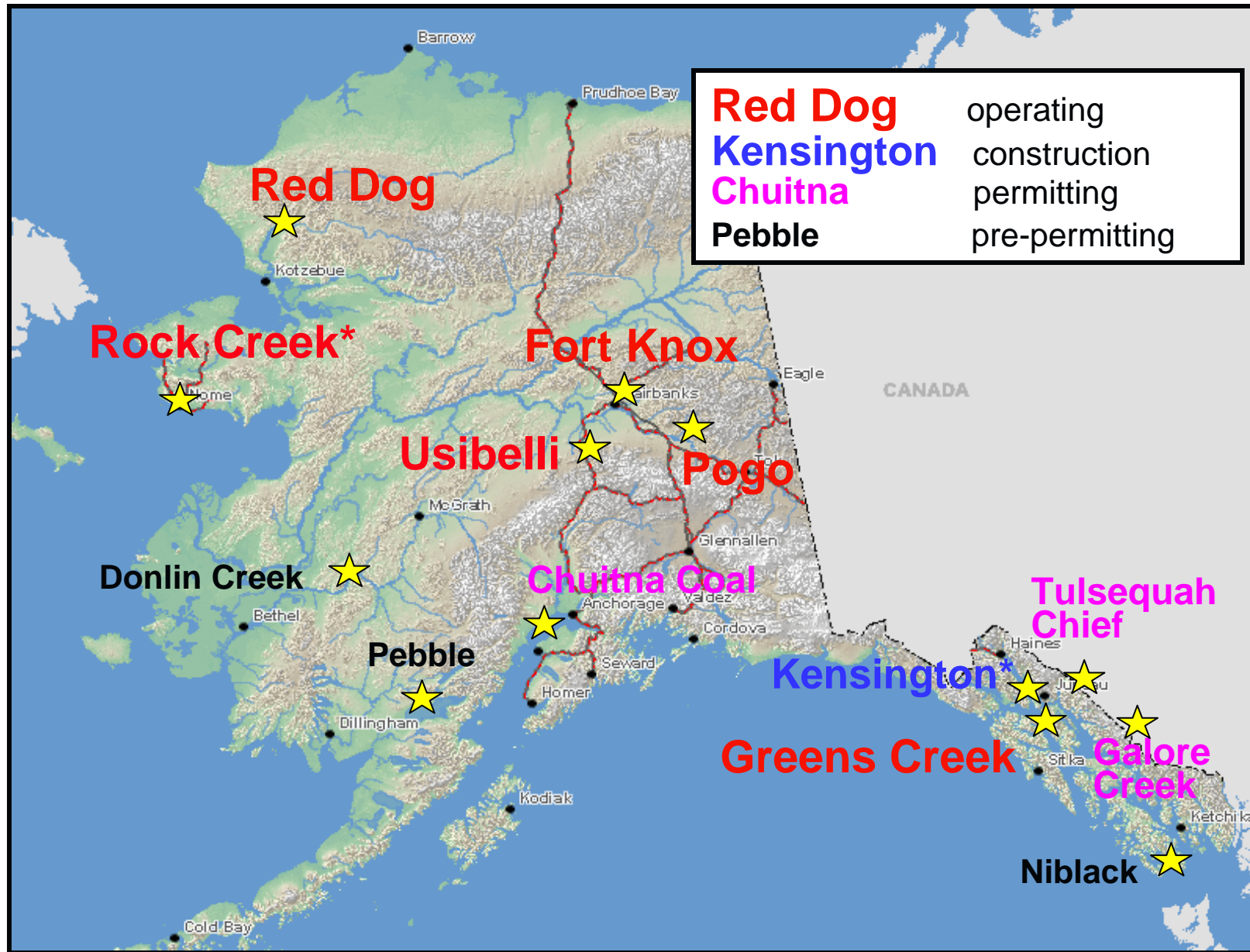
**March 25, 2009**

Ed Fogels, Director

Office of Project Management and Permitting

Alaska Department of Natural Resources

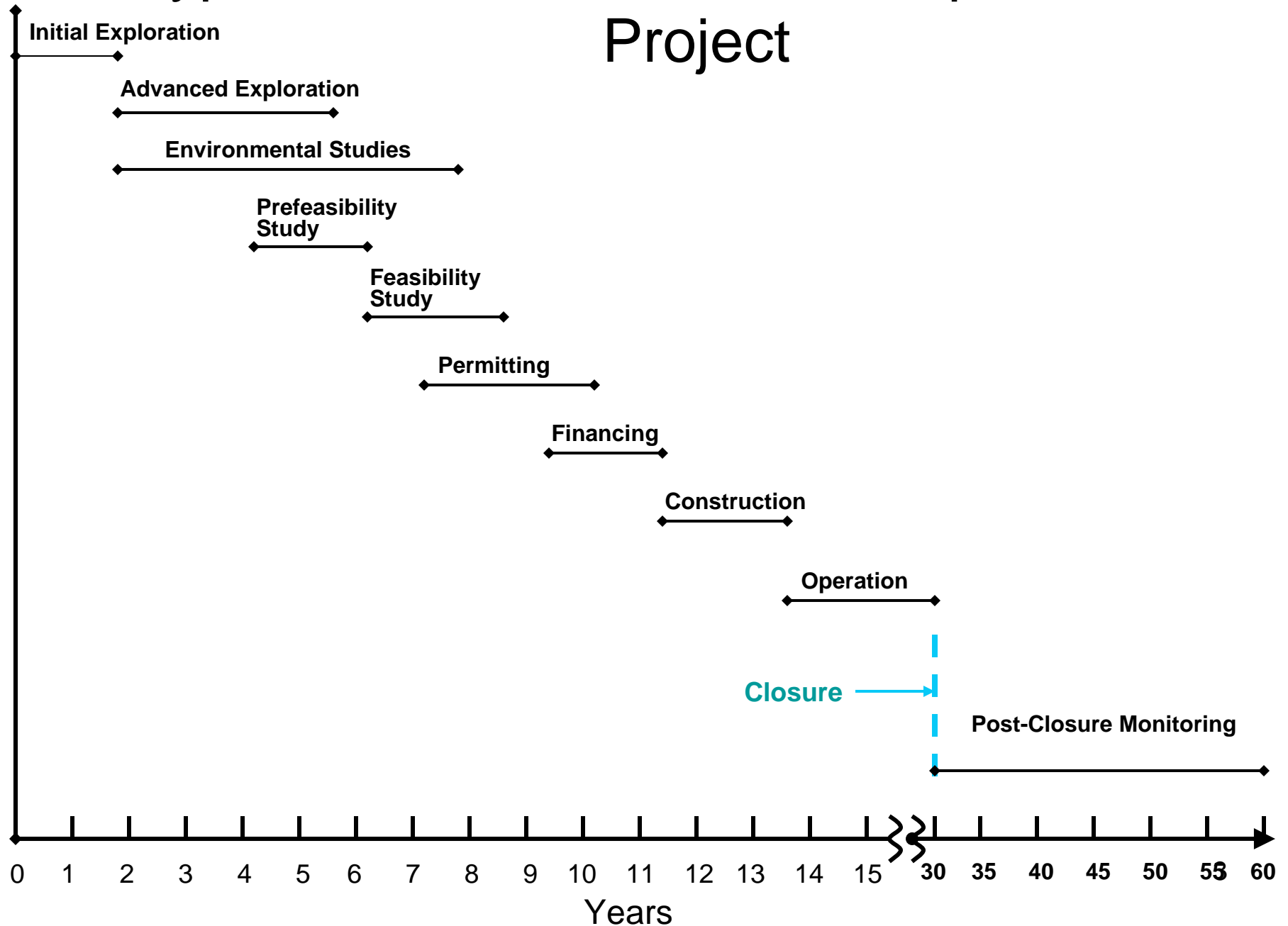
# Large mining projects in Alaska



\*Temporary Closure

\*Litigation

# Typical Time Frame for a Completed Mine Project



# No Single Permit to Mine: there are many permits & authorizations

## STATE

- Plan of Operations (DNR)
- Reclamation and Bonding (DNR)
- Waste Management Permits and Bonding (ADEC)
- Certification of NPDES and ACOE Permits (ADEC)
- Sewage Treatment System Approval (ADEC)
- Air Quality Permits (ADEC)
- Fish Habitat and Fishway Permits (ADF&G)
- Water Rights (DNR)
- Right of Way/Access (DNR/DOT)
- Tidelands Leases (DNR)
- Dam Safety Certification (DNR)
- Cultural Resource Protection (DNR)
- Monitoring Plan (Surface/Groundwater/Wildlife) (DNR/DEC)
- Coastal Zone Consistency Determination (DNR)

## FEDERAL

- US EPA Section 402 NPDES Water Discharge Permit
- US EPA Air Quality Permit review
- US EPA Safe Drinking Water Act (UIC Permit)
- US ACOE Section 404 Dredge and Fill Permit
- US ACOE Section 10 Rivers and Harbors Act
- US ACOE Section 106 Historical and Cultural Resources Protection
- NMFS Threatened and Endangered Species Act Consultation
- NMFS Marine Mammal Protection Act
- NMFS Essential Fish Habitat
- NMFS Fish and Wildlife Coordination Act
- USFWS Threatened and Endangered Species Act Consultation
- USFWS Bald Eagle Protection Act Clearance
- USFWS Migratory Bird Protection
- USFWS Fish and Wildlife Coordination Act

**(These are only some of the authorizations required)**

# State Agencies

## LARGE MINE PERMITTING TEAM

- Department of Natural Resources  
Lead State agency for coordination: AS 27.05.010(b)
- Department of Environmental Conservation
- Department of Fish and Game
- Department of Transportation & Public Facilities
- Department of Commerce, Community and Economic Development
- Department of Law
- Department of Health & Social Services

# Federal Agencies

- US Environmental Protection Agency
- US Army Corps of Engineers
- US Fish and Wildlife Service
- National Marine Fisheries Service
  
- Bureau of Land Management
- U. S. Forest Service
- National Park Service

# **MAJOR FEDERAL REGULATORY REQUIREMENTS**

- **US EPA Section 402 NPDES Water Discharge Permit**
- **US ACOE Section 404 Dredge and Fill Permit**
- US ACOE Section 106 Historical and Cultural Resources Protection
- NMFS Threatened and Endangered Species Act Consultation
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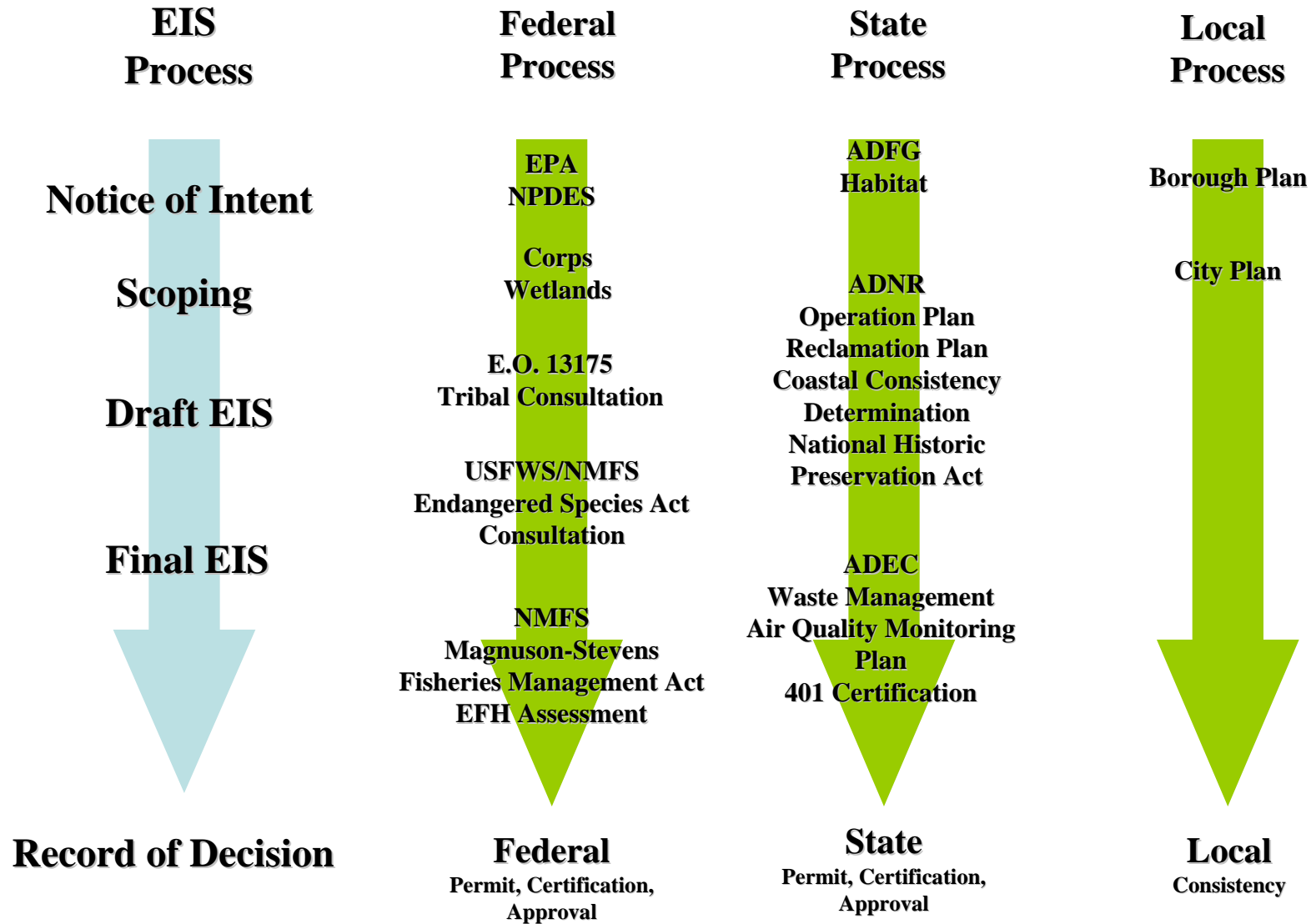
# NEPA - EIS

- EIS Content
  - proposed project and alternatives to the project
  - description of the affected environment
  - analysis of the environmental consequences of the proposed project and alternatives





# Parallel Process

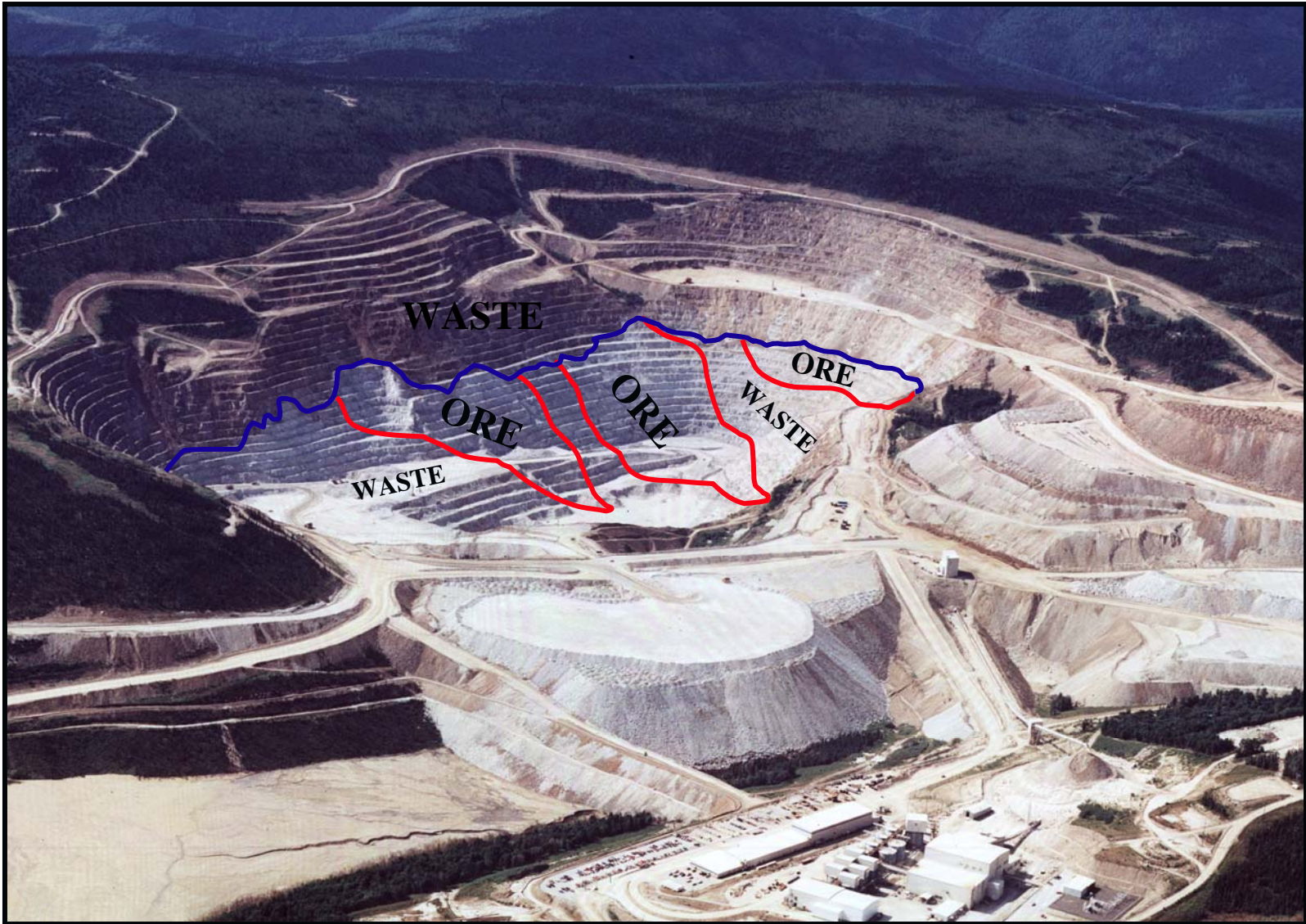


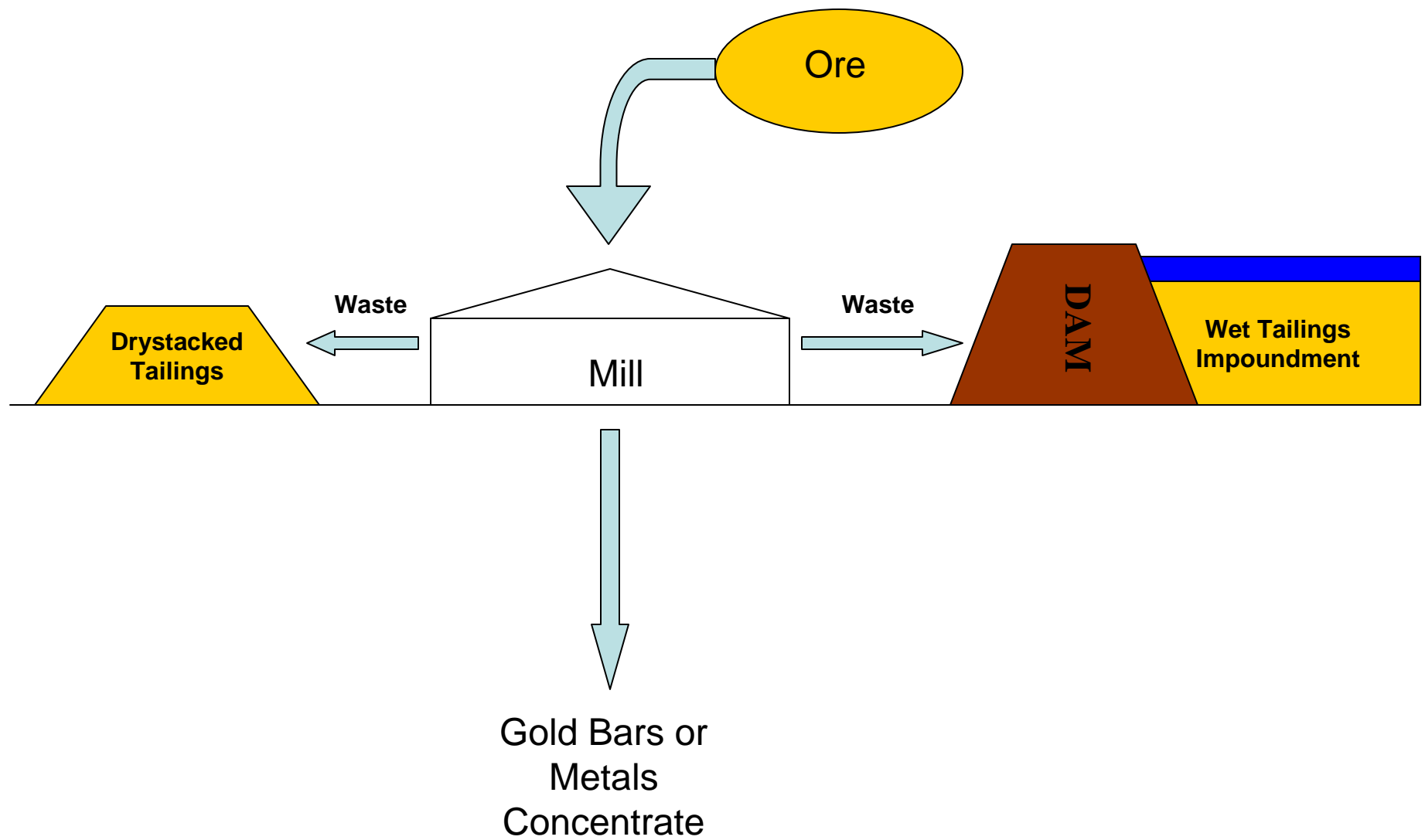
# **Baseline Studies**

- **Surface Water Quality & Quantity**
- **Groundwater Quality & Quantity**
- **Subsistence**
- **Aquatic Life**
- **Wildlife**
- **Wetlands**
- **Socioeconomics**
- **Cultural Resources**
- **Meteorology**
- **Traditional Ecological Knowledge (TEK)**
- **Visual Resources**
- **Noise**
- **Air Quality**

# Ore and Waste

A generalized example, based on Fort Knox

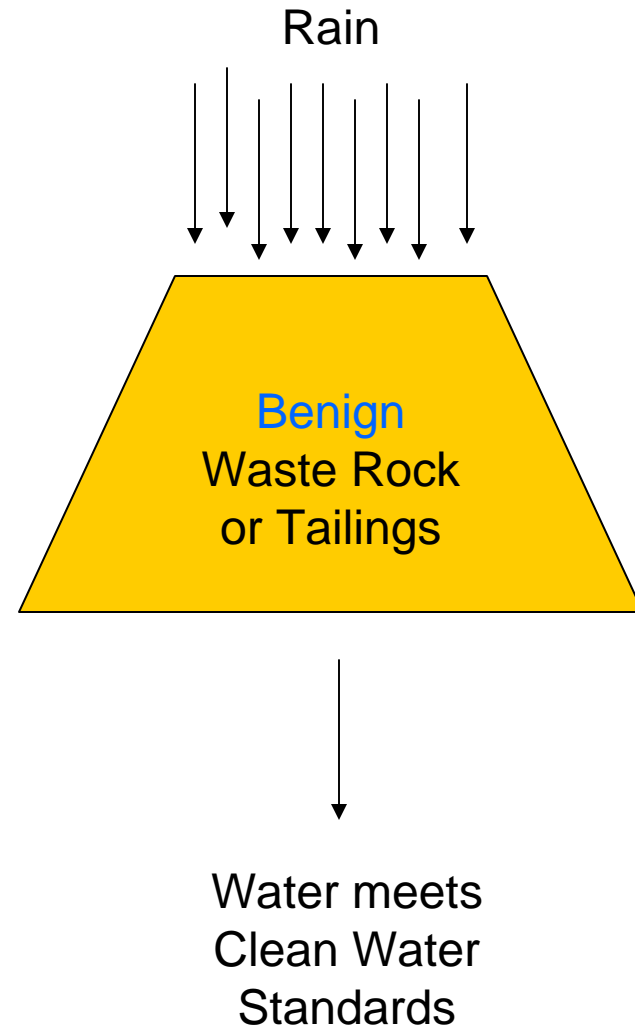
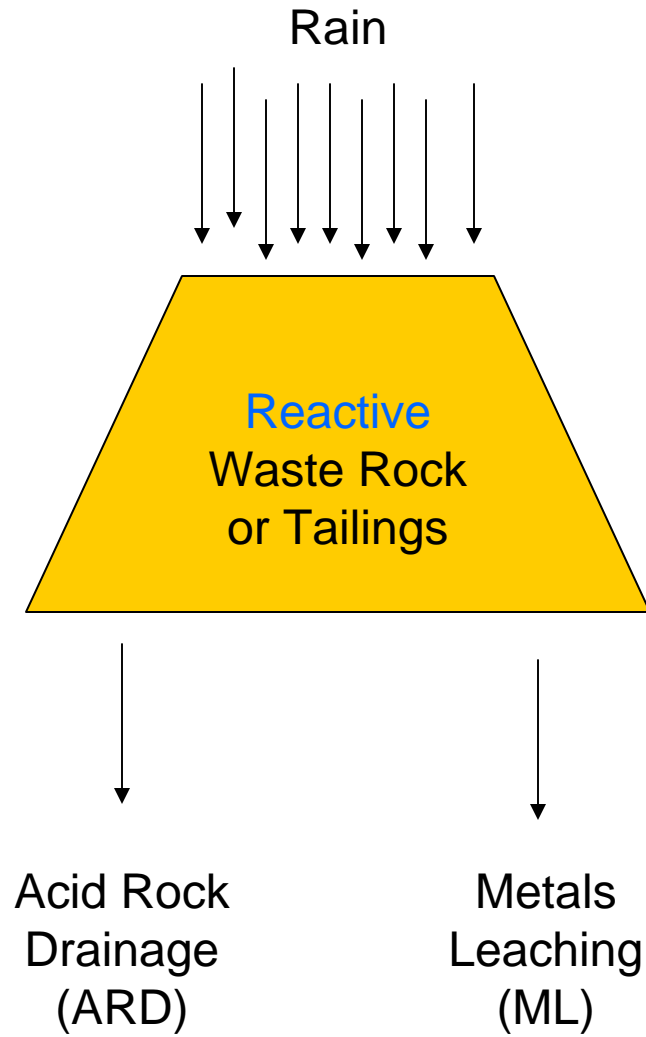


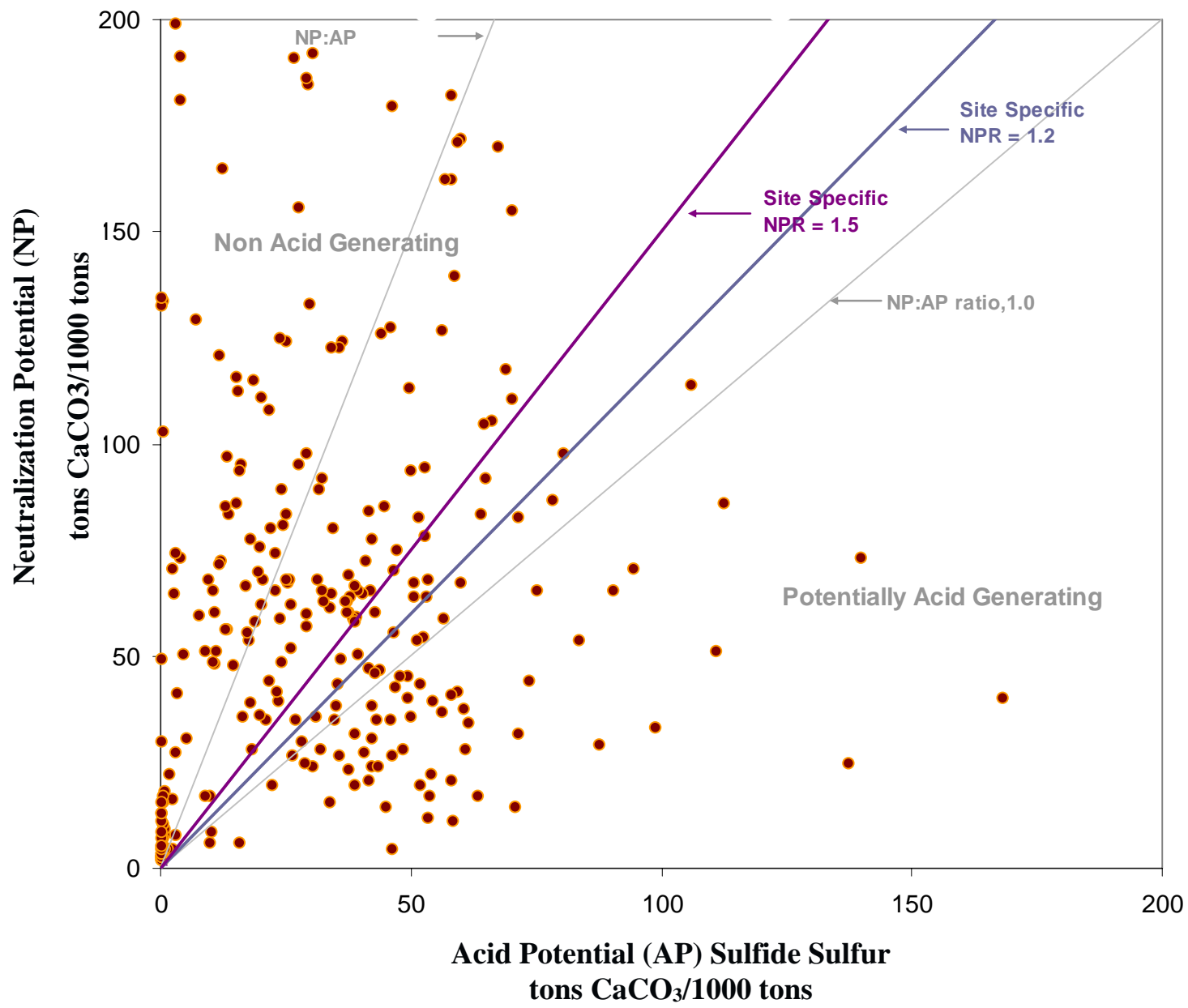




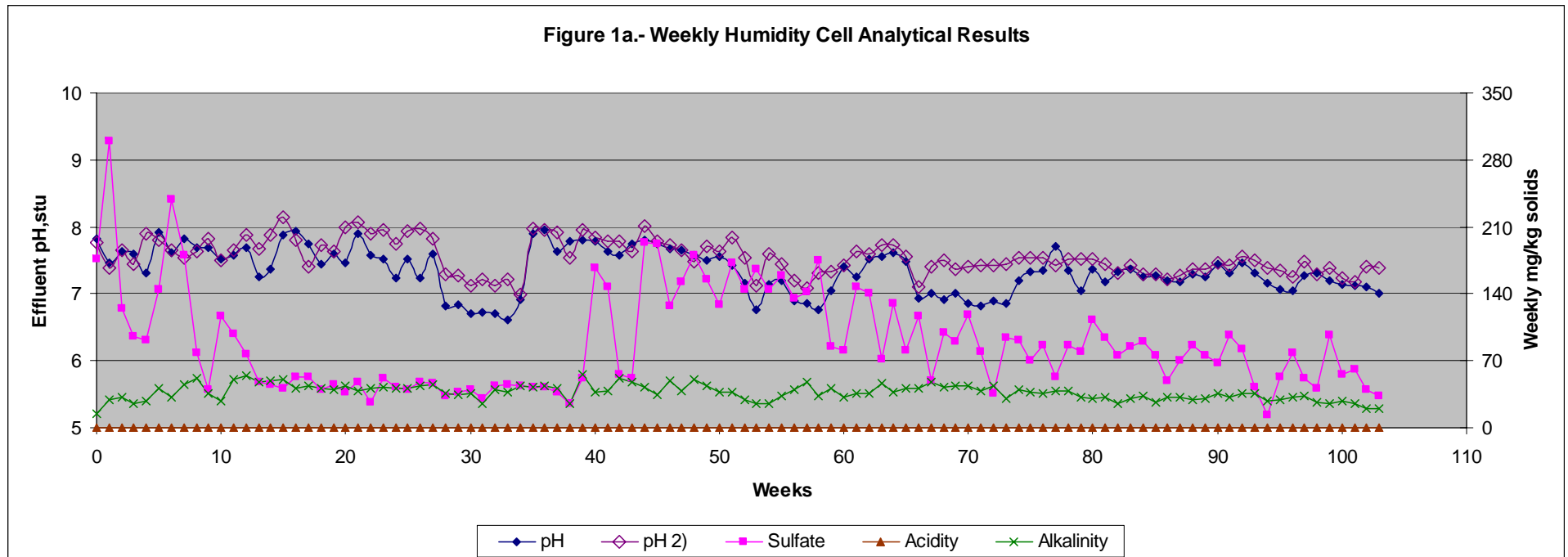
# Red Dog Tailings Dam & Mill Facilities







# Humidity Cell Tests



This test lasted for 103 weeks before being terminated.





Historic  
Issues (Spain  
& Pennsylvania.)

Desired  
Outcome  
(Alaska)





# ADEC Integrated Waste Management Permit

- Integrated Waste Management Permit
  - 18 AAC 60 – Solid Waste Management
  - 18 AAC 70 – Water Quality Standards
  - 18 AAC 72 – Wastewater Disposal
- Typical Wastes Managed
  - Tailings
  - Waste Rock
- Potential contaminants controlled
  - Acid Rock Drainage
  - Metals Leaching
  - Process Chemicals
- Financial Assurance Required

# RECLAMATION PLAN APPROVAL

## Issued by DNR

Division of Mining, Land and Water/Mining Section

- Minesite must be returned to a stable condition, compatible with the post-mining land use (AS 27.19.020)
- Financial Assurance must ensure State can do reclamation even if company cannot.

Illinois Creek Mine Dumps



Initial Recontour & Seeding



# Illinois Creek Reclamation



# DAM SAFETY CERTIFICATION

## Issued by DNR

Division Of Mining, Land And Water/Dam Safety Unit

- All dams (tailings and water storage) must be designed to State standards.
- Includes seismic standards
- Financial assurance for long term care and maintenance



# Financial Assurance is based on a detailed engineering analysis

Teck - Pogo Inc.  
teckcominco

Reclamation & Closure Plan Update

Table F.1: Demolition Hourly Labor Wage Rates

Description		General Demolition Crew	Mechanical Crew	Heavy Equipment Operator	Electrical Crew	Foreman	Laborer
Base Hourly Rate - straight time		\$26.55	\$26.04	\$27.77	\$30.83	\$30.55	\$23.43
Overtime for 50 hour week	10.0%	\$2.66	\$2.60	\$2.78	\$3.08	\$3.06	\$2.34
Adjusted Hourly Base Rate		\$29.21	\$28.64	\$30.55	\$33.91	\$33.61	\$25.77
Social Security, Medicaid, Unemployment, Liability, and Workers Comp Insurance	21.7%	\$6.34	\$6.22	\$6.63	\$7.36	\$7.29	\$5.59
<b>Total Direct Hourly Labor Costs</b>		<b>\$35.54</b>	<b>\$34.86</b>	<b>\$37.18</b>	<b>\$41.27</b>	<b>\$40.90</b>	<b>\$31.37</b>

Labor Indirects

Benefits - percentage of adjusted hourly rate	1.74
Field Overhead - percentage of direct labor costs	1.32
Small Tools Allowance - rate per hour	1.00
Camp and/or Travel Allowance - rate per hour	1.00
<b>Total Indirect Hourly Costs</b>	<b>1.06</b>

**Total Hourly Costs**

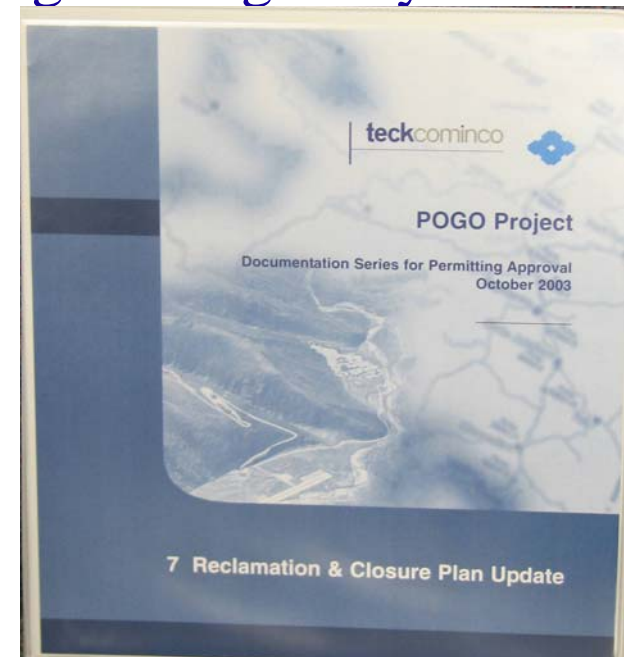
Table F.2: Hourly Equipment Rates (\$)

Equipment	Equipment Lease Rate	Maintenance & Fuel	Support & Transport	Total
				1.42

<b>Teck - Pogo Inc.</b> <b>teckcominco</b>		<b>Reclamation &amp; Closure Plan Update</b>				
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**Table F.2: Hourly Equipment Rates (\$)**

Equipment	Equipment Lease Rate	Maintenance & Fuel	Support & Transport	Total
Excavator 330	31.00	52.00	16.60	100.00
Excavator 375L	48.00	89.00	27.40	164.00
Excavator 235	31.00	52.00	16.60	100.00
Dozer D10R	73.00			
Dozer D8R	42.00			
D6R Dozer	30.00			
Grader 16G	34.00			
Water Truck	20.00			
Tamrock Drill	48.00			
Shotcrete Machine	20.00			
Picker Truck	30.00			
Re-seeding	15.00			
Shear on 375L	65.00			
FE Loader 950	30.00			
FE Loader 980G	45.00			
FE Loader 992C	62.00			
Dump Truck 14Cy	25.00			
Self Load Flat Bed	50.00			
Low Bed Truck	35.00			
Dump Truck 17cy	31.00			
Crane Truck 20T	45.00			
Crane Truck 50T	70.00			
Track Skidder S28	50.00			



<b>amec</b>		<b>POGO: RECLAMATION COST ESTIMATE (SEPTEMBER 2003)</b>					<b>Project Number: U419F</b> <b>Currency: USD 4Q2002</b>				
Description	Qty Unit	Unit Direct Hr	Total Direct Hr	Total Direct Lab Cost	Unit Mat	Total Mat Cost	Unit Sub	Total Sub Cost	Unit Equip	Total Equip Cost	Total Cost
<b>Phase I: Post-Construction</b>			4,988	287,345		13,213		26,400		156,977	483,935
<b>Phase II: Reclamation Concurrent with Mining</b>											
A-07 WELLS			115	6,294		1,200		0		0	7,494
A-09 GRAVEL PADS			363	21,312		900		0		25,013	47,224
A-12 ROCK PILES			2,928	165,891		0		0		197,786	363,677
A-13 LINERS UNDER ROCK PILES			629	35,340		0		0		41,040	76,381
A-14 PADS UNDER ROCK PILES			340	19,996		870		0		23,860	44,726
A-15 EXPLOSIVES STORAGE			406	23,515		0		0		10,904	34,418
R-01 SURFACE BOREHOLES			2,000	114,060		50,000		0		31,260	195,320
S-00 WATER QUALITY ASSURANCE			0	0		0		10,000		0	10,000
<b>Phase II: Reclamation Concurrent with Mining</b>			6,781	386,408		52,970		10,000		329,862	779,241

# Financial Assurances for Alaska Mines

Not static, audited & recalculated every 5 years  
or when significant changes occur

<i><b>Operation</b></i>	<i><b>Total Bond (\$ Millions)</b></i>
Greens Creek Mine	\$29.2
Red Dog Mine	\$154.9
Fort Knox (& True North) Mine	\$37.6
Usibelli Coal Mine & Exploration	\$11.3
Kensington Project	\$7.4
Rock Creek Mine	\$6.8
Pogo Mine	\$27.6
Nixon Fork Mine	\$3.5
TOTAL	\$278.3

# Title 16 Permits

## Issued by ADF&G Habitat Division

### •AS 16.05.841: Fishway Act

For activities within or across a stream used by fish that could represent an impediment to the efficient passage of fish. e.g., culverts; water withdrawals; stream realignments or diversion; dams; low-water crossings; and construction, placement, deposition, or removal of any material or structure below [ordinary high water](#)

### •AS 16.05.871: Anadromous Fish Act

All activities within or across a specified anadromous waterbody and all instream activities affecting a specified anadromous waterbody require approval from the OHMP, including construction; road crossings; gravel removal; mining; water withdrawals; the use of vehicles or equipment in the waterway; stream realignment or diversion; bank stabilization; blasting; and the placement, excavation, deposition, or removal of any material.





# Monitoring Plan Approval (ADEC/DNR/ADF&G)

- Air Q
- Water Q
  - Surface
  - Groundwater
- Fish & Wildlife Studies

**Baseline**



**Operation  
(Compliance)**



**Post-Closure  
(Compliance)**

# Environmental Audits

- Environmental Audits on 5 year schedule tied to reissuance of permits
- All environmental systems audited
- Audits evaluate Agencies as well as operations
- Audits by 3<sup>rd</sup> party experts
- Financial Assurances revisited and recalculated based on Audit results

# Take Home Message

- Many permits required, many agencies involved.
- Experienced agency professionals involved in permitting and regulation
- Financial Assurance required

# Take Home Message

- There are many ways to prevent contamination from occurring and control or remediate contamination once it occurs.
- Key to this:
  - Understand waste characteristics, water balance, and environmental conditions.
  - Minimize footprint and minimize contact with water
  - Design for closure
  - Appropriate Monitoring & Inspection
  - 5-Year Environmental Audits

**CHECK US OUT AT:**

**<http://www.dnr.state.ak.us/opmp/>**

**or**

**<http://www.dnr.state.ak.us/mlw/mining/largemine.htm>**

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