

MINING

Exploration to Permitting to Reclamation

Sarah Samples, U.S. EPA Region 9
RTOC, May 29, 2024



AGENDA

- Mining Basics
- Exploration
- Mining
- Permitting
- Closure and Reclamation





MINING BASICS

Mine Development, Claims,
Lands/Open Closed to Mining, Etc.

MINING LAWS AND REGULATIONS

- Mining regulated federally by the Mining Law of 1872.
 - Established conditions under which U.S. citizens can explore and occupy federal land mining claims.
 - Sets basic standards for location, recording, and patenting of mining claims.
- The Bureau of Land Management and the U.S. Forest Service have their own agency-specific mining regulations.

LANDS OPEN/CLOSED TO MINING

- **Open:** All federal lands not specifically withdrawn from entry under the Mining Law, including national forests.
- **Closed Lands:**
 - Bureau of Reclamation lands
 - Conservation Areas
 - National Monuments, Parks, and Wildlife Refuges
 - National and Scenic Rivers within ¼ mile of bank

MAJOR STEPS IN THE MINE DEVELOPMENT PROCESS

Exploration

- Exploratory programs
- Exploration permitting

Planning and Permitting

- Baseline data collection
- engineering and feasibility studies
- Plan of operation development
- NEPA/ Permitting
- Financing

Construction

- Site preparation
- mine infrastructure construction
- Environmental monitoring

Operation

- Ore Mining
- Processing
- Waste and water management
- Environmental monitoring

Closure and Reclamation

- Backfilling and sealing
- Environmental monitoring and maintenance

Post Closure

- Post-closure activities as needed, such as water management, monitoring, maintenance, etc.

EXPLORATION

Overview and Types of Permits



EXPLORATION BASICS

- Exploration generally has little ground disturbance.
- It becomes more expensive with continued success.
- Permits are required for ground disturbing activities.



PERMITS FOR EXPLORATION

Federal Permits

- Potentially Clean Water Act 404 general permit for wetlands disturbance
- If on federal land, approval by USFS and/or BLM

State Permits

- Vary with state
- Typically land use permit





MINING

Overview of Typical Mining in
Region 9

WHAT IS A MINE?

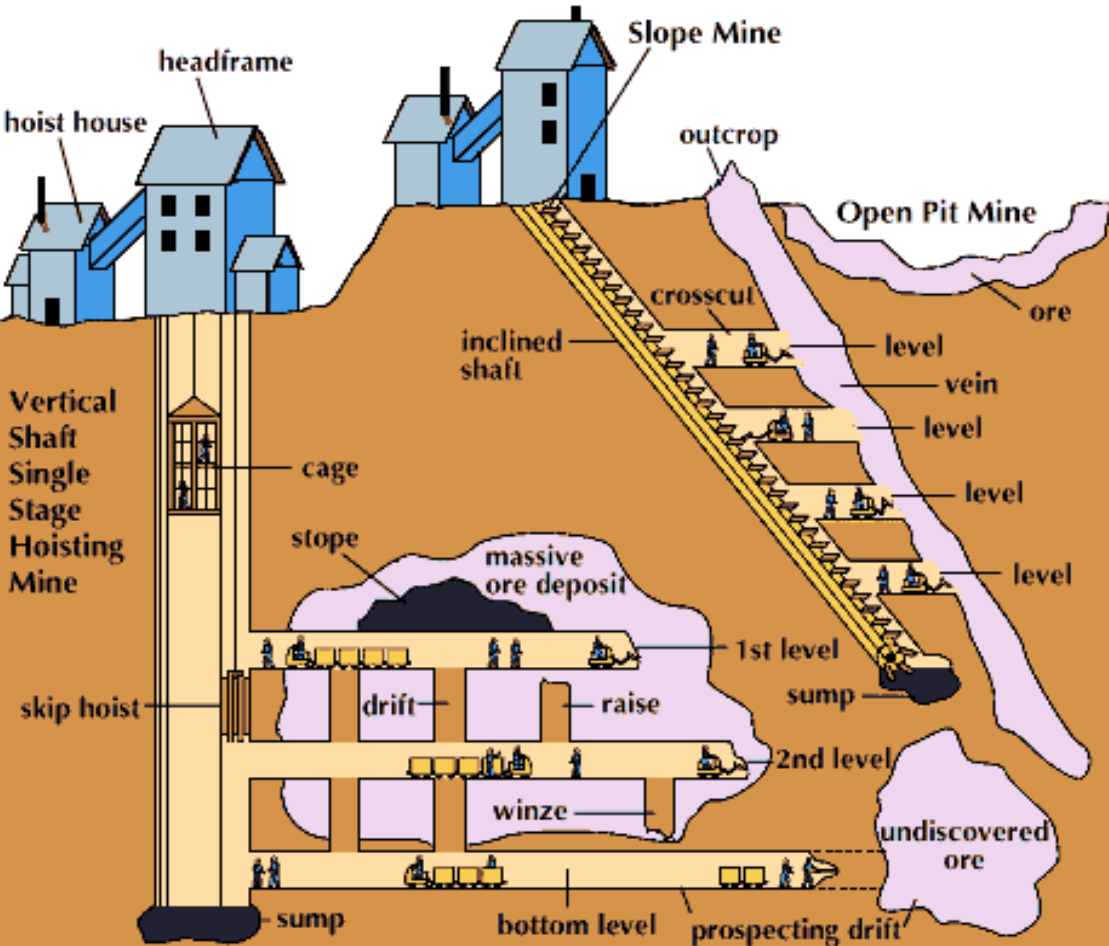
- Ores containing valuable minerals are extracted from the ground.
- Mining rates range from 100s to 100,000s of tons/day.
- Types of mining:
 - Open pit
 - Underground
 - Strip
 - Placer
 - Brine

OPEN PIT MINING



UNDERGROUND MINING

Some Types of Mines



OTHER TYPES OF MINING



Strip



Placer



In-Situ



Brine

MINERAL PROCESSING STEPS

1.

Particle Size Reduction and Sorting

2.

Concentrating the Valuable Mineral

3.

Purifying the Valuable Mineral

PARTICLE SIZE REDUCTION AND SORTING



CONCENTRATING THE VALUABLE MINERAL

Flotation



CONCENTRATING THE VALUABLE MINERAL

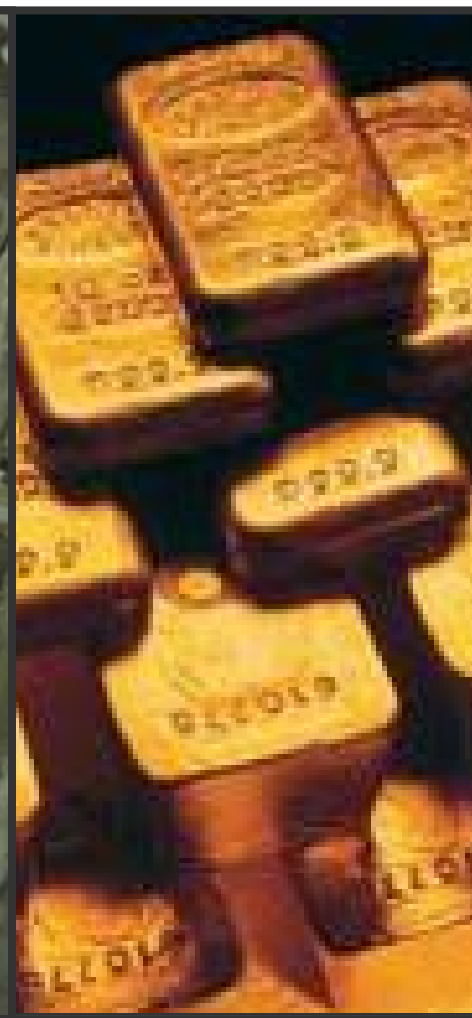


Vat & Tank Leaching



Heap Leach

PURIFYING THE VALUABLE MINERAL

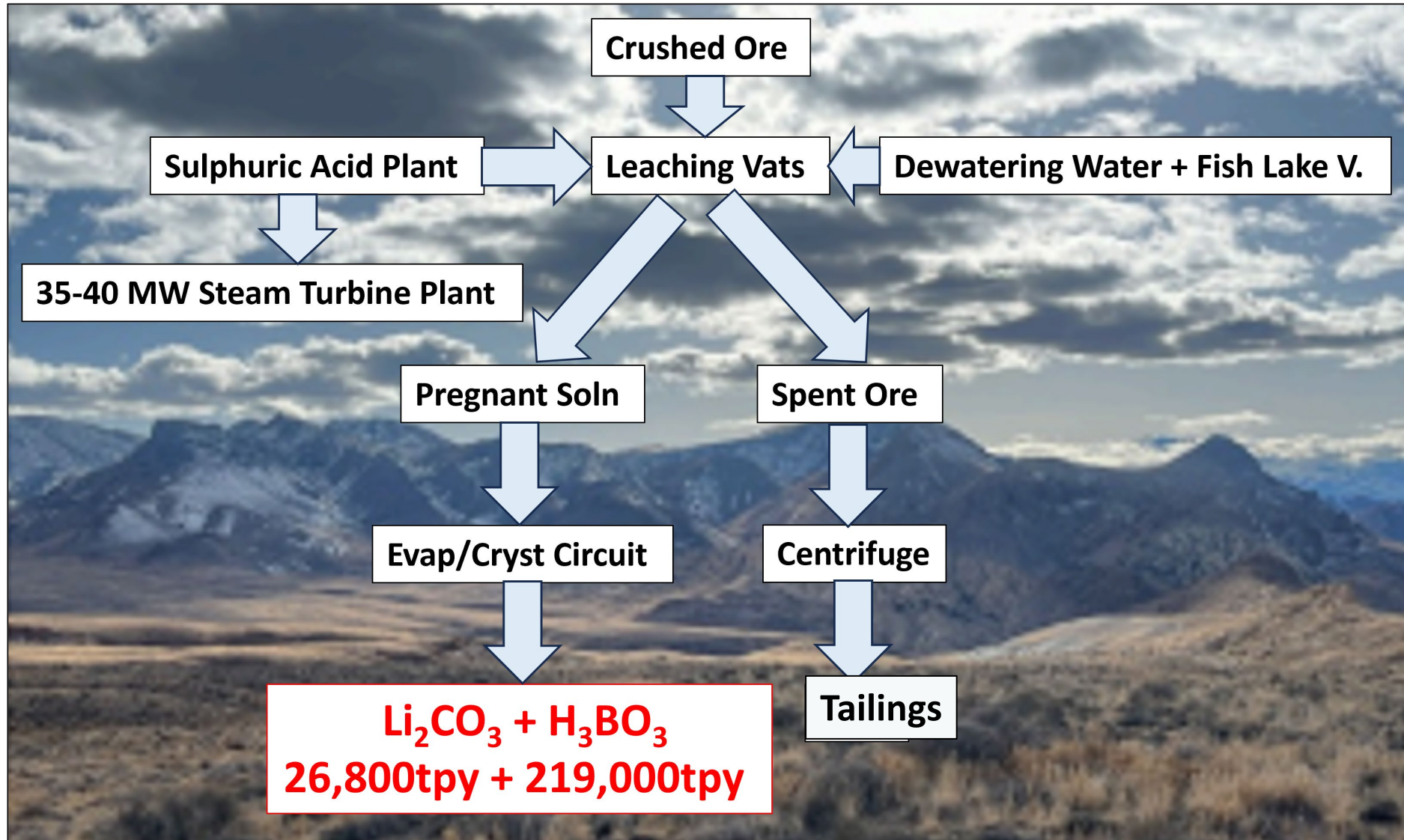


MINING INFRASTRUCTURE

- Water
- Power
- Pipelines
- Access (e.g., roads)
- Communications
- Personnel camps



PROCESSING EXAMPLE: RHYOLITE RIDGE





MINE PERMITTING

Major Environmental Permits
Needed to Operate a Mine

Permits and Authorizations	Regulatory Agency
PoO/Record of Decision	BLM
Explosives Permit	U.S. Department of the Treasury; Bureau of Alcohol, Tobacco, Firearms and Explosives
Surface Disturbance Permit, Class II Air Quality Operating Permit, and Class I Air Quality Operating Permit	Nevada Department of Conservation and Natural Resources; NDEP Bureau of Air Pollution Control
Water Pollution Control Permit	Nevada Department of Conservation and Natural Resources; NDEP BMRR
Mining Reclamation Permit	Nevada Department of Conservation and Natural Resources; NDEP BMRR
Permit to Appropriate Water Nevada Department of Conservation and Natural	Nevada Department of Conservation and Natural Resources, Division of Water Resources
Clean Water Act 404 Permit	U.S. Army Corps of Engineers
Industrial Artificial Pond Permit	Nevada Department of Wildlife
National Pollution Discharge Elimination System Permit	Nevada Department of Conservation and Natural Resources; NDEP Bureau of Water Pollution Control
General Discharge Permit (Stormwater)	Nevada Department of Conservation and Natural Resources; NDEP Bureau of Water Pollution Control
Hazardous Materials Storage Permit	State of Nevada, Fire Marshal Division
Hazardous Waste Identification Number	EPA
Class III Waiver Landfill Permit	Nevada Department of Conservation and Natural Resources; NDEP Bureau of Solid Waste

MULTIPLE AGENCIES REGULATE MINING

Federal Agencies

- Land Management Agencies:
 - U.S. Forest Service
 - Bureau of Land Management
 - National Park Service
- EPA
- U.S. Army Corps of Engineers
- U.S. Fish & Wildlife Service
- National Marine Fisheries Service

State Agencies

- Environmental Department
- Natural Resources or Lands Department
- Fish and Game
- Department of Law
- Historic Preservation Office

Tribal Governments

Local Government

CLEAN WATER ACT PERMITTING

CWA Section 301 Prohibits discharge of a pollutant without a permit.

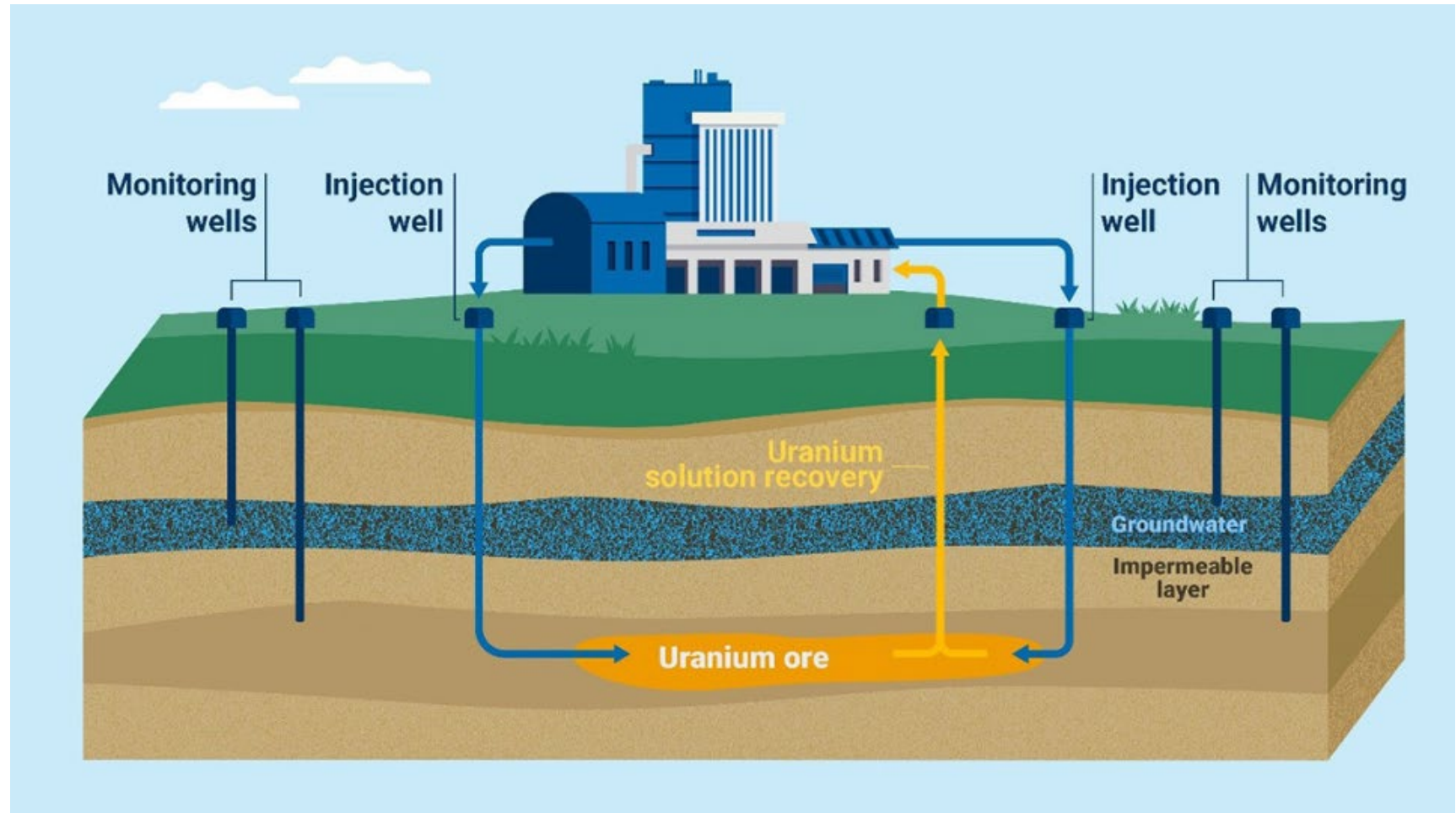
CWA Section 303 Requires States to establish water quality standards to protect surface waters.

CWA Section 402 NPDES permits required for the discharge of pollutants from point sources to waters of the U.S. (other than dredged or fill material)

CWA Section 404 Permits issued by Army Corps of Engineers are required for the discharge of dredged and fill materials in waters of the U.S., including wetlands.

UNDERGROUND INJECTION PERMIT

- Required for injection of wastewater into the ground wells
- Issued by EPA or delegated states



CLEAN AIR ACT PERMITTING

- Delegated to states; EPA provides oversight and reviews air quality permits.
 - New Source Performance Standards
 - National Emission Standards for Hazardous Air Pollutants
 - Title V Operating Permitting
 - Fugitive Dust

OTHER EPA AUTHORITIES

- Emergency Planning and Community Right to Know Act and the Toxics Release Inventory.
- Hazardous waste under the Resource Conservation and Recovery Act.
- Solid wastes from mining and mineral processing are excluded.

WHAT EPA DOESN'T REGULATE

- Exploration activities
- Solid wastes from mining
- Reclamation and closure
- Financial assurance

YET... these are regulated by states and, on federal land, by the U.S. Forest Service and the Bureau of Land Management.



MINE CLOSURE AND RECLAMATION

- Heap leach drain down
- Backfilling pits
- Sealing shafts

CLOSURE & RECLAMATION

- Reestablishing vegetation
- Stabilization
- Road removal
- Stabil

Current EIS-Level Mining Projects in Region 9

- ★ Rhyolite Ridge – Lithium, Boron (new mine)
- ★ Hermosa – Manganese and Zinc (new mine)
- ★ South Railroad – Gold, Silver (new mine)
- ★ North Bullfrog – Gold (new mine)
- ★ Spring Valley – Gold (new mine)
- ★ Tonopah Flats – Lithium (new mine)



Questions

Sarah Samples

samples.sarah@epa.gov

Future Training Sessions on Mining:

1. What is EPA's role in mining?
2. NEPA Comments: How, What, When, Why.
3. What you need to know about reporting polluters.
4. Lithium mining