Colorado’s Inactive Mine Reclamation Program

Perspective on Inventories

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What is Colorado’s Inactive Mine Reclamation Program?

1977 – Federal Surface Mining Control and Reclamation Act
- Fee collected from active coal mine operations
- Portion of fee designated for abandoned mine land reclamation
- Physical hazards given priority (open shafts, adits, coal mine fires, subsidence)

1979 - Colorado Surface Mining and Reclamation Act
- Established Inactive Mine Reclamation Program

Mission:

Undertake reclamation aimed at reducing hazardous situations associated with past mining activities.
Department of Natural Resources
  - Division of Reclamation, Mining and Safety
    - Office of Active and Inactive Mines
      - Inactive Mine Reclamation Program
      - Mine Safety
    - Mined Land Reclamation
      - Coal Program
      - Minerals Program
Public Safety: Hazardous Mine Openings

- Collapsing uranium mine adit
- Open gold mine adit
- Open Shaft
- Open Stope
- Timbered vertical Shaft w/ladder
Additional AML Related Public Safety Hazards

Undermined Neighborhoods

Underground Coal Mine Fires
Environmental AML Hazards

Water quality impacts
Original Inventory

1980 to 1982 – Conducted physical inventory of AMLs within the State.
  ◦ Emphasis on Coal AMLs
  ◦ ~8,000 mine hazards inventoried;
    ◦ 900 coal sites; 7,300 hardrock sites.
  ◦ 12 Active underground coal mine fires.
  ◦ >46,000 acres of land subject mine related subsidence.
  ◦ >170 adits with acid mine drainage.
  ◦ 95 waste and tailings piles impacting water quality.
Never digitized.
Estimated over 23,000 AML physical hazards throughout the State.
Current Inventory

Typically day forward:
  ◦ Inventory for next project, not comprehensive.

Maintain database (Brasscap) of completed safety closures.
  ◦ >10,400 AML hazards safeguarded as of July 2017.
  ◦ Average 300 safety closures per year.

Reclaimed over 4,000 acres.

Completed environmental reclamation projects at over 220 sites.

4 new inventory initiatives.
Draining Mines Inventory

- DRMS partnered with Water Quality Control Division (CDPHE) to survey and sample draining abandoned mines in 2016.
- 165 mine sites were surveyed and 145 were draining and sampled during visitation.
- Mines sampled in the study are less significant pollutant loaders than those being addressed through EPA Superfund Program.
- Data from study made publicly available.
- https://erams.com/co-abandoned-mines-water-quality
Abandoned Mines Lands Data Hub

- Joint effort headed by CDPHE and CGS to provide a publicly available interactive map of AMLs in Colorado.
- Multiple Federal and State agencies provided information for the database.
- Database includes more than 50,000 records.
- Made publicly available.
  - https://erams.com/aml
Department of Energy Inventory

- Over 1,500 Defense Related Uranium Mines (DRUMs) throughout Colorado.
- DRMS will be assisting DOE with inventory of many of those sites over the next 5 years.
- Inventory will consist of site surveys for physical and environmental hazards.
Legacy Project

Digitize the 8000+ entries in 1980s inventory.

Develop GIS based on that inventory.

Correlate to other existing inventories (USFS, BLM, DOE)
Final Thoughts

Coordinate future inventory and prioritization with multiple agencies through mixed ownership group.

Inventory efforts, goals, prioritization differ depending on funding source and agency.

Multiple land management agencies = multiple inventories.

Inventories are often duplicative across agencies.

Inventories must be viewed as dynamic...things change.

Utilize technology to facilitate inventory collection and updates:
  ◦ Mobile computing, LIDAR, UAVs