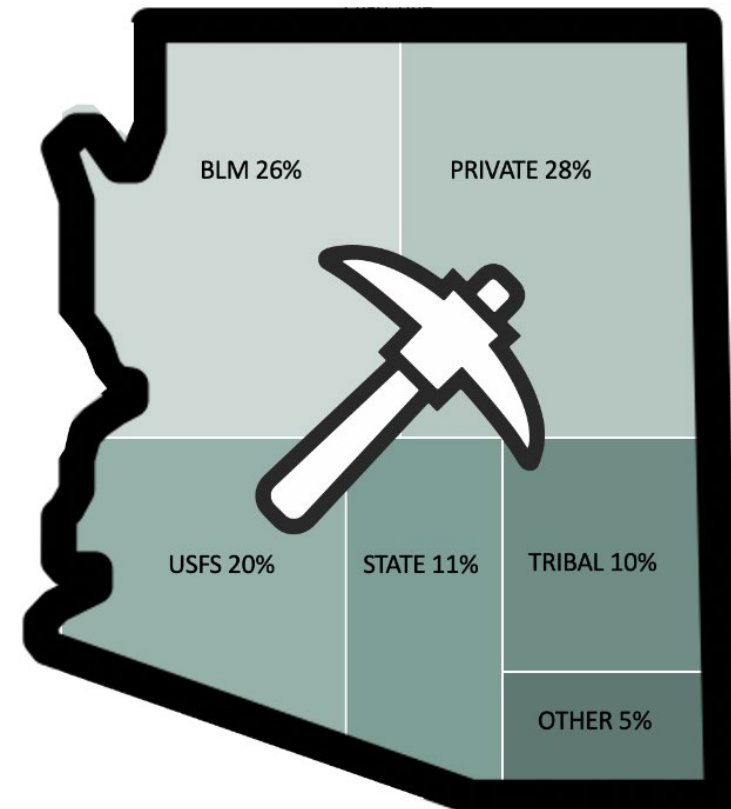
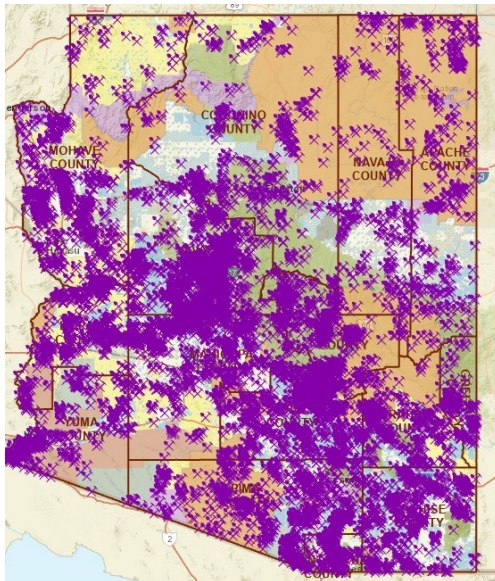


Arizona's Approach: Legacy Mine Remediation

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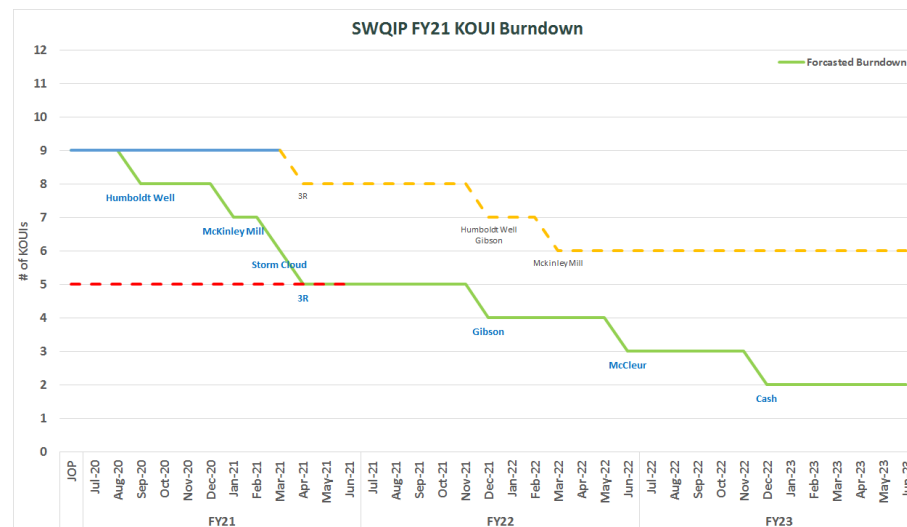


- Mining boom began in mid-1800s
- The 5C's of Arizona's Economy
- Thousands of mines
 - 10,000-100,000+



History of the “Program”

- Arizona Management System
- Impaired waters driven
- Developed a Watershed Team Approach
- Agency Prioritization – Known, ongoing sites
- Use voluntary and regulatory approaches



- Impacts to Human Health
- Impact to the Environment
- Perennial Waters
- Continuous Discharges
- Distance to receiving water



- Real-time Assessment Tool
- XRF Field Application
- Tableau Analytics
- Game Cameras



- Internal
 - CWA 319(h)
 - Performance Partnership Grant
 - Water Quality Assurance Revolving Fund

- External
 - US Forest Service
 - 319 Grantee Match



Hillside Mine



Metal	Pre Implementation (ug/L)	Post Implementation (ug/L) (2019-2020)	% reduction
Arsenic (d)	91	75	18%
Arsenic (t)	171	117	32%
Iron (d)	95	45	53%
Zinc (d)	586	49	92%



Lead Queen Mine



Pollutant	Pre Plug (mg/L)	Post Plug (mg/L)	Designated Use
Lead (total)	0.021	0.0013	PBC (0.015)
Copper (total)	1.4	0.033	<u>AgL</u> (0.5)
Copper (dissolved)	1.3	0.027	<u>AWe</u> (0.055)
Zinc (dissolved)	4.1	0.082	<u>AWe</u> (2.4)
pH	3.69	7.01	PBC (6.5-9.0)

Storm Cloud Mine



3R Mine



3R Mine



- Establish universe and prioritize inventory
 - ADEQ estimates 20-40 sites that impact water quality
- Learn from neighboring States, other Agencies and Industry
- Explore and develop alternative remedial actions
- Continue to build community support
- Secure needed resources (funding and technical)
 - \$20-30M for site remediation

Western State Comparison

State	Formal AML program?	Inventory of AML sites and features?	Objective of AML Program?	Structure of program?	Resources Available?	Outcomes Achieved?
Arizona	No	No complete inventory ~10,000-100,000	Protect human health and the env.	Within ADEQ	• 3 FTE • NPS grants • Grants with Fed Agencies • WQARF	individual parameter delists
Colorado	Yes	Sites and features in GIS systems	Protect Public Health and Safety	Inactive Mine Reclamation Program	• 16 FTE • State funding • NGOs • Industry • BLM/USFS	
Nevada	Yes	~ 200 prioritized in GIS database	Protect human health and the environment	Multiple Agencies	• 4FTE • State Funding • RPs and BLM/UFS • RAMS/ACoE	
New Mexico	No	No	Protect Public Health and Safety	NMDE, Groundwater Quality - thru EPA funded site assessments	• 1 FTE • Federal grant funds • RP	
Oregon	No	No	Protect Public Health and Safety and the Environment	ODEQ's Cleanup Program	• 1 FTE • Federal Grant Funds	
Utah	No	No	Protect public health and the environment	Within UDEQ/DWQ	• 2 FTE	
Idaho	Yes	No	Protect Public Health and Safety = Restore land and water resources	Idaho Department of Lands	• 4 FTE • State Funding • RP • Federal funding • BLM/USFS	
California	Yes	Yes	Primary AML program is focused on physical safety.	Responsibilities spread across several agencies for water quality issues		