



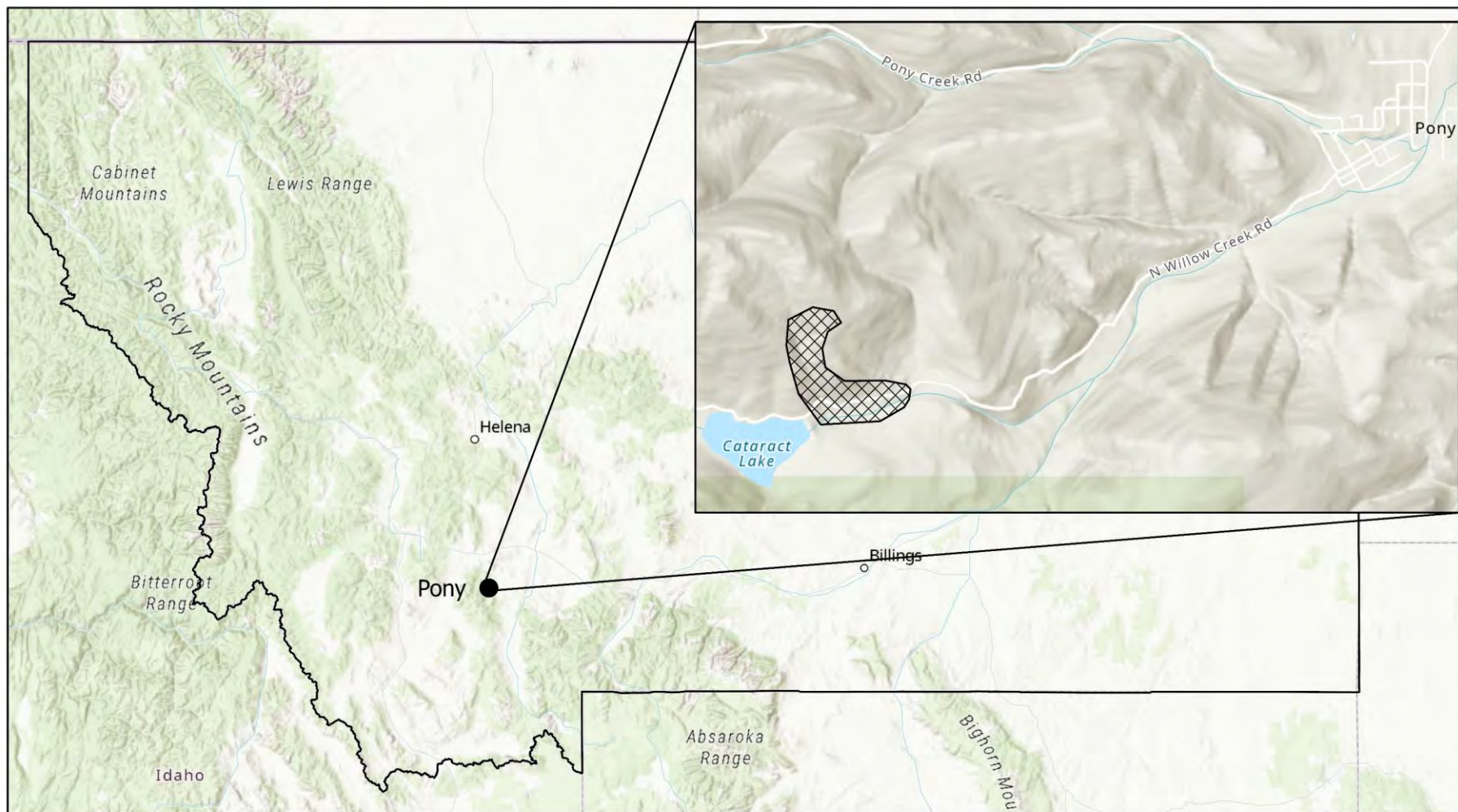
Garnet Gold Reclamation Project; Pony, MT

Wil George

Montana Department of Environmental Quality

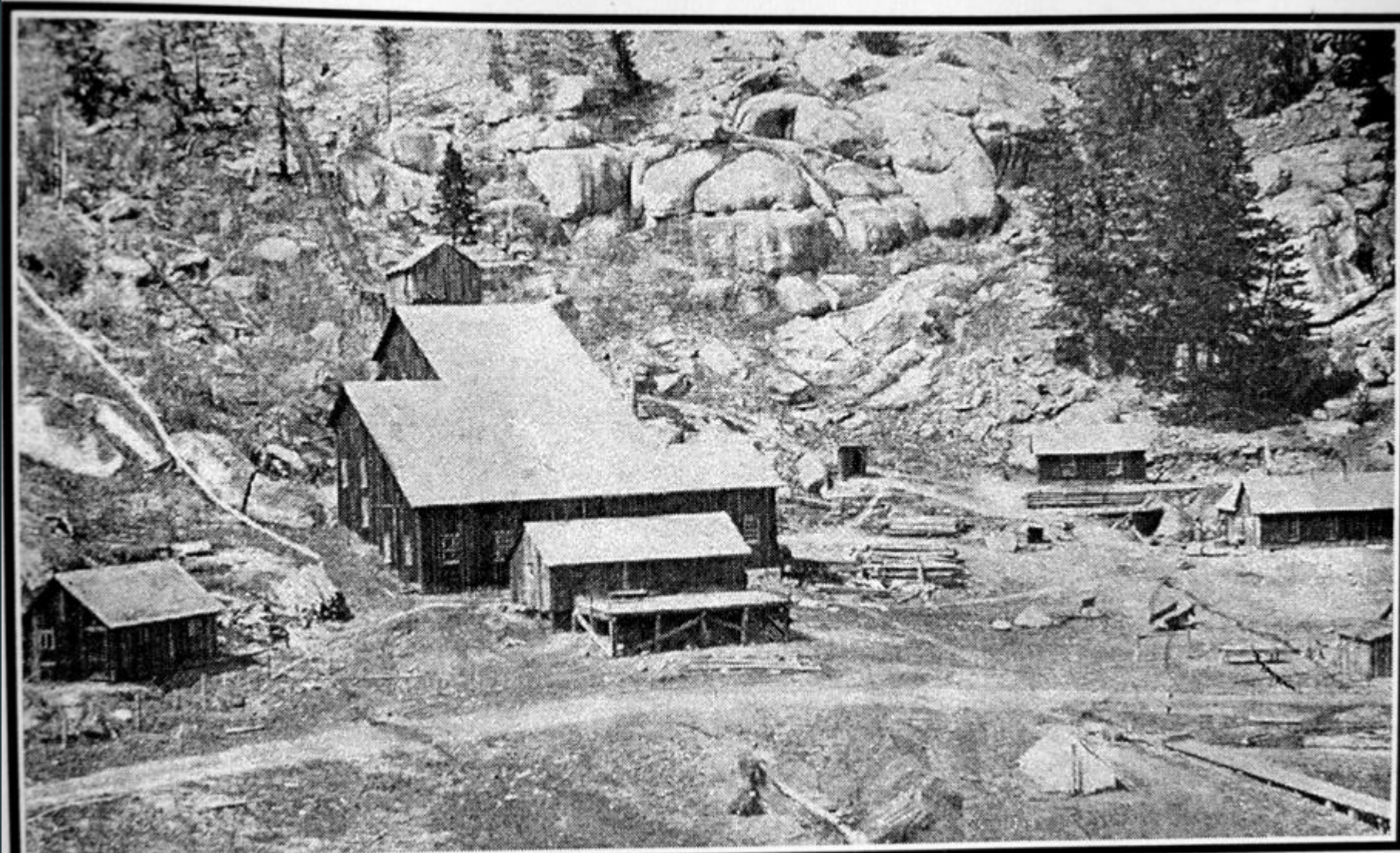
Abandoned Mine Lands

July 25th, 2023



Garnet Gold Project Location

Mining History



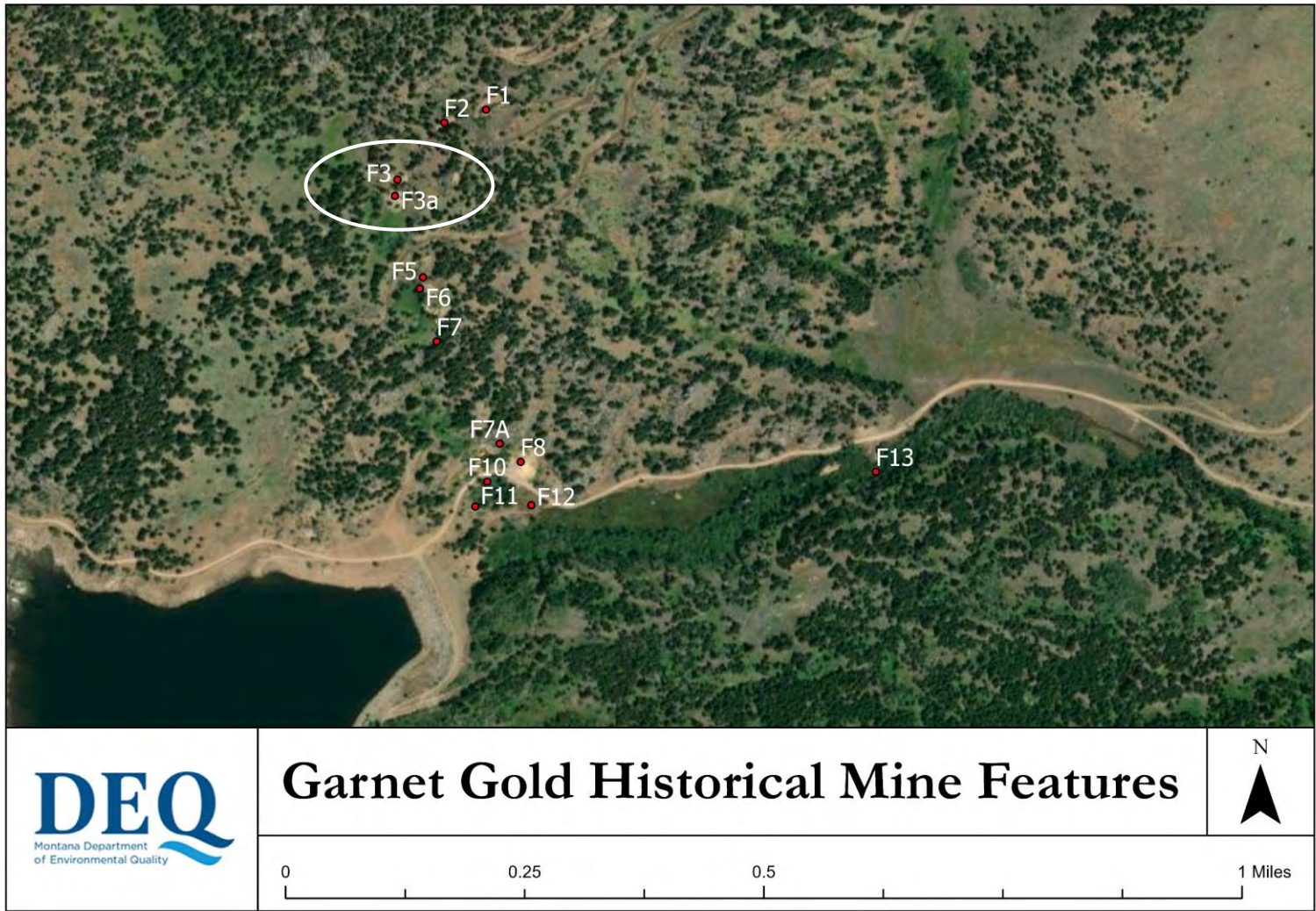
Historical Mine Features



Historical Mine Features



Historical Mine Features



Historical Mine Features



Historical Mine Features



Historical Mine Features



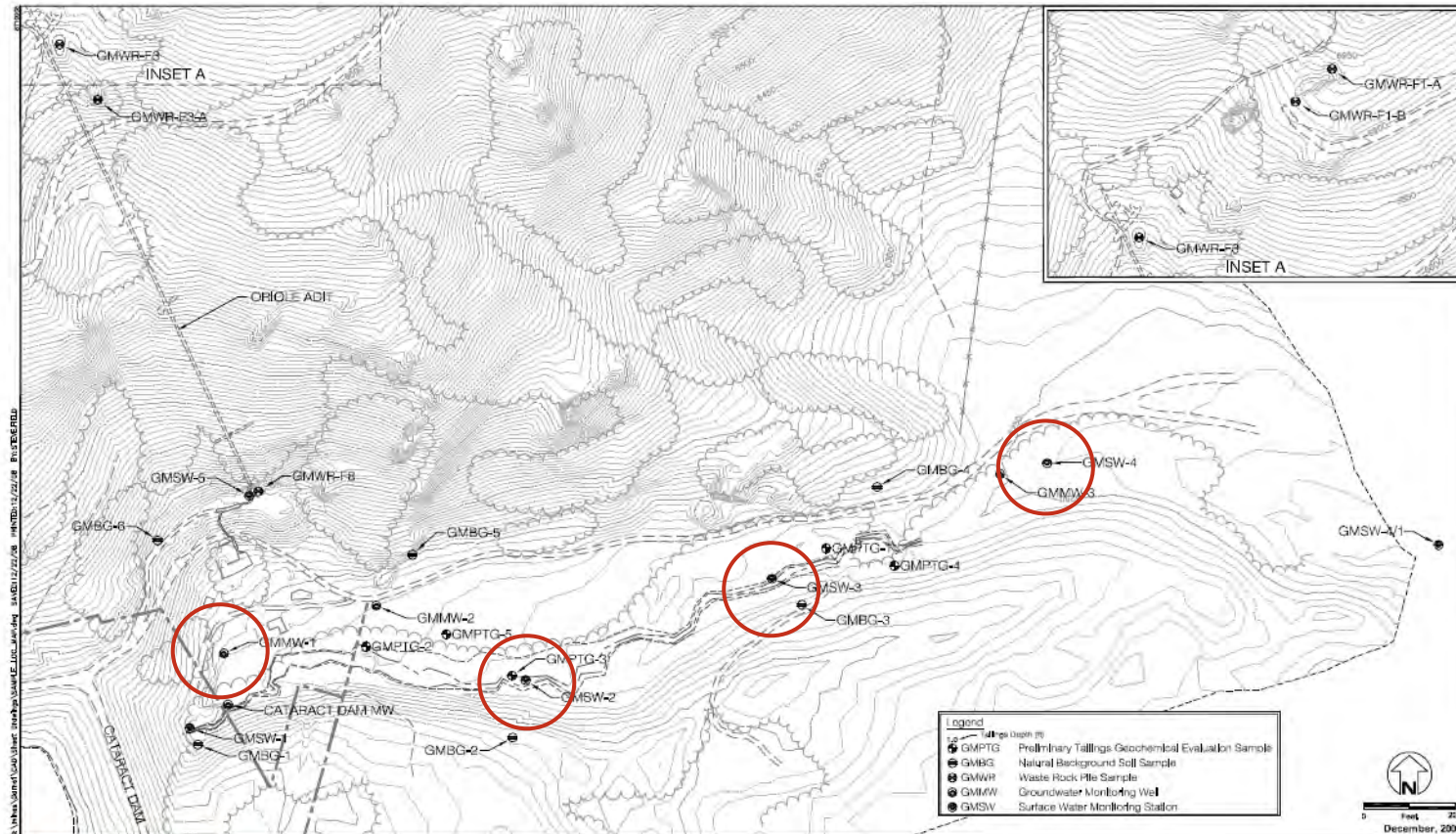
Historical Mine Features



Work Up To This Point

- ▶ 2008 Cultural/Mine History Assessment; Geotechnical Investigation
- ▶ 2009 Reclamation Investigation
- ▶ 2010 Removal Action Memo
- ▶ 2011 Expanded Engineering Evaluation/Cost Analysis
- ▶ 2012 Invitation to Bid

Health/Environmental Risks



Ground Water, Surface Water, Waste Rock, Background Soil, and Preliminary Tailings Geochemical Sample Locations Map
Garnet Mine Reclamation Project
Madison County, Montana
SITE MAP A-3



Health/Environmental Risks

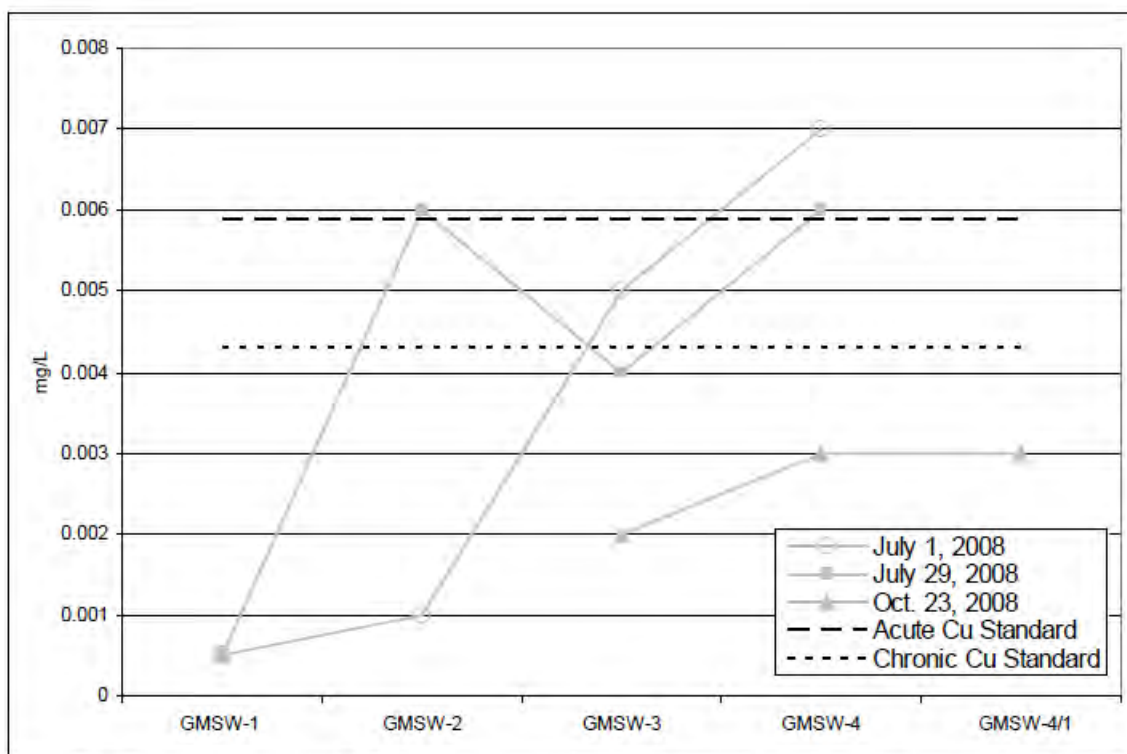


Figure 3-1. Total recoverable copper concentrations in Cataract creek surface water.

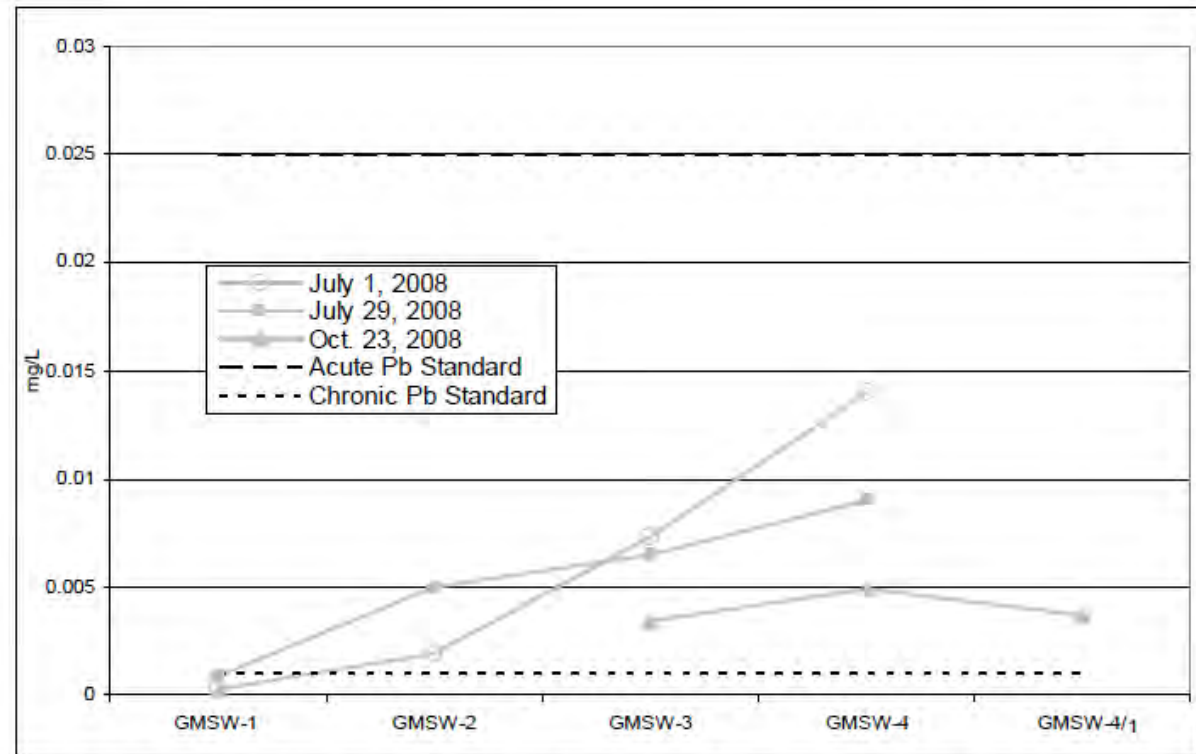


Figure 3-2. Total recoverable lead concentrations in Cataract creek surface water.

Health/Environmental Risks

TABLE 5-2 Hazard Quotients for Recreational Visitors Exposed to Surface Water and Fish Ingestion Garnet Mine Reclamation Area						
COC	Average Surface Water Concentration (µg/L) ⁽¹⁾	Surface Water Guideline (µg/L) ⁽²⁾	RH/GP Water Ing. HQ	Fish Ingestion Guideline (µg/L) ⁽²⁾	Fish Ingestion Hazard Quotient	Maximum Water Routes Hazard Quotient
Copper	7.0	18,900	0.0004	996	0.0070	0.0004
Lead	7.3	220	0.0332	165	0.0442	0.0332
Total HQs			0.0336		0.0515	0.0336

Notes:
 (1) Data from Tetra Tech (2009) - mean concentration at GMSW-4
 (2) Guidelines obtained from Tetra Tech, (1996). The guidelines are based on a Hazard Index of 1.0 or an increased cancer risk of 5×10^{-5} for 50 days exposure for rock hound/gold panner scenario and 42 days exposure for fisherman.

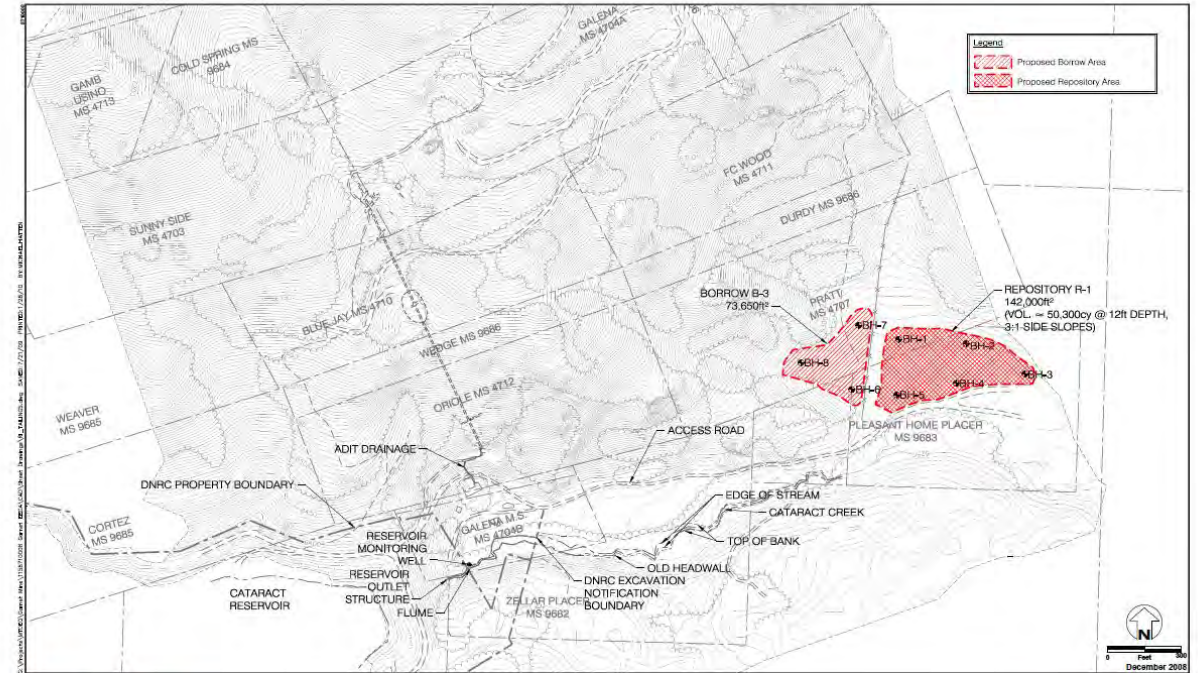
TABLE 5-4 Ecological – Impact Quotients (EQ) Garnet Mine Reclamation Area				
Contaminant	Aquatic Life Surface Water	Aquatic Life Sediment	Plant Phytotoxic Mine Waste	Total EQ
Cadmium	0.1194	NC	NC	0.1194
Copper	1.1583	0.6128	2.7040	4.4751
Iron	NC	NC	NC	--
Lead	0.2871	8.3182	2.6175	11.2228
Mercury	0.029412	0.0	193.5	193.5
Zinc	0.1706	0.2941	0.8045	1.2692

Note: NC – Not calculated, toxicity data and/or concentration data unavailable

Preferred Alternatives

TABLE 10-1
Preferred Alternative Estimated Cost
Garnet Mine Reclamation Area Project

Item	Estimated Cost
Source Areas Uphill of Oriole Adit	
WR-3 (Surface Controls for F-1 waste rock pile and adit)	Included in WR-4 cost
WR-4 (Total Removal and Disposal in Slope [F-2] for remaining wastes)	\$86,616
Oriole Adit Waste Rock Pile	
WR-F8-5 (Total Removal and Disposal in On-Site Repository)	\$82,881
Cataract Creek Tailings Deposit	
T-6 (Complete Removal and Disposal in an On-Site Repository)	\$1,022,395
Oriole Adit Portal	
OA-3 (Coarse Rock Plug Portal Closure)	\$30,581
OA-4 (Packer Installation in Leaking Bore Hole)	\$11,047
OA-6 (Concrete Hydraulic Plugs)	\$831,611
Activities Common to All Alternatives	
Upgrading Access Roads	\$84,269
Total Estimated Cost	\$2,149,400



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Borrow and Repository Areas
Garnet Mine Reclamation Project
Madison County, Montana
SITE MAP A-6

Preferred Alternatives



Preferred Alternatives



Next Steps

- ▶ Update EECA/Remedial Design
- ▶ Update Cost Values
- ▶ Phase Project
- ▶ Grants/AML Funding Availability

Questions?