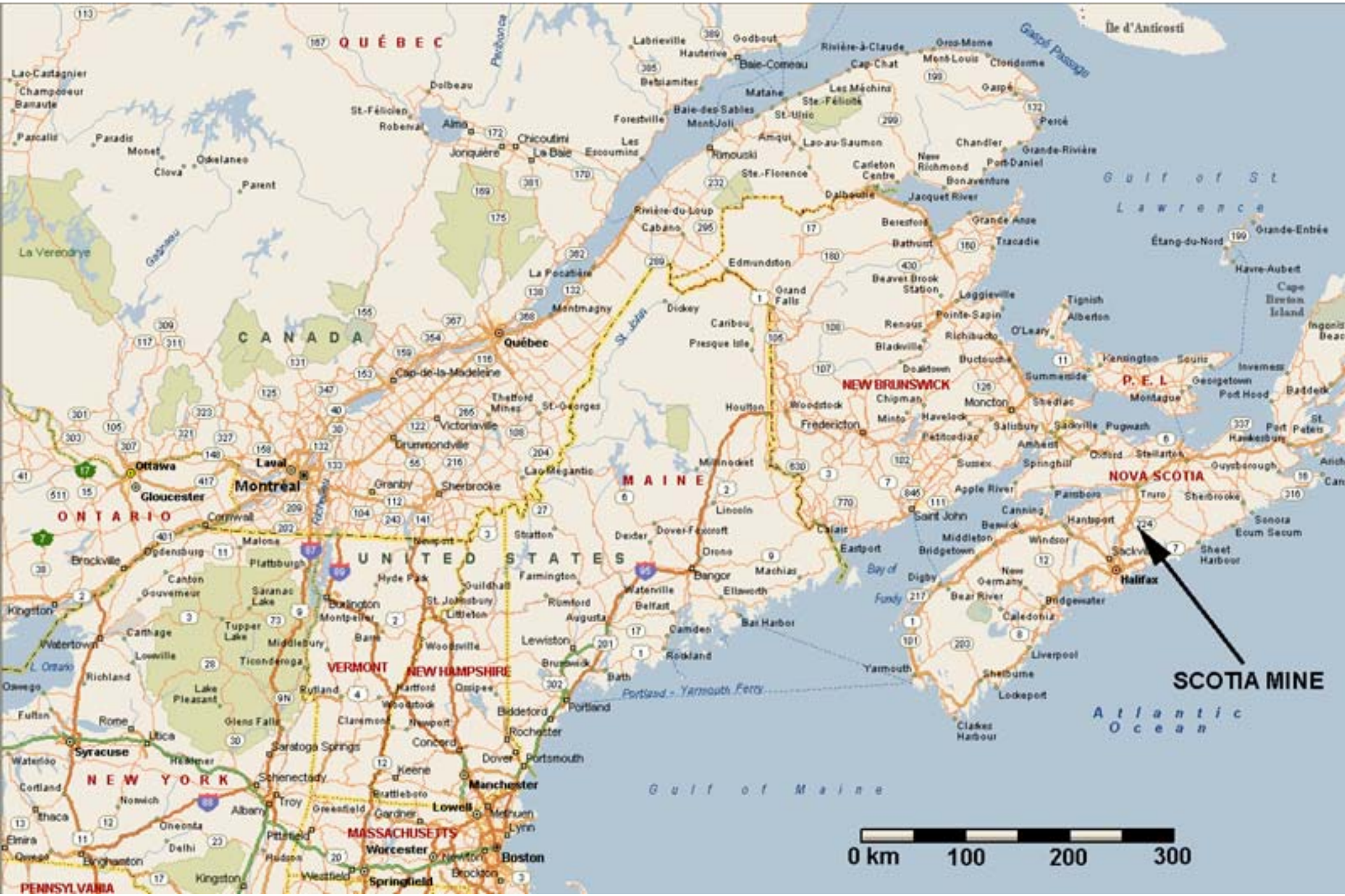

SCOTIA MINE
0 km
100
200
300
QUÉBEC
CANADA
ONTARIO
NEW BRUNSWICK
NOVA SCOTIA
P. E. I.
MAINE
UNITED STATES
VERMONT
NEW HAMPSHIRE
NEW YORK
MASSACHUSETTS
PENNSYLVANIA
Québec
Montréal
Ottawa
Laval
Gloucester
Boston
Halifax
Moncton
Fredericton
Saint John
Bangor
Portland
Gulf of St Lawrence
Gulf of Maine
Bay of Fundy
Atlantic Ocean
Île d'Anticosti
Portland - Yarmouth Ferry


SCOTIA MINE SITE
NOVA SCOTIA
SHIP LOADING FACILITY
Kennetcook
Stewiacke
Upper Musquodoboit
Shubenacadie
Middle Musquodoboit
Elmsdale
Enfield
Meaghers Grant
Sheet Harbour
Tangier
Musquodoboit Harbour
Waverley
Sackville
East Chezzetcook
Clam Bay
Martinique Beach Provincial Park
Seaforth
Halifax
Eastern Passage
Halifax Harbour
Atlantic Ocean
0 5 10 15 20 25
Scale in Kilometres

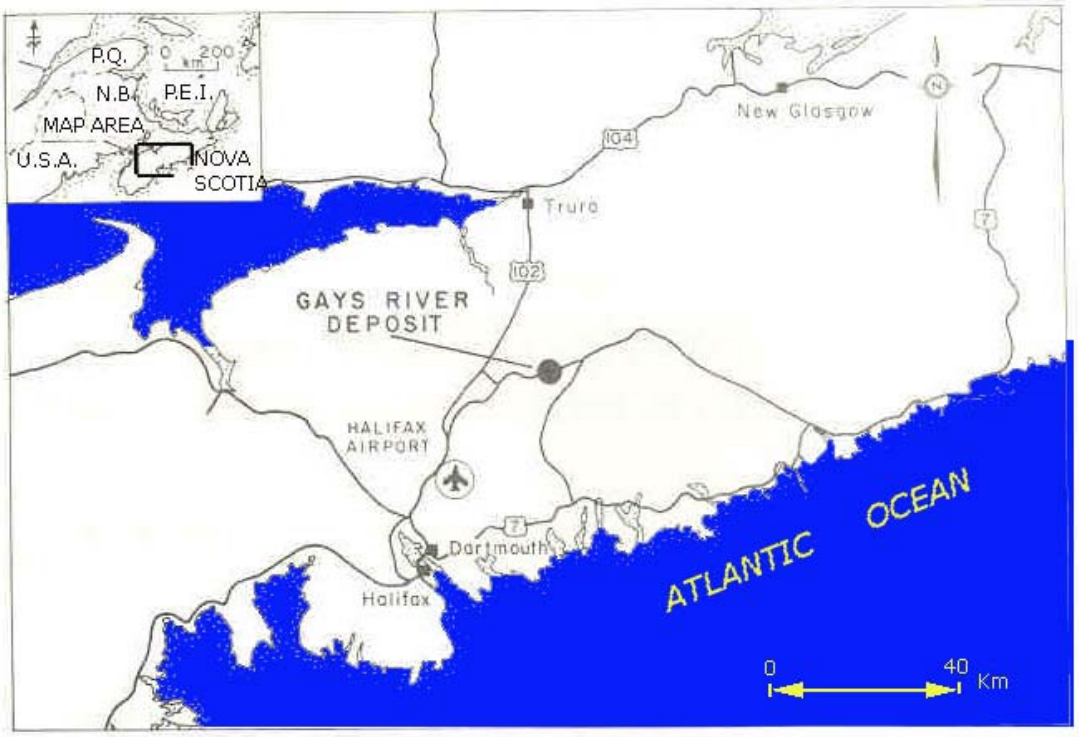


Figure 1: Gays River Location Map

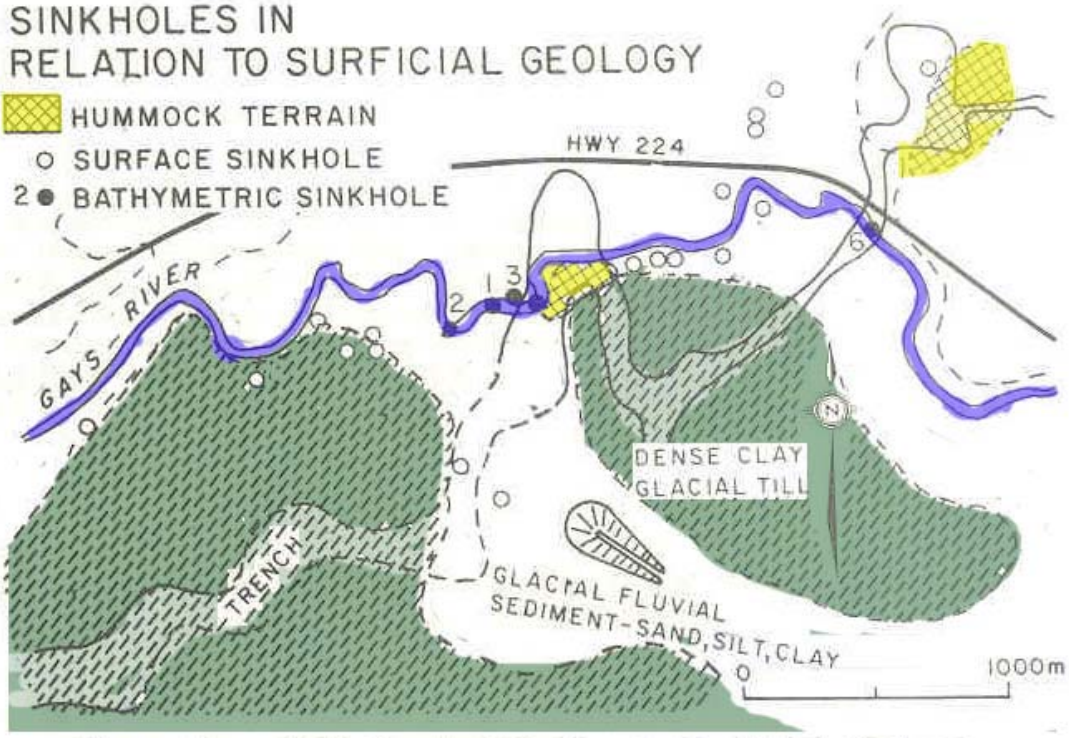
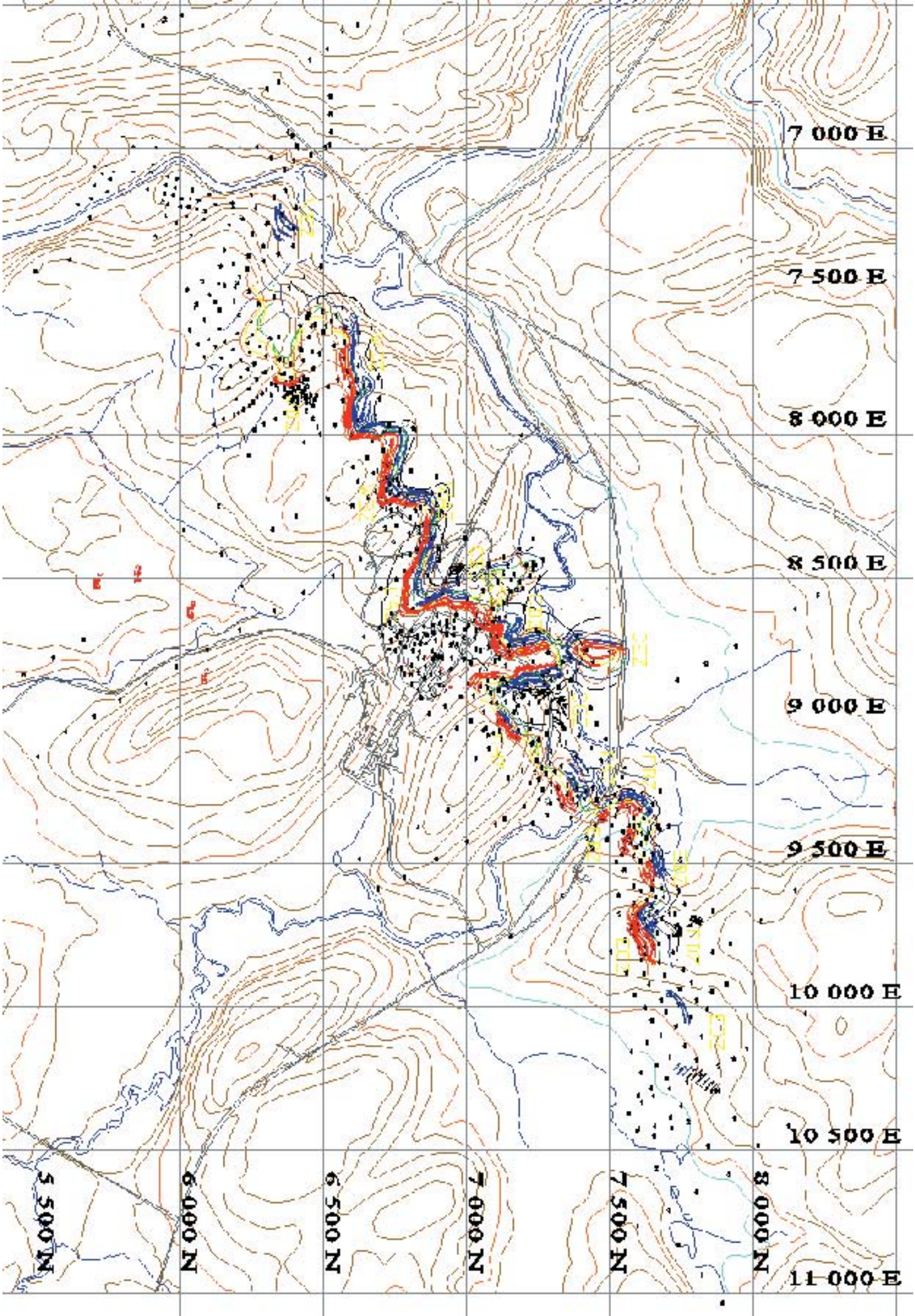
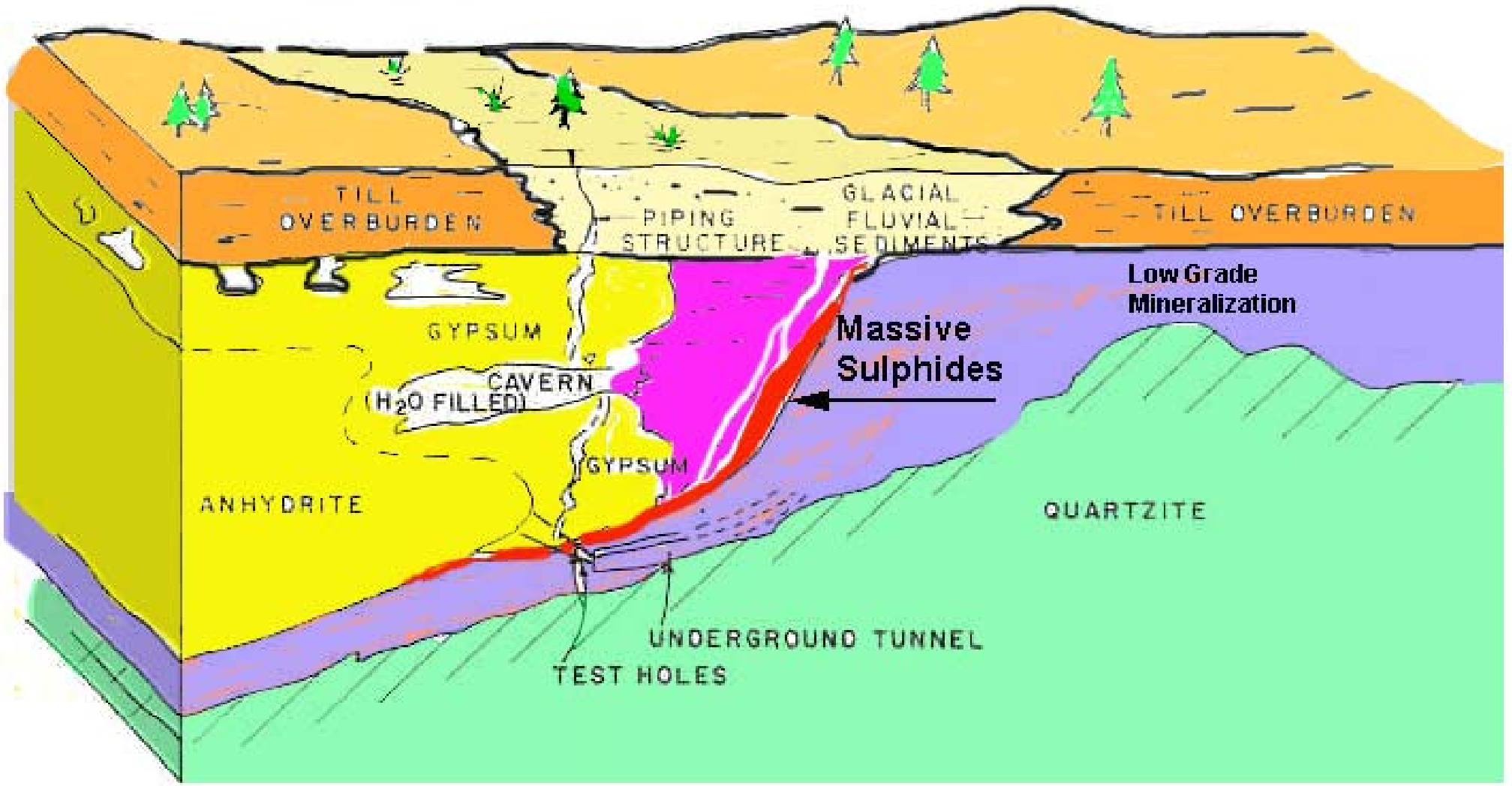
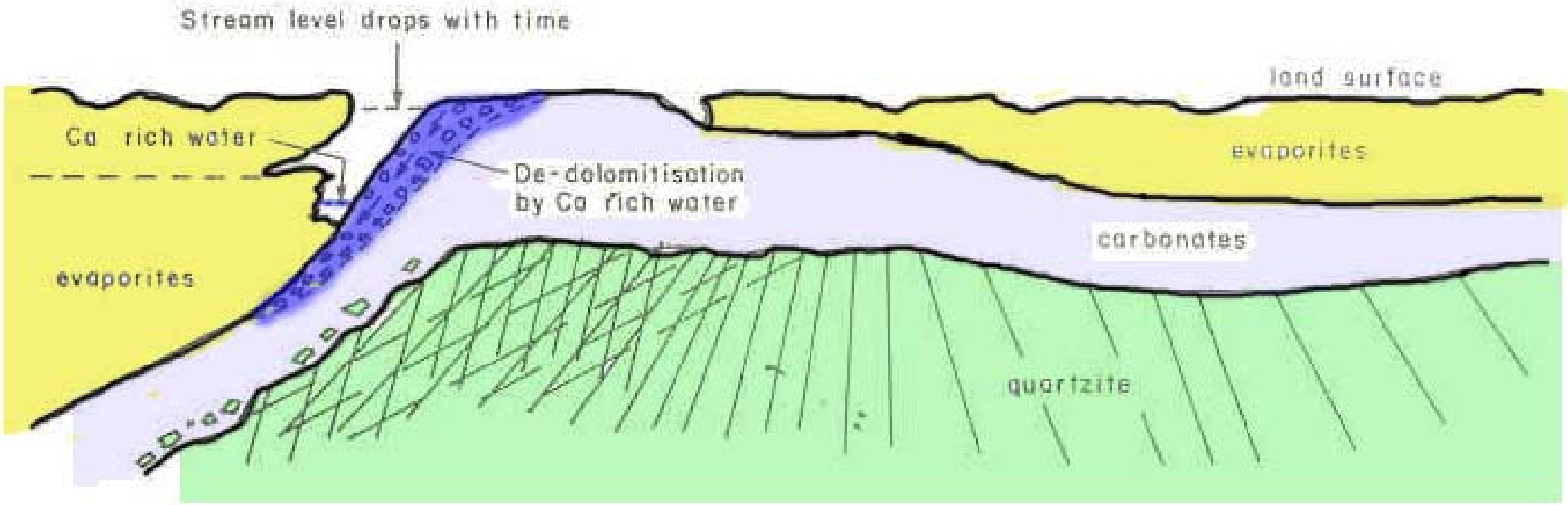


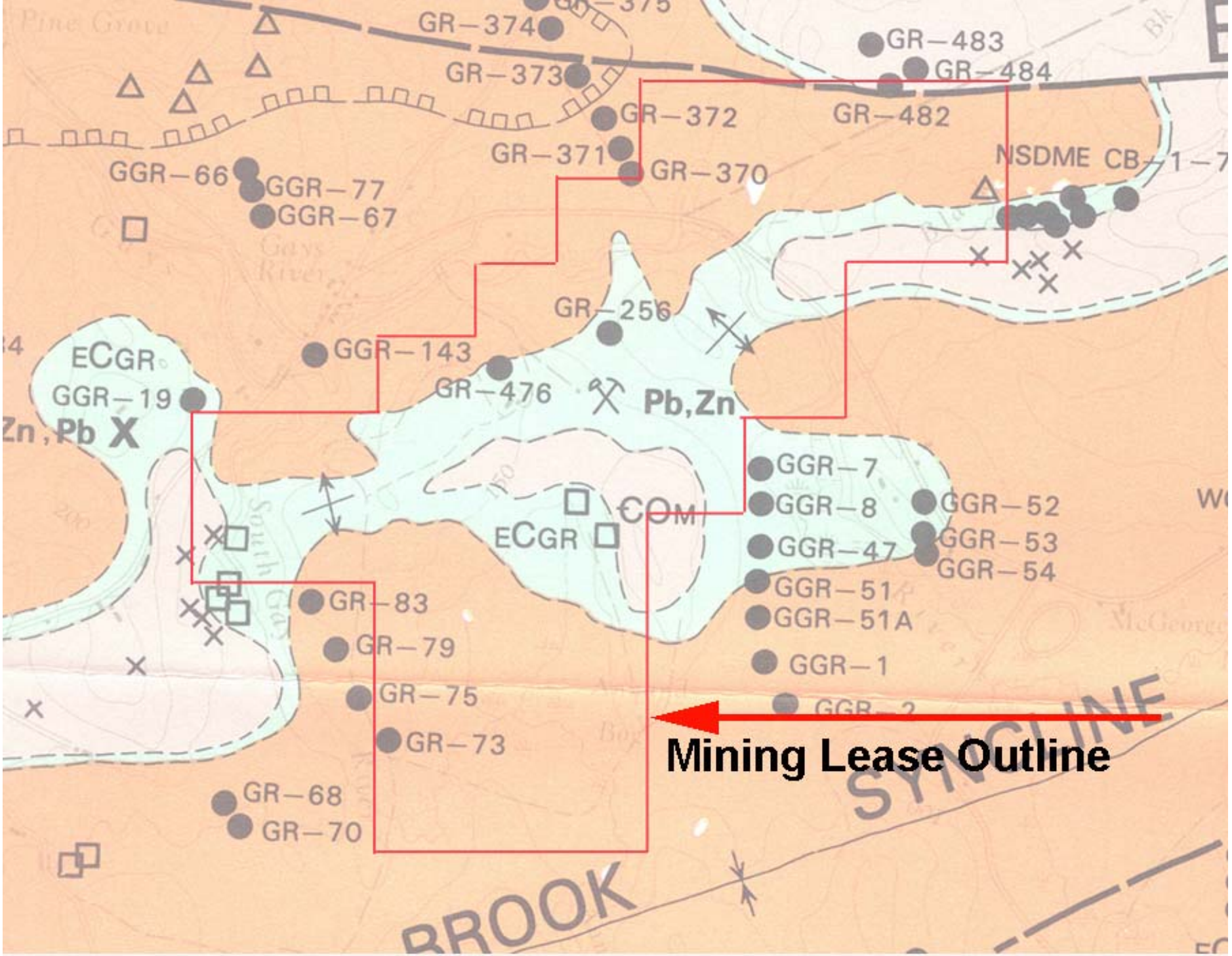
Figure 2: Sinkholes in Relation to Surficial Geology

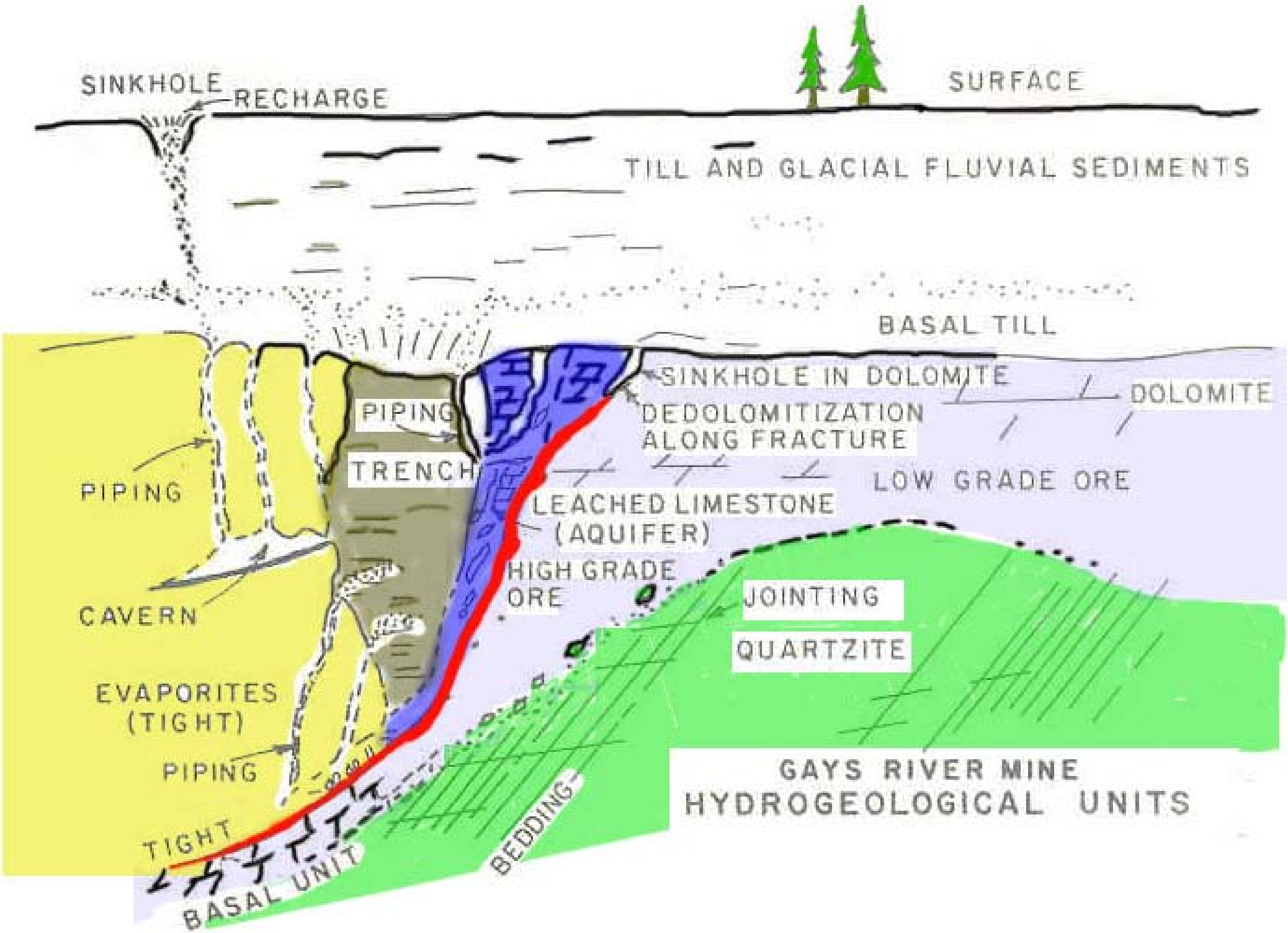

7 000 E
7 500 E
8 000 E
8 500 E
9 000 E
9 500 E
10 000 E
10 500 E
11 000 E
5 500 N
6 000 N
6 500 N
7 000 N
7 500 N
8 000 N


TILL
OVERBURDEN
PIPING
STRUCTURE
GLACIAL
FLUVIAL
SEDIMENTS
TILL OVERBURDEN
Low Grade
Mineralization
Massive
Sulphides
GYPSUM
CAVERN
(H2O FILLED)
GYPSUM
ANHYDRITE
QUARTZITE
UNDERGROUND TUNNEL
TEST HOLES

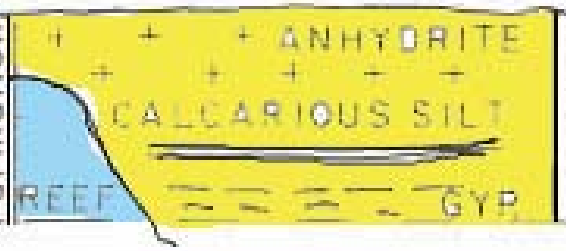
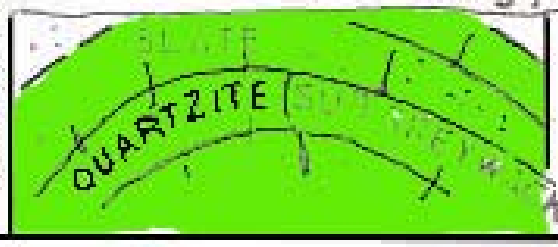


Cretaceous Weathering


GR–374
GR–373
GR–372
GR–371
GR–370
GR–483
GR–484
GR–482
NSDME CB–1–7
GGR–66
GGR–77
GGR–67
GR–256
GGR–143
GR–476
Pb,Zn
ECGR
GGR–19
Zn,Pb X
COM
ECGR
GGR–7
GGR–8
GGR–47
GGR–51
GGR–51A
GGR–1
GGR–52
GGR–53
GGR–54
GR–83
GR–79
GR–75
GR–73
GR–68
GR–70
Mining Lease Outline
SYNCLINE
BROOK
0
1
2
3
Scale in Kilometres


SINKHOLE
RECHARGE
SURFACE
TILL AND GLACIAL FLUVIAL SEDIMENTS
BASAL TILL
SINKHOLE IN DOLOMITE
DOLOMITE
PIPING
DEDOLOMITIZATION
ALONG FRACTURE
TRENCH
LOW GRADE ORE
PIPING
LEACHED LIMESTONE
(AQUIFER)
HIGH GRADE
ORE
JOINTING
CAVERN
QUARTZITE
EVAPORITES
(TIGHT)
PIPING
GAYS RIVER MINE
HYDROGEOLOGICAL UNITS
TIGHT
BEDDING
BASAL UNIT

STRATIGRAPHIC UNITS, GAYS RIVER MINE

ERA	PERIOD	DIAGRAMATIC COLUMNAR SECTION	LITHOLOGY	HYDROLOGICAL CHARACT
CENOZOIC	QUATERNARY (Pleistocene)	 Recent stream sediment. Glacial till cut by outwash channel Till, Bedrock	Glacial fluvial sediments-silt, sand and gravel cutting clay rich glacial till	Glacial fluvial sediment homgenous aquifer Glacial till - soil piping
		There is no record of Tertiary Sediments		
MESOZOIC	CRETACEOUS (Lower)	 Trench eroded between carbonate and evaporites	Trench: hard, dense clay, clayey silt, and gravel and gypsite	Trench - soil piping (large capillaries) Cavernous zones
There is no record of Pennsylvanian, Permian, Triassic, or Jurassic Sedimentation				
Uplift and Erosion, (Post Lower Mississipian, Pre Middle Cretaceous)				
PALEOZOIC	MISSISSIPPIAN Gays River Formation	 Anhydrite with Gypsum & argillaceous limestone/dolomite horizons	Calcium Sulphate Salts	Impervious (but soluble)
		Erosion?		
	Windsor Group	 Reef complex micritic, algal, clastic, and coral facies	Dolomitic limestone dedolomitized vuggy carbonate at the trench contact	Fracture porosity
		Folding, Faulting, Uplift and Erosion		
	CAMBR.-ORDOV. Meguma Gr. Gold'vl. Frm.	 Blocky, massive quartzite to greywacke beds with slate horizons	Quartz sand, minor chloride	Essentially imperous Fracture porosity only

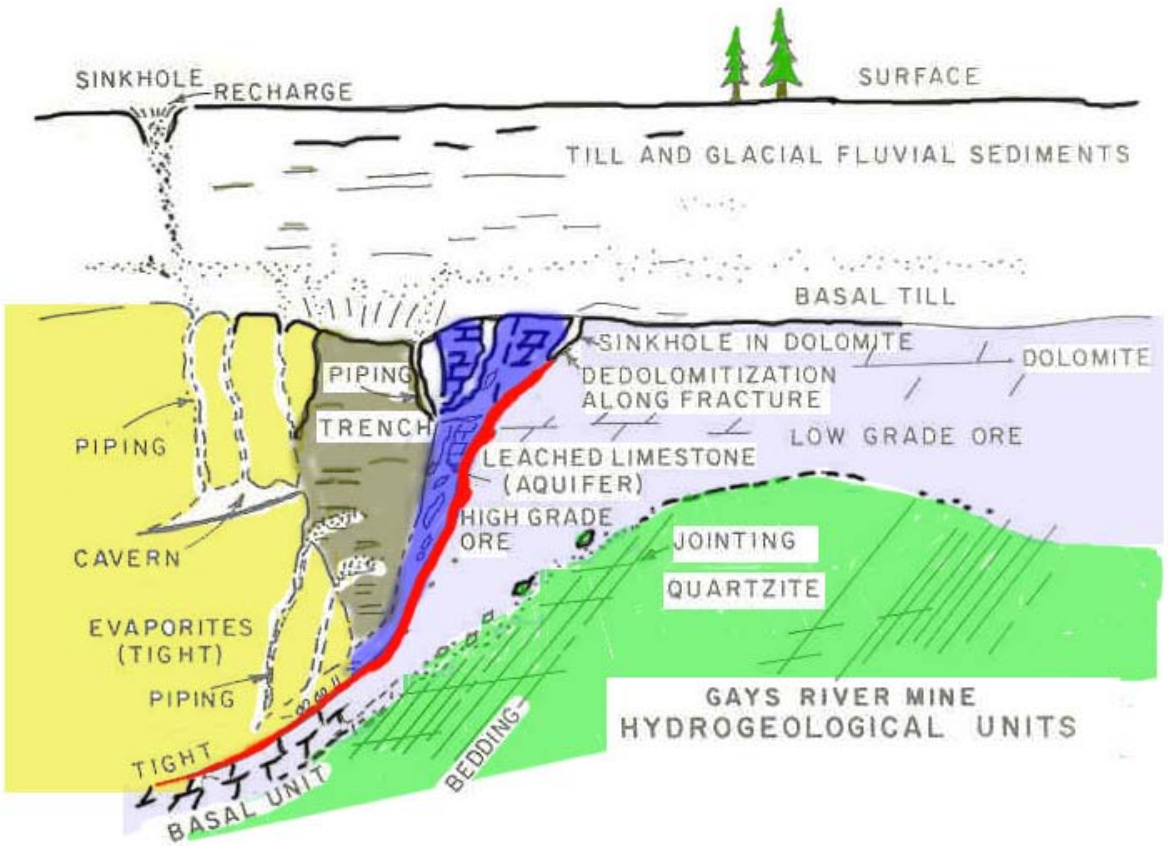


Figure 3: Gays River Hydrogeological Units

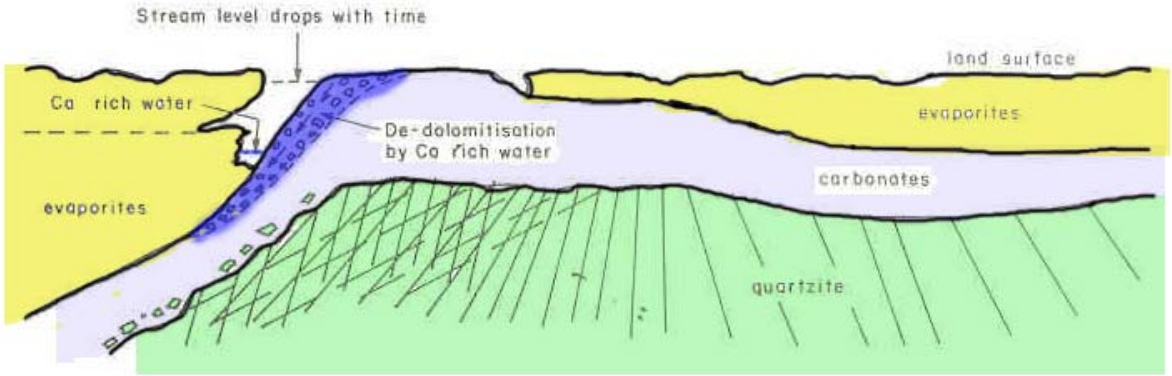


Figure 4: Reconstructed (Lower Cretaceous) Cross-Section

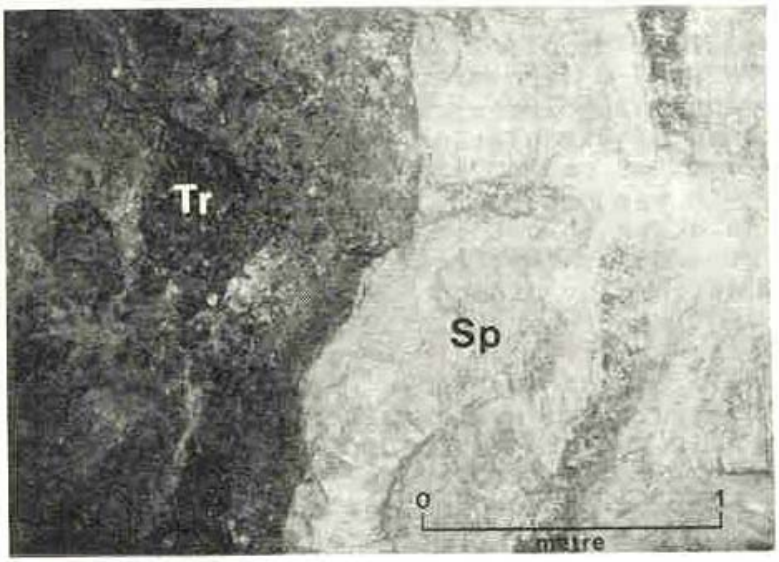


Figure 5: Photo of Massive Sphalerite - Trench Contact
Sp-Sphalerite, Tr-Collapse Breccia in Trench

UNDERGROUND DEWATERING WELL

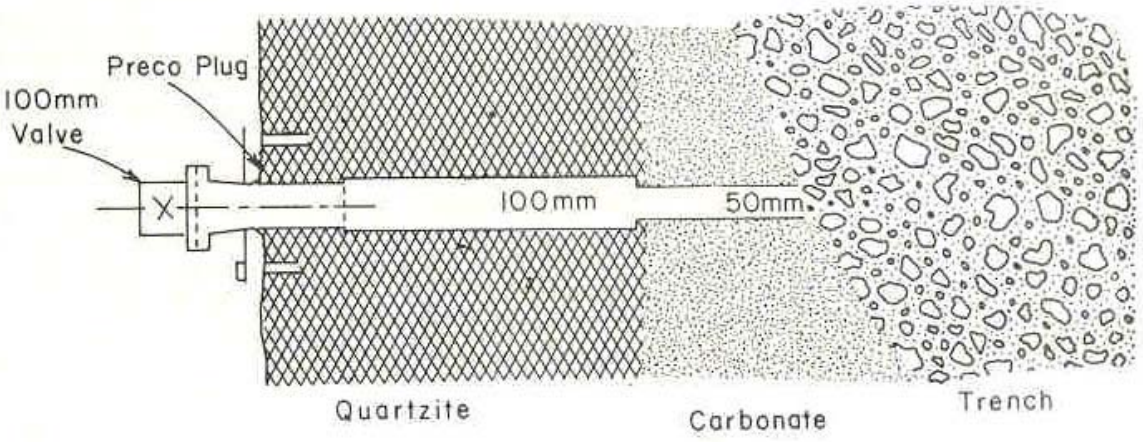


Figure 6: Underground Dewatering Well Set-up

Figure 7: Photo of Sinkhole in Glacial Fluvial Sands Over the 119 Area

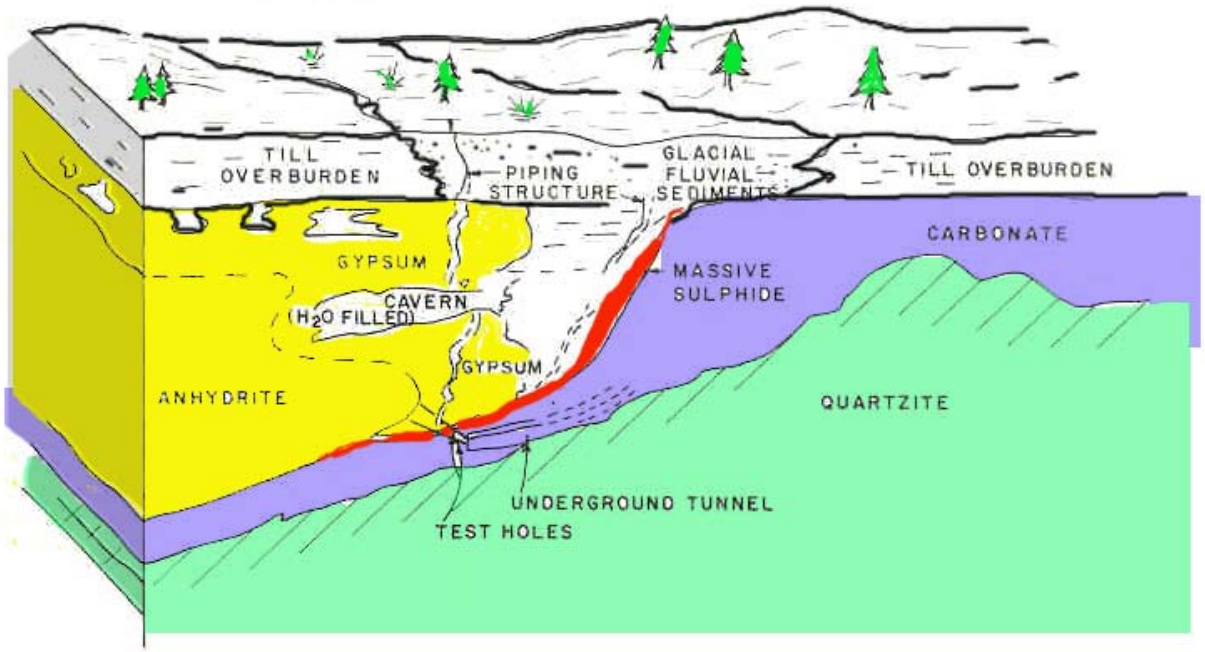


Figure 8 (a): The underground heading is advancing in ore, testholing along the way. The testholes miss the piping structure.

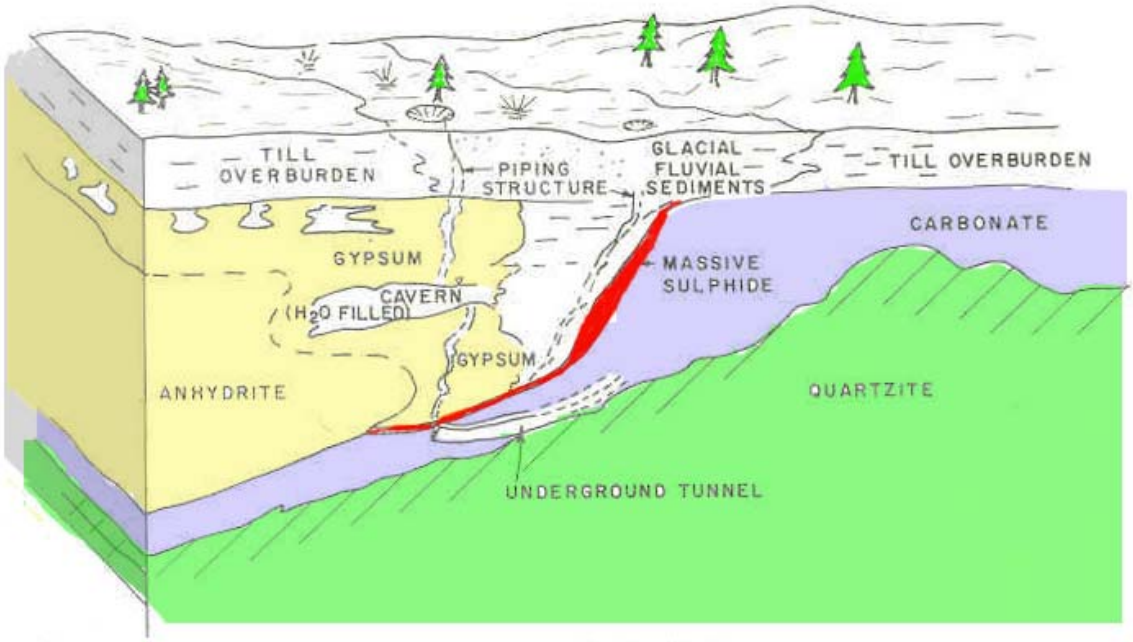


Figure 8 (b): The water-bearing "pipe" is exposed when the round is blasted. The heading floods with water, sand and mud. Sinkholes form on the surface.

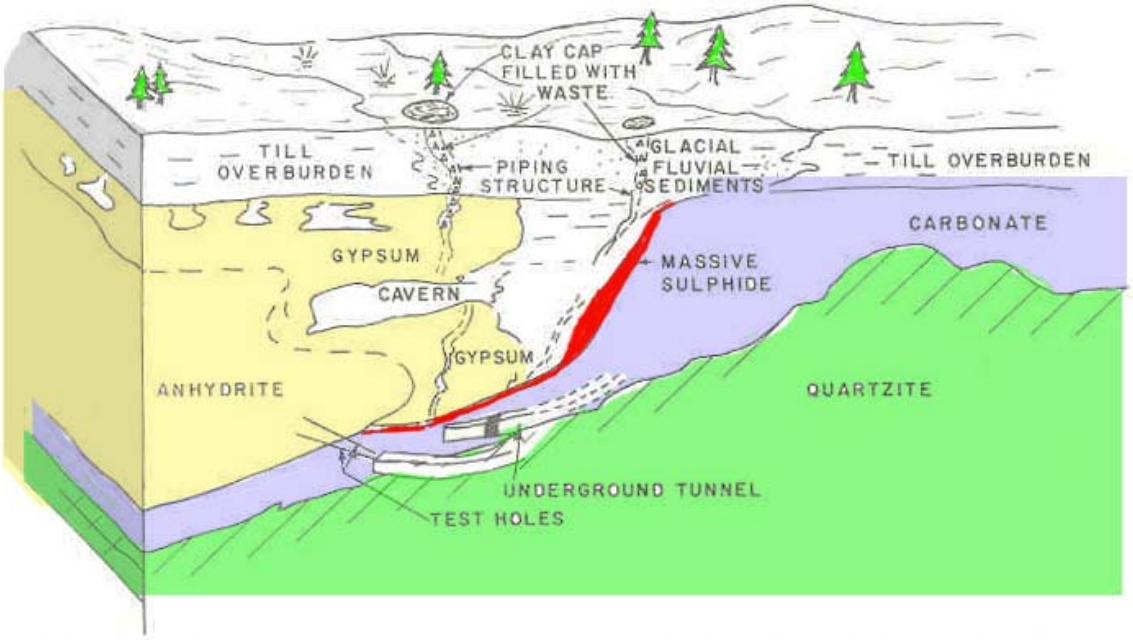


Figure 8 (c): The drift is pumped out and a reinforced concrete bulkhead is built. The heading must go through waste to bypass the water.

SCOTIA MINE
LEAD/ZINC MILL