HOPE MINE

Background information

Mine Name: Hope Mine

Mine District: Monaghan

Alternative Names:
Cornalough

Elements of interest:
Pb, Zn, Ag

Project Prefix: HOPE-

County:	**Townland:**	**Grid Reference:**
Monaghan	Cornalough	E283126, N316125

Hope Mine is located 3.5 km south of Castleblayney, less than 1 km from the N2. It is a small site of around 1.3 ha that includes an engine house chimney (photo, below) and a few small waste heaps, as well as the possible remains of a dressing floor. Most of the land around it is grassland. The site is now part of a farm although no grazing animals were observed in the course of site visits.

Production and Mining History

According to Morris (1984), Hope Mine was probably in operation between 1852 and 1869, and possibly up to 1874. Production figures for 1852-69 (Morris 1984) give a total output of 314 tonnes of ore, including 235 tonnes of lead and 16,017g (565 oz) of silver. Cole (1922), quoting Griffith (1861), states that the ore consisted of argentiferous galena (PbS) in barite ($BaSO_4$). Morris (1984) recorded barite, sphalerite and galena in 1982.

The lode developed at Hope Mine was apparently between 2 and 30m in depth. Two smaller parallel lodes were developed in Carrickgarvan about 450m to the northeast (Morris 1984).

Site Description and Environmental Setting

The Hope Mine site is today partly grassed over and partly under trees and shrubs (Fig. 1). The engine house chimney is surrounded at its base by coarse spoil and a second spoil heap is found in the trees northeast of the chimney. According to Morris (1984) this spoil heap is just north of the main engine shaft which, in 1983, consisted of a large circular rubble-filled 4m-deep depression. This is now completely overgrown and no definite trace of the shaft was observed in 2007. A flat grassed, partly water-logged area west of the chimney has the appearance and

dimensions of a dressing floor. Estimated volumes of solid waste on the site are given in Table 1. The site is evidently part of a working farm, though no animals were observed grazing in the field in the course of two visits (September 2007 and May 2008).

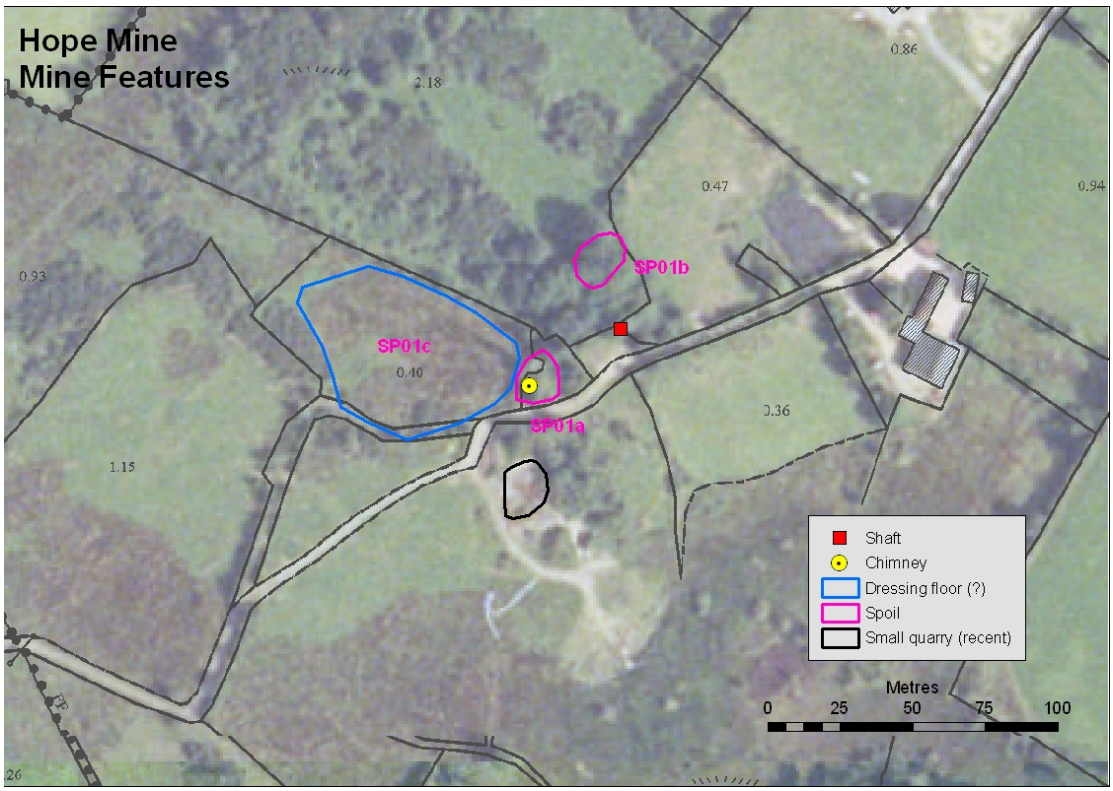

Fig. 1 Hope Mine Features

Table 1 Area and volume of waste heaps, Hope Mine

Waste ID	Area (m^2)	Volume (m^3)
HOPE-SP01a	210	210
HOPE-SP01b	159	398
HOPE-SP01c	2994	1497

Geochemical Assessment

1. Surface water

No surface water samples were collected at Hope Mine. A drainage ditch or stream traverses the low ground to the southwest but the water in it was found to be stagnant.

2. Groundwater

Groundwater samples were not collected in the Hope Mine area. Leachate from a composite sample taken from the two spoil heaps had 49 µg/l Cu but otherwise generally low levels of dissolved metals: 8 µg/l Pb, 10 µg/l Zn, 4 µg/l As and 24 µg/l Ba.

3. Stream sediments

No stream sediment samples were collected in the vicinity of the Hope Mine for the HMS-IRC project nor did GSI's 1984 programme include any sites in the area.

4. Solid waste

Only four *in situ* XRF analyses were performed at Hope Mine, three on the spoil heaps and one on the "dressing floor" (Fig. 2). Pb (2833 – 3818 mg/kg) and Zn (77 – 1019 mg/kg) were detected in all samples, As and Ba in some. Table 2 summarizes the results for those elements of interest that were detected.

Table 2 Summary data, *in situ* XRF analyses, Hope Mine (mg/kg)

Sample site	Pb	Zn	As	Ba	Cu
1	2833	694	190	3625	0
2	165	113	20	0	21
3	185	77	0	0	0
4	3818	1019	287	2319	0

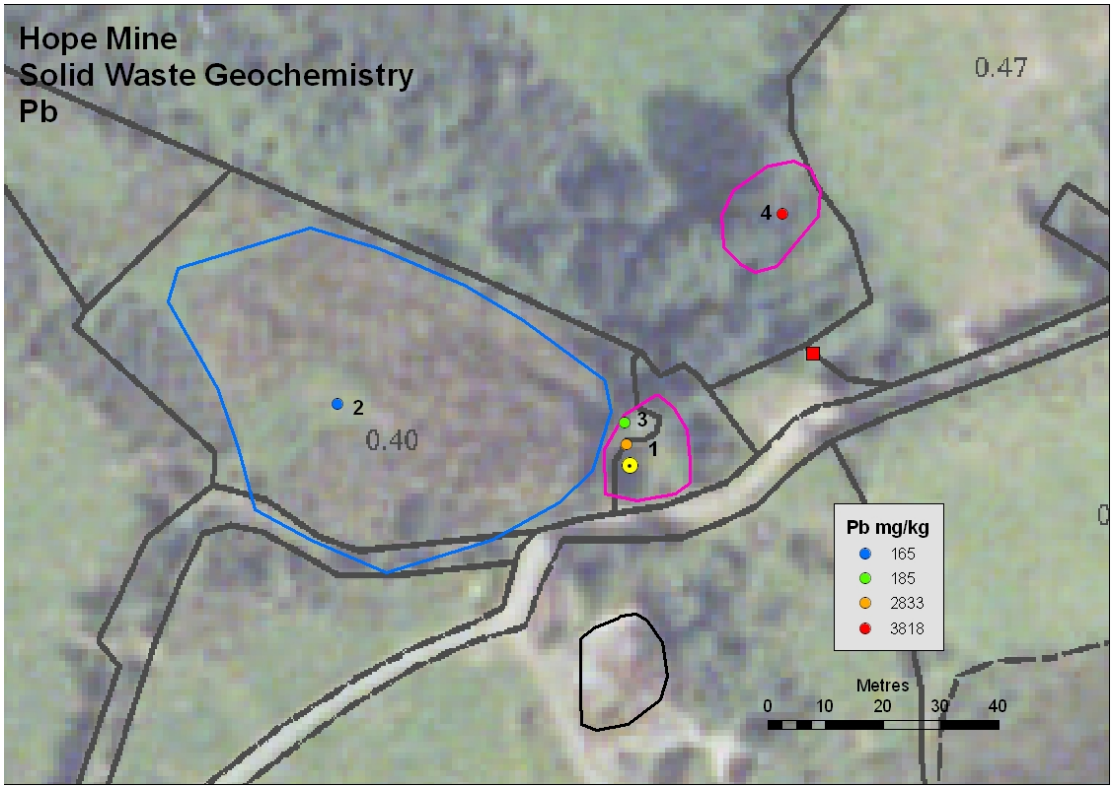

Fig. 2 Distribution of Pb in solid waste samples, Hope Mine

5. Risk Ranking Score

Table 3 HMS-IRC Site Score, Hope Mine

Waste	SP01a	SP01b	SP01c	Total
1. Hazard Score	14	14	15	43
2. Pathway Score				
Groundwater	4.21	4.21	4.60	13.03
Surface Water	0.03	0.03	0.03	0.09
Air	0.00	0.00	0.01	0.01
Direct Contact	0.08	0.08	0.79	0.95
Direct Contact (livestock)	-	-	-	-
3. Site Score	**4**	**4**	**5**	**13**

The HMS-IRC Site Score for Hope Mine is 13 (Class V), with each of the three waste heaps contributing a similar score (Table 3). Because only four samples were analysed, a median composition for the site was computed and used for each waste heap. Thus the variation in score between the heaps reflects the size of the heap rather than any chemical variation. Only Pb makes any significant contribution to the hazard score. The greater area of SP01c, the dressing room floor, accounts for the fact that it has a significantly higher Direct Contact pathway score than the other two waste heaps (Table 3). Overall, the relatively small concentration of Pb measured in the solid waste and the small size of the waste heaps account for a site score that is among the lowest of any Pb mine site in the country.

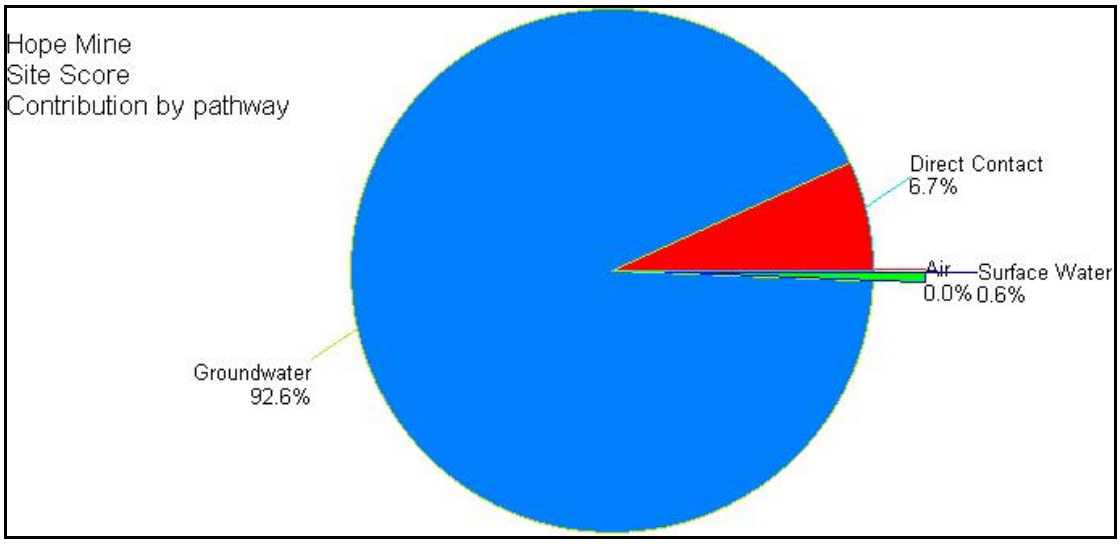

Fig. 3 HMS-IRC Site Score, Hope Mine: contribution by pathway

Groundwater is the dominant pathway/receptor, contributing 92.6% of the total score (Fig. 3). The relative unimportance of the surface water pathway/receptor (0.6%) reflects the absence of any surface water drainage close to the waste heaps or any man-made drain linking the waste with a water course. The relatively large surface area of the dressing floor (SP01c) accounts for the Direct Contact contribution (6.7%).

6. Geochemical overview and conclusions

Hope Mine was a small mine that produced a limited quantity of lead ore over the course of a decade. It had a correspondingly limited impact on its surroundings and today only minor amounts of solid waste remain. This waste has, by comparison with solid mine waste elsewhere in the country, relatively low levels of Pb, Zn and As. The low site score reflects the small volume of waste remaining and the low measured concentrations of elements.

References

Cole, G.A.C. (1922) Memoir and Map Localities of Minerals of Economic Importance and Metalliferous Mines in Ireland. *Memoirs of the Geological Survey of Ireland*.

Morris, J.H. (1984). The Metallic Mineral Deposits of the Lower Palaeozoic Longford-Down Inlier, in the Republic of Ireland. Geological Survey of Ireland Report Series RS 84/1 (Mineral Resources), pp72.