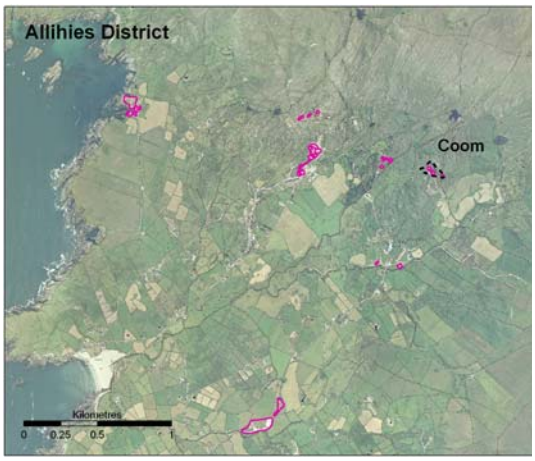
COOM

Background information



Mine District: Allihies

Mine Name: Coom

Alternative Names:

Elements of interest:
Cu, Sb

Project Prefix: ALL-

County:
Cork

Townland:
Coom

Grid Reference:
E59780, N45512

Site Description and Environmental Setting

The Coom mine is the eastern-most mine in the Allihies district, occupying high ground above Caminches mine. The mine opened in 1870, relatively late in the history of the district, and never made significant profits. Production was relatively small, "only 70 or 80 tons" (Cole 1922), and the workings were of limited extent and depth, with Bewley's shaft, the main engine shaft, reaching 90m (Fig. 1).

The site today is dominated by Coom engine house (left), erected in 1872. There are three extant open shafts. One of these is unfenced and open, displaying timbering around the collar (below, right). It is flooded to within 3m of the surface. Several other shafts marked on old six-inch sheets have not been located.

An adit, situated at a much lower topographic level than the engine house and shafts, discharges a small amount of mine water seasonally. This adit appears to be the main drainage adit for the mine. The water flows south before seeping into the ground. There appears to be no direct discharge to any surface water course.

A substantial volume of spoil (SP10b) forms a heap beside the engine shaft (left).

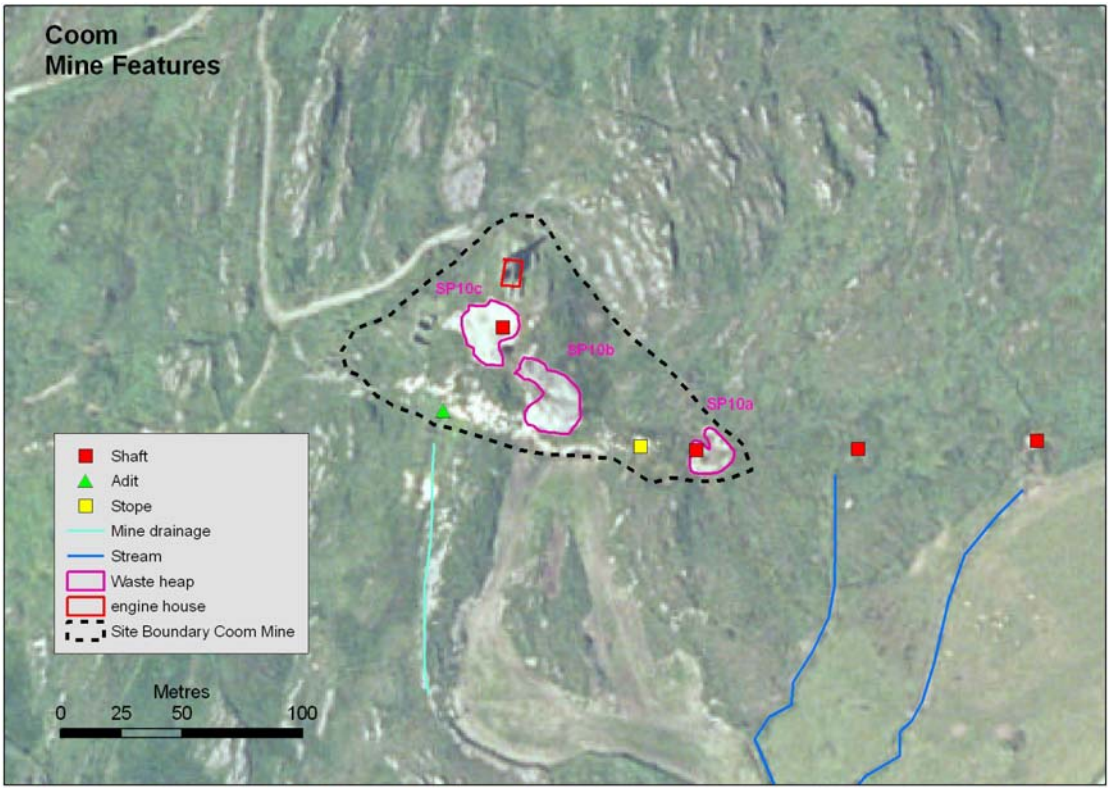


Fig. 1 Coom: extant mine features

Table 1 Area and Volume of spoil heaps, Coom

Waste ID	Area (m^2)	Volume (m^3)
ALL-08-SP10a	237	118
ALL-08-SP10b	503	1975
ALL-08-SP10c	424	466

Geochemical Assessment

1. Surface Water

The adit discharge was sampled in autumn 2007. The pH was 6.95 and the EC 0.52 mS/cm. The latter suggested the possibility of high metal concentrations but analysis revealed only 44 µg/l Cu, 64 µg/l Pb and 55 µg/l Sn.

2. Groundwater

Apart from the adit discharge, no groundwater samples were available for sampling at Coom. A leachate sample was prepared using samples from SP10c. Only Cu was significantly elevated relative to surface water samples for the Allihies district. The measured concentration of 673 µg/l Cu indicates some potential for groundwater contamination.

3. Stream Sediments

As Coom is situated on top of a small hill, there are no upstream water courses to sample. Two minor streams merge 100m above the public road and flow south into the Ballydonegan River (Fig. 2). Neither drains the main part of the mine site though both rise close to shafts. It is possible that at the time of mining there may have been a more direct drainage from the main part of the mine to the Ballydonegan River, as the topography would have allowed for this. A sample of stream sediment was taken just below the public road, 85m above the confluence with the Ballydonegan River. A modestly elevated Cu concentration of 185 mg/kg suggests possible contamination by mining. However, this is one of the lower Cu concentrations measured in stream sediment in the Allihies district and suggests that Coom's contribution to elevated Cu in stream sediment has been limited.

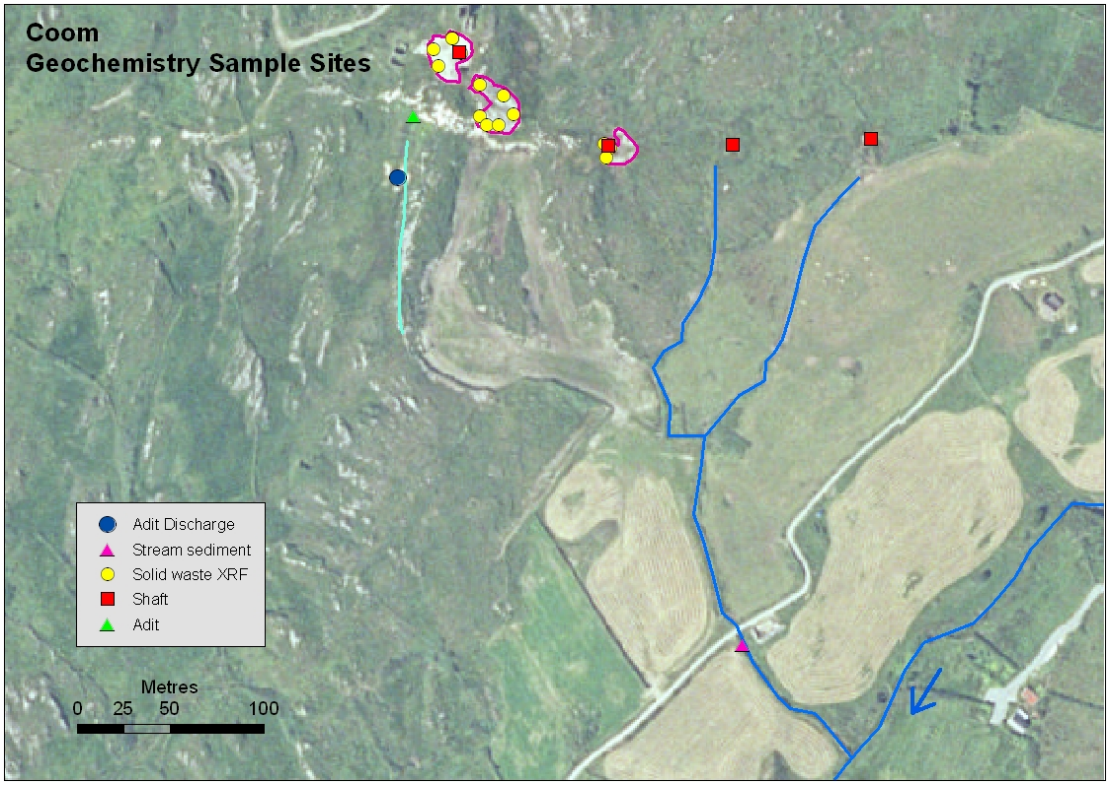


Fig. 2 Coom: Geochemical sampling sites

4. Solid Waste

The distribution of Cu in solid waste at Coom is illustrated in Fig. 3 and Table 2. The data have been classified using all field XRF analyses for Allihies so that the Coom values can be assessed in the context of the Allihies District as a whole. Only Cu was found to be present in solid waste in significant concentrations. In most samples analysed, Cu concentrations are similar to or below the average for the district as a whole. The median Cu concentration at Coom was 2348 mg/kg, just below that for the Allihies district (2588 mg/kg). Unlike other sites examined in Allihies, none of the Coom samples had a Cu concentration within the highest quantile for the district, i.e. > 6857 mg/kg. In fact, the maximum Cu in solid waste at Coom was 3861 mg/kg.

Table 2 Summary statistics, Solid Waste Geochemistry, Coom

mg/kg	Cu	Sb	As	Pb	Zn
n	13	13	13	13	13
Minimum	652	0.0	0.0	27	0.0
Maximum	3861	191	129	109	0.0
Mean	2209	122	55	48	0.0
Median	2348	154	48	43	0.0
Median (all Allihies)	2588	74	19	33	0.0

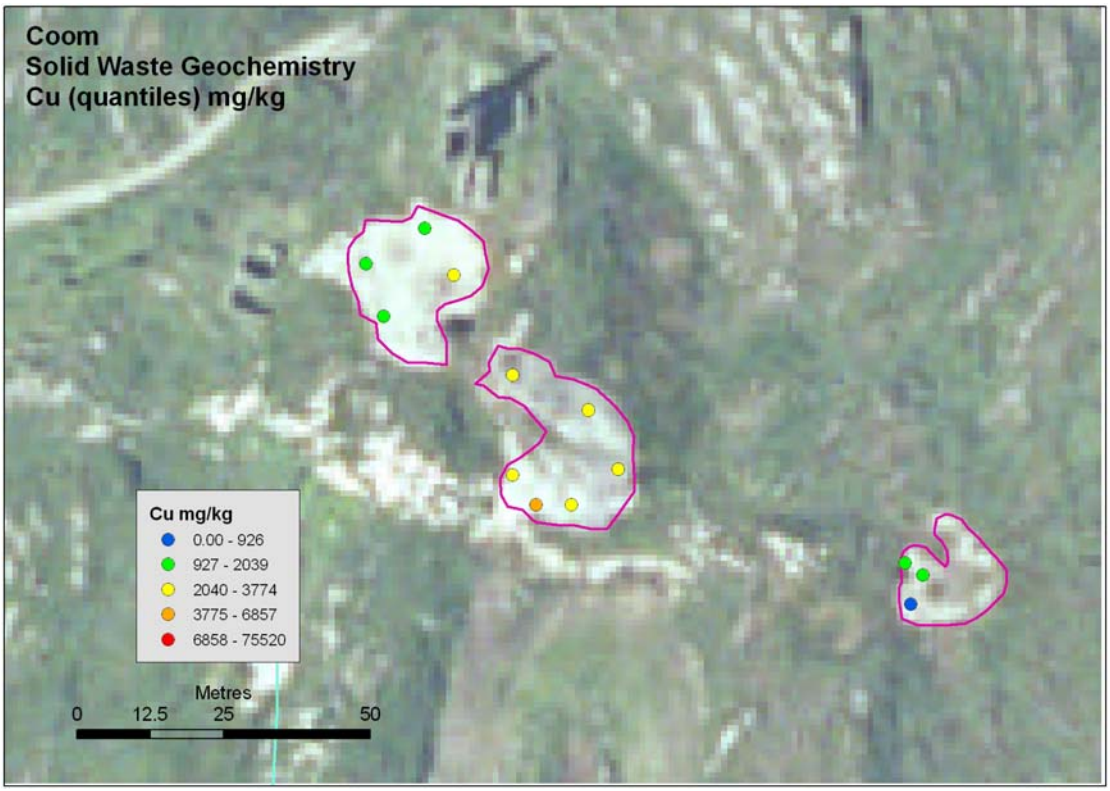


Fig. 3 Coom: Solid Waste Geochemistry: Cu

5. HMS-IRC Site Score

The total HMS-IRC Site Score for Coom is 4, contributed by the three solid waste heaps (2) and the adit discharge (2) (Fig. 3; Table 3). For the purpose of scoring, the individual scores for each heap have been combined into one overall score, since the individual scores are very low. As indicated above, the measured concentrations of Cu and other potential contaminants in solid waste at Coom are among the lowest in the district.

In contrast to the situation for the Allihies District as a whole, the groundwater pathway (88.5%) is by far the greatest contributor to the site score (Fig. 4). The surface water pathway is a relatively minor contributor (11.2%). A similar situation prevails at Dooneen. The relatively low contribution of the surface water pathway reflects the distance of the site from the surface water drainage system. Although there are no important aquifers in the area, any leachate from solid waste is more likely to contaminate groundwater than surface water. Moreover, the adit discharge drains into the ground rather than a surface water course. The negligible

contribution of the Direct Contact and Air pathways follows from the low volume and area of the solid waste as well as the absence of significant concentrations of any elements of high relative toxicity. Stream sediments are scored as part of the district as a whole (see Allihies District report).

Table 3 HMS-IRC Site Scores, Coom

Waste	SP10	W040	Total
1. Hazard Score	11	12	23
2. Pathway Score			
Groundwater	1.64	1.82	3.46
Surface Water	0.18	0.25	0.44
Air	0.00		0.00
Direct Contact	0.01		0.01
Direct Contact (livestock)			
3. Site Score	**2**	**2**	**4**

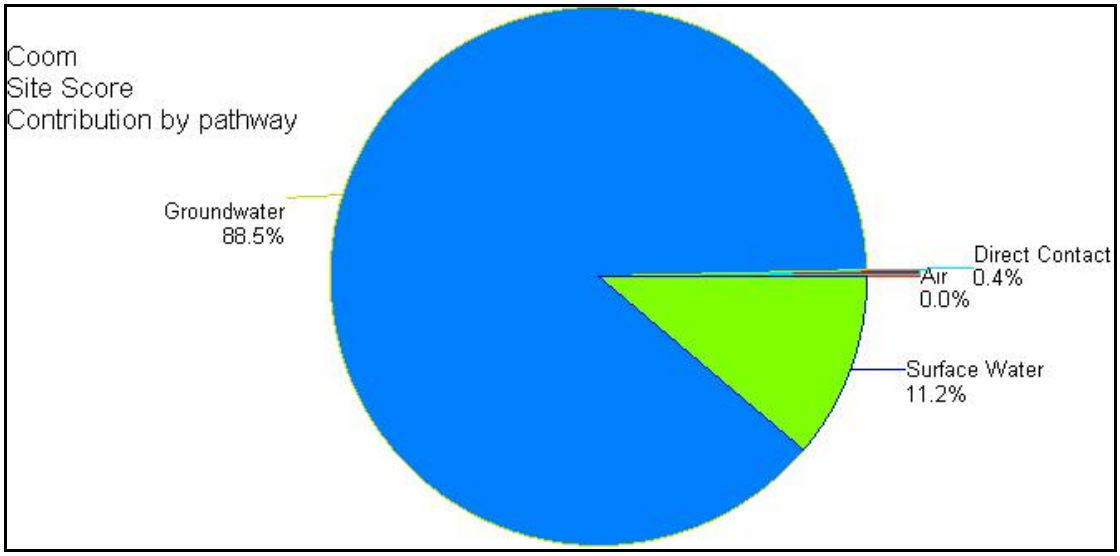


Fig. 4 Coom HMS-IRC Site Score: contribution by pathway

6. Geochemical overview and conclusions:

Solid mine waste at Coom has lower median concentrations of Cu than waste on most sites elsewhere in the Allihies district. Moreover, the volume of waste on this small mine site is relatively low. The concentration of Cu in stream sediment down-gradient of the site is also relatively low, suggesting limited movement off-site of solid waste over the years. Only the leachate sample (673 µg/l Cu) suggests any potential for contamination but the very modest Cu concentration in the adit discharge (44 µg/l) suggests that, at present, the mine is unlikely to contaminate either surface or groundwater directly. Again, as elsewhere in the district, the low volume of the waste and the absence of high concentrations of elements of high relative toxicity give rise to a low site score. Direct drainage of Cu-rich leachate to groundwater appears to represent the most significant potential environmental risk on the site.