CROOKHAVEN

Background information:

Mine District: West Cork

Mine Name: Crookhaven

Alternative Names:

Elements of interest:
Cu

Project Prefix: CRK

County:	**Townland:**	**Grid Reference:**
Cork	Crookhaven	E81094, N25454

Geology and Mineralization

The Cu-Ba mines of West Cork are hosted by the Old Red Sandstone succession of the Munster Basin. The sediments of the Munster Basin were deposited in a half graben and subsequently uplifted and folded into eastnortheast-trending anticlines that now comprise the rugged peninsulas of the southwest corner of the island. According to the 19th-century GSI mapping the copper mineralization is hosted by three bedding-parallel quartz veins, on the same strike as the Brow Head veins several km to the southwest. The focus of most mining activity has been the Champion lode, recognized at the surface, where it reaches 9m in thickness, as a saddle reef (Reilly 1986). The host rocks are purple and green slates and sandstones of the Castlehaven Formation. The veins were worked to a depth of over 70m (Cole 1922). Jukes and Kinahan (1861) report “yellow” and “purple” copper minerals, presumably chalcopyrite ($CuFeS_2$) and bornite (Cu_5FeS_4).

Production and Mining History

The mine was originally investigated in 1846 by Mr. St. Pierre Foley. Twenty tons of ore were raised from two shafts (Cole 1922). According to O’ Sullivan (2004) the early attempts in the 1840s were not successful owing to the famine and depressed copper prices in Ireland at the time. The Crookhaven Mining Company operated the mine from 1852 to 1856, again under the direction of Mr. Foley. Although a pumping engine house was built in 1851 very little ore was ever produced. Some 43 tons, valued at £194.00, were raised in 1854 but this was much less than the expenses incurred and the mine closed shortly afterwards. In 1859 there was a renewed interest and an apparently genuine attempt to prove the potential of the lodes at depth. A large capital investment was made but ultimately with little reward. By 1861, £64 had been made after an investment of over £6,000. As the mine was extended deeper in search of an intersection of veins where rich ore was anticipated, hard rock and ingress of water caused increasing problems (Cowman and O’Reilly 1988). Finally, the target depth was reached without meeting the

anticipated intersection. Further fruitless attempts were made to find good ore but the mines eventually closed in 1863.

Site Description and Environmental Setting

There are several mine buildings at Crookhaven in vary states of preservation. Two distinctive powder houses, or magazines, are almost wholly intact, one on the northern side and the other to the southern side of the peninsula (photo, right). The former is fenced off and used as a hen house. Low walls and the base of a chimney are all that remain of the engine house (photo, below left). The site of the old dressing floor beside the engine house is now grassed over and in use as a garden. A small heap of grassed solid waste forms the ground around the engine house and shaft. Some solid waste is also found along the track that leads south to the area of the shafts. The main engine shaft beside the engine house is securely fenced and filled with builder's waste to within 10m of the surface (O'Sullivan 2004). The trial shaft at the eastern end of the site is also securely fenced. However, the three shafts on the southern cliff edge are all open and unfenced and represent a potential risk to the unwary in an area popular with holiday-makers (Fig. 1). A large cleft in the cliff also provides access to the underground workings (O'Sullivan 2004). Much of the land on the peninsula is now included in the gardens of private dwellings. The rest is rough pasture for sheep and cattle.

Table 1 gives the estimated area and volume of the solid waste remaining on the Crookhaven site, as used for the HMS-IRC Site Scoring system.

Table 1 Crookhaven: Solid waste volume and area

Waste ID	Area (m^2)	Volume (m^3)
CRK-SP01	96	96
CRK-SP02	89	89

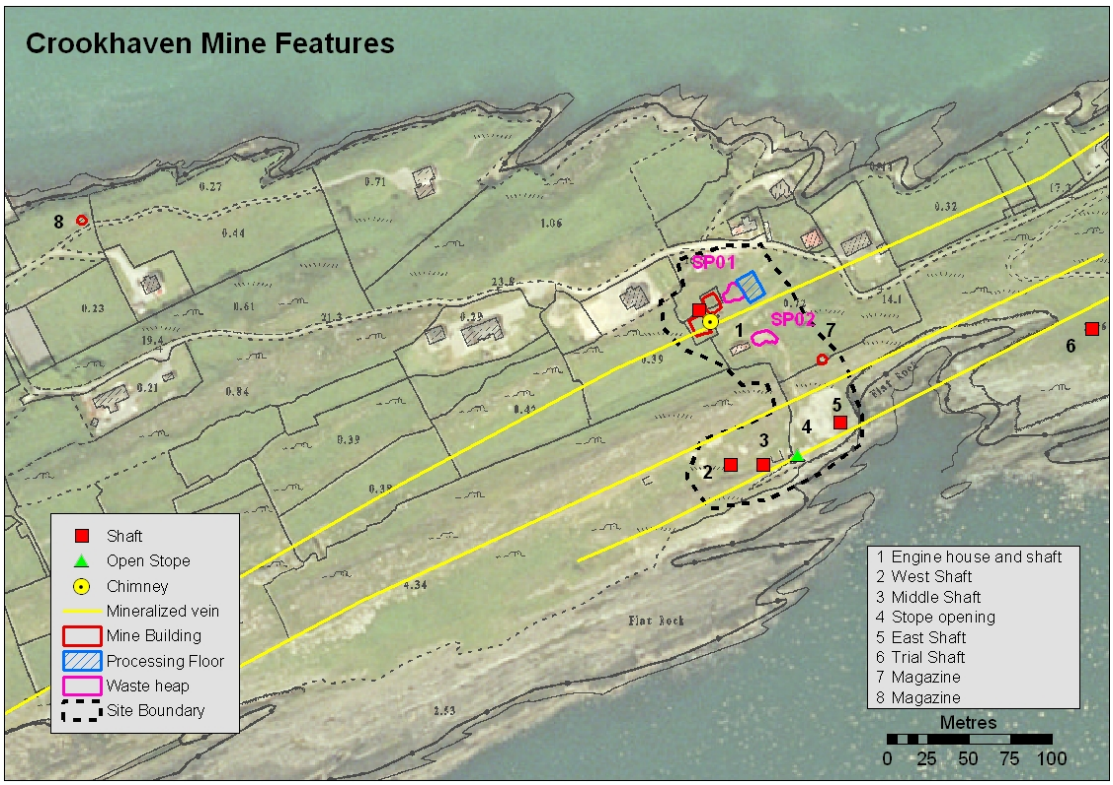

Fig. 1 Crookhaven: mine features

Geochemical assessment

1. Surface water

No surface water samples were taken.

2. Groundwater

No groundwater samples were taken and no leachate tests were carried out on solid waste.

3. Stream sediments

Since there are no streams in the area of the mine site mean, no stream sediment samples were taken.

4. Solid waste

Solid waste was analysed in a total of five sample sites at two locations (SP01 and SP02 on Fig. 1). Table 2 summarizes the data. Only the waste around the engine house (SP01) showed significant concentrations of Cu (3,676 – 13,652 mg/kg). Small amounts of Zn and Ba were also measured in some samples.

Table 2 Crookhaven solid waste XRF analyses

mg/kg	Cu	Zn	Pb	Ba
n	5	5	5	5
Minimum	62	0.0	52	0.0
Maximum	13652	403	222	884
Median	3676	0.0	76	534
Mean	4359	91	100	456

0.0 = < detection limit

5. HMS-IRC Site Score

The total HMS-IRC Site Score for Crookhaven is less than one but has been rounded up to one. The very small amount of solid waste on the site, its low metal content, the lack of other forms of waste, the absence of potential receptors such as a surface water drainage system and the lack of leachate or groundwater data all combine to produce the low score.

Table 3 HMS-IRC Site Score, Crookhaven

Waste	SP01	SP02	Total
1. Hazard Score	11	11	22
2. Pathway Score			
Groundwater	0.23	0.23	0.46
Surface Water	0.07	0.06	0.13
Air	0.00	0.00	0.00
Direct Contact	0.00	0.00	0.00
Direct Contact (Livestock)			
3. Site Score	**0**	**0**	**1**

6. Geochemical overview and conclusions

The Crookhaven mine produced very little ore over almost a decade of endeavour when most of the extensive underground workings were excavated in search of mineralization rather than in extracting it. Some small volumes of solid waste lie about the site and concentrations of Cu as high as 1.4% have been measured. However, their generally low metal content, and in particular the absence of high-relative toxicity elements, combined with a paucity of potential receptors give rise to a very low HMS-IRC Site Score for this site.

References

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O'Sullivan, P. (2004) A preliminary report on Crookhaven Mine, County Cork. *Journal of the Mining Heritage Trust of Ireland*. Vol 4, 11-18.

Reilly, T.A. (1986) A review of vein mineralization in SW County Cork, Ireland. In Andrew, C.J, Crowe, R.W.A., Finlay, S., Pennell, W.M. and Pyne, J.P. *Geology and genesis of mineral deposits in Ireland*, Irish Association for Economic Geology (Dublin), 475-480.

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