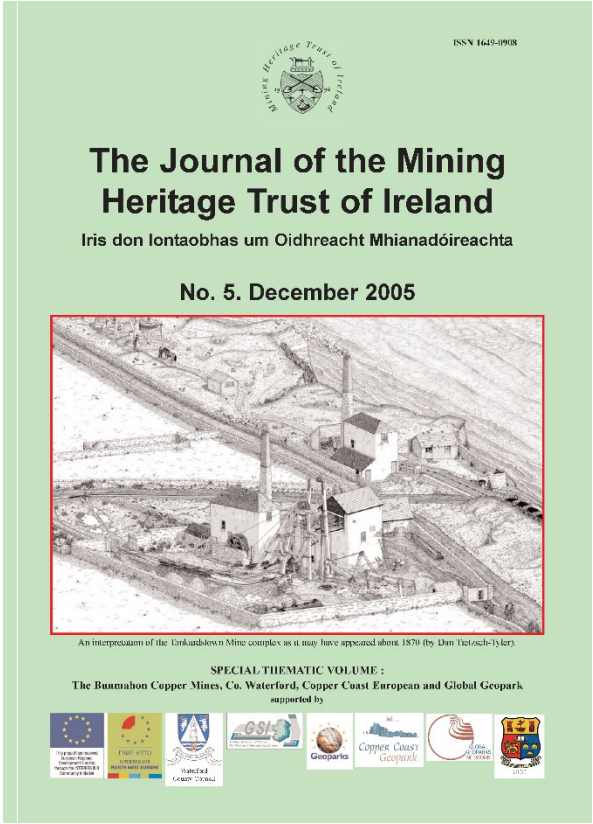

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CONSERVATION WORKS AT TANKARDSTOWN MINE, BUNMAHON, CO. WATERFORD

by Martin Critchley [1] and John Morris [1,2]

[1.] Mining Heritage Trust of Ireland, [2.] Geological Survey of Ireland

Abstract: This paper records and illustrates conservation works undertaken between 2004 and 2005 on the Tankardstown Engine House complex, Co. Waterford. *Journal of the Mining Heritage Trust of Ireland*, **5,** 2005, 75-79.

THE SURFACE INSTALLATIONS AT TANKARDSTOWN

The Knockmahon mining district in SW County Waterford was one of the most important copper mining regions in Ireland during the C19th (see Cowman 2005, this Journal). The copper mineralisation consists of a number of generally northwest orientated vein workings covering a 10km stretch of the coastline between Annestown in the east and Ballydwane in the west. The inland extent of the vein workings is limited northwards to less than 4km. The largest mine workings were just to the east of the village of Bunmahon where a series of shafts and adits were driven into the veins by the Mining Company of Ireland between 1824 and 1849. An extensive ore processing works was installed at Bunmahon, very little of which remains today. Mining at Bunmahon began to decline by the early 1850s, about the same time as a new deposit was discovered some 2km east along the coast at Tankardstown. The Tankardstown Mine became the mainstay of the copper mining in the area from about 1855 to closure in the 1870s, and a mineral tramway was installed to carry the ores to the main Knockmahon dressing floors (Morris *et al.* 2005, this Journal). The mine was reopened briefly between 1905 and 1907 as a speculative venture and it, and the surrounding area, has been the subject of intermittent prospecting since then, most recently during the 1970s.

The surface remains of the Knockmahon mining district are quite sparse and those at Tankardstown Mine are the most extensive. Some limited remains can be seen at the site of the dressing floors in Bunmahon and there is a fine engine house at Tankardstown North Mine. At Tankardstown the remains are set against the background of the dramatic coastline and are comprised of two engine houses, a boiler house, flue and chimney. There are also footprints of various other buildings the use of which is not known at the present time (Figure 1). The engine houses consist of the larger pumping engine near to the coast road and the smaller winding engine house to the east; both worked from the same shaft (Heron's Shaft). Adit workings from the base of the adjacent cliffs give some idea of the extensive workings which are now flooded below the water table (Critchley 2002).

The mining remains at Tankardstown occur within the Copper Coast Geopark - a coastline composed of Ordovician and Silurian volcanoclastic rocks. The Copper Coast Geopark is presently receiving funding from the European Union under the INTERREG 3B, NW Europe Region programme to provide infrastructural developments which will aid the long term sustainable development of the Geopark. The surface remains at Tankardstown Mine are a key part of the plan, with the objective to provide a resource which can be used for education, tourism and arts. There are several phases to the works at Tankardstown:

- Recording, geophysical and archaeology investigations (see Barton 2005, and Hurley 2005, this Journal)
- Conservation works on the buildings
- Landscaping
- Installation of interpretative boards
- Installation of a viewing platform within the pumping engine house

This paper is primarily concerned with the conservation works.

APPROACH TO CONSERVATION

The conservation of historic mine buildings requires a through understanding of the form and function of the structures to be conserved. Reference to other similar structures, especially Cornish style engine houses, is of value in this work and the two recent publications by Europamines (Brown *et al.* 2005 and Sharpe 2005) are of value in this work.

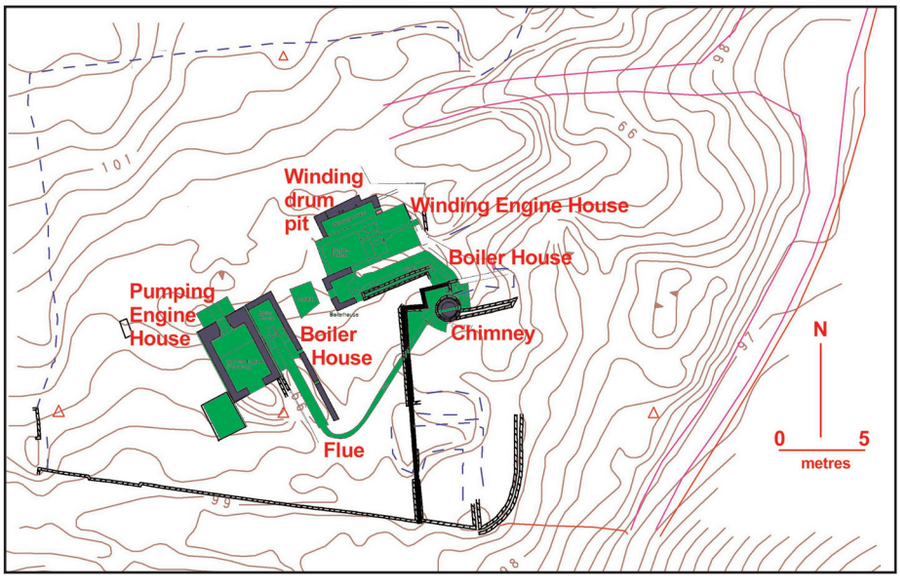

Figure 1. Plan view of the Tankardstown mine site, showing the two engine houses and related features. Contours at 20cm intervals.

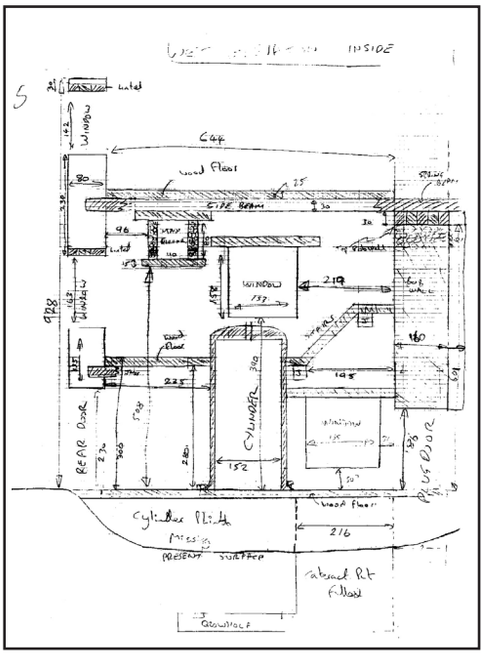

Figure 2 Left. Sketch plan of internal view of west wing wall, Pumping Engine House.

Figure 5. Facing page Top row: three views of conservation works on east wing wall, Pumping Engine House, before (left), during (centre) and after (right; note foundation level footprint of boiler house in the foreground) completion of works.

Figure 6. Facing page Middle row. Three views of floor level conservation works inside the Pumping Engine House, before (left: original floor level, F. Hurley and assistant standing on completely back filled cataract pit), during (centre: excavated cataract pit, and back filling behind re-constructed cataract pit wall. Note missing masonry and lintels around plug doorway at base of bob wall in the background in this and the preceding view), and after completion (right: concrete floor level. Note partially reconstructed masonry and new lintels over and around plug doorway in background).

Detailed measurements of all buildings were undertaken prior to conservation works (Fig. 2). These facilitated both conjectural reconstructions to be made of the interior of the engine houses when the engines were working, as well as assisting specification of the conservation works to be undertaken, including materials to be used. The works were put out to tender by Waterford County Council in July 2004 and the successful company selected for the works was Cornerstone Ltd, based in Cobh, Co. Cork. The works commenced in autumn 2004 and were completed by late 2005.

The use of matching stones, lime mortar and oak timbers were some of the materials specified in the works. Oak timbers were supplied by Coillte Ltd and hydraulic lime by the Traditional Lime Company Ltd. Special bricks were imported from Cornwall through Darrock and Brown Ltd., Bodmin.

PUMPING ENGINE HOUSE

The pumping engine house was built in the mid 1850s to house a beam engine which was reputed to have been moved to the site from its previous location atop the cliffs at Stage Cove (Knockmahon: Morris *et al*. 2005, Fig. 52 therein). The main shaft at Tankardstown is believed to be 164 fathoms (250m) deep, although this is presently not open to surface as it was blocked during the use of the site as a film set in the late 1960's. The main shaft was used both for pumping and for winding, with separate engines being installed for each operation. The engines were installed in the two engine houses which now remain on the site (Figs. 1, 3). The pumping engine house (Fig. 3) contained a 50", single acting steam powered Cornish beam engine, which lifted the pump rods within the main shaft. Parts of the engine bedstone remain (Fig 4). These, unusually, have an ochre coloured coating on one side, which is believed to be the remains of the original ammonia-iron filings-urine packing/leveling material hammered into position under the steam cylinder (K. Brown 2004, *pers. comm*.).

The pumping engine house is constructed of local stone, mainly of light brown volcanic rocks. The engine house was in a reasonable state prior to the conservation works, except for a hole in the east wall (presumably made when the engine was being scrapped; Fig.5) and the partial removal of the raised cylinder plinth floor inside the house (possibly the stone was robbed for building elsewhere; Fig. 6). The cataract pit was also infilled with rubble.

The main works undertaken on the pumping engine house were:

- Rebuilding of damaged walls (mainly on the east wall where the stonework was removed when the engine was scrapped; Figs 3, 5)
- Rebuilding stonework and brick archway of rear door (Fig.7)
- Consolidation of floor (Fig. 6)
- Restoration of cataract pit and crawl tunnel (Fig. 6)
- Replacement of all wooden lintels (Figs 5, 6, 7)
- Installation of iron security grilles to all ground and first floor openings

Figure 3. Tankardstown Engine House complex, September 2004, after completion of archaeological excavations, prior to conservation works. Pumping Engine house on right, winding engine house centre, and single chimney which served both boiler houses on the left.

Figure 4. Left. Bedstone fragments with ochre packing material.

Figure 7 Bottom row: views of rear gable and bob walls: before and after conservation works on gable wall (left, centre: note reconstructed masonry and brick arch over cylinder doorway, and replaced oak lintels in windows above); and after completion of works on Bob wall (compare with views in Figs. 3 and 6 before conservation works).

Figures 8a, b (below left, right): Levant Winding Engine House, Cornwall: exterior view of totally enclosed engine house and lean-to boiler house in foreground (left), and (right) interior view looking towards the engine cylinder. Note the enclosed bob resting on an internal wooden beam, the sweep rod attached to the flywheel crank (behind the security mesh), in turn to the external winding drums; and people standing on the cylinder floor level.

WINDING ENGINE HOUSE

The winding engine house contained a smaller, rotary steam winding engine housed in a totally enclosed engine house, virtually identical to that at the Levant Mine in Cornwall (Fig. 8a). There are no records of the size of the winding engine cylinder but examination of the remains of the bedstone, suggest that it was a 20" engine, which Morris *et al.* (2005, this Journal) suggest may have been moved here from a previous engine house location in Ballynasissala. Very little of this structure now remains, save only the rear wall and part of one wing wall, a substantial portion of which collapsed between 1970 (when it was still visible in the MGM film "The McKenzie Break"; Fig. 10) and the early 1990s. The entire bedstone masonry plinth had been robbed out, along with the front wall and most of both wing walls (Fig. 9). Archaeological excavations, however, revealed the footprint of the boiler house on one side, the winding drum pit on the other, and fragments of the limestone bed stone.

The conservation works undertaken (Fig. 9) were:

- Rebuilding of bedstone masonry plinth, including bolt tunnel and drain channel through to rear of building
- Rebuilding masonry sections in rear wall, along with insertion of oak lintels
- Rebuilding parts of both wing walls to stabilize extant remains, including tying in an isolated pillar (Figs. 3, 10), all that remained of the wall section which supported an internal wooden beam to support the wholly enclosed beam (as at Levant, Fig. 8b)
- Sealing/ re-bedding all wall tops as needed

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Figure 9: Above left - Tankardstown Winding Engine House, viewed from the same perspective as Fig. 8b. The original cylinder floor level was located just below the base of the internal plaster level visible above the people standing in the area of the completely robbed out cylinder bedstone masonry plinth. Note the crow hole tunnel and drainage channel located beneath the plinth. Part of internal bob beam support wall visible on right (the isolated pillar in Fig. 3). Flywheel and crank originally located along inside edge of left hand side wing wall (left foreground), and to external winding drums outside the building, on the left.
Above centre - similar view during conservation works, showing replaced oak lintels and masonry in rear wall, and reconstruction of masonry plinth, above crow hole level, in progress
Above right - external view of rear wall showing replaced lintels and reconstructed masonry sections

Figure 10. Chimney stack conservation and reconstruction: above, as visible in the 1970 film, "The McKenzie Break" (reproduced by permission of MGM Films); right, similar view, 2004. Note and compare the loss of part of the Winding Engine house wing wall between 1970 and 2004, and also the external winding drum pit on the nearside of the building, with prominent grooves for axle hold down bolts; far right, during reconstruction of the brick chimney top in 2005.

MINING HERITAGE TRUST OF IRELAND - Iontaobhas Oidhreacht Mianadóireachta

The Mining Heritage Trust of Ireland was formed in 1996 to provide a focus for all those persons interested in Ireland's historical mining industry. The Mining Heritage Trust of Ireland seeks to develop the informed public awareness, appreciation, conservation and enjoyment of all facets of mining heritage throughout Ireland. Membership is open to anyone who supports the mission and objectives of the MHTI. The MHTI undertakes a range of activities throughout the year; including a newsletter, field meetings, workshops and lectures. Other activities include the on-going recording of extant mining remains. We always welcome new members and the expertise they can provide. The MHTI is a member of the National Association of Mining Heritage Organisations (NAMHO). NAMHO provides a mechanism for the exchange of information relating to mining heritage in Ireland and the UK and furthering the study of mining heritage. MHTI is a founding member of Europamines - a network of mining heritage groups.

Objectives

The objectives of the MHTI are:

Europamines
www.europamines.com

- To promote awareness, appreciation and conservation of the mining heritage of Ireland.
- To create and maintain an inventory of surface and underground mining remains.
- To actively participate in, facilitate and promote the surveying and documentation of extant mining heritage.
- To create and maintain a library of information to assist researchers.
- To provide an active programme of lectures, field meetings, publications and a newsletter.
- To undertake general mining heritage educational activities.
- To support mining heritage as tourist amenities.
- To promote a "Code of Practice" for sites.
- To provide representation on mining heritage to relevant statutory authorities.

Meetings

A varied programme of meetings is organised. Field meetings are normally held in the Spring and Autumn. These are generally held over a weekend and may include an evening lecture. Field meets consist of visits to old mine sites in Ireland and abroad and practical workshops. Lecture meetings and one-day workshops are also organised around certain themes. An AGM is held each year, where Directors are elected and a report is made for the year's activities.

Publications

A newsletter is produced three or four times a year. This contains items of topical interest, including the forthcoming programme of the MHTI and short articles. This annual Journal series commenced in 2001. More comprehensive individual publications will also be issued when they are produced. The Trust also sells some titles related to Irish mining heritage.

Site Inventory

A major project for the MHTI is the production of an inventory of mine sites and remains. This inventory will form a baseline for future studies and more importantly highlight sites requiring conservation. A site survey form is available and the results will be compiled on a computer database. All the MHTI's members are encouraged to contribute to the site inventory

Membership

There are six classes of membership of the MHTI, related to insurance requirements, plus a library subscriber option.

- Full Caving Member - Receives newsletter, Journal and meetings notices. Third part liability insurance for underground and surface activities.
- Full Non-Caving Member - Receives newsletter, Journal and meetings notices. Third part liability insurance for surface activities and events only.
- Insured Member - Receives newsletter, Journal and meetings notices, but insured with another group.
- Family/Group Member - two adults over 16 yrs, plus children.
- Corporate Member - any organisation supporting the MHTI and paying a minimum of the annual rate.
- Sustaining Member - any organisation which supports the aims of the MHTI and paying a major contribution.

MHTI, c/o ERA-Maptec, 36 Dame Street, Dublin 2
Or c/o Geological Survey of Ireland, Beggars Bush, Haddington Road, Dublin 4
Tel. 01-6782000 Fax. 01-668-1782
www.mhti.com