

FRONGOCH.

An underground exploration. by Roy Fellows

The Frongoch lead and zinc mine is situated about two miles from Pontrhydygroes in mid Wales. The history and surface remains have been well documented in an excellent book by David Bick, however I shall start by giving a brief description of the surface remains as they relate to the underground exploration. Geographically, the site may be divided into two areas bisected by a council road. The upper workings to the East comprise the main group of shafts, engine houses, and other associated buildings. The lower workings to the West, the dressing floors and workings of the Wemyss mine which once worked separately. Passing through the Iron Gate which leads into the upper workings, one passes a heap of spoil on the left, at the top is rubbish filled depression. This is Williams Shaft.

Passing the ruins of the mine office one next reaches the ruined engine house associated with Engine Shaft. Climbing up to the shaft collar it is possible to look down to where the shaft APPEARS to be filled with rubbish; the pump rod protrudes through the fill.

Looking East, a huge opencast can be seen, and beyond that, an isolated shaft in the middle of a field marks the Eastern extremity of the workings. At one time it was possible to climb down into the open workings, and reach a huge stope with a timber floor. A few years ago a fall of rock blocked this off.

Above the engine house there are a few metres of level leading to a blockage which may have been a manway down into the workings. Back through the gate and down the road for a short distance gives one a panoramic view of the lower workings, dressing floors to the left, and Wemyss mine to the right, with other workings on the same vein extending as far as the Graiggoch mine in the distance. Below and to the right of where one is standing are the spoil heaps of Boundary Shaft, this shaft is oval, stone lined, and again APPEARS to be filled with rubbish. Looking down at the Wemyss mine the square powder magazine stands out, just above this a depression and adjacent concrete engine bed, marks the position of Balls Shaft. Below the magazine is an open incline shaft, after a short distance it connects with the top of a vertical shaft of about sixty feet, overhung with the actively collapsing false floor of an adit, (run in at the portal). I have not descended this shaft due to lack of suitable belay and its condition. Adjacent to the dressing floors there is another adit (open). This leads to Balls Shaft where it is blocked. There are some minor workings off. To visit the adit it is best to park ones car just off the Council road below the dressing floors, and then enter the site by the gate.

Walking down hill parallel to the road a cutting is reached which leads to the adit. This is a grotty looking hole with a large volume of water pouring out.

It was not until the dry spell of 1995 that I felt like going in, then in a full wet suit. My first visit was late April, and then entry was into chest deep water. After this came a series of three flat out crawls in fast running water. After this normal progress is possible in waist deep water, from a point where daylight originally entered from above. Proceeding inbye one passes through an area where the roof has been stoped out to a height of up to about fifteen feet with much old timberwork. Also a bait area is passed on the left. The adit trends E.N.E with many twists and turns, it passes the Wemyss workings altogether but two blocked passages on the right may have connected. It is possible to climb some stemples into where the old Wemyss adit came in. After that mine was taken over by the Frongoch people the adit was re-dialled and the floor taken out as part of the work of extending the adit up to the Frongoch 24 fathom level.

After about 400 metres, a large chamber is reached, the roof being about fifty feet high. The level then continues for another sixty or seventy metres to a forehead, however about twenty metres before this there is a cross cut south to Boundary Shaft. The adit has a timber catwalk, a feature that was to -prove useful later on.

In the vicinity of Boundary Shaft there is an iron kibble and a long hooked bar used for pulling it in from the shaft. The shaft itself is blocked just above roof height with rusting scrap metal, and also at floor level, but open to the height of the level. The level itself circumvents to shaft to the East, and then cross cuts a major working. From here, going right, (West) passes a blind heading on the left and reaches a flooded understope where water rises. This has a short length of ladder up to what was once a timber platform. Here there is a rise to higher workings. This place is the subject of one of the photographs in David Bicks book. Left at the cross cut (East) takes one under a stull to a forehead after about thirty metres. However, a climb up a short length of ladder takes one into a continuation of the adit, which again trends E.N.E. At one point the adit turns north and passes through an area, which has been stoped in each direction, here the level has been heavily timbered. This is the subject of the other photograph in David Bicks book.

After passing a flooded winze on the left the adit reaches Williams Shaft, a solid fill, the adit circumvents the shaft as before, to the left. About twenty metres further on the adit was originally blocked by a solid collapse, which formed a cavity in the roof. There was sign that other explorers had attempted to dig through this without success. (They where digging in the wrong place). After this initial exploration it became obvious that further exploration would be possible in two ways. By digging through the collapse, and by crossing the flooded understope, although my instincts told me that there would be other flooded understopes. This was to prove correct. Both projects where to prove successful, and in one at least where to lead me into workings where no other modern explorer had been.

Exploration west (The flooded stopes)

The first was easily crossed using a 15ins inner tube as a buoyancy aid. Also I decided to fit traverse lines, these were to prove invaluable later on. After the crossing, a climb over some rubble leads to an area where it is possible to look up into stope workings seventy or eighty feet high. The next obstacle is a section of what appears to be under water false floor covered in rocks. I think that it is more likely backfill that has settled over the years. In any event it took my weight, I have also fitted here a traverse line of sorts. Next there is another flooded understope, this time of about fifteen metres. This was also crossed and a traverse line fitted. It would have been very difficult to climb out of the water at the end but for a ledge on the left-hand side. Here I found myself standing on a 'bridge' of rock across the stope, a mere foot wide. The 'hole' in front of me, although only a few feet across, had sheer sides rising several feet from the water. Also the opposite side had a pile of loose rocks perched right on the edge. A rotten plank crossed it on two rotten stemples, clearly unsafe to cross.

My solution to this problem was to return to the adit and remove a section of the catwalk, however being well sodden it wouldn't float. This was overcome by tying a tape sling round it and clipping it into the traverse lines. Once into position the last hole was safely crossed. However, a few metres on, again more flooded understope, this time with a timber catwalk in situ. The catwalk ended about ten metres short. Here, the stope was much narrower, so I was able to propel myself along using my hands, again with the inner tube as an aid. A bit of extra fun was three stemples a few inches above water, which had to be ducked. Out of the water and onward, the level went for another forty or fifty metres to a forehead, with blind headings to the left. At one point I passed a laddered winze going down into blue water. There were clog prints everywhere, and only one set that could have been modern wellies. However, I have to say that I had removed my heavy boots for this last swim as a safety precaution, and it is possible that other explorers may have done likewise.

East, the first dig.

I attempted this by digging in the same place as previously attempted by other explorers, without success. At one time I was absolutely exhausted, working in a confined space, in a wet suit, with poor ventilation. On the 14th May 1995 I returned with a long iron bar as well as my digging implement. This digging has been done by working inside the roof cavity formed by the collapse, and all previous effort had been directed at the back, i.e. forward. Probing around with the iron bar I was able to generate a draught by working on the left. So taking off my wetsuit top (what relief) I set to with a vengeance and was through in about two hours.

The passage beyond was in a few inches of water, and after about twenty metres reached a Y junction. The right branch went into a large stope with a wooden launder in the floor. A section of mud was a mass of clog prints, some small enough to be those of children. The level continued through the stope to a collapse. The left-hand branch continued for another eighty metres to Engine Shaft, which underground is well and truly open. It is possible to look up to a height out of range of ones caplamp. The pump rods, rising main and associated bits and pieces are all in situ. There are many other artefacts in this area, including a wooden wheelbarrow in an adjacent level. Further digging past this point would be impossible, as the collapse is on the vein.

Originally, it was only possible to enter these workings during a prolonged dry spell, I did attempt it in some wet weather and nearly had my day ruined; big time. Later, the adit shaft was cleared and ladders fitted providing a more sociable access.

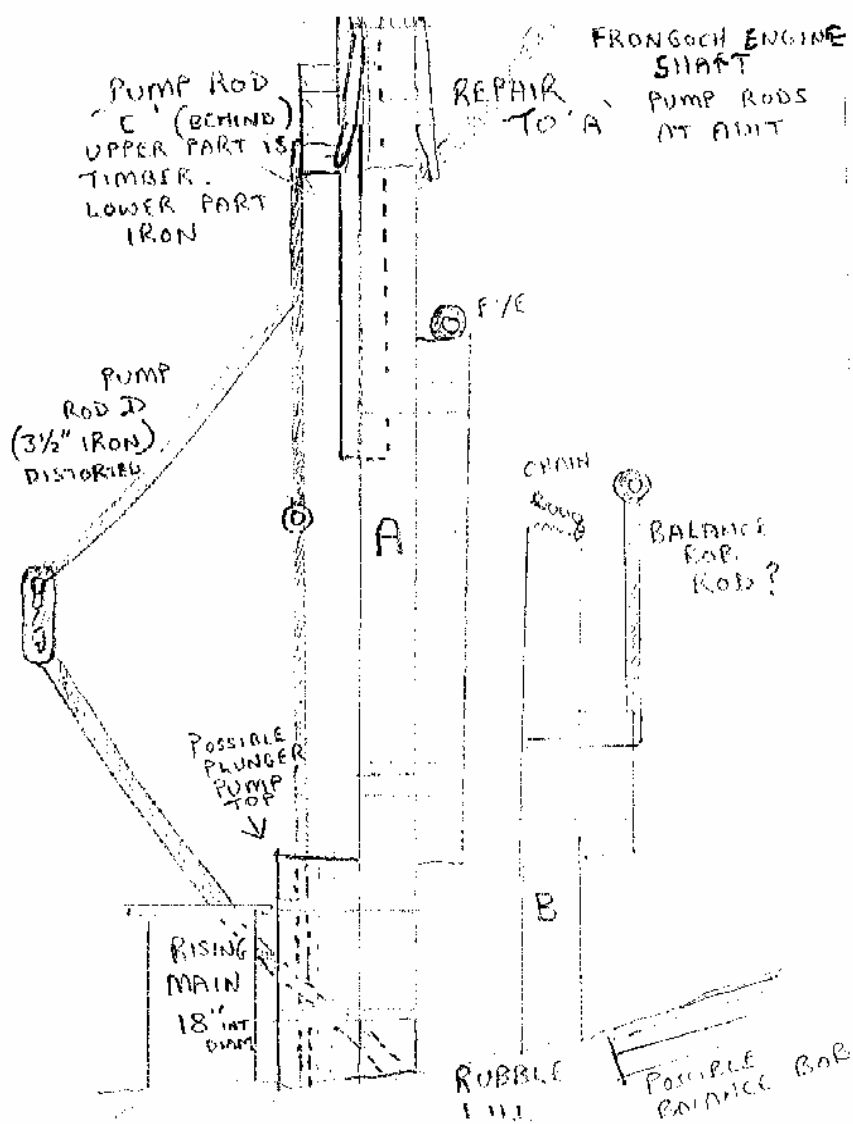
Engine shaft.

The Frongoch Engine Shaft has four, in situ pump rods to be seen today, (See drawing) Pump rod A can be seen to continue up the shaft as far as a caplamp will reach. About 40ft up the shaft it has been reinforced or repaired with heavy planks of wood and iron bands. It has a timber secured to it with iron bands, with an eye piece on the top. This would be for attachment of a balance bob rod. At about knee height there is another timber attached with a more pronounced offset, this is probably the upper part of a plunger pump. Rod B ends about sixteen feet up the shaft, and has a timber secured to it which carries a rigid iron rod, which ends in an eye. This also is probably for attachment of a balance bob rod, The timber of rod B also has some chain round the top, not of sufficient weight to be part of the lifting arrangement, it was probably used to secure the pump rod to the side of the shaft, out of harms way, when this rod was taken out of use. Pump rod C has every appearance of a piston pump, but this it cannot be. Its timber upper section can be seen to continue all the way up the shaft, and is in much better condition than A and B. Rod D is of heavy 3-2' inch diameter steel or iron rod, with a fulcrum piece at about eye level. This also can be seen to continue all the way up the shaft. I have seen a pump rod of this type elsewhere, (Bog Mine engine shaft SN 738814. This is about 60ft on the underlie, to water). I feel that this latter rod was probably put in as a standby, rod C being the last one in use. One should remember that this point (24 fathom) wasn't always adit level, as the Wemyss Mine was at one time a separate concern, and the workings didn't connect before Frongoch acquired the Wemyss property.

In those days pumping would have been to surface. or more probably to the old shallow adit. (now lost). There would have probably been cisterns and plunger pumps at this level and above, It is interesting to note that the shot holes in the adit change direction at a point about sixty metres outbye of the cross cut to Boundary Shaft, indicating two way driving. Also there is no noticeable misalignment, so the dialling must have been spot on. Another point of interest is the way that the adit has been driven to circumvent all the shafts and the Wemyss workings. this suggests a connection below adit, and a mistrust of wooden launders. In the vicinity of the engine shaft there are various other artefacts, a stout wooden box, corners reinforced with iron, contains heavy bolts. There is a rather curious wooden plug about 18inches long, tapering from 12inches down to 7 inches, purpose

unknown. In a level beyond the shaft is a wooden collar launder which would have been bolted to the top of the rising main to direct the water away clear of the shaft. Also near the shaft, and buried under debris, is what may have been a balance bob. I think that it is clear that they had a lot of trouble with premature failure of the timber pump rods, and did a bit of experimenting with alternative arrangements.

FRONGOCH ENGINE SHAFT ARRANGEMENTS



The Adit Shaft

For some time, I had been considering the adit shaft as another possible means of entry. In 2002, with the mine being on the NAMHO meets list, I decided to do something about it. Visiting the mine, accompanied by Dave Seabourne, we used an aluminium extending ladder to examine the shaft's condition from below. To our surprise, we found it possible to climb up to where daylight could be seen coming in about thirty feet up. I have some doubt about it actually being a shaft ever used for access; it's actually the upper part of an open gunnis. It was to prove quite interesting in itself, from part of the way down, old men's workings can be seen extending towards the road. These workings are probably quite old.

On subsequent weeks, we commenced the work of clearing and stabilising the shaft with the intention of fitting fixed ladders. I had previously had talks with the landowner, Mr Arthur Edwards. I proposed that together with the other work, the shaft would be capped with concrete and steel and fitted with a manhole for access. Mr Edwards readily agreed to this, however I was soon to realise what a daunting task I had undertaken.

Our initial work was stabilising the lower end of the shaft by fitting wooden stemples backfilled with rock in places where there were unstable ledges. These then provided useful staging for the fixed ladders. Next, a steep slope of earth and rubble was stabilised by creating large "steps" using mine timber. Eventually, much of this slope would be circumvented by the installation of fixed ladders. A partial blockage of old car body sections was taken out and compressed into a convenient cavity. This left the upper section of the shaft clear, a distance of thirty feet from daylight to the rubble slope. It was decided to leave this for the time being and concentrate on the surface work. One problem was that the shaft collar was some fifteen feet down a steep grassy hollow. It was about ten feet long by about 3 to 4 feet wide, following the direction of the vein away from the road. It was only possible to descend on a rope, as the open shaft was below. It was therefore decided to tackle the job in two halves, doing the road side first. Once this outside end was done, a way down could be made which would make it easier to work. The shaft is not vertical, but has a few degrees, and the upper part of the hanging wall was seen to be unstable.

First task was to dig back from the collar to expose the bedrock, this was done by Dave Seabourne dangling on a rope. At the same time, I had the opportunity to acquire some damaged concrete fence posts. These are of cast concrete reinforced with very high tensile steel rods. A section of rod about a foot long is impossible to bend by hand, although only about ¼ inch thick. These, I considered ideal to form part of the capping, and they were transported to the site. Initial work was to stabilise the upper part of the hanging wall, short 3 ft lengths of the concrete post were concreted in sloping down at an angle into a convenient cavity. Other loose cavities were concreted or bricked up. All done while hanging on a rope! Further stabilisation work done at surface included filling various cavities up with liquid concrete as part of building up a "collar" which would eventually be bridged over with the posts.

On Sunday 30th June I returned to work solo in the shaft, installing a false floor at the random of an "old mans level" heading towards the road. I suspect that there was one upper level from daylight, entering the gunnis at this point. I worked all day at this, hammering into place heavy timbers to support the floor. More wooden ladders were permanently installed in place, and an aluminium extending ladder fitted from the floor to surface. At a later date the wooden ladders were replaced by a short aluminium ladder and longer one of steel.

The reason for carrying out all this work is to secure the shaft against material falling in from surface, with the attendant risk of the adit becoming blocked, and to provide a more "sociable" method of entry. Up to the time of the work on the shaft, the only method of entry was a flat out crawl in running water from the adit portal.

Later work resulted in the whole shaft being capped. There is a large manhole cover with a drain on either side. A length of scaffold pole has been concreted in just below the drain on the footwall side. This is to provide a suitable belay point in the event the first ladder is removed. (This is up to Dave Seabourne, whose ladder it is!) The length is 18 feet down the footwall to a timber solar I have fitted. After a short ladder, a rubble slope leads to the final ladder down; this is 15 feet to the adit. I have to express my sincere gratitude to Dave for the help he willingly gave in this work. At times we were labouring in nearly 90-degree heat, mixing concrete in a barrow down by the adit portal and carrying it up the hillside in buckets - Not to mention the concrete sleepers. He never complained, except for the fact that the 'RV' inscription in the concrete is actually about half an inch bigger than the "DS" if carefully measured!

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The Big Dig

The next lot of work involved the digging of a fall on the adit adjacent to the Engine Shaft. This was a terrible job and went on from about October 2002 to the beginning of 2003 when it was temporarily abandoned. So what was it all about? Well, examination of the plans shows about 50 metres of passage between the Engine Shaft and the next shaft on the lode, Pryse's Shaft. Before Pryse's Shaft there is a 'bypass level' similar to the levels that bypass Boundary Shaft and Williams'. If this can be gained, the level will bypass the inevitable blockage at Pryse's Shaft to rejoin the main adit level at a point that I have christened 'Four Ways'. One way here is the way the explorer would have come, another will lead back to the likely blockage at Pryse's Shaft, another will continue along the main lode, (probably blocked by falls), and the last is a crosscut to a long (about 600 metres) drive on the North Lode. The North Lode is the vein that the adit is driven on from portal, and is only slightly stoped. To make the whole proposition even more exciting, there is another crosscut further on between the Main Lode and the North Lode, this would probably bypass any falls on the Main Lode. Also, there is 140 feet of ground in this area between adit and grass, with the possibility of rises and ladderways up to higher workings. David Bick comments in his book that the mine probably has 3 miles of adit workings, examination of the plans show this to be very likely.

I was working on the dig almost every Sunday, with the exception of the bank holidays when it is my habit to spend a few days down Cornwall. In November 2003 the dig broke through to a right hand side passage shown on the plan. This is a crosscut to a drive on the lode that has been thrown to the south of the adit drive. As a point of interest the whole mine is a geological anomaly. Although there are only two faults shown on the plan, the main lode is all over the place, the footwall becoming the hanging wall and vice versa. The side passage crosscut leads to a junction at the (thrown) vein. Left is blocked, right leads past a dangerous hanging shale block to a blocked rise that strongly draughts. There is no stoping. Unfortunately, at the breakthrough, the way on

ahead is blocked by more fall. I therefore tidied up the work that I had done, and then left it to maybe return at a later date, and then start a new dig onward. Obviously, there is plenty of room to dump the spoil, and working conditions are not too bad in that area. In the event that there is no breakthrough within about 12 feet, it is likely the project will be terminated, as its 16 meters to the Pryse's Shaft bypass.

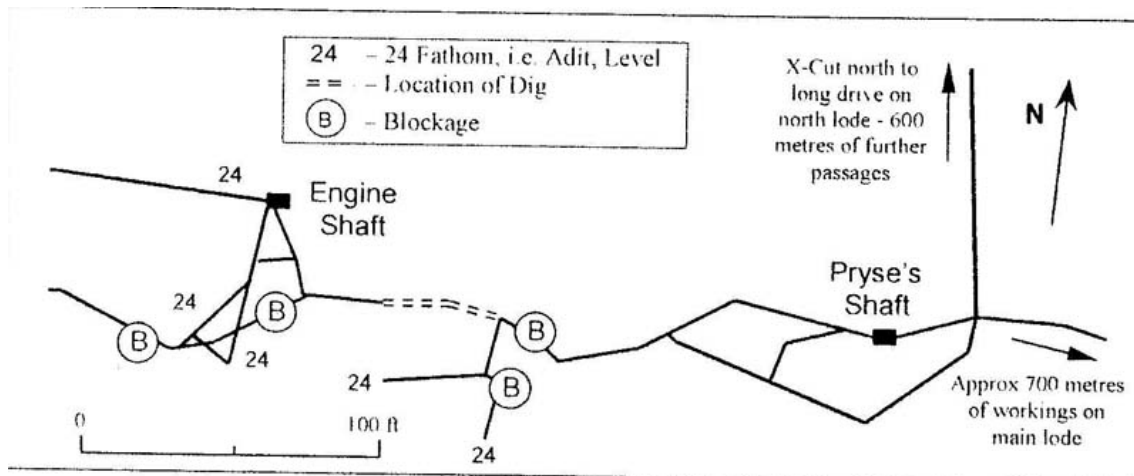
The prospect of abandoning the project fills me with dismay, however one has to be realistic. The length of dug 'passage' is ten metres, yes, metres NOT feet. Pushing this has been a feat of endurance at times lying flat out with water coming down on me from above. However, in dry weather it is a reasonable, if somewhat long, crawl. The passage itself leading up to the dig was of very dubious condition, being all in timber of uncertain condition. The dig provided much solid rock that was used to build a packwall on the footwall side of the dodgy passage. Also, I have put in quite a bit of extra timbering here. An old wheelbarrow that NAMHO visitors may remember has been relocated. Out of the dig I recovered a curious artefact. It is a timber sleeve about a foot long and a foot inside diameter. It is made tip in the same way as a wooden barrel of timber strips and two iron bands. However, unlike a barrel it is straight. My guess is that it was probably part of some timber lagging for a steam pipe from the 60 inch pumping engine that must have been thrown into the engine shaft when the engine was removed. It then probably found its way down through the stopes.

In the event that the dig has to be abandoned, no doubt the dig itself may become a source of curiosity to future explorers, possibly earning itself the name "Fellows Folly".

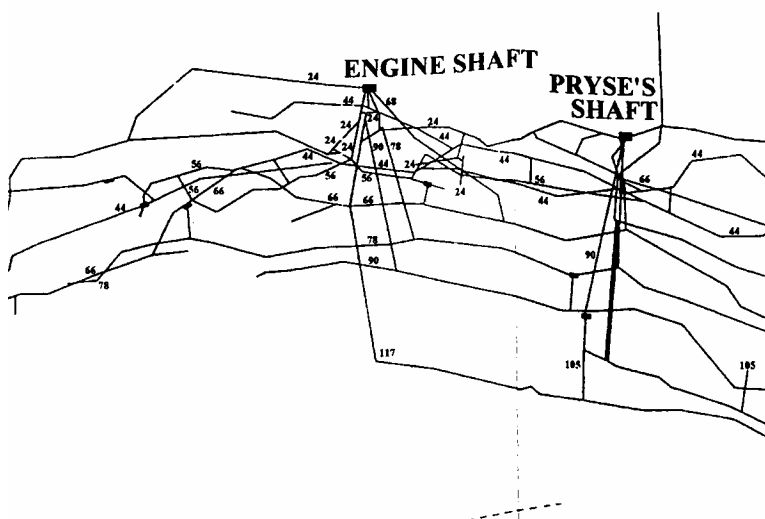
Conditions of Access

Access is also by courtesy of the landowner, Mr Arthur Edwards of Cwm Newidian Uchaf. It is restricted to groups who are properly equipped for underground exploration and who have NAMHO/BCRA third party liability insurance. However, there is no necessity to visit the farm house prior to a visit; neither is there a lock fitted to the adit shaft.

There is no implied right of public access to the land, regardless of the existence of a stile, which should be used by visitors rather than climbing over the fence. Strictly NO DOGS as the land is used for grazing.



Frongoch -- Workings in the vicinity of the dig

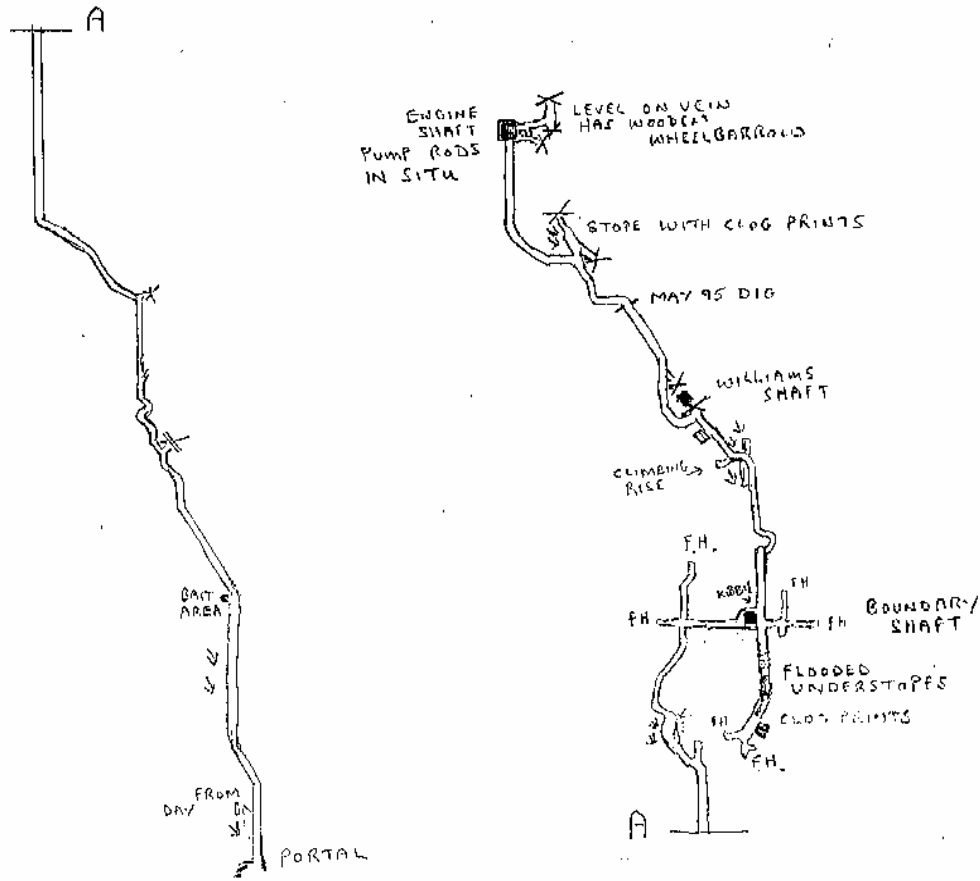


FRONGOCH ADIT. PLAN OF ACCESSIBLE WORKINGS.
 PORTAL AT SN 713743

- MAJOR SHAFT
- WINZE
- X COLLAPSE
- ↓ STOEPE DOWN

20 METRES

R.F. 1995





Engine Shaft