A Brief Report into the History of the Lanarkshire Deep Lead and Associated Workings at Rutherglen Victoria.

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This report has been prepared in response to granting of a planning permit for property development on Ready Street Rutherglen adjacent to the Rutherglen Golf Course and a property owned by Ann Killeen on Killeen Road in an area once mined extensively for gold. It has not been solicited by any person, rather I felt it necessary to become involved as the permit has been issued under conditions which do not fairly represent the land over which the permit is issued.

An article regarding this development was seen in the Border Mail by myself and immediately after reading I knew that a serious mistake had been made which could lead to serious consequences in the future. Unfortunately I was unaware of the Planning Permit when first applied for as I do not live in the Rutherglen area.

On the following pages I will describe the various mining methods used, and in particular describe in some detail, where errors have been made, and the likely consequences of those errors.

I submit this report without bias, prejudice or favour.

A Brief History of the Lanarkshire Workings- Rutherglen.

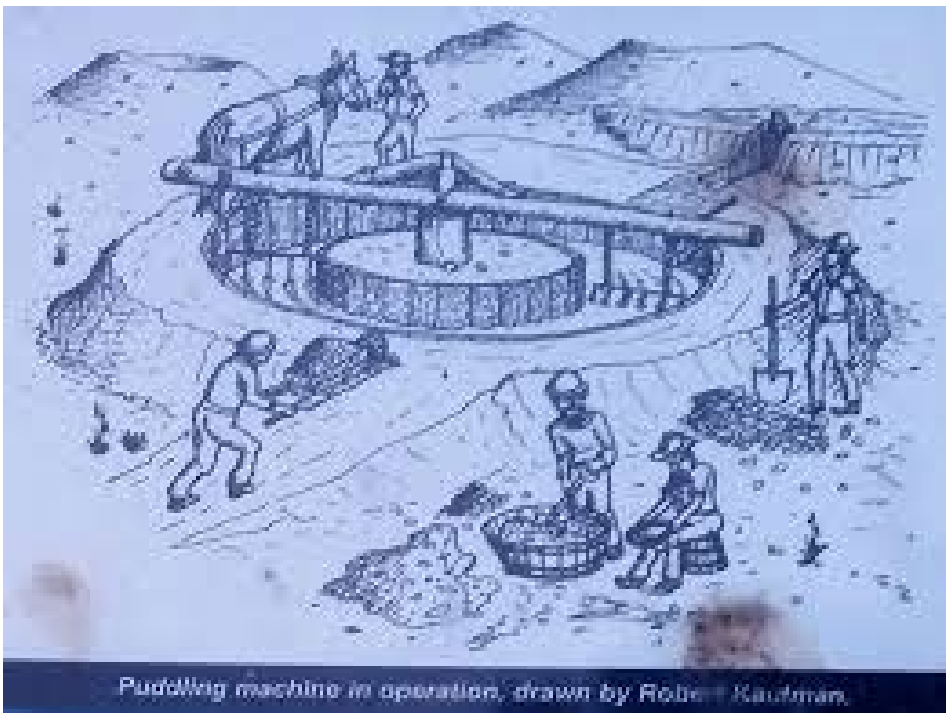
Gold was discovered in the area known as the Lanarkshire lead in 1860, and was the earliest known workings in the Rutherglen area.

There were three distinct methods of working this area which I will describe:

1- **Alluvial Workings-**

The earliest workings were alluvial workings which basically means the surface and near surface areas were mined to very shallow depths. Typically the surface soil was removed down to a clay level or bedrock and the gravels and surface soils washed, firstly with gold pans and cradles and later, due to the prevalence of clay, by use of puddling machines.

There is evidence of 3 puddling machines being used to this effect due to 3 water tanks being constructed immediately adjacent to the main workings. These tanks are adjacent to the area of the property development and are clear evidence of these workings. As part of the process mercury was used to concentrate the gold in the pan, cradle and puddling machine.



Puddling machine in operation, drawn by Robert Kaufman.

2- Quartz Mining-

Quartz mining was the second stage of mining and took place from the mid 1860's.

Once the surface alluvials had been worked gold bearing quartz reefs were exposed on the surface.

The reef workings in the property development area shown on Geovic as the Lanarkshire Reef.

The method of working these quartz reefs was initially small surface workings to shallow depths, but quickly this was followed by the sinking of shafts to a depth of around 80 feet, and driving along and stoping the reefs back to the surface.

Currently there are no known plans of the quartz reef workings, which is not uncommon as many of these workings were Miner's Right Claims where reporting was not required in the early days.

The quartz once removed, was either crushed in a "dolly pot" or taken to a stamp battery. Small amounts were crushed on-site but the larger tonnages were put through stamp battery's such as the still existing Rutherglen State Battery.

There may have been a small battery on-site and there is some evidence of this.

The by-product of milling gold bearing quartz in a stamp battery is fine sand with remnant arsenic from the ore, and mercury. Mercury was used in stamp battery's to recover gold. The violent action of a stamp battery meant a large amount of mercury was inevitably lost and would remain as methyl mercury in surrounding soils. There is ample evidence of a series of shafts on the course of the Lanarkshire Reef on a property adjoining the new development.

3- Deep Lead Mining

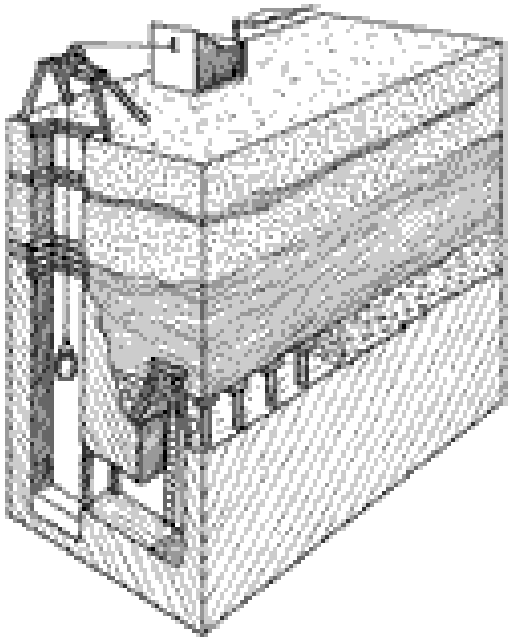
The deep lead workings of the Lanarkshire Lead are the main point of discussion in this report.

Deep Lead Mining was a method used to extract gold bearing gravels from buried underground streams. These gold deposits were formed millions of years ago when the hills were higher and the valleys deeper than we see in the current time. Erosion of the rock and soils forming the hills and mountains filled the valleys forming what we know today as Deep Leads. These leads do not follow straight lines. They are sinuous, and irregular, and often had side shoots or deposits, so what appears to be a straight line on a map is in fact far from what actually happens underground.

There are many deep lead deposits in the Rutherglen area however in this report I shall again focus on the Lanarkshire Lead workings.

Deep lead mining methods were to initially sink a shaft, which in the case of the Lanarkshire Lead was to a depth of 180 feet. Pumps were installed, as deep lead mines are by nature wet mines.

Once the workings were drained driving (tunnelling) commenced always heading up stream or in an uphill direction to facilitate the draining of the workings. Pumps had to work continuously to keep water under control and the risk of pump failure was the first and foremost concern of a deep lead miner.
The method used for deep lead mining was a two level method. A tunnel was driven through hard rock below the deep lead gravels, to give a dry access area for haulage of ore and drainage of mine workings.
The miners would then dig an upper level at the base of the deep lead which allowed water to drain to the lower level, then towards the main shaft where it was pumped to the surface.
This meant the miners would work in relatively dry conditions extracting gold bearing deep lead gravel.



Once the wash gravels were taken to the shaft and removed to the surface they were either treated by puddling and sluicing on site or taken elsewhere to be treated. Waste rock from the sub (bottom) level was taken and dumped near to the shaft.
The workings of the Lanarkshire Deep Lead Mine are extensive and cover at least 1 Mile and 25 yards in length and various widths along it's length due to cross courses.
Unfortunately the underground mine plans for the Lanarkshire Deep Lead have not been located but there are many and numerous reports of the workings from 1860's to the end of workings.
An important point here is that the workings of the deep lead were taken over by Chinese miners at some stage and they continued to work this deep lead for many years. The Chinese miners were notorious for not keeping records which probably explains why there are currently no known mine plans however I see no

reason why the plans of other deep lead mines in the Rutherglen system could not be used as an example of methods used, and deep lead deposition.
There are also numerous reports available that report tonnages of ore removed and amount of gold recovered which proves that the workings were extensive.

The Lanarkshire Deep Lead Workings begin at a property on the North Side of the Murray Valley Highway and then continue south under Moodemere Street and up to Ready Street, passing directly under the property development on Ready Street.

4- Post Mining-

Once mining had finished in this area it would have been a wasteland of deep shafts, mullock heaps, and mine tailings. There is ample evidence to prove this was the case.

At some time since mining ceased there has obviously been an attempt to rehabilitate the land by a private landowner, however plenty of evidence remains of early mining activity.

Alluvial mining always left behind spoil heaps, shallow holes, and exposed clay where the gravels had been removed down to clay or bedrock.

Quartz mining once finished led to remaining open shafts, with unknown drives in different directions. Sometimes these were capped, often with just a sheet of tin covered with soil. These would remain for years but eventually, once the tin rusts away, leaves the potential for a collapse of mine workings.

Deep Lead Mining. When deep lead mining ceased the workings were often capped and supposedly made safe. However, the workings would re fill with water once the pumps were turned off. This is where the biggest concerns are. With the two level mining method used, whilst the workings were being pumped dry, the mine was relatively safe although cave-ins were not uncommon. However once the mine filled with water the exposed workings at the upper level, even with timber supports, are far more prone to collapse, and/or the formation of sink holes and subsidence. This has been evidenced in other deep leads in the Rutherglen System such as the Great Northern Mine, and others.

Timbers were used extensively throughout these deep lead mines but after 150 years underground would be prone to collapse. There is anecdotal evidence of a car disappearing down a collapse of mine workings and missing livestock.It is obvious that the land has been partly reclaimed by filling of holes and flattening of stone piles and mullock which gives the appearance of no mining activity.

5- Concerns re property development on Ready Street.

a) The Issued planning permit contains a Geovic report stating that no mining activity took place in the area of the property development. This is not correct.

Geovic, which I use on an almost daily basis is highly inaccurate, lacks detail and in many cases is just plain wrong. The Geovic plan presented to obtain the planning permit shows a green line purporting to be the Lanarkshire Lead. The “Green Line” shows the lead to be a length of approximately 1300 metres, however evidence shows that the lead is approximately 1650 metres long or one mile and 25 yards. So there is a difference of some 300plus metres, which takes the deep lead workings under the property development and up to Ready Street. In addition these workings branched out to the east and west

from the “Green Line” at unknown distances but most likely up to 20 or 30 metres. What this means is that there is a vast subterranean chamber most likely continuing under the property development from the main shaft area on the north side of Moodemere Street. As the property development is at the furthest upstream point from the Lanarkshire Shaft it means that the workings are relatively shallow and I would estimate no more than 80 feet from the surface. If these workings have not been backfilled which is the most likely scenario then a collapse will happen. Not may, but will.
I have had the good fortune to descend into a deep lead mine in the Rutherglen area in 1995 and saw first hand how sink holes form from deep lead mine workings. A mine at Mt Ophir Winery was under a closure order by the then Mines Department. I was asked to accompany the Victorian Mines Inspector for North East Victoria, Mr. Michael Matthews, to the mine as a safety back up as he had to inspect the mine which was closed due to unsafe conditions. As we descended into the mine we could see that the shaft had collapsed from the bottom up The massive cavern was bell shaped and the thickness of rock at surface was no more than 20 feet deep. The rest had disappeared into the bottom of the 210 feet deep shaft. At the surface there was no evidence of what was happening underground. This is a risk for the Lanarkshire and other workings in the Rutherglen Deep Lead System. I should add here that the ladderway Mike Matthews was on at the 80 foot level (I was one level above) collapsed. Fortunately I was able to assist him to get out of the mine. All the timbers were covered in a white fungus that had consumed them and made them useless. This would be the same in any other mines not inundated by water where timber supports were used.

b) **<u>Possible hydraulic action in the drainage retention dam.</u>**
There have been two events in recent weeks where there appears to be hydraulic action just below the inlet into the retention basin at the north end of the property development. When dams are constructed, it is common to see bubbles rising to the surface as trapped air pockets from earthworks are released. However there have been two instances in recent weeks where large amounts of either water or air have come up from the bottom of the dam. This could indicate trapped air escaping from a subterranean cavity due to water ingress from the new development. The water would fill any cavity and force air out through the weakest point which in this case may be the base of the dam. On the second occasion there was a large amount of carbonaceous material that was released. This may indicate that water has reached the top of the underground mine workings and the carbonaceous layer from rotting timber has made it to the surface. This is a serious concern as it raises a huge possibility that a collapse is imminent.

6- Summary-

The issuing of a permit for the property development at Ready Street Rutherglen based on a single page document sourced from Geovic, stating that there is no evidence of mining activity is farcical. Geovic is not accurate, far from it. I use Geovic weekly in my work and it is a basic guide only. Nothing more.
To use this as a basis for granting a permit is negligent, lacks due diligence, and is very questionable as to motive.
Obviously no research has been undertaken, as there is ample evidence available online that clearly shows comprehensive mining activity in the area of Killeen Road and Ready Street along the Lanarkshire Reef and Deep Lead.
There is a risk of sinkholes forming or continuing to form, subsidence, and collapse of the ground. Of course no one will know until they open up as has happened elsewhere.
Should this development continue and houses built, the risk of liability and culpability for the Indigo Shire increases.
This permit was issued without due diligence being undertaken, without even the most basic research being carried out, and in total ignorance of an understanding of deep lead mining.
It must be revoked or suspended pending proper geotechnical, and hydrogeological testing and comprehensive investigation into the workings of the Lanarkshire Deep Lead Mine.
To not revoke the current permit for this property development would leave the Indigo Shire open to litigation when a collapse occurs.

7- References-

At this time there is no need to provide references as every point I have made can be found in evidence online through Geovic, and Trove however if required I can and will provide as much reference material as required.

8- My Background-

I am a small scale miner and have worked in a number of underground and surface mines over many years. I have been involved in mining in one way or another all my life. I teach small scale mining in Australia and Papua New Guinea.

I am a member of the Australian Mining History Association, a member and former Vice President and Secretary of the Prospectors and Miners Association of Victoria, Director of Sustainable Alluvial Mining Services Papua New Guinea, Member of The Alliance for Responsible Mining, and a Fairtrade Registered Goldsmith.

I have a Bachelor Degree in Fine Arts Gold and Silversmithing(RMIT), and a Diploma in Small Scale Gold Mining (Bendigo School of Mines).

During the early 2000's I was heavily involved in field work for Peter Freeman and Associates who were contracted to undertake the Indigo Shire Heritage Study where we interpreted mines sites throughout the Indigo Shire including Rutherglen.

My knowledge of mines, methods, and history in the Indigo Shire and throughout North East Victoria is comprehensive.

I urge you to revisit the property development at Ready Street Rutherglen, as to ignore what I have said in this report and to allow the project to proceed is negligent, ignorant and leaves the Indigo Shire and the property developed liable to litigation in the future.

I am happy to discuss this face to face, at the property development site with Indigo Shire and Excel Gray Bruni and any other interested persons at a time suitable to all parties.

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