Eureka Reef Heritage Walk

Castlemaine Diggings National Heritage Park

Welcome to Eureka Reef. This unique cultural landscape tells the story of the Dja Dja Wurrung People and the Victorian Gold Rush, which changed the course of Australian history. This remarkable story is etched into the landscape, and is the reason why Castlemaine Diggings became the first National Heritage Park in Australia. The Eureka Reef section of the park contains some of the oldest and best-preserved quartz mining relics in Victoria, offering visitors a golden opportunity to explore this extraordinary era in Australia's history.

A cultural landscape

Womin-dji-ka (Welcome)

Eureka Reef is part of the traditional lands of the Dja Dja Wurrung People whose rights were recognised through a Recognition and Settlement Agreement with the State of Victoria in March 2013. The Dja Dja Wurrung People maintain a close and continuing connection to Djandak, their traditional Country.

Djandak is a cultural landscape that includes both tangible objects such as scarred trees, mounds, rock wells, and stone artefact scatters, and intangible stories. Djandak is a living entity, which holds stories of creation and histories that cannot be erased. You can see evidence of this connection in the rock wells near the start of the walk.

Parks Victoria pays our respects to Dja Dja Wurrung elders, past, present, and future, and asks that visitors do the same. Aboriginal artefacts are protected by law, and it is prohibited to disturb them in any way.

The rush for gold

Gold was discovered in the Castlemaine area in 1851. People from around the world raced to Victoria, hoping to strike it rich. The gold rush, and the social and political changes that it triggered, played a huge part in shaping the multicultural democratic Australia of today.

Relics of the earliest quartz mining operations in the country are found at Eureka. Quartz mining was slower and more complex than digging for alluvial gold, so many miners came with their families and built homes at Eureka. Once there was a village here and the sounds of machines filled the air.

However, the glory days of the gold mines were short-lived and by the 1870s most of the mines had closed. Prospectors have returned to Eureka many times since – including during the economic depressions of the 1890s and 1930s – hoping to discover the gold that their predecessors missed, but without much success.

When the gold was gone there was little to keep people in villages like Eureka. As they left in search of new opportunities, many small mining towns and villages simply faded away, homes and businesses slowly crumbling to rubble. Today, the only sounds you'll hear at Eureka are the birds and the wind in the trees.

Nature's resilience

The forest at Eureka is different now than it was before the gold rush. The Box-Ironbark forests that covered these hillsides then contained fewer but larger old trees. However, the demand for fuel and building materials lead to the forests being stripped bare. The loss of mature trees with nesting hollows, combined with habitat fragmentation and introduced predators has taken a toll on native birds and animals.

Although mining had a detrimental impact on Box-Ironbark forests in the short term, it has also contributed to their protection in the long term. To ensure timber was available for mining needs, areas that might otherwise have been converted to farmland were set aside as forest reserves.

Today, the forests are regenerating, and Eureka is a beautiful place to appreciate both nature's resilience and the extraordinary story of the gold rush. In late winter and early spring, the forest comes alive with wildflowers, and with different species of eucalypts and wattles flowering throughout the year, there is always something to appreciate.

Things to do

Walking

A 1.8km self-guided walk in relaxing bushland takes you back through 140 years of mining history. The walk helps you see the forest through the eyes of the Dja Dja Wurrung people, alluvial gold diggers and quartz reef miners. Numbered posts along the track correspond to the text in this factsheet.

This is a Grade 3 formed track, with a few short steep sections and uneven ground that may be slippery after rain. Suitable for most ages, with moderate fitness levels, including children with close supervision. Dogs are permitted, but must be kept on a leash.

Full loop: 1.8km, stops 1-20, allow 1-1.5 hours.

Shorter loop: 550m, stops 1-9, allow 30-45 minutes.

There are no toilets at Eureka Reef. The nearest public toilets are in Chewton, behind the Town Hall, or at 23 Lyttleton Street, Castlemaine, approximately 20 minutes away by car.

Parks Victoria
Phone 13 1963
www.parks.vic.gov.au

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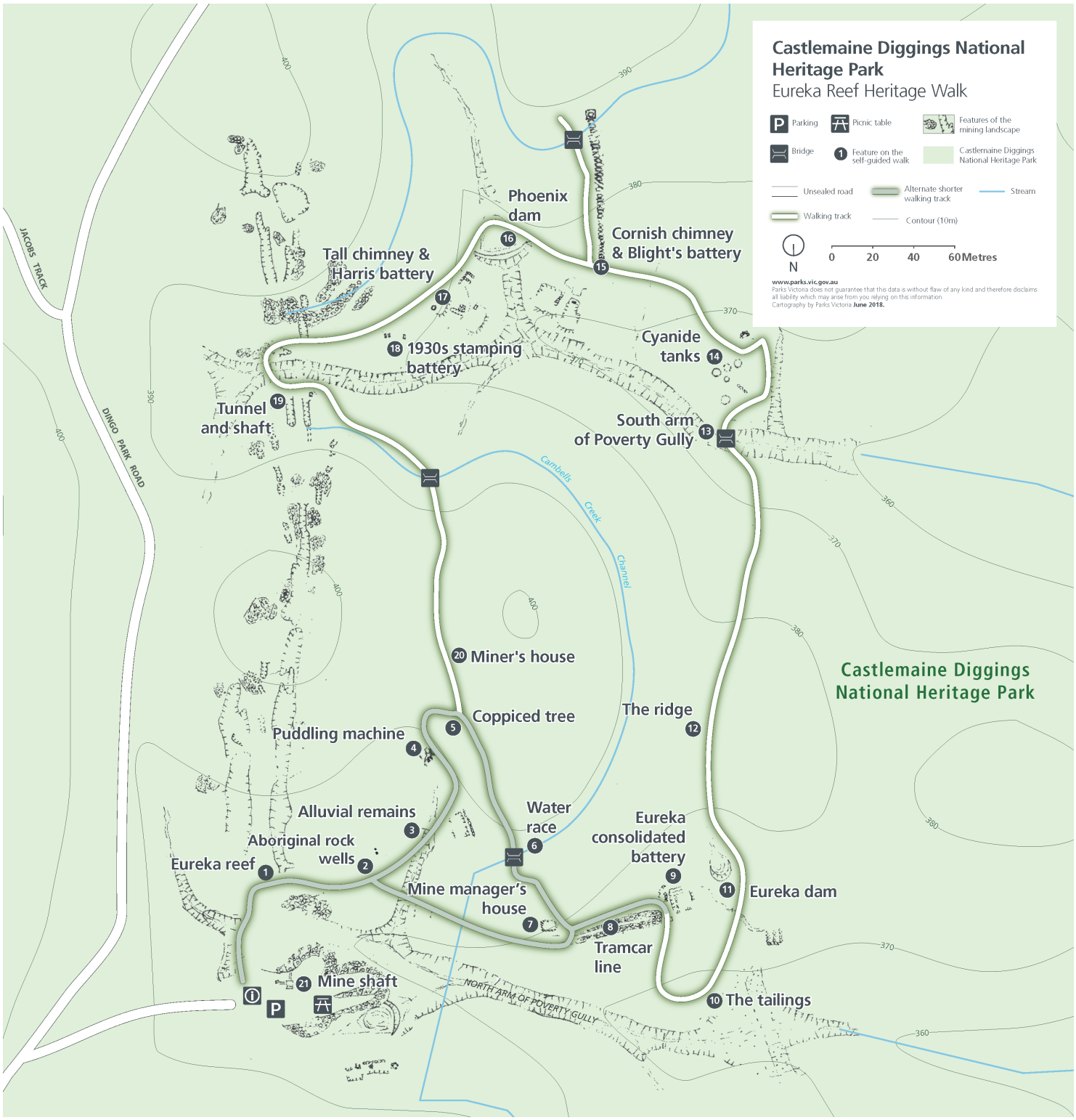


Picnics

There is a picnic table at the far end of the car park, and a couple of benches scattered along the walk. However, there are no bins, so please take your rubbish home with you.

Birdwatching

Many species of birds can be seen at Eureka, including year-round residents like currawongs and honeyeaters, and migratory species like the endangered Swift Parrot. Bring your binoculars and a bird guide, and look up into the canopy, on the tree trunks, in the grasses and on the ground.

As you explore Eureka Reef, stop and listen. How many different species of birds can you see or hear calling?

Wildflowers

From late winter through to early summer, the forest floor is full of wildflowers. How many different species can you see? If you don't have a field guide, bring a camera or a sketchbook and see how many you can identify when you get home. The Castlemaine Field Club have a wonderful website that can help you name what you saw castlemaineflora.org.au. Please tread lightly – all plants and flowers in the park are protected, and it is forbidden to remove or disturb them.

Exploring the relics

Stop 1

Eureka reef – a golden opportunity

Here you can see the remains of the reef. Before the miners arrived, there was a huge outcrop of white quartz extending in a ridge across the hills. In the 1850s and 1860s, the reef was mined as an open cut. Miners broke up the rock and crushed it to extract the gold.

The exclamation '*Eureka!*' comes from Ancient Greek and means 'I found (it)'. It became a familiar cry during the gold rushes of Victoria and California, and was adopted as a name by many places associated with gold mining.


PLATE II.—(B.)

FISSURED CENTRE COUNTRY, WITH LARGE BODY OF QUARTZ, EUREKA LINE OF REEF.

Looking south; quartz up to 40 feet wide, centre portion not stoped. Walls diverge in depth, forming east and west legs of a saddle reef.

The open cut at Eureka Reef in 1902. Source: Castlemaine Historical Society

Stop 2

Aboriginal rock wells – water for the Dja Dja Wurrung People

The small depressions in the sandstone here are rock wells. The *Djaara* (Dja Dja Wurrung People) created them to collect rainwater by enlarging natural holes. They placed rocks over the holes to prevent animals, leaves and debris from polluting the water. Wells like these allowed them to travel long distances, even in dry weather. The Djaara refer to mining landscapes like Eureka as 'upside down country'.

Stop 3

Alluvial remains – gold in the grass

In 1854, and again in the 1870s, diggers came here looking for alluvial gold that had slowly eroded and washed off the reef into the soil, grass and creeks. They washed the topsoil in cradles, pans and puddling machines to separate the gold from the soil. Before long they'd stripped the hillsides, and the small mounds of earth here are the slurry from puddling machines which flowed downhill to fill up the gully.


MINERS PROSPECTING

Wood engraving of prospectors panning for gold in the 1860s, by Nicholas Chevalier. Source: State Library of Victoria.

Stop 4

Remains of a puddling machine – technology to speed things up

To the left of the track is the remains of an 1870s puddling machine. Panning for gold is a slow process. To speed it up, diggers constructed circular ditches nearly a metre deep with an island in the middle. On the island was a pivot post that supported a long strong pole pulled around the edge of the ditch by a horse. Paddles or iron rakes hung from the pole to stir the soil and water into a slurry. When the slurry drained away, the miners could retrieve the heavy gold that had sunk to the bottom.

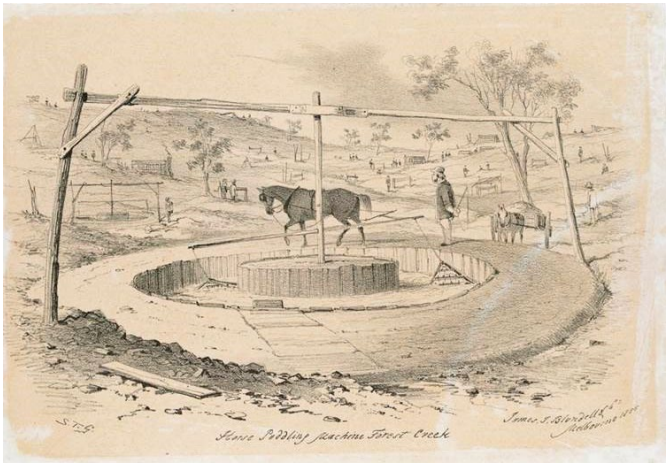


Illustration of a typical puddling machine at nearby Forest Creek, by S. T Gill for James J. Blundell & Co. 1855. Source: State Library of Victoria.

Stop 5

Coppiced Trees – surviving fire and felling

There is a clump of trees in a circle where the track divides here. Although they look like separate trees, they are actually multiple trunks of a single Red Ironbark (*Eucalyptus sideroxylon*), known as *yeeripp* by the Dja Dja Wurrung.

The tree probably began its life around 500 years ago, and originally had a trunk about one metre in diameter. Cut down near the base during the goldrush, the tree grew new shoots that developed into multiple trunks. This is known as 'coppicing' – a natural mechanism for eucalypts, enabling them to survive after fire.

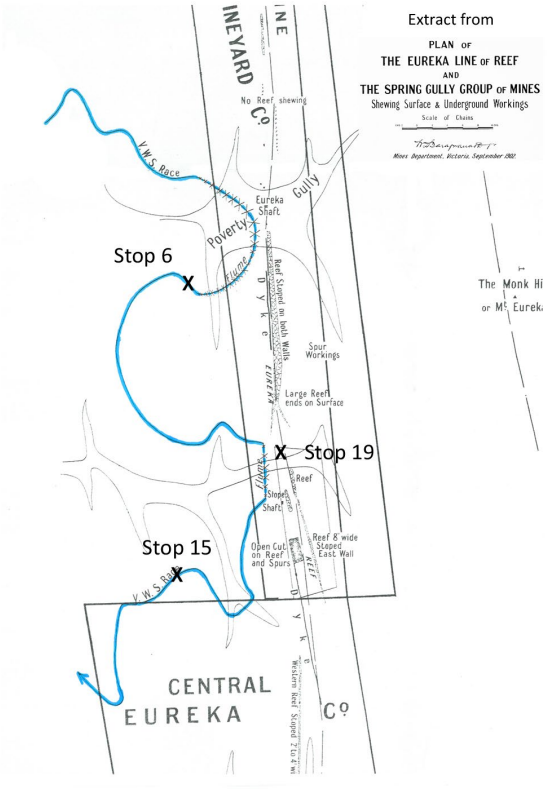
A) original tree, B) tree cut down near its base, C) new shoots appear aroudn the rim, D) the shoots grow into multiple trunks and the old trunk rots away. Illustration by Robert Avitabile. Source: *Discovering the Mount Alexander Diggings*, Mount Alexander Diggings Committee, 1999.

Stop 6

The water race – and the race to end the drought

Droughts plagued the diggings, and sometimes work had to stop due to lack of water. This channel is part of a water race that was constructed in the 1860s and 1870s to bring water from the Coliban River. When water is released into the system (generally during summer) water appears in the channel here, as if by magic.

It is an incredible feat of engineering. The races are virtually flat, having a drop of only a few feet to the mile. No pumps are used – only the force of gravity allows water to flow gently downhill along the races. To achieve the very gradual slope and controlled flow required, the water races were constructed to wind around the sides of hills, following the contours. Where a steeper section was necessary, the race was lined and reinforced with stonework.



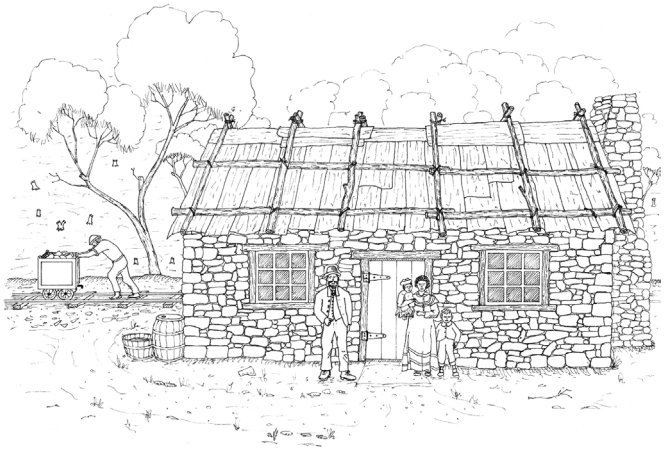
An extract from a September 1902 survey map showing the water race (marked in blue) and the open cut mine at Eureka. The crosses indicate the best stops on the walking track to view the channel. Adapted from *Plan of the Eureka line of reef and the Spring Gully Group of Mines*, Mines Department, Victoria, 1902 Underground Survey of Mines, Castlemaine. Source: GSV Geological Survey of Victoria www.geology.data.vic.gov.au.

Stop 7

The school-teacher's and mine manager's house

This house was built in the late 1850s by a young English prospector who later became a school-teacher. The two-room stone cottage was described as having a "fine flagged floor and the best fire-place in all the Eureka".

When William Palliser moved to Castlemaine, his home was ideal for the manager of the Eureka Consolidated Company. Gold was precious, and security was always a concern. Living next to the tramway allowed him to keep a close eye on the company's gold!



Reconstruction of the mine manager's house beside the tramway by Robert Kaufman.

Stop 8

Trolleys and tramways – smoothing the way

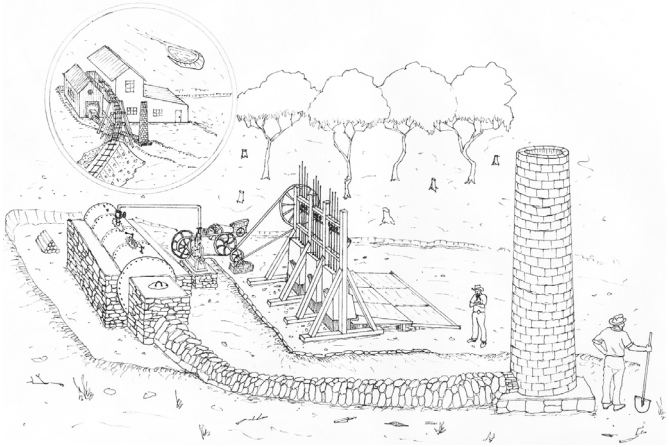
Alongside the mine manager's house was a tramway. Every day, trolleys moved tons of ore from the reef to the crushing plant. The wooden rails have rotted away, but the solid embankment remains. You can still see blocks of quartz on the ground nearby that may have fallen off an overloaded trolley.

Stop 9

The Eureka Consolidated Battery – crushing quartz into dust

Eureka Consolidated's quartz crushing plant operated here in the 1870s. Its foundations can be seen to the left of the track. A steam engine powered a series of pulleys and straps that operated twelve heavy iron hammers that crushed the quartz to dust to extract the gold. Day and night, six days a week, the sound of the battery's stampers would have echoed through the valley. The noise would have been deafening.

As you continue down the track, look for bricks from the boiler's chimney lying across the path.



Reconstruction of the Eureka Consolidated Battery by Robert Kaufman.

If you only want a short walk, turn around here and take the short-cut between the house and the tramway back to the carpark.

Stop 10

The tailings – an enormous pile of dust

What happened to all the quartz dust from the Eureka Consolidated battery?

If you stand near the fence here, you'll be standing on a huge pile of it! A wicker embankment (made of criss-crossed sticks and branches) at the narrowest point of the northern arm of Poverty Gully, trapped the tailings. However, the dam was breached long ago and most of the tailings have washed away.

Stop 11

The Eureka dam – no water, no life!

Water was crucial to life on the diggings, needed by the miners for survival, and also to separate gold from the rocks and soil. After the construction of the water races, water was supplied from the races to the dams. Each battery had its own dam – this one supplied the Eureka Consolidated Battery. Water was released to the crushing works by removing a plug from a hole in the dam wall. You can still see the fine stonework around this outlet.

Stop 12

The ridge – a recovering forest

Box-Ironbark forests once covered 13% of Victoria, but now only 17% of those original forests remain. During the gold rush, the trees at Eureka were felled for building and fuel, and hillsides like this were stripped bare. Remarkably, many native plants survived, and the forest is regenerating.

Eucalypts dominate the upper canopy, with many smaller species of trees and shrubs, like wattles, below. Common trees along the track here include the Long-leaf Box (*Eucalyptus goniocalyx*), Red Box (*Eucalyptus polyanthemos*), and Yellow Box (*Eucalyptus melliodora*).

The leaves of the Long-leaf Box are small and round in young trees and on new shoots (**left**), which is why the tree is also known as the Cabbage Box, but become long, thin and drooping (**right**) in mature trees. The leaves of the Red Box look quite similar to young Long-leaf Box leaves, but have longer individual stalks.

In spring and summer, the forest floor is full of wildflowers, with species like Sticky Everlastings (*Xerochrysum viscosum*), Waxlip Orchids (*Glossodia major*), Leopard Orchids (*Diuris pardina*), Creamy Candles (*Stackhousia monogyna*), Pink Bells (*Tetratheca ciliata*), Black-anther Flax Lilies (*Dianella revoluta*), Chocolate Lilies (*Athropodium strictum*), Tall Bluebells (*Wahlenbergia stricta*), Magenta Stork's-bill (*Pelargonium rodneyanum*) and many others.

Nature's gold at Eureka: **Left** Sticky (also known as Shiny) Everlastings, **Right** Yam Daisy

Yam Daisies (*Microseris lanceolata*), known as *moonar* to the Dja Dja Wurrung, have a small underground tuber which tastes like a sweet radish if eaten at the right time. The Dja Dja Wurrung People actively cultivated them as a food source. Their smooth leaves and bent-over flower buds help to distinguish them from similar plants.

The tussocks of fine grey-green grass here are Red-anther Wallaby Grass (*Rytidosperma pallidum*). It is one of many Australian plants that are stimulated to flower and seed after fire has passed through, displaying bright orange-red anthers in late spring or early summer.

Stop 13

Poverty Gully – looking back through history

Why name somewhere with so much gold 'Poverty Gully'?

It was probably named by early prospectors to discourage their rivals! The south arm of Poverty Gully is one of the most complex mining sites in the Castlemaine Diggings National Heritage Park. As the track continues up the gully, you can find the relics of several waves of mining spanning a century from the 1850s to the 1950s.

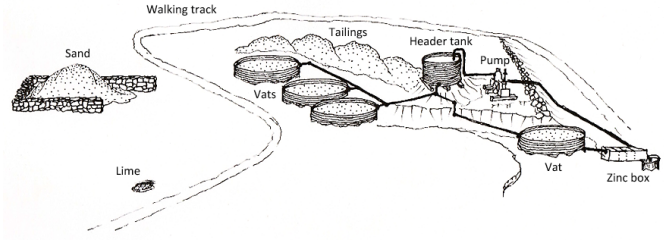
Stop 14

The cyanide tanks – a poisonous past

A cyanide plant was first established at Eureka during the 1890s to extract gold from the tailings of earlier diggings. It was reworked in the 1930s and 1950s when the tanks you can see were used.

Unfortunately, cyanide produces highly toxic mustard gas when combined with arsenic, which gold-bearing rock often contains. Mustard gas can cause severe burns, loss of eyesight, respiratory problems, rashes, blisters and extreme pain. It was used with devastating effects in World War I. To stop the gas from forming lime was added to the tanks. A small heap of this white clay-like material can be seen further along the track.

The tailings were soaked in the cyanide solution in sand-filled vats with a porous base. The dissolved gold passed through the porous base, while the tailings remained above it. This process took about 3 days, so filling the three tanks on consecutive days allowed the tailings to be processed continuously. The dissolved gold passed through charcoal or zinc shavings, forming a layer of slime which turned to liquid when heated in a furnace. It was poured into moulds where the gold reformed, leaving a layer of black glass-like waste on top which could be chipped off and discarded.



Reconstruction of the cyanide plant at Eureka by Robert Kaufman.

Stop 15

An earth-bound chimney – a cost-effective solution

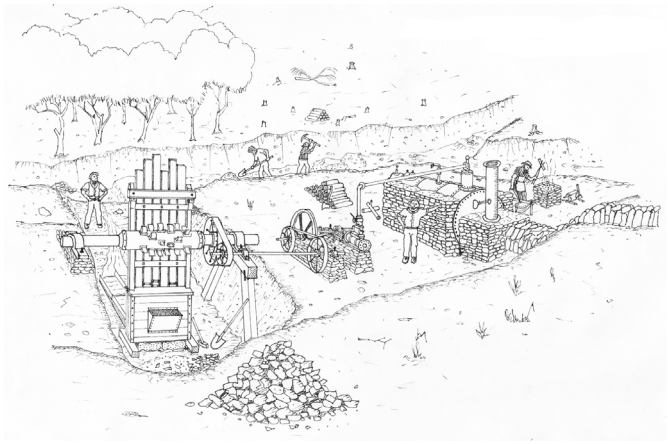
This 'Cornish chimney' is one of the earliest quartz mining relics in Victoria. It dates from the late 1850s when the Phoenix Mining Company (also known as Blight's) battery operated in the gully below.

To avoid the cost and difficulty of building a tall chimney, Cornish miners built tunnels of bricks up the slope of a hill. The smoke drifted up inside the earth-bound chimney and emerged from a small upright section at the top. The small vents you can see were probably used for cleaning.

Stop 16

The Phoenix dam – being reclaimed by nature

This dam wall was probably constructed by the Phoenix Quartz Mining Company in the 1850s, before the system of water races was built, to catch rainwater flowing down the gully. The impressively-constructed stone retaining wall is still visible, but the dam itself has silted up.



Reconstruction of the Phoenix Mining Company (or Blight's) Battery by Robert Kaufman.

Look on the slopes nearby for large Red Ironbark trees, with deeply rutted bark, which attract a wide variety of native birds, like the endangered Swift Parrot (*Lathamus discolor*).

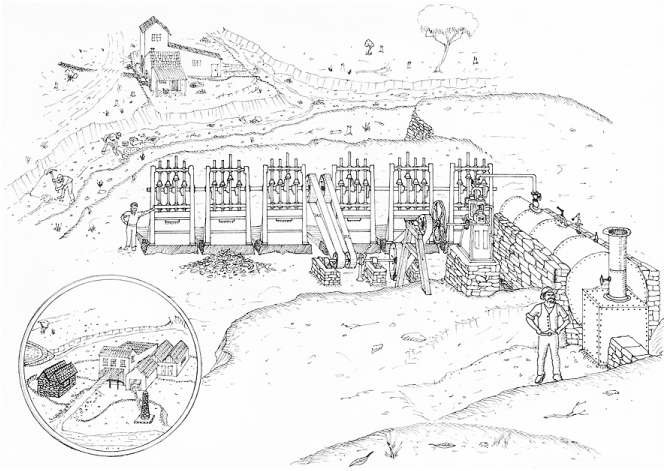
A Swift Parrot feeding on wattle blossoms.

Stop 17

A tall chimney – an expensive endeavour

This is the site of a battery owned by a Mr Harris. On the left of the track as you approach the viewing area, are the brickwork foundations of a blacksmith's workshop. Blacksmiths provided essential services to both miners and farmers – without them, work on the goldfields would have ground to a halt.

To the right of the viewing area are the remains of a vertical chimney, which was once 12m high. It cost £100 to build – a huge sum of money in those days. The battery and stampers were in the gully below.



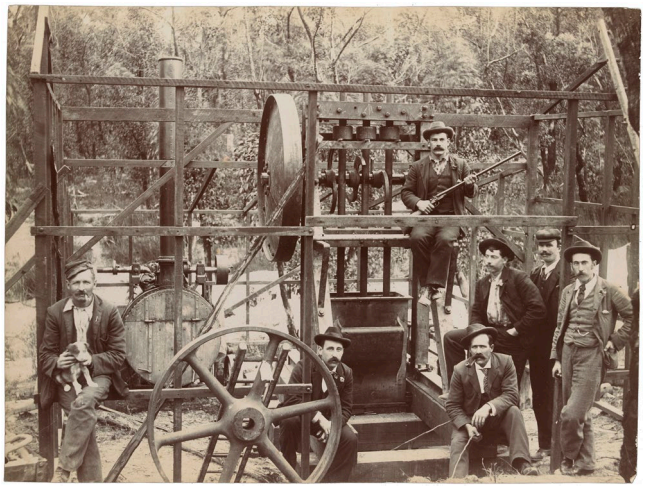
Reconstruction of the Harris Battery and tall chimney by Robert Kaufman.

Stop 18

1930s stamping battery – a relic of the Great Depression

Eighty years after mining began at Eureka, a new battery was built here. In the economic depression of 1889 and the early 1890s, and the Great Depression of the 1930s, prospecting was more appealing than unemployment. Many mines were reopened, although few were profitable.

In the 1930s the sound of ten stamping heads would have echoed through this gully, supported by two blocks of concrete that formed the foundations.

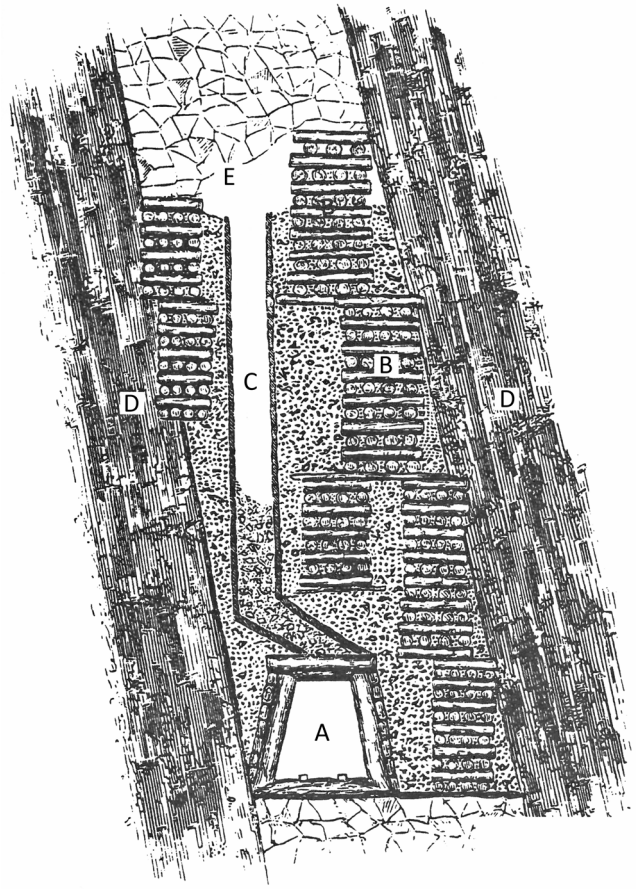


A photo of men at a similar battery on the Mafeking and Mount William goldfields in 1890. Photo by W Hale. Source: State Library of Victoria.

Stop 19

Tunnels and bats – finding a niche below the reef

In the 1930s, this tunnel (known as an 'adit') was dug into the sandstone below Eureka Reef. About 150 metres in, a vertical shaft (a 'stope') was constructed, allowing the reef to be mined from below. To the left of the tunnel is another shaft and a headframe constructed in the 1950s. For safety, both are closed to visitors.



Working a stope: A) the tunnel or 'main drive'; B) supporting stacks of timber and rubble; C) the 'pass' leading to the quartz reef; D) the 'walls' of the reef; E) the quartz reef yet to be mined. Illustration by Robert Avitabile. Source: *Discovering the Mount Alexander Diggings*, Mount Alexander Diggings Committee, 1999.

The tunnel is now a roosting site for the Common Bent-wing bat (*Miniopterus schreibersii*), a small insect-eating bat. The bats are sacred to the Dja Dja Wurrung People, who call them *yaranmillawit*.

Common Bent-wing bat. Photo © Lindy Lumsden.

Just beyond the tunnel and shaft, to the right of the track, is another section of the water race. There would once have been a wooden bridge (also known as a flume or aqueduct) here that carried water across the gully to the race on the southern side. This was later replaced by a 'siphon' (an undergound pipe). There are no pumps involved – just clever engineering and the force of gravity.

Stop 20

The miner's house – a clue to life on the goldfields

The ruins here were once home to a miner, and possibly his family. They remind us of the simple life people lived on the goldfields. The house was about 3m x 2.5m with a chimney at one end – about the size of a bathroom in a modern home.

In 1857, there were around one hundred men and twenty or so families living at Eureka. Regular wages from the mining companies allowed them to build homes and keep food on the table.

Stop 21

The mine shaft – and multiple waves of mining

The Eureka Consolidated Company began a gold mining operation here in 1871. It continued for about seven years and extracted nearly 16,000 tonnes of ore, yielding 175 kilograms of gold (roughly the weight of two adult men). The concrete platform in the car park covers the shaft dug to get to the lower level of the reef, 150m below.

In the 1980s, the shaft was briefly reopened to extract quartz for crushing into chips for the tops of graves. You can still see fine chips of quartz on the ground around you.

There's a hole in the platform big enough to drop one inside. Listen carefully and you can hear how long it takes to reach the bottom.

The quartz mine operating at Eureka in the 1980s and 1990s.
Photo by CE Wilmann, c. 1991.

Acknowledgements

The information in this factsheet and the digital tour was drawn from several sources including:

- *Discovering the Mount Alexander Diggings*, Robyn Annear, David Bannear and Philip Ingamells for Mount Alexander Diggings Committee, 1999
- *Gold Education Kit for Primary Schools,* Ian O'Halloran for Friends of Mount Alexander Diggings Inc., 2002

- *Living Stories of the Victorian Goldfields (Short Films and Podcast Tours),* The Storyteller's Guide to the World and DAZ MEDIA for Mount Alexander Shire & City of Greater Bendigo, 2008

The full *Living Stories of the Victorian Goldfields* podcasts for Eureka Reef can be found here janwositzky.com.au/audiotours/eureka-reef-walking-tour/

Other sites to visit

There are many fascinating sites to visit in the Castlemaine Diggings National Heritage Park, including the nearby Garfield Water Wheel, Monster Meeting site, Spring Gully mine site, Pennyweight Flat Children's Cemetery and the Forest Creek Gold Mine between Chewton and Castlemaine, where you can follow an easy self-guided trail and learn about alluvial gold mining.

Tute's Cottage, in Greenhill Avenue, Castlemaine is a wonderful example of a miners home and garden from the 1850s, and Expedition Pass Reservoir near Chewton is a great spot for swimming, canoeing, fishing or a picnic.

Camping is available at Vaughan Springs, Warburton Bridge and Chokem Flat campgrounds (no bookings or fees, limited facilities). Go to parks.vic.gov.au for further information.

Taking care of the park

The ruins at Eureka are remarkably well-preserved and of enormous national cultural and historic significance. Left undisturbed, they will remain for many future generations to rediscover. You can help protect Eureka Reef by following these simple guidelines:

- Take all rubbish with you for recycling or disposal.
- Fires and firewood collection are prohibited.
- Vehicles, including motorbikes and trailbikes, are only permitted on formed roads, not on walking tracks.
- Aboriginal sites are scattered throughout this landscape. Please tread lightly and be mindful of conserving and protecting these important sites. All artefacts are of cultural significance and protected by cultural heritage laws.
- Please do not touch the ruins or disturb the ground. All plants, animals, historical and archaeological sites and geographic features are protected by law.
- Fossicking, prospecting and digging for gold are strictly prohibited. Penalties apply. The Heritage Act 2017, Section 89 (1) states that "A person must not remove, relocate or demolish, damage or despoil, develop or alter or excavate, all or any part of a registered place." Individuals may be fined 10 penalty units (several thousand dollars), groups or organisations may be fined 20 penalty units.
- Prospectors can access a prospecting map of the Castlemaine area showing where prospecting is allowed from local visitor information centres or parks.vic.gov.au

Safety

Eureka Reef was a heavily mined area and contains a variety of continuing hazards. We recommend that you stay on the path. In addition to uneven ground and shafts, mine tailings may contain the toxic residue of arsenic, mercury, and cyanide. Fortunately, they pose little risk if left undisturbed. If you wish to safely explore mining relics away from formed tracks, we recommend hiring an experienced guide. Enquire at the Castlemaine and Maldon Visitor Information Centres.

Mobile phone reception is patchy at Eureka, and signals often drop out, especially in the gullies. In case of an emergency, the best spots to try and make a call are on higher ground.

Emergency Information

For emergency assistance call Triple Zero (000).

Eureka Reef is in the North Central fire district. Bushfire safety is a personal responsibility. Anyone entering parks and forests during the bushfire season needs to stay aware of forecast weather conditions. Check the Fire Danger Rating and for days of Total Fire Ban at emergency.vic.gov.au, on the VicEmergency smartphone app or call the VicEmergency Hotline on 1800 226 226. No fires may be lit on Total Fire Ban days.

On Catastrophic Fire Danger Rating days this Park will be closed for public safety. Do not enter the Park. If you are already in the Park, leave the night before or as early as possible in the morning. Warnings signs may be erected, but do not expect a personal warning. Check the latest conditions at parks.vic.gov.au or by calling 13 1963.

September 2022.