OCEANAGOLD
WAIHI OPERATION

OceanaGold UPDATE

November 2022

Mining and Subsidence

As a mining company, one of the most common questions we get asked in relation to our underground operations is "but what if it collapses?". This also isn't surprising for Waihi, as the town has had subsidence events in the past due to historic mining practices that were common in their day, such as not backfilling underground voids.

Much like any industry that operates over many decades, mining has changed and developed. The early Martha Mine began operating in 1878, when both New Zealand and the world were very different places. Queen Victoria was the reigning monarch, and our currency was the New Zealand Pound. Rugby had been introduced in 1870, but it would still be another 23 years before the iconic black jersey was formally adopted as the national playing strip. Alexander Graham Bell had only patented the telephone two years prior, and even the very first Ford Model T automobile wouldn't leave their factory for another 30 years.

In 1952 when the historic mine was closed, the pumps were turned off, water returned, and it flooded the underground workings.

Waihi has had three subsidence events; in 1961, 1999, and 2001, which are all related to historic mining (pre-1952). The latter prompted a major investigation which resulted in Hauraki District Council preparing a subsidence report that identifies all of the High Hazard Zones attributable to historic mining, this assessment subsequently led to the closure of part of Seddon Street and the removal of houses from the area we now call Slevin Park.

Subsidence events like this are caused by historic stopes (large cave areas left after gold-bearing rock has been removed) that have not been backfilled. These are deep underground. In some cases, over many decades, the roof of the stope can progressively collapse and the void moves—or migrates—up to the surface. This is what happened in the three subsidence events in Waihi, all of which are related to historic mining (pre-1952).

HDC SUBSIDENCE/HAZARD ZONES REPORT
www.hauraki-dc.govt.nz/our-district/mining/subsidence

Underground Mining Today: So what's to stop history repeating itself?

The voids in our modern underground mines are backfilled. Our Favona and Trio mines have been backfilled, with our Correnso mine currently being progressively backfilled. Our current Martha Underground Project will be too (including some of the pre-1952 voids we are interacting with), as would the proposed Wharekirauponga Underground Mine. The requirement to backfill is a consent condition. Our modern mining method involves working the ore body from the 'bottom up'. As each level of ore is removed it is replaced with rock. Mining machinery drive on and compact the rock to work the next level. By the time the ore body has been mined out, the void has been progressively replaced with compacted rock.

Modern underground mining at Waihi is only undertaken in andesite rock, avoiding younger potentially softer rocks closer to the surface. This is a key control to avoid damaging differential ground settlements (called tilt). There is an extensive network of ground settlement survey markers around Waihi to monitor for any changes in ground movement. On-going survey and groundwater readings have been taken throughout the modern mining period and the results have been reviewed and reported to Hauraki District and Waikato Regional Councils. Monitoring indicates any potentially damaging ground tilt can be effectively mitigated by the controls put in place for modern mining. The monitoring regime will continue and be extended to include coverage for the proposed Wharekirauponga Access Tunnel and Gladstone Open Pit for the Waihi North Project. As has occurred throughout the duration of modern mining, any identified anomalies in the survey and monitoring data will be investigated and, should the need arise, appropriate mitigation will be implemented.

ASK THE EXPERTS ABOUT: Blast Vibration — Waihi North Project

DR JOHN HEILIG
Owner, Heilig & Partners
Doctorate in Engineering, RPEQ

HEILIG & PARTNERS
Engineered Excellence

Blasting required as part of the Waihi North Project would be subject to a number of conditions. These conditions would appropriately combine the requirements of protecting the amenity of the residents of Waihi and preventing damage to buildings or disturbance of the natural environment in other areas, whilst also allowing for a scaleof drilling and blasting appropriate for mining.

On the 29th of November between 9:00 am and 2:00 pm, Dr John Heilig will be available in our Project Information Office at 86 Seddon Street, Waihi, to answer any questions you might have on blast vibration relating to the Waihi North Project.

Dr John Heilig, owner of Heilig & Partners, has consulted on more than 1,500 projects involving both large and small companies, private and government groups, quarries, mines, and civil companies in New Zealand, Australia, Asia Pacific, South Africa, North America, and Europe.

A NUMBER OF TIMES ARE AVAILABLE, BUT BOOKING IS ESSENTIAL. Bookings can be made via 0800 924 444, waihi.info@oceanagold.com or by visiting the Project Information Office. 86 Seddon Street, Waihi.

Investing in Our Host Community

SPONSORSHIP APPLICATION FORM
www.waihigold.co.nz/sponsorship-donations

SPONSORSHIPS AND DONATIONS APPROVED IN THE PREVIOUS MONTH

The Friends of the Otahu Catchment for Water sample analysis.	$740.00
Waihi Bowling Club for tournament prizes.	$600.00
Waihi Miners Inline Hockey Club for uniforms for three youth players.	$1,500.00
Waihi Salvation Army Christmas hampers for families in need.	$7,000.00
	Total = $9,840.00

IF YOU HAVE ANY QUESTIONS OR CONCERNS, PLEASE CONTACT US.
Community Engagement Line: 0800 924 444 | Project Information Office: 86 Seddon St., Waihi.
Email us via our website: www.waihigold.co.nz

NOTE: WE ARE NOT CURRENTLY BLASTING IN THE MARTHA OPEN PIT. CHANGES TO THIS WILL BE NOTIFIED.