



Vibration Summary Report

Fourth Quarter 2022

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Summary

- Results from the Envirohub vibration monitoring system for the fourth quarter of 2022 are reported for the Favona, Trio, Correnso, SUPA and Project Martha Underground Mines.
- Development and production blasting continued in the Martha Underground component of Project Martha. There were no blasts in Correnso. Mining in Favona and Trio has ceased.
- Compliance for Project Martha/SUPA blasting was achieved during the quarter. The maximum vibration recorded during the quarter was 7.80 mm/s.
- Seven vibration-related complaints were received during the reporting period, up from the two received in the previous quarter. The number of complainants also increased; five during the quarter cf. two in the previous period.
- The total number of blasts (888) was lower than the previous quarter (1018). The number of blast events was similar to the previous quarter (160, cf. 161 in the previous quarter).
- A security update caused a communications loss between vibration monitors and the Envirohub system. Vibration results were downloaded manually during this time.

1. Introduction

This report documents vibration measurements and assessments to meet the requirements of:

- a) Hauraki District Council (HDC) LUC No. 97/98-105 (Condition 3.11) for the extended Martha Mine Project.
- b) HDC Land Use Consent 85.050.326E (Condition 24) for the Favona Underground Mine.
- c) HDC Land Use Consent RC - 15774 (Condition 9) for the Trio Underground Mine Project.
- d) HDC Land Use Consent RC – 202.2012 (Condition 22 (f)) for the Correnso Underground Mine.
- e) HDC Land Use Consent RC – 202.2016 (Condition 14 (f)) for the Slevin Underground Mine (SUPA).
- f) HDC Land Use Consent RC – 202.2017 (Condition 18 (f)) for the Martha Drill Drive Project (MDDP), Condition 18 (f) for MDDP has been assumed by Project Martha below (g).
- g) HDC Land Use Consent LUC 202.2018.857.1 (Condition 53) for Project Martha.

As agreed between OceanaGold and HDC these reports summarise vibration results and general performance of the monitoring system over calendar quarters rather than the dates set out in the consents.

2. Equipment

“Envirohub”, the vibration monitoring system, has been used for reporting purposes, providing real-time monitoring, recording and review of results on a website. Access to the website is controlled, with permissions for review provided to HDC staff and OceanaGold users. The system is set with trigger levels between 0.40 and 0.75 mm/s for Martha and Underground operations.

The Project Martha vibration monitoring network comprises 12 monitors (some shared with the Correnso network). These all have a trigger limit currently set at 0.75 mm/s. Any blasts fired during the period (highlighted in red) and the monitor locations are shown in Figure 1. SUPA utilises some monitors from the Correnso network and some from the Project Martha network, with the data incorporated into a database shared with Project Martha.

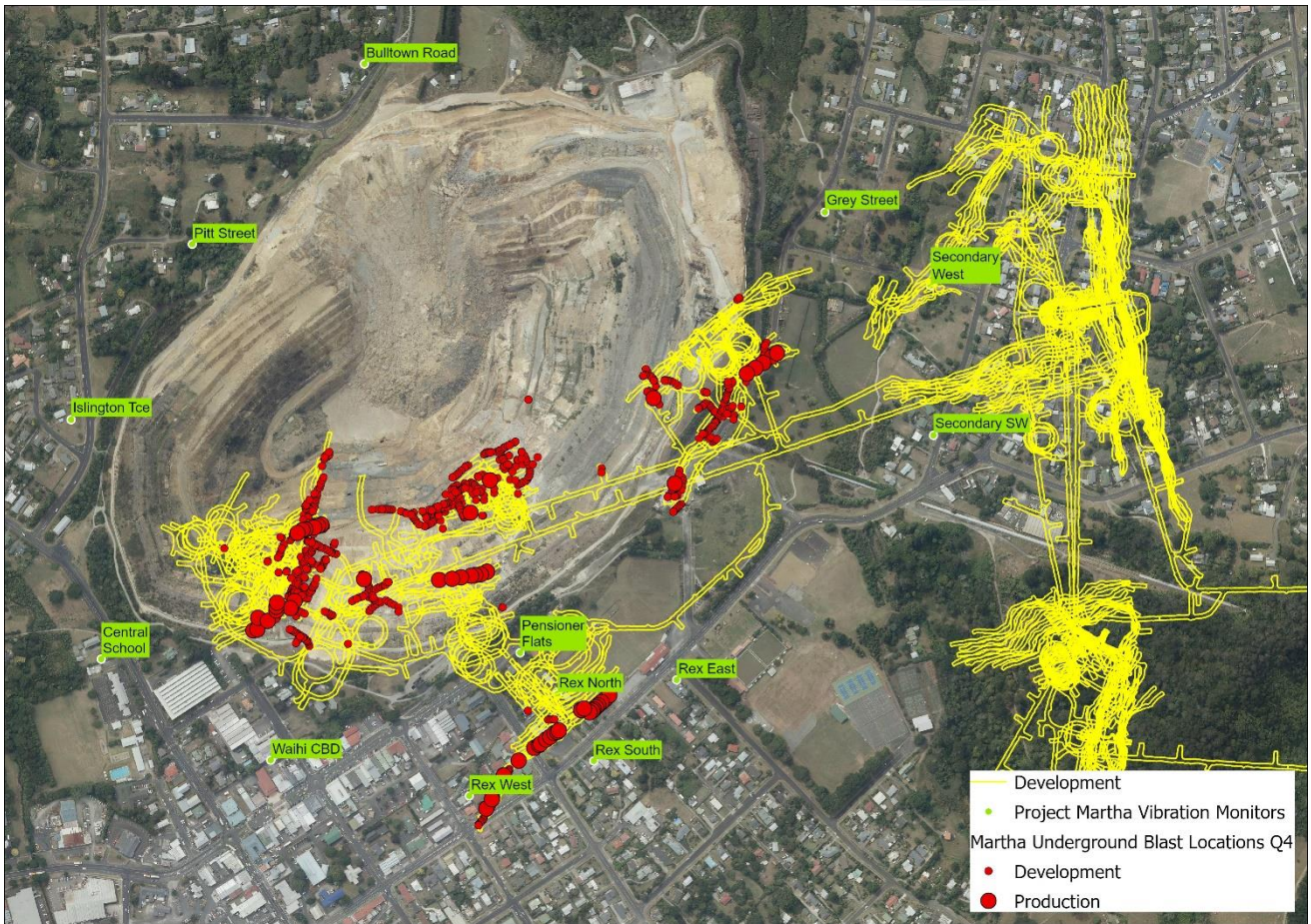


Figure 1. Vibration Monitor & Blast Locations – Project Martha, SUPA

Note: Larger icons indicate production blasts

The Trio Underground Operations have five compliance monitoring locations situated at Boyd Rd, Moore St, Clarke St, the Coreshed (Barry Rd) and the Scout Hall (Baker St). In addition to these, one other monitoring location is located near the Trio vent shaft (Trio VS). As there is currently no mining being undertaken in the Trio Project area, vibration monitors are not installed at these locations, but the infrastructure remains so monitors can be reinstalled should work in the Trio area recommence. Monitoring locations are shown in Figure 2.

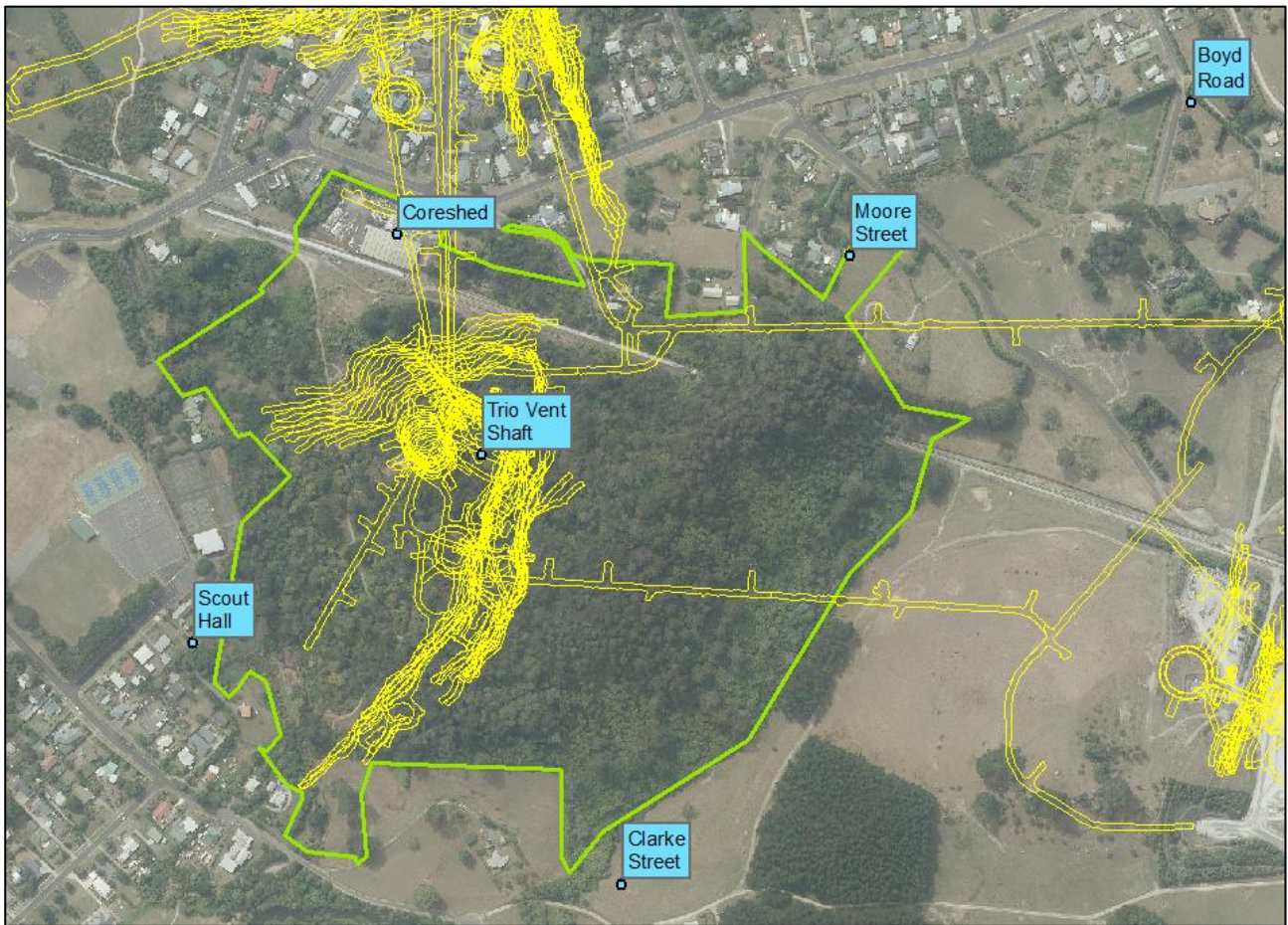


Figure 2. Vibration Monitor Locations – Underground Operations (Trio)

The Correnso Underground monitoring network comprises 7 permanent vibration monitors (previously 10). Approval from HDC was obtained to discontinue monitoring at 3 locations within the Correnso network earlier in 2022. The remaining 7 monitors all have a trigger limit currently set at 0.75 mm/s. Monitor locations are shown in Figure 3.

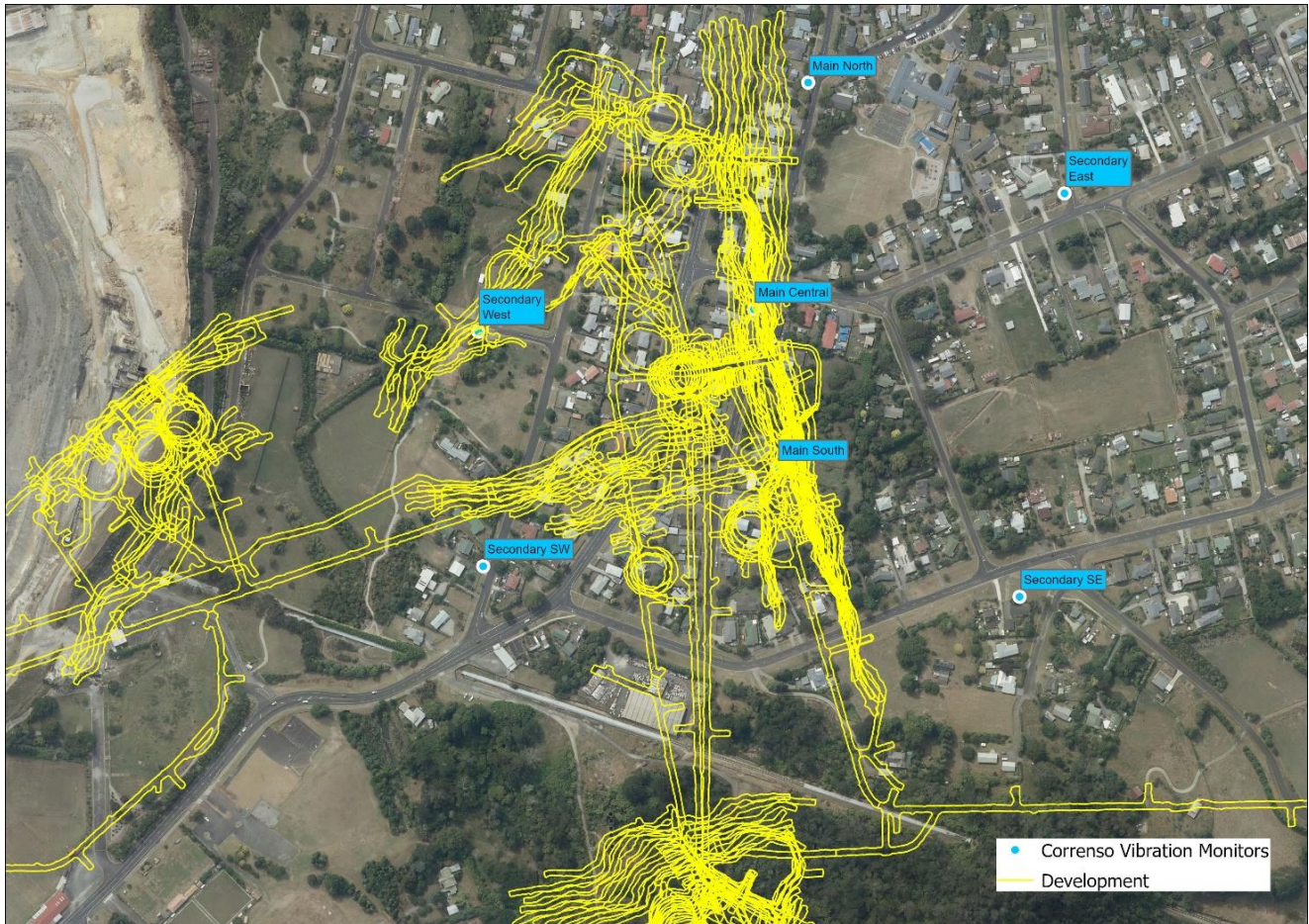


Figure 3. Vibration Monitor Locations – Correnso

3. Calibration

Calibration of monitoring equipment, including the roving monitors, is completed on a six-monthly rotation to allow enough coverage of vibration monitoring while calibrations take place. A six-monthly calibration run was undertaken in Q3 of 2022. Calibration certificates can be viewed on Envirohub; refer to the monitoring results during those periods. The calibrations were undertaken by the Saros Group Pty Ltd in Queensland and conducted in accordance with AS/NZS ISO9000-2000 and AS ISO/IEC17025-2005 quality standards.

4. Compliance Assessment

Table 1 sets out the consented compliance limits for blast magnitude (peak particle velocity - vector sum) for Correnso and Project Martha, and the corresponding vibration results, reported as of the last day of the quarter (31 December 2022). Compliance with all limits was met throughout the quarter. There were an insufficient number of blasts in the previous six months to calculate average and 95% numbers for Correnso, furthermore, no Correnso blasts occurred in quarter 4.

Table 1. Compliance Assessment Table for Correnso and Project Martha Q4 2022

	Consented Compliance Limit	Q4 Results - Correnso	Q4 Results - Project Marta
Development 95%*	5 mm/s	No blasts	2.55 mm/s
Development Average*	2 mm/s	No blasts	0.82 mm/s
Production 95%*	5 mm/s	No blasts	3.78 mm/s
Production Average*	3 mm/s	No blasts	1.35 mm/s
Maintenance/Safety	1 mm/s	No blasts	No blasts

Note: Data is presented as at the end of the quarter

* six month rolling limit

4.1 Project Martha

160 blast events occurred in Martha Underground during the reporting period (cf. 161 in the previous quarter), with 63 triggering compliance monitors.

Of the 888 individual blasts during the period:

- 823 were development blasts
- 65 were production blasts

The peak vibration levels for Martha Underground Operations (both production and development) during the quarter are shown in Figure 4 below.

Development:

- The highest six-month average¹ for development blasting at a compliance monitor was assessed as 0.82 mm/s REX West, below the consent limit average of 2mm/s.
- The development six month rolling 95 percentile¹ for all locations was assessed as 2.55 mm/s, below the 5mm/s limit.
- No Martha Underground development blast events recorded vibration levels above 5 mm/s during the period.
- One Martha Underground development blast was fired outside of the standard hours permitted by Condition 31 of Land Use Consent 202.2018 on 17 December 2022.

Production:

- The six-month average² for production blasting at a compliance monitor was assessed as 1.35 mm/s at West, below the consent limit average of 3 mm/s.
- The production six-month rolling 95 percentile¹ for all locations was assessed as 3.78 mm/s, below the 5mm/s limit.
- Three Martha Underground production blast events recorded vibration levels above 5 mm/s during the quarter.
- The highest level of vibration recorded during the quarter for production blasting was 7.80 mm/s at the Rex West monitor on 21 October 2022.

No maintenance/safety blasts were required in Martha Underground during the period and there were no blasts on Sundays or public holidays.

¹ Data is presented as at the end of the quarter

² Data is presented as at the end of the quarter

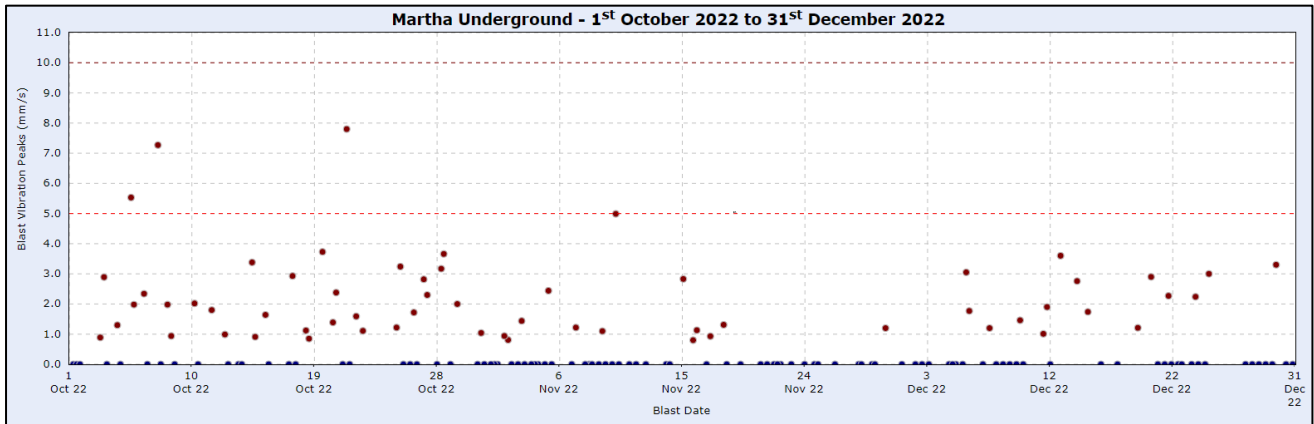


Figure 4. Maximum Peak Vibration Levels (Production and Development) – Martha Underground/SUPA Operations

4.2 Underground (Favona & Trio) Operations

Mining plans for Trio were exhausted in the first quarter of 2020, and no blasting occurred during the reporting period. Likewise, no blasting was undertaken within Favona.

4.3 Correnso

No blasts were undertaken within the Correnso Project area during quarter 4 of 2022.

5. Blasting

The 160 blast events during the period was a similar number to the previous quarter (Table 2).

Table 2. Quarterly blast events

Operation	1 st Quarter 2022	2 nd Quarter 2022	3 rd Quarter 2022	4 th Quarter 2022
Martha Underground	109	161	160	160
Underground (Trio)	0	0	0	0
Correnso/SUPA	15 (1 independent)	0	4 (1 independent)	0
Total	110*	161	161*	160

*Some blasts occurred simultaneously with blasting in other operational areas and did not contribute to the total number of blast events. Trio and Correnso events only contribute to the total when they are independent of Martha Underground.

Multiple blasts may be fired during the one blast event. There were 888 sub-blasts initiated within 160 blast events during the reporting period (Figure 5).

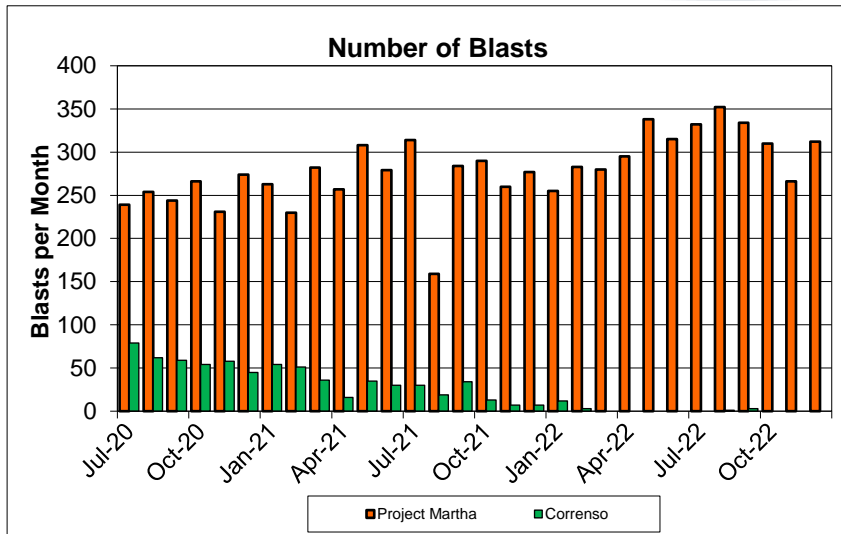


Figure 5. Number of Blasts (Project Martha and Correnso)

6. Complaints

Seven vibration-related complaints were received during the reporting period, up from 2 received in the previous quarter (Figures 6 & 7). The number of complainants also increased; five during the quarter cf. two in the previous period. Table 3 provides a summary of the complaints received during the quarter.

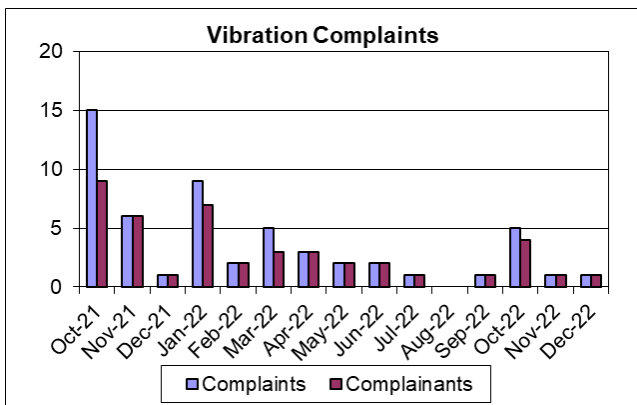


Figure 6. Number of Complaints & Complainants

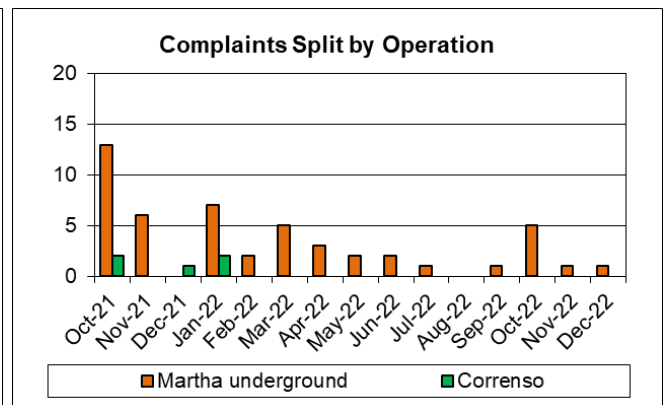


Figure 7. Complaints by Operation

Table 3. Summary of vibration complaints registered by OceanaGold

Date	Location	Nearest Monitor	Vibration nearest caller (mm/s)	Maximum vibration (mm/s)	Monitor with Max Vibration
6/10/2022	Johnston St	Rex West	6	5.53	Rex West
7/10/2022	Johnston St	Rex West	7.3	7.27	Rex West
7/10/2022	Johnston St	Rex West	7.3	7.27	Rex West
21/10/2022	Johnston St	Rex West	7.8	7.80	Rex West
27/10/2022	Kenny St	Rex West	2.8	1.51	Rex South
10/11/2022	Johnston St		-	-	-
7/12/2022	Kenny St	Rex South	2.1	3.05	Pensioner Flats

7. Vibration and Complaint Management

7.1 Vibration Management

During the quarter a security update caused a communications loss between vibration monitors and the Enviohub system. Vibration results were downloaded manually from monitors in the field during this time so no data loss occurred. The issue was resolved and the system fully functioning within the quarter.

7.2 Roving Monitoring

Roving monitoring was undertaken at two properties on Phillips Lane during the period. Heilig and Partners are analysing the results collected. These results will be reported to the Council once analysis is complete.

7.3 Mitigation Actions

Mitigating actions were required in relation to the three high level blasts recorded at the Rex West monitor during the quarter. These mitigation actions included:

- Lowering blast charge weights to reduce the likelihood of further high level blasts.
- Burden and spacing of (distance between holes) was reviewed.
- Increased supervision whilst charging holes.