

## Monthly Report on Filled/Unfilled Stopes and Seismic Monitoring

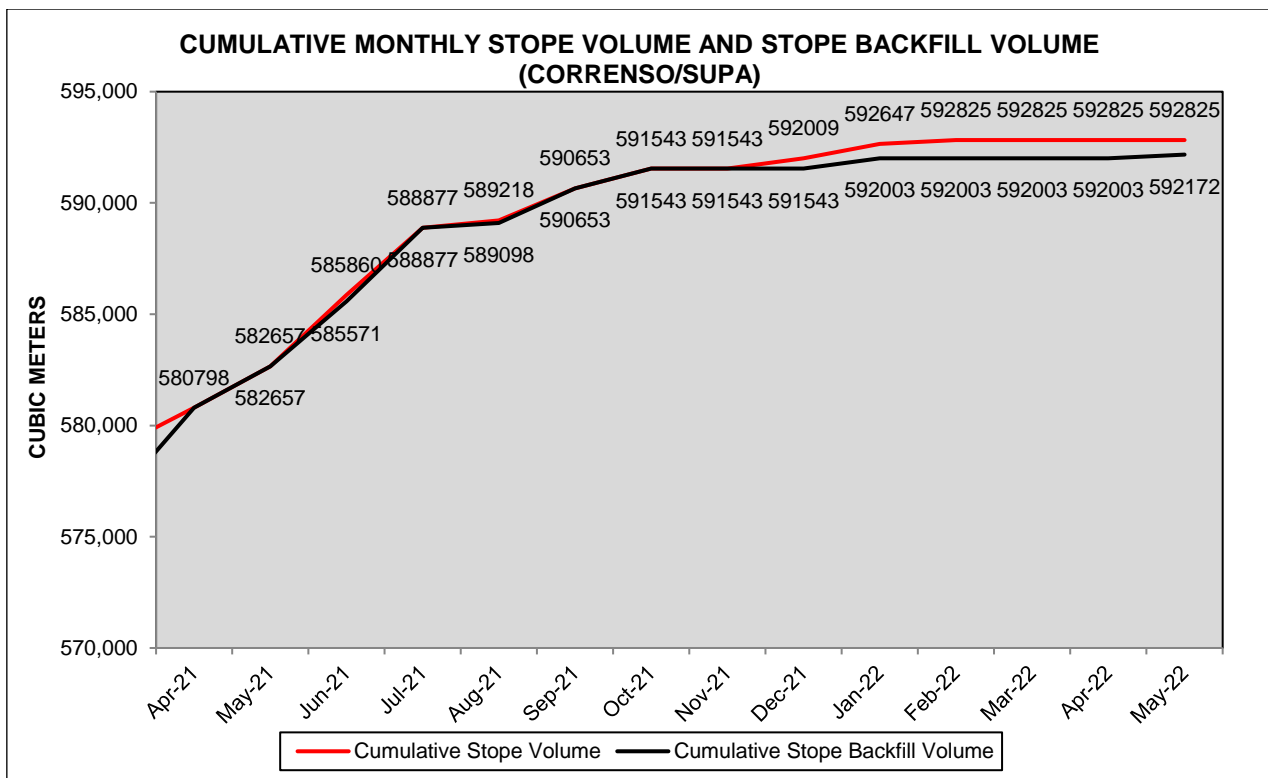
Hauraki District Council Land Use Consent 202.2012 (Correnso) requires monthly reporting of total stope volume and filled stopes for each mining method (Condition 26(a)) and any anomalous results from seismic monitoring and rock movement monitoring (Condition 26(b)).

Hauraki District Council Land Use Consent 202.2016 (SUPA) requires similar reporting of stope volumes and filled stopes (Condition 20(a)) and for seismic monitoring and rock movement monitoring (Condition 20(b)). In addition, Condition 20(a) also requires reporting relating to safeguards around proximities to historic workings.

Hauraki District Council Land Use Consent 202.2018 (Project Martha) similarly requires reporting of void and stope volumes, seismic and rock movement monitoring and reporting relating to safeguards around proximities to historic workings (Condition 75). Additionally, Condition 75 requires reporting of the volume of fill used to fill historic unfilled voids.

Refer Appendix for full transcripts.

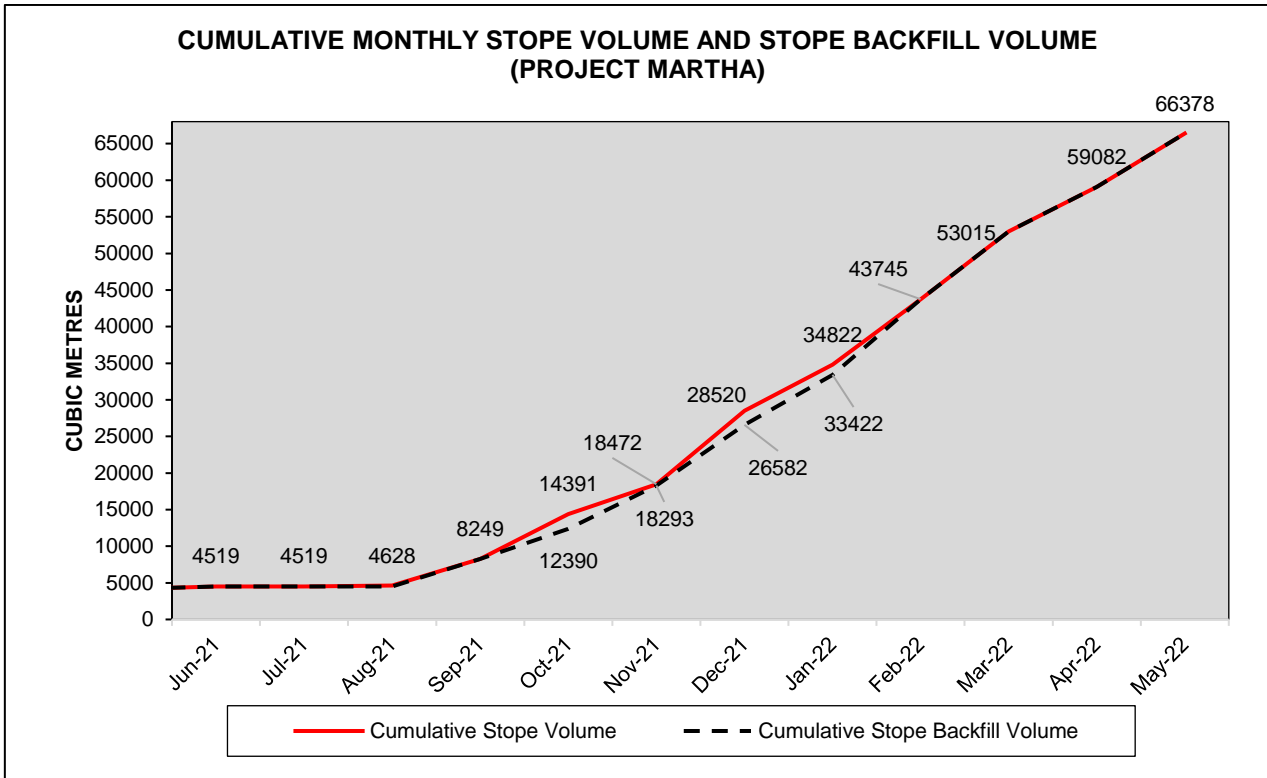
### Filled/Unfilled Stopes (Correnso/SUPA)



	Cumulative Stope Volume (m³)	Cumulative Backfill Volume (m³)	Month End Voids (m³)
June 2021	585860	585571	288
July 2021	588877	588877	0
August 2021	589218	589098	120
September 2021	590653	590653	0
October 2021	591543	591543	0
November 2021	591543	591543	0

December 2021	592009	591543	466
January 2022	592647	592003	644
February 2022	592825	592003	821
March 2022	592825	592003	821
April 2022	592825	592003	821
May 2022	592825	592172	652

**Filled/Unfilled Stopes (Martha Underground)**



	Cumulative Stope Volume (m <sup>3</sup> )	Cumulative Stope Backfill Volume (m <sup>3</sup> )	Month End Voids (m <sup>3</sup> )	Cumulative Historic Void Backfill Volume (m <sup>3</sup> )
June 2021	4519	4519	0	1346
July 2021	4519	4519	0	2098
August 2021	4627	4519	108	4486
September 2021	8249	8249	0	4486
October 2021	14391	12390	2000	4486
November 2021	18472	18293	177	4486
December 2021	28520	26582	1937	11353
January 2022	34822	33422	1400	13220
February 2022	43745	43745	0	13220
March 2022	53015	53015	0	13220
April 2022	59082	59082	0	13311
May 2022	66378	66378	0	13311

Explanatory notes:

1. At the end of each month, cumulative void volumes will vary per the production cycle and the remaining open stopes at that time.
2. No stoping was completed in Correnso/SUPA during the month. 7,295 m<sup>3</sup> was undertaken in Martha Underground.
3. 652 m<sup>3</sup> of stopes were open at the end of the month in Correnso, no stopes were open in Martha Underground.
4. No of historic voids were backfilled during the month.
5. A limited amount of mining in the Correnso Upper and Louis West areas remains.

6. The main mining method used to date in Correnso, SUPA and Martha Underground has been Modified Avoca. A limited amount of material has been extracted using an Overhand Cut and Fill method in Correnso. As the volumes associated with this method are comparatively small, reporting of cumulative totals for both methods has been combined in this report.

## **Anomalous Results from Seismic Monitoring or Rock Movement Monitoring**

### **Seismic Monitoring**

The purpose of the seismic system is to monitor seismic rock mass response to mining activity in and around active mining areas. The current seismic system is able to record events at least as small as ML = -3.0 in the identified critical areas. The agreed critical magnitude is ML = -0.5.

Anomalous seismic behaviour of the closure pillar that must be reported to the HDC is defined as:

- Event magnitudes exceeding ML = -0.5.
- An increase in released seismic energy that does not subside after two weeks.

The current geophone locations are listed below.

Underground seismic sensor locations, coordinates and sensor details highlighted in Table 1, Figure 1 and Figure 2:

**Table 1: Seismic Sensor locations and details**

Name	East	North	RL	Type	Location
<b>S2</b>	396513.4	643183.4	798.9	Uni-axial	823 COR SP1
<b>S6</b>	396397.3	643275.1	831.2	Uni-axial	844 SP
<b>S7</b>	396484.8	643260.4	940.7	Uni-axial	942 COR ACC
<b>S9</b>	396422.8	643249.3	883.9	Tri-axial	882 COR DEC
<b>S10</b>	396494.3	643130.9	932.7	Uni-axial	972 RAD
<b>S21</b>	395321.9	642792.6	951.3	Uni-axial	EDW 007 SAC
<b>S22</b>	396039.3	643121.9	917.7	Tri-axial	920 EMP DEC ACC
<b>S23</b>	395618.9	642743.9	887.5	Tri-axial	ROW 11 DEC/INC
<b>S24</b>	395903.4	642787.0	917.3	Uni-axial	REX ACC SP3
<b>S25</b>	395721.0	642944.2	782.5	Tri-axial	800 SP5
<b>S26</b>	395528.3	642859.5	792.8	Tri-axial	EDW 800 - RB DOWN

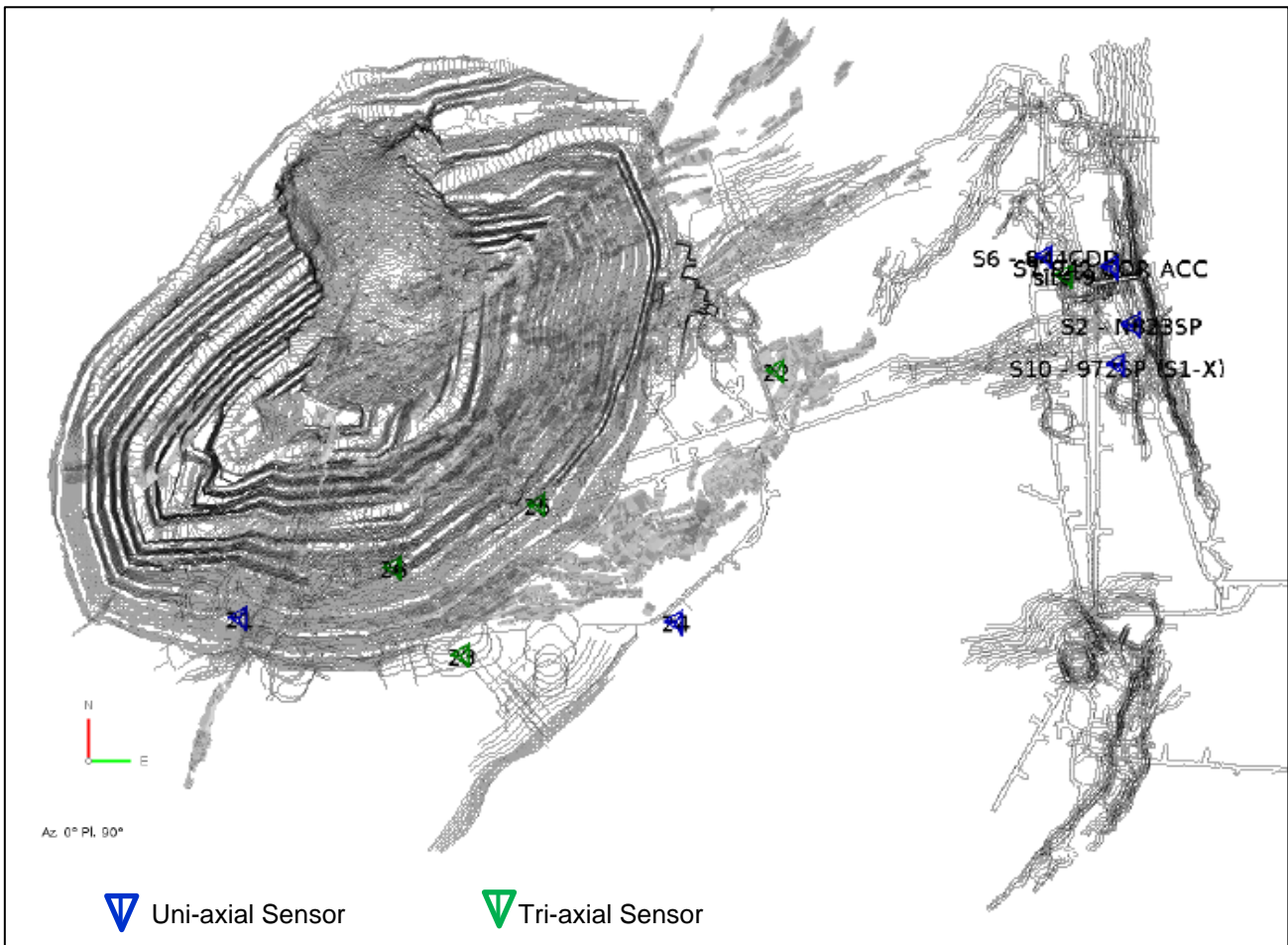


Figure 1: Plan view micro-seismic sensor locations

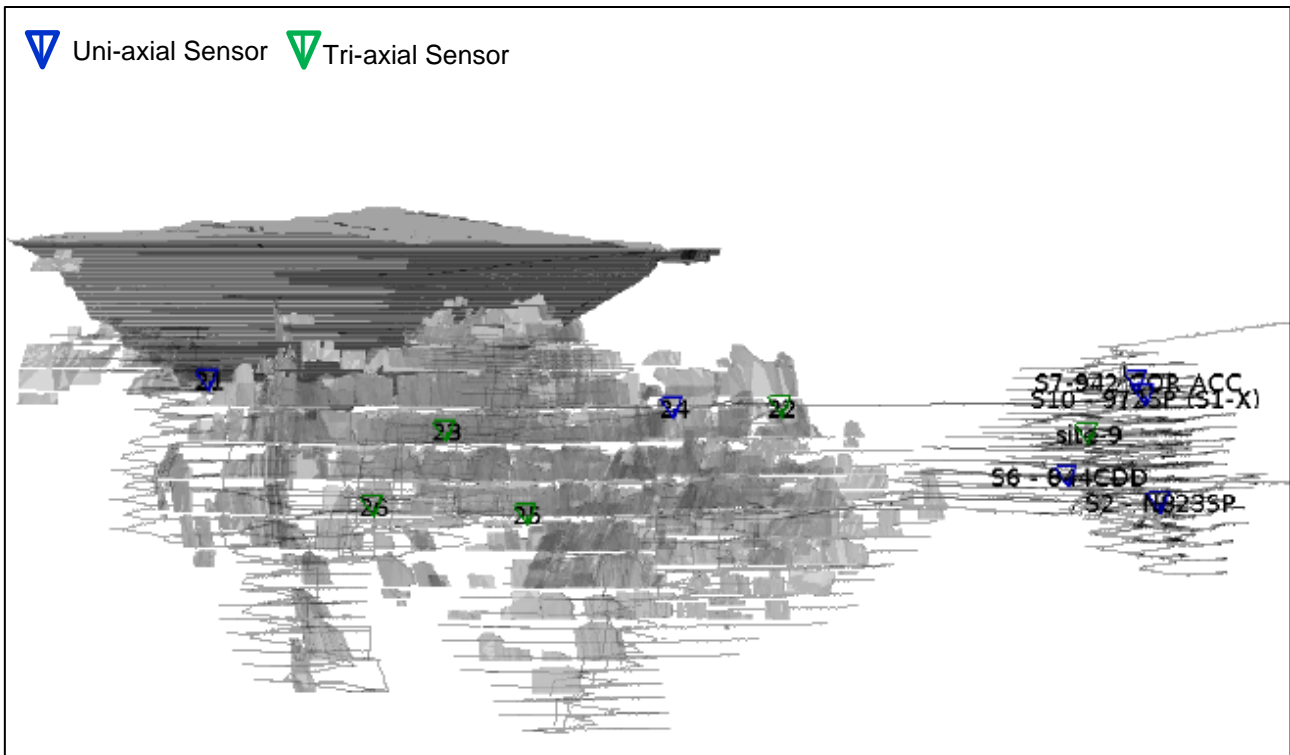
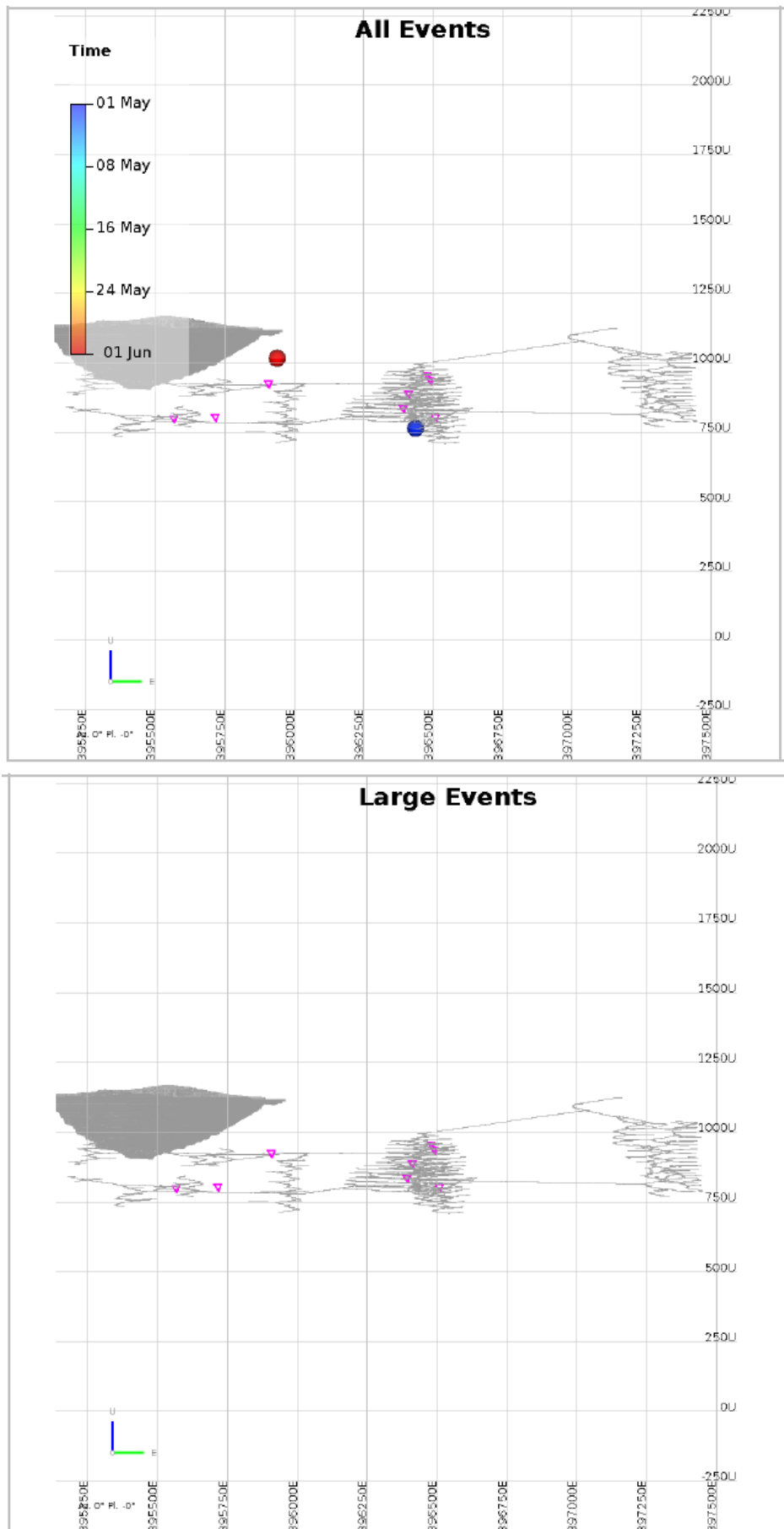
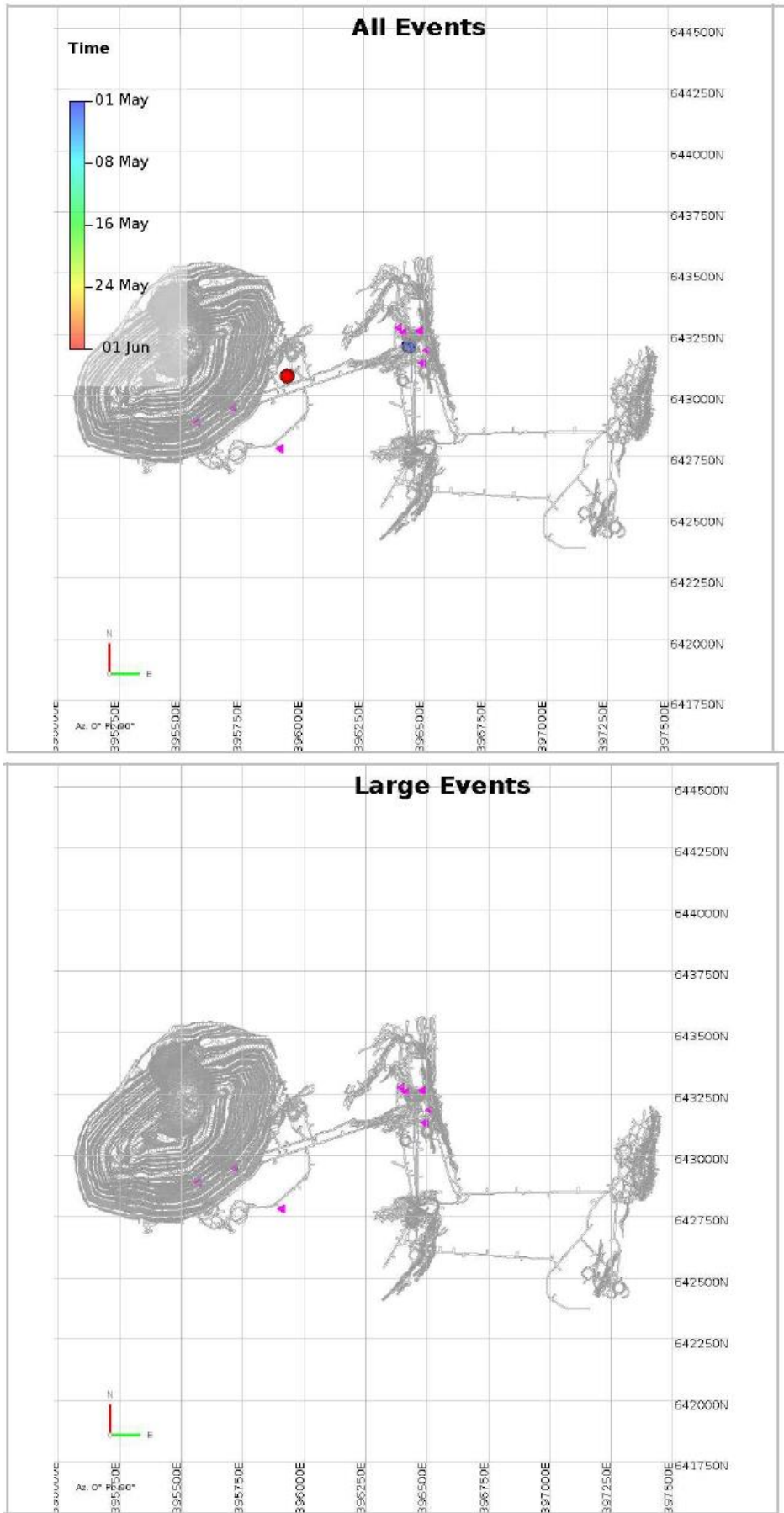


Figure 2: Section view north showing distribution and location of sensors



**Figure 3:** Sections showing location of triggered events & reportable events (> M-0.5 - None) during MAY 2022



**Figure 4: Plan View showing location of triggered events & reportable events (> M-0.5 - None) during MAY 2022**

**Results:**

There were no reportable mining induced seismic events during May 2022. Overall seismicity continues to remain low. Two filtered events (M -2.4 & M -2.8) were recorded these event locations are highlighted in Figure 3 & 4. Cumulative events and Potency is summarized in Figure 5.

System health remains at 100% throughout the month of May.



**Figure 5** Cumulative Number of Events vs Cumulative Potency and recorded events over reported period

**Seismologist Comments:**

Only two small events this month and the system health has improved during the second half of the month.

**Interpretation and or mitigation required:**

None.

**Extensometer / Deformation Monitoring**

There are no extensometers currently in operation Underground. Clock-its are installed whenever possible if drives pass over the top of historical voids even though the historical drive dimensions are so limited that the risk of any cave propagation is very small. Two clock-its and a bucket-monitor are installed in the 800 Edward Incline to monitor above a historical drive (dimensions 2 m x 2 m) about 10 m below the Incline. There has been no movement on any of the monitors.

**Other Monitoring**

Six slough meters monitor the Rex Access through the section where it crosses over the top of the Royal stopes. The slough meters are configured to give coverage over approximately 70 m of the Access representing the full horizontal extent of the north-dipping stopes. Slough meters have all anchors intact indicating no subsidence or collapse propagation is occurring in this section of the historical workings.

**Probe Drilling (SUPA Consent RC-202.2016 c.20a)**

Probe drilling for Correnso/SUPA is now complete. Reporting of probe drilling meters is not required by Project Martha Consent RC-202.2018 but is reported here for continuity.

**Probe Drilling for the Month (Project Martha)**

Total probe drilling for April 2022: 1745.4m

## **APPENDIX 1 – CONSENT CONDITIONS**

### **HDC LAND USE CONSENT No. RC-202.2012 (Correnso)**

#### 26 Reporting on Filled/Unfilled Stopes and Seismic Monitoring

- a) The consent holder shall report to the Council on a monthly basis on the total stope volume and volume of fill stopes for that month for each mining method employed namely: cut and fill area, transverse stope area: and all Avoca areas combined. The report shall be in a form acceptable to the Council and the data shall be for the situation at the 20th day of the reporting month. The report shall be delivered on or before the end of the calendar month covered.
- b) The consent holder shall report to the Council on a monthly basis detailing any anomalous results from the seismic monitoring and rock movement monitoring required by Condition 23. The report shall be delivered on or before the end of the calendar month covered.

### **HDC LAND USE CONSENT No. RC-202.2016 (SUPA)**

#### 20 Reporting on Filled/Unfilled Stopes and Seismic Monitoring

- a) The consent holder shall report to the Council on a monthly basis on the total stope volume and volume of filled stopes for that month for each mining method employed. This shall include volume of voids created, the volume of fill in voids that have been created and the volume of fill in surveyed unfilled historic voids. each stope mined during the month where adjacent to an unfilled historic stope void. The report shall be delivered on or before no later than 10 working days after the end of the calendar month covered.
- b) The consent holder shall report to the Council on a monthly basis detailing any anomalous results from the seismic monitoring and rock movement monitoring required by Condition 23. The report shall be delivered on or before the end of the calendar month covered.

### **HDC LAND USE CONSENT No. RC-202.2018 (Project Martha)**

75. The consent holder shall report to the Council on a monthly basis on the total stope volume and volume of filled stopes for that month for each mining method employed. This shall include the volume of voids created, the volume of fill in voids that have been created and the volume of fill in surveyed unfilled historic voids (including the volume of fill up to 30 m below the toe of the Phase 4 Cutback). The report shall be in a form acceptable to the Council and the data shall be for the situation as at the 20th day of the reporting month. The report shall be delivered no later than 10 working days after the end of the calendar month covered.

The consent holder shall report to the Council on a monthly basis detailing any anomalous results from the seismic monitoring and rock movement monitoring required by Condition 71. The report shall also report against the stand-off distances specified within the Void Management Plan required by Condition 72 (where applicable). The report shall be delivered no later than 10 working days after the end of the calendar month covered.

*Note: Mining statistics are already recorded on a calendar month basis. For practicality and consistency, it was agreed that the reporting above would be for monitoring during the calendar months and the situation at the end of the month, with the report to be delivered on or before the 10th of the following month.*